AIR DEFENSE ARTILLERY

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32nd AADCOM Report — Page 31

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Professional Bulletin of United States Army Air Defense Branch
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ADA Board

"On the Testing Front," Page 16, is the first of a two-part series on the U.S. Army Air Defense Artillery Board and weapon system testing.

FEATURES

Army Picks ADATS 10
On the Testing Front 16
Hawk and Patriot, the Mix that Wins 22
Patriot Users Meet Patriot Makers 28
The Changing Face of 32nd AADCOM 31
Stinger Operators Join in Test 36
Recognition List Grows 38
Study Group Shares Vision of ADA WO Future Role 40
Every Commander's Duty 45

DEPARTMENTS

Intercept Point 1
NCO to NCO 3
Vapor Trails 5
ADA Career News 48
First to Fire News 51
Letters to the Editor 57

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Intercept Point

by Maj. Gen. Donald R. Infante
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ADATS Key Players Pull Off Miracle

On August 26, 1985, the Sergeant York program was canceled. On November 30, 1987, the Army announced the selection of ADATS as the winner of its line-of-sight forward (heavy) (LOS-F-H) competition. Both historical events for our Army. Both historical events for Air Defense Artillery. Worth some discussion and reflection.

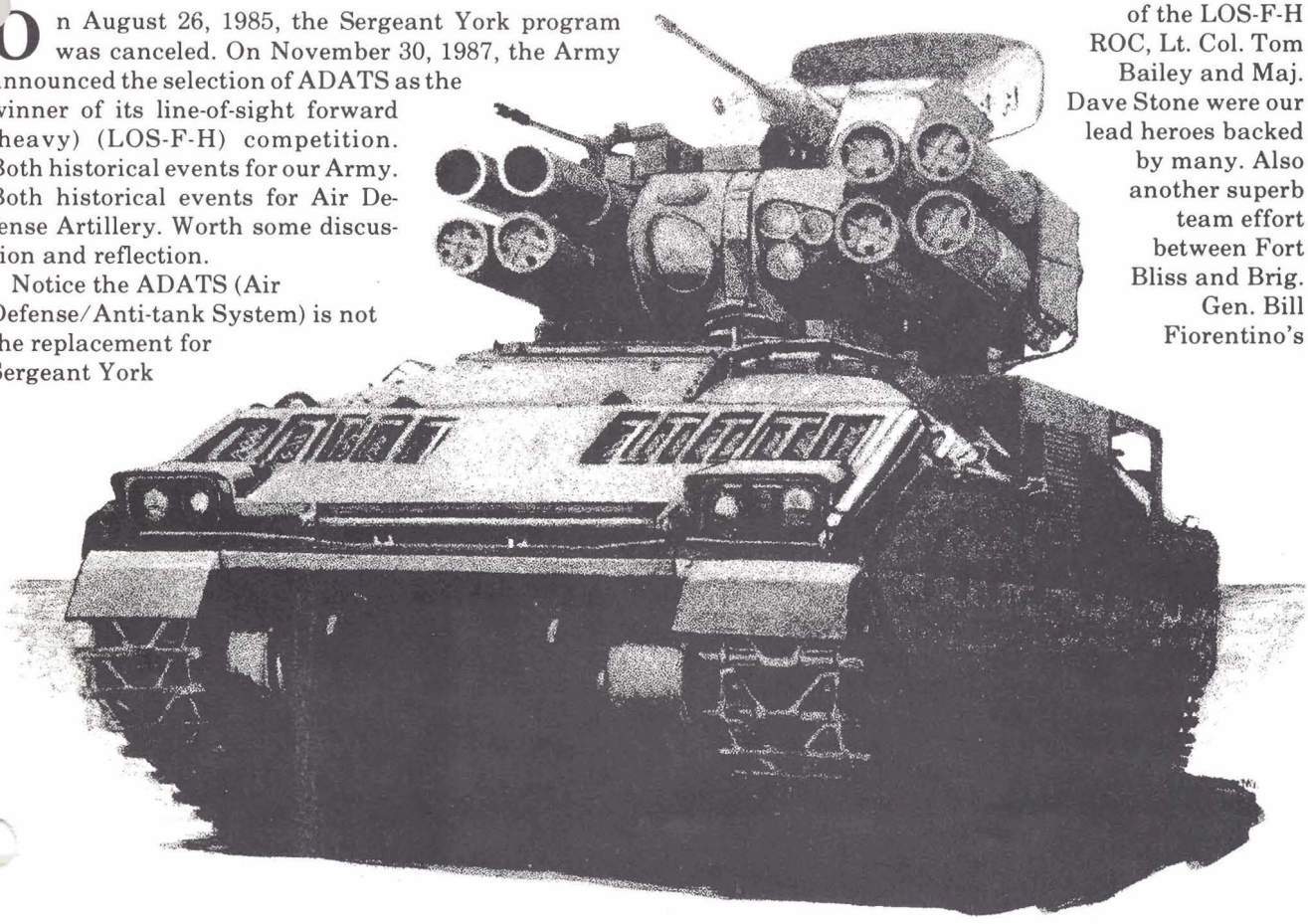
Notice the ADATS (Air Defense/Anti-tank System) is not the replacement for Sergeant York even though it will fight in the same environment and counter basically the same threat. The system is described in detail in "Army Picks ADATS" on page 10. Let there be no doubt, however, the Sergeant York replacement is the forward area air defense (FAAD) system of systems. However, the key component of the FAAD system of systems is LOS-F-H.

Sergeant York was one system against multiple threats. Sort of like in football asking a lineman to double at safety. Almost impossible. What was needed was a system of systems — FAAD. Figure 1 summarizes the multiple threat and multiple FAAD response. Our focus today is LOS-F-H — but always in the FAAD system context.

Before launching into a description of ADATS, let's review the decision path that got us here. Four key events led to this decision.

Establishing the Requirement

Those in the trade call this the "ROC"(required operational capability). The purpose of the ROC — state the Army's need. What do *you* expect this weapon to do? Where do you expect it to fight and what do you expect it to fight with? Where do we need this weapon in the field? One of the important jobs of our Directorate of Combat Developments at Fort Bliss is to write ROCs. In the case of the LOS-F-H ROC, Lt. Col. Tom Bailey and Maj. Dave Stone were our lead heroes backed by many. Also another superb team effort between Fort Bliss and Brig. Gen. Bill Fiorentino's



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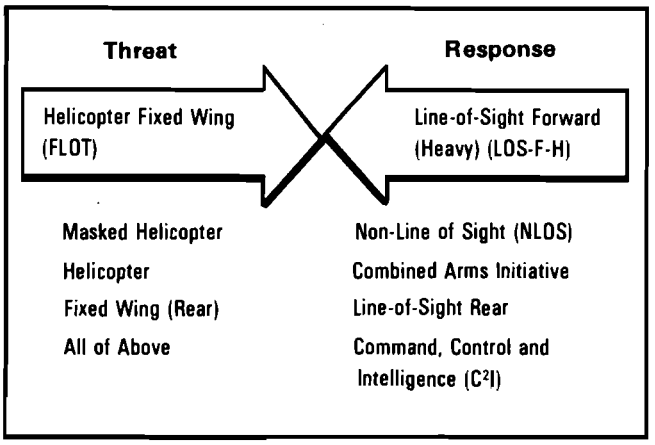


Figure 1

Initial

- Missile Only
- Minimum Required Range (about 4 km) and ECM
- Mobility and Survivability Commensurate with M113A2
- Minimum Ready Missiles

Full

- Missile and Gun (25mm Desired)
- Extended Ranges (over 5 km) and ECM
- Mobility and Survivability Commensurate With Supported Force
- Increased Number of Engagements Prior to Reload

Figure 2

folks at the FAAD Program Executive Officer (PEO) shop at Redstone Arsenal. Figure 2 shows in unclassified form what our team published. Remember, the Army has an urgent near-term need, thus we are willing to accept our "initial" system with less than "full" capabilities but the system must have growth capabilities.

Requesting Proposals from Industry

Those in the trade call this the "RFP" (request for proposal). What the RFP does is add to the operational statements of the ROC the technical specifics required to make the system a reality. The RFP tells industry the performance details of what we want to buy, where we want what quantities in the field, and about what it should cost. The RFP for LOS-F-H focused on performance, schedule, growth and cost. One important part to the contractors is "Section M," Evaluation Criteria —what factors are more important than others in the selection process. LOS-F-H is about a $4-billion program. Needless to say, Section M receives some close reading! The key drivers behind the RFP are the folks in the LOS-F-H Project Office. Kudos to the whole team headed by Program Manager (PM) Col. Mike Gamino and Deputy PM Mr. Jon Spano. In Figure 3 are the basics of what the RFP said was important.

Conducting the Candidate Evaluation

Since our acquisition strategy was one of "off-the-shelf " now with growth as required, we had to determine from where we start. This was accomplished by what is termed the "NDICE" (Non-Developmental Item Candidate Evaluation). The idea is simply to put together a test plan and evaluate the candidates against the criteria in the plan. Easier said than done! Especially when you have to build a test range, train soldiers to operate the systems, integrate the million details needed to conduct the test and analyze the data, and do it all in less than eight months. That this was accomplished, and done so with class, ranks as a miracle.

The test was the most impressive feat I've seen in my time as a soldier. Kudos here are numerous but must begin with Col. "Wild Bill" Pedigo, the boss at the Air Defense Board; Mr. Joe Chavez from the White Sands Missile Range Army Materiel Test and Evaluation Directorate who ran the firing phase; Maj. Bob Reynolds who ran the acquisition and tracking (acq-track) phase and Maj. Mike Kennedy who ran the data analysis phase. Colonel Gary Bridgewater, the operational Test and Evaluation Agency (OTEA) honcho, and Mr. Rafael Ramirez, the software guru at the Air Defense Board, can't be forgotten.

What we said was come fire 10 missiles and conduct about 1,200 acq-track trials, all in an intense countermeasure environment. We'll put our soldiers on your system for the acq-track part (all of who performed spectacularly), gather all the data and pass it to the folks doing the source selection evaluations. Mission accomplished! An understatement at terming a miracle.

Evaluating the Proposals and Test Results

This was the job of our august body termed the SSEB (Source Selection Evaluation Board). Membership of the SSEB is secret. Thus, the work of this dedicated team of about 200 folks who worked over 167,000 man-hours selecting the winner can be recognized only as a body.

What this dedicated team of experts did was evaluate the proposals from each of the four contractors, integrate the test results, assess risks associated with each system for both the initial and full system and make a recommendation to the senior Army leadership. Dedication and professionalism throughout. A job well done which will serve our Army well. Mr. James Ambrose, the Under Secretary of the Army who also serves as the Army Acquisition Executive (AAE), without doubt had all the information he required to make his decision.

In sum, a tough process requiring teamwork on the part of the total Army. But, well executed. The Army's ability to preserve the peace will be substantially enhanced by the addition of ADATS. There are also three remaining key figures who we all owe a big thanks to —the integrators of this whole operation: my "spaghetti" brother and FAAD PEO Brig. Gen. Bill Fiorentino,

What Did Our Request for Proposal Say Was Important?

- Counter 1990 time frame threat with threat growth capability
- In production or ready for production (Congressional language)
- Effectively engage rotary-wing and fixed-wing aircraft in ECM and clutter
- Results from hardware test and proposal evaluation combined and selection announced by November 26, 1987
- Four phase procurement:
  - — Candidate evaluation
  - — Operational test
  - — Initial system (first unit equipped for 4 divisions in Europe — earliest date)
  - — Full system
- Must meet initial requirements at first unit equipped — can grow to full system
- Important considerations:
  - — Demonstrated results in candidate evaluation test
  - — MANPRINT and warranty
  - — Growth to full system

Figure 3

his deputy Mr. Clarence Tidwell, and the FAAD TRADOC System Management Officer Col. Vinnie Tedesco.

What then does this give us for our Army and branch? Here's my personal perceptions of ADATS:

• Overall a superb system. The laser beam-rider (LBR) technology is well suited for killing helicopters at extended ranges in clutter. Any helicopter threat will have extreme cause to worry. Against fixed-wing maneuvering aircraft the speed and agility of the missile will cause any enemy pilot to have thoughts about his future. A killer. The enemy will not return a second time.

• Ability to perform in countermeasures especially impressive. The acquisition radar and suite of tracking sensors (IR or TV) complement each other. The acq radar with its frequency agility is a work of art. Countering the LBR missile is next to impossible. I feel good about its ability to do its job in the toughest environments.

• Growth to full system capability is minimal. What was tested most nearly matches what we want as the initial system, and growth to full system is nominal. With the addition of the 25mm Bushmaster gun, we will have our full system requirements.

• Ability to contribute to the anti-tank mission. ADATS, as its name so states, has a significant anti-tank capability thereby giving the task-force commander built-in flexibility for the unknowns of battle. Complicates a little the training of our air defense soldier, but they are up to the challenge. Makes us even more valuable to our combined arms brothers.

• Readiness for operational test is maximum. While we take joy in our "battle" victory the "campaign" is not over. The soldier is not served until the system is deployed in the field. For that to happen, the system must in mid-1989 undergo a rigid combined arms operational test. ADATS, because of its design maturity and readiness for production, is almost ready for this key test. Makes guys like me sleep better at night!

A big decision for the Army. A big decision for Air Defense Artillery. A good decision for both. The role of Air Defense Artillery in ensuring our combined arms Army accomplishes its AirLand Battle mission significantly enhanced. The challenge now remains for the Army team to put ADATS in the hands of the soldier. Exciting times to be an air defender.

First to Fire!

NCO to NCO

by CSM Harry E. Hicks
U.S. Army Air Defense Artillery School

The Acid Test

In a Vietnam War movie released late last summer, "Hamburger Hill," there was a short scene that may have been overlooked by civilian moviegoers, but should have screamed volumes to soldiers watching.

"Hamburger Hill" is a story about Vietnam, and soldiers, and life and death. No surprises — it's a simple story, an honest story, a timeless story. The reason this seemingly insignificant scene was so gripping to me is precisely because war movies are timeless. History is riddled with conflict and our job even today is to prepare for the next conflict no matter where or when it comes —and it will.

So what was the scene? A platoon (many, seasoned soldiers) was sitting in small pockets on the muddy side of a jungle slope. All of them had been away from their base camp a number of days, had fought the enemy and were now resting. The camera caught snatches of conversation — a soldier sharing a loving letter from a sweetheart back home, an NCO hastily checking on provisions for his men that night, a belligerent political

First to Fire Resolutions

It's a new year, try these training resolutions.

Make training your number one priority — Training is the number one business of a peacetime army. NCOs need to take the initiative to be involved in planning for training.

Train to standards — Raise the quality of individual and small-unit training. Success in battle depends on the coordinated effort of a number of small units working together.

Don't put on a show — Training isn't meant to impress a senior commander. Putting on a show doesn't fool the troops. Be sure every minute spent training is meaningful to your soldiers.

Focus on wartime training — Make sure your soldiers know what they must do to survive. A demanding training environment will spark a regeneration of the virtues vital to our survival — integrity, physical fitness, discipline, respect for authority and respect for others.

statement aimed at igniting a physical shuffle — just glimpses of emotions and concerns and fears.

But one young (and still relatively green, though he had already seen combat) soldier was having none of that. He wasn't concerned about politics, or sweethearts or even getting a good meal that night. No, he had more pressing thoughts on his mind. And the more he thought and mumbled, the funnier the scene. He was trying to remember EVERYTHING he was supposed to have learned during his stateside training. There he was with his soggy green socks pulled off, searching between his toes for an enemy fungus and reciting which colored anti-malaria (orange or white) pill he was supposed to take when. He was also trying to remember important radio codes and on and on. Finally, he shouted in exasperation that he just couldn't deal with the physical discomforts of living in the jungle and the whole war scene in general when he was so busy trying to remember everything he had been taught — those suddenly valuable survival skills.

As the old saying goes, there's truth in humor. The scene was funny, yes, partially because it was exaggerated, but mainly, because it was so real — there is a lot to remember about surviving in war, and there are a lot of pressures when you get there that makes remembering even that much harder.

Have you ever been taught something that perhaps you had never been exposed to before and knew you were going to be expected to be able to do soon and knew it would be painful if you didn't learn how? — say something like how to gear up for rapelling or tossing your first live grenade. Remember how your heart raced, your palms got sweaty and your total focus was on watching every move the instructor made. Nothing, absolutely nothing could have broken your concentration. There was an immediacy in the event — you knew what was at stake and you learned quick.

But, how about during your eighth-grade science class when the teacher was about to mix water and acid — do you add water to acid or acid to water? Do you remember? Probably not, though at the moment it was an exciting experiment, I'll bet you never thought you'd be mixing water and acid very often in the future. There was no immediacy, so you forgot. But what if right now your life depended on your being able to mix acid and water? Would you be moaning and mumbling about what you had been taught and forgotten? Would it seem so funny?

So what's that got to do with airhead movie soldiers, you ask me? Well, NCO to NCO, its about you putting immediacy back into training. I'm not going to go into a dissertation on how important training is to Air Defense Artillery and the U.S. Army. You know it is. I know it is. So, why do we allow our training to become so mundane that our soldiers begin to think we don't believe it's important?

You are the answer. The NCO is the key to individual training. That's not my original thought. It's common knowledge. But that means an NCO has a hell of a responsibility, and it may be one that he's treating like his eighth-grade science class — the future seems too far away to get excited about.

Granted, it may be tough some days to get up and sound enthused about how to probe for mines, follow a team leader out of an impact area or construct a hasty firing position. But if you don't, if you can't give the training a sense of immediacy, your soldiers are not going to learn, or remember for long.

A sense of immediacy doesn't mean verbal abuse if a soldier doesn't get it right, it means making the learning personal. Help the soldier understand the benefits, the worth, of that knowledge. It also means you must give the task credibility by knowing it frontward and backward yourself and executing it in a way that shouts, "I need to know if I'm to survive."

If a soldier hasn't learned his combat survival skills, don't expect him to be too concerned about aircraft recognition, operating his Hawk system or setting up his radar when the battle begins. This undisciplined soldier will worry about his own skin and jeopardize himself and his unit. Only when a soldier's combat skills become instinct, not a list of exhaustive tasks to be tested annually, will he be the soldier you need in combat.

Some NCOs today may be at a disadvantage in that they can't mesmerize young soldiers with gruesome stories of screw ups they witnessed in war-torn jungles; but they can't let that stop them. As part of the noncommissioned officer corps, it is your unrelenting duty to help raw soldiers learn the skills of not only their mission but the skills of survival.

It's honestly not a matter of SQT scores and periodi weapons qualification scores, or training holidays ano promotions to come. You know it. I know it. But does that young soldier in your platoon know it? □

The evaluator sees all — but no errors — in the 6/56th ADA's case. The battalion's top 12 Chaparral crews scored better than 99 percent in tough competition in Crete. (Photo by SSgt. M. Katherine Burke)

6/56th ADA-Clean Sweep, Top Of The Heap

Captain Alphonso Dillard, commanding officer, A Battery, 6th Battalion (Chaparral/Vulcan), 56th Artillery, 32nd Army Air Defense Command, is a very happy man these days, and rightfully so. His battery went to the firing range at Crete, Greece, recently to fire their Chaparral periodic weapons qualification (PWQ). When they had finished, he and his men emerged on top in Chaparral gunnery and battle drill — the second year in a row. They had made a clean sweep: they were best squad, best platoon and best battery. Clearly, top of the heap. The best by test.

Regulations state that 90 percent of all crews must have a leader or gunner who has live-fired a missile and qualified in all battle drills within the past three months. That is tough to do. Further, only 12 of the 24 crews get to fire a live missile.

This impasse is solved by competitive testing of every member of every crew. The scores are calculated to three decimal places. Consider, the twelfth place crew scored 99.304! The other 12 crews had the humiliating role of "sitting on the rocks" and learning by watching. Next year, they might be firing.

The testing consisted of a 50-question written system-knowledge test, a 50-question visual aircraft recognition test, and crew battle drills. The drills included the following: load/reload procedure; emplace and prepare for action; engage hostile targets; and perform hangfire, misfire and malfunction procedures. Points were deducted for each misstep in the drills, plus demerit points were taken for safety violations, equipment misuse and overtime drills.

Dillard said, "The battery's had a rough month, but we never let up on training. We were working right up to the day we flew down here. These guys are young, and we've got new platoon leaders and new crews. I think if you're as hungry as these guys, you'll excel as they did."

Staff Sergeant Reginald McCoy led his squad of Spec. Dennis J. Brown, Spec. Charles A. Bertog, and Pvt. 2 Mark S. Eudy to a perfect PWQ this year — no cuts, no gigs, 100 out of 100. Each member of his team aced the 50-question written test and accurately identified each of the 50 aircraft. They went on to upload missiles without error. Then they emplaced and prepared their system perfectly. Finally, they hit their target dead center on the live-fire range.

"There's really no secret," said McCoy. "When you go to war, you go as one team. I don't baby-sit. I try to give everybody a purpose. A soldier in the Army today has to feel that he has a purpose. I try to keep them informed, motivated, and I educate them constantly. I take input from each crew member and see if what they say works. I also observe other crew leaders and use the good things they do. I may bend it a little to fit my own situation and style."

by SSgt. M. Katherine Burke

It Takes All Kinds, And We're Glad

It was an odd gamble. Six days before their periodic weapons qualification in Crete, Greece, C Battery, 6th Battalion, 56th Air Defense Artillery, put a rookie on one of its Chaparral crews. He was Spec. John Morisette, a five-ton wrecker operator.

In less than a week, John went from the motor pool to the missile range. Since February, the closest he had been to a Chaparral was seeing it across the motor pool. Six days away from the Crete live-fire exercise, he suddenly found himself a grass-green rookie on a Chaparral missile system crew.

Morisette explained, "One day the first sergeant came up and told me that I'd done a good job for the battery and asked me if I'd like to go to Crete, because they needed a fifth man on one of the crews. He

said they were sending me as kind of a reward.

"So, six days out, they put me in Sgt. Green's 'War Dogs' platoon. The whole platoon worked with me and got me ready to go. It was a group effort.

"They kept pounding aircraft recognition into me, showing me slides, telling me what shape characteristics to look for to recognize a particular aircraft. I'd never had any visual aircraft recognition training before. They kept working on me, night and day, every day. Finally, I got to where I could look at an aircraft and identify it in less than five seconds," he said.

Shortly before the battalion left for Crete, Major William Laramore, the battalion S-3, heard about Morisette's on-the-job training.

"I saw him in the hallway at battalion," Laramore said, "and asked him if he was really going as a crewman or was it just a vacation? He told me he was going as a crew member, would take all the tests and do the battle drills, and that he'd do well! I bet him a Coke that he couldn't score at least a 98 on the test."

Laramore paid up on that bet —in front of the whole battalion.

"He was really surprised when I saw him and told him that I got a 98 on the test," Morisette explained. "It was a lot of fun, especially having him pay up in front of everybody. It was lots of hard work and a big change from my regular job, but I don't think I'll go into it permanently. I've been working on cars and engines since I was a little kid."

by SSgt. M. Katherine Burke

A 6/56th ADA crewman shows that he is "at home" on the Chaparral range during missile upload battle drills. (Photo by SSgt M. Katherine Burke)

2/67th Vulcan Crews Test Marksmanship

Soldiers of the 2nd Battalion, 67th Air Defense Artillery, took to the field at Fort Riley's new enlarged multipurpose range recently to conduct periodic weapons qualification for crew members of the gatling gun-like M-163 Vulcan ADA system.

Carrying up to 2,000 20mm rounds, the Vulcan packs a lethal, deafening 1,000 rounds-per-minute punch against low-flying enemy aircraft and ground targets.

"While other field exercises offer live-fire training exposure, this quarterly event serves as a primary 'record fire' opportunity for Vulcan crew leaders, senior gunners and drivers," explained SFC Stephen Taylor, standards and weapons training NCO for the battalion.

Although the 2/67th ADA is a Vulcan/Stinger battalion, they fire their former weapon, the Redeye, until the now-obsolete rounds are expended from inventory. "Gunners of the portable, shoulder-fired Redeye/Stinger anti-aircraft missile occupy the fourth position on each Vulcan crew, but must qualify separately," Taylor said, "because Redeye/Stinger live fire requires use of a separate range.The Vulcan and longer-range Stinger work together," he added "to provide close air defense support.

"Competition between the unit's 36 Vulcan crews is especially intense during qualification, a proving ground not only for marksmanship skills but also for crew teamwork and the quality of year-round Vulcan maintenance support," Taylor noted.

Remote-controlled miniature aerial targets (RCMATs) gave gunners eight initial aerial engagements. Stationary ground targets added another four chances.

Flown at a range of 1,000 meters, the RCMATs provide the target equivalent of actual enemy aircraft at 3,000 meters. "The planes are shaped to resemble Soviet MiG fighters, can be camouflaged for added realism, and are considered 90 percent effective in simulating a live combat engagement," Taylor said.

Qualifying individually on separate days, each of the battalion's three firing batteries included a night-fire engagement to familiarize the Vulcan crew members with night perimeter defense.

Using a new, larger range, whole Vulcan batteries were able to move on line and fire together, making the exercise more realistic and building teamwork and uni esprit de corps.

by Tim Frame

2/5th ADA Conducts Stinger Live-Fire Mission

The 2nd Battalion, 5th Air Defense Artillery, recently teamed up with soldiers from the 6th Air Combat Cavalry Brigade and the 1st Cavalry Division to hold a joint Stinger live-fire mission.

This marked the first time that a mission of this kind was held at Fort Hood, Texas, according to 1st Lt. Joseph Gmitter, assistant S-3 for the 2/5th ADA.

The team of Sgt. Ronnie Ashford and PFC Benjamin Ady of D Battery scored a hit. Two Redeye teams, Sgt. Bernard Epps with Spec. Danny Jackson and Spec. Alvin Kennedy with PFC Fred Davenport, were also successful against their airborne targets.

Lieutenant Colonel Barry Cardwell, the 2/5th ADA commander, commented, "I'm pleased with the Redeye and Stinger teams' performances. It's a definite credit to the 'Shoot-em-Down' battalion."

by Bernie Bohlman

Sgt. Ronnie Ashford checks PFC Benjamin Ady's aim with the Stinger missile trainer at a recent Fort Hood live-fire exercise by the 2/5th ADA soldiers. (Photo by William A. Speicher)

1/3rd ADA Joins Four-Force Exercise

A detachment of air defense artillery soldiers from the 1st Battalion, 3rd Air Defense Artillery (Vulcan/Stinger), of the 101st Airborne Division at Fort Campbell, Ky., traveled to the U.S. Marine Corps Air Station, Beaufort, S.C., recently to take part in an anti-air warfare exercise (AAWEX 4-87) conducted by Marine Air Group 31 (MAG-31) at that base.

Eleven Stinger teams, led by 2nd Lt. Reggie Davis, C Battery, 1/3rd ADA, and an element of the battalion S-3 HIMAD section, led by 1st Lt. Oswald Enriquez, augmented MAG-31 to defend the air base, located just north of Parris Island, S.C. They were joined by a Hawk battery from the 3rd Light Anti-aircraft Missile (LAAM) Battalion from Cherry Point, N.C.

The overall objectives of the operation were to examine and evaluate various combinations of air defense assets and technologies to achieve maximum air base defense effectiveness. Ancillary goals were to give the Stinger crews practice in the tracking of high performance aircraft; identification, friend or foe (IFF) training; early warning procedures and USMC early warning-FAAD (forward area air defense) interface.

The ultimate success of the simulated battle drill hinged on the full and quick execution of each of the above aims. With each Stinger crew using a tracking head trainer and aircraft responding to the IFF challenges, acquisitions, tracking and engagements were easy to monitor and control. The aircraft classifications were passed from the Stinger crews to the Hawk unit and vice versa.

The 1/3rd ADA soldiers deployed to the maneuver site aboard UH-60A Blackhawk and CH-47 Chinook helicopters. Upon arrival, one UH-60 was used to position (and remove) crews in locations unreachable by land vehicles, such as tide-bound small islands and coastal clearings along suspected air avenues of approach. This allowed the Stinger crews to acquire, track, identify and engage aircraft flying at high speeds and at low altitudes over the water, forcing the fast movers to fly at higher altitudes where the Hawk system could acquire, track and engage them.

The Army ADA detachment was part of a coordinated force cooperating with the U.S. Marine Corps, Navy and Air Force. A wide variety of aircraft took part in the exercise, giving the defenders broad exposure to recognition and flight characteristics. These were F-4s, F-15s, A-10s, A-7s, A-6s, C-141s, A-4s, AV-8s, B-52s, and TA-4s with Soviet markings.

MAG-31 provided an F-18 fighter squadron to serve as the friendly air force. Marine Air Control Squadron Five (MACS-5), also of

Beaufort, operated the Tactical Air Operations Center (TAOC).

The Navy launched air strikes from an offshore aircraft carrier, while the Air Force launched planes from Charleston Air Force Base (AFB), Andrews AFB, Shaw AFB, Loring AFB, Myrtle Beach AFB, Langley AFB, Barksdale AFB and Hunter Army Airfield.

To ensure effective early warning, the 1/3rd ADA contingent placed a liaison officer in the TAOC and an air defense fire control officer (ADFCO) in the battery control center of the Marine Corps Hawk battery. The ADFCO used the Hawk acquisition radars to locate and identify incoming aircraft and then passed track information to the Stinger teams over the AM radio early-warning net. The TAOC got long-range track information from Navy E-2C aircraft and passed it over a direct FM radio link to the ADFCO. Thus, the Hawk and Stinger crews received early warning, identification and cuing from the TAOC through the ADFCO. This system proved to be very flexible and effective.

At the conclusion of the exercise, the Stinger and Hawk elements compiled engagement data which showed conclusively that with adequate early warning and timely counterair, mass sorties of enemy aircraft can be effectively nullified.

1/68th ADA Fires And Looks For Payoff

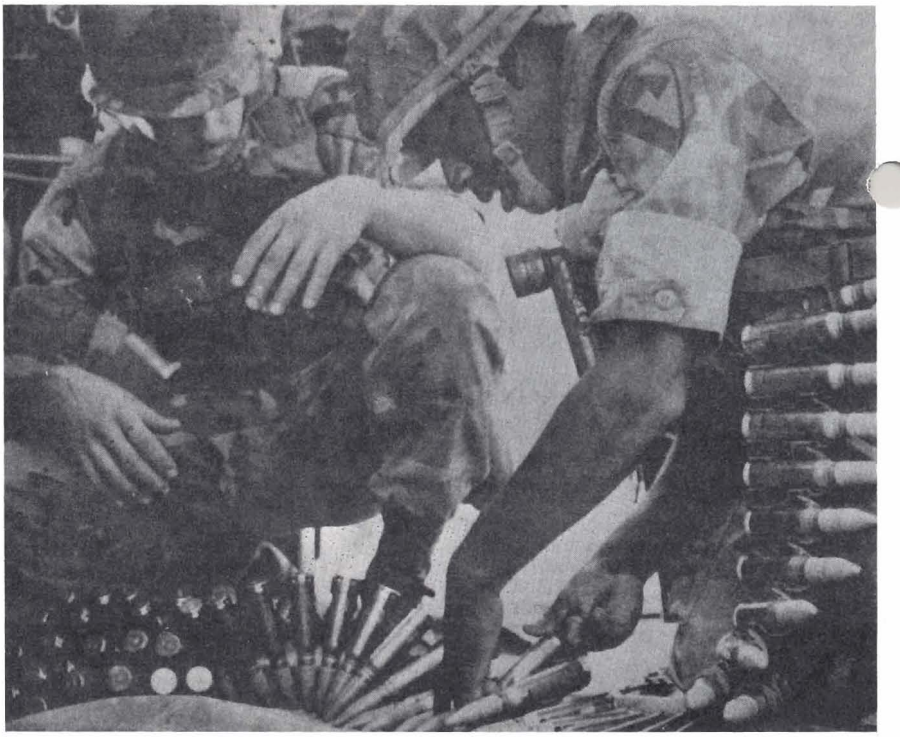
The 1st Battalion, 68th Air Defense Artillery, culminated several grueling weeks of field training with a Vulcan live-fire exercise at Trapnell Range, Fort Hood, Texas, recently.

They engaged both aerial and ground targets during their periodic weapons qualification. In all, 21 Vulcan crews were evaluated during the two days of live fire.

The mission called for gunners to engage eight simulated MiG-23 aerial targets up to 900 meters distant. They also made four ground engagements which included moving vehicle targets and silhouetted troops. The Streaker aerial target system used during the shoot was new to the Vulcan gunners and new to the "First Team."

Soldiers of the 27th Support Battalion and engineers from the 8th Engineer Battalion provided support. The engineers dug defensive fighting positions for the Vulcan crews while the 27th Support Battalion fed and fueled the ADA troopers.

The Vulcan crews, who qualify twice a year, looked forward to the payoff for their long hours of training. Sergeant Jerry T. Williams, an A Battery squad leader, said it was a time to do what they do best — knock down enemy aircraft for their 1st Cavalry Division comrades.



Pvt. 2 Scott Hartman and Sgt. Jerry Williams of the 1st Battalion, 68th ADA, prepare ammunition for upload. (Photo by J. Andrew Malcolm)

"If we can teach it, they can do it," Williams boasted of his squad. "They're still learning, but they'll do real well."

"The exercise and firing ran smoothly," said 1st Lt. Kevin Randall, the battalion range safety officer. "This is the most realistic training this unit has had. In a tactical environment, as we have established here, it is the most meaningful training they could experience. It gives the soldiers a sense of what they will encounter in combat."

by J. Andrew Malcolm

st Lt. Ozzie Enriquez, HHB, 1/3rd ADA Battalion, Fort Campbell, Ky., inspects the guard of the 5th Anti-aircraft Artillery Group at Camp Hachinohe.

1/3rd ADA Offficers Visit Japan

Five members of the 1st Battalion, 3rd Air Defense Artillery, of the 101st Airborne Division, participated recently in an observer exchange program (OEP) with members of the 5th Anti-aircraft Artillery (AA) group, Japanese Ground Self-Defense Forces (JGSDF), in Hachinohe, Japan.

The ADA battalion contingent included Maj. Byron J. Young, operations officer; Capt. Cornell T. McGhee, Headquarters Battery commander; Capt. John E. Seward, B Battery commander; 1st Lt. Ozzie Enriquez, assistant air battle management operations officer; and 1st Lt. Walter R. Williams, C Battery executive officer.

The Department of the Army operates an individual personnel exchange program with friendly nations worldwide and delegates the operation of the OEP to the U.S. Army Forces Command (FORSCOM). FORSCOM sends teams of five to 12 officers and enlisted men from tactical units and sometimes mini-teams to like units in friendly countries at the host country's request. They have been sending three teams to Japan each year.

The goals of the OEP were to exchange experiences, professional knowledge and military procedures and techniques, while developing interoperability between the U.S. Army and the JGSDF.

The overall objectives of the OEP team visit were to identify similarities and differences in tactics and equipment used by the JGSDF and to compare air defense employment doctrine.

After arrival in Tokyo, the team moved to Camp Zama, the headquarters of the U.S. Army, Japan/IX Corps, where they received a briefing on Army and JGSDF operations.

The next day, the team flew 700 kilometers north to Misawa Air Force Base. There they were met by their escort and an interpreter who took them to Camp Hachinohe, the headquarters of the 5th Anti-aircraft Artillery Group.

The JGSDF 5th AA Group is a Hawk unit slightly larger than our Hawk battalion, with four Hawk batteries, a direct support maintenance unit, a signal battery, a radio-controlled aerial target detachment, and a Headquarters and Service Company.

The team observed 5th AA Group soldiers in all aspects of their daily training. They also saw static displays of all of the equipment organic to the group.

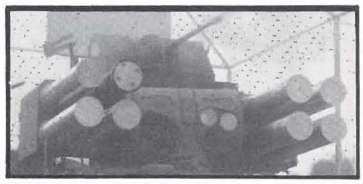
They then visited the 201st (Japanese Air Force) Base Defense Squadron at Misawa Air Force Base. This short-range air defense unit is armed with the Stinger missile system, the Vulcan 20mm gun system and the Japanese Tan SAM Air Defense system (similar to the Chaparral missile system).

To facilitate the goal of cross-cultural experience, the OEP team lived and ate with their Japanese soldier hosts while at Camp Hachinohe. They visited camp facilities, ate and toured in the local downtown area, and visited Japanese homes. They exchanged small gifts with their hosts.

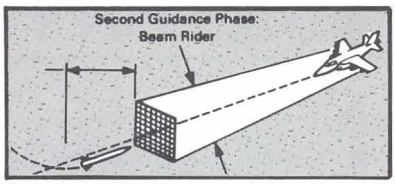
The exchange visit was thoroughly enjoyed by all members of the observation team. Each officer felt professionally and personally enriched. Despite the language barrier, the observers were able to compare their experiences with those of their JGSDF counterparts, emphasizing the many similarities shared by air defenders and soldiers worldwide.

by 1st Lt. Walter R. Williams

System Description Page 11



ADATS Guidance System Page 12



FAAD News

Vol. 2, No. 101 | Ft. Bliss, Texas | Jan. — Feb. 1988

Army Picks ADATS

New FAAD System Rides Laser Beams to Victory

ADATS carries three crew members. A 25mm cannon will provide supplementary firepower.

Since the cancellation of the Sergeant York Gun, Air Defense Artillery's "burning question" has been: What system will replace the canceled Sergeant York Gun at the forward edge of the battlefield?

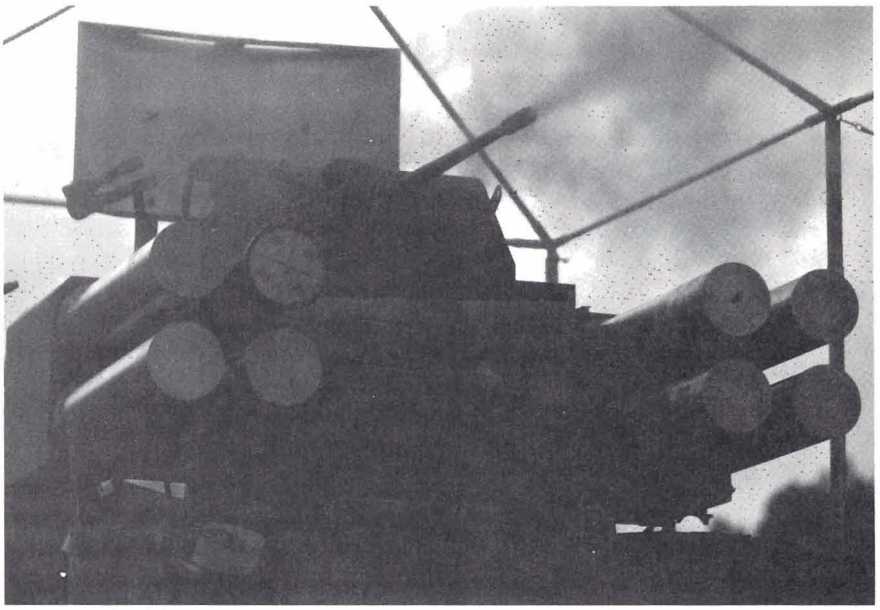
The apparent answer is ADATS.

ADATS is the acronym for Martin Marietta/Oerlikon-Buhrle's air defense/anti-tank system. The Army awarded the coveted forward area air defense (FAAD) system line-of-sight forward heavy (LOS-F-H) contract to the Martin Marietta/Oerlikon-Buhrle team last November following a four-way shoot-off at White Sands Missile Range, N.M.

During the shoot-off, soldiers operated each of the four competing weapons systems in hundreds of non-firing engagements that evaluated the candidates' ability to find and track low-level attacking jets and helicopters using countermeasures. In addition, each of the four competitors fired 10 missiles in engagements against unmanned jet aircraft and helicopters.

The Army intends to award a contract to Martin Marietta, when FY 88 funds become available, to buy four ADATS fire units that will be used in extensive operational tests beginning next year before making the decision to go into full production.

ADATS, however, isn't home free. Before ADATS assembly lines roar into full production, the system must survive a series of grueling operational and evaluation tests. The same sort of tests eliminated the Sergeant York Gun following its victory in a competitive shoot-off. The jury, in other words, is still out; the final verdict is yet to be returned.



ADATS carries eight laser-beam-riding missiles which travel at three times the speed of sound with a range of about five miles. A proximity fuze detonates the 25-pound warhead.

Col. Vince Tedesco, the U.S. Army Training and Doctrine Command's system manager for the FAAD systems, predicted the verdict will be favorable.

"I'm confident that ADATS will pass its operational tests," Tedesco said. "The Air Defense Artillery School has gotten a hell of a lot smarter than it used to be. We've applied the lessons learned from previous tests, and we've worked with the people from our Combined Arms and Tactics Department to make sure we know how we want to fight a system before we test it.

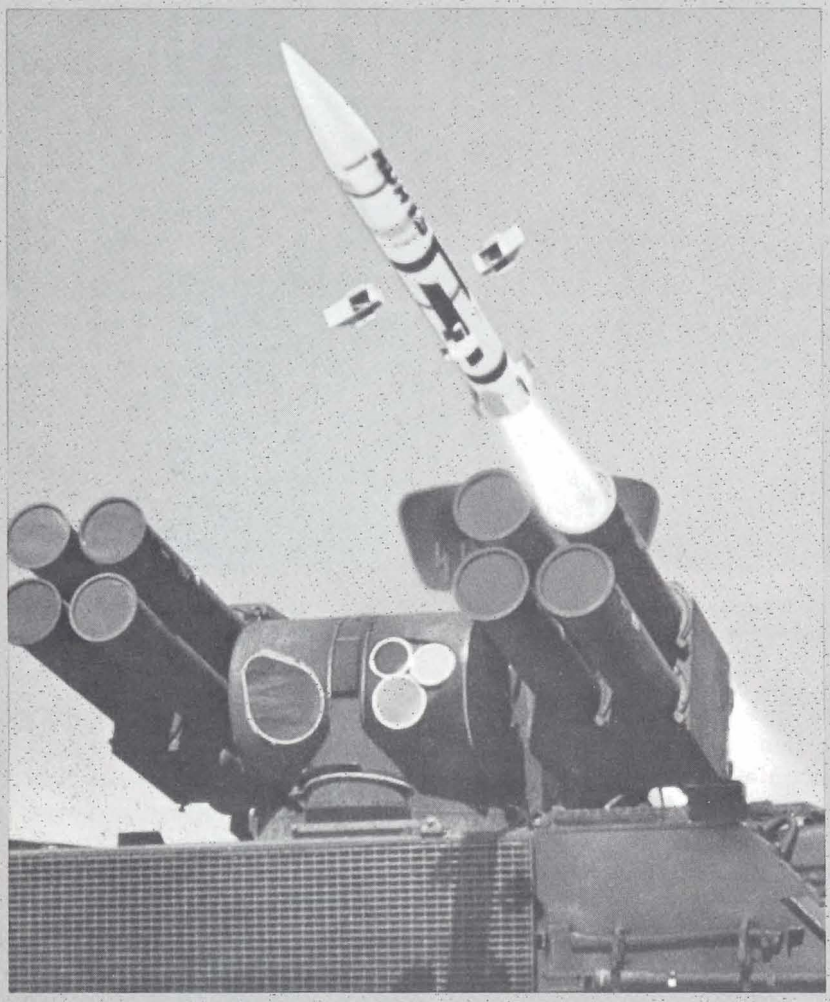
"The ADATS answered a lot of questions during the candidate evaluation tests," he added. "It can kill helicopters in clutter at extended ranges — something the Sergeant York couldn't do. We're also convinced ADATS has the growth potential to counter future threat developments."

The LOS-F-H candidate selection is already viewed as a triumph for the FAAD source selection and candidate test teams. The FAAD system is a complex system that, from its inception, has faced a complex series of hurdles and a tough fielding schedule. In the spring of 1986, when the FAAD concept arose from the ashes of the Sergeant York Gun, many observers thought the hurdles insurmountable and the timetable impossibly ambitious. To date, Air Defense Artillery has cleared every hurdle on time:

- Boeing Aerospace's Avenger, a pedestal-mounted Stinger system, was named the line-of-sight rear candidate following a three-way shoot-off last summer.
- In October 1987, the Army awarded TRW a multi-million dollar contract to develop computer software for the FAAD C^2I system. Industry is gearing up to compete for FAAD C^2I sensor and radar contracts.
- The Army released a request for proposals to industry in November 1987 for further development of its fiber-optic guided missile technology (FOG-M), the sole candidate for the non-line-of-sight component. While the Army refuses to speculate on either the identity or number of potential FOG-M contenders, two U.S. teams — Boeing/Hughes and Martin Marietta/Raytheon — have revealed plans to bid on the FOG-M contract.
- With the selection of ADATS as the LOS-F-H candidate, Air Defense Artillery has cleared what, from the beginning, loomed as the toughest hurdle of all.

System Description

ADATS' main components include a volume-search radar which can track up to 10 prioritized targets simultaneously, a passive target-acquisition and tracking system, laser guidance beam assembly, laser rangefinder and eight laser-beam-riding missiles mounted on an M-3A1 Bradley chassis.



System Performance

- ☐ **Intercept range:** greater than 5 miles (8km)
- ☐ **Ceiling:** 16,400 feet (500m)
- ☐ **Missile velocity:** greater than Mach 3
- ☐ **Eight missiles ready to fire**

Search Radar

- ☐ **Airspace surveillance**
- ☐ **Range:** greater than 12 miles (20km)
- ☐ **Dual-beam system**
- ☐ **Search during move**
- ☐ **Strobe-on-jam**

Missile

- ☐ **Length:** approximately 6.8 feet (2.05m)
- ☐ **Diameter:** 6 inches (152mm)
- ☐ **Weight:** approximately 112 pounds (51kg) at launch

Dual-Purpose Warhead

- ☐ **Weight:** more than 26 pounds (12kg)
- ☐ **Electro-optical proximity fuse**
- ☐ **Impact fuse**
- ☐ **Shaped-charge and fragmentation effects**
- ☐ **Bradley FAADs fire unit:** 40,000 pounds (18,144kg)

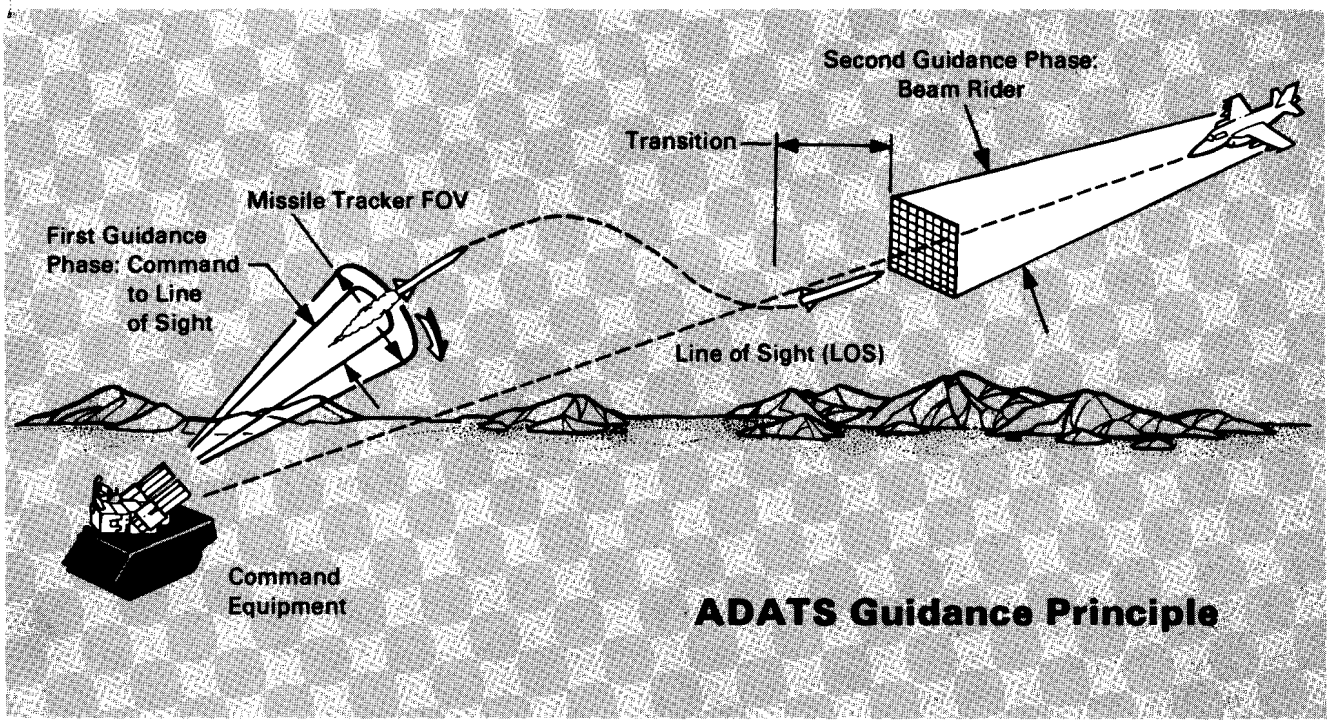
ADATS can operate autonomously or in a battlefield network of up to five other ADATS units. It can also be linked with the FAAD C^2I network. Each ADATS fire unit will use its own autonomous radar or electro-optics system to detect low-flying aircraft, or it will be netted to larger systems such as FAAD C^2I for command and control. Radar targets are handed off to ADATS' passive optical tracking system, which is highly resistant to anti-radiation missiles and electronic countermeasures. The long-range passive target tracking system consists of a TV sensor for daytime detection and tracking, and a forward looking infrared sensor for acquiring and tracking targets at night and during adverse weather conditions.

A spatially encoded laser beam, insensitive to countermeasures, guides the supersonic missile to the target. The missile is powered from a factory-sealed launch canister by a smokeless rocket motor and rapidly accelerates to more than three times the speed of sound. A proximity fuse detonates the special dual-purpose warhead for airborne targets while an impact fuse detonates a conical charge for armor targets.

Laser Beam Guidance

ADATS was the only one of the four LOS-F-H competitors to use laser-beam-riding missile guidance, a highly accurate system virtually immune to countermeasures. The other competitors used radar-based missile guidance systems.

Martin Marietta engineers decided to bypass traditional radar-based systems because of



ADATS Guidance Principle

their tendency to suffer degradation from electronic jamming and because they are easier to detect by the enemy. Instead, designers incorporated laser-beam-riding technology into ADATS when work began on the system during the mid-1970s. Martin Marietta, a leader in laser-beam-riding technology, originally designed and developed ADATS for Canadian low-level air defense requirements under contract to Oerlikon-Buhrle.

"Our responsibility was to leapfrog the marketplace," explained Fred Marion, vice president of Air Defense for Martin Marietta Electronics & Missiles Group of Orlando, Fla. "Because of the concurrent work we were doing in electro-optic navigation and targeting systems for U.S. aircraft, we recognized the probability of similar advances in enemy technology and directed our efforts toward creating a system capable of meeting future threats.

"Defeating the Warsaw Pact's aircraft and countermeasures is a major challenge, but is well addressed by the laser-beam-riding technology developed by Martin Marietta," Marion continued. "Combining beam-riding with the well-developed targeting system we produced for the Apache helicopter and F-15 and F-16 aircraft provides the technological edge the Army is seeking."

Laser-beam-riding is a three-point guidance system in which the beam simultaneously tracks the target while guiding the missile.

"Beam-riding means the target and missile are 'riding' the same beam," Marion explained. "The beam transmits a code to the missile which directs it to intercept the target."

The narrow laser beam provides extraordinary precision for tracking and is quite difficult to detect or jam. Besides being more resistant to countermeasures, ADATS can be used in a wide range of battlefield environments, including darkness, adverse weather and a variety of obscurants.

The laser-beam-riding system is built into ADATS' electro-optic module, a derivative of the target acquisition designation sight/pilot night vision sensor Martin Marietta builds for the Apache helicopter. The module also houses the laser rangefinder which uses pulsed energy to measure the range of the target.

The ADATS missile flies at more than three times the speed of sound, taking full advantage of the laser-beam-riding technology and allowing ADATS to react quickly to a dense array of enemy threats. Instructional codes are transmitted to the missile's onboard laser receivers for tracking the target. The warhead is then activated by either an impact or electro-optic proximity fuse and is effective against advanced rotary- and fixed-wing aircraft as well as ground armor. A yoke assembly allows crew members to reload ADATS missiles within minutes.

Final Exams

Before the Army commits to total fielding of the ADATS system, some hard questions will have to be answered:

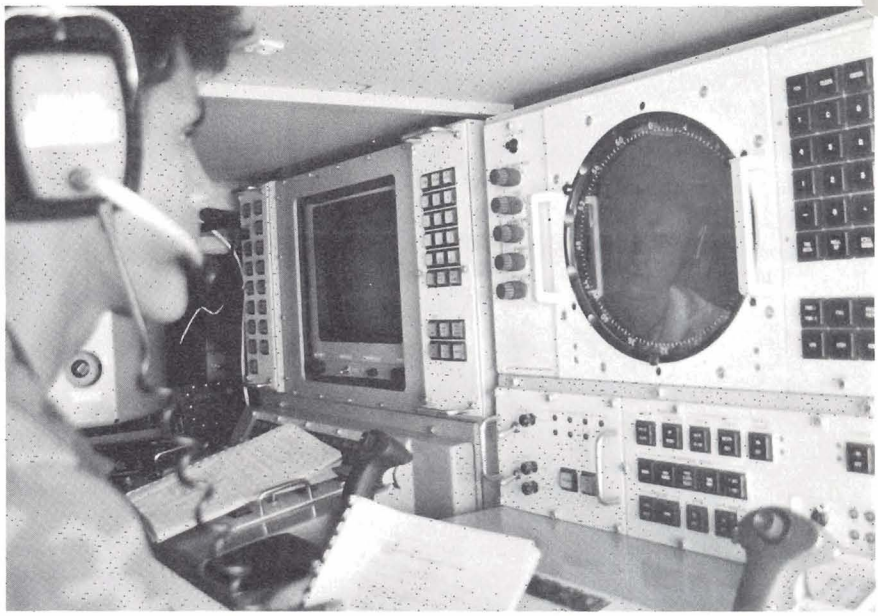
- Can typical ADA soldiers be trained to effectively operate the system?
- Will the system work in an integrated combined arms environment?

The initial response, judging from the shoot-off results, seems to be yes. ADATS, unlike Sergeant York, is not without credentials. Following a two-year technical and financial evaluation involving seven competing systems, Canada chose ADATS for its low-level air defense system.

The Canadian's approach to system selection, however, was quite different from the U.S.'s approach. U.S. observers point out that not a shot was fired in what they considered a "paper" evaluation.

Seven contractors responded to the canadian request for proposals. The Canadian operational evaluation consisted of a general assessment of the proposals against the statement of requirement, detailed cloth model and map exercises, simulation, war-gaming, an engineering evaluation and a hands-on operation of the equipment. There was no live-fire against simulated targets.

ADATs' toughest competition in the U.S. shoot-off apparently came from Liberty, LTV-Thomson's LOS-F-H entry. (*Defense Weekly*, an influential trade journal, picked Liberty as the "apparent winner" over ADATS in a front page story that appeared the morning of the announcement. Ironically, LTV's Crossbow had finished a close second to Boeing's Avenger in the LOS-R competition.)



ADATS crewman Spec. Gilbert Villanueva operates the system's radar and electro-optic equipment.

The U.S. LOS-F-H shoot-off was closely watched by Canadian air defenders who viewed the results as a validation of their own selection process.

FAAD program managers are confident that, in ADATS, they picked the right system. They await the results of operational and evaluation tests with confidence.

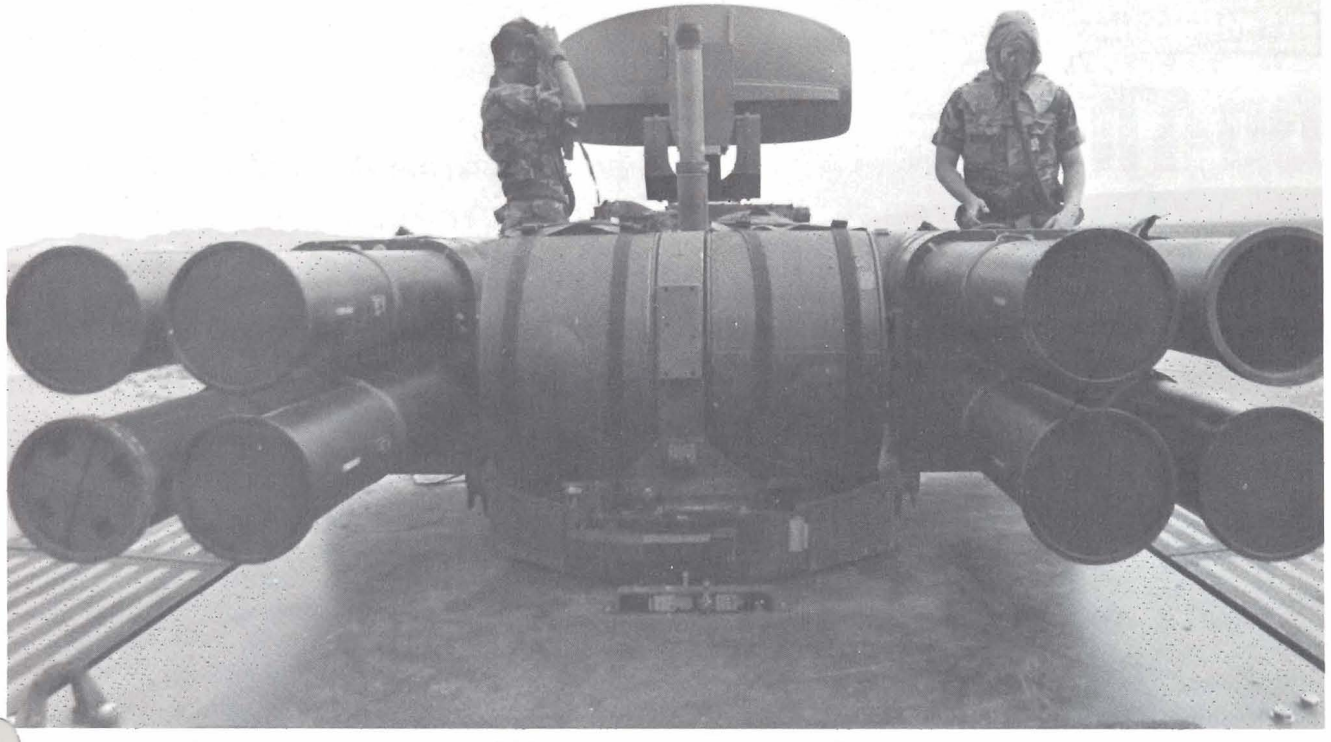
Balancing the FAADS Trade Deficit

The four weapon systems entered in the forward area air defense line-of-sight forward heavy (LOS-F-H) candidate selection test shared a common characteristic — each was a derivative of a foreign system.

Aware that the U.S. Congress would likely balk at appropriating billions of defense dollars destined to be spent outside the United States, the foreign manufacturers quickly formed partnerships or consortiums with U.S. defense contractors, an arrangement that ensured a percentage of the money spent on the LOS-F-H will stay in the United States.

ADATS, the victor in the recently completed LOS-F-H shoot-off, was no exception.

The FAAD version of ADATS is a derivative of Canadian ADATS. The Canadian system was originally designed and developed by a U.S. firm Martin Marietta, under a privately-funded contract from Oerlikon-Buhrle of Switzerland.



ADATS crew members don MOPP-4 gear. The LOS-F-H shoot-off simulated a combat environment.

In 1986, the Canadian government picked ADATS over six other competing systems for that nation's low-level air defense requirements. Oerlikon Aerospace was awarded a $600 million contract by the Canadian government to supply 36 ADATS units. The award followed a two-year technical and financial evaluation by the Canadian government (see "Canadian Low-level Air Defense Project," Page 32, *Air Defense Artillery* magazine, Summer 1986).

As the principal subcontractor to Oerlikon Aerospace for Canadian ADATS, Martin Marietta produces ADATS' electro-optical module and will deliver the first module, on schedule, in April. Oerlikon assembles Canadian ADATS units at its new manufacturing plant in St.-Jean-sur-Richelieu, Quebec, and is scheduled to deliver the first ADATS units to the Canadian government this fall.

Martin Marietta, however, is the prime contractor for U.S. ADATS. Beginning with delivery of the first system, more than 90 percent of the program's dollar value will be produced in North America, with 70 percent in the United States.

The Army will pay approximately $24.25 million for the first four ADATS. Scheduled for delivery this year, the four systems will be used in the operational and evaluation tests at Fort Hunter Liggett, Calif. After the tests are done, the Army expects to pay $10.3 million apiece for 166 vehicles to be delivered in the early 1990s. Eventually, the Army may purchase a total of 562 ADATS.

Its $1.7 billion price tag makes the LOS-F-H contract the most lucrative of forward area air defense sytem contracts.

A Nickname for ADATS

ADATS stands for the air defense/anti-tank system, but ADA soldiers won't have to commit the new acronym to memory. The Army expects to come up with a more colorful name for the new forward area air defense system.

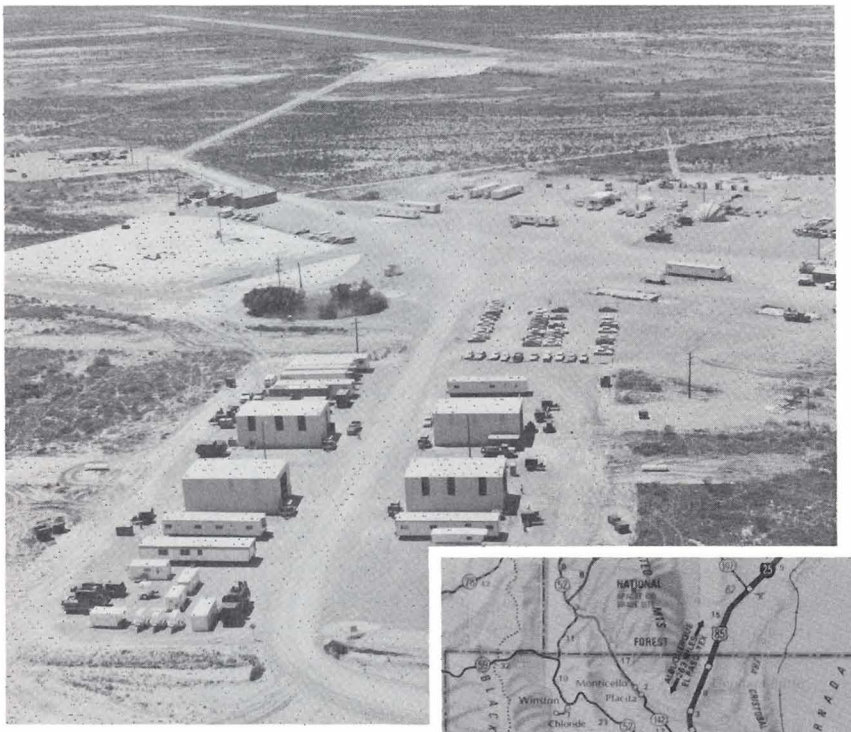
Canada, which purchased its own version of ADATS last year, wrestled the same problem and came up with the name "Pathfinder."

First of a Series

On The Testing Front

Air Defense Artillery Board, WSMR directorate team as referees in FAAD shoot-off

by Ed Foster

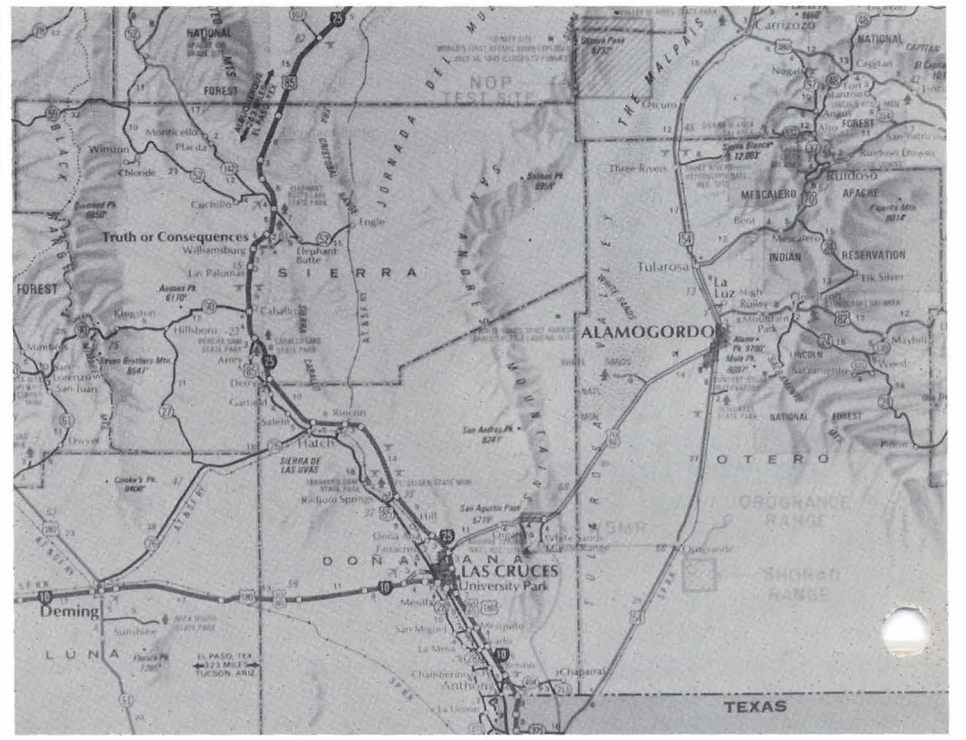


Largest structures at base camp at Oscura Range (above) are four pre-fabs, shown at center, housing (clockwise from upper right) Paladin, Rapier, Liberty and ADATS. Map (right) provides Southern New Mexico setting for FAAD test-range firings. (Photo by Dennis McElveen)

Lay it to the dry and bracing New Mexico mountain air or lay it to the mission, but a certain exhilaration marks the speech of the men called upon to prove the air defender's weapons systems of the coming decade.

"Me? You're asking *me*?"

A grin breaks across the face of Capt. Dwayne Hill. He dutifully has recited the factual data on Paladin, descendant of Roland, on the line this time in a high-tech gun-missile shoot-off to be



the Army's up front defender against low-flying attack helicopters and fixed-wing aircraft.

" — American version of a short-range, all-weather air defense system . . . Mounted on the U.S. Army's XM-975 tracked vehicle . . . Supersonic missiles will protect moving columns . . . frontline armor . . . airfields . . . Prime mission equipment in a helicopter-transportable fire unit module — "

So ran his practiced litany, as Paladin's surveillance radar whirled atop 39,000 pounds of compacted armor and technology. But as he finished, the personal question had come: "You. Your role in all this advanced testing out here? How do you feel about that?"

The bursting smile triggered a gleam in his eyes. He fixed them on the pulsating weapon system of which he is test officer. "In terms of air defense," he said, measuring out the words in a depth of feeling, "I've come all the way from the age of stone-hurler to be part of this." Behind him, the Paladin system, wired and switched to readiness, hummed at parade rest.

How To Decide

ADATS. Liberty. Paladin. Rapier. Each sought the big prize, the contract to build and maintain the line-of-sight forward heavy (LOS-F-H) component of the Army's family of systems that would see forward area air defenses through the 1990s.

How was the Army to decide among them? How could it be sure — this time — that its choice was the premier choice, capable above all others at engaging, tracking and killing threat aircraft in close, in low, in clutter and at extended ranges?

Key leaders in Air Defense Artillery, their branch pride nicked in the cancellation of the Sergeant York air defense gun program two years ago, had an answer. It was this: Put the competing systems through a rigorous testing that replicates battlefield conditions, and record the results with such accuracy and detail that the selection process cannot be compromised.

"We invite industry to submit proposals and come to a 'shoot-off,' " wrote Maj. Gen. Donald R. Infante, chief of Air Defense Artillery, in the November-December issue of *Air Defense Artillery* magazine, "to prove to us that their candidates perform as claimed."

So here they were, ADATS, Liberty, Paladin and Rapier, each housed in its own prefab maintenance hangar at the Oscura Range "base camp," a half-mile by quarter-mile plot of tableland looking west across a sweep of Tularosa Basin toward Trinity Site, N.M.

. . . an urgency to get on with the mission

Scientists detonated the first atomic device 42 years ago at Trinity Site. And 30 years ago, this base camp, where ADATS, Liberty, Paladin and Rapier systems waited their turns to go to the test-fire area, was the staging grounds for crews testing Nike-Ajax, the United States' first surface-to-air guided missile.

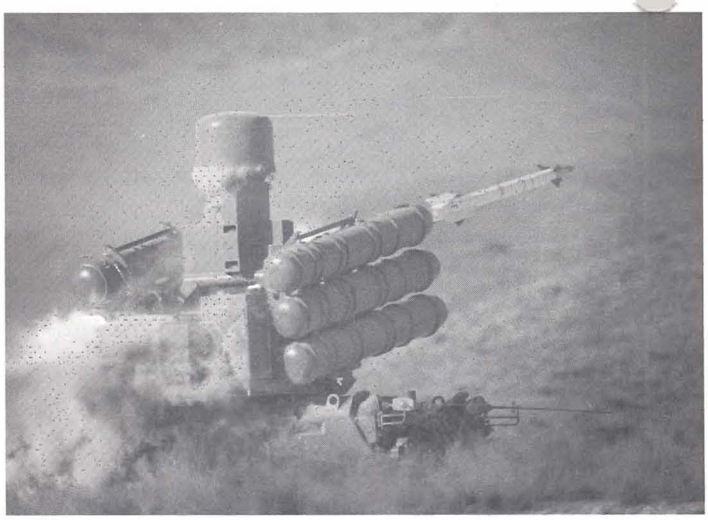
Scenery and history. Hand in hand, they snare the imagination, or would. But there is an urgency here, when tests are under way, that will not allow it, an urgency to get on with the mission.

And so, in the July-through-October shoot-off for LOS-F-H supremacy, instead of dwelling upon the likes of Anthony Gap, Radar Peak and Rattlesnake Ridge en route to the Oscura Range Center, military and civilian members of two Army test commands worked 60-, 70- and, yes, 80-hour weeks in an interlocking of partnership and competition.

Older hands, at least some of them, may have been there driven by an impulse to lay to rest the ghost of Sergeant York. It's a subject not pursued, save, perhaps, in the camaraderie of their own informal gatherings. The story cropped up, ruefully told by a range officer, of Lt. Col. Douglass Hemphill's parody of the Frank Sinatra hit of some years ago, "New York, New York," the wonderful town and all that.

Hemphill is renowned as a composer. He wrote the lyrics to the "ADA March," chosen last year as the branch anthem. Anyway, so went the story, when the news hit in 1985 that the Pentagon had scratched Sergeant York, Hemphill reached into his bag of bitter-sweet humor and came up with "No York, No Y-O-R-K!" to the same rousing tune as Sinatra's.

Firing for the record at Oscura Range fire point is captured in photo sequence. (Photos by Dennis McElveen)



Liberty

Paladin

Captain Hill, test officer for Paladin and liaison between the government and the contractor, was just two years out of ROTC from St. Augustine College in Raleigh, N.C., when Sergeant York died. As a junior ADA officer, he grew keenly aware of the challenge to his branch to continue its air defense mission by developing and fielding a weapon system that would do what Sergeant York would have done — and more!

What the Army conceived, and what Congress subsequently mandated be developed, was a forward area air defense system, to be known as FAAD.

How did Hill become a central figure?

"I'd been in my [advanced officer] class two or three days down at Fort Bliss," he said, "when Col. Pedigo [William Pedigo] came in. Pedigo announced he was going to 'change the lives of four officers' — just like that. He needed to interview people with experience in Vulcan, Chaparral and Stinger.

"I had that experience. After four interviews, I was notified to report to the Air Defense Board."

His sparse account tells it all: The Air Defense Artillery Board is in charge of operational testing, whether at Fort Bliss' McGregor Range or the ranges to the north under the jurisdiction of the Army Materiel Test and Evaluation (ARMTE) Directorate at White Sands Missile Range, N.M. And Pedigo ("Wild Bill Pedigo," Infante wrote of him in *Air Defense Artillery*) heads the Air Defense Artillery Board.

Now here Hill was, a test officer in the FAAD system shoot-off for the component that most closely would match the Sergeant York expectation for close-in engagement.

Test officers for the other competing systems were, like Hill, liaison for government and contractor. Although all the systems are an amalgamation of international industrial input, none bore the markings so distinctly as did Rapier.

"Tracked . . . single-vehicle system . . . gun with virtual attrition/suppression — " began test officer Capt. Brian Baker, in taking the wraps off 14 tons of Rapier lethality.

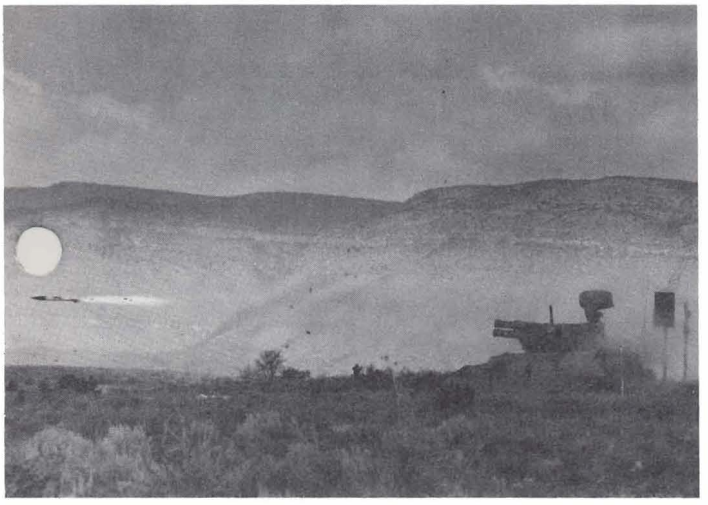
But what caught the eye was the mustached figure alongside him, that of Maj. John Gibbins of the British Royal Air Defense Artillery. He stood in barrack dress including side hat, stable belt and a swagger cane passed down to him from his daddy, Maj. Leslie Gibbins, who brought it from serving the Queen in Singapore.

Gibbins headed a contingent of 12 British soldiers sent to participate in the try by Rapier, a product of United Aerospace Defense Systems (British Aerospace, FMC and Norden), for the landmark contractual award.

Gibbins called it a highlight of his 18 years in British artillery, the past two years with Rapier, to find himself on "the only land-based range I know of in the world where you can fire an air defense missile."

The British presence notwithstanding, soldiers from Fort Bliss, Texas, 140 miles to the south, played the major role in putting Rapier through its paces. Quartered at Holloman Air Force Base 50 miles south of base camp, they and their buddies who manned the competing systems arrived

Rapier



ADATS

at daybreak or earlier to put in mostly seven-day weeks.

The only dining facility at base camp seemed to be a "munch box." So what did they eat? "Sack lunches," volunteered Sgt. Donald Carmichael of Bisbee, Ariz. "Air Force sack lunches."

Good stuff?

PFC Gary Rankins of Los Angeles shrugged. "You get used to them," he said.

So much for weight problems on the test range.

Lean rations seemed to dim nobody's enthusiasm. Groups of soldiers, when they gathered to talk, said as the tests wound down that they hoped most of all to stay together and train as "16-Limas," LOS-F-H crew members of whichever system won the shoot-off.

Liberty's test officer, Capt. Christopher Rasmussen of El Paso, Texas, wasted no time when his turn came to demonstrate the LTV-Thompson CSF product, derivative of Crotale. Crotale back in 1964 was the winning design for France's anti-aircraft weapon system.

Revolving turret, scan radar, TV cameras —all got due exposure before Rasmussen opened up Liberty's inside quarters to disclose a crew at their battle stations. Section Sgt. Leon Pollock of Wilmington, N.C., had the command seat at front right; PFC Paul Wood of Indianola, Neb., sat in the gunner's spot; in the seat for the driver, PFC James Rawls of Dallas placed his eyes at the exact level for seeing through three periscopes to the outside. Rawls is 6 feet 3 inches, a height that exacted a sharp elevation of knees.

Cramped?

He said no, that he was quite comfortable. He proved it, too, with a show of maneuverability and comfortable leg room, height of knee notwithstanding.

Captain Wesley Riddle of Houston provided the vital statistics for ADATS, an air defense anti-tank system developed by Martin Marietta of the United States and Oerlikon Aerospace of Switzerland. Canada already had selected ADATS for airfield and forward applications. Riddle claimed an 85-percent success ratio in ADATS' 60 missile flights over the course of the shoot-off.

Inside ADATS, Sgt. Sergio Ocampo of Brownsville, Texas, commander and radio operator, demonstrated the capability to track six targets simultaneously. His push of a button would "hand off" a contact of his choosing to the gunner beside him, PFC Mark Budro of Baytown, Texas, while Pvt. Ronald Sauer of Leominster, Mass., manned the driver's position.

Had the testing been a rewarding experience for the ADATS crew?

"Well, yes," said Budro. But there was in his expression a look of unfinished business. "We want our system to *win*!" he said.

On The Firing Line

Congress mandated the testing be completed in time for analysis and announcement of a winner by Nov. 26, and top leadership at Department of Defense vowed there would be no delays.

On the firing range 20 kilometers north of base camp, where the contenders paired off in acquiring, tracking and firing duals fitted to a round-the-clock schedule, a suspicion held that the

Sgt. Sergio Ocampo pushes the button that hands off a target to ADATS gunner, PFC Mark Budro. (Photo by Dennis McElveen)

An Apache helicopter emerges from a cloud of smoke at Oscura Range fire point during Rapier's turn on the firing line. (Photo by Dennis McElveen)

powers that be at DOD didn't really believe all the test missions could be completed. After all, hadn't it taken 10 years to bring the Sergeant York program to its final trials? Research and development on the Patriot missile system, fielded in 1982, began in 1958.

So Pedigo is particularly fond of recalling visits by both Under Secretary James R. Ambrose and Jack Krings, Director of Operational Testing, Office of the Secretary of Defense. Both chose the word "miracle" to describe what they found taking place.

"I'm seeing half a miracle," Pedigo quoted Krings as saying on Aug. 8, near the half-way mark in the testing process.

Then on the Sunday before the final weeks of tests, Pedigo said, Ambrose told a gathering of officers at Fort Bliss that he'd witnessed a miracle and that "I'm very happy."

Pedigo says major credit for the achievement should go to Joe Chavez, deputy test manager of live fire; Maj. Bob Reynolds, deputy test manager for the acquisition and tracking phase, Maj. Mike Kennedy, who headed up the board's data analysis group, and other organizations which struggled to keep the test on schedule.

"During the preparation for the test, several major actions had to be performed on short notice to make the test happen," Pedigo said. "Both the local procurement office, headed by Mr. Ty Ryan, and the TRADOC contracting office at Fort Eustis, headed by Mr. Porter Taylor, expedited numerous procurements, almost overnight. For example, we asked for and got new IBM mainframe computers in less than two weeks. The maintenance buildings at Oscura Peak went up in 10 days. These things normally take several months, even years."

Other military organizations that provided essential test support included the Vulnerability Assessment Laboratory; Army Aviation units from Forces Command, TRADOC and the New Mexico National Guard, Project Manager, Smoke; the Army Materiel Systems Analysis Activity; and the Operational Test and Evaluation Agency. Soldiers involved in the test praised the performance of civilian contractors such as TRACOR Flight Systems, Management and Communications Assistance Corp. of America; Clark and Spender; and Dynaspan Corp.

"Almost-ready," that was another description. No telling what benefits, with a bit more study and application, might accrue from bringing what once had promise off the shelf for another look. After all, hadn't great gobs of money and time already been invested?

That was the thinking. And so the Army drew up specifications for what it would like to have to meet the threat of in-close, low-flying threat aircraft in the forward area of the AirLand Battle and invited the nation's industrial concerns, and others in the Free World as well, to see what they had in stock that might do the job, then compete for the contracts.

Capt. Dwayne Hill, right, pauses in his delivery of information about Paladin to hear from SSgt. Walter Burns. (Photo by Dennis McElveen)

Col.William Pedigo and Col. Robert Mathis survey the LOS-F-H test site at Oscura Range. Blair-Hall Co. of El Paso, Texas, built four 1,650-square-foot maintenance buildings, including the one in the background, in only 10 days to house the competing weapon systems.

Pvt. Ronald Sauer mans the ADATS driver controls. (Photo by Dennis McElveen)

First to compete were General Dynamics, LTV and Boeing in a shoot-off to field a pedestal-mounted Stinger for the line of sight rear component of FAAD. General Dynamics quickly dropped out, and Boeing went on to win in stiff competition for the LOS-R component with LTV in late summer at Fort Bliss' Orogrande Range south of the Oscura test site.

Interestingly enough, only ADATS among the contenders so far had been new enough in the defense industry that it did not have a weapons technology from previous U.S. competitions lying on a shelf somewhere that might be dusted off for a new application.

The next shoot-off at Oscura Range, sometime this year, will be for the third component of FAAD, the non-line-of-sight (NLOS), a missile system that can "see" hovering or hiding aircraft over hills and tree lines. Testing for the command, control and intelligence and combined arms initiative will follow, as well as advanced testing for the winners.

As the rigorous weapons testing continues across the 3,400 square miles of desert tableland, Pedigo says yet another factor in the breakthroughs needs to be recognized. It is, he says, the unique partnership forged between the Air Defense Board out of Fort Bliss, responsible for the operational side of testing, and ARMTE, responsible for the technological side and headed by Col. Robert N. Mathis of White Sands Missile Range. The arrangement made possible the pairing of Reynolds, the Air Defense Board officer, and Chavez, the ARMTE civilian, as deputies.

More than 1,000 people, most of them engineers and technicians of the highest order, serve under Mathis, himself holder of a master's degree in nuclear physics from Tulane University and a West Point graduate the year research began on the Patriot system. It's estimated the activities of ARMTE alone pump $1 million a day into communities bordering the testing ranges. The current scale of testing is projected to continue over the next five to six years.

Next: An up-front look at "shoot-offs on the range" in the March-April issue of *Air Defense Artillery* magazine. □

Ed Foster is an assistant editor with *Air Defense Artillery* magazine.

Hawk and Patriot, the Mix that Wins

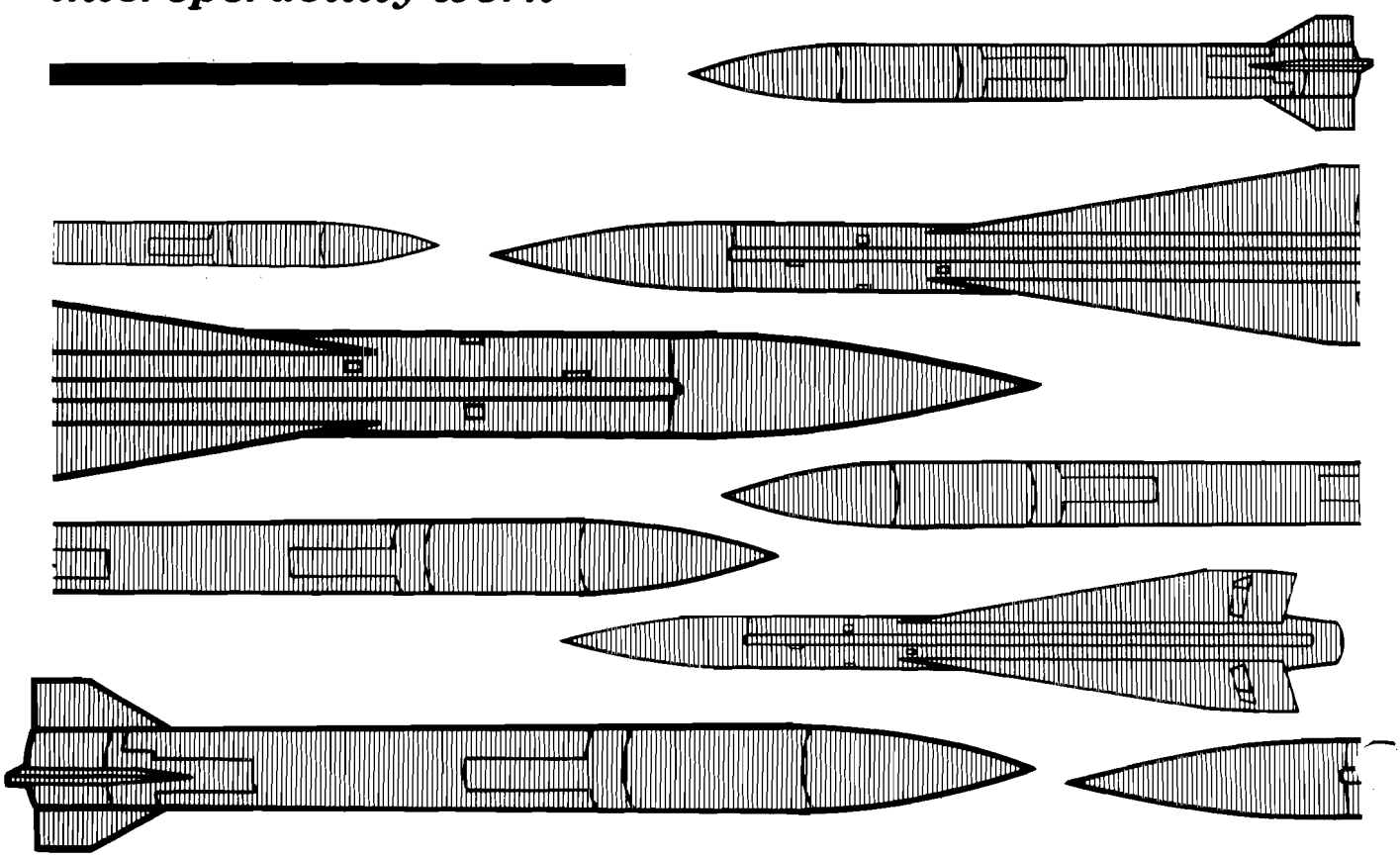
Effective command and control makes interoperability work

by Capt. Frederick C. Rotchford

Effective command and control (C^2) of Air Defense Artillery maximizes the firepower of subordinate weapons systems and affords the fire unit commander the greatest degree of freedom to operate.

Consider this an ADA maxim and use it like the transitory property of algebra to test the effectiveness of management procedures and control techniques. In other words, if a management procedure maximizes firepower, then it is effective command and control. If it doesn't, it isn't.

When fire units are a mix of ADA systems, high-to-medium air defense (HIMAD) and short-range air defense (SHORAD), at either theater, brigade or battalion level, effective command and control provides technical and procedural interoperability. This maximizes the firing capabilities of each weapon system fighting in the integrated air defense of the AirLand Battle.



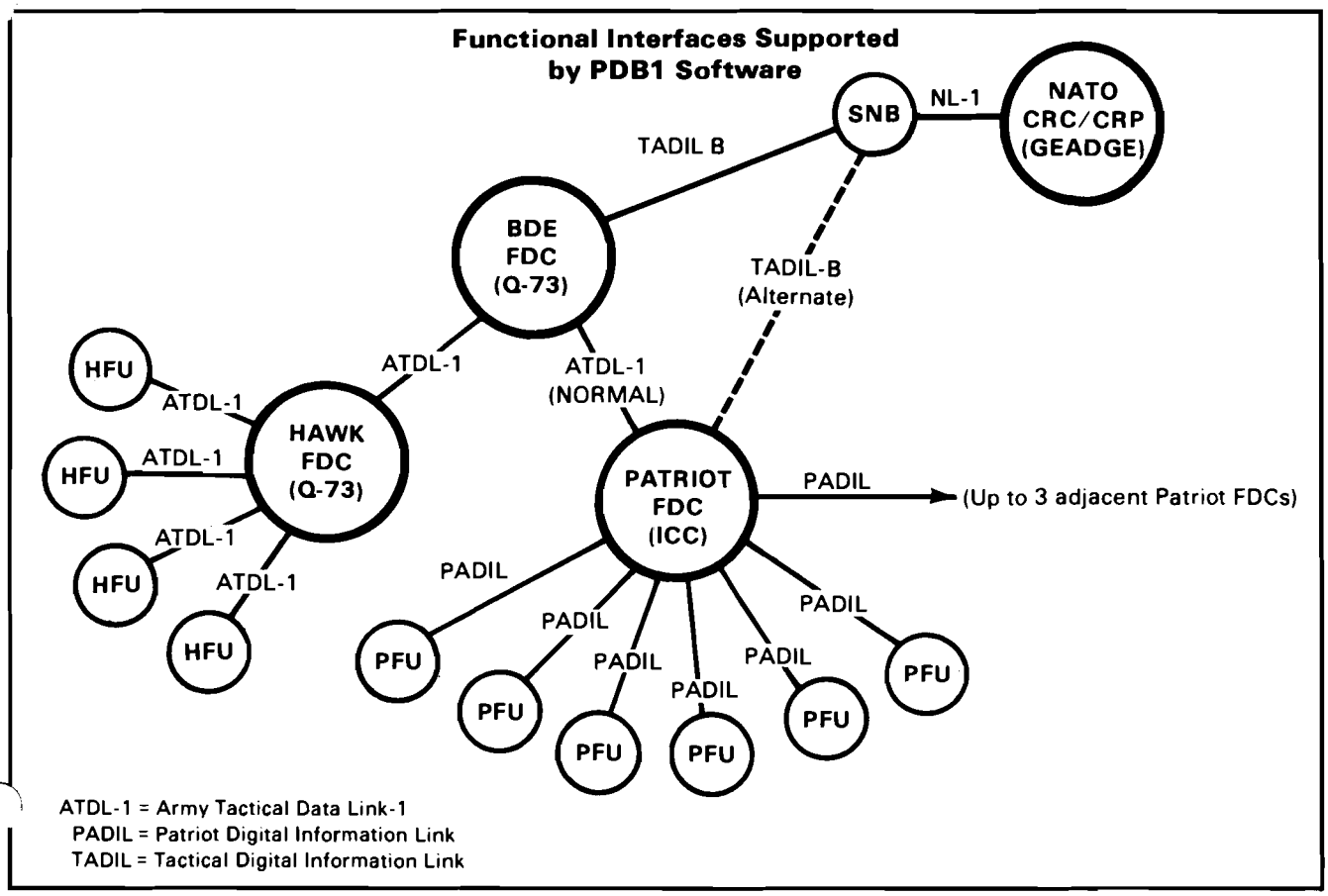


Figure 1

Building on Current Patriot Hawk Interoperability

Interoperability Block 1 (Patriot PDB II)

- To be Fielded in July 1988
- Integration of Hawk Fire Units into a Patriot Battalion
- ID and Engagement Coordination
- Shared Data Between HIMAD Battalion When Transfer Through Brigade is not Possible

Interoperability Block 2 (Patriot PDB III)

- To be Fielded in Jan. 1990
- Brigade ICC Performs as Brigade/Master Battalion
- ICC Can Control AN/TSQ-38 and AN/TSQ-73 as Well as Another ICC
- Mixed Battalion Functions are Enhanced: Track Management, Auto Fire, ID Coordination

Standardized HIMAD C^2

Automated Command Post

Recently the Training and Doctrine Command System Manager (TSM) for Patriot, Col. James R. Ervin, became the TSM HIMAD and is now responsible for bringing together the Patriot, Hawk, and Missile Minder (AN/TSQ-73) systems into a single ADA family of interoperating systems. The mission of this management effort will be to ensure that HIMAD systems are fully integrated early and continuously throughout their development, production and deployment. A major objective of this mission is to achieve optimum interoperability between HIMAD systems both in concept and reality.

The good news is that there is a sound doctrinal base upon which to build this increased interoperability. The ADA employment principles of mass, mix, mobility, and integration, and the ADA employment guidelines remain unchanged. These provide clear definition to what the systems must achieve in a defense design.

Doctrine and concepts of operation for mixed composite defenses and mixed brigades are mature, well known and well proven. The current

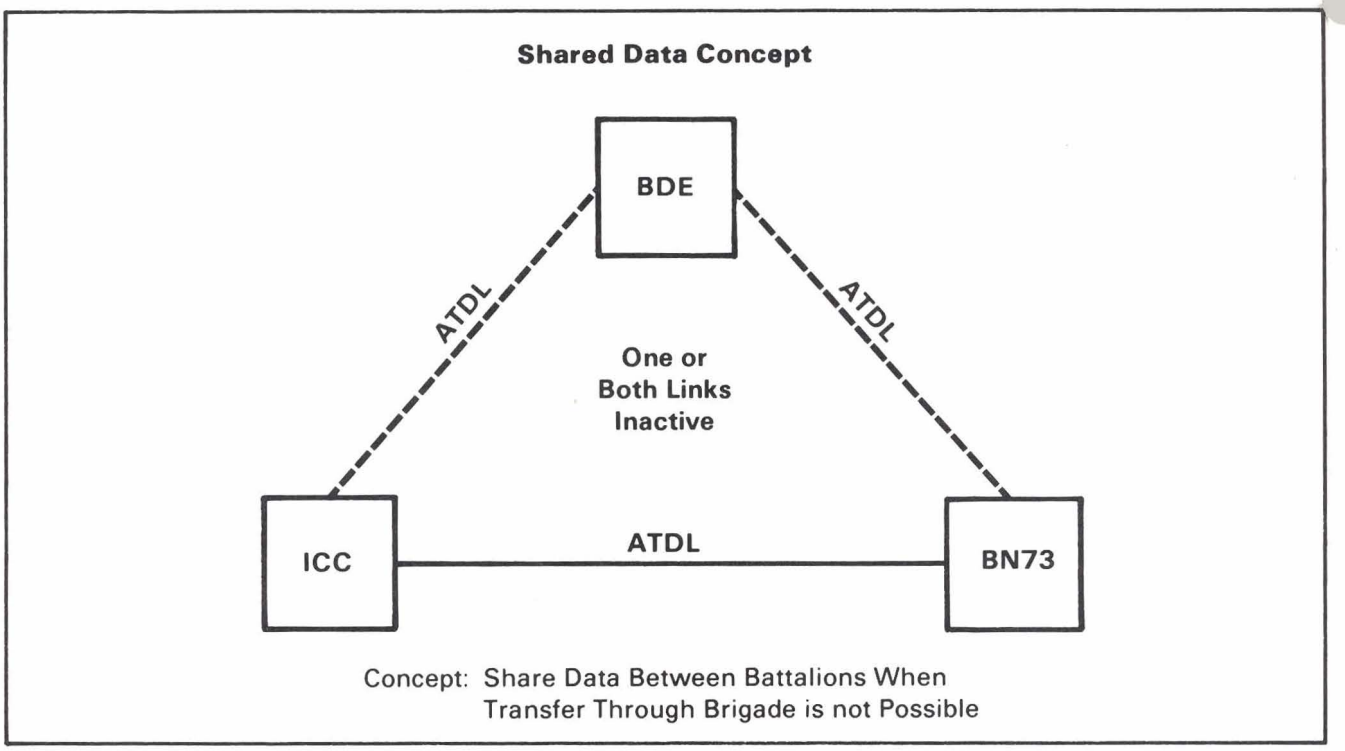


Figure 2

AN/TSQ-73 is technically capable of integrating the fires of Hawk and Patriot at the brigade and master battalion level (see Figure 1). Despite this good foundation, however, work remains to be done.

Previously established operational requirements are resulting today in capabilities that will dramatically increase the effectiveness and firepower of ADA systems. Passive target acquisition, multiple engagements, tactical missile defense and the technical capability to mix Patriot and Hawk at the battalion level are providing Air Defense Artillery with the ability to reach out and touch the bad guys.

Air defense artillerymen are becoming more aggressive. In the next air battle while fire direction centers and fire units execute the current engagements, commanders and S-3s will be planning the use of that firepower for the next phase or next wave which may be only minutes or hours away. Following are some of the concepts and technical advancements that will influence their planning.

Passive target acquisitions, external air picture and external sources of early warning will enable Air Defense Artillery to minimize radar emissions and enhance fire unit survivability. Each level of the C^2 structure that can provide track information to an integrated air picture increases the flexibility of the ADA defense design, contributes to the protection of friendly aircraft and increases the likelihood of successful engagement of all hostile targets.

Patriot-shared data in post-deployment build (PDB)-2 and the information coordination central (ICC) master battalion capability in PDB-3 will significantly improve Patriot ability to maintain this integrated air picture and to provide the Patriot air picture to other ADA units

Shared data in PDB-2 will allow the ICC to provide its air picture directly to an adjacent battalion AN/TSQ-73 when that AN/TSQ-73 has lost its link to the brigade (see Figure 2). Position, identification and engagement status of Patriot local tracks will be passed to the adjacent battalion on an ATDL-1 link.

PDB-2 shared data will not pass remote air tracks received from higher echelon nor will it process adjacent Hawk battalion tracks that do not correlate with its own air picture; PDB-2 shared data is basically an interim step toward the PDB-3 master battalion capability which will implement these capabilities along with full track management. Additionally, with PDB-3, the ICC will perform automatic threat ordering for subordinate battalions, both Patriot and Hawk.

Maximizing the capabilities of various ADA systems in a mixed defense requires employing those weapon systems in the same engagement

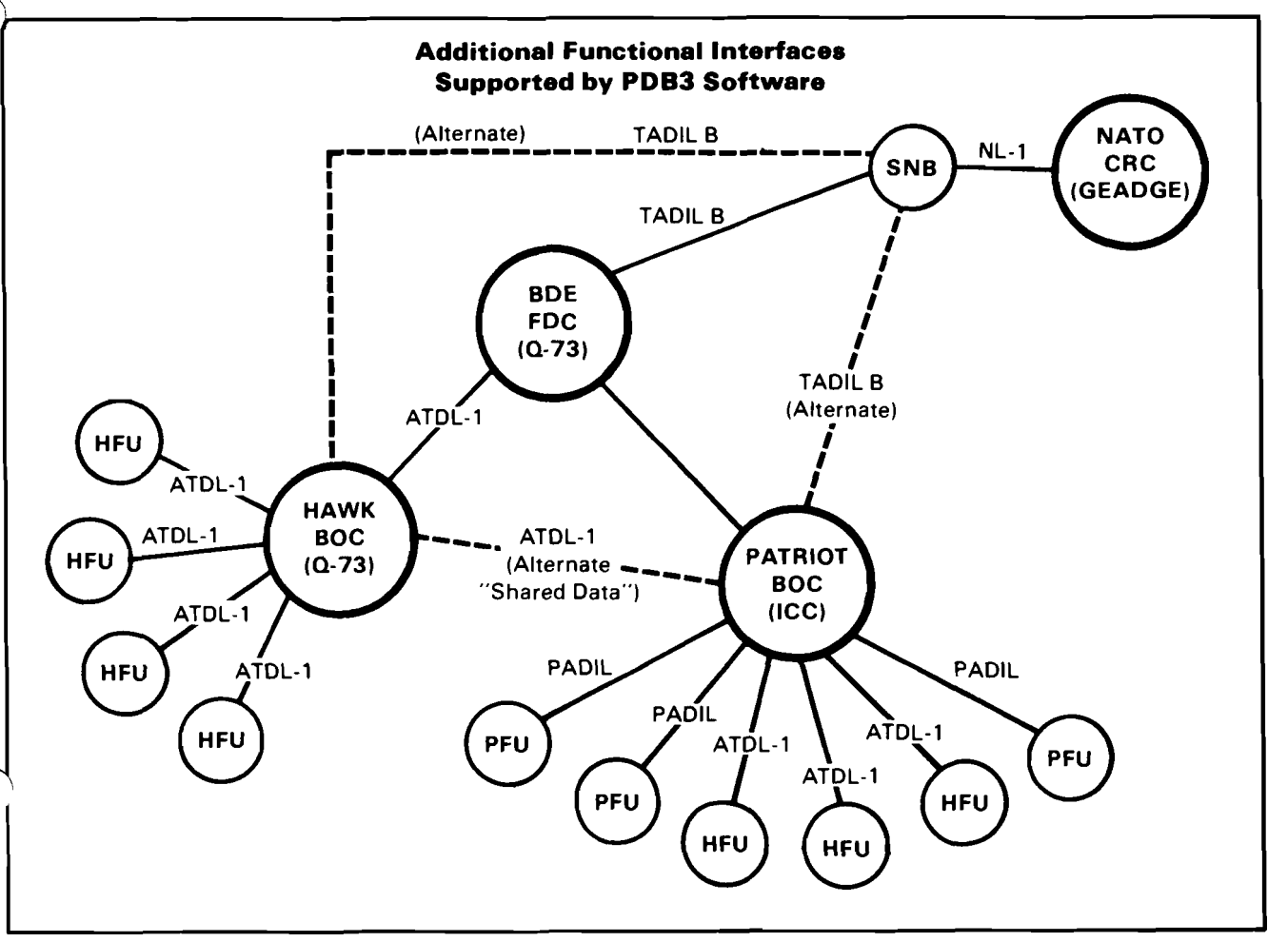


Figure 3

zone. For Hawk and Patriot to operate in the same engagement zone without centralized control or an area management procedure is a waste of the firepower of both systems. Because of the speed of the Patriot multiple engagement sequence, Hawk will be denied targets, and Patriot missiles will be wasted on targets which Hawk could have engaged.

To maximize the firepower of both systems, engagements must be managed or controlled to ensure that Hawk engages not only targets that Patriot cannot see but also targets which will conserve Patriot missiles for use against targets which Hawk cannot engage.

Patriot PDB-2 will enable Hawk fire units to be integrated directly with the ICC. The ICC will correlate all Hawk tracks, provide automatic identification, and make automatic recommendations for Hawk engagements. Fire distribution to the Hawk units will be manual with PDB-2 but will be automated with PDB-3. These software improvements will maximize Hawk engagements in a mixed Patriot/Hawk battalion task force.

PDB-3 will also provide the software capability for the ICC to integrate up to 12 Hawk fire units or six Patriot fire units. Technically, it will be possible to form a mixed battalion task force of Hawk and Patriot at a ratio of two Hawk fire units for each Patriot fire unit up to a total of 10 fire units.

While some allied users of Patriot and Hawk will use these capabilities to form permanent composite battalions, U.S. Army Air Defense Artillery will use the factors of mission, enemy, terrain, troops, and time available, known as METT-T, and the defense design to determine the appropriate mix in accordance with the situation. Together, the master battalion and mixed battalion capabilities provided by PDB-2 and PDB-3 will afford HIMAD units optimum flexibility to meet the defense design requirements (see Figure 3 and Figure 4).

The first, and probably the most serious, threat to face Air Defense Artillery in the air defense battle will be tactical ballistic missiles (TBMs).

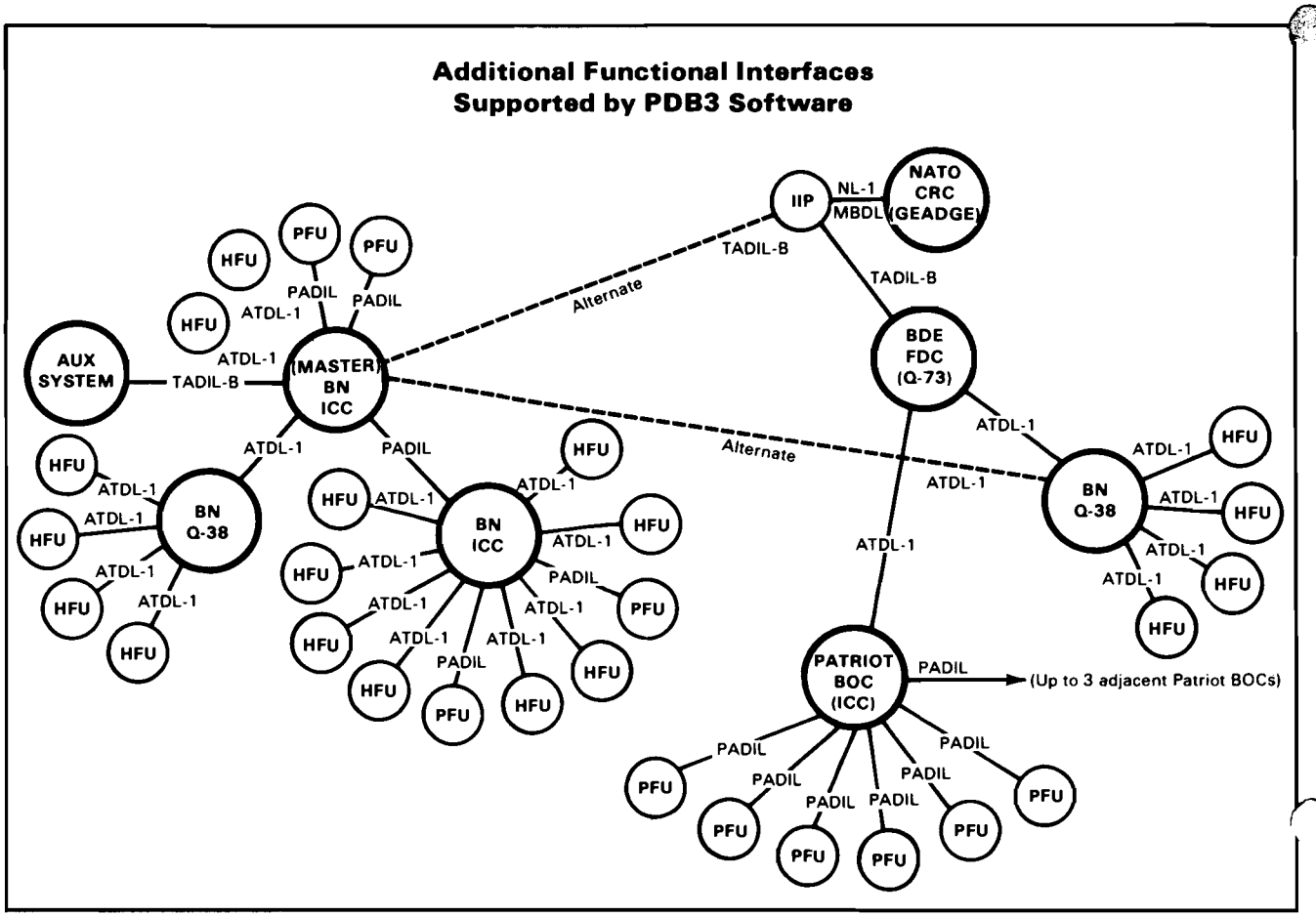


Figure 4

Air Defense Artillery will counter the TBM threat with emission control, movement, decoys and active defense.

The PAC-1 capability in PDB-2 will provide Patriot with a TBM surveillance mode, a mission kill against specific TBMs, an automatic launch capability against self-defense targets and operator-initiated engagements for limited asset defense. While in the TBM mode for surveillance or engagements, Patriot retains its capability against the air-breathing threat. Patriot fire units will also have the capability to engage TBMs via told-in data.

During the heavy air battle each of these capabilities increases the need to provide effective control of multiple engagements. Effective control must extend from the fire units to the highest echelon to which communication is possible in order to optimize integration of the air defense battle. Yet, effective control must also provide for execution of hostile declaration and engagements at the most efficient level that is capable of fire distribution.

Centralized control of the air picture is necessary for the following reasons:

- To provide an optimum composite of track sensor, intelligence and other track information
- To maximize friendly protection
- To minimize simultaneous engagements

The technical capabilities in HIMAD systems to meet these requirements are automated identification and automated engagement. This automated control of execution is necessary to deal with the large number of simultaneous actions/decisions which must occur to maximize the multiple-engagement firepower of HIMAD weapons systems.

In the minute-to-minute air battle this automated execution is controlled by the battalion ICC or AN/TSQ-73 while system parameters for the next phase of the battle are planned in the tactical operations center (TOC). These parameters are determined in accordance with the technical capabilities of the interoperating ADA weapons systems, the rules of track management, and the orders or guidance passed through each echelon of higher operational and tactical control. That is,

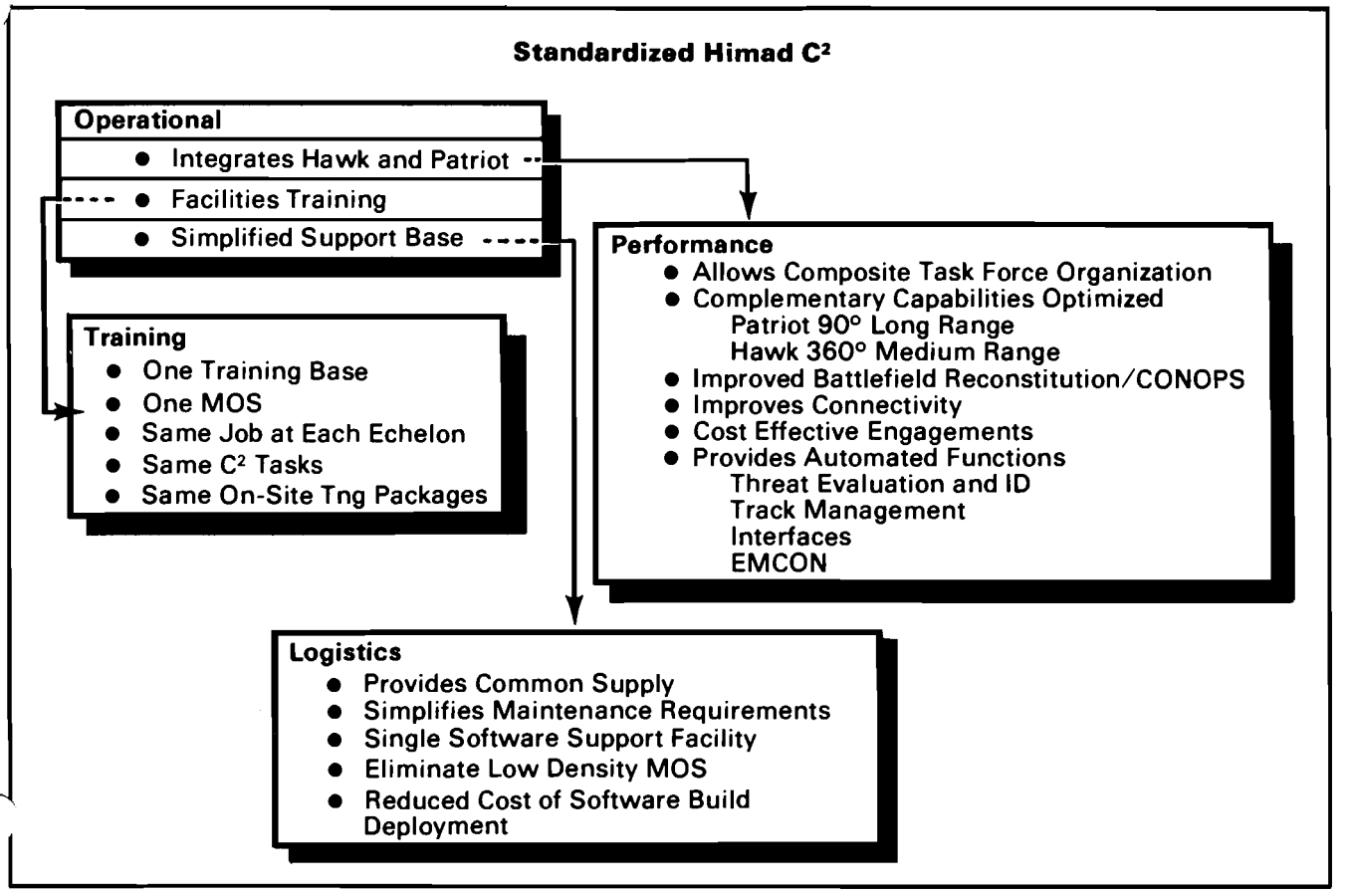


Figure 5

Command Post Automation

Manage and control widely dispersed fire units

Exchange large volumes of rapidly changing data

- Tactical
- Technical
- Logistic
- Administrative

Reduce transmission on overburdened voice networks

Conduct mission planning

Determine automatic parameters for fire unit system

- Terrain analysis
- Unit ground movements and placement
- Air defense coverage
- Communications

Figure 6

control and reporting centers control brigades, brigades control battalions, battalions control batteries.

The most significant technical improvement for this area will be to provide a standardized HIMAD C^2 system (see Figure 5) and to provide automated planning capability in the TOC (see Figure 6).

These systems will both serve to optimize interoperability and to allow the ADA commander to get inside the enemy planning cycle and meet the next air battle with maximum firepower.

We have doctrinal and technical interoperability for HIMAD systems today. PDB-2 and PDB-3 for Patriot, as well as other technical improvements in the Missile Minder and Hawk weapons systems, will make significant improvements in HIMAD integration in the very near future. A little further into the future, the standardized HIMAD C^2 system and the automated command post will provide the necessary effective command and control required to make HIMAD a single family of systems. □

Capt. Rotchford is an action officer in the TRADOC System Manager (HIMAD) Office, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.

Patriot Users Meet Patriot Makers

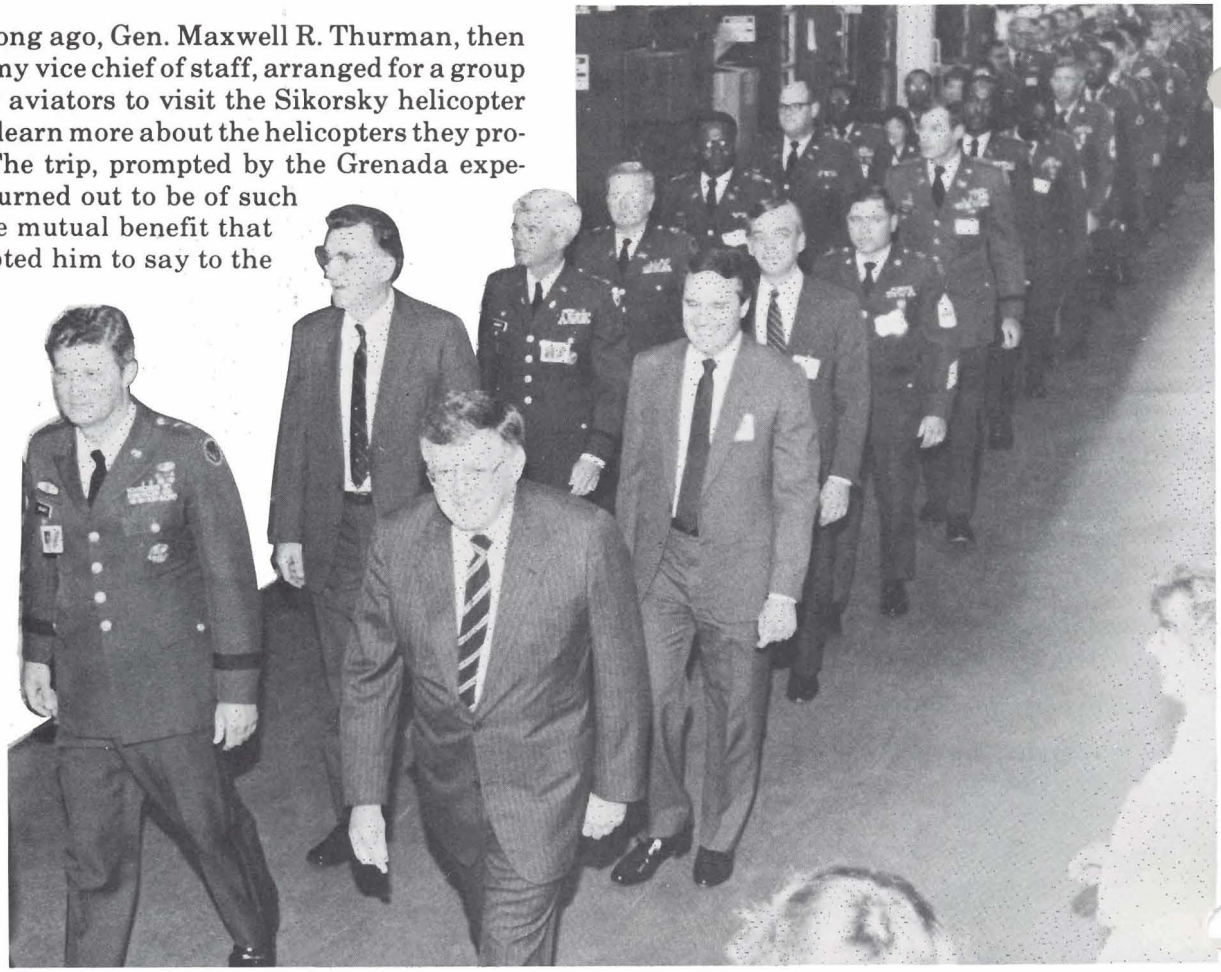
Their common bond is a weapon system and the defense of the United States

by Len Novak

Not long ago, Gen. Maxwell R. Thurman, then Army vice chief of staff, arranged for a group of Army aviators to visit the Sikorsky helicopter plant to learn more about the helicopters they produced. The trip, prompted by the Grenada experience, turned out to be of such immense mutual benefit that it prompted him to say to the Raytheon Corporation, "You folks should do the same thing with the Patriot units." Their reply was, "Great idea."

In a memorable cross-cultural, cross-training experience in May 1987, 31 Patriot soldiers of the 6th Air Defense Artillery Brigade, Fort Bliss, Texas, led by their commanders and Maj. Gen. Donald R. Infante, chief of Air Defense Artillery, traveled to Boston, Mass. They went to learn about where and how their missile systems were manufactured. This was the first half of what was later to become a reciprocal arrangement. In October 1987, 48 Raytheon executives and plant staff visited Fort Bliss for a memorial retreat ceremony and Patriot missile live fire at McGregor Range, N.M.

During the May visit, thousands of the Raytheon Corporation's Missile Systems Division (MSD), Andover, Mass., plant employees lined the halls of their facility to applaud and welcome members of the 43rd Air Defense Artillery and the



Maj. Gen. Donald R. Infante, chief of Air Defense Artillery, and Raytheon executive Dennis J. Picard lead ADA soldiers through Raytheon's Andover, Mass., assembly plant.

U.S. Army Air Defense Artillery School's 6th ADA Brigade from Fort Bliss. The Army troops, who will be using Patriot equipment in the field, traveled to Andover to meet the people who manufacture the system and see the process which produces the advanced technology they will employ in the field.

The Lexington Fife and Drum Corps led a parade within the facility from the Andover Room to the High Bay dedication area at the opposite end of the Andover plant. After the national anthem was played, plant manager Bill Swanson introduced Walt Trainor, vice president and manager of the Patriot program, who welcomed the soldiers and called the visit an opportunity for the Raytheon community to support those who use the Patriot system.

Dennis J. Picard, senior vice president and Missile Systems Division (MSD) general manager, called the event a unique occasion for Raytheon, MSD and the U.S. Army. "There are two groups of people here today," he said, "those in uniform and those who are not. Are they different? Not really. Their common bond is the Patriot system and the freedom and defense of the United States."

Picard described this link as a "marriage" between the maker and the user. "When these soldiers take our equipment to the field and it works well, they will remember the support of the people back here at this plant," he stated. "We heard the fifes and drums today, which remind us of the Revolutionary War and the patriots who fought for the freedom of this country. We have the patriots of today with us now."

Infante called the ceremony the first of its kind which brought the user and the maker of a defense system face to face. "The Army has a chance to see the people who make the greatest air defense system in the world. Every time I come to Raytheon in Andover and see the sign that reads 'Quality people make quality products,' I let out a big 'amen.'

"We have the finest quality soldiers ever, and we need quality machinery of war. Today is a melding of the soldiers and the system. Patriot performs in an outstanding manner and will play an increased role in defense," he said.

Bill Swanson called for a round of applause for the Patriot battalions, standing before a 20-by-30-foot U.S. flag. Then he and Infante unveiled four unit plaques, representing the 1st, 3rd, 6th and 8th battalions of the 43rd Air Defense Artillery, to be displayed in an honored place in the plant.

The Fort Bliss visitors, composed of two soldiers from the 6th ADA Brigade headquarters, eight from the 1/43rd ADA, nine from the 3/43rd ADA,

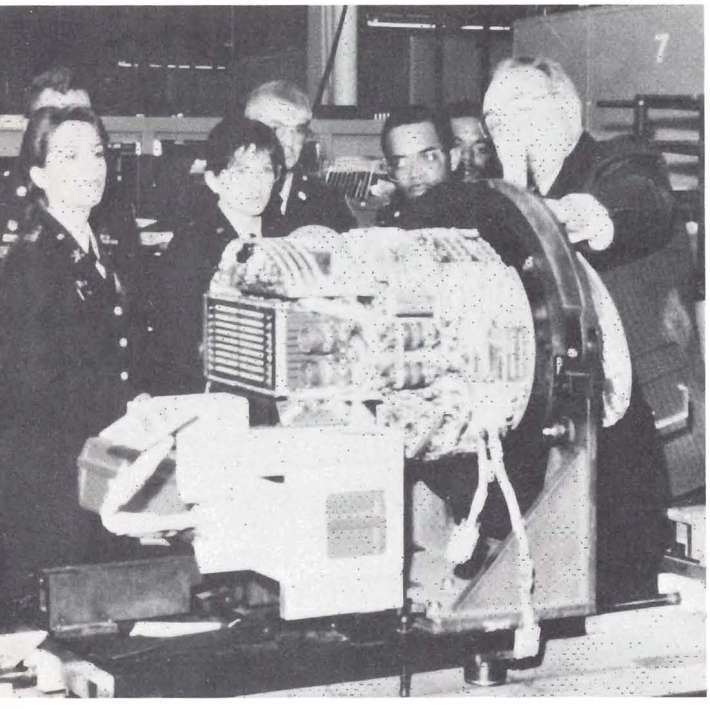
A Raytheon executive explains how Patriot components are assembled.

nine from the 6/43rd ADA and eight from the 8/43rd ADA, were then given product briefings, from the manufacturing process standpoint, and a tour of the plant.

The visiting Patriot missilemen were favorably impressed. Spec. 4 Jeffrey Higdon, Headquarters and Headquarters Battery, 1/43rd ADA, said, "It blew my socks off to see this plant, and I come from Detroit. The briefings were super, the automation and efficiency are fantastic, and I was amazed to see how many people and how long it takes to build this system. I also liked the city of Boston. This is my first visit here, and you can almost feel the sense of history."

Second Lieutenant Kimberley Kadlec, a fire control platoon leader with A Battery, 6/43rd ADA, said, "They welcomed us with open arms. The workers were genuinely glad to see us and share their expertise. They cared, were committed and behind us. It was good to talk to people who felt that what we are doing is important. They showed us special company equipment and gave us a real behind-the-scenes tour. The quality control measures were superb. I never saw a civilian company which took such measures to build morale and pride in their work force. I enjoyed seeing many of the tests used and seeing the high-tech electronics in the missiles."

Later that evening, all of the visitors and many of their plant guides and hosts went to dinner



The sophistication and automation of the Raytheon assembly lines impressed air defenders.

together to experience the fine New England cuisine. During the course of the evening, it became apparent that most, if not all, of the Raytheon workers there had never seen a live fire of their missile system, or any other air defense system. Upon becoming aware of this fact, Infante invited their hosts to come to Fort Bliss to witness the next battalion's (6/43rd ADA) center certification and live firing in October.

From this background, the return visit was arranged. On the morning of Oct. 19, 1987, forty-four Raytheon employees from the Andover plant, plus four company vice presidents and their wives, flew to Fort Bliss for a busy two-day visit to the Air Defense Artillery Center and their recent Patriot soldier guests.

The honored visitors attended high-to-medium altitude air defense briefings and then observed Patriot soldiers in training at Fort Bliss' Abernathy Park, an equipment practical-exercise area of the U.S. Army Air Defense School.

That afternoon they went to Memorial Circle for solemn proceedings there. After the national anthem and the reading of the Yorktown Day message, Infante welcomed the Raytheon guests and then introduced Picard. The MSD general manager, on behalf of the Raytheon Company, presented a Patriot missile to the United States Army Air Defense Artillery Center and Fort Bliss.

After the retreat ceremony and the ADA March, there were appropriate remarks by the chaplain. Then, Picard, on behalf of Raytheon, presented the Hoffman family with a $5,000 check to the endowment fund of Maryhurst College, Erie, Pa., in the name of 2nd Lt. Christine Marie Hoffman. She was a former fire control platoon leader of C Battery, 6/43rd ADA, who lost her life on Aug. 16, 1987, at the age of 23 in a commercial plane crash.

The following day the Raytheon party traveled to McGregor Range to watch the 6/43rd ADA Patriot fire, the main purpose of their visit. After a briefing on range operation and procedures, they were given information on the techniques and procedures the Patriot batteries would use to certify the adequacy and effectiveness of both the troops and their missile system.

After lunch at the McGregor Range dining facility, they watched a short-range air defense (SHORAD) demonstration by E Battery, 2nd Battalion, 56th Air Defense Artillery. For the distinguished visitors, E Battery fired a Stinger missile, a Redeye missile, a Chaparral missile, and a towed and self-propelled Vulcan 20mm gun.

When the SHORAD firing ended, the Raytheon visitors returned to Observation Post Five to watch the 6/43rd ADA batteries fire. The Patriot batteries obliged; Alpha Battery, followed by Charlie Battery and then Bravo Battery, all fired successfully.

The visitors were gratified by their user's success, and highly complimentary of all that they had seen at Fort Bliss.

Clara Nagy, a Raytheon Company group leader for Printed Wire Assembly, said, "This was a once in a lifetime adventure and an excellent learning experience. I was honored to attend."

The manager of customer relations, Missile Systems Division, Robert Hatem, added, "This was one of the finest experiences I ever had, first, because of the gracious hospitality and, second, it was very educational. This trip gave me a better appreciation for the responsibilities of our soldiers today."

Following the live fire, Mary Maloney said, "As a former Hawk platoon leader and now an employee of Raytheon Company, to witness the total ADA umbrella of weaponry was truly impressive. As I sat in the stands to watch the live fire I really appreciated the effort it took to make it happen. I'm lucky to have had the experience. Fort Bliss was the perfect host."

Raytheon Company plans to continue sponsoring Patriot soldiers visits to Andover fostering their common bond — the Patriot system and the freedom and defense of the United States. □

The Changing Face of 32nd AADCOM

". . . the force is strong, tough and smart." —

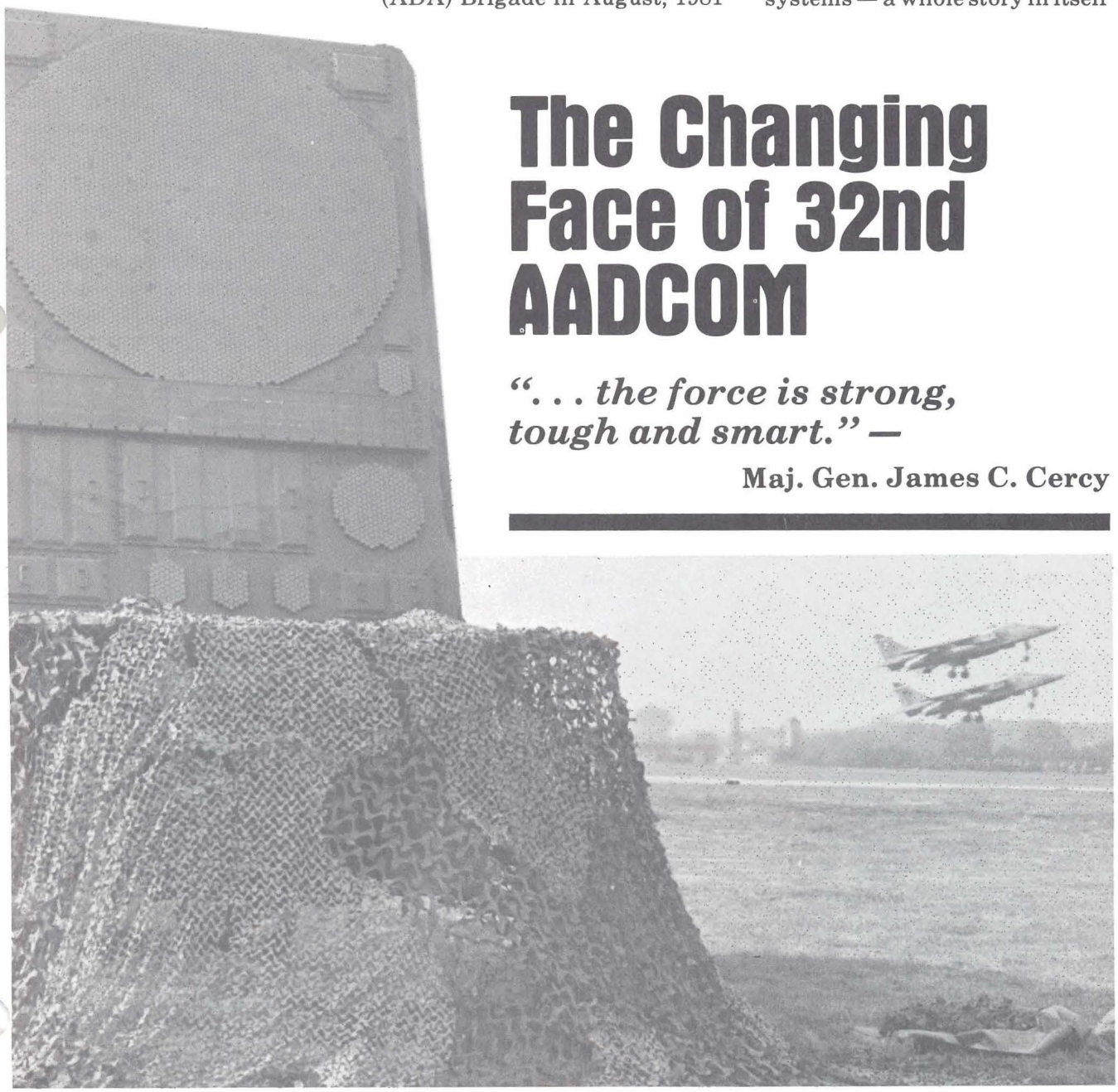
Maj. Gen. James C. Cercy

by Maj. Gen. James C. Cercy

Having recently concluded my first 100 days in command of the 32nd Army Air Defense Command (AADCOM), I believe it may be most useful to share with you my impressions of the command and the directions in which we are moving.

I turned over command of the 108th Air Defense Artillery (ADA) Brigade in August, 1981 and left 32nd AADCOM and Germany. The thing that struck me the most upon my return six years later was the tremendous positive change that had taken place.

Today, as I travel throughout the command, I am impressed by the quality and self-motivation of our young soldiers. I am continually reminded of the great strides we have made, not only in upgrading our systems — a whole story in itself



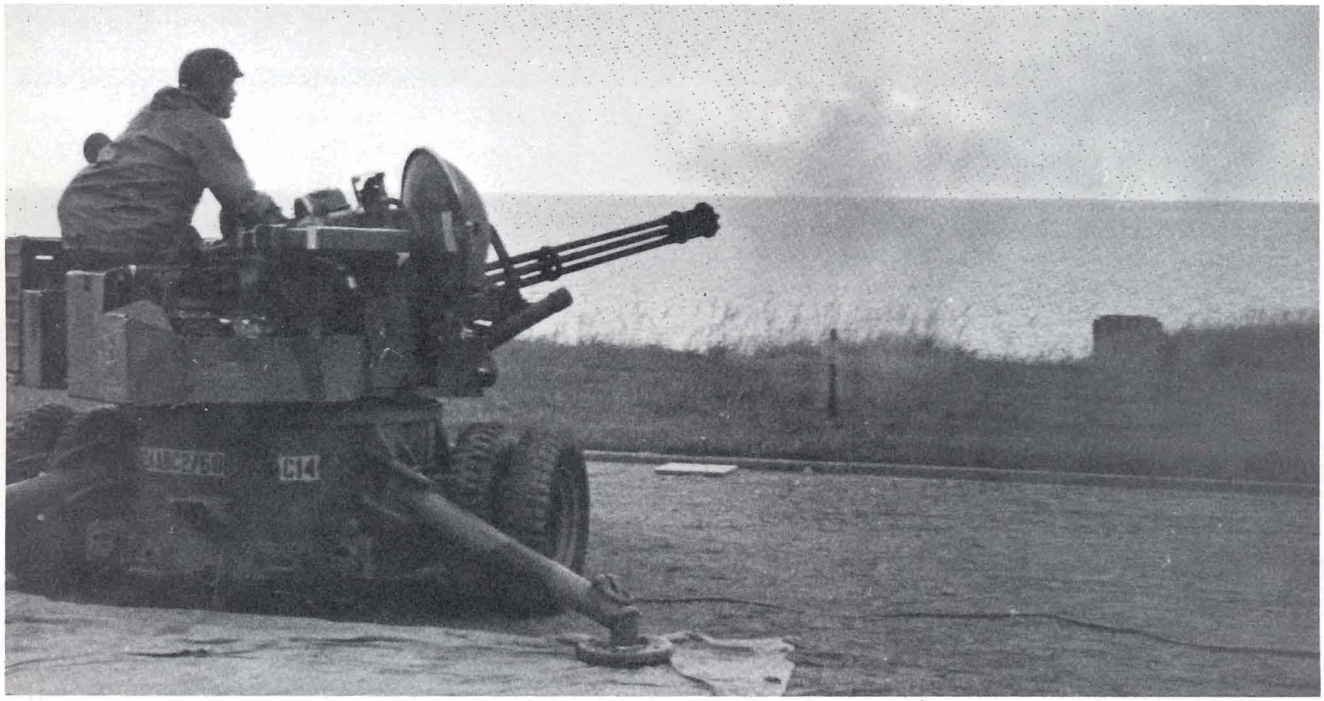
During Exercise Hammer, the English countryside and two Royal Air Force Tornados provide an unusual backdrop for a Patriot phased-array radar belonging to 4/3rd ADA.

— but also in improving our facilities and the quality of life for our soldiers and their families. The efforts of many fine and dedicated soldiers and civilians who planned and funded these improvements over the past decade are now bearing fruit. We owe them all a great deal.

The face of 32nd AADCOM is changing in many ways. A lot of money has been spent on improving the old and building the new. Our soldiers and their families, as a result, lead better, more productive lives.

As you might expect, the new facilities built to accommodate our new Patriot battalions are impressive. They feature modern dormitories, comfortable dining facilities and efficient motor pools. The initial ready positions are unlike anything any air defender has ever encountered. They match the excellence of the weapon system itself.

You may be surprised, however, to discover that facilities



This 32nd AADCOM Chaparral crew (top) has just fired its annual service practice round at a NATO range. A Vulcan crew (above) checks its shooting over the North Sea range.

for our older systems have been dramatically upgraded. Much time, effort and money have been invested to make the 32nd AADCOM environment more conducive to training and mission accomplishment. Gone are the motor parks in the mud. Our Hawk TAC sites are no longer eyesores. These days you rarely find a TAC site without a hardstand motor pool, prefabricated support buildings, a modern dining facility and training and recreation facilities. The same is true for our short-range air defense (SHORAD) units.

The military communities have played a big part. An aggressive, positive campaign is underway throughout U.S. Army, Europe, to upgrade community facilities and housing areas. New shopping centers and commissaries are going up. New gymnasiums, theaters and arts and crafts centers are being built and older ones are being remodeled. I, for one, am very pleasantly surprised to see the progress that has been made. All these things have come about to give the world's most deserving soldiers and families a higher standard of living. This, in turn, translates into a better cared for, better motivated soldier and a force that can concentrate on training and thus reach the peak of its war-fighting capability.

Let's talk about those soldiers for a moment. They are a success story all their own. In my travels within the command I get to see a great many soldiers doing a great many jobs, and doing them extremely well. I am unabashedly proud of today's young air defense soldier, regardless of his or her MOS or grade. The air defense soldier of today is a top-notch professional —well educated, eager and motivated. He or she can perform the most demanding tasks the Army has to offer. More often than not our air defense soldiers exceed the standard.

Maj. Gen.
James C. Cercy

And, of course, I must mention the air defense systems. Early 1988 will see 32nd AADCOM field its sixth Patriot battalion. We now have four truly composite brigades, each consisting of both Patriot and Hawk battalions. They have allowed us to establish an integrated defense designed to inflict maximum attrition on any would-be attacker. The Chaparrals and Vulcans of our two rear brigades provide a strong defense of critical assets in the rear combat zone. An increased number of Stinger teams throughout the command provides us a lethal mix of the world's most capable, sophisticated air defense systems.

When you combine the factors I've just referred to, the result is a tough, effective fighting force of 13,000 soldiers, manning the best air defense network in the world, spread across 56,000 square miles of central West Germany. And let there be no doubt, I am proud to command it.

I've purposely saved mentioning leadership until now. When you combine the support systems with the soldiers, and the soldiers with the equipment and the high quality leadership which we have at all levels throughout 32nd AADCOM, you come up with a potential training environment which is second to none. We do our best to ensure the training is smart and innovative.

The most exciting challenge 32nd AADCOM faces is integrating our air defense and command and control systems into a truly flexible and coordinated defense. The defense must maximize the capabilities of each system and combine those capabilities into the best possible weapons mix, both in the forward area and in the rear combat zone.

At the heart of this concept lies a defense design which integrates our systems on several levels.

In both the forward and rear areas, Patriot and Hawk battalions are employed in a mixed defense. In the rear area SHORAD

is added to form two composite brigades with an even more comprehensive mix of systems. All units are mobile and displace frequently to improve coverage, accomplish a new mission, improve survivability or create a deception.

These systems must be integrated on three distinct but complementary levels if we are to maximize the full potential of the defense design:

- Force Integration. The defense must be molded into the operational and tactical concepts of air and land operations.
- Defense Design Integration. The systems must interact with each other's positions.
- Air Battle Integration. The fires and the systems must be coordinated to maximize the protection of vital assets and the attrition of the attacking force.

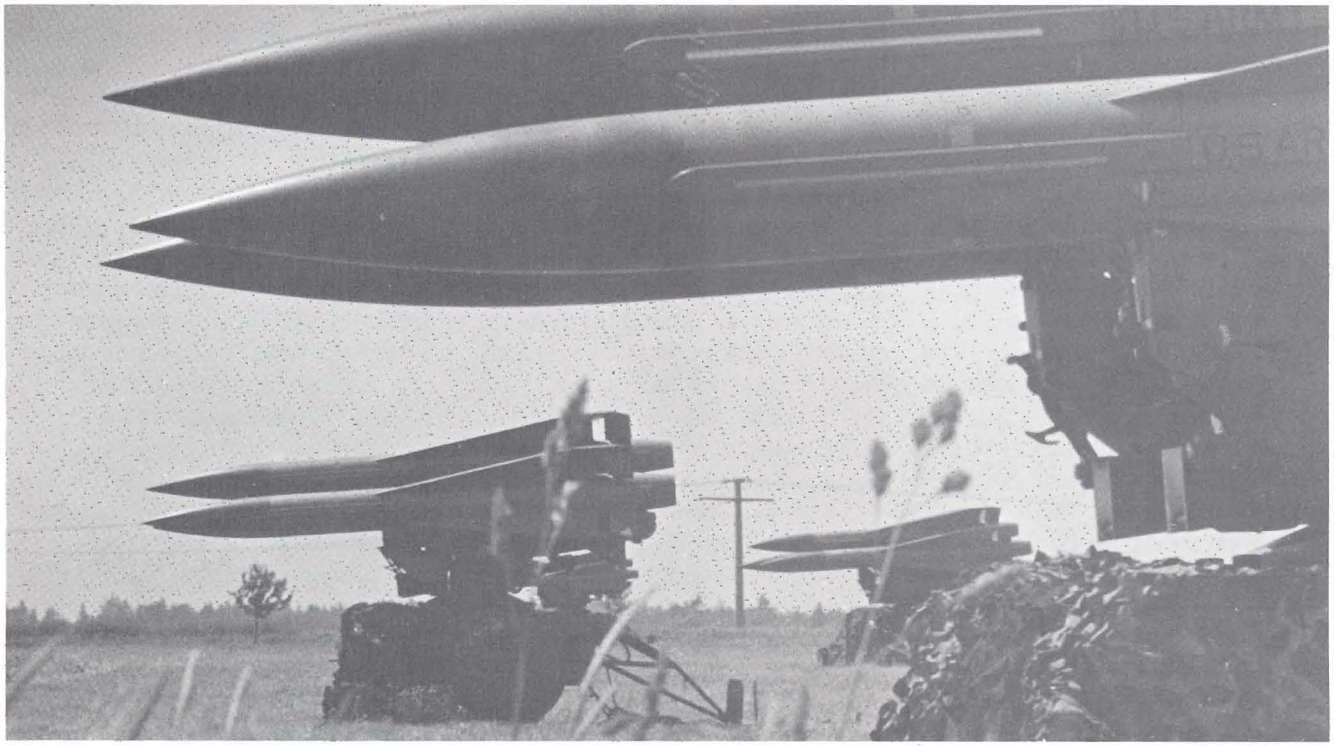
Applying these concepts and training up to standards is, I believe, the single biggest challenge facing the command. I have every confidence that the command will meet this challenge through careful planning, practice, training and applied leadership.

As important as the concepts of how we operationally and tactically employ weapon systems are, we must never for a moment lose sight of the soldiers who will ultimately take those concepts and turn them into a battlefield reality. The leadership of this command cannot and will not let down on basic skills. We must always emphasize standards. The challenge of training to win on the modern battlefield requires tough, exacting standards of performance, standards which, I am happy to report, are being attained on a daily basis by the 32nd AADCOM soldiers.

If test scores accurately measure the ability of our soldiers to achieve and maintain the highest of standards, then, by the yardsticks we know as the Army Physical Readiness Training Test, Marksmanship Qualification Test and Skill Qualification Test, the force is tough, strong and smart. In short, our soldiers are ready and able to meet the challenges of an increasingly sophisticated and demanding mission.

The challenge to leadership here, to ensure standards are met, is not only to plan, conduct and evaluate tough, rigorous training, but also to make that training interesting, stimulating and, yes, fun. Here again 32nd AADCOM units, leaders and soldiers are meeting that challenge.

Throughout the command, 32nd AADCOM units participate in military competitions with their host nation partnership units on various levels, testing the skill and mettle of the soldier. This is, of course, important for a variety of reasons, but



The highly reliable, effective Hawk missile system will play a significant role in the 32nd AADCOM's air defense planning for years to come, thanks to improvement programs.

it introduces a healthy sense of competition and fosters camaraderie with our allies.

Exercise Hammer 87-1 saw 350 soldiers of the 10th ADA Brigade airlift a composite Patriot-Hawk force to Great Britain in May 87 to participate in the largest live-fly exercise conducted in Europe. The soldiers of 2/43rd ADA (Patriot), 3/52nd ADA (Hawk) and HHB, 10th ADA Brigade gained valuable experience in airlift redeployment and integrated air defense operations. The vast majority of the soldiers also took the opportunity to visit at least some of the British Isle.

Units of 6/52nd ADA proved that the 69th ADA Brigade motto, "Team of Winners," is more than just a catchy phrase. D Battery, 6/52nd ADA recently participated with a German ADA unit in the 1987 German-American Hawk competition at Regensburg, while the soldiers of B Battery, 6/52nd ADA, won the August 1987 32nd AADCOM Military Stakes competition.

Basic soldier and survival skills were emphasized during a week-long "NCO FTX" conducted by the NCOs of 2/60th ADA. In all, 418 enlisted soldiers and NCOs from the 94th ADA Brigade unit spent a week in the field learning first-hand survival and field skills in a field training exercise which featured neither officers nor vehicles. The objectives, admirably achieved, were to fine-tune basic skills, build teamwork and, in the words of the organizer, " . . . develop the warrior spirit . . . . "

Soldiers of the 108th ADA Brigade recently participated in the French Commando Course in Breisah, West Germany. Thirty-seven soldiers of the brigade's Chaparral/Vulcan battalion, 6/56th ADA, spent 14 days going through this tough, demanding training alongside soldiers from the French Army. This marked the first time air defense soldiers have ever participated in the course. It paid big dividends for the soldiers and the unit in terms of building experience, skill, self-confidence and teamwork.

Regular training with the Stinger tracking head trainer is a must for 32nd AADCOM Stinger crews.

As I stated at the beginning, it is indeed great to be back once more in 32nd AADCOM. I have shared my impressions and observations of the command as I see it, especially in light of the many obvious changes I see after a six-year hiatus. Changes — tremendous changes, positive changes — have taken place in all areas of the command.

I find it particularly rewarding to see the progress made in improving the quality of life of our soldiers and their families. Better working areas, better living quarters, and improved installation facilities all add up to a soldier of high morale who is supported as he or she should be.

Weapon system employment has changed dramatically in what is really a very short time. The challenges with which the much improved capabilities of our weapons systems present us, especially in the areas of training, defense design and employment, are vital and exciting. The challenge of fielding the forward area air defense system, while maintaining a high state of readiness, awaits us.

The real challenge for 32nd AADCOM is to put all of these factors, the human and the hardware, the tangible and the conceptual, together in the optimum combination to maintain and further develop the decisive edge in the war-fighting capability we now enjoy. With the assets 32nd AADCOM has at its disposal, especially our soldiers, this challenge will be met. □

Maj. Gen. James C. Cercy is the commander of the 32nd Army Air Defense Command, West Germany.

Stinger Operators Join in Test

Human factors come to the fore as early warning device gets tryout

by Paige Eversole

Soldiers search the sky with Stinger trainers to identify incoming aircraft. (Photo by Gail Connors)

Stinger operators who participated in a test at Yakima Firing Center, Wash., have learned that human factors engineering is important to soldier survival in tactical situations.

Human factors engineering is the science of designing products with soldiers in mind.

The Stinger operators who use the shoulder-fired missile to shoot down low-flying aircraft were participants in a test coordinated by the Army Combat Developments Experimentation Center (CDEC) Board at Fort Lewis, Wash.

The Human Engineering Laboratory (HEL) gathered data at the test site on a cuing device designed to provide early warning of incoming aircraft for Stinger operators. The lab's researchers also performed a human factors engineering evaluation on the test bed in place at the site, the forward area air defense command, control and intelligence (FAAD C^2I) test bed system. The cuing device, known as a fire unit display (FUD), is one component of the test bed.

Evaluators wanted to find out how well the system could process and display data collected by sensors on the range. They also evaluated how well the Stinger teams could acquire and engage hostile aircraft with the help of the system.

"We're getting some indication of the capabilities of the system in a live environment," said Joe Williamson of the CDEC Board, who helped design the test. "We are asking what this system can do to help the soldier."

Stinger operators taking part in the test watched a computer display for a cue. A correct cue gave them time to ready their missiles and begin searching the horizon for the target following the initial warning of an enemy aircraft. When glare on the computer screen made it hard to read or when false alarms made the soldiers wonder whether or not aircraft really were approaching, the HEL researchers made notes.

Lieutenant Colonel Jack Taber, representing the U.S. Army Air Defense Artillery School in the Fort Lewis testing, said the FAAD C^2I prototype

tests generate data useful in developing new doctrine and tactics. As automated FAAD systems move from prototype toward final development, doctrine and tactics are refined at the same time as the hardware to which it eventually will be applied.

Gary Kurtz, head of HEL's air defense team within the lab's Aviation and Air Defense Division, said that data gathered now will be used to develop MANPRINT input to the FAAD program. MANPRINT (Manpower and Personnel Integration) is an Army initiative to improve the design of systems by considering aspects of human factors engineering, safety, health hazards, manpower requirements, training and personnel capabilities.

Bruno Sinigaglio, chief of HEL's field office at Fort Lewis, is one of the researchers who took notes as the fire unit crews used the FUD and "shot down" aircraft. "The data collectors know when the planes are coming in. The soldiers are looking at the screen of the fire unit display," he said.

While the soldiers watched the display, Sinigaglio said, researchers watched them, recording soldiers' reactions and procedures that couldn't be recorded on the automated data collection equipment that HEL installed at the test site.

HEL's Rick Huey designed and managed HEL's fire unit data collection facilities, consisting of computers and other recording equipment mounted in commercial motor homes. He also managed a crew of data collectors who recorded test events using both clipboard and computer.

Using the automated gear, researchers kept track of the time it took gunners to acquire, identify and engage an aircraft after the Stinger teams received cues as to its direction of flight and other key characteristics from the FUD.

Huey's design included the means for a daily transfer of data for reduction and analysis on a personal computer. CDEC will use this data to compile a system evaluation report. The data also may be used to replay the trials on HEL's prototype FUD and air battle management operations center (ABMOC).

Two shelters at the test site and one several miles away housed the collection points for the message and track information as it came in from the sensors and other command posts and was relayed to the Stinger teams. The two shelters represented the battalion-level ABMOC and the battery-level command post and were fully automated. The human factors evaluation that the HEL team conducted on the test bed in Yakima will address the subject of soldier-machine interface from a number of points, including workstation design within the two shelters.

While soldiers watched the display, researchers watched them

The forward air defense command control system in place in the field today is manual, using voice radio communications and pencils to chart incoming aircraft on a Plexiglas grid. An automated system would approach real-time tracking, reduce inherent transmission error rates and free manpower for other tasks.

Soldiers who participated in the test appeared to welcome the idea of an automated system. "I want my teams to have equipment that gives early warning because I can't give it to them," said SSgt. George Redington. "They'll know that way out there they've got fast movers moving in. The team will know when to start looking."

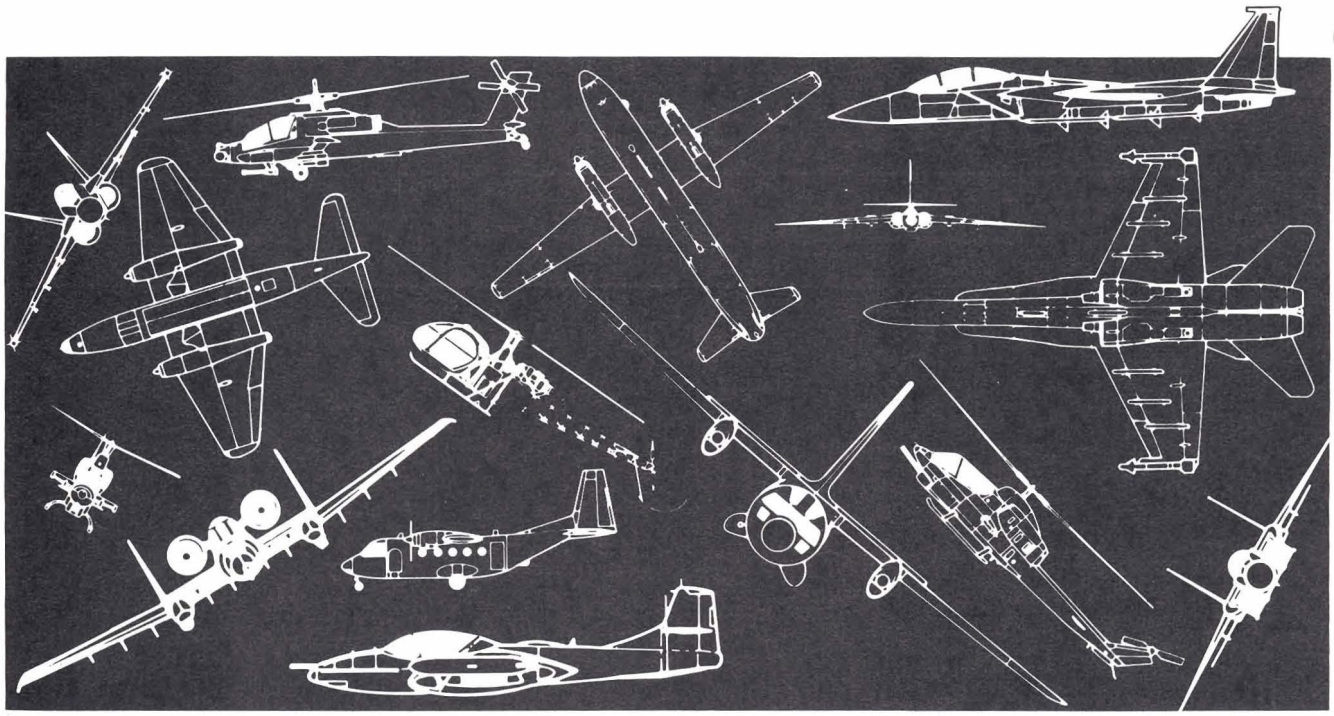
Specialist William C. Sampson III, a Stinger gunner for the 18 months he has been in the Army, said, "I think the idea behind the whole test is excellent. The idea is a computerized early warning system. We can only see so far. Without a radar system, we really have no chance to engage and protect the assets we're supposed to be protecting.

"Computers are the future," he added. "Why not use the technology to protect our country?"

"I think we're making tremendous strides in taking the mental and physical pressure off the soldier," said Maj. Richard Brown, technology manager for the Army Development and Employment Agency at Fort Lewis. "We'll have to teach the soldier to have a little more confidence in the automated command and control system. Testing against live aircraft helps them gain confidence."

The Human Engineering Laboratory is one of seven Army research laboratories nationwide that report to the U.S. Army Laboratory Command, the newest major subordinate command of the Army Materiel Command. □

Paige Eversole is a writer with the U.S. Army Laboratory Command in Adelphi, Md.



Recognition List Grows

Revised STPs will contain 50 aircraft; SHORAD offers tips for using current manuals

by John Pliler

The next revision of the 16-series SHORAD soldier training publication (STP) will contain 50 aircraft. These aircraft were selected by an aircraft selection board for inclusion in the STP by the Short Range Air Defense (SHORAD) Department at the U.S. Army Air Defense Artillery School (USAADASCH), Fort Bliss, Texas.

Meanwhile, the selection board stresses that SHORAD units are to continue training for visual recognition with the 40 aircraft currently listed in their field manual/STP until the revised STP has been fielded.

The goal is to have the 50 aircraft in the revised STP listing taught at the school starting in FY 89, which begins in October. To reach its goal, the selection committee is adding aircraft in increments. Just this January, the selection committee made the following additions: Mi-6 Hook, UH-60 Black Hawk, F-104 Starfighter, Tornado, OV-1 Mohawk, Puma, AV-8 Harrier, Mirage F-1, G.91, AH-64 Apache, F/A-18 Hornet and A-4 Skyhawk.

Still on the list from previous selections are the following: AH-1 HueyCobra, Mi-24 Hind A/D/E, A-10A Thunderbolt II, MiG-27 Flogger D, UH-1 Iroquois, Mi-8 Hip, F-4 Phantom II, Su-7/17/20 Fitter, OH-58 Kiowa, Mirage III/5, A-7 Corsair II, Alouette III, Su-24 Fencer, F-16 Fighting Falcon, CH-47 Chinook, F-5 Freedom Fighter, MiG-21 Fishbed, OV-10 Bronco, An-12 Cub, Lynx, C-130 Hercules, BO 105, Gazelle, OA-37 Dragonfly, Jaguar, F-111, F-15 Eagle, CH-53 Sea Stallion, Alpha Jet and Mi-4 Hound.

To be added during FY 89 are the following: Su-25 Frogfoot, Mi-28 Havoc, MiG-29 Fulcrum, A-6 Intruder, C-160 Transall, Mi-26 Halo, Su-27 Flanker and Mi-2 Hoplite.

Emphasis on visual recognition declined as a required skill for ground-based weapons crew members after World War II as a result of guided missiles replacing guns, a widespread assumption

that U.S. forces would continue to maintain air superiority, and an extensive reliance on electronic equipment to identify aircraft as friendly or hostile.

Since the advent of short-range air defense artillery weapon systems, the need for visual recognition skills has become more critical. Field Manual (FM) 44-30, which is source material for personnel conducting unit training in aircraft recognition, stresses the following points:

- Aircraft losses to air defense guns and small arms have re-established that the individual soldier on the ground is capable of inflicting heavy losses on aircraft operating at low altitudes.
- Continued retention of air superiority now is questionable.
- Limitations of electronic identification equipment in satisfying the identification requirements of individual soldiers and small units are now recognized.

Additional emphasis on the need for visual aircraft recognition has been generated by the provision of large numbers of short-range air defense (SHORAD) weapons to all divisional and some non-divisional ground combat forces. The crews employing these weapons depend on visual recognition of aircraft in making their engagement decisions. The effectiveness of their weapons in combating the low-altitude air threat is directly affected by the proficiency of the crews in visually recognizing aircraft, as FM 44-30 sets forth.

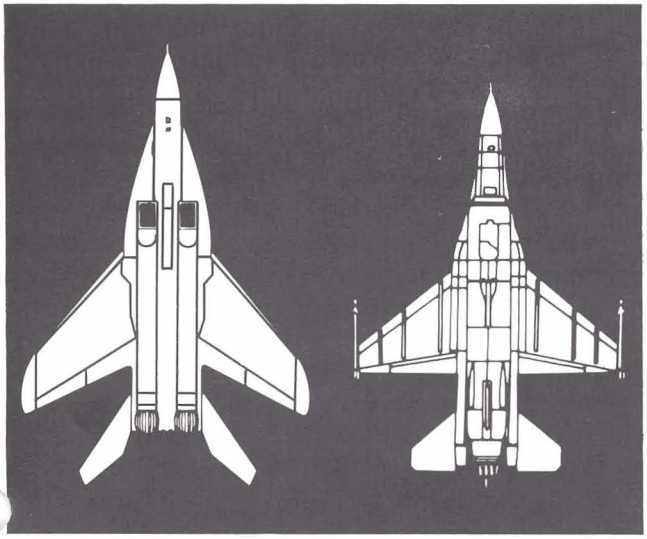
USAADASCH has sent to the SHORAD units complete or partial issues of Aircraft Recognition Training Visual (ART-V) 35mm slide kits. The school also sent an example lesson plan and instructions for loading slide trays to train in visual aircraft recognition (VACR).

To assist further in developing and conducting a successful VACR training program, the school offers some do's and don'ts that include the following:

- Test initial entry replacement soldiers on their VACR skills and record the results in their job books. You should test only those aircraft the soldiers learned to recognize at the school. If you test new soldiers against your unit's "hot list," you might decrease their level of confidence. At the same time, you might also get an inaccurate picture of the new soldier's VACR skills.
- Test replacement soldiers as soon as possible after arrival and begin VACR training where the soldier's actual VACR skill level stops.
- Train skill level 1 soldiers separately from levels 2 and 3. Soldiers of the higher levels may only need review and testing, while level 1 soldiers usually need detailed instructions.
- Train your soldiers to recognize all aircraft listed in your STP and any additional critical aircraft you are required to recognize in your particular area of operation. Select additional aircraft carefully. Valuable training time is wasted learning and teaching aircraft you will not see in combat (for example: high-flying interceptors, long-range bombers and most seaborne helicopters).
- VACR training is easier when scheduled often, on a regular basis and in training periods of no more than two or three hours. Once you've trained your soldiers to standard, you might be able to reduce VACR sustainment training time to as little as 30 minutes to an hour weekly.
- Learn and teach all aircraft wing, engine, fuselage and tail (WEFT) characteristics. Aircraft camouflage patterns, fin flashes, wing markings and aircraft speed are interesting but are not recognition features.
- Use paired comparison training. Always use the same headings and climb angles when comparing aircraft and point out both similarities and differences. Single views of aircraft are used only when presenting a new type of aircraft or when reviewing and testing. □

Compare!

Because . . .



. . . paired comparison is the key to effective aircraft recognition training.

John Pliler is the author of FM 44-30 and developer of the ART-V kit. He is a training specialist with the SHORAD Department, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.

Study Group Shares Vision of ADA WO Future Role

Air Defense Artillery warrant officers are making a leap into the high-tech future without losing the values of their past history and tradition

by CWO 3 Jim N. Cupp

"To gauge the progress of our efforts, we must share a vision of our Army," stated U.S. Army Chief of Staff, General Carl E. Vuono. "This vision takes in the past, the present and the future. We build on the past, we are responsible for the present, and we shape the future.

"Our programs are not born of whim or fancy. Understanding the basic intent and the key factors that were in play can explain and help predict the current and future effectiveness of a doctrine or a program. In this sense, our vision cautions us to avoid change for the sake of change. It prompts us to take the time to determine how a particular challenge was addressed in the past, to look at the facts affecting the problem as we face it in the present and to assess the applicability of all or a part of the past to the present," he charged.

The results from the recent Air Defense Artillery Warrant Officer Study Group (WOSG) were not born of whim or fancy, just as Gen. Vuono cautioned. In fact, the WOSG never lost sight of the corps' tradition as it searched for answers to today's problems while generating a direction for the future of ADA warrant officers.

The WOSG received its charter from Maj. Gen. Donald R. Infante, chief of Air Defense Artillery, in June 1987. This was to be the first comprehensive study of Air Defense Artillery warrant officers. Based on the charter, the study group examined the current and future role, professional development, training, retention, accession, and other life-cycle

management policies and practices for ADA warrant officers.

The Office, Chief of Air Defense Artillery (OCADA), U.S. Army Air Defense Artillery School (USAADASCH), Fort Bliss, Texas, was tasked by Maj. Gen. Infante to create the study group. The group consisted of a cross section of warrant officers and personnel experts that worked from June until October before briefing the commandant on their findings. Their findings included not only firm recommendations but also impressions about how things may have gone wrong and suggestions on how to repair any possible damage to the ADA warrant officer program.

A first and major concern for the WOSG was to create a clear definition of an ADA warrant officer. The group was looking for something more that a rehash of the generic warrant officer definition created by the Total Warrant Officer Study (TWOS) completed last year. An ADA warrant officer is unique in many ways, and the group hoped to capture all the possible elements in one conclusive statement.

The WOSG, in its final notes, pointed out that "the ADA warrant officer corps had lost some of the zest it used to have. Many warrant officers feel they are only technicians and are not as concerned with the integrating aspects of a unit. They have no total operation outlook and perspective. They are concerned mainly with the area of trying to run a maintenance program. A change is needed and a sense instilled that a warrant officer is someone special who needs to have a total operations perspective.

"The ADA warrant officer is special in that his role and functions are different from commissioned officers or noncommissioned officers. He must establish a maintenance program with follow-up procedures to ensure its effectiveness. He must ensure his personnel not only know what is wrong but also know how to make it right. He must bring new dimensions of insight into the methods most effective for sustainment of a successful maintenance program under combat conditions. A warrant officer must quickly become recognized by the senior leadership as a very valuable source of advice and information on air defense operations and maintenance. His advice must be invariably accurate and to the point. It, then, can be extremely useful in forming command decisions and policy," it stated.

The role and function was examined in detail and the WOSG developed the following definition for the ADA warrant officer:

"He is a leader, manager of resources, system expert, highly qualified technician, soldier and teacher able to transition his emphasis with relative ease. He is a systems analyst and integrator, with an ability to

ADA Warrant Officer Directions Based on WOSG Findings

- **Adopt the TWOS definition of warrant officer**
- **Clarify the role and function of ADA warrant officer**
- **Expand the accession base**
- **Implement option two — HIMAD and FAAD warrant officers**
- **Increase civilian education opportunities**
- **Tie positions to the Army Educational Review Board requirements**

. . . a continuing need for a highly specialized, officer-level technician

prescribe maintenance concepts that encompass all hardware and software integral to Air Defense Artillery weapon systems. Recognized as a valuable source of advice and information on air defense maintenance and operations, and is therefore utilized as a technical advisor to the commander."

The role of the ADA warrant officer in the future is expected to be similar to that described above. There appears to be a continuing need for a highly specialized, officer-level technician to provide the "man-machine interface" on the battlefield. Today's technology offers the soldier highly sophisticated and reliable weaponry able to troubleshoot itself. But, the question arises, "Who will fix the computer when it cannot tell the soldier what's wrong?" Without the warrant officer, Air Defense Artillery runs the risk of soldiers becoming too dependent on technology. The study group sees a need for a systems expert and trainer who will continue to be needed well into the next century.

In addition, the ADA warrant officer must be recognized as a leader, soldier, teacher and manager of all aspects of the air defense system. Not only must he set high standards for personnel in key leadership positions as well as his subordinates, he must also train junior officers, enlisted operators and maintenance personnel in operations and tactics.

According to the WOSG, "ADA warrant officers must fight the ongoing battle of lack of respect for WOs by making sure each and every ADA warrant officer is trained in system operations, maintenance management, logistical procedures, tools, test equipment, proper trouble-shooting procedures, safety and tactics. He must know and understand the operation of each major item to ensure personnel are properly operating and maintaining it."

Upward battle or not, the WOSG feels that this definition of the ADA warrant officer answers the question of how to utilize him and is concise and forthright enough for warrant officers not to lose sight of their responsibilities and for commanders not to misassign them.

Role and Training

The WOSG studied three options for the future role of ADA warrant officers: to create a branch generic warrant officer, to create high-to-medium air defense (HIMAD) and forward area air defense (FAAD) warrant officers, or to implement a combination of both options.

The WOSG recommended the creation of a HIMAD and a FAAD warrant officer (option two). The study group did not recommend a generic warrant officer responsible for five ADA weapon systems because the training requirements would be extensive and, therefore, too expensive. Also, skill degradation effects would leave the branch with a "master of none" product.

OCADA and the Directorate of Training and Doctrine, USAADASCH, are working up a training strategy. The strategy will include a plan to train warrant officer candidates based on their background experience, concentrating on the system of which they are least knowledgeable.

Armywide, warrant officer positions are being cut. And ADA's share of these cuts is not known. The WOSG agreed that the decreasing authorizations for ADA warrant officers requires a new method of employing them. The branch may no longer have the available resources to allow one warrant officer in each organizational unit. In view of this, a determination on where to put the warrant officers must be made. Considering his role and function, the study group recommended that the branch take the position that the warrant officer is needed at battery level in all ADA units and fight to keep him there.

However, if this proves impossible, the branch should create generic HIMAD and FAAD warrant officers and use their abilities in maintenance and training on primary staff, battalion or brigade levels. The ongoing MOS Consolidation Study is expected to recommend one maintenance MOS for each ADA weapon system, thereby creating a senior enlisted master mechanic. The existing training system for ADA warrant officers will be greatly simplified.

The WOSG pointed out that more goes into the proper utilization of a warrant officer than just the training and area of responsibility he is assigned.

"The confidence of ADA warrant officers is slowly eroding as they degrade from being the 'commander of a tactical site' to merely a 'technician.' " According to the study group, improper use of warrant officers by not allowing them direct access to the commander and eliminating their leadership and supervisory roles by assigning maintenance personnel to platform leaders detracts from their potential worth to the unit.

Retention

Currently, ADA warrant officers are leaving service between their twentieth and twenty-second year of active federal service. The concepts of the TWOS study such as a CWO 5 rank, 30 years warrant officer service and Regular Army integration at CWO 3 are not considered appropriate incentives to encourage ADA warrant officers to remain beyond the 20-year point.

The group identified the following reasons for ADA warrant officers leaving service:

- Misassignments
- Short turn-around times between assignments
- Deteriorating working environment
- Pay comparability with other officers
- Family care issues
- Marketable skills

The group has made recommendations in these areas where the branch may have impact. The WOSG recommends that every effort should be made to offer permissive TDY, DA fully funded and DA partially funded civilian education programs to ADA warrant officers. It also recommended that warrant officer positions should be tied to Army Educational Review Board (AERB) requirements thereby providing the opportunity for a four-year degree for warrant officers. The current Warrant Officer Training System, as prescribed in TRADOC Reg. 351-14, allows for this. With these positions identified by the AERB coding, civilian education programs will be better allocated to warrant officers in the future, perhaps encouraging them to remain past the 20-year mark in their careers.

Besides the incentives of better civilian education opportunities, the WOSG recommended ways to correct misassignment of ADA warrant officers and to improve their overall role in ADA units.

The group pointed out that direct access to the commander is a must for the ADA warrant officer. In the field now, warrant officers do not have direct access to the commander, nor do they have any maintenance personnel. They must be recognized by senior leadership as a valuable source of advice and information on air defense operations and maintenance. By having direct access to the commander, the commander, by using the warrant officer's advice and recommendations, may form successful readiness and people oriented programs.

Misassignment of warrant officers is a major concern in relation to retention according to the group's findings. Forward momentum in a career is a must, but in some cases senior warrant officers have been assigned below a junior warrant officer in a unit. Allowing misassignments has caused great concern for warrant officers who see themselves "backing up" in their careers.

A possible solution is to assign warrant officers at levels according to their rank whenever possible. A WO 1 or WO 2 would be assigned at battery and battalion level, a WO 3 would be assigned at battalion or brigade level and a WO 4 would be assigned at AADCOM or USAADASCH level.

. . . a change must come from within the warrant officer

One group member assured, "If a senior warrant officer knows that his next assignment is not going to be right back to a battery, and the probability is that he is going to a higher level, maybe we won't lose him at 20."

According to one advisor in the group, a change must also come from within the warrant officer. He must make a professional commitment to something bigger than himself. A warrant officer does not have to know the detailed nuts and bolts operation of the equipment; but, he must know and understand the operation of each major item to ensure his personnel are properly maintaining and operating it. He should know tactics, he should know all system requirements for given situations. He must be ready to advise battery commanders and lieutenants on the use of equipment — when to fight or train with it and when to fix it.

Expand Accession Base

Beyond the issue of retaining warrant officers in Air Defense Artillery, right now the branch is not meeting its warrant officer accession goals. Air Defense Artillery is approximately 20 percent short of its total authorized strength.

Sergeants first class are no longer the largest pool for accessions; staff sergeant is the primary rank desiring appointment to warrant officer. This is due, in part, because sergeants first class are not eager to attend the Warrant Officer Entry Course (which some liken to basic training) which they find demeaning at their career level.

Applicants are applying at 9.9 years of active federal service and are reaching the field at approximately 11.5 years of active federal service. After serving one or two tours at the organizational level, they are selected to attend the advanced (senior) course. These warrant officers are then considered for intermediate maintenance (SQI V) and appropriate training at the Ordnance School. Not all, of course, will be selected. The selection rate is driven by the needs of the Army and has been as high as 50 percent. This causes Air Defense Artillery to lose warrant officers and Ordnance to gain them after only four or five years. The study group supports the creation of a separate MOS for intermediate maintainers.

The WOSG, to enlarge the pool for accessions, recommends changing the prerequisite for accession to warrant officer from sergeant promotable to just sergeant. This would increase the current accession base by 610 soldiers from both career management fields (CMFs) 23 and 27.

" . . . you cannot take a man off the street and make him a warrant officer"

The WOSG recommends allowing any soldier in CMF 23 to apply for any ADA warrant officer MOS. Currently, soldiers holding a short-range air defense MOS cannot apply for a HIMAD or command and control warrant officer MOS without a waiver. The Training and Doctrine Command methodology for appointment to warrant officer requires that a candidate first be trained and then appointed. In view of this, soldiers holding MOSs within CMF 23 should be allowed accession to any ADA warrant officer MOS.

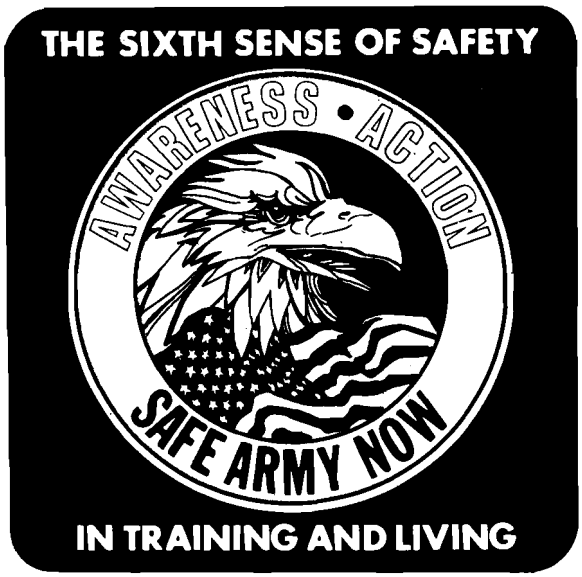
The establishment of a separate MOS for command and control caused a transfer of proponency from the Signal School to Air Defense Artillery. The AN/TSQ-73 is the primary equipment involved for MOS 225B. Command and control responsibilities may increase with the advent of command control and intelligence (C^2I) and the Super Information and Coordination Central (ICC) currently proposed and may, then, require a separate MOS. The general opinion of the study group was that the current duties (AN/TSQ-73) could be rolled to other system MOSs — be it Patriot, Hawk or others. However, additional research should be done for C^2I and ICC.

The WOSG warned that "you cannot take a man off the streets and make him a warrant officer. Also, just because a man is an outstanding NCO does not necessarily make him qualified. The quality of the warrant officer corps is directly proportional to the quality of soldiers we recruit. All branches are screening applicants thoroughly."

The study group also emphasized that whoever is chosen to be an ADA warrant officer must know that warrant officers are something special: that their knowledge of the ADA weapon system is the key to success. It is the responsibility of the Air Defense Artillery branch to determine how best to train and then use this valuable asset.

The WOSG examined crucial issues affecting the future of ADA warrant officers and made recommendations it felt kept alive the fine historical record of warrant officers while at the same time ensured that the branch receives the best possible technical expertise for the AirLand Battle. The study's recommendations will become the basis of the approved courses of action; the implementation of the study's courses of action will continue through 1990. Refinement and development of active component issues will occur first and will serve as a model for the Army Reserve and the National Guard.

For more information on this study, contact CWO 3 Jim N. Cupp, Office, Chief of Air Defense Artillery, USAADASCH, Fort Bliss, Texas. Call AV 978-6217 or commercial 915 568-6217. □



Every Commander's Duty

ADA commanders at all levels can save lives through a new risk management process

by Lt. Col. Bill Kunzman

A soldier was killed during a recent battalion night road march because dangers inherent in the operation were not identified and reduced or eliminated. Consequently, an armored personnel carrier rolled over a 20-foot embankment, pinning the track commander beneath the vehicle.

Although this type of death is not new to the Army, the risk management process that could have prevented it is.

The risk management approach is a concept for balancing risks with mission needs. It involves the identification of risks associated with a particular operation and the requirement to weigh these risks against the overall training value.

Risk management is a systematic process which integrates safety into the development of tactical operations during the planning phase. For the most part, risk measurement is a subjective assessment of hazards. However, the act of consciously evaluating a mission results in the commander thinking through the factors that affect mission safety.

Different missions will involve different elements that can offset mission safety. However, the following seven elements are central to safe completion of any mission:

- Planning
- Supervision
- Soldier selection
- Weather
- Mission complexity
- Equipment
- Terrain

Using specific criteria for each element, the mission is analyzed and risk factors are assigned according to the level of safety in each element. As an example, a specific, in-depth plan holds much less risk than a vague one that provides minimal guidance.

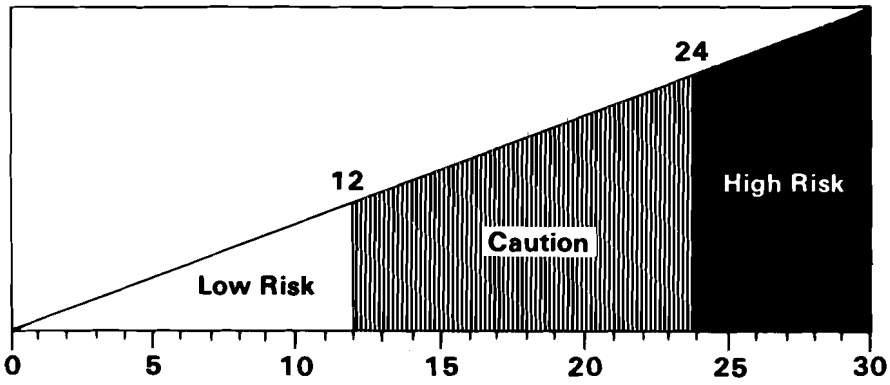
Soldier selection is measured by comparing the length and quality of soldiers' rest and the soldiers' relative experience compared to the required task. The level of supervision is measured by comparing mission type — support non-tactical, day tactical, night tactical. Operation complexity is measured by length and type — river crossing, critical asset defense, convoy. Equipment is measured by considering maintenance status, type, age, accident injury and inherent safety problems.

The Risk Management Process

1. Risk identification —
   This is risky, this isn't.
2. Risk evaluation and quantification —
   The risk is this great.
3. Risk reduction —
   Risk can be reduced by this and this.
4. Risk decision making —
   This risk we can live with, this we can't.
5. Risk decision follow up —
   Is the risk and benefit as projected?
6. Risk research —
   What is the risk? What risk is essential?

Risk Management Gauge

After all risks have been assessed, the values would be totaled and applied to a quick reference gauge.



Operations with a value of zero to 12 would be judged as low risk. A value of 13 to 23 is seen as a caution area. High-risk operations assigned a value of 24 to 30 require coordination with the next higher level of command external to the organization making the assessment.

Assigning risk values of one through five in each of the seven elements will give you a total value for the operation. You can use this total as an indicator to determine whether the operation is low, medium or high risk.

The planning commander may execute a low-risk operation. However, complete unit command involvement is warranted for medium risk to reduce or eliminate hazardous operations. And high-risk operations require coordination, before executing the mission, with the next higher level of command external to the organization making the assessment.

Let's apply risk management to the armor battalion convoy mentioned earlier, but, first, we need to describe the accident.

The unit had planned the convoy several weeks in advance and had been deployed in the training area during that period,

Air Defense Artillery Gets Specialized Safety Help

In world War II, one out of every five U.S. soldiers killed died as a result of an accident. In Korea, more than half the Army personnel who were hospitalized were injured in accidents. In Vietnam, accidents claimed more than 5,700 lives, disabled more than 106,000 soldiers and resulted in nearly five million non-disabling injuries.

Each year we kill the equivalent of a battalion of soldiers in accidents, we lose to sick leave the equivalent of an entire mechanized infantry brigade for more than six weeks because of accidental injuries. The cost of accidents is high and increases each year. The cost must be paid, and it is, in one form or another, out of readiness. For this reason, the Army has placed renewed interest in safety.

One way the Army has demonstrated its increased emphasis on safety has been the recent addition of branch safety managers to the U.S. Army Safety Center (USASC) at Fort Rucker, Ala.

Last summer, Air Defense Artillery, Field Artillery, Armor, Infantry, Ordnance, Engineer and Signal officers arrived to work with their respective branches. Their mission is to develop preventive programs which will reduce the accident rates in the ground combat arms.

These are new positions and numerous possibilities exist for developing branch safety programs which will help increase combat readiness through the combat multiplier, safety.

The Air Defense Artillery safety manager in the USASC will act as the branch safety focus and will work closely with the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, to develop a branch safety program.

The program will be based upon recent ADA accident statistics, but will primarily come from those good safety practices and programs that units are using right now.

conducting fire and maneuver operations in preparation for a battalion army training and evaluation program.

The terrain was rugged desert and extremely dusty. The convoy moved through an area where there were steep hills and twenty-foot embankments along an eighteen-foot-wide road with a lot of dust. The track commander ordered the driver to go left without being able to see in the blackout, dusty condition. He drove the vehicle over the embankment, rolling the vehicle, killing the track commander.

A simplified analysis of the elements affecting mission safety reveal the following points. Although adequate planning time was available, specific guidance concerning the terrain and dusty conditions was not given by the battalion. A night tactical move under blackout conditions is a high-risk operation. Soldiers were well trained and well rested. The weather was clear and dry. But, with little illumination in the extremely dusty condition, visibility was further limited. The tactical road march was not long nor complex. Equipment was well maintained armored vehicles. The terrain was hilly, mostly on improved roads, with the exception of the one kilometer stretch of very bad terrain where the accident occurred.

Advantages of Risk Management for Command

- Detect risks before losses
- Quantify risk
- Provide risk reduction alternatives
- Better management decisions
- Greater integration of safety
- Increased mission capability

Had the unit applied risk management, it would have identified this as a high-risk operation. A night tactical road march under conditions described above requires risk reduction or elimination to balance the great risk with mission needs.

Possible alternatives include a unit recon that would have revealed the requirement to take a different route, or ground guides could have been posted throughout the hazardous areas. The hazardous area could have been marked in some fashion or the drivers could have been briefed on the dangers.

Applying risk management before this exercise could have revealed the hazards of the road march that were so obvious in the aftermath of the accident. □

There are a lot of smart safety ideas that are not being shared. Of course, lessons learned will be reported in various publications like the USASC's *Countermeasure*, but the best part of the ADA Safety Program must come from the smart things that we are already doing.

The safety manager will be conducting field visits to interact with units on all aspects of safety. Development of the ADA Safety Program will be a collective effort, and the help of all air defenders is required to build the program and share the ideas that have contributed to make Air Defense Artillery one of the Army's safest branches.

In the past four years, eight air defense soldiers have died in combat vehicle and Army motor vehicle accidents. Our branch goal is no fatalities. During this same period, 45 soldiers died in privately owned vehicle accidents. We must work together to stop this great waste of our most precious resource — soldiers. One thing we cannot replace is a soldier's life, whether he dies in a combat vehicle or in his own car.

Generally, the ADA Safety Program will encompass all aspects of safety. The primary objective is to build a safety awareness attitude among our soldiers which will motivate them to "buy in" to safety because they want to and not because they have to. To do this, we encourage incorporating risk management into all unit operations. It is an effective tool to help make safety a continuous process and not an occasional event.

Lieutenant Colonel Bill Kunzman is the ADA safety manager at the USASC. He is your resource. He is developing the ADA accident prevention kit that will include more detailed information concerning risk management. While developing the ADA Safety Program, he is available to assist you in improving your safety program. If you have questions or want to share smart safety ideas, please contact Lt. Col. Bill Kunzman at — Commander, USASC, ATTN: CSSC-SPG-ADA, Fort Rucker AL 36262-5363; or call AV 558-6595/4198.

ADA Career News

Officer

OAC Evaluation Process

Though evaluation of students in the new small group instruction officer advanced course is subjective, they undergo a much more intense process than in the old course.

Students are evaluated every day in writing on a "Go/No-Go" standard based on class preparation and performance. No-Go ratings trigger immediate counseling. If a student consistently receives No-Gos, he will be counseled by the Officer Advanced Course branch chief and others.

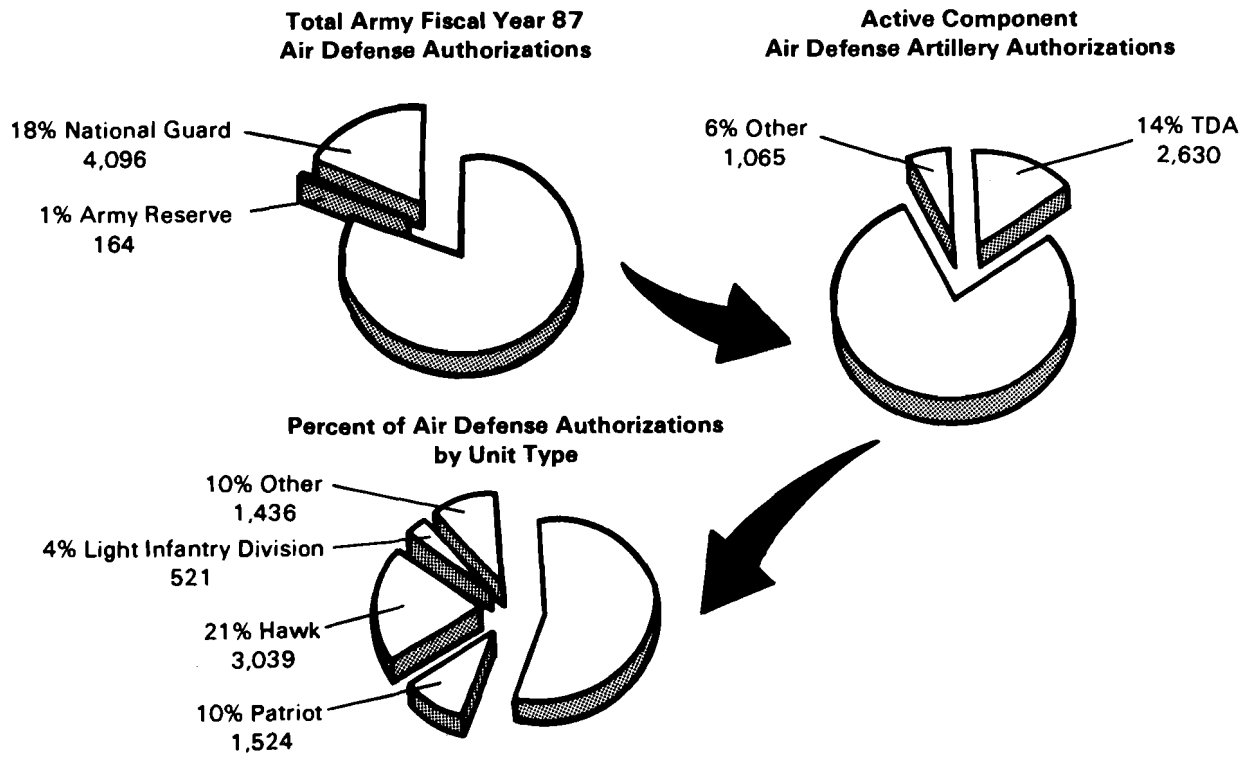
Students also are evaluated on everything they write. They do three talking papers for professional reading, essays on their philosophy of leadership and philosophy of command and a 1,500-word research project. Papers are reviewed by team leaders and Army Writing Program personnel. Everything a student writes is kept in a file, including operations orders and periodic daily quizzes, to check on lesson preparation.

Students also give briefings numerous times during the course, and each of their briefings is evaluated to point out students' strengths and weaknesses.

No student can hide in a 15-man small group. In the old course, the first sign of a problem was usually a student flunking a test; now problems are identified much sooner. Then the small group and the team leader work to make weak students improve and carry their load, often with long hours of personal instruction. The end result is to make those officers weak in some areas more proficient, not wash them out.

Air Defense Artillery Authorizations Breakdown

Here's a look at how authorized personnel positions broke down for the branch in 1987.



ADA Career News

ADA Advanced Course Team Leaders

A key to the success of the Air Defense Artillery Officer Advanced Course has been the high quality of its team leaders, according to Maj. Conrad Crane, chief, Officer Advanced Course Branch, Combined Arms and Tactics Department (CATD), U.S. Army Air Defense School, Fort Bliss, Texas.

Prospective team leaders must have completed a successful command. They should also have served on a battalion staff and should be Combined Arms and Services Staff School (CAS^3) graduates. If they have not attended CAS^3 when they are selected, they are either sent en route to Fort Bliss or are sent as soon as possible after arrival.

The key element in the selection process is the personal interview conducted by the director of CATD. He looks for intelligence, dedication and communication skills. Once he has decided on a team leader, he also makes the arrangements for assignment to CATD.

Commanders in the field have been asked to look for outstanding officers to be team leaders, and many of those selected were initially recommended by a field commander.

Lieutenants at Training Centers

Air Defense Artillery has many Training and Doctrine Command requirements at U.S. Army training centers. Lieutenants satisfying these requirements serve as platoon leaders during the basic training cycle.

Usually, lieutenants are rotated from a training center assignment to a TOE assignment sometime between their eighteenth and twenty-fourth month during their training center assignment. It is important to send a DA Form 4187 transfer request to start the process. The DA Form 4187 ensures that everyone involved is aware of the proposed personnel transaction.

The tour at a training center is an excellent opportunity to learn both basic soldiering skills and the relationship between the officer and NCO. During a tour at a training center, a lieutenant will learn the exact standards to which a soldier is trained during a basic training cycle. This will undoubtedly benefit him when he becomes a platoon leader.

Another advantage is that a lieutenant gets to work with the finest trainers in the Army. The techniques and standards used by the NCOs offer excellent examples on which a lieutenant can base his own platoon's training program.

OERs Your Responsibility

Everytime your official military personnel file is reviewed for promotion, branch transfer, civilian schooling or any other personnel action, your officer evaluation report (OER) is carefully evaluated.

A portion of the OER is your responsibility to verify. You must fully review the administrative data on every OER before you sign it. Your signature verifies that all information above it is correct. For more information on OERs, consult AR 623-105 or talk to your Total Army Personnel Agency (formerly MILPERCEN) branch assignments officer.

It Speaks For You

Whenever officers' career management individual files are pulled, their officer record briefs (ORBs) are reviewed. Without question, the ORB is the most important administrative document in a file. Unfortunately, many officers do not seem to realize the importance of the ORB and do not keep it updated or correct.

The only way your assignment officer knows your civilian education, marital status, assignment history, date of rank and myriad other bits of information is from your ORB. Your ORB is sent to every promotion board. If the information is wrong, you lose.

Enlisted

ADA MOS Added to 1988 SRB Program

Seven Army military occupational specialties (MOSs) were added to the FY 88 selective reenlistment bonus (SRB) program and five specialty multipliers were increased as of Sept. 23.

Further, the 1988 SRB program eliminated 14 MOSs and reduced bonus payments in nine others.

ADA command and control system operator/repairer was added to the SRB program. In addition, multipliers were increased for Vulcan crew member and MANPAD crewman. However, multipliers were decreased for Vulcan system mechanic, Chaparral system mechanic and Patriot operator/system mechanic.

Air Defenders Follow New Promotion Path

Selectees from the 1987 Master Sergeant Promotion Board will be sequenced and promoted within their military occupational specialties.

The Department of the Army will determine new promotions to master sergeant by recommended MOS on a monthly basis the same way promotions to sergeant first class now occur. Current policies used for promotion of reclassified soldiers to sergeant first class will also apply for promotion to master sergeant.

In the past, selectees for promotion to master sergeant were sequenced by seniority based on their dates of rank. They were promoted regardless of the strength of the MOSs they were promoted into.

The change in the sequencing method and the promotions based on it will contribute to more efficient force alignment. Two years of promotion to sergeant first class by MOS have shown more balanced military occupational specialties for that rank.

This promotion policy and method will result in soldiers in shortage MOSs being promoted earlier than those in overstrength MOSs, regardless of their dates of rank for sergeant first class.

Promotions will be determined by authorizations and budgetary constraints to meet the needs of the Army.

This policy of promotion by military occupational specialty does not affect the promotion board selection process. It affects only the order in which promotions occur.

ADA NCOs Take Part in Evaluation Transition

Learning from experience, the Army is taking special care as it changes the NCO evaluation system. This ensures that the change does not result in actual or perceived injustice to those being evaluated, according to SGM Clyne A. Goode of the U.S. Total Army Personnel Agency, or TAPA (formerly MILPERCEN).

"This is especially true when new methods of evaluation are supplemented by new requirements," Goode said, "such as the mandatory counseling provision of the new Noncommissioned Officer Evaluation Report (NCO-ER).

"We need to stop evaluating under the old rules on a single date. We must provide a buffer time for performance counseling and learning about the new system, and then gradually begin evaluating under the new rules," he said.

TAPA has established the following procedures to do this:

- The Active component will close out the present enlisted evaluation reporting system with final reports using the old form. This will occur before the end of January. NCOs who were scheduled to receive reports before then will get them as closeouts. Most other NCOs will receive reports as of Jan. 31. A new rating period for all NCOs will begin Feb. 1.

- The Active component will change to the new system between Feb. 1 and April 30. February and March will be counseling months, during which all NCOs must receive their initial counseling. April will be used to prepare for completing the new report. The Army will authorize only relief-for-cause reports during the transition period. New NCO evaluation reports will gradually become due starting May 1.

- The Reserve components will close out the EER system and change to the NCO-ER, by rank, as regularly scheduled reports are due, from August through November. Raters will conduct mandatory counseling, by rank, the month after a closeout is given.

Training Tips

SHORAD Develops MTPs

Mission training plans (MTPs) for headquarters elements and battle drills for squad-level teams and below are being developed by the Short-Range Air Defense (SHORAD) Department at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas.

The department's unit training division writes the MTPs in book form, divided into six chapters. Development of MTPs starts with a front-end analysis that helps the developer choose what collective tasks are critical for support of the wartime mission. The developer then drafts training and evaluation outlines for collective tasks and integrates individual tasks to support them.

Among the several milestones to be incorporated in development of an MTP are preliminary, coordinating and final drafts and camera-ready mechanicals. A single MTP development cycle normally covers 27 months. The finished product is a descriptive document of "what" and "how" to train to achieve the critical wartime mission.

All through the development cycle, field units are provided draft copies of MTPs for their inputs. Further, a SHORAD Department assistance team validates the MTP before its final production.

Development of battle drills follows much the same procedure. By revising certain MTP task statements and improving task conditions to suit SHORAD weapon systems, drill standards are set forth to support both individual and collective training objectives.

Questions about MTPs and battle drills can be addressed to SHORAD Department, Unit Training Division, ATTN: ATSA-SHT-U, Fort Bliss, Texas, or call AV 978-1643/1616.

Basic Avenger Training Readied

With the first Avengers due to roll off Boeing production lines in the fall, writers and training developers at the U.S. Army Air Defense Artillery School (USAADASCH), Fort Bliss, Texas, already are whipping together training materials for the soldiers who will man the pedestal-mounted Stingers (PMSs).

Soldiers currently MANPAD system qualified (MOS 16S) will become operators for the Avenger after they've mastered the skills and absorbed the knowledge for basic duties in the forward area air defense (FAAD) system.

Avenger

Boeing personnel are training instructors who will teach the courses. But the teaching materials and schedules they'll follow in turning out the first PMS crew members as the new equipment emerges are being prepared by the school.

Training classes for replacement personnel will be conducted at the U.S. Army Training Center (USATC) at Fort Bliss. Soldiers transitioning from the MANPAD system to PMS will be trained in the field. The scope of the new courses includes instruction in MOS skills required for march order and emplacement; target engagement; operator checks and services; crew drill functions; and weapons handling, transportation and preparation for use of the brand new PMS.

Among missions assumed by the proposed PMS training programs are the following:

- Provide low-altitude air defense for critical assets, maneuver elements and march columns
- Engage ground targets as required
- Conduct operations in a nuclear, biological, chemical (NBC) environment
- Conduct sustaining operations
- Support combat operations
- Survive on the battlefield
- Conduct passive air defense measures
- Conduct MANPAD system operations

An array of duties and responsibilities fall within each mission. For example, in supporting combat operations, the crew members-in-training will learn to operate the platoon command post. They

also will learn to prepare systems for air lift, air transport, air drop and land transport.

Surviving on the battlefield will involve lessons in employing smoke and reacting to indirect fire, NBC attack and direct fire.

In projecting an agenda, the training developers note that introduction of a new system like FAAD PMS generates new training requirements, both to train initial personnel and to sustain replacement needs thereafter.

Training concepts call for specific weapons instruction in all critical tasks associated with the operation, operator maintenance and employment of the FAAD PMS.

Professional development concepts seek to prepare the PMS non-commissioned officer with the leadership skills necessary to train, supervise and lead subordinate personnel. In line with all USAADASCH instructional efforts, the soldier with his hands on the Avenger controls is to become capable of "completing the assigned mission and surviving on a battlefield."

Other points in the proposed instructional agenda include the following:

- Entry level personnel selected for the PMS training should receive basic combat training at USATC, Fort Bliss
- Crew member training will be conducted during both peacetime and mobilization environments
- Eligible soldiers may attend the Primary Leadership Development Course at skill level 2
- Reinforcement/sustainment training will come at skill level 3 and selected soldiers will be trained as NCOs
- Selected soldiers will attend the Advanced NCO course

Take It By Correspondence

The U.S. Army Air Defense Artillery School has developed four new correspondence subcourses for the Chaparral air defense weapon system.

Developed for MOS 16P and now in the field are "Operate the M730A1 Carrier Under Unusual Conditions" (AD 5706) and "Emplacement of the M541A2 Chaparral Guided Missile System" (AD 5705).

Developed for MOS 24N and to be available to enroll in after February are "Corrective Maintenance of the Chaparral FLIR Missile Subsystem" (AD 5606) and "Boresighting the Chaparral FLIR Missile Systems" (AD 5607).

Four ADA officer correspondence courses and 25 enlisted correspondence courses are available. Enrollment procedures are explained in DA Pamphlet 351-20 (April 1987), Army Correspondence Course Program Catalog. Additional information may be obtained by writing the school, ATTN: ATSA-DTC-EP, Fort Bliss, TX 79916-7090.

Visual Aids Have a Place

When giving a briefing, use visual aids only if they clarify a point or make your briefing more vivid and concise.

This is but one of a number of pointers provided on using visual aids by the Communicative Skills Office of the Directorate of Training and Doctrine, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.

Other suggestions:

- Practice your use of visual aids in a "dry run" of your briefing at the office or, better yet, in the room where you'll be performing.
- Specify, when appropriate, the proportions used in your visual aids or include a scale of relative distances.
- Use lettering that goes from left to right rather than top to bottom — it's easier to read.
- Check your visual aids for readability in the rear of the room before the briefing.
- Use a pointer to indicate key items and always point with the arm closest to the visual. Put the pointer down when you're through using it.
- As you discuss the material on the visual aid, don't block it with your body.
- Talk to the audience, not the visual aid.
- Do not simply read from the visual aid; you'll bore and insult your audience.
- Don't put up a visual aid until it is pertinent. After you use it, remove it or cover it up.

Feedback

Investigation Finds TEWA Program Glitch

Some Hawk units have had difficulty using the Threat Evaluation Weapons Assigned (TEWA) Program to achieve automatic and/or semiautomatic weapons assignment with the AN/TSQ-73. Investigators from the U.S. Army Air Defense Artillery School's Hawk Department uncovered

that defended points, which are required to make TEWA work, were not being entered.

At least one defended point must be entered for automatic weapon assignment to occur as indicated under the special response for CC121 command on Page 12-30-2, Training Manual 9-1430-652-10-6.

Defended points are based on the wartime mission as delineated in the unit's general defense plan. Your battalion S-3 has this information. All units should check to see that defended points are entered.

Illustration by Dennis Kurtz

Oh, Shucks!

Stout-hearted though short gunners be, they'll never fire Stinger in the Air Defense Artillery.

To a country singer, the rhyming might suggest tune. But to an air defense soldier under 5 feet 4 inches, it's the plain old unvarnished truth.

Asked if he'd ever thought of adding Stinger qualifications to his specialty as a Chaparral crew member, Spec. Matthew Palmer shook his head. "Too short," he said. He's 5 feet 2 inches.

The Stinger itself is 5 feet long. Army Regulations call for Stinger crew members to be at least 5 feet 4 inches.

But wait. Now the Stingers are to be mounted. Might a short gunner too /be a member of the crew/ when the Stinger is pedestal-mounted?

Palmer, on temporary assignment as a mail distributor at Headquarters and Headquarters Battery at the U.S. Army Training Center at Fort Bliss, Texas, liked the thought.

The query went to SFC Lawrence Leach, project NCO at the Office, Chief of Air Defense Artillery, Fort Bliss.

"Not likely," said Leach, although crew qualifications for the yet unfielded pedestal-mounted Stinger still have to be written. "One of the new weapon's advantages is that, should the vehicle on which it's mounted become disabled, crew members would then shoulder and fire the Stinger just as when it was unmounted."

In the unleashing of man-portable Stinger, you've just gotta have some inches between the tail end of the tube and the ground, a requirement in which short gunners come up, well, short!

Palmer took the news in stride.

Vague Procedures for AN/TSQ-73

Procedures in the flow chart for raid tape operation and on-line simulation for the AN/TSQ-73 system are vague and lead to confusion, according to Hawk Department investigators with the U.S. Army Air Defense Artillery School, Fort Bliss, Texas.

Investigators warn that this confusion in running a raid tape is caused by Note 4, Sheet 3 of Figure 7-2, Page 7-5 of Training Manual 9-1430-652-10-3 w/Change 10, which is incorrect. They explain that the CC120 command cannot be entered at the point indicated. The format for entering the hot missile count according to the example in Note 5 of the above reference is not defined.

They recommend that, prior to running a raid tape, fire units must be defined immediately after system configuration using a CC120 command. The format for entering the hot missile count referred to in Note 5 of flow chart is 01 BB001 10 where 01 indicates the first fire unit designated for use in the raid, BB001 is the fire unit address, and 10 indicates the hot missile count.

To prevent further confusion, enter a pen-and-ink change in the training manual until you receive the official change. For more information on this, contact CWO 3 Ronald Jackson, USAADASCH Hawk Department, ATTN: ATSA-HD, Fort Bliss, TX 79916-7140, or call AV 978-2916.

Scanning

Identification Friend Foe Or Neutral Joint Test Force (IFFN JTF)

A serious problem facing air defense forces is the accurate and timely identification of aircraft in a tactical air environment, especially one that includes large numbers of friendly and hostile airplanes and missiles, modern electronic warfare threats, and surface-to-air and air-to-air weapons systems which operate beyond visual range (BVR).

Many studies have shown that current electronic identification systems are too slow, unsuited for positively identifying enemies and friends, have insufficient range, and are subject to interference from electronic countermeasures (ECM) and other environmental factors.

Using real-time man-in-the-loop simulations of Army, Air Force and NATO C^2 and weapon systems, the IFFN testbed is designed to do the following: evaluate the contribution of indirect identification information to U.S. capabilities to perform the identification function while operating within the NATO air defense C^2 system; identify deficiencies in the current procedures for collecting, disseminating and using indirect identification information; and propose potential near-term procedural changes and equipment work-arounds to improve C^2 identification data flow and optimize the use of BVR weapons.

The IFFN testbed interfaces manned simulators and computer models to emulate an integrated air defense system consisting of C^2 units, information sources, and BVR weapons systems operating in the NATO Central European region during the late 1980s. Programmed air battle scenarios are centrally executed and distributed to the test nodes in real-time.

The test nodes consist of "live" participating units (LPUs), which are tactical simulators manned by operationally trained crews, manned simulated participating units (MSPUs) operated by role-playing test-force personnel, and unmanned simulated participating units (USPUs).

There is normally at least one LPU for each type of weapon system included in a given test configuration. The MSPUs and USPUs realistically load the C^2 nodes and provide cross talk to the live units.

MSPUs are used where an interactive voice link is required. The data links between the participating units and environmental conditions such as weather and ECM are simulated by the central program.

Early Warning Scheme Not 'School Solution'

An article titled "Early Warning Scheme," which appeared under "Training Tips" in the November - December 1987 edition of *Air Defense Artillery*, was published prematurely.

The article, which presented a proposal for new early warning techniques, was taken from staff paperwork circulating through the U.S. Army Air Defense Artillery School, Fort Bliss, Texas. The school's Combined Arms and Tactics Department is currently reviewing the proposal.

The proposal was generated by ADA officers working at the National Training Center, Fort Irwin, Calif., and not by USAADASCH's Directorate of Evaluation and Standardization (DOES) as the article stated. DOES collects feedback from the field, but does not, itself, propose changes to tactics or doctrine.

Finns Approve Defense $$

The Finnish government has approved financing for the long-awaited medium air defense procurement program.

The Ministry of Finance has allocated the equivalent of $182 million toward the system. A special provision has been made for the system's procurement in next year's defence budget.

Systems which the Finns are examining include the Soviet-made SA-8, SA-9 and SA-23. SA-9 systems already have been sold to Hungary, Poland, Yugoslavia and Vietnam.

Western-made systems under examination include the Swedish RBS70, the BAe Rapier, Matra's Crotale and the Oerlikon-Buhrle/Martin Marietta ADATS.

First deliveries are not expected until early 1989. (*Jane's Defence Weekly*, Sept. 12, 1987)

The man-portable version of ADAD is positioned as much as 500 meters away from the weapon. (Photo courtesy of *Jane's Defence Weekly*)

ADAD Order Placed

The United Kingdom Ministry of Defence has placed a contract worth close to $90 million with Thorn EMI Electro Optics Division for its new air defense alerting system known as ADAD.

The contract is for "hundreds" of systems, both the man-portable and vehicle-mounted variants for use with weapons such as Javelin and Starstreak.

Thorn EMI says that ADAD is now prompting a lot of interest from the U.S. Army, which might hinge ADAD to its forward area air defense (FAAD) network.

ADAD is a passive system which protects ground forces from low-flying aircraft and helicopters. It picks up the infrared emissions of potential targets and alerts the weapon operator. The remote display unit gives this alert and shows the target's bearing by flashing the appropriate light on a circle. Up to four targets can be displayed simultaneously. The man-portable version of ADAD can be placed up to 500 meters away from the weapon itself.

ADAD is to enter service in the early 1990s and will be used mainly by the British Army in northwest Europe. The man-portable system allows up to four separate weapon systems to be linked into a single ADAD station. (*Jane's Defence Weekly*, Sept. 26, 1987)

HIMAD Directorate Formed

The HIMAD Directorate was created within the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, at the beginning of this fiscal year. The directorate brings together the Patriot and Hawk training departments under one umbrella organization to more closely align training with other ongoing initiatives involving the two systems.

In addition, recently, the TRADOC System Manager, Patriot (TSM-P) became TSM-HIMAD to better manage activities involving both Hawk and Patriot.

Tactical situations may call for deployment of Hawk and Patriot in mixed brigades and battalions requiring a high degree of systems interoperability. An improved Patriot Information and Coordination Central is being considered as a standardized HIMAD command and control system for the Patriot battalion and the Phase III Hawk battalion.

The school has initiated a study to consider combining Patriot and Hawk warrant officers as HIMAD warrants, trained in both systems, and to integrate Patriot and Hawk operators into one HIMAD operator MOS.

Extensive technology transfer from Patriot has been integrated into the Hawk Phase III system allowing interchangeability of repair parts and commonality of displays and the kinds of information portrayed.

Luftwaffe Gets Roland System

The first production Euromissile, Roland Flarakrad surface-to-air missile (SAM) system, has been handed over to the Luftwaffe in ceremonies in Munich. This latest boost in West German air defense capability is seen as another milestone in a comprehensive plan for its upgrading.

A total of 115 of the shelter version of Roland, installed on the rear of a high-mobility cross-country truck, will be delivered by late 1990. Of these, 68 will go to the Luftwaffe and 20 to the navy, with the remaining 27 being used to defend

U.S. Air Force bases in West Germanmy. The latter also will be manned by the Luftwaffe.

The U.S. Air Force will be taking delivery of 12 systems over the next 18 months.

Until introduction of the Roland into the Luftwaffe, the only weapons available for close airfield defense were twin Rheinmetall 20mm cannon which are limited to clear weather use.

The Luftwaffe also mans the long-range Nike Hercules, which is being replaced by the Patriot system. Patriot, apart from being much more effective, also is far more mobile and less manpower intensive.

Tripod-mounted Tests for Stinger

Tests were expected before the end of 1987 of a tripod-mounted Stinger anti-aircraft missile system in South Korea, General Dynamics officials announced at the Marine Corps Show in Washington.

The Danish armed forces have made a request for trials of the system in early 1988.

The system was developed as a private venture by the Valley Systems Division of General Dynamics and was field tested at Fort Bliss, Texas, as long ago as November 1985.

Since then, the U.S. Army has selected pedestal-mounted Stinger as part of the forward area air defense system. Tripod-mounted Stinger has been improved, with the day optical sight replaced by a British Marconi forward-looking infrared system for bad weather and night capability.

Standard Stinger missiles are used, and laser rangefinders and a fire-control computer could be integrated into the system if required. (*Jane's Defence Weekly*, Sept. 12, 1987)

Site Opens for Experimentation

The Army Tactical Command and Control System Experimentation Site (AES) has opened at Fort Lewis, Wash., for development and fielding of automation for use on the battlefield.

The Army Development and Employment Agency (ADEA) will coordinate operation of the site. Maj. Gen. John M. Shalikashvili, ADEA commander, said the site provides the opportunity for merging maneuver control, fire support, air defense artillery, combat service support and intelligence and electronic warfare systems into one for testing new ideas and experiments.

Much of the work in development of a tactical command and control system will be done with soldiers of the 9th Infantry Division (Motorized) at Fort Lewis. Establishment of AES starts the process of system development which will be defined and built for quicker and more accurate dissemination of battlefield information, Shalikashvili said.

AES will allow all involved an opportunity to come together and "try it, refine it and recommend it," according to an announcement from ADEA's public affairs office. This common experimental environment brings the Army combat developer and Training and Doctrine Command together with the equipment developers, the announcement said. They, along with others, will coordinate with ADEA.

For Air Defense Artillery, AES answers the need for a near-term vehicle to explore concepts, doctrine and procedures to be used by the forward area air defense (FAAD) system. Also, AES will serve as a surrogate representative of FAAD's command, control and intelligence system during early stages of site development.

SAM Missile Parts Captured

Chadian forces recovered intact five crates of SA-13 surface to air missile parts in a recent attack on the Libyan air base at Maaten-es-Sara. The crates were taken to the Chadian capital of N'Djamena to be examined by experts hoping to assemble a complete SA-13 missile from the parts.

The weapon largely still is unknown in the West. Most examples have come from Chad, where four batteries of the Soviet-built weapon were captured during fighting around Ouadi Doum last March. Also known by the code name Gopher, the SA-13 is used for low-altitude air defense and has a range of about eight kilometers. (*Jane's Defence Weekly*, Sept. 26, 1987)

ATAS Contract Let

U.S. Army Missile Command has awarded the Valley Systems Division of General Dynamics its first production contract for air-to-air Stinger (ATAS). First production systems will be delivered in the second half of 1988 for installation on OH-58C helicopters.

ATAS can be fired from other helicopters including the AH-1G, AH-1S, OH-58A and Lynx 3.

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Letters to the editor

Regimental Colonels

I enjoyed reading the article "Regimental Colonels" by Ed Foster (Nov-Dec 87). He produced a nice summary of a long phone talk we had.

However, I don't want to take credit for what I'm not entitled to. There are a couple of entries in the article that are inaccurate.

I was not a regimental commander in WWII, I was only the commander of a battalion in the 62nd AAA Regiment. Later, when the regiment was deactivated, my battalion was designated the 62nd AAA Gun Battalion (Separate). I retained command.

Also, I was not a regimental S-3, I was an acting S-3 while the regular S-3 was in Europe establishing liaison with the overseas people in London and preparing for the regiment's arrival in England.

Many thanks for the write-up.

Col. Adam S. Buynoski, Ret.
San Francisco, Calif.

Col. Buynoski is the honorary colonel of the 62nd ADA Regiment.

Guardsmen Still ADA

I found it interesting, yet somewhat distressing, to note that, in your Jul-Aug 1987 issue, Army National Guard ADA battalions were omitted from the listing of ADA units. Whatever happened to the "One Army" concept?

While we Guardsmen generally do not depend upon military service for our livelihood, we are no less patriotic, no less proud of our units and no less determined in our pursuit of professional excellence than our air defender brethren in active component units. Recently, air defense units in the Reserve Components have been given a shot in the arm with the introduction of Chaparral, Hawk, and Stinger equipment to our inventory. We accept the challenges of training our soldiers on new weapon systems, and we relish the opportunity to go to the field with equipment capable of defeating the modern air threat.

I sincerely enjoy keeping abreast of current events in the ADA community and Fort Bliss through your professional journal. On behalf of my fellow Guardsmen in the ADA battalions of Ohio, Virginia, South Carolina, Florida and New Mexico, I hope future issues of *Air Defense Artillery* will be written for all "ADA — First to Fire" soldiers.

Nicholas Fletcher
Maj., AD
South Carolina ARNG

Army National Guard units will appear in future listings.

Some People Can't Be Fooled

I read with interest your "82nd Airborne" article in the Jul-Aug 87 inaugural edition of the Air Defense Artillery Bulletin. However, I must take issue with you over the 82nd Airborne Corps describing themselves as "the only air defense and airborne soldiers in the free world."

My regiment is an integral part of the British 5 Airborne Brigade and we provide parachute artillery in direct support to the parachute battalions. I also provide a parachute air defence troop (P Troop) consisting of 12 parachute-trained Javelin detachments assigned to the Lead and Follow-up Parachute Battalion Groups (LPBG and FUPBG) of 5 AB Bde.

You may be interested to know that we train regularly with the in-role parachute battalion groups and, at the end of last year, parachuted into Oman in a major OOA exercise with six detachments of Javelin. These are capable of providing immediate air defence for the DZ/airhead until reinforced by Rapier, which is destined to arrive later. The Javelin operators jump into action with their normal scaling of equipment and personal weapons (weighing some 100 pounds) while the launcher and missiles are dispatched from the same aircraft in a 1,000-pound "wedge."

Airborne,

All the way.

Lt. Col. J. H. Lewin, MBE RHA
7th Regiment
Royal Horse Artillery
Lille Barracks
Aldershot
Hampshire GU11 2NQ

The 82nd Airborne has the only airborne air defenders in the free world who spell air defense with an "s" rather than a "c."

AAA's Important Role

I enjoyed Col. Joel Ward's article, "Guardians of the Flame," in your September-October 1987 issue. But he should have included a reference to the important role played by the AAA battalions in WWII. The 9th Armored Division had the 482nd AAA Battalion attached during practically all of its combat operations. If it hadn't been for the Quad. 50s, we would have had a hard time at St. Vith. They are, as you know, devastating when employed in the ground role against ground troops. They filled in lots of gaps in our lines when shortages of troops existed.

Col. Cecil E. Roberts, USA, Ret.
Fort Worth, Texas

The contingencies of war have often required air defenders to train their sights on enemy armor and infantry rather than hostile aircraft — a role history has largely ignored. Air Defense Artillery has printed several articles that portrayed air defenders in ground-support functions.

We certainly agree, however, that this subject deserves more in-depth coverage. We hope to devote more pages to ADA in ground-support roles in future issues.

Coming in the next issue . . .
"Shootout on the Corporate Range," Part II of *Air Defense Artillery's* coverage of the ADA Board.