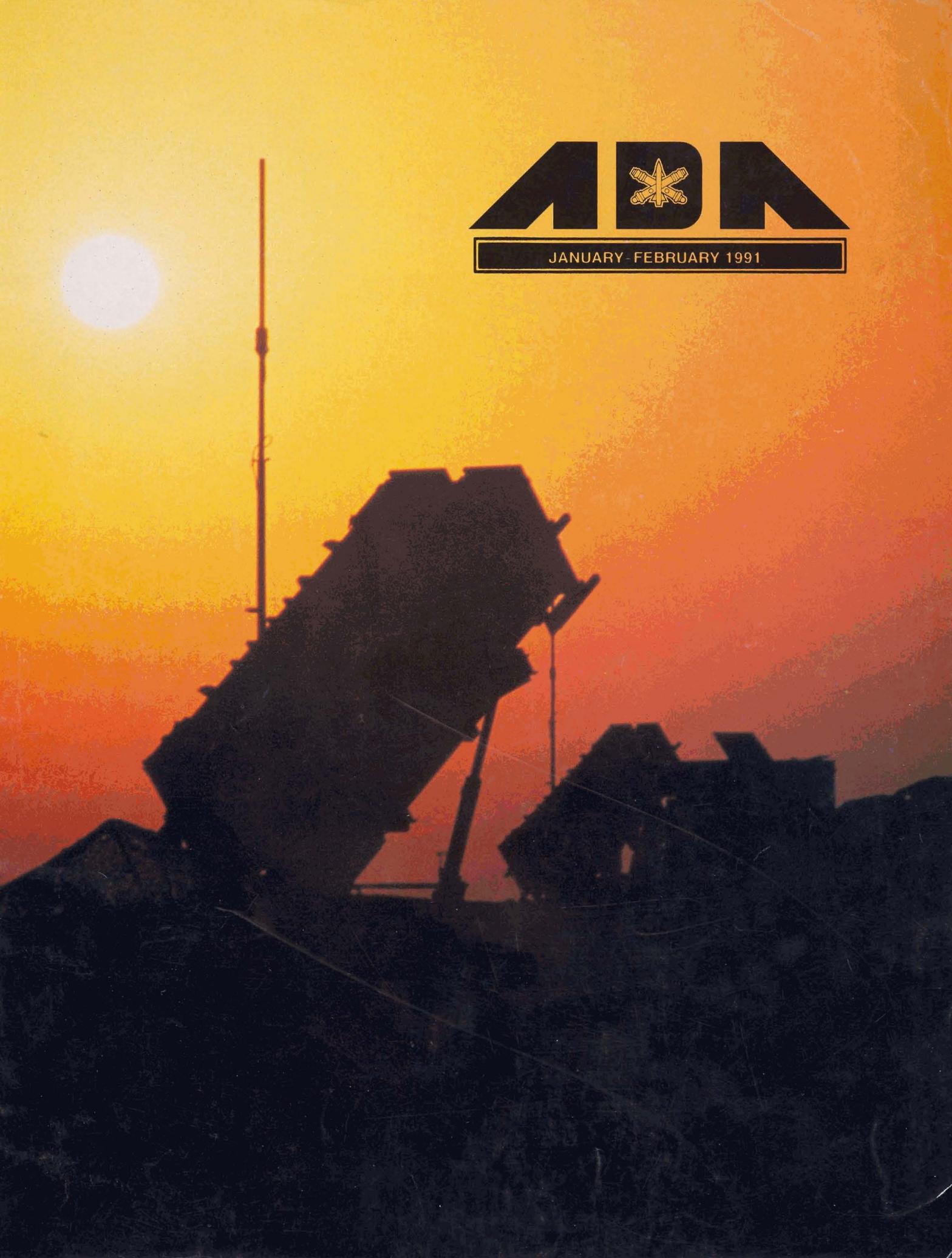




JANUARY - FEBRUARY 1991





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### On the Cover

A Patriot missile launcher belonging to the 11th ADA Brigade is silhouetted by the sunset glow in the Saudi Arabian Desert.

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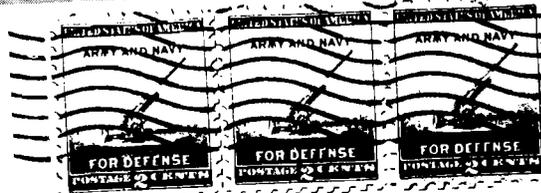
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## DEAR ADA

### Boeing/Army Teamwork Pays Off

Recently, I received my most challenging assignment as a Boeing new equipment instructor — train 18 Avenger crews and support personnel in three weeks, rather than the normal two-and-a-half months, to ready them for Operation Desert Shield.

Fortunately, the soldiers of the 4th Battalion, 5th Air Defense Artillery, Fort Hood, Texas, proved to be truly outstanding soldiers. They trained 12 to 14 hours every day, seven days a week, even eating meals inside the Avenger cabs so no time was wasted. At the same time, they did all the things — filling out forms, getting shots, making arrangements for dependents — that all soldiers have to do to prepare for overseas deployment. They went from never having seen an Avenger to firing one in just seven days, and the results were unbelievable.

Boeing and the Army really pulled together to get the job done. Whatever we needed we got, and that's the reason we got the job done right!

**M. "B. T." Butler**  
The Boeing Company  
Huntsville, Alabama

### Tone of "Double Time" Inappropriate

I would like to comment on your article, "Double Time," which appeared in your November-December 1990 issue. I feel that the picture of a dachshund and its puppies is an affront to every ADA family that is enduring a separation due to Operation Desert Shield.

I understand and can sympathize with Capt. Ben Weiner's missing his wife, and can appreciate the unique situation of dual military couples, since I number among them. However, the sympathetic tone of the article, citing the hardships of this particular captain's lifestyle, is completely inappropriate. There is

a profound difference between "babies" and "puppies."

I feel sorry for Ida's [Capt. Ida Weiner] missing the birth of those puppies. I feel sorrier for myself, because my husband will miss the birth of our second child in January. But mostly, I feel sorry for the thousands of children who will miss their dads or moms (or both) on their birthdays, at Christmas and throughout their day-to-day growing pains when a parent's support and attention are so critical.

**Capt. Mary Fletcher**  
6th ADA Brigade  
Fort Bliss, Texas

### 5-62nd ADA Not a Patriot Battalion

As a noncommissioned officer serving in the 5th Battalion, 62nd Air Defense Artillery (11th ADA Brigade), I feel I should bring your attention to a serious error. In the September-October 1990 issue of your magazine, on pages 29 and 30, you referred to the 5-62nd ADA as a Patriot battalion, while in fact we are the 11th Brigade's lone SHORAD (SP Vulcan/Stinger) battalion, known on Fort Bliss as the Vulcan-Stinger "Savages." There is a certain pride among SHORADsmen, and quite a bit of offense was taken by being misidentified as a HIMAD [high- to medium-altitude air defense] unit. Several soldiers in my battery noticed this, and were very unhappy about it, to include not only "line dogs," but combat support soldiers as well.

Other than this discrepancy, I found Blair Case's article informative and interesting.

**Sgt. Donald H. Pence**  
5-62nd ADA  
Saudi Arabia

*(Continued on page 4)*



## INTERCEPT POINT

I've devoted my last two Intercept Points to our Saudi buildup emphasizing, naturally, the critical role Patriot and Hawk are playing in theater missile and air defense. Although we've noted our limited Avenger deployments, not much has been written about divisional Air Defense Artillery.

This crisis in the Middle East finds us in a challenging short-range air defense modernization posture. Except for Avenger, only now being fielded, the promise of forward area air defense (FAAD) is just that — an unfulfilled dream of the kind of Air Defense Artillery we must have in our force. To make matters worse, our continental United States (CONUS) and European heavy divisional ADA battalions are in different reorganizational configurations: in CONUS, Chaparral was consolidated in corps ADA brigades, while in Europe, Chaparral remains in divisions awaiting Avenger as the trigger for organization of a corps Chaparral battalion. Finally, this crisis caught us having partially implemented a Department of the Army directive to turn in the forward area alerting radar (FAAR). We modified this directive at the start of the crisis to permit deploying divisions to recover their FAARs and sail with them to Saudi.

So our divisional air defenders prepare to cover maneuver formations and critical assets with the weaponry in place: Vulcan, Stinger and, in some cases, Chaparral. Thankfully National Training Center (NTC) experiences have shown us how to design and optimize Air Defense Artillery in a high-intensity desert environment. Our contribution, just as at the NTC, will be significant . . . so long as we employ Stinger well forward and survivable, within either Vulcan or

another M-113/Bradley Fighting Vehicle (BFV) class carrier. Range limited though it is, Vulcan will provide excellent close-in air defense for priority assets. And finally, remember our high- to medium-altitude air defense assets positioned forward in Saudi, such as Task Force Scorpion, to provide ADA overwatch.

Where do we stand in our efforts to modernize divisional ADA?

The good news is Avenger. In production and being deployed, it's already in the 3rd Armored Cavalry Regiment and the 1st Cavalry Division.

The quest for a sensor replacement for FAAR is more good news. We've picked a winning candidate, P-STAR (see article on page 40, this issue), for the lightweight requirement . . . and the ground-based sensor candidates are being tested now at White Sands Missile Range, N.M.

However, NLOS, the non-line-of-sight FAAD component, was terminated for monetary reasons in this resource-tight Army that is trying to build down. Unknown now whether this is the "end of story" or if there is a possibility of program renewal. Certainly the requirement didn't go away. Must wait this one out. Meanwhile, the Boeing Company (see story on page 26) plans to independently continue NLOS development.

Finally, our forward line of own troops ADA machine, the ADATS that tested so well operationally, is in a two-year delay to give Martin Marietta adequate time to fix the reliability problems our soldiers experienced. A good decision — the last thing we need is to export a maintenance problem to the field. However, this means ADATS won't begin to be fielded to our heavy divisions until 1996.



## INTERCEPT POINT



Let me discuss now an interim approach we will take in our heavy divisions while we await ADATS. The concept that will best protect the force and posture the divisional battalions for ADATS is to replace every Vulcan with a BFV and to place a Stinger team, with its entire basic load, in each of these vehicles. MOS 16R soldiers will drive the BFV and operate the turret (25mm gun and the TOW missile) to help defend against the attack helicopter threat and to protect the ADA BFV. The Stinger team will be the primary killer of both fixed- and rotary-wing aircraft.

The Commanding General, U.S. Army Training and Doctrine Command, has approved this concept for Armywide consideration. It is the next logical step to the Stinger Under Armor concept used successfully at the NTC for a number of years. Putting Stinger forward into the best air defense fighting position, in a vehicle that offers greater survivability and mobility commensurate with the force protected, optimizes our coverage of the maneuver arms.

Drills are being developed for the use of the 25mm chaingun in the air defense role. It offers good effectiveness against helicopters that would try to engage the force within two kilometers of the battle. The op-

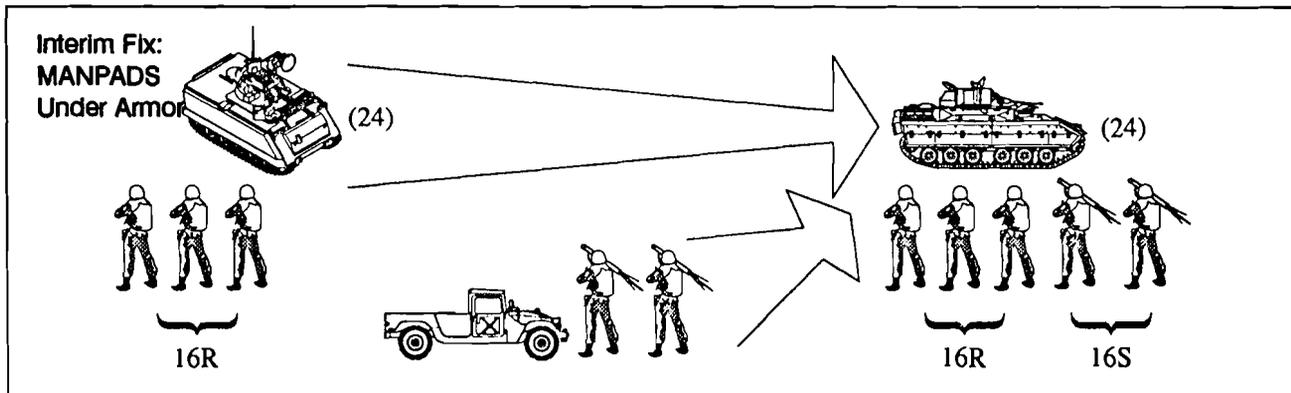
tics aboard the BFV greatly enhance target acquisition at night and on the dirty battlefield. The TOW can be used for protection against armored vehicles as well as in the anti-helicopter role.

Employment guidelines being developed call for balanced and mutually supported fire unit coverage overwatching the defending forces. The Stinger's range and the BFV's optics make this employment effective. Using the BFV's armor protection and maneuverability, fire units can bound laterally or to the rear to support the scheme of maneuver and counter the threat.

Offensively, air defense fire units will be positioned well forward, using the armor and weapons on the BFV for protection, to cover chokepoints and obstacle breaches. As the attack develops, they will accompany the maneuver units through the belt network and achieve decisive ADA force ratios on the objective.

Both hasty and deliberate crew drills have been developed for the Stinger team. Storage rack modifications being designed allow for transportation and handling of Stingers in the BFV as well as accessibility to the TOW missiles.

# INTERCEPT POINT



This is a smart interim step to take as we await the fielding of ADATS. It is not the objective air defense capability we know we will get with FAAD. Although it will cause some turbulence, we cannot continue to operate Vulcan into the 21st Century. If we try, Vulcan could go the way of FAAR . . . and with it the superbly trained force of 16R soldiers, especially the NCO corps, who truly understand the ADA role on the combined arms battlefield.

We must preserve our 16R force so they can be ready to convert to ADATS. Of course, none of this

helps our divisional air defenders in Saudi Arabia today, but their challenge certainly motivates the ADA leadership to get on with it. Our divisional soldiers deserve nothing less. They must have the tools they need if they are to be . . .

*First to Fire!*

— Maj. Gen. Donald M. Lionetti  
Chief, Air Defense Artillery

(Continued from DEAR ADA, page 1)

## 2-52nd ADA Also in Saudi Arabia

It's nice to see ADA units receive coverage of their participation in Operation Desert Shield, but it's not nice to get left out. Your article titled "Operation Desert Shield — A Line Drawn in the Sand" (September-October 1990) neglects to mention that the 2nd Battalion, 52nd Air Defense Artillery, was part of the initial deployment. We were, in fact, among the first to "draw the line" in Saudi Arabia.

Maj. Jed A. Sheehan  
2-52nd ADA  
Fort Bragg, North Carolina

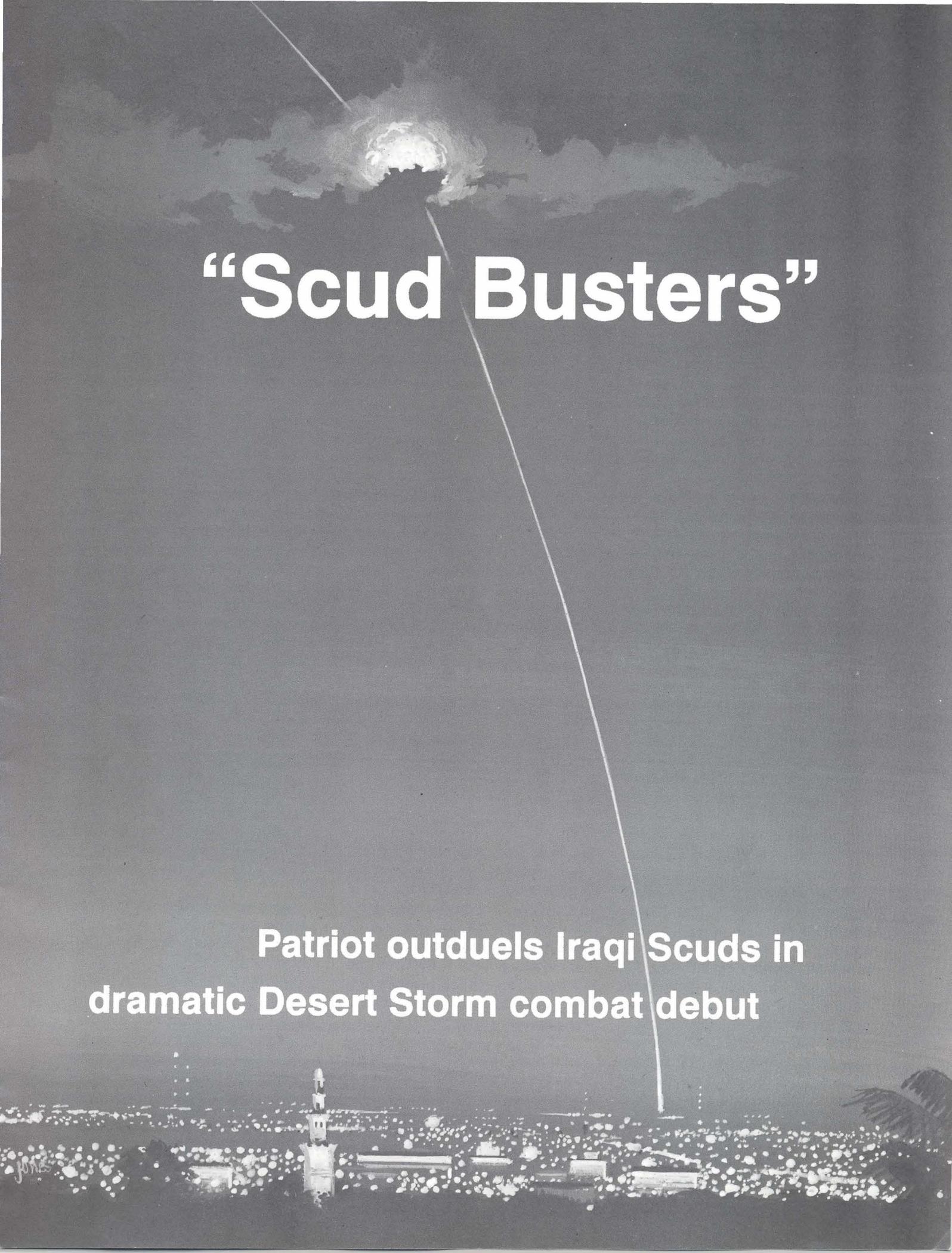
In his "Intercept Point" column for the November-December 1990 edition, Maj. Gen. Donald M. Lionetti credits 2-52nd ADA's Stinger teams with being the first air defenders on the ground in Saudi Arabia.

## MOPP Gear Incorrect

1st Lt. Mary Hillman's article titled "Chemical Attack!" in the November-December 1990 issue of ADA was very accurate, but her effort was put to shame by the photographs in the article.

The picture on page 20 shows two soldiers in MOPP-4 who would die in a chemical attack. The soldier without a helmet has his boots and gloves on the outside of his MOPP ensemble. The soldier in the foreground also has his gloves on the outside of his MOPP ensemble, and I would bet, since his buddy has his boots on the outside, so does he. The soldier with the helmet on page 21 appears to be "ready," but is not. He should be giving the "hand and arm" signal for gas, and should have his hood zipper down.

SSgt. Ivan Lee Baros  
3-200th ADA  
Belen, New Mexico



# **“Scud Busters”**

**Patriot outduels Iraqi Scuds in  
dramatic Desert Storm combat debut**

by Blair Case

**P**atriot batteries defending Dhahran, a major coalition staging area, and Riyadh, the capital of Saudi Arabia, shot down incoming salvos of Iraqi Scud missiles during a dramatic duel that emerged as perhaps the single most impressive feat of American arms during the opening days of Operation Desert Storm.

Patriot's dramatic combat debut was the highlight of a period marked by the triumphant combat debut of a host of untried "high-tech" weaponry. Millions of Americans who witnessed the fiery midair destruction of Scuds via live satellite television broadcasts also viewed the arrival of U.S.-manned Patriot fire units in Israel. Rushed to defend Tel Aviv against further tactical ballistic missile attacks, these European-based Patriot fire units proved instrumental in persuading the Israelis to refrain, at least temporarily, from launching any retaliatory strikes many feared might split the fragile Arab-Western coalition aligned against Iraq.

By dawn of the sixth day of Operation Desert Storm, "First to Fire" soldiers had recorded three historic firsts: they had become the first to intercept and destroy a tactical ballistic missile in actual combat, the first to intercept and destroy multiple tactical ballistic missiles during simultaneous engagements under any conditions, and the first foreign soldiers to actively participate in the defense of Israel. The Patriot missile system emerged as what a CNN commentator termed "a formidable force in modern weaponry" by downing 12 of 12 Scuds that threatened Arab-Western coalition logistical and combat support centers.

The historic first intercept on Jan. 17 (4:28 a.m., Jan. 18, in Saudi Arabia) occurred at what a National Public Service reporter said was an altitude of 1,000 feet. Most

Americans who saw the intercept were watching network coverage of the Gulf War that had preempted prime time melodramas and situation comedies.

Air raid alarms wailed. "Condition Red! Condition Red!" droned a voice on the public address system. "Don your gas masks. Don your gas masks!" Suddenly, a glowing orb streaked horizontally across the nighttime sky above Dhahran and made a sudden vertical leap into clouds instantly illuminated by the golden-orange glow of an intercept.

"What was that?" asked ABC's Ted Koppel.

"I don't know," replied a nervous ABC correspondent.

But hundreds of air defenders watching the action on television back home in the United States thought they knew — though many probably had trouble believing their eyes — and they stayed glued to their television sets until the official confirmation came from the Pentagon: "A Patriot missile has intercepted a Scud missile over Saudi Arabia."

Other air defenders had front row seats.

"It had a long, white, fiery tail," said 1st Sgt. Charles Bucker of the Army Reserve's 358th Military Police. "It went out and turned, hooked around right toward our position. Then it went straight up in the sky right over us. It veered straight up and then we saw the Scud headed toward the airport at right angles. I thought, 'this is it.' We were quiet, because we were on alert, but we probably couldn't have said anything even if we'd wanted to. We were awed, and I was frightened for a moment. Then the Patriot hit and it blew up."

"I was sitting in my jet, getting ready to go," said F-15 pilot 1st Lt. Steve Kirik, "when I looked over at my port engine and there it [the Patriot] was. It was like a big, brilliant

flare. It jumped off the ground, snaked back and forth a couple of times, and then boom! It was pretty spectacular. Let's just say my respect for them [Patriot crewmen] rose tremendously."

"I was standing about three kilometers away," said Lt. Col. Lee Neel, the Patriot battalion commander. "I saw the explosion, but it didn't register immediately. Then I thought, 'My god, that's one of mine.' It [the Scud] was there, we reacted properly, and it was gone."

"I had no doubt at all," Neel said, when asked about his confidence in the Patriot's performance. "We train to that end. We came off a very good field training exercise just prior to deploying. In that exercise, the soldiers were actually engaging targets. They are well trained, highly motivated, and did what they are supposed to do. I'm very satisfied because all the training and hard work paid off."

When asked if his Patriot crewmen could imitate fighter pilots by painting victory symbols on their Patriot systems, Neel said, "It has not been our tradition in the past, however, I won't stop them if they want to."

Reporters quickly descended upon the firing unit.

"I knew right away what it was," said 1st Lt. Charles McMurtrey, who was manning the Patriot engagement control station when the Scud appeared on the radarscope. "There's no way you can confuse it."

Capt. Jim Sprangler said that the historic intercept went perfectly, just like in training. But, he added, "It's a lot different when you know, if you miss it, it could mean people will die. We're very excited. We're the first Patriot battery in the history of the world to shoot down a Scud."

Following a subsequent attack successfully defeated by Patriot, battery commander Capt. Joe DeAntona commented: "We saw

the symbol on the radarscope, realized it was a Scud, tracked it in and destroyed it. We were very controlled, but we knew we were under attack. Our attitude now is let's get ready and do it again."

The intercept, which occurred as Iraqi Scuds aimed at Israel were slamming into Tel Aviv and Haifa, made front page news the next morning. Soon Patriot was being hailed as the "hardware hero" of the Gulf War.

"In its maiden flight of destruction," reported the *New York Times*, "the American-made Patriot missile won the gratitude of thousands of soldiers and civilians this morning as it blew an Iraqi Scud missile out of the sky over one of Saudi Arabia's largest air bases."

"The Patriot battery, ugly stepchild of one of Saudi Arabia's biggest air bases, shot down a Scud missile Friday and became everyone's darling," said the *Washington Post*, which went on to describe the Patriot launchers as "ugly Dumpster shapes" juxtaposed amid the glamor of sleek fighter-bombers on adjacent runways (to Peter Jennings of ABC, the Patriot launchers looked like "elevated freight trucks," while Dan Rather of CBS compared them to "Graham Cracker boxes").

"The performance of Patriot was a huge relief," said NBC reporter Arthur Kent, who reported the action live from a Dhahran rooftop. "Those guys in the Patriot missile battery, let me tell you, were the most popular guys on base."

Patriot crewmen told reporters that they were confident they could shoot down multiple launches of Scuds, even though, until arriving in Saudi Arabia, they had only practiced tactical ballistic missile engagements during computer simulations. "It works the same way," one assured a television reporter.

But still the world wondered. "It may have been a lucky shot," said one analyst, aware that anti-tactical

ballistic missile technology is still in its infancy, but perhaps unaware that manufacturers Raytheon and Martin-Marietta had rushed the latest computer software and new "Scud Buster" missiles to Patriot units deployed in Saudi Arabia. "That's only one Scud missile intercepted," pointed out ABC's Sam Donaldson while commenting on the first intercept, "but so far, Patriot is batting a thousand."

### **U.S. Patriot in Israel**

Most of the nervousness was not over the damage Saddam Hussein's Scuds might inflict on coalition forces in Saudi Arabia, but over the impact of Scuds that hit Israel on Jan. 17 and again on Jan. 18. Would Hussein succeed in provoking an Israeli response?

"The question on everyone's lips," said ABC's Jennings, "is Patriot. The Israelis have Patriot units, why aren't they using them?"

The answer he received from his reporter at the Pentagon was that Israeli Patriot crews were still in training, "somewhere in Texas," a speculation that the Army refused to confirm, although a Fort Bliss, Texas, spokesman told El Paso reporters that "every Patriot crewman in the world is trained at Fort Bliss."

Part of Israel's grudging willingness to depart from its historic doctrine of instant retaliation became apparent Saturday, Jan. 19, when Patriot fire units from Europe were filmed arriving at an Israeli airfield. The U.S. soldiers were shown setting up their launchers in an open field ringed by trees and what appeared to be streets bearing moderately heavy traffic. Israel's ambassador to the United States said the U.S. crews would be in place for, perhaps, only a matter of weeks, until Israeli crews were prepared to take over the mission. "We don't expect others to do our fighting for us," he said. The Pentagon reported the U.S. fire units were op-

erational by nightfall of the same day, but no Scuds arrived during the unit's first or second night of deployment.

Back in Saudi Arabia, ADA units put the "lucky shot" allegation to rest on Sunday, Jan. 20, when Iraq unleashed two separate salvos of missiles at Dhahran and Riyadh. It was night in Saudi Arabia, but afternoon in the United States and most Americans were watching the Buffalo Bills-Oakland Raiders playoff game. (The fans waved U.S. flags in support of Desert Storm soldiers and the Raiders, trailing 41-3 at halftime, probably felt as though they were in downtown Baghdad.) The image on the television screen switched suddenly to Dhahran and the by-now familiar wail of air raid sirens.

There was a resounding boom. "There goes a Patriot," said NBC's Kent. The midair collision of Scuds and Patriots flared like fireflies in the night sky. The Pentagon at first said two Scuds had been intercepted by five Patriots. ("We think two hit the Scuds and one hit the debris. When the other two arrived, there may have been nothing left to hit.") While the Pentagon was busy sorting out the confusion, a second salvo of Scuds arrived, treating pro-football fans (by now, the Raiders had fallen 51-3 and the New York Giants, who wore yellow arm bands for their playoff game, trailed the San Francisco 49ers) to another pyrotechnic demonstration.

Later in the evening, Lt. Col. Mike Gallagher of Central Command in Riyadh explained to Americans what they had watched on television earlier in the day. "We now believe," said Gallagher, "10 missiles were launched and U.S. Patriot air defense systems shot down nine of them. Iraq fired the first launch of three Scud missiles into eastern Saudi Arabia about 9:50 p.m. Saudi time. They were engaged by five Patriot air defense

missiles and were shot down near Dhahran. In the second attack on Jan. 21, about 12:45 this morning Saudi time, Iraq fired seven Scud missiles: four at Riyadh, two at Dhahran and one into the Arabian Gulf off Dhahran. Six of these missiles were shot down by Patriot missiles. The one that landed in the water did not require engagement."

Counting the initial engagement — and discounting the errant Scud that Patriot fire control officers apparently declined to waste a missile on — Air Defense Artillery stood at 10 for 10 and was still batting a thousand.

### The "Best and Brightest"

Many of the accolades were directed at ADA soldiers as well as the technical perfection of the Patriot system.

"The troops of the 11th ADA are dogged, stubborn air defense artillerymen who wear chemical warfare suits 24 hours a day and who have been on Scud alert ever since Operation Desert Storm began," said the *Washington Post*. "They spend their days in a dark van full of computers watching green television screens, waiting to see the telltale parabola that lets them know an enemy ballistic missile is inbound."

"The Patriot system is manned by some of the Army's best and brightest," said NBC's Tom Brokaw. "Weapons experts are calling the success of the Patriot a monumental event in the history of weaponry."

As the Patriot crews watched television replays of themselves shooting down Scuds, reporters described the "Scud Buster" units as being "tremendously excited and proud of their success." "They say

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*This Desert Storm Patriot launcher belongs to the ADA element that shot the first Scud missile out of the air over Saudi Arabia.*

---

nothing works perfectly. How do you guys do it?" asked ABC's Donaldson.

"The anti-missile game is going to be a growing game because a lot of Third World countries have missiles, and we have to be able to counter them," said Col. V. J. Tedesco, Deputy Assistant Commandant of the U.S. Army Air Defense Artillery School at Fort Bliss. "We are proud as hell of the Patriot systems and the soldiers who man them."

It was a feeling that spread like wildfire throughout the world of Air Defense Artillery.

"I felt the joy they must have felt when they shot down the first Scud," said Lori Johnston, wife of Spec. Waylen Johnston of the 11th ADA, now in Saudi Arabia. "Even so, there has to be a sense of caution in your thinking as fighting intensifies. But I've been married to the Army for eight years and, if that's taught me anything, it is to have confidence in these guys. My faith in my husband and his training is what keeps me going."

"Today, Air Defense Artillery units are playing a pivotal political as well as strategic and tactical role in the Gulf War," said Maj. Gen. Donald M. Lionetti, chief of Air

Defense Artillery. "We are jubilant over their initial successes and are confident they will continue to perform in such an extraordinary manner. But while celebrating the magnificent achievement of our Patriot units, let's not forget our soldiers in other ADA units who accompany our ground combat forces as they position themselves for the climactic ground battle that, at this date, seems inevitable. We are thankful that losses among our soldiers and combat pilots have been miraculously light. We pray that our good fortune continues throughout Operation Desert Storm."

On Monday, Jan. 22, Patriot batteries destroyed two more Scuds while four fell in unpopulated desert areas or into the Persian Gulf and were, apparently, not engaged. The Scud Buster's tally stood at 12 for 12. The rocket casing of one Scud, minus the warhead, fell into the streets of Riyadh where it attracted a crowd of curious sightseers.

Air Defense Artillery units, during the opening week of Operation Desert Storm, made international headlines by intercepting every Scud that came their way and reduced the tactical effectiveness of Saddam Hussein's most feared weaponry to absolute zero.





**Spec. Curtis Stokes, left, and PFC Michelle Morris, C/2-1st ADA, erect a Bedouin tent to house the unit's medical aid station.**

# The 11th ADA Brigade in Saudi Arabia

*story and photos by Robert Locke*

**W**hen the *shamal* winds blow stinging sand across the desert, Operation Desert Shield encampments look like drab ghost towns. The gray-and-tan camouflage netting that covers Patriot and Hawk missile launchers and tactical operation centers slaps noisily about. Some Bedouin tents — high-peaked, white cotton affairs about 10-feet square that serve as popular living quarters — occasionally collapse as soldiers learn new lessons about the wind.

When Charlie Battery, 2nd Battalion, 1st Air Defense Artillery, 11th Air Defense Artillery Brigade, arrived to build a base for their Hawk missiles on the northern sands of Saudi Arabia, they found nothing but three dead camels, sev-

eral dead sheep and lots of live scorpions that visit their tents at night. The soldiers named their camp the Pet Semetary.

Asked what they need to make life more bearable in this brutal desert, one replied: "Batteries and news." Like other U.S. soldiers in the Mideast, they said they feel isolated and shut off from news of home.

Chow and mail are about the only things soldiers say they look forward to in Saudi Arabia. The quality of food varies according to location. Those stationed near the port cities enjoy a lot of A-rations, the Army's name for fresh food. "We give 'em good food — the best in Saudi Arabia," said SSgt. Donnie Reed as he supervised the making of mackerel patties for 200 soldiers of an 11th ADA encampment. "Complaints?"

We haven't had a one — except that they don't get enough." Breakfast options include toast, eggs, pancakes, bacon and cereal, with omelettes on Sunday. Almost all meals are A-rations.

Things change farther north. A-rations get scarce near the front. One fresh-food meal every couple of weeks is about par. The next step down is T-rations — just-add-water hot meals that include reconstituted scrambled eggs, chile, macaroni and cheese and corn. Hot T-rations generally are served once every day or so at the MKTs — mobile kitchen trailers with work areas, stoves and serving lines that seem to follow U.S. troops almost everywhere. "Send jalapeno peppers," lamented one cook. "That's all I hear all day."

Probably throughout Saudi Arabia, but certainly among the 11th ADA and other units that deployed to Saudi Arabia from Fort Bliss, Texas, or other posts in the American Southwest, spices are highly valued at mealtime. A soldier's best friend seems to be a bottle of Tabasco sauce, which adds a little bite to bland meals. Soldiers don't rave about T-rations, but they are better than the alternative: MREs, or Meals, Ready-to-Eat. Supply depots have mountains of MREs, this generation's version of the C-rations their fathers ate in Vietnam.

The rations come 12 to a case in vacuum-packed heavy plastic bags. They include a meat dish, a side dish such as applesauce, crackers, peanut butter or jelly, cocoa mix, instant coffee, fruit-drink mix, candy, gum, salt, pepper, sometimes a tiny bottle of Tabasco sauce, and a few other odds and ends. The main courses — barbecue beef, beef

stew, chicken a la king, corn beef hash — can be heated in the bag; cooks keep a tub of hot water for that purpose in the MKT while troops often set them in the hot sand or on vehicle radiators for a while. But often as not, they're simply drenched with hot sauce and eaten cold.

Soldiers listen to the U.S. Armed Forces Radio or, when they need a laugh, tune in to propaganda broadcasts emanating out of Iraq. They call her Baghdad Betty, Baghdad Bertha or Iraqi Irma. And she seems about as ineffective a propagandist as the Hanoi Hannahs and Tokyo Roses of earlier wars. The heavily accented and not particularly sultry "Voice of Peach from Baghdad" hits the airwaves at irregular intervals and reaches GI radios in the northeastern desert of Saudi Arabia.

As a propaganda tool, it leaves something to be desired. Capt. Daniel Burger, liaison between the 11th ADA and 3rd Armored Cavalry Regiment, figures Betty's not too bright. "A while back, she started a thing about 'American soldiers, why are you not home to celebrate the feast of Halloween?' Now come on — the feast of Halloween? But I don't know how funny that's going to be when it's Thanksgiving or Christmas coming up."

Soldiers sent to Saudi Arabia were never given a timetable, but many believed, correctly or not, that they'd be rotated home after spending three to six months in the desert. But in November, Defense Secretary Dick Cheney said there would be no rotations, that soldiers in Saudi Arabia would stay for the duration. Although Cheney later modified the statement, saying that

rotations are still up for discussion, the blow to morale was devastating.

"Up until that announcement, morale was pretty high. That hurt," said 1st Lt. Jonathan Cohen, an 11th ADA personnel officer. He added that it didn't help that soldiers found out about the change not from the Army but from their families at home.

"My heart just fell when I heard that," said PFC Bryan Patterson.

"We were one of the first units over here, and we feel like we ought to be going home."

"That," said Sgt. Wayne Phillips, "was a morale killer." Said Sgt. Joseph Stautihar: "The hardest thing [about duty in Saudi Arabia] is not knowing when we're going home."

Why are you here in the desert? The question was asked of dozens of Fort Bliss soldiers. Answers ranged from the patriotic to the indignant, from global economics to the obligations of an Army contract freely made. And for many professional soldiers, the question just wasn't relevant.

"We're protecting a way of life," said CWO 2 Charles E. Johnson, a technician for a Patriot missile battery of the 11th ADA Brigade. "We have interests in this country. That's what the president tells us."

"We're not defending a democratic society (among the Arab monarchies). That's for sure," said Capt. Terry Webb, an 11th ADA operations officer. "There are two factors: to turn back aggression and to defend the world's oil."

But 2nd Lt. Eric Wagner of the 11th ADA had mixed feelings. "We're not here defending America's freedom. I hear the politicians say we're here to help out a friend in need. I wonder if we would be doing all this if our friend didn't have all this oil. I would hate to see American kids die over something like that. Regardless of my personal feelings, I'm going to do my job and fulfill my contract."

Colonel Victor J. Tedesco, Jr.  
Executive Director  
Air Defense Artillery Association  
P.O. Box 6101  
Fort Bliss, Texas 79906

Dear *V. King* Tedesco:

As we enter a new decade, the soldiers of the 11th ADA Brigade have again been called upon by the nation to turn back the forces of aggression and tyranny, this time in the remote deserts of Saudi Arabia far from home. I know that the members of your association understand the courage and commitment of our soldiers and the challenges confronted by the families and loved ones left behind.

I appreciate the outstanding support that your association has given to the Army in the past. I now ask that you redouble your efforts to provide the assistance that is so needed by every soldier and family that is in one way or another involved in Operation DESERT SHIELD.

On behalf of the entire Army, I extend to you my personal and professional thanks for everything your association has done in response to this national crisis. I believe that your continued support will have a positive and powerful impact on the success of this vital operation.

Sincerely,



Carl E. Vuono  
General, United States Army  
Chief of Staff

## Press Pool Provides Hometown Coverage

Robert Locke was one of three El Paso journalists chosen by lot to report for El Paso newspapers and television stations on Fort Bliss units deployed to Saudi Arabia. "Soldiers were fascinated that reporters would come all the way from West Texas to talk to them," Locke reported. "And the reporters were deeply touched by the small, private messages they were asked to take back across the ocean to El Paso. The men and women in Saudi Arabia seem almost terrified that Vietnam will come back to haunt them. Soldiers who couldn't have been in grade school when the last U.S. troops left Southeast Asia plead that they not be forsaken by the people at home — "Like we were in Vietnam."



*El Paso Press Pool members, from left to right, are Mike Smith, KDBC-TV, Robert Locke, El Paso Times, and David Garcia, KTSM-TV.*

For ADA soldiers stuck in the Arabian Desert, the enemy is clear and personal: Saddam Hussein pulled them 12,000 miles from home. They rarely mention the million-man Iraqi army they may face in the months ahead. They talk only of Saddam. And their talk usually involves a boot applied forcefully to a specific part of the Iraqi dictator's anatomy.

"I'd like to see Saddam Hussein back down and pull out of Kuwait, but I doubt it," said Cohen.

"It all comes down to Saddam Hussein," said Webb. "It gets really personal. It's strange how one man can turn the world upside down and affect so many lives."

You don't often forget in Saudi Arabia that the soldiers across the border are your sworn enemy.

Listen for a moment to Spec. Mario David Mejia of Chicago: "Yeah, you do get nervous. Especially on guard duty. At night. When there's no moon. It's very dark, and you can't see your field of fire. You hear a little noise, and you think it must be somebody out there. But it's not.

It's just the howling of the wind."

Yet few seem genuinely afraid. In fact, after months of waiting for something to happen, many say they're eager to lock and load and head north — if that'll get them home sooner.

"We try to encourage each other," said Mejia, of Echo Battery, 2nd Battalion, 7th Air Defense Artillery. "We know we have a job to do and if we do that job well, we're going to go home. We're going to go home alive. I'm praying there will be a peaceful solution to this, but I've got a feeling something bad is going to happen."

That feeling is common in Saudi Arabia.

"I try not to worry about it from day to day. If it happens, it happens," PFC Dusty Grimstead of the 11th ADA Brigade said.

"You think about it a lot," said Wagner. "You think about never going home, never seeing your family or friends again. You think about it a lot."

"The reminders are constant. The threat is real," said Spec. Al-

bert Sierra of the 2-7th ADA.

A touch of nerves seems not only natural but prudent in this forbidding desert. Almost everyone admits to a bit of fear during their first uncertain days in country, but time and boredom have a way of erasing that.

A strong sense of camaraderie — of shared hardships and dangers — is obvious among troops in the Saudi desert. Some come to know one another so well they act almost like old married couples, bantering casually and finishing each other's sentences.

Consider this exchange with Sgts. Wayne Phillips, Melvin Watson and Javette Jones, members of an 11th ADA Hawk crew that has been at a front-line camp for 65 days.

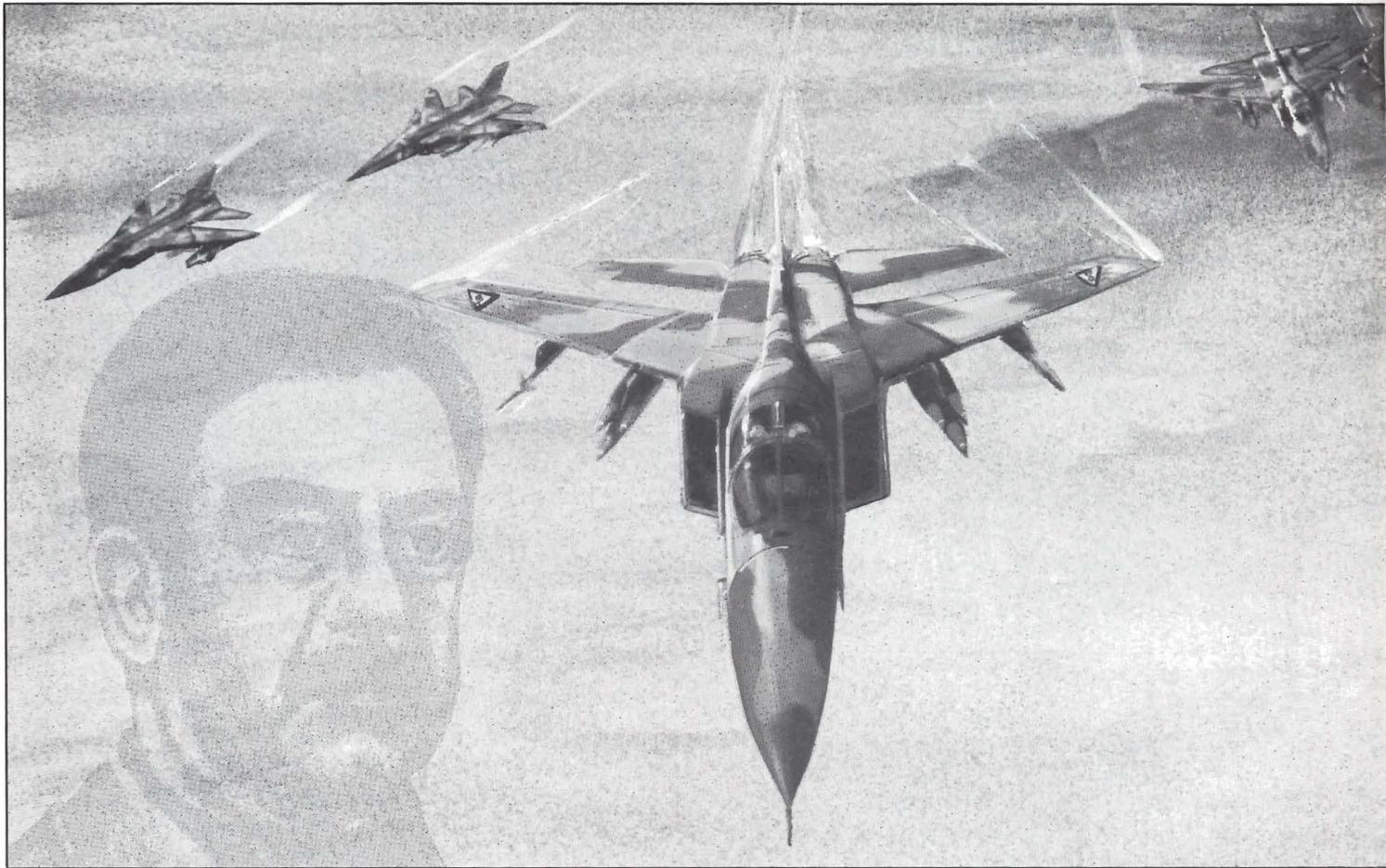
Reporter: "Any message for your families?"

Phillips: "Say we miss 'em . . ."

Jones: "a lot . . ."

Watson: "and we're going to be home soon."

**Robert Locke** is city editor of the *El Paso Times*.



# Foes Fly “Friendlies”

by Lt Mary E. Peterson

**A**ir defenders confront a formidable “two-faced” challenge in identifying aircraft in the Persian Gulf.

First, they face a potential foe — the Iraqis — who fly a lot of “friendly” aircraft. Iraq has an international array of two-faced aircraft made by almost every country which manufactures fixed or rotary wing aircraft — including the United States, the USSR, France, England

and China. In addition, air defenders must differentiate between foes flying friendlies and friends flying friendlies. The task is not inconsiderable.<sup>6, 7</sup>

With about 600 modern combat aircraft, including some of the latest Soviet and French-made fighters, Iraq has the strongest air force in the Arab world. Helicopters and low-performance aircraft present one of the major threats to friendly ground forces. High-performance aircraft may attack division and corps rear, nuclear delivery means,

command and control facilities, logistic facilities and reserve forces. The most dangerous times for these attacks are early morning (pilots are rested and aircraft repaired, fueled and armed), noon and early evening.

However, Iraqi air strikes against strategic targets impressed few observers of the Iran-Iraq War. “Iraqi pilots were notorious for dropping their bombs blindly from 20,000 feet over Iranian cities to avoid air defenses,” reported the *New York Times*. The *Defense Monitor* noted

## IRAQI AIR THREAT



that "their ground-attack air units are rated higher due to their modern weapons and combat experience in the war against Iran, but overall effectiveness is limited due to the small number of well-trained pilots." Iraqi close combat-support pilots, of course, might develop the same bad habits as their strategic bomber pilots when faced with a strong forward area air defense.

According to *ABC News*, the Iraqis are constructing three shelters for each of their combat aircraft and will shift them from shelter to shelter to make them harder to take out on the ground. Some analysts expect Iraq would preserve its air power by using it sparingly. "I don't think they would lose all of their airplanes right away," said one ana-

lyst. "They will hide in their armored shelters, and we will have to keep hitting the air bases all the time."

The overall consensus is that Iraqi air power will not prove very effective against the sophisticated combat aircraft and air defense systems assembled for Operation Desert Shield and that Iraqi "frequent flyers" will become "frequent dyers."

Russian aircraft now in use by Iraqi forces are identified in this article by their more familiar NATO code names. Air defenders will readily recognize the names of French, British and American aircraft.

The accompanying information (by no means all-inclusive) on Iraqi aircraft, derived from unclassified sources, provides a brief description of the aircraft. For more detailed information, consult your intelligence officer.

### *A-4 Skyhawk*

This American-built, carrier-based attack aircraft, despite its small size, carries a large ordnance load.<sup>6</sup>

### *Aero L-390 Albatross*

The Aero L-390 is a Soviet-built jet trainer with four underwing weapon stations and strengthened wings.<sup>2</sup>

Performance:<sup>2</sup>

Maximum Speed: 469 mph at 16,400 feet

Service Ceiling: 36,100 feet

Range: 621 miles on internal fuel

### *An-2 Colt*

Soviet-built transport.

### *An-12 Cub*

This Soviet-built transport usually carries equipment and cargo, but

also has troop transport capability. Its usefulness is limited by lack of an integral rear loading ramp or door. Instead, the bottom of the rear fuselage is made up of two longitudinal doors that hinge upward inside the cabin to permit direct loading from trucks on the ground or airdropping of supplies and equipment. A full load of 60 paratroopers can be dispatched from this door in under one minute.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: 482 mph

Service Ceiling: 33,500 feet

Range: With max payload 2,236 miles

### *An-26 Curl*

The Curl is a Soviet-built twin-turboprop freighter and the first aircraft to embody Oleg Antonov's unique rear loading ramp. This forms the underside of the rear fuselage when retracted in the usual way, but can slide forward under the rear of the cabin to facilitate direct loading onto the floor of the hold, or when cargo is to be airdropped. An OPB-1R sight is available to ensure pinpoint delivery into the drop zone. The Curl may be converted to carry troops or litters;

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## References

- <sup>1</sup> *Air Force Magazine*, March 1989
  - <sup>2</sup> *Air Force Magazine*, March 1987
  - <sup>3</sup> *Jane's Defense Weekly*, 18 August 1990
  - <sup>4</sup> *Jane's Soviet Intelligence Review*, July 1990.
  - <sup>5</sup> *Aviation Week & Space Technology*, March 14, 1988
  - <sup>6</sup> *FM 44-30, Visual Aircraft Recognition*, October 1986
  - <sup>7</sup> *World Military Helicopters*, Elfan ap Rees, 1986
  - <sup>8</sup> *Air Force Magazine*, August 1990
-



conversion takes 20 to 30 minutes in the field. Maximum payload is 12,125 lbs.<sup>1</sup>

The Curl has a crew of five, plus a station for a load supervisor or dispatcher. It has an electrically powered 4,409-pound mobile hoist to facilitate loading and airdropping of supplies, and provisions for carrying 40 paratroopers or 24 litters (improved).<sup>1</sup>

Performance:<sup>1</sup>

Cruising Speed: 273 mph at 19,675 feet

Service Ceiling: 24,600 feet

Range: 683 miles with maximum payload

#### *Chinese Chengdu J-7*

The J-7 is a Chinese version of the Soviet MiG-21 Fishbed.<sup>3</sup>

Performance:<sup>3</sup>

Speed: Mach 2.05

#### *Hunter*

The UK-built Hunter is similar to the A-6 Intruder.<sup>6</sup>

#### *Il-14 Crate*

Soviet-built transport.

#### *Il-28 Beagle*

Soviet-built bomber.

#### *Il-76 Candid*

The Soviet design includes rear-loading ramp/doors, a T-tail, full-span leading-edge slots and triple-slotted flaps for good field performance, a navigator's station in the glazed nose with ground-mapping radar in a large undernose fairing, and a unique and complex 20-wheel landing gear.

The entire accommodation is pressurized to carry 140 troops or 125 paratroopers as an alternative to freight. The Candid has equipment for all-weather operation, including a computer that permits automatic flight control and landing approach.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: 466-497 mph at 29,500 to 39,350 feet

Nominal Range: 3,100 miles with payload of 88,185 lbs

Maximum Range: 4,163 miles

#### *MiG-17 Fresco*

This Soviet-built fighter is similar in appearance to the MiG-15 Fagot, but has a completely redesigned tail section and a longer fuselage.<sup>6</sup>

#### *MiG-19 Farmer*

Soviet-built fighter.

#### *MiG-21 Fishbed*

The Soviet-built MiG-21 air superiority fighter was developed for air-to-air combat, with emphasis on good transonic and supersonic handling, high rate of climb, small size and light weight. The MiG-21 developments include improvements in range, weapons and all-weather capability. The MiG-21 has become the most widely-used fighter in the world and is probably the backbone of Iraq's air power.

Performance:<sup>1</sup>

Maximum Speed: Mach 2.05 above 36,000 feet (Mach 1.06 at low altitude)

Service Ceiling: 50,000 feet

Range: 683 miles on internal fuel (1,118 miles with three external tanks)

#### *MiG-23 Flogger*

This Soviet-built, single-seat air combat fighter has a Tumansky R-27 turbojet. It contains a J-band radar (NATO 'High Lark') that is capable of a 53-mile search range and a 34-mile tracking range. Flogger B also contains three radar warning systems, an infrared search/track pod beneath the cockpit, and Doppler. Its down-looking radar allows it to track and engage targets flying below.<sup>2</sup>

Flogger E is an export version of Flogger B. It has a smaller radar,

**Fixed-Wing Aircraft Summary**

| <b>Aircraft</b>      | <b>Crew</b> | <b>Role</b>                                                                                                                        | <b>Armament</b>                                                                                                                                                                                      |
|----------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A-4 Skyhawk          | 1 or 2      | Attack, close air support                                                                                                          | Bombs, rockets, missiles, gun pods, two cannons                                                                                                                                                      |
| Aero L-390 Albatross | 2           | Attack, reconnaissance                                                                                                             | Bombs, rockets, air-to-air missiles, recon packs, 23mm GSh-23 cannon                                                                                                                                 |
| An-2 Colt            | 2           | Light transport (10 equipped troops), general utility                                                                              | Usually none                                                                                                                                                                                         |
| An-12 Cub            | 6           | Medium cargo, transport (90 equipped troops, vehicles and weapons), electronic countermeasures, electronic intelligence            | 2x 23mm NR-23 guns in tail                                                                                                                                                                           |
| An-26 Curl           | 5           | Short haul, light transport, cargo (40 equipped troops, vehicles and weapons), electronic countermeasures, electronic intelligence | Usually none                                                                                                                                                                                         |
| Chengdu J-7          | 1           | Fighter                                                                                                                            | Probably similar to MiG-21                                                                                                                                                                           |
| Hunter               | 2           | Fighter-bomber, reconnaissance                                                                                                     | 30mm guns, rockets, cannons                                                                                                                                                                          |
| Il-14 Crate          | 5           | Medium transport, cargo (25 equipped troops)                                                                                       | Usually none                                                                                                                                                                                         |
| Il-28 Beagle         | 3           | Light bomber, trainer                                                                                                              | Bombs, cannon in tail                                                                                                                                                                                |
| Il-76 Candid         | 7           | Heavy transport, cargo (tanks, guns and other equipment)                                                                           | 2x 23mm NR-23 guns                                                                                                                                                                                   |
| MiG-17 Fresco        | 1           | Fighter-bomber                                                                                                                     | 3x 23mm cannons, bombs, rockets                                                                                                                                                                      |
| MiG-19 Farmer        | 1           | Interceptor, ground attack, trainer                                                                                                | Missiles, bombs, cannons                                                                                                                                                                             |
| MiG-21 Fishbed       | 1           | Interceptor, ground attack, trainer                                                                                                | Interceptor (23mm GSh-23 gun with 200 rds AA-2, 2x K-13 As, 2 UV-16-57 rocket pods, 2x missiles)<br>Ground attack (4x UV-16-57 rocket packs, 2x 1,100 lb and 2x 550 lb bombs, 4x S-24 240mm rockets) |
| MiG-23 Flogger B     | 1           | Fighter, interceptor                                                                                                               | Cannon, missiles                                                                                                                                                                                     |
| MiG-23 Flogger E     | 1           | Fighter                                                                                                                            | Missiles                                                                                                                                                                                             |
| MiG-23 Flogger F     | 1           | Fighter, bomber                                                                                                                    | 23mm GSh-23 gun, rockets, missiles (AA-8, AA-7)                                                                                                                                                      |
| MiG-23 Flogger G     | 1           | Fighter                                                                                                                            | Missiles                                                                                                                                                                                             |
| MiG-29 Fulcrum       | 1           | Counterair fighter, attack                                                                                                         | Missiles, 30mm gun                                                                                                                                                                                   |
| Mirage F-1           | 1 or 2      | Fighter, ground attack, reconnaissance                                                                                             | 30mm cannon, bombs, rockets, missiles                                                                                                                                                                |
| Su-7B Fitter A       | 1           | Ground attack                                                                                                                      | 2x 30mm cannon, rockets, bombs, air-to-surface missiles                                                                                                                                              |
| Su-17 Fitter C       | 1           | Ground attack                                                                                                                      | Cannon, rockets, missiles, bombs, (AA-2, 30mm NR-30 guns, 7,000 lbs of bombs)                                                                                                                        |

**Fixed-Wing Aircraft Summary (continued)**

| <b>Aircraft</b> | <b>Crew</b> | <b>Role</b>                                                           | <b>Armament</b>                                                                                                                                       |
|-----------------|-------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Su-20 Fitter D  | 1           | Ground attack                                                         | Cannon, rockets, missiles, bombs, (AA-2, 30mm NR-30 guns, 7,000 lbs of bombs)                                                                         |
| Su-22 Fitter F  | 1           | Ground attack                                                         | Cannon, rockets, missiles, bombs (AA-2)                                                                                                               |
| Su-24 Fencer    | 2           | All-weather attack, fighter-bomber, strike                            | Cannon, rockets, missiles, bombs, (30mm Gatling gun, air-to-surface, AS-7, AS-10, AS-11, AS-12, AS-13, AS-14                                          |
| Su-25 Frogfoot  | 1           | Close air support, ground attack                                      | 30mm cannon, AA-2D or AA-8 missiles, 57mm and 80mm rockets, bombs (9,920 lbs air-to-ground, 1,100 lb incendiary, antipersonnel, and chemical cluster) |
| Tu-16 Badger    | 6           | Strategic bomber, electronic intelligence, electronic countermeasures | 7x 23mm NR-23 guns, 2x Kingfish missiles, up to 19,800 lbs bombs                                                                                      |
| Tu-22 Blinder   | 3           | Bomber, reconnaissance, electronic intelligence                       | 2x Kitchen missiles, 12 to 18 bombs, GSh-23 gun                                                                                                       |

(NATO 'Jay Bird') with an 18-mile search and 12-mile tracking range.<sup>1</sup>

Flogger F is an export counterpart of the Flogger D ground attack variant. It has the slope nose shape, laser rangefinder, raised seat, cockpit external armor plate and larger, low-pressure tires of the Flogger D.<sup>1</sup>

Flogger G basically resembles Flogger B, but has a much smaller dorsal fin, lighter weight radar and, on some aircraft, an undernose sensor pod of a new design.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: Mach 2.35 at height (Mach 1.2 at sea level)

Service Ceiling: 59,055 feet

Combat Radius: 580-805 miles

**MiG-25 Foxbat**

*[Foxbat is still the fastest Soviet-built combat aircraft. Algeria, India, Libya and Syria now fly Foxbats with their national markings.]<sup>1</sup>*

Foxbat A is a basic interceptor designed to attack high-flying targets. It is built mainly of steel, with

titanium only in places subject to extreme heating (such as the wing leading-edges).<sup>1</sup>

Foxbat B is a reconnaissance version with five camera windows and various flush dielectric panels aft of a very small dielectric nose cap for radar. Foxbat B probably contains a Doppler navigation system and side-looking airborne radar.<sup>1</sup>

Foxbat C, a trainer, has a separate cockpit with an individual canopy forward of the standard cockpit and at a lower level.<sup>1</sup>

Foxbat D, a reconnaissance version similar to Foxbat B, has a larger dielectric panel farther aft on the side of the nose and no cameras.<sup>1</sup>

Performance: Foxbat D.<sup>1</sup>

Maximum Speed: Mach 3.2 at height

Service Ceiling: 88,580 feet

Operating Radius: 560 miles

Foxbat E is a converted Foxbat A with changes to radar gear and equipment that provide a limited

lookdown and shutdown capability. The Foxbat E also has an undernose sensor pod and engines that are uprated to 30,865 pounds. The high-performance Foxbat E has set the world's current absolute height record of 123,523 feet.<sup>1</sup>

Foxbat F was first called 'Wild Weasel' because of its defense suppression capabilities. The airframe is generally similar to Foxbat interceptors, but its dielectric panels are aft of radome on the port side (possibly both sides) of the front fuselage.<sup>1</sup>

Performance: Foxbat A/B/C/E/F.<sup>1</sup>

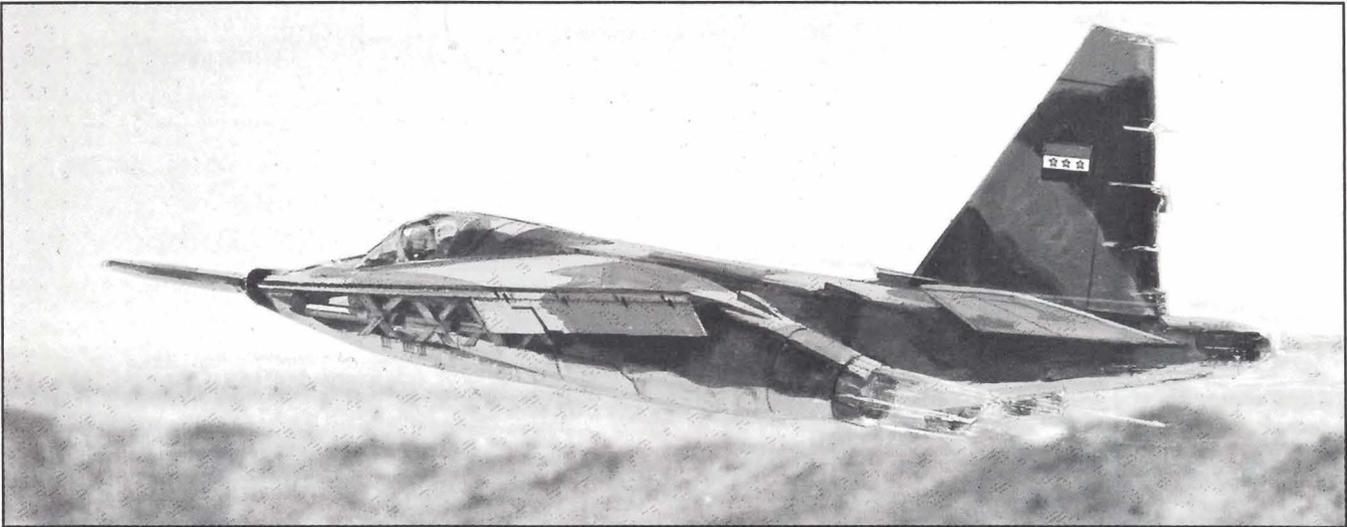
Maximum Speed: Mach 2.83 (Mach 0.85 at low altitude with missiles)

Service Ceiling: 80,000 feet

Maximum Combat Radius: 900 miles

**MiG-29 Fulcrum**

The Soviet-built Fulcrum B is a combat trainer with a second cock-



pit in front of the normal cockpit. The nose radar was replaced by a radar rangefinder and it has a periscope above the canopy. The underwing also has storage pylons.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: Mach 2.3 at height (Mach 1.06 at sea level)

Service Ceiling: 56,000 feet

Combat Radius: 650 miles

#### *Mirage F-1*

French-built fighter.

Performance:<sup>8, 3</sup>

Maximum Speed: Mach 2.2 at height (Mach 1.2 at sea level)

Service Ceiling: 65,600 feet

Combat Air Patrol Endurance: 2 hours, 15 minutes

Attack Radius: 265 to 863 miles depending on flight profile and weapon load

#### *Su-7/17/20/22 Fitter*

The Soviet-built Su-7 Fitter A is a single-seat ground attack fighter.

The Su-17 Fitter C, a basic single-seat attack aircraft, has manual wing sweep control and a curved dorsal fin. Its equipment is said to include a fire control system, Sirena

3 omnidirectional radar warning system, and SRO-2M IFF.<sup>1</sup>

The Su-20 Fitter D, similar to Fitter C, has an added undernose electronics pod for Doppler navigation radar and a laser rangefinder in its intake centerbody.

The Su-22 Fitter F is an export counterpart of Fitter D. The Fitter F has a modified undernose electronics pod.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: Mach 2.09 at height (Mach 1.05 at sea level)

Service Ceiling: 59,050 feet

Combat Radius: 275 to 425 miles with 4,410 lbs external storage

#### *Su-24 Fencer*

A Soviet-built fighter, the Swing Wing Fencer has twice the combat radius of the Fitter while carrying a comparable weapon load. The Fencer has the ability to carry a wide range of air-to-surface missiles that provide defense suppression and some hard-target kill potential. A specially developed long-range navigation system and electro-optic weapons delivery system enable the Su-24 to penetrate hostile airspace

at night or during poor weather with great precision and then deliver ordnance within 180 feet of its target. The Fencer can also be used as a Guddie tanker.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: Mach 2.18 at height (Mach 1.2 at sea level)

Service Ceiling: 54,135 feet

Combat Radius: Over 200 to 805 miles with 6,615 lbs weapons and two external tanks

#### *Su-25 Frogfoot*

The cockpit of this Soviet-built fighter is protected by flat slabs of armor. Frogfoot's large wings can support ten weapon pylons for a wide range of ordnance, including chemical weapons and air-to-air missiles for self-protection.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: 608 mph

Combat Radius: 345 miles with 4,410 lbs of weapons and two tanks

#### *Tu-16 Badger*

The Soviet-built Badger A is a basic strategic jet bomber capable of carrying nuclear or conventional free-fall weapons. Some Badgers

## Rotary-Wing Aircraft Summary

| Helicopter   | Crew   | Role                                                                                                 | Armament                                           |
|--------------|--------|------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Alouette III | 1      | Light attack, transport (six equipped troops), general purpose                                       | Machine guns, cannons, anti-tank missiles, rockets |
| Gazelle      | 1      | General utility, attack                                                                              | Machine guns, rockets, missiles                    |
| Mi-1 Hare    | 1      | Utility, liaison, transport (3 passengers)                                                           | Usually none                                       |
| Mi-4 Hound   | 3      | Transport (12 to 16 equipped troops), armed support, trainer                                         | Machine gun pod, rockets                           |
| Mi-6 Hook    | 5      | Heavy transport (65 equipped troops), vehicles                                                       | Machine gun                                        |
| Mi-8 Hip     | 2 to 3 | Armed assault transport (24 equipped troops), light weapons and vehicles, up to 8,820 lbs of freight | Rockets, anti-tank missiles, machine gun, bombs    |
| Mi-24 Hind   | 2      | Assault, gunship, anti-tank, transport (8 troops, 4 litters), mechanic                               | Missiles, guns, rockets                            |
| Puma         | 2      | Armed transport (16 troops)                                                                          | Cannon, missiles, rockets, 2x 7.62mm machine guns  |
| Super Frelon | 3      | Multipurpose, transport version carries 27 to 30 troops                                              | 4x torpedoes, 2x Exocet antiship missiles          |

are also specially equipped as aerial refueling tankers, using a unique wingtip-to-wingtip transfer technique to refuel other Badgers or Blinders.<sup>1, 2</sup>

Performance:<sup>2</sup>

Maximum Speed: 616 mph at 19,700 feet

Service Ceiling: 40,350 feet

Range: 3,680 miles with 8,360 lbs. of bombs

Combat Radius: 1,955 miles unrefueled

#### Tu-22 Blinder

The Soviet-built Blinder A is an original reconnaissance bomber version with a fuselage weapons bay for free-fall nuclear or conventional bombs. Iraqi Air Forces have about seven Blinders.<sup>1, 2</sup>

Performance:<sup>1, 2</sup>

Maximum Speed: Mach 1.4 at 40,000 feet

Service Ceiling: 60,000 feet

Combat Radius: 1,800 miles unrefueled.

#### Mi-1 Hare

A Soviet-built helicopter, the Hare was originally designed to meet general utility specifications. Later, the Hare was used for missions such as search and rescue, liaison, training and observation work.<sup>7</sup>

Performance:<sup>7</sup>

Maximum Speed: 105 mph

Service Ceiling: 9,842 feet

Range: 360 miles

#### Mi-4 Hound

Soviet-built, the Hound is similar to the Whirlwind and the Sikorsky. Configured for a basic utility role, it can carry up to 16 combat-equipped troops, small vehicles or up to 3,528 lbs. of supplies. Some Hound helicopters operate in the close-support role and are fitted with a machine gun and side-mounted air-to-surface rockets.<sup>7</sup>

Performance:<sup>7</sup>

Maximum Speed: 230 mph at 18,045 feet

Service Ceiling: 18,045 feet  
Range: 155 miles

#### Mi-6 Hook

The Soviet-built Hook has a large, five-blade, all-metal main rotor and four-blade tail rotor. It has a 39-foot-long cargo bay. As a heavy-lift helicopter the Hook introduced major tactical air assault capability. As an ambulance, the Hook can carry 41 stretcher cases with two medical attendants (a pure heavy-lift role).<sup>7</sup>

Performance:<sup>7</sup>

Maximum Speed: 186 mph

Service Ceiling: 14,764 feet

Range: 385 miles

#### Mi-8 Hip

The primary combat task for the Soviet-built Mi-8 Hip is to deliver assault troops, equipment and supplies behind enemy lines within 15 to 20 minutes of a nuclear or conventional bombardment or strike.<sup>1</sup>

Performance:<sup>1</sup>



Maximum Speed: 161 mph at 3,280 feet  
 Service Ceiling: 14,760 feet  
 Range: 311 miles as passenger transport

***Mi-24 Hind***

The Soviet-designed Hind was originally a heavily armed assault transport for a squad of troops (a capability retained in all versions), which means that it lacks the slim silhouette optimum for a gunship. But its variety of weapons and operational equipment make it a formidable adversary. As a result of combat experience in Afghanistan, infrared jammers, suppressors and decoy dispensers have been added, along with increased armor plating.<sup>1</sup>

Instead of wingtip attachments, the Hind G has "clutching hand" mechanisms (probably associated with radiation sampling) on lengthened pylons.<sup>1</sup>

Performance:<sup>1</sup>

Maximum Speed: 192 mph  
 Service Ceiling: 14,750 feet  
 Combat Radius: 99 miles with military load, 466 miles with maximum fuel

***Sa-316 Alouette III***

The French-designed Alouette III is mainly used for light transport, search and rescue and training, but can carry a wide variety of armament.<sup>3</sup>

Performance:<sup>3</sup>

Maximum Speed: 136 mph  
 Range: 375 miles with maximum payload

***Sa-321 Super Frelon***

The Super Frelon is the largest French helicopter originally designed as a troop transport. Further refinements and role equipment modifications, such as search radar and sonar, have since been introduced.<sup>7</sup>

Performance:<sup>7</sup>

Maximum Speed: 170 mph

Service Ceiling: 10,335 feet  
 Range: 509 miles

***Sa-330 Puma***

The Puma, built both in France and the UK, is an assault helicopter that has a cargo hook as standard equipment. Some Puma helicopters are fitted with ORB-31 nose radar and some are used for search and rescue.<sup>3</sup>

Performance:<sup>3</sup>

Range: 390 miles

***Sa-342 Gazelle***

The French-built Gazelle is used mainly for training.<sup>3</sup>

Performance:<sup>3</sup>

Maximum Cruising Speed: 164 mph

Service Ceiling: 16,400 feet

Range: 416 miles.

Material compiled by 1st Lt. Mary E. Peterson, Threat Office, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.

# SRBMs & ADA

## POINT COUNTERPOINT

by 1st Lt. Mary E. Peterson

Iraq's arsenal of short-range ballistic missiles (SRBMs) — and the ability of Patriot and Hawk ADA units to counter them — has often been the focus of news reports generated by Desert Shield.

Iraq has several missile programs that seem to center around upgrading the Scud. The Soviet Union supplied Iraq with Scud B missiles in the early 1970s, and delivered several hundred more to support Iraq in the Iraq-Iran War.

Another missile program Iraq developed, with assistance from Argentina and Egypt, is the Condor or Project 395. West German and Italian engineers and technicians helped Iraq build the test facilities. The completed plant manufactured chemicals for solid fuel rocket motors, enabling Iraq to start developing and assembling its own missiles.

### Scud B

The Soviet-designed Scud is said to take 90 minutes to prepare for launch. The missile must be vertical at launch because any deviations degrade missile accuracy.<sup>2</sup>

### Al-Hussein

Iraq appears to have used the Al-Hussein primarily in the "War of the Cities" with Iran, firing a total of 189 Al-Husseins (an average of 3.6 missiles per day). The maximum number fired in one day was 11 with a maximum of seven missiles fired at one time. In general, the Iraqis could fire one at a time from the launcher; it is possible that the Al-Hussein is fired like a Scud. According to European engineers who witnessed the operations, the Iraqis will need approximately 30

minutes to prepare the missiles for launch.<sup>1, 2</sup>

The Al-Hussein is an upgraded version of the Scud B missile. It takes three Soviet Scud B missiles to develop two Al-Husseins. The original range for the Al-Hussein was 650 km, but it could never reach that range. The maximum range was closer to 600 km with an estimated circular error probability (CEP) of 480 meters.<sup>1, 2</sup>

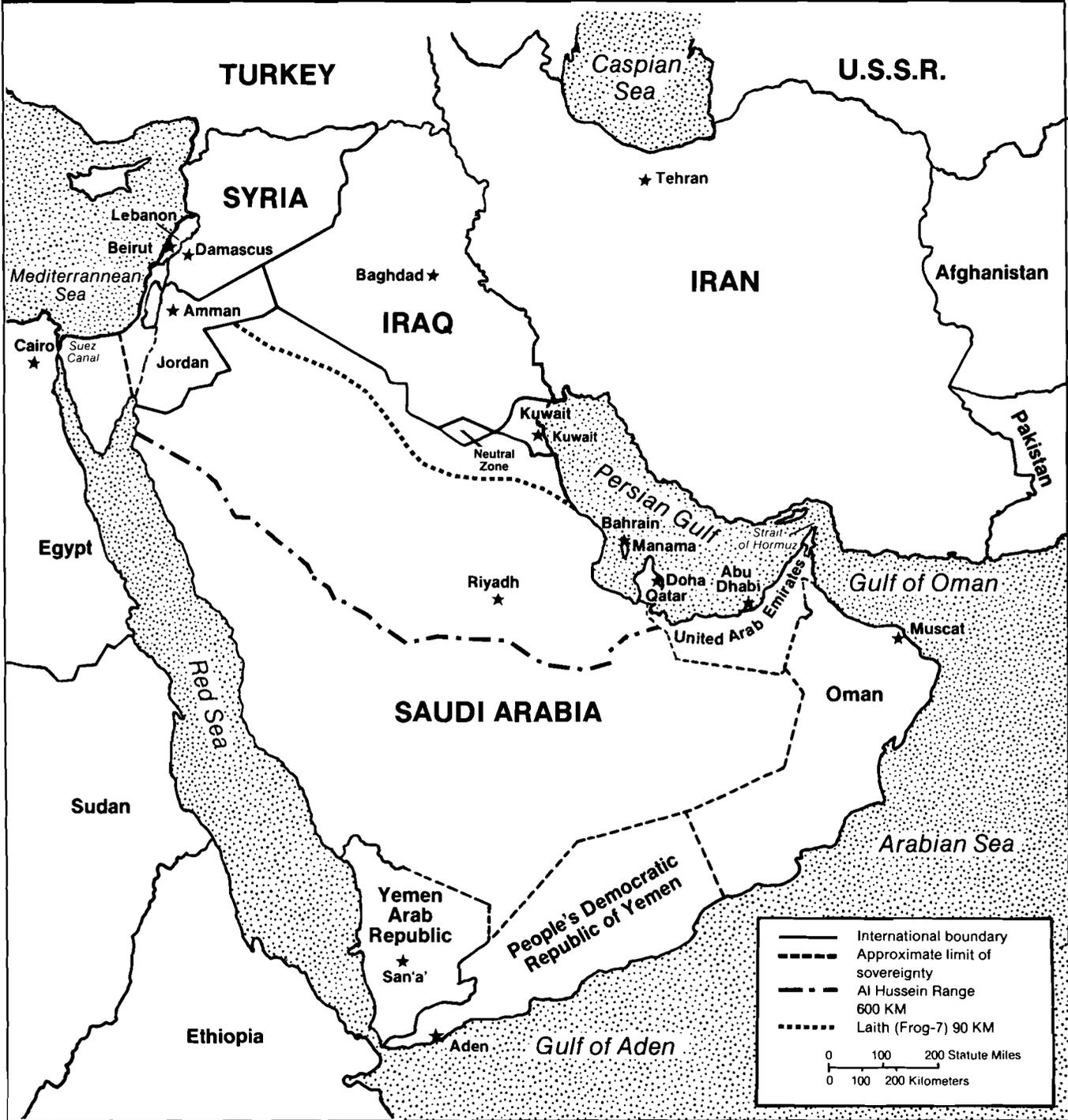
The effects of the Al-Hussein in a populated area can be devastating. The Al-Hussein detaches from

### Iraq's SSM Arsenal

| Missile     | Range     | CEP     | Status |
|-------------|-----------|---------|--------|
| Ababil      | 50-100km  | Unknown | D      |
| Al-Abbas    | 850km     | 300m    | D      |
| Al-Abid     | 2,000km   | Unknown | D      |
| Al-Hijara   | Unknown   | Unknown | Unk    |
| Al-Hussein  | 600km     | 500m    | O      |
| Chinese M-9 | 600km     | Unknown | Unk    |
| Condor-2    | 900km     | Unknown | D      |
| Fahd        | 250-500km | Unknown | D      |
| Laith       | 90km      | 380m    | O      |
| SCUD B      | 280km     | 1,000m  | O      |
| Tammuz 1    | 200km     | Unknown | D      |

D-Developing O-Operational

# IRAQI SURFACE-TO-SURFACE MISSILE THREAT



the missile fuselage prior to impact, and the missile lands in two parts. A warhead explodes from each part, resulting in the effects of two missiles from each Al-Hussein.<sup>1</sup>

### Ababil

The Ababil, a long-range artillery rocket, comes in 50km and 100km versions. The Ababil can be fitted with a cluster munition warhead.<sup>1</sup>

### Al-Abbas

The Al-Abbas is another generation of the Al-Hussein and represents nothing more than an improved or upgraded version. The

## IRAQI SURFACE-TO-SURFACE MISSILE THREAT

additional range of the Al-Abbas enhances its operational flexibility over the Al-Hussein. Like most of the Iraqi missiles, the Al-Abbas has not yet been able to reach its planned range of 900 km.<sup>2</sup>

### *Al-Abid*

The Al-Abid, developed about the same time as the Tammuz 1, was first test-fired in December 1989. According to Iraq, the Al-Abid is a three-stage rocket that weighs 48 tons. A review of video footage indicates that the first stage consists of five clustered motors that appeared to be the Scud B version. The second stage has a single motor design used for first-stage rockets. The third stage specifications are unknown. The Al-Abid can probably reach an altitude of 12,000m, but this is not confirmed at this point.

### *Al-Hijara*

Iraqi President Saddam Hussein announced in October 1990 that he had a new missile called Al-Hijara. Al-Hijara, meaning "stones," was named after the "Children of the Stones" in the Israel uprising.<sup>3</sup>

The Al-Hijara's existence has not been confirmed, nor has Hussein provided any technical information to support its existence.

### *Chinese M-9*

No information is available on the Chinese M-9 except what is in the chart on the preceding page.

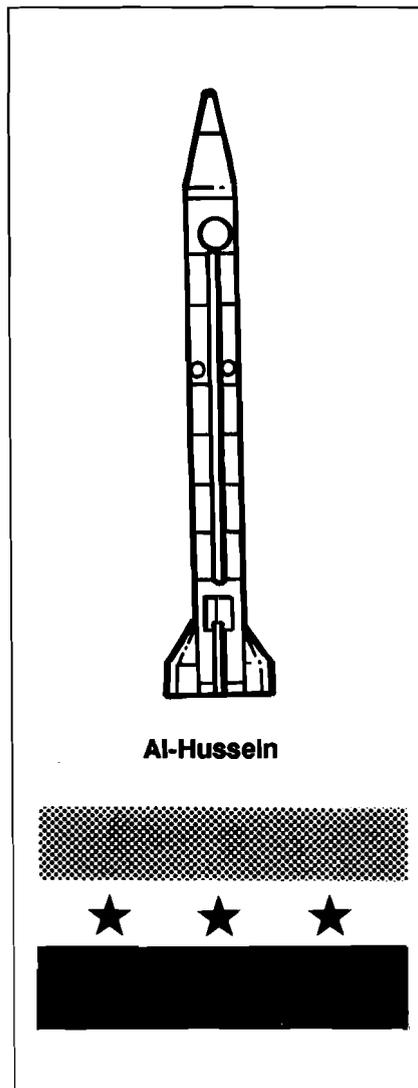
### *Condor-2*

Iraq was trying to build the Condor-2 SSM with the help of Egypt and Argentina, now among the nations aligned against Hussein. The Condor-2 is believed to be used for chemical weapon development, but Iraq now lacks the key components

to complete the project and build an accurate guidance system.<sup>4</sup>

### *Fahd*

The Iraqis are attempting to design a new family of missiles called the Fahd. One of these missiles will have a range of 250 km or more. The other will have a range of at least 500 km. Iraqi intentions are to replace the Al-Hussein missiles with Fahd missiles. Progress on the development of the Fahd is unknown at this time.<sup>1</sup>



**Al-Hussein**

### *Laith (Frog-7)*

Laith is an improved version of the Frog-7, has a range of 90 km and is capable of carrying a cluster munition warhead.

Iraq also possesses the Soviet-manufactured Frog-7, which has an estimated maximum range of 70,000m and an estimated minimum range of 11,500m. The CEP is approximately 380m. The Frog-7, in full configuration, is air transportable by the An-22 Russian cargo aircraft. Since Iraq does not have the An-22, the Frog-7 can be broken down and flown on the Cub and Candid.

### *Tammuz 1*

No unclassified information is available on the Tammuz 1. It is likely that the missile is based on SCUD B technology and may be similar to the Al-Abid (which was unveiled at the same time).<sup>2</sup>

In short, the emergence of Iraqi surface-to-surface missiles is an advanced example of the type of tactical ballistic missile threat emerging throughout the Third World. Operation Desert Shield, as a result, will likely add new impetus to the continuing development of Air Defense Artillery's anti-tactical missile capability.

### **References**

- <sup>1</sup> *Jane's Soviet Intelligence Review*, May 1990
- <sup>2</sup> *Jane's Soviet Intelligence Review*, June 1990
- <sup>3</sup> *El Paso Times*, Oct. 10, 1990
- <sup>4</sup> *Jane's Defense Weekly*, Dec. 23, 1989

This material was compiled by 1st Lt. Mary E. Peterson, Threat Office, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.



## VAPOR TRAILS

### MICOM Supports Desert Shield

Two young engineers from the U.S. Army Missile Command, Redstone Arsenal, Ala., converted the forward area alerting radar to a better transport vehicle for use in Operation Desert Shield.

Danny Price and Steve Drzycimski, both of the Chaparral/FAAR Project Office, spent several days at Fort Hood, Texas, to make FAAR conversions for the 4th Battalion, 5th Air Defense Artillery, currently deployed to Saudi Arabia. FAAR is the short-range air defense, low-altitude early warning system.

"That radar was scheduled for inactivation at the end of FY90. The Desert Shield Operation delayed the inactivation of the radar for these units. In fact, several of them have been or are being deployed to support Desert Shield," Price said.

"The reason we made the conversions was because the existing carrier for the FAAR was the M-561 Gama Goat. The Gama Goat is totally unsupportable from a maintenance standpoint, and commanders didn't feel it was acceptable for the environment it was going to be used in," he said.

The project office had been working for the past year in developing a FAAR carrier conversion program using the two-and-a-half ton truck. The office had been working on this with Lockheed Sanders of Nashua, N.H., as prime contractor. That effort stopped because of the Army's decision to remove the system from the field. "When it was decided to reactivate some of these FAARs, the reason we didn't go to the contractor was because of the shortage of funding and time," Price said.

Working 14-hour days, Price and Drzycimski developed a conversion using an M-35A2 as the radar carrier. They used the best aspects of the contractor's conversion and similar conversions done in the past by soldiers at Fort Lewis, Wash., and Fort Bliss, Texas. The final conversion kit costs about \$1,000. The radar itself is a multimillion-dollar system.

While putting together the first experimental unit, the two engineers faxed a set of instructions to MICOM to get approval on their conversion ideas. Gaylon Branam, chief of the Chaparral/FAAR engineering division, took the engineering information they



**Lockheed-Sanders is mounting FAAR on five-ton trucks for Desert Shield ADA units.**

# VAPOR TRAILS

provided and got approval from the various MICOM organizations including Safety, Missile Logistics Center and Product Assurance.

Plans are to direct the contractor, Lockheed Sanders, to assemble these MICOM conversion kits and provide them, with instructions, to soldiers in the field. "In the future we plan to convert between 50 and 60 systems in various locations, some overseas and some not," Price said. The contract will mount FAAR on five-ton rather than two-and-a-half ton trucks.

Soldiers of the 4-5th ADA assisted in making the initial conversion. Price singled out SSgt. Jessie Santos of that unit as being "especially helpful." Weapons systems that can be used with the radar include Stinger, Vulcan and Chaparral.

Mounting the radar on two-and-a-half ton trucks rather than the old Gama Goats means less breakdowns and easier maintenance due to availability of parts. "The Gama Goat is a woeful carrier for the FAAR. It's had a number of problems in the past; and the two-and-a-half ton truck has proven itself to be a much better carrier," Price said.

"The old vehicles will be sent to the Defense Reutilization Marketing Office as non-usable items. The FAAR was the last tactical piece of equipment using the Gama Goat anyhow," Price remarked. "We've got a Gama Goat 'boneyard' at Toole Army Depot, Utah."

Feedback on the vehicle conversion from soldiers in the field is good. "They feel there is a tremendous mobility improvement, and it reduces their emplacement and march order times — put up and tear down — by five to 10 minutes, which is a significant portion of their allotted time," Price said.

"After we got done, I thought it looked good," Drzycimski said. "The troops were real happy with it and it looked good on the truck, compared with what they had."

"The FAAR's retirement was going to be followed by manual forward observing teams; we were going to replace the radar with a guy with binoculars," said Price. The conversion effort was a very economical effort to assure the ADA units retained early warning capability."

— Skip Vaughn

## Final Training 'On the Hill'

"I guess the fat lady has finally sung," said Brig. Gen. John H. Little, Assistant Commandant, U.S. Army Air Defense Artillery School, as he addressed the cadre of 3rd Battalion, 56th Air Defense Artillery, at Soldier's Hall in the Logan Heights area of Fort Bliss, Texas.

"I was the brigade commander here a little over two years ago when we received word that we were going to stop basic training here," Garner continued. "I told the brigade at that time that we would fight the decision, that it wasn't over until the fat lady sings." Unfortunately, due to budget cuts, Fort Bliss must say goodbye to that traditional aspect of every soldier's beginning.

For a lot of soldiers and others who are familiar with the area, the phrase "on the hill" has always been synonymous with the thought of basic training.

There are not many people who can say they have witnessed a change as great as the one witnessed by loved ones who greet their new soldiers when they return home from basic training. Basic training teaches recruits that, even though their fellow man may be of a different race or background or may have conflicting opinions about protecting their country, they must forget their differences and unite. For the drill sergeants of D/3-56th ADA, the end of basic training means the end of their part of instilling confidence and self-motivation in soldiers. Since basic training will be inactivated many of the basic training drill sergeants will become advanced individual training drill sergeants.

"I would like to stay in basic training," said drill sergeant SSgt. Humberto Rivera. "In advanced individual training, you don't get to spend as much time with the soldiers because they're in school a lot. I love being in the field. I like training soldiers for combat."

"I was hoping this (the closure) wouldn't happen. It doesn't seem real, because this is where I had basic training," said drill sergeant SSgt. Kenneth Weaver. "We're able to take raw recruits off the streets and mold them into soldiers."

"It's hard for 11B (Infantry) drills to be in Air Defense Artillery Advanced Individual Training sometimes," said drill sergeant SSgt. Kyle Johnson. "We're like fish out of water."

# VAPOR TRAILS

The 56th ADA Brigade was activated in 1987 to replace the U.S. Army Training Center. The 2nd and 3rd Battalions were inactivated in September 1990. The 1-56th ADA will be assigned to the 6th ADA Brigade and will continue to teach advanced individual training at Fort Bliss.

— Livian Mack

## Hawks in Ohio

The third of four National Guard fielding sites for the Hawk missile system was dedicated recently in a ceremony in McConnellsville, Ohio, coinciding with the 183rd Ordnance Detachment's 30-year reunion also held in McConnellsville.

"It's one of four National Guard sites that we're going to have," said Carolyn Powers, a program analyst in the Hawk program management office. "The first one was fielded in New Mexico in July 1987, the second in Florida in March 1990 and the third in Ohio in September 1990. The fourth remaining one is scheduled for fielding in South Carolina in FY92."

The National Guard Hawk missile battalion in McConnellsville is the 2nd Battalion, 174th Air Defense Artillery. About 800 members of the Ohio National Guard will work at the 476-acre training site upon its completion in 1993. About 375 full-time members of the National Guard will work 40-hour weeks at the site. The remaining 425 will be assigned to work one weekend per month. The military people will learn to operate and maintain Hawk missiles.

The 183rd Ordnance Detachment was formed in 1959 at Redstone Arsenal. Its mission was to provide direct support for a Hawk missile artillery battalion. After many months of schooling and training, approximately 36 members of the 183rd were ready for assignment. Classified movement orders were issued Aug. 24, 1960, to proceed to Schweinfurt, West Germany. The detachment deployed to Europe that fall, 30 years ago, to support the 3rd Missile Battalion, 7th Artillery. Following the 183rd's deployment, the 3rd Missile Battalion, 7th Artillery, relocated from Fort Bliss, Texas, and established four firing batteries and a headquarters in Schweinfurt. The 183rd and 3rd Missile Battalion became the first Hawk units to be deployed on active duty.

Today Hawk units can be found in countries throughout the world, including a current assignment as part of Operation Desert Shield in Saudi Arabia.

— *The Redstone Rocket*

## SINGGARS

For six weeks last fall, the 31st Air Defense Artillery Brigade, Fort Hood, Texas, filled a critical role in the most recent test of the Single Channel Ground and Airborne Radio System (SINGGARS).

A previous Test and Experimentation Command (TEXCOM) Combined Arms Test Center report describes SINGGARS as a modular-designed, high frequency, frequency modulated (FM) radio system that is electronically tuned and controlled and that operates in the 30-88 megahertz frequency range.

The system provides jam-resistant electronic counter-countermeasures capability by a process commonly referred to as frequency hopping. This allows the radio to automatically change frequencies many times a second in a pseudo-random manner. This system interoperates with the Army's current FM radio but breaks less often.

The Integrated Communications Security (ICOM) radio may be operated while mounted in a vehicle or from a manpack.

Troops from the 31st ADA Brigade replicated division and brigade assets based on adjacent units on the ground, according to Capt. Triest Smart, Site Support Officer.

"We had 40 vehicles assigned to participate in different scenarios," Smart said. "Each vehicle was equipped with three or four radios. The operators didn't do anything with any communications equipment without being told."

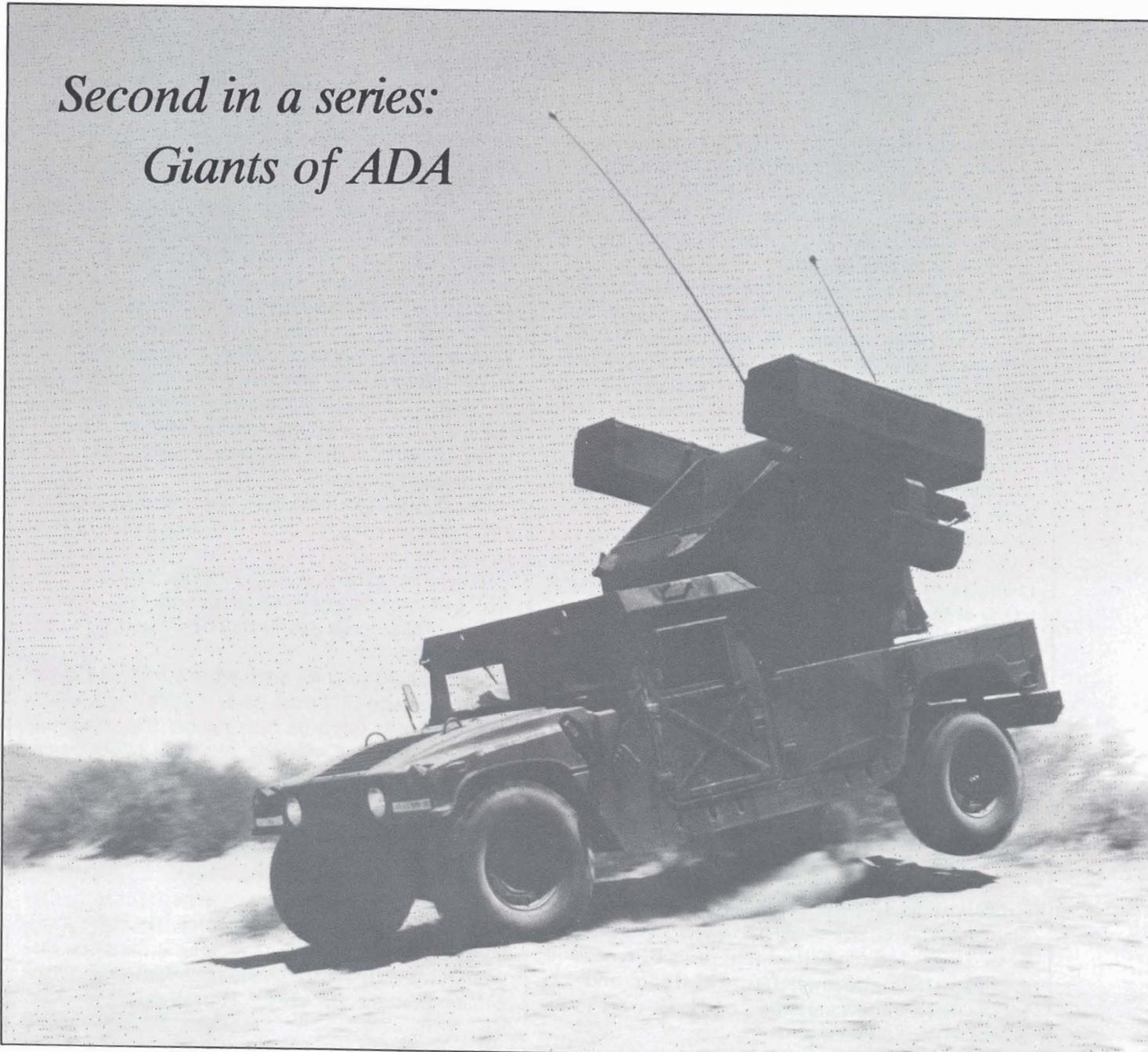
"We controlled all variables: location, power, jamming, what messages were sent, when, at what frequency and so on," according to Capt. William D. Horton III, SINGGARS Test Team.

All messages were artillery data messages since they are most susceptible to interference. No voice transmissions were used. "We're looking at the worst case scenario. Surely if data communications work, voice communications will work," Horton said.

— Mazie D. Leichman

# The Boeing C

*Second in a series:  
Giants of ADA*



# ompany

by David E. Barnes

**T**he Boeing Company, founded in July 1916 in Seattle, Wash., produced many military aircraft and more commercial jetliners in the last 74 years than any other company in the world. However, in the past two decades, Boeing also has become a leader in the missile, rocket, helicopter and space fields.

Boeing's Defense and Space Group handles its missile and space work. The Boeing Aerospace & Electronics Division in Huntsville, Ala., a key participant in this group, builds two air defense systems for

## Avenger On the Fly

An Avenger air defense unit stormed across the desert during recent training exercises by the U.S. Army. Avenger, built by Boeing Aerospace & Electronics in Huntsville, Ala., can fire its Stinger missiles at airborne targets while on the move, as well as at night during inclement weather.

Avenger was the first element of the Army's forward area air defense system to be fielded. Several units of the Avenger system, in full scale production since the first delivery to the U.S. Army Missile Command on Nov. 1, 1988, are currently deployed in Saudi Arabia.

## *A leader in aircraft production for 74 years, Boeing helps set the pace in the missile, rocket, helicopter and space fields*

the U.S. Army Missile Command (MICOM) forward area air defense (FAAD) program — the Avenger and the non-line-of-sight (NLOS).

The Avenger carries eight Stinger missiles in two pods ready for rapid firing from a turret. The missiles and pods are mounted on the Army's high mobility multipurpose wheeled vehicle (HMMWV). The other FAAD system, NLOS, is also mounted on the HMMWV and can shoot down enemy helicopters or destroy tanks and other armored vehicles with command and control accomplished via a fiber-optic cable to the missile. The NLOS is currently in development by Boeing in Huntsville with team member Hughes Aircraft in Tucson, Ariz. These pieces of high-tech hardware are the modern branches in the family tree of air defense systems development initiated by Boeing and others.

How did Boeing get into the business of surface-to-air missiles? During World War II, determined enemy aviators destroyed thousands of Boeing-built B-17s in the skies over Europe. In turn, thousands of enemy aviators were shot down by a combination of aerial and ground-based guns. After the war, a group of engineers at Boeing embarked on a company-funded effort to develop

a small, pilotless airplane that could accomplish what the hordes of piloted ME-109s and FW-190s did in combat over Europe. The project was called Ground-to-Air Pilotless Aircraft (GAPA). Several test flights of GAPA provided Boeing with enough information to prove the feasibility of the concept. By the mid-1950s, Boeing had enlisted the help of the University of Michigan's Air Research Center to start the design of a tactical pilotless aircraft designed to destroy massed aircraft raids — the same type of raids that were so devastating to Germany and Japan during WWII.

The result was BOMARC, now an acronym for Boeing Michigan Air Research Center. At one time BOMARC referred to a pilotless airplane that featured a revolutionary propulsion system. It launched vertically using either a liquid or solid fuel rocket to accelerate to a speed where two large supersonic ramjets took over the propulsion chores. BOMARC carried a sophisticated flight control and autopilot system and, in the nose, behind a sharply pointed radome, a large "target seeker" radar. In its initial configuration, BOMARC had a liquid-fueled booster that used highly corrosive oxidizers. It soon became apparent that the logistics of handl-

ing the oxidizer would cause serious problems for any tactical deployment, and a B model was developed, which used a solid rocket for boost. The resulting Interceptor Missile (IM)-99B also had an improved target seeker that permitted BOMARC to lock onto targets at extended ranges and to reject most of the primitive electronic countermeasures (ECMs) of the time.

BOMARC was designed to be tied in to the semi-automatic ground environment (SAGE) network, which would cover the nation's borders with a radar shield and be able to direct BOMARC squadrons toward incoming raids while they were still far offshore. Each individual BOMARC would live in its own shelter mounted on a launcher. Upon activation, the shelter roof would split in the middle and the two sides would slide open. The launcher would rise, the missile would be run through a series of readiness tests, the starting sequence for the ramjets would be initiated and the booster fired. BOMARC would climb to extremely high altitudes and, with its advanced engines, fly at very high speeds. At the time, it was the fastest, highest flying airplane in the world. From this lofty vantage point, the target seeker would point in the direction of the incoming raid, and the antenna, in a rectangular scan pattern, would begin its target search. Upon detection, the antenna would stop and the target seeker would take over missile guidance and direct the missile to intercept. BOMARC used a warhead designed to inflict fatal damage on more than one plane in a formation.

In preparation for full scale production of BOMARC, Boeing leased an automobile manufacturing facility near its main operations in Seattle. It was known as the Missile Production Center building and was readied for a long production

run. Early in the production program, it became obvious that massed air raids, particularly those having to cross vast oceans to get to the United States, were neither practical nor necessary. The age of the intercontinental ballistic missile was dawning. BOMARC installations were completed along the East coast and Canadian border before the program was phased out.

In the early 70s, the Army established a requirement for a short-range air defense system to cover the gaps in the overall air defense umbrella. Hawk was already fielded and what was then SAM-D (now Patriot) was in development.

As part of the "two-way street" policy within NATO, the Army looked at existing offshore systems to see if they could meet the requirement and identified three potential candidates: identified: the British Aerospace Rapier, the Thomson CSF Crotale and the MBB Aerospatiale Roland. In each case, an American firm acquired licenses to market the system in this country. Hughes Aircraft Company and Boeing teamed up to represent the Roland system.

Roland, a self-contained air defense system, was mounted on a German tracked vehicle in Germany and on a French vehicle in France. In each case, the system had been integrated into the vehicle by either MBB or Aerospatiale. The three foreign systems were transported to White Sands Missile Range, N.M., for testing. Both Rapier and Crotale required more than one vehicle to make up a system. Roland possessed an inherent advantage in mobility since no interconnection between vehicles was required. After field tests at White Sands, the Army finalized a request for proposal (RFP) for a SHORAD system and selected the Roland.

Roland represented a new challenge for Boeing. Early on, the company decided to modularize the

weapon rather than integrate it into a vehicle as was done in Europe. In this way, it would have the capability of being carried on a variety of vehicles. Then the job of technology transfer began. Taking literally thousands of drawings — some in French, some in German — Boeing converted them to acceptable Army format. In the end, it was necessary for Boeing to visit the manufacturer's facilities in France and Germany to talk with the engineers until, finally, all the data was obtained. Once again, Boeing obtained an existing facility in Seattle. Known as the Thompson site, it was configured to produce Roland.

In its original proposal, Boeing depicted Roland mounted on a

## **Avenger: Flexible, Mobile Lethality**

The U.S. Army's Avenger air defense system carries eight missiles in two pods ready for rapid firing from its gyro-stabilized, 360-degree rotatable turret (or pedestal). Below the right-hand missile launcher is an M-3P .50-caliber machine gun that covers the Stinger missiles' dead zone.

The Avenger can be operated by remote control with the unit that is carried in the cab on the HMMWV, or high-mobility multi-purpose wheeled vehicle. It can be operated from either the passenger or driver's side of the vehicle and is easily removed to operate the fire unit remotely, up to 50 meters away from the HMMWV.

The unit controls are redundant with those in the turret, where the gunner normally is stationed for the widest field of view. The remote control unit also can be used when the turret is removed from the HMMWV. The turret can be mounted on a variety of other vehicles.

large, articulated wheeled vehicle called the Goer. Such a mounting would have resulted in the most economical solution for the RFP stated mobility requirements. However, Roland on Goer just didn't look like an Army weapon system. Boeing decided to modify the M-109 Howitzer chassis and install the modular fire unit on it. This was the configuration that was put into low rate production.

Roland carried a total of 10 missiles: two on launch arms at the ready position and an additional eight in two magazines directly below the launch arms. When a missile was fired, the launch arm would drop the empty container just as the magazine door opened. The open-

ing door would hit the falling container and push it over the side of the vehicle. The launch arm would then dip into the magazine, grasp a new missile and return to the ready position. Each magazine rotated 90 degrees each time a missile was extracted, bringing the next missile into position — like having two five-shot revolvers mounted on an M-109. Roland, with both an acquisition and a tracking radar, also sported an optical sight the gunner could use if his other sensors were down. The system had the capability of changing from radar to optical guidance (or vice versa) while the missile was in flight. The missile itself had a command-to-line-of-sight guidance system. The fire unit

tracked small infrared flares at the aft end of the missile, compared these to the track line to the target and sent corrections to the missile to maintain its intercept trajectory. The fire unit was operated by a three-man crew: a driver, gunner and commander.

After 27 fire units were built, the program was terminated and the existing assets were assigned to the New Mexico National Guard. The fire units remained in New Mexico until 1988 when they were decommissioned. While working on Roland, Boeing undertook an internal research and development task, which entailed mounting a Stinger missile on one of Roland's launch arms, using Roland's acquisition



and track radars to point Stinger and assessing the difference in acquisition range between the dismounted and mounted Stinger. It soon became evident that a Stinger accurately pointed at a target could acquire that target before the human eye could see it. With this concept proven, Boeing obtained an early version of the HMMWV, designed a lightweight turret that would fit on the back and mounted two Stinger missile pods on the turret's launch arms. They called it Avenger and took it to Fort Lewis, Wash., where the Army Development and Employment Agency was charged with looking at or developing new and innovative techniques, tactics and equipment for light divisions. Avenger proved a rousing success with the troops. They contributed valuable comments on elements they thought Boeing should change, substantiated things they

thought Boeing did right and helped immensely in refining the man-machine interface.

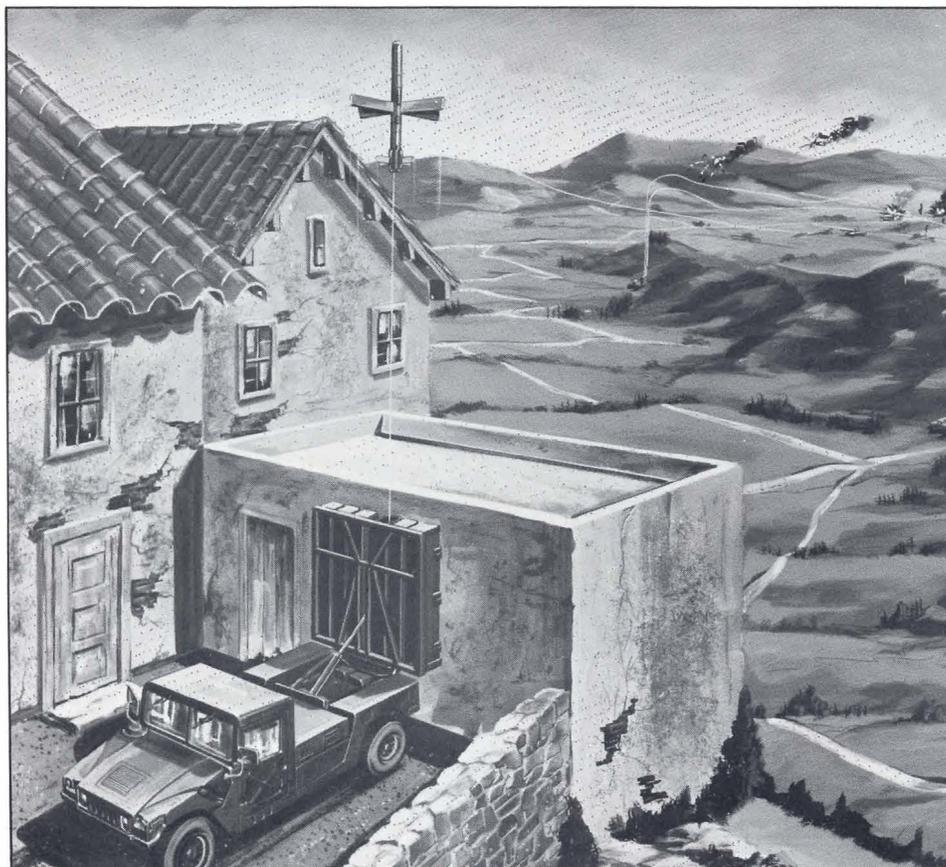
The Army, now recognizing the merits of a pedestal-mounted Stinger, issued an RFP. In the RFP, they asked for a non-developmental item; that is, they did not want to pay for development. In effect, if you had a pedestal-mounted Stinger and wanted to bring it to White Sands Missile Range to let the Army test it, they'd be happy to have you. Boeing responded to the RFP with Avenger as did LTV with a system called Crossbow. The primary difference between Avenger and Crossbow was the position of the gunner.

The Avenger gunner sits in the turret and is always looking directly at what the turret is pointing at. With Crossbow, the gunner sat in the HMMWV cab and looked only at his forward-looking infrared

screen. A third contractor showed up with a hastily assembled fire unit, but was excused from the competition when compliance with weight requirements could not be demonstrated.

In August 1987, Boeing was awarded a production contract for Avenger. Fourteen months later, the Army received its first two Avengers. These units, along with additional production units that followed, participated in a highly successful test and evaluation program. Currently, Avenger is in full scale production and has been fielded with the 3rd Armored Cavalry Regiment, Fort Bliss, Texas, and the 4-5th Air Defense Artillery Battalion, 1st Cavalry Division, Fort Hood, Texas. (Both are now deployed with Operation Desert Shield.)

Following in the footsteps of this proud tradition will be the next



state-of-the-art air defense weapon — NLOS. Once again, the Boeing/Hughes teams have joined to develop an extremely versatile missile system. The first captive flight occurred fourth quarter 1990 with first live launch scheduled in early 1991.

NLOS is based upon pioneering work done by the Army's Missile Research, Development and Engineering Center at Redstone Arsenal, Ala. In the early 80s, RDEC, led by its current director, Dr. William McCorkle, proved that two-way, broad-band communications over an optical fiber was possible, even when one end of the fiber was moving rapidly through the air. In an effort called FOG-D for Fiber Optic Guidance-Demonstration, RDEC flew a small model aircraft with an optical fiber bobbin attached to a wingtip. At modest speeds the flight proved that it was

possible to "pay out" fiber from the bobbin without breaking it.

FOG-D progressed into FOG-M, an RDEC-designed proof of principle missile tested extensively during the mid- to late 80s on MICOM test ranges. FOG-M conclusively demonstrated that it was possible to transmit video from a seeker in the nose of the missile down to a ground station at the same time guidance commands were being sent back up the fiber to control the missile.

After the demise of the Sergeant York air defense gun, the Secretary of Defense viewed an RDEC video that gave the TV camera view of a FOG-M acquiring, tracking and impacting a droned Huey in flight on a MICOM range. Shortly thereafter, the Army selected FOG-M technology as the preferred solution for the non-line-of-sight element of the FAAD system.

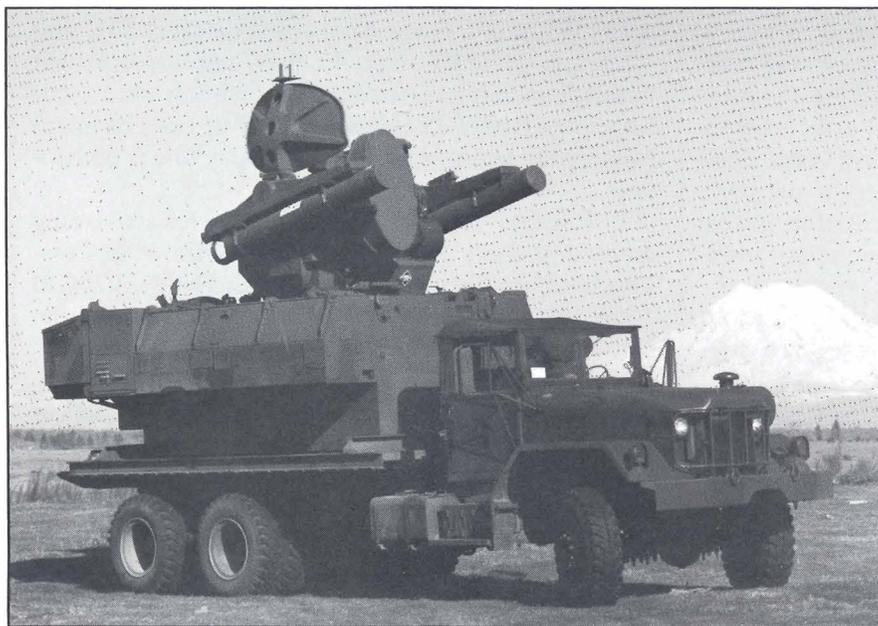
While RDEC explored the FOG technology, personnel in the Boeing Huntsville office initiated independent research and development efforts to better understand this new technology. When it became apparent that the Army would proceed with a major program based upon FOG technology, Boeing stepped up its technology and marketing efforts. The Army acquisition strategy imposed a requirement that no single contractor would be permitted to bid on the new program. Boeing set out to identify a partner and, after "interviewing" potential team members, confirmed what they had suspected from the beginning — Hughes offered the best "fit" with Boeing.

In December 1988, the Boeing/Hughes team won a full-scale development contract for NLOS. The Army, Boeing and Hughes refer to their program as NLOS rather than FOG-M since the NLOS will be a fully qualified, militarized, hardened, MANPRINTed tactical system with all the attendant logistics tail. FOG-M was a brilliant development of technology but was never designed to be a tactical system.

Although NLOS funding has been cancelled, U.S. Army Air Defense Artillery School leaders contend that the requirement for NLOS remains. The system may yet become a part of the nation's air defense arsenal.

It is no happenstance that Boeing has had a presence in Huntsville for many years. By collocating with the Army Missile Command, the Army Strategic Defense Organization and the NASA Marshall Space Flight Center in Huntsville, Boeing has gained substantial insight into the technology required for success in highly competitive arenas.

**David E. Barnes**, vice-president of defense systems at Boeing's Defense & Space Group in Huntsville, Ala., manages all Huntsville-based military programs.

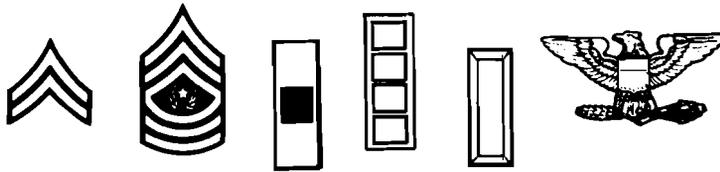


### NLOS Live Launch

NLOS fiber-optic guided missile technology gives a safely-hidden gunner missile flight control and a real-time view of the battlefield, allowing engagement of hidden helicopters and ground targets.

### Roland System

The Roland (above), a completely self-contained, all-weather, radar-directed system, provides short-range air defense against high-performance aircraft attacking at low levels.



## CAREER NEWS

*Editor's Note: Assignment personnel in the Air Defense Artillery Branch's Enlisted Personnel Management Directorate contributed this issue's articles.*

### Stop Loss Program Clarified

The most controversial personnel issue created by Operation Desert Shield is the suspension of active component voluntary separation of officers and enlisted personnel — the "Stop Loss" program. On Sept. 1, 1990, the Secretary of the Army suspended the laws that pertain to separation and retirement for the duration of the current call-up (up to 180 days). The Stop Loss program suspends Army service members essential to the continued maintenance of readiness in deploying units and the remainder of the force by retaining service members with critical skills in both the active and reserve components. Stop Loss does not affect all soldiers initially; however, the program may be expanded or limited as the situation in the Middle East develops. It does allow for compassionate exceptions.

For the active component, the program basically states voluntary separations and releases are suspended for all personnel who —

- Are (or about to be) engaged in operations in or around the Arabian Peninsula;
- Are (or about to be) engaged in direct support of operations in or around the Arabian Peninsula;
- Possess critical skills associated with operations in or around the Arabian Peninsula; or
- Possess skills in short supply.

Stop Loss further states that all enlistments, extensions (except those to receive medical care), periods of obligated service and other periods of active duty (except active duty for training) for all ADA CMF 14 (ADA Operations) personnel assigned or attached to the units stated above are extended until further notice.

This applies only to soldiers with an ETS of Sept.

1, 1990, or later who are eligible to reenlist according to AR 601-280. Soldiers ineligible to reenlist will be separated at their ETS. Soldiers cannot be extended and may not reenlist if they exceed the retention control point for their grade or, if promotable, the next higher grade. Transition leaves approved prior to Aug. 28, 1990, for personnel whose ETS is on or before Nov. 30, 1990, remain valid. These soldiers will be separated at their ETS. Transition leave will not be approved for soldiers on or after Aug. 28, 1990, regardless of ETS date.

Soldiers should initiate SIDPERS transactions and a DA Form 2-1 entry denoting a delayed ETS and retention on active duty. Enlisted personnel caught in this involuntary extension are encouraged to reenlist immediately. They are entitled to cash payment for accrued leave providing the 60-day rule is not violated.

PERSCOM has established a hotline for active duty enlisted soldiers having questions about Stop Loss. The lines are open Monday through Friday, 0700 to 1700 EST. Recorded messages can be left anytime. The number is 703-325-0928 (AV 221).

Volunteers for Desert Shield are also an issue. Active duty soldiers may contact the ADA Branch at 703-325-8052 (AV 221). Retirees should call the Army Reserve Personnel Center (ARPERCEN) toll free at 1-800-325-2660. Individual Ready Reservists should contact their ADA career manager at ARPERCEN (1-800-325-4730). AGR soldiers can contact the Full Time Management Support Center at 314-263-9545.

As always, the ADA Branch, Enlisted Personnel Management Directorate, stands ready to assist our soldiers with any problems or questions they may have. Feel free to call anytime to discuss your professional development, next assignment or any air defense issue at (703) 325-8052 (AV 221).

— Capt. Kent E. Friederich

# CAREER NEWS

## Civilian Education

Civilian education and promotion cuts two ways. Nearly all CMF 14 NCOs have some level of college work; consequently, college work is not as big a discriminator as some may think. Many NCOs have two-year degrees, some have four-year degrees and a few even have master's degrees. The catch is that most NCOs who have completed undergraduate and graduate degrees have only limited time in leadership positions, on primary staff or duty overseas. They have normally served repetitive tours at Fort Bliss in instructor or technical positions.

The message from board members is clear: civilian education is a discriminator among quality files only when performance, demonstrated leadership capability and promotion potential are equal. These factors are the keys to success — make sure these three areas are solid before seeking to improve yourself with civilian education. Don't strive to achieve civilian education goals and let your job performance suffer.

— Capt. Kent E. Friederich

## Sergeant and Staff Sergeant Promotions

The ADA Branch, Enlisted Personnel Management Directorate, receives numerous phone calls from commanders at all levels who are extremely concerned when they experience a shortage of sergeants and staff sergeants. Commanders must understand that DA does not promote to 100 percent of authorizations in these grades, and habitual shortages occur everywhere except in priority installations and units, which are always filled to their required level. The remaining soldiers are then equally distributed to the remaining organizations.

Commanders can alleviate some of their own problems by maintaining a healthy inventory on their sergeant and staff sergeant promotion lists. Many times certain MOSs are not promoted to their authorized percentages because the promotion list is exhausted before the percentage is attained.

Ensuring promotion boards are routinely convened and healthy promotion lists are maintained is a necessity. Both our soldiers and our organizations reap the benefits of a well-planned and maintained promotion program.

— Capt. Kent E. Friederich

## Military Education

Many soldiers still believe they can get promoted without military education. Promotion boards in the past, when certain levels of military education were not a requirement, say otherwise. Virtually all NCOs promoted during the last year have already met the requirements of today: the Primary Leadership Development Course for sergeant, the Basic NCO Course for sergeant first class and the Advanced NCO Course for master sergeant. The so-called "grandfather clauses" have all expired, and no one will be promoted without fulfilling the school requirements.

The message is simple. The road to promotion goes directly through the NCO Education System. Don't delay military schooling — you could be delaying your next promotion.

— Capt. Kent E. Friederich

## 1990 Master Sergeant Selection Review

With the newly released master sergeant list, the board released an overall assessment of CMFs 14 and 23 (ADA System Maintenance).

Generally, CMF 14 is very healthy with files reflecting highly qualified, competent NCOs. Secondary zone soldiers markedly stood out when compared with the primary zone. Many soldiers had completed a tour as a drill sergeant, recruiter, or service school/NCOES instructor. The records were normally well maintained and indicated the NCOs are following normal career progression with alternating CONUS and OCONUS assignments. The average CMF 14 NCO was highly technically qualified with superior performance indicated in several leadership positions.

The panel identified sergeants first class for promotion to master sergeant who were first considered fully qualified. The best qualified of those fully qualified NCOs were then selected for promotion according to the Army's needs.

The average fully qualified soldier's file reflected an NCO of impeccable moral and ethical standards, a hard worker with some civilian education beyond high school and an NCO who has pursued the tough jobs and spent the majority of time in troop units. Very few had served in first sergeant or master sergeant leadership positions, and most had solid careers with no record of recent disciplinary action. Second-

# CAREER NEWS

ary zone soldiers had a higher civilian education level and fewer minor disciplinary infractions.

Generally, physical fitness levels were good across the board. There were very few cases of eligible NCOs who were overweight or who had failed the Army Physical Fitness Test; however, a number of CMF 14 and 23 soldiers looked overweight in their photos, and some had photos that were old or outdated. The board generally viewed the absence of an updated photo in the file as a lack of concern by the individual NCO. Failure to take a physical fitness test in the current grade, recurring weight problems, or a photo in which the candidate looked overweight often resulted in an adverse recommendation by board members.

Military and civilian education levels had marked improvement over last year. Many soldiers in both primary and secondary zones had a high school degree to 12 semester hours of college credit. A qualified NCO's college credits were seen as a positive discriminator.

Most CMF 14 and 23 NCOs had served in leadership positions; there were only a few indications that some soldiers were not seeking jobs with troops. Repetitive assignments in the schoolhouse, recruiting, equal opportunity and reenlistments placed a candidate at risk with his contemporaries. Also, a few space-imbalanced MOS (16T and 24T) soldiers in CONUS were often assigned outside their MOS. Overall, the leadership capability is very strong.

As the Army looks to reduce the force in the future, it becomes even more critical that all personnel double their efforts to verify that their files are current, sanitized and have current, quality up-to-date photos on file.

— SFC Cribb

## Appealing an Evaluation Report

When an evaluation report is forwarded and accepted for inclusion in a soldier's official military personnel file (OMPF), it is presumed to be administratively correct, prepared by the proper rating officials and representative of an objective judgment and considered opinion of the rated soldier. The appeal system exists to protect the interests of the Army and ensure fairness to the soldier whenever administrative errors occur or the soldier's potential and manner in

which he or she has performed his or her duties is inaccurate. At the same time, it avoids casting doubt on the integrity and judgment of the rating officials unless sufficient cause exists.

If you disagree with an evaluation report and can support a valid appeal with legitimate and substantiating evidence, read Chapter 4, AR 623-205, in its entirety. A complete understanding of the appeals system will save you time, effort and, of course, the anxiety created by having your appeal returned without action.

Submit your appeal in a timely manner, as preparation of a successful appeal packet becomes increasingly difficult as time passes. A complete appeal packet is a must — it will not be forwarded or considered unless you enclose all supporting documentation.

— SFC Cribb

## Professional Development

An ADA career advisor's role is two-fold: not only is he responsible for the professional development of each ADA NCO, he is also responsible for managing these NCOs' careers as well as numerous other duties that affect the total force.

For instance, career advisors nominate NCOs for duty as recruiters, drill sergeants, observer-controllers and other special management assignments. They act as consultants to the civilian assignment manager and are instrumental in the final preparation of each and every NCO assignment.

Career advisors contribute to the professional development of their NCOs by ensuring they receive varied assignments and increased responsibility. They identify NCOs who require special training for their next assignment (such as the Observer-Controllers Course and the First Sergeants Course) and ensure the NCOs receive that training, usually on a TDY en route basis.

A career advisor establishes an accurate picture of an NCO's qualifications and career progression in two ways: the Enlisted Master File (EMF) and the Career Management Information File (CMIF). If the NCO's CMIF contains DA Forms 2A and 2-1, a Personnel Qualification Record (PQR), an updated official photo and correct copies of the most current DA Form 2166-7, *NCO Evaluation Report*, the advisor can ob-

# CAREER NEWS

tain a true assessment of the NCO's career. As a result, the NCO will be more competitive for nominative assignments or school selections.

Each and every ADA soldier must make sure the information on his PQR is correct during the annual records update conducted by local Personnel Service Centers. Although career management is the responsibility of the career advisors at PERSCOM, career development begins with the individual soldier.

ADA NCOs who have questions about how their career advisors can help them with their next assignment may call 703-325-8052/8053 (AV 221) or write Commander, PERSCOM, ATTN: TAPC-EPK-A, 2461 Eisenhower Avenue, Alexandria, VA 22331-0452.

— SFC Furman

## Drill Sergeant Duty

CMF 14 and 23 soldiers may not be aware that budget cuts and closings of some basic training installations have reduced drill sergeant authorizations. Air Defense Artillery now has only 28 drill sergeant authorizations (18 in CMF 14 and 10 in CMF 23), making the selection process very tough. The ADA Branch nominates only the most qualified soldiers for this duty. Nominated soldiers' records are turned over to the Drill Sergeant Branch for a review of the Career Management Information File and Enlisted Master File. After a thorough investigation, those soldiers with the best records are selected for Drill Sergeant School. Upon successful completion of the school, the soldiers are assigned to drill sergeant duty at Fort Bliss, Texas.

Soldiers volunteering for drill sergeant duty must submit their packets, according to AR 614-200 (paragraph 8-17), to the Drill Sergeant Branch at PERSCOM. PERSCOM reviews the packets to make certain that the soldier qualifies for a drill sergeant position. If the soldier qualifies, the Drill Sergeant Branch contacts the ADA Branch to find out if the soldier can be released for drill sergeant duty.

The ADA Branch tries to give all soldiers the opportunity to enhance their careers; therefore, we ask that qualified soldiers do not re-submit after successfully serving one tour on status.

— SSgt.(P) Lewis

## Pinpoint Assignments

When soldiers are considered for CONUS assignments, the Career Branch assigns them to the installations that are short or are projected to have the lowest assigned strength by MOS. The installation G-1/AG assigns soldiers to specific units on that installation.

The Career Branch issues pinpoint assignments only under specific situations. These include assignments for soldiers enrolled in either the Exceptional Family Member Program or the Married Army Couples Program. Master sergeants, promotable sergeants first class and the major command NCO of the Year also receive pinpoint assignments to the overseas gaining unit at the time of levy notification. These specific assignments require extensive coordination and are extremely limited.

In summary, the next time you call the career branch and request your ultimate assignment overseas, think about whether or not you fall into one of the above categories. If not, contact your local levy section first and request a query of 1st Personnel Command to find out where your assignment will take you.

— SSgt.(P) Lewis

## CMIF Update

A soldier's assignment manager and professional development NCO use the Career Management Individual File (CMIF) as a tool for assignment and career development consideration.

The Career Branch initiates the CMIF upon a soldier's promotion to staff sergeant. The assignment manager requests copies of DA Forms 2A and 2-1 — the nucleus of the CMIF — from the soldier. The CMIF grows through accumulation of assignment and career development transactions, correspondence to and from the soldier and documentation detailing the abilities and performance of periods of service by the soldier.

Soldiers can guarantee that the most accurate data represents their desires by forwarding copies of their DA Forms 2A and 2-1 at least every other year. Updating these forms will ensure that the most current data represents each soldier and greatly assists in matching the desires of the soldier with the needs of the Army.

# Stinger couts

*Becoming the hunter, not  
the hunted*

*by 1st Lt. Garland M. Frost*



**W**hy the *defense* in Air Defense Artillery?

Today, the U.S. Army Air Defense Artillery School is working to insert more aggressive roles for air defense units into ADA doctrine — an overdue change, and one that every air defender should welcome. As an ADA platoon leader, I have long wondered why air defense uses the Stinger, the most versatile antiaircraft weapon in the world, strictly as a defensive weapon. Ours is the Army's only combat branch whose sole mission is a defensive one. History has shown time and again that almost any defense, regardless of size and strength, is subject to defeat.

To assume solely a defensive posture is to concede losses. In every conflict since World War II, the United States has enjoyed air superiority. This has lured us into a false sense of confidence and has allowed our air defense doctrine to remain relatively unchanged over the years. With the advent of modern ADA weapon systems we now have the capability to conduct offensive operations. We must take the lessons learned in Afghanistan and integrate them into our doctrine. Like the *Mujahideen* Stinger gunners, we may now also be the hunter instead of the hunted.

The term *offensive operations* does not mean attaching a Stinger.

team to an infantry platoon or a Vulcan squad to an armor unit. This type of employment lacks positive command and control, allows for virtually no resupply of Class V, little early warning, poor fields of fire and, most likely, no mutual support. What is meant by an *offensive operation* is the use of good intelligence preparation of the battlefield, command and control and mobility to actively seek out and engage hostile aircraft before they can pose a threat to friendly units — employing flak traps, landing zone denials and air defense assets with scout units as the rule instead of the exception.

Stinger, no matter how it is employed, cannot perform the role envisioned for the ADA components of the forward area air defense (FAAD) system. However, recent funding decisions have delayed the

projected fielding of ADATS, the FAAD system's line-of-sight forward (heavy) component until 1966, and who knows what further delays the FAAD system might encounter. It is not necessary to wait for the deployment of advanced air defense or for the publication of ADA doctrinal revisions to conduct offensive operations.

Stinger is ideally suited to offensive missions. Offensive operations can be conducted with the present Vulcan/Stinger (V/S) battery with only minor changes to the modified table of organization and equipment (MTO&E). Each V/S battery would be reorganized with a two-section Stinger platoon (the Stinger Scout platoon), whose primary mission would be to conduct offensive operations. The remaining Stinger teams would be permanently at-

tached to the battery's three Vulcan platoons. The permanently attached Stinger teams would substantially increase that platoon's firepower, much like the strike platoon concept employed today at Fort Campbell, Ky. The benefits of having a Vulcan platoon habitually training with the same Stinger section and actually being a part of the same platoon will greatly enhance that platoon's combat effectiveness.

An added advantage of a separate Stinger Scout platoon would be the positive command and control provided by actually having a platoon leader commanding in the field. One problem with a typical MTO&E Stinger section is that, in the field, the platoon leader is the liaison officer in the brigade or battalion tactical operations center (TOC). That Stinger platoon leader cannot effectively command and control his platoon from a brigade TOC. Effective command and control of the platoon is more important than his presence in the TOC as the air defense advisor. He can always return to the TOC or use radio communication when needed.

Presently, Stinger sections in the field are led by section sergeants acting as both platoon leader and platoon sergeant. One staff sergeant has to resupply his section, maintain command and control, design defenses and advise supported units. The other alternative often used is to attach a section to a Vulcan platoon. The problem with this is that the section and platoon most likely have not trained together as a unit, yet they are expected to fight together and be effective. This system is simply not the most efficient use of the weapon.

With the Stinger Scout platoon, the platoon leader would have only two sections and, therefore, be able to maintain better command and control. His experience and expertise could be better used. The Stinger Scout platoon would be able to



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**Stinger Scouts on the offensive would be able to use organic HMMWVs.**

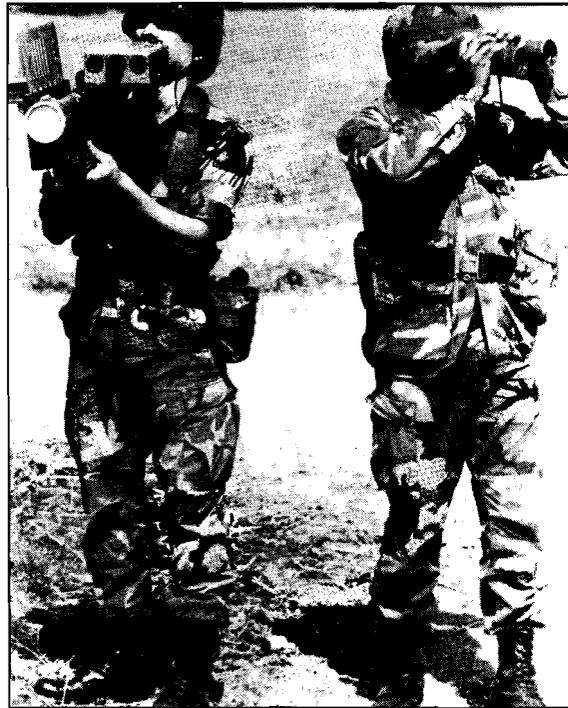
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train together in garrison and execute offensive missions together in the field. Stinger Scout offensive operations include scout missions, air ambushes, landing zone denials and Stinger insertions.

*Scout missions.* Placing Stinger teams with scout platoons has proven extremely effective in exercises at the National Training Center, Fort Irwin, Calif. However, the problems that have arisen include the resupply of Stingers, little early warning and the lack of experience in scout tactics. A Stinger Scout platoon would train specifically in scouting tactics and be better suited for this type of mission than the typical MTO&E Stinger platoon. The platoon should be employed one terrain feature behind the infantry or armor scouts. This would provide needed security and better fields of fire. The Stinger Scouts would use their own vehicles, allowing them to carry more weapon rounds and enhancing command and control by the Stinger platoon leader. The added mobility would enable them to deploy quickly in an overwatch position or along air avenues of approach to conduct air ambushes.

Another advantage of having Stingers on the forward edge of the battle area is their ability to engage enemy sorties before they threaten forward friendly units. Stinger Scouts will be able to degrade the enemy's intelligence gathering capabilities and the effectiveness of its aerial forward observers by destroying their observation aircraft.

An additional benefit of having Stinger Scout platoons deployed forward is their ability to report intelligence. ADA units typically have more communication assets than other units and would be able to use this equipment effectively. They could assist the forward-deployed scout platoon in information gathering and reporting. And the early warning they could provide would be of great significance.



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***Stinger Scouts could engage enemy aircraft before they threatened our forward deployed maneuver units.***

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*Air ambush.* The air ambush, or flak trap, is not a new concept, but employment is usually the exception instead of the rule. A great deal of coordination, timing and practice is necessary to effectively execute an air ambush. An operation of this type would require the ADA assets to be deployed rapidly. The typical ADA unit usually has its assets in direct support of other units. Using a supported unit's ADA assets to conduct air ambushes renders that unit vulnerable to an air strike. Using Stinger Scout platoons would not decrease the supported unit's air defense coverage. A Stinger Scout platoon would also continually train in air ambush operations and be better prepared to conduct an air ambush than a typical Stinger platoon.

If conducted correctly, the air ambush would allow the air defender to use the element of surprise. A sound tactical emplacement of the Stinger teams would allow all the aircraft to be engaged and destroyed while in the kill zone, without exposing the gunner's position.

The Stinger Scout platoon would also be able to provide early warning to friendly units should an enemy aircraft escape the ambush.

*Landing zone denials.* Landing zone denials have proven effective on numerous exercises, especially Team Spirit '89. Again, the problem of leaving the supported unit without air defense while conducting the landing zone denial must be addressed. Using the Stinger Scout platoon for landing zone denials would free the other ADA platoons to provide air defense for their supported units. The Stinger Scout platoon, using high mobility multipurpose wheeled vehicles, would be more mobile and could be deployed more rapidly.

*Stinger insertions.* The Stinger insertion is somewhat daring and unconventional; however, it may be the most effective of the offensive operations if executed properly. For example, during the recent Falklands War, the British Navy sustained substantial losses due to the Argentine air force's long-range, air-to-surface missiles. The

Argentine air force used the Exocet missile to engage and destroy the British Fleet's ships from 150 miles away. The British Navy, unable to defend itself against the air strikes, was forced to move its fleet farther away from the island to stay beyond the Exocet's strike distance. As a result, reinforcement and resupply of forces ashore suffered. The lesson learned: a relatively small air force can have devastating effects on a world power's military logistics and support system.

The British logistic support was greatly slowed and their ability to use close air support was hindered, all as a result of their inability to provide adequate air defense. Their weapon systems simply did not have the range to cover areas of operations because they were employed according to traditional air defense doctrine.

Remember, the British have the Blowpipe weapon system, similar to our Redeye. One of the best ways to defend the fleet would have been to engage the Argentine aircraft while they were most vulnerable and unable to release ordnance: during takeoffs and landings. A possible solution would have been to insert a highly trained Blowpipe (or Stinger) section close to the enemy air bases. They could have engaged the aircraft before they became a threat.

This same type of insertion should be incorporated into our air defense doctrine. Because the Stinger round leaves little signature and has passive homing, the section could engage and destroy the enemy aircraft and remain undetected. Insertion operations would require Stinger sections highly trained in insertion and survival tactics (not a typical Stinger section). The success of these operations would depend on a separate, specifically tailored Stinger platoon. Just one such mission, successfully conducted, could have long-lasting ef-

fects. The threat of continued insertion missions may cause the enemy to rethink when and how they fly. The enemy might also divert additional assets to patrol and secure their air bases. Successfully disrupting the enemy's air doctrine and base security may, in fact, be of more benefit than the actual destruction of their aircraft.

The best way to ensure that these Stinger Scout platoons are well trained and able to conduct these offensive missions is to implement a Stinger Scout course. Obviously, in this time of defense spending cutbacks, the idea of starting a new school may not be popular. But the benefits of this training would far outweigh the cost.

Armor conducts a Scout course and Infantry has the Pathfinder and Ranger courses. I propose that Air Defense Artillery begin a course encompassing those tactics combined with the Stinger offensive tactics. The graduates of this course, officer and enlisted, would be qualified for duty in the Stinger Scout platoon.

The Stinger Scout course should run approximately two weeks. Fort Bliss would be an ideal place for this course. The post's training areas offer a realistic environment to practice all four types of Stinger Scout missions. Elements of the 3rd Armored Cavalry Regiment would constitute an outstanding opposing force, and would also benefit considerably from the training opportunity.

To be effective, the course should consist primarily of hands-on training. The course should emphasize weapon system knowledge combined with daily moving target simulator training. Much time should be spent studying Stinger Scout tactics, as well as actually conducting these missions on numerous field training exercises. Graduates of this course would be trained well enough to join their units and actually conduct offensive

## New ADA Doctrine Reflects Offensive Spirit

New air defense doctrine being prepared at the U.S. Army Air Defense Artillery School will place ADA units on the offensive, according to doctrinal literature writers in the school's Combined Arms and Tactics Department (CATD) doctrinal writers.

The soon-to-be-published FM 44-77, for example, addresses the employment of Stinger teams in flak traps and landing zone denials.

"The latest ADA doctrine being written right now reflects an offensive spirit," said CATD Director Col. E. Paul Semmens. "The current emphasis is on synchronization to achieve mass at the critical time and place, a return to the combat-proven, aggressive tactics antiaircraft artillery units used during World War II."

Stinger missions in their new scout platoons.

The need for Air Defense Artillery in an offensive role has been demonstrated in exercises and actual combat. We have the weaponry and the trained soldiers to conduct the offensive operations. The question still remains, "Why the *defense* in Air Defense Artillery?" Can we, as air defenders, afford to sit back and wait for the enemy to inflict casualties on our supported units before we react? The Stinger Scout platoon would provide us with the means to take the fight to the enemy — to be the hunter instead of the hunted.

1st Lt. Garland M. Frost, a former Vulcan and Stinger platoon leader, is the executive officer of A Company, 1st Battalion, 28th Infantry Regiment, Jackson, S.C.



*Soldiers have completed months of field exercises with Martin Marietta's ADATS.*

# ADATS Back on Track

**C**ongress has approved interim funding for Martin Marietta's Air Defense/Antitank System (ADATS), the line-of-sight forward (heavy) component of the forward area air defense system, to give the manufacturer a chance to correct reliability problems before the Army makes a final procurement decision.

The reliability problems surfaced during operational tests in which ADATS compiled an excellent record for live-fire accuracy against fixed- and rotary-wing aircraft, but

suffered frequent breakdowns. Army leaders are confident Martin Marietta will solve reliability problems that have been described as "mostly chassis" rather than target acquisition, tracking and firing problems.

In August 1990, the Army Systems Acquisition Review Council approved a plan to delay ADATS production to give Martin Marietta time to correct the system's reliability problems. The plan will set back ADATS fielding from late 1993 to early 1996.

In July 1990, the ADATS restructured program was approved by the House Armed Services Committee but rejected by the Senate Armed Services Committee. However, funding for the program was restored in September when the House and Senate met in conference to approve a final 1991 defense authorization bill.

The Army plans to spend approximately \$6 billion to purchase 378 ADATS.

"It was laser beam rider technology that sold the Army on

ADATS," said Maj. Gen. Donald M. Lionetti, chief of Air Defense Artillery. "Operational and evaluation tests demonstrated the technology works. ADATS kills stand-off attack helicopters operating in clutter, something no other candidate could accomplish.

"I'm convinced Martin Marietta can fix the reliability problems," he continued. "The reliability problems are serious, but not unusual. They are the type of problems you would expect with a new, complex weapon system.

"We will not field the system unless we are absolutely convinced the reliability problems have been corrected," he continued. "I'm confident the problems will be solved and that the Army will get a weapon fully capable of performing its forward area air defense mission.

"Weapons such as the Abrams tank, Bradley Fighting Vehicle and the Apache helicopter all suffered reliability problems during their development," he added. "Thankfully, these systems continued in development and today represent the bulwark of a modernized combined arms team facing the threat of war in the Middle East."

The poor reliability performance of ADATS has done little to dampen the enthusiasm of air defense leaders for the system that has met or exceeded test criteria in all other categories.

Test data collected, reduced and evaluated by independent sources and certified by the U.S. Operational Test and Evaluation Agency (OTEA) showed that ADATS, despite its reliability problems, was able to detect and engage fixed- and rotary-wing aircraft attacking the maneuver force and kill them at levels exceeding test requirements. ADATS decisively defeated Hind surrogates in testing at Fort Hunter-Liggett, Calif. Moreover, it defeated the Hind follow-on, the Havoc, at operational

ranges beyond the Havoc's ability to kill the ground force.

Part of the secret to ADATS' success is passive tracking and high-velocity missiles. A pilot receives two types of radar warnings. The first is that an acquisition radar is in the area; since acquisition radars will be present in most tactical environments, the pilot takes no evasive action. The second is that a tracking radar is locked on his aircraft; the pilot at this time takes immediate evasive action. However, ADATS does not have a tracking radar. Once targets are acquired, ADATS tracks the aircraft through passive optics. Threat pilots are not alerted that ADATS is about to launch a missile against their aircraft. The speed of the ADATS missile precludes evasive action on the part of helicopters once the missile is fired.

To perform their mission, pilots must bring their aircraft into sight of the maneuvering force and ADATS. Of course, they will do what they can to stay alive, even if it means hiding behind terrain. Helicopters hiding behind terrain cannot engage enemy forces and are vulnerable to the non-line-of-sight (NLOS) component of the FAAD system. Together, ADATS and NLOS deny the rotary-wing threat an offensive capability against the maneuver force.

ADATS has dispelled doubts about its ability to kill threat aircraft in adverse weather conditions. The system's ability to kill threat aircraft in bad weather and through battlefield obscurants was demonstrated repeatedly in tests that showed ADATS is effective under more severe conditions than the minimal conditions required for helicopters to attack ground forces. The ADATS was evaluated in cloud, fog, smoke, dust and other battlefield obscurant environments.

ADATS tests were also conducted in Saudi Arabia during August 1986. Although a single envi-

ronmental incident, a sandstorm of such severity that no aircraft could have operated, delayed testing for two hours, ADATS proved its ability to successfully engage drones and a tank in the same harsh environment that faces Operation Desert Shield air defenders today. The Saudis, who already possess an air defense system to defend fixed sites, are considered a potential market for ADATS once a U.S. procurement is made.

Despite ADATS' strong overall showing, the United States will not commit to production beyond the eight systems procured for test and evaluation purposes until the reliability and maintainability problems have been corrected. The total cost of the ADATS program is \$6.1 billion, including fire units, missiles, spares and program management. Martin Marietta will fix ADATS at its own expense.

"The first priority, by far, of the Army and of Air Defense Artillery," said Lionetti, "is to get the best system for the soldier. The entire LOS-F-H program has been committed to that goal. The candidate evaluation was designed to select the best system available in the world. Subsequent testing was designed to find and fix any and all problems with the selected candidate. The program to date has demonstrated the Army's commitment to ensure that soldiers have a capable and reliable system."

Meanwhile, ADA units will likely continue plugging the forward area air defense gap with "home cooked" variations of Stinger Under Armor alternatives that push Stinger teams into the forward battle area. The U.S. Army Air Defense Artillery School, Fort Bliss, Texas, expects to soon effect an improved MANPADS Under Armor concept as a sensible interim solution while awaiting the fielding of ADATS, our objective LOS-F-H system.



## ADA FORUM

Air Defense Artillery units deployed to Saudi Arabia for Operation Desert Shield are being widely praised for their professional competence, high state of morale, and their ability to adapt to a challenging environment.

An indirect compliment to an ADA unit, of course, is an indirect compliment not only to the ADA non-commissioned officers responsible for the high state of readiness ADA units are exhibiting in Saudi Arabia but to the Noncommissioned Officer Education System (NCOES) which, today, is producing the very best noncommissioned officers the Army's ever possessed.

The Army, following Operation Desert Shield and conventional force reductions in Europe, will be a smaller Army, but an Army no less dedicated to the education of its noncommissioned officers.

This determination was expressed during a U.S. Army Sergeants Major Course graduation address by Army Chief of Staff, General Carl E. Vuono, when he assured Class 35 graduates that despite looming fiscal reductions and restraints, NCO education and professional development will receive his full and unyielding support.

Vuono further charged Sergeant Major of the Army Julius C. Gates with the responsibility to maintain professionally designed and developed, battle-focused, performance-oriented noncommissioned officer developmental courses that will ensure commanders at all levels a tactically and technically proficient Noncommissioned Officer Corps.

The U.S. Army Sergeants Major Academy, of course, will continue to play a leading role in Army leader training and development. According to SGMs Dan Murphy and Bill Smolak of the Academy's Di-

rectorate of Training and Doctrine, the academy, with its predominant role in the NCOES and supporting functional courses, began this decade with a review, refocus and revitalization of all the courses taught not only at USASMA, Fort Bliss, Texas, training facilities, but at PLDC, BNCO, and ANCO training sites throughout the total force.

### New Battle Staff Course

Responding to a recommendation by the 1989 Noncommissioned Officer Leader Development Task Force Action Plan, USASMA's Directorate of Training and Doctrine conducted an in-depth analysis of the feasibility of combining the Operations and Intelligence Noncommissioned Officer Course with the Personnel and Logistics Course, said Murphy.

The result of these efforts, he explained, is a functional course designed to improve the interaction of battle staff elements. It emphasizes integration of staff functions in com-

mand posts through performance-oriented, train-as-you-fight, fast-paced training.

The academy's new course is targeted to G1/S1, G2/S2, G3/S3, and G4/S4 staff noncommissioned officers assigned to TO&E battalion, brigade, division, and corps level units, and readiness group noncommissioned officer advisors, which comprise some 6,000 duty positions throughout the Army.

One week of distributive training material, done at home station, will precede the resident training session. The course has the potential to train 1,120 noncommissioned officers annually.

Sequential lessons, driven by a European event list scenario, will culminate with a command post exer-



# ADA FORUM

cise. The envisioned six-week scenario will take the task force organization from Peace in Week 1; through Week 2, Alert; Week 3, Increased Tensions; Week 4, Terrorism; Week 5, Border Violations; and Week 6, Reactions, through an integrated staff command post exercise.

Collective tasks from ARTEP 7-20, 71-2, and 71-3 MTPs will emphasize battle-focused staff noncommissioned officer collective and individual tasks through both manual and automated involvement.

State-of-the-art automation used throughout the course will include the Maneuver Control System; the Brigade/Battalion Simulation; standard office desktop computers; the Joint Interoperability Tactical System (JINTACCS)/U.S. Message Text Format/JINTACCS Automated Message Preparation System; as well as reinforcement training in radio telephone operations, radio net control procedures, communications security, electronic countermeasure, and meaconing-intrusion-jamming-interference reporting.

Battle Staff NCO Course (BSNCOC) students will be evaluated throughout the course in both an individual and in a collective training environment using a GO/NO GO checklist.

"This will be a "do" course and will require students to produce studies, information briefs, and miscellaneous reports, as well as face evaluation for their part in team efforts," said Smolak. "Successful completion of all phases and requirements of the CPX will represent 20 percent of the course academic requirement."

He added that faculty members will facilitate after action reviews at the end of each shift throughout the period of the CPX, providing immediate feedback as to success and shortfalls.

The Sergeants Major Academy has scheduled the pilot course for 14 January 1991, and the first class for 1 April 1991. There will be only four BSNCOC classes in FY91.

## Student Allocations

Student allocations for BSNCOC will be processed via the Army Training Requirements System. Operations and Intelligence, and Personnel and Logistics Course graduates can fill battle staff positions, and are eligible to attend the new Battle Staff NCO Course.

Pursuant to the provisions of AR 600-200 and AR 611-201, commanders may award the ASI "2S" to soldiers who successfully graduate from the Battle Staff NCO Course.

## The Road to Promotion

The Battle Staff NCO Course is just one example of how the NCOES is constantly being revamped and fine-tuned to give our noncommissioned officers the knowledge and skills they need to perform at top potential. NCOES will play an even more important role in career development in the smaller, more professional Army that will emerge from the post-Cold War drawdown than it does today.

On page 35 of the "Career News" section of this issue of ADA magazine, Capt. Kent Friederich of the ADA Enlisted Personnel Management Directorate, PERSCOM, points out that soldiers who still believe they can get promoted without military education are misinformed. "The so-called 'grandfather' clauses have all expired, and no one will be promoted without fulfilling the school requirements," Friederich writes. "The message is simple. The road to promotion goes directly through the NCO education system. Don't delay military schooling — you could be delaying your next promotion."

Continuing education for Desert Shield is, of course, deferred until the Gulf Crisis is resolved, but our soldiers serving in the Saudi Arabian desert who were scheduled to attend NCOES courses will be re-scheduled for the next available class upon their return. Meanwhile, they have the opportunity to prove themselves, hone their NCO leadership skills and earn promotion points in a crisis situation. For soldiers who were not aboard the airlifts bound for Saudi Arabia, Operation Desert Shield is a reminder that the scenarios we study in NCOES classrooms can quickly become real-life situations.

— CSM Robert W. Harman  
U.S. Army Air Defense Artillery School

# P-STAR

*Army set to field interim replacement for Air Defense Artillery's forward area alerting radar*

**T**he Army has chosen a portable search and target acquisition radar (P-STAR) as the forward area air defense (FAAD) light and special division interim sensor and will begin replacing ADA's forward area alerting radars (FAARs) with the new radar this summer. Some units may begin receiving the new radars even earlier. Fielding priority will go to ADA units deployed or alerted to deploy

for Operation Desert Shield.

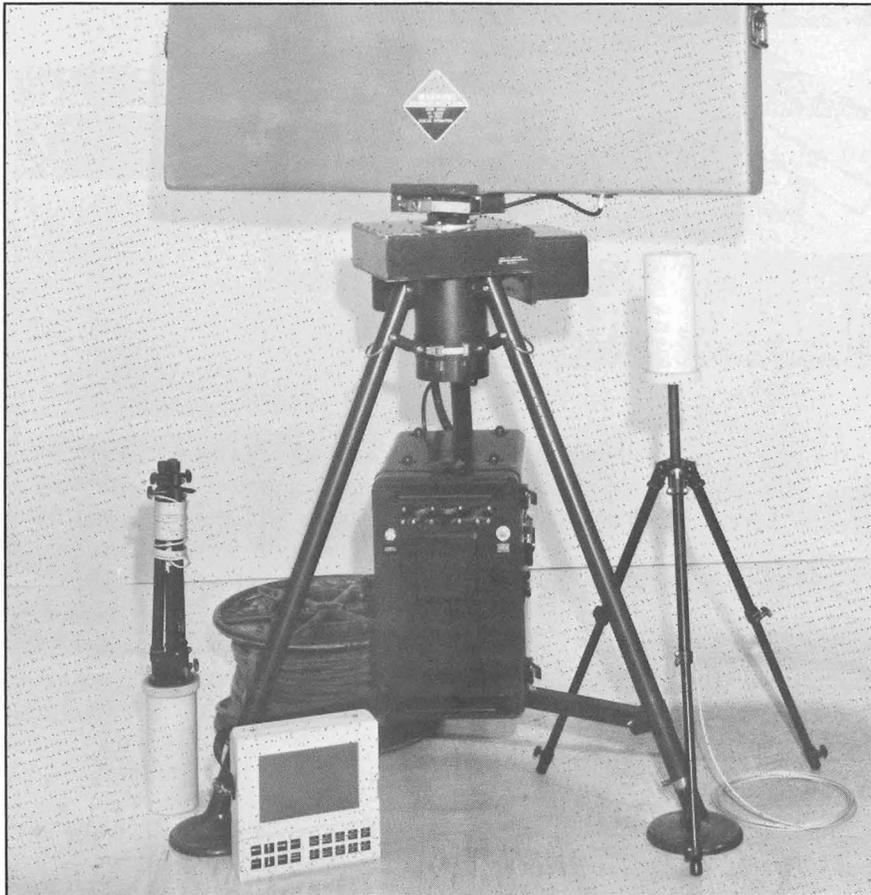
Manufactured by Lockheed-Sanders Inc., P-STAR is a low-cost, lightweight, state-of-the-art radar designed to provide effective air defense warning for light infantry forces in low- and mid-intensity conflicts. Weighing about 300 pounds, the three-piece unit is man-portable and simple to set up and operate. P-STAR has exceptional "sub-clutter visibility," permitting

early detection of low-flying fixed- and rotary-wing aircraft.

The pulse doppler radar can detect helicopters based on the unique signature of their rotor blade returns. The unit can identify both friendly and hostile aircraft with the radar's identification friend or foe (IFF) interrogation system. Rapid weapons alerting improves firing unit reaction time and shifts the battle initiative to the air defender.



**The Army has selected Lockheed-Sanders' P-STAR as the interim replacement for FAAR.**



**Center is the P-STAR's main antenna. The control indicator unit, bottom left, is sunlight-readable and backlit for night operations. At right and left are two stationary, omni-directional sidelobe canceller antennas for electronic counter-countermeasures.**

Other features include electronic counter-countermeasures, performance enhancers and a capability to directly interface with a command and control network. The unit can be delivered by parachute and move in and out of battle positions quickly.

Competition is underway to select a candidate for the FAAD ground-based sensor, the "objective" replacement for the interim P-STAR system.

ADA units had been instructed to turn in their FAARs for storage effective Sept. 30, 1990; however, the Department of the Army subsequently directed ADA units alerted for Operation Desert Shield deploy-

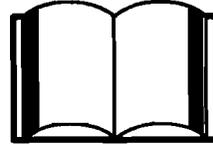
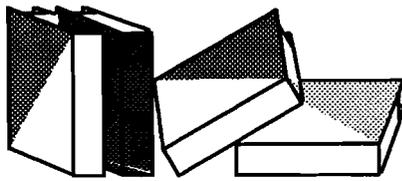
ment to retain their FAARs, and the veteran system is in operation in Saudi Arabia today.

While there is no dedicated maintainer MOS for the interim sensor, FAAR operators will retain their military occupational specialty (MOS 16J) and operate P-STAR once it is fielded. FAAR operators in units that turned in their FAARs are currently performing manual early warning duties while awaiting P-STAR fielding.

"The P-STAR is an excellent interim replacement system that's going to make life a lot easier for our former FAAR operators," said Maj. Gen. Donald M. Lionetti, chief of Air Defense Artillery. "It can be set up in 10 minutes and march-ordered in one minute. We get a highly capable, technologically superior, air-droppable system that's much easier to operate."

## P-STAR Features

|                              |                                                                                                                                                                                                                         |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency</b>             | L Band                                                                                                                                                                                                                  |
| <b>Range</b>                 | 20 km (1m2, sw1)<br>(12.4 mi)                                                                                                                                                                                           |
| <b>Altitude</b>              | 0-3,000m (0-10,000 ft)                                                                                                                                                                                                  |
| <b>Transmitter</b>           | <ul style="list-style-type: none"> <li>- 1,000w peak, 50w average</li> <li>- Block stagger, dual PRF</li> <li>- 19 Channels</li> </ul>                                                                                  |
| <b>ECCM</b>                  | <ul style="list-style-type: none"> <li>- Two side-lobe cancellers</li> <li>- Clear channel search</li> <li>- Frequency agility</li> <li>- Sector blank</li> <li>- Strobe on jam</li> </ul>                              |
| <b>Target ID</b>             | Integral IFF antenna                                                                                                                                                                                                    |
| <b>Target classification</b> | Fixed- or rotary-wing                                                                                                                                                                                                   |
| <b>Antenna</b>               | <ul style="list-style-type: none"> <li>- Antenna pattern:               <ul style="list-style-type: none"> <li>· -5 to +30 degrees nominal</li> <li>· Entire pattern adjustable -5 to +5 degrees</li> </ul> </li> </ul> |
| <b>Accuracy</b>              | <ul style="list-style-type: none"> <li>- Azimuth +3 degrees RMS</li> <li>- Range +/-300 meters RMS</li> </ul>                                                                                                           |
| <b>Subclutter visibility</b> | 60 dB                                                                                                                                                                                                                   |
| <b>Rotation speed</b>        | 10 rpm (60 degrees/second)                                                                                                                                                                                              |
| <b>Data link</b>             | Integral network<br>C2I data link                                                                                                                                                                                       |
| <b>Operator display</b>      | <ul style="list-style-type: none"> <li>- Sunlight readable</li> <li>- Remotable 100m (328 ft)</li> </ul>                                                                                                                |
| <b>Transportability</b>      | Vehicle or man-portable                                                                                                                                                                                                 |
| <b>Wind speed</b>            | <ul style="list-style-type: none"> <li>- Steady 88.5 km/hr (55 mph)</li> <li>- Gusts 113 km/hr (70 mph)</li> </ul>                                                                                                      |
| <b>Maintenance</b>           | <ul style="list-style-type: none"> <li>- Built-in test</li> <li>- 15-min MTTR</li> <li>- Greater than 1,000 hrs MTBF</li> </ul>                                                                                         |



## ADA LIBRARY

**Other Losses: An Investigation into the Mass Deaths of German Prisoners at the Hands of the French and Americans After World War II** by James Bacque. 248 pages. Stoddart Publishing Co. Ltd, Toronto, Canada, 1989. \$26.95.

Many documented war crimes were committed by Germany, Japan and the Soviet Union during World War II, but are other nations guilty as well? What about Great Britain, France and the United States?

*Other Losses* presents a compelling argument that the U.S. and French armies in Western Europe were directly responsible for the deaths of almost one million German prisoners (military and civilian) between June 1944 and January 1946. The title of the book comes from the bland heading used in U.S. Army reports to account for the deaths of these prisoners.

Bacque, assisted by senior U.S. Army historian Col. E.F. Fisher, discusses the number of German prisoners captured by the Allied armies after the Normandy invasion and the appalling conditions, even after Germany surrendered, under which these captives were interred in the American and French POW camps.

Some so-called camps, nothing more than open fields surrounded by barbed wire, had no shelter from the elements — no tentage, no blankets and certainly no buildings. Many of these enclosures were extremely overcrowded and lacked food, water, sanitation facilities and adequate medical care.

POWs dug holes for shelter from the wind and the cold, and some prisoners reportedly drowned in them because they were too weak from starvation and disease to climb out.

The author attributes the unacceptable treatment received by German captives — clear violations of the Geneva Convention — to a secret policy decision by Gen. Dwight D. Eisenhower, Supreme Allied Commander. Bacque further alleges that Eisenhower and

selected immediate subordinates engaged in a cover-up by falsifying some official records while destroying others, using press censorship and denying visits by the Red Cross and other humanitarian organizations.

The Canadian author also contrasts the deplorable lack of care provided by American and French forces with the humane treatment extended by the British and Canadians.

If this story of gross dereliction is to be believed, facts are required.

With 248 pages of facts, acknowledgments and appendices, Bacque has thoroughly researched his work. Over 30 pages of footnotes reference official government documents, published memoirs, diaries, letters, personal remembrances and interviews with numerous eyewitnesses. He seems to have collected many pieces of a story that few knew existed. When assembled, these pieces form a damning exposé of one of America's greatest heroes — Dwight D. Eisenhower. So much data cannot be lightly dismissed.

Bacque presents his case in a logical order and writes in an organized manner; he makes his final conclusion understandable and convincing.

This book is thought-provoking yet disturbing. The facts presented are chilling, and the allegations call into question the image America has of itself. The book is not enjoyable from the point of view of reinforcing one's self-image, but it is worth reading. *Other Losses* is recommended for students of military history and those who believe "it can't happen here."

— Maj. Donald Croom, USMC

**America's Tenth Legion; X Corps In Korea, 1950** by Shelby L. Stanton. 335 pages. Presidio Press, Novato, CA. 1989. \$24.95.

While telling a gripping tale of the operations of the U.S. X Corps at the outset of the Korean War, *Amer-*

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*ca's Tenth Legion* falls short of what it promises. In the foreword, Shelby L. Stanton expresses his intent to give detailed insights into corps-level operations, commanders' leadership abilities on these operations and the Army's attitudes toward racial segregation.

Instead of the promised treatment, the reader will find a simple narrative account of the actions of X Corps from August to December 1950. Even this effort is lacking. Stanton's often bombastic style detracts from the seriousness of his subject matter. ("Higher placed officers were not so intimidated, but they knew Almond's instructions carried the weight of MacArthurian directives.") In recounting numerous instances of gallantry during the X Corps' campaigns, he focuses exclusively on the acts of officers; nothing is written about enlisted men. A paucity of maps (seven in all, most drawn by the author) makes it difficult for a reader unfamiliar with the campaign to follow the action.

Corps-level operations, ostensibly the theme of the book, are narrated but never analyzed. Stanton tells about logistical operations but fails to analyze the staff work that made them possible.

Perhaps the greatest shortcoming of the book is Stanton's failure to come to grips with the leadership deficiencies of the X Corps commander, Maj. Gen. Edward A. Almond. At first, Stanton seems intent on lionizing Almond by comparisons with Stonewall Jackson. He then goes on to detail numerous examples of Almond's lack of leadership ability and outright bigotry — but without comment. He finally makes a feeble, unsuccessful attempt to tie up all of the loose ends in the final chapter. While admitting in the end that Almond's prejudices resulted in poor command, Stanton tries to soft-pedal Almond's responsibility by blaming the Army. ("The main culprit in this case was actually the United States Army. Almond was simply a product of Virginia at the turn of the century, and cannot be chastised for a lack of modern sensitivity toward human equality.")

In spite of its deficiencies, *America's Tenth Legion* illustrates several lessons relevant to today's focus on contingency operations. The first is that a technologically inferior enemy can compensate through numerical superiority and the domination of key terrain. Readers will also gain insight into the dangers inherent

in employing non-linear tactics against a numerically superior enemy. Most important, contingency theaters are generally multi-service operations and thus require a high degree of cooperation. The accounts of the problems resulting from Almond's lack of leadership ability make the book worth reading.

— Maj. Joseph Paugh

**The Bridge at Dong-Ha** by John Grider Miller, 186 pages. Naval Institute Press, Annapolis, MD, 1989. \$16.95.

Usually the publisher's promotional copy tends to oversell the contents. Not so with *The Bridge at Dong-Ha*. Most readers will find themselves so engrossed that, by the time they get to the epilogue, they won't be able to help but swallow a lump in their throats.

Not only is Miller's conversational style easy to digest, but the person he writes about is someone readers will be eager to know better with each page turned.

*The Bridge at Dong-Ha* is the true story of U.S. Marine Corps Capt. John Ripley who, during the 1972 North Vietnamese offensive, almost singlehandedly destroyed a strategic bridge in Quang-Tri province. Ripley's courageous efforts materially contributed to the defeat of the offensive by buying time for American and South Vietnamese forces. His actions earned him a richly-deserved Navy Cross.

Miller's story was written with the cooperation of Ripley, a Marine still on active duty. This collaboration is evident throughout the book as the reader is continually made aware of Ripley's most personal hopes, fears and triumphs on that 1972 spring day when a single bridge was essentially all that stood between a massive North Vietnamese force and control of the critical province of Quang-Tri.

As the story unfolds, readers become intimately familiar with the overwhelming odds that Ripley faced and the genuinely courageous actions he took to accomplish his mission.

Enemy forces were poised at one end of the bridge — ready to come across at any minute — yet Ripley pushed on, surviving on what seemed like pure adrenaline. He sustained some three hours of direct hostile fire to plant explosives underneath the structure.

## ADA LIBRARY

Readers experience exhilarating highs and frustrating lows as Ripley's harrowing ordeal takes unexpected twists and turns. This is truly a story of action above and beyond the call of duty.

*The Bridge at Dong-Ha* portrays Ripley as the quintessential warrior hero, making him seem almost larger than life. But the reader, having been given a chance to see Ripley's human side, knows that the spirit Ripley displayed at Dong-Ha is within us all — if only we dig deep enough to find it.

Ripley embodied what all military officers should strive for — commitment and selfless dedication to duty. For this reason, *The Bridge at Dong-Ha* stands out as a must-read book and a valuable addition to any professional library.

— Maj. Cole H. Effert, USAF

**Soviet Air Defense Missiles: Design, Development and Tactics** by Steven J. Zalogda, Jane's Information Group Ltd., Alexandria, VA, 1989. \$50.00.

Steven Zalogda has gathered an excellent collection of what alone would have been mere bits of trivia, and put them together to create a history of the Soviet air defense forces, with an emphasis on the role missiles have played in that service.

According to Zalogda, the PVO-Strany has had its share of disasters, successes, good intentions and poor planning. All of these have led to the modern-day air defense force that guards the Soviet skies.

Since the PVO has had a great deal to do with the air defense technologies available to the Soviet Union, the author includes chapters on each of the missile systems that the air defense forces fields and also includes information on particle beam and anti-ballistic missile research, gun systems with the field armies and a short organizational history of the PVO-Strany.

*Soviet Air Defense Missiles* is one of the few thoroughly researched and unbiased books on the Soviet air defense forces. Most books on the subject usually include it as a section on Soviet missiles, lumping surface-to-surface, surface-to-air and anti-tank missiles together. Weapon capabilities are off-handedly dismissed as inferior to Western systems, and rarely is

mention made of Soviet successes or advances in SAM technology. Zalogda changes that in his book.

Zalogda mentions defects that some of the Soviet systems possess, but puts the technology used in the context of when the weapon system was designed. He also points out that, although Soviet SAMs may not always have the same capabilities of their Western counterparts, they are always more cost effective. This is why most Third World countries opt for Soviet air defense systems over American or European.

The author also points out that despite the low publicity given to Soviet SAMs (as opposed to shipments of small arms or aircraft), Soviet SAMs have seen more combat than all other competitors put together. This includes the SA-2 "Guideline," which has been fired more times in anger than any other SAM in the world, except perhaps Stinger and the SA-7.

Zalogda's inclusion of the combat use of each weapon is an excellent method of gauging the effectiveness of Soviet SAMs, particularly when Soviet anti-aircraft tactics are stressed. A single Soviet missile system on its own might not be entirely effective, but the Soviets are not about to leave a single system out by itself; they complement it with other systems. The PVO-Strany stresses the same elements U.S. Army ADA does, and integration is an element they use very well.

Mass is another tenet Soviet air defense forces practice. Zalogda points out that the reason for the proliferation of so many SAMs is the Soviet attempt to protect each echelon of their forces, from the platoon to the front, with its own air defense system. Incidentally, this also helps with integration.

Soviet experiences with electronic warfare have had a significant impact on Soviet air defense, resulting in the introduction of weapon systems with many redundant targeting systems as well as ways to better interlock existing systems.

Officers concerned with air defense would do well to read *Soviet Air Defense Missiles*. Technology or style notwithstanding, it is air defense, something Soviets have spent much of their resources and time on. It would be a shame for the professional soldier not to benefit from the Soviets' successes and failures when they might someday be very relevant to his job.

— 2nd Lt. James D. Crabtree



Your ADA Association supports our ADA soldiers taking part in Operation Desert Storm. I know I speak for you all when I say how proud we are of their performance.

Association revenues are up. We continue to add new members and chapters, the newest of which is the Fort Hood Chapter. Our chapters are constantly growing and adding new programs. We've put more than \$42,000 into awards programs and plan to increase this effort. Our 1991 budget of \$129,326 will provide continued growth and services.

Effective Jan. 1, 1991, corporate membership rates changed from \$500 lifetime memberships to \$100 annual memberships. Lifetime memberships already purchased will, of course, remain in effect. The new rate will encourage more corporations to join and, in the long run, will increase revenues.

CWO 4 (Ret.) Sam Pignatella, our new membership chairman, is designing a program to increase membership and services across the board. Our 1991 goals are to increase all types of membership and completely establish of our Best Soldier, Best Battery and Top Gunner Awards.

First to Fire!

V. J. Tedesco Jr.  
COL, AD  
Executive Director,  
ADA Association

# ANNOUNCING

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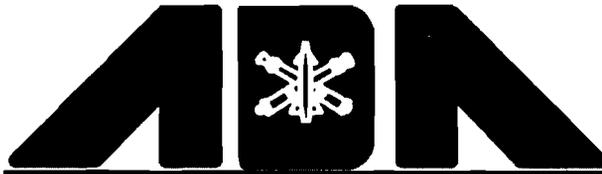
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