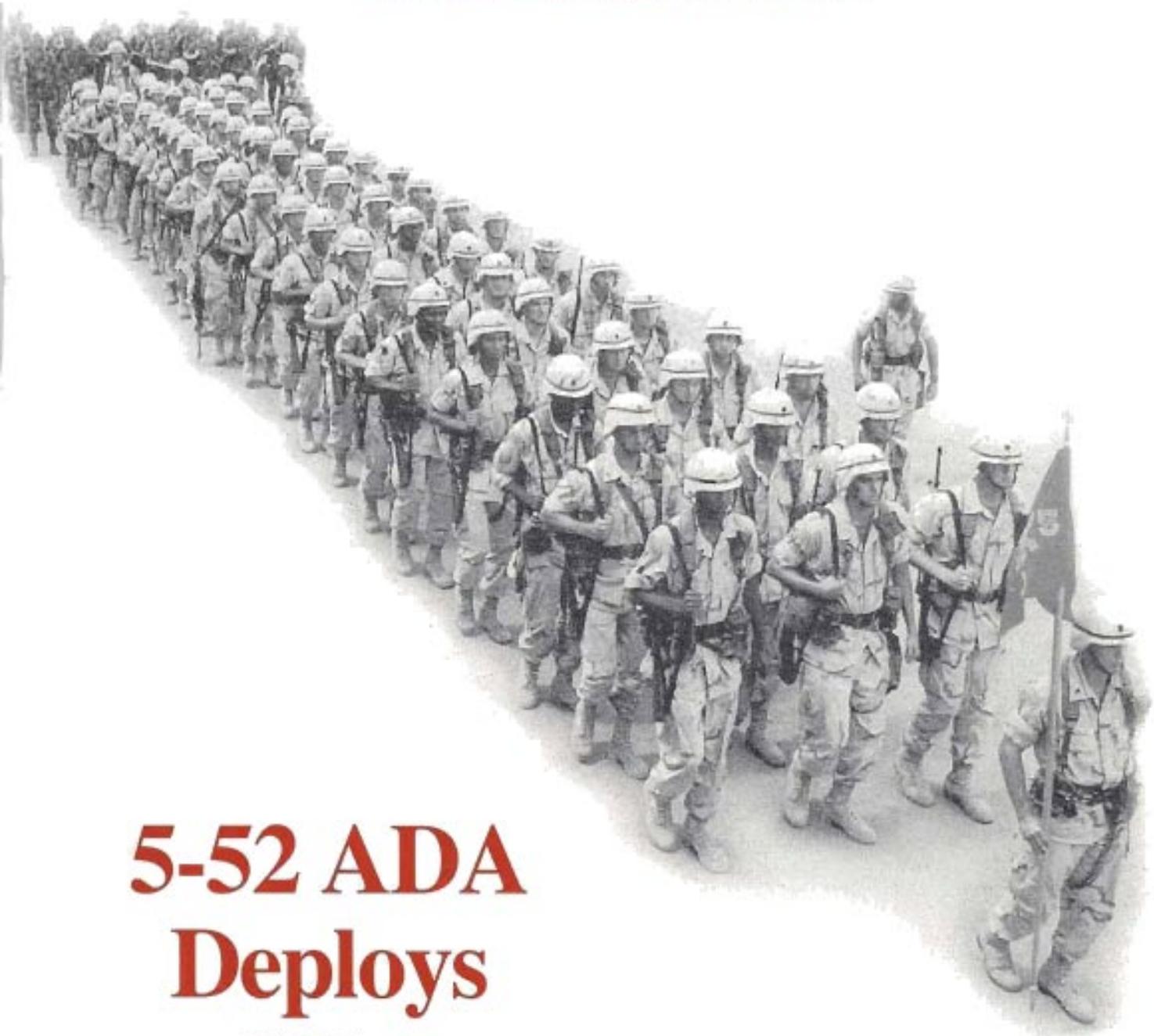




JANUARY-FEBRUARY-MARCH 1997



5-52 ADA Deploys

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ON THE COVER

11th ADA Brigade Public Affairs Officer Sgt. Forrest Vincent photographed 5-52 ADA Patriot soldiers as they paraded prior to a rapid deployment from Fort Bliss, Texas, to Southwest Asia. The September 1996 deployment was part of a U.S. buildup in response to Iraqi provocations.

Maj. Gen. John Costello
Commandant, USAADASCH

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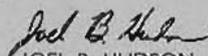
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Intercept Point

In November, 750 Patriot soldiers of Task Force 2-43 ADA, 108th ADA Brigade, deployed from Fort Bliss, Texas, to Saudi Arabia. The good news is that soldiers of the 5th Battalion, 52nd Air Defense Artillery, 11th ADA Brigade, who made a rapid deployment from Fort Bliss to Saudi Arabia in September in response to Iraqi provocations, will be home for the holidays. Task Force 2-43 ADA's deployment, the first for the 108th ADA Brigade since its move from Fort Polk, La., to Fort Bliss, illustrated Fort Bliss' growing importance as a force-projection platform. It also showed how much the nation depends, even in peacetime, on the willingness of soldiers to bear any burden.

As 5-52 ADA soldiers paraded prior to their deployment, I was struck, as I always am when viewing moving formations, by how much our national security depends on soldiers, not just sophisticated weapon systems. Their pre-positioned Patriot systems awaited them in another desert thousands of miles away, but they marched toward the C-141 transports with essentially the same gear (rifles and backpacks) that American soldiers carried on dusty roads leading to Yorktown or Gettysburg. American soldiers are the heart of the nation and the last, best hope of a large portion of the planet that, without them, would face social disintegration or despotism.

Army Chief of Staff Gen. Dennis J. Reimer says "soldiers are our credentials." The phrase, which has become a Force XXI slogan, has its roots in a World War II incident. When a German commander demanded to see Brig. Gen. Charles Canham's credentials prior to surrendering, Canham pointed to some battle-weary but victorious

G.I.s and responded, "These are my credentials." When the chief of staff says "soldiers are our credentials," he means American soldiers — not weapon systems — are the strength of the Army and the symbol of American resolve and commitment to democracy.

The chief of staff credits the Army with doing "70 to 80 percent of the 'heavy lifting' in the past five years," even though it absorbed only 24 percent of the Department of Defense budget. A review of the past fiscal year demonstrates that ADA soldiers did their fair share of the heavy lifting.

- In Europe, Avenger and Bradley Stinger Fighting Vehicle (BSFV) batteries guarded Task Force Eagle as it crossed the flood-swollen Sava River. As I write, Avenger and BSFV crews continue the peacekeeping mission in strife-torn Bosnia.

- In Atlanta, Sentinel crews protected the Olympics from aerial terrorist attack.

- In the Caribbean, ADA units continued their mission of helping to restore democracy in Haiti and provided security for Cuban and Haitian refugees at Guantanamo Bay.

- Five years after Desert Storm, Patriot battalions remain on guard in Southwest Asia.

- During my recent visit to Hawaii and Korea, I saw our soldiers busily engaged in the challenging duty of maintaining the air defense presence in the Pacific region.

Other soldiers fielded new air defense systems, created Force XXI doctrine and tactics, and took part in warfighting exercises that reshape the Army. ADA soldiers consistently demonstrate the highest levels of professionalism, expertise and adaptability. They are the best credentials of the "First to Fire" branch as it . . .

Leads the Charge into the 21st Century!

*Maj. Gen. John Costello
Chief, Air Defense Artillery*

THE YOUNG LIONS

He will raise a signal for a nation afar off and whistle for it from the ends of the earth, and lo, swiftly it comes!

None is weary, none slumbers or sleeps, not a waistcloth is loose, not a sandal-thong broken; their arrows are sharp, all their bows bent, their horses' hooves seem like flint and their wheels like the whirlwind.

Their roaring is like a lion, like a young lion they roar; they growl and seize their prey, they carry it off, and none can rescue.

They will growl over it that day, like the roaring of the sea. And if one looks to the land, behold, darkness and distress; and the light is darkened by its clouds.

— Isaiah 5:26-30

When the great day of battle comes, remember your training. You must succeed, for to retreat is as cowardly as it is fatal. Americans do not surrender. During the first days and nights ashore you must work unceasingly, regardless of sleep. A pint of sweat will save a gallon of blood. The eyes of the world are watching us. The heart of America beats for us. God is with us. On our victory depends the freedom or slavery of the human race. We shall surely win.

— Gen. George S. Patton
Operation Torch, 1942

COMMON SENSE MANAGEMENT



CSM Jeffery G. Jordan counseled soldiers on promotional opportunities during a recent visit to 5-3 ADA, Wackernheim, Germany.

The Army's Noncommissioned Officer Corps faces a restructuring that will affect each branch and every military occupational specialty (MOS). Air Defense Artillery is currently realigning its force by consolidating various functions and tasks due to changes in air defense weapon systems. These changes will produce a more durable force that will be more efficient on the battlefield. Rest assured that Army leaders and personnel specialists are aware of the risks involved in force restructuring and are working to protect promotion and career opportunities for enlisted soldiers and NCOs at all levels.

I am personally working with other branch command sergeants major, branch proponent office personnel specialists and the U.S. Army Personnel Command to inject common sense management into the process. I'll give you updates in subsequent columns. Meanwhile, I want to tell you about the bright side of Army personnel management.

New technology has improved the performance of ADA weapon systems. Now, new technology is helping the Army keep its commitment to improving personnel management. The new personnel tempo (PERSTEMPO) data base and the Standardized Installation and/or Division Personnel System-3 (SIDPERS-3) are good examples.

PERSTEMPO is the Army's new way of measuring and lessening the impact of frequent deployments. PERSTEMPO will

spread deployments more equitably among units, substituting skill requirements when possible and searching for ways to reduce the number of deployments and major training exercises. The recent activation of a tenth Patriot battalion, 3-2 ADA, is an example of efforts to lighten the load for frequently deployed Patriot soldiers. Every day a soldier spends away from home will count toward a still-unofficial 120-day ceiling.

SIDPERS-3 will automate personnel actions, seamlessly integrating the Army's personnel data base. Personnel specialists will match force structure requirements with current and projected soldier populations, locate soldiers with special skills needed for specific assignments, and forecast when soldiers can expect their next move in a matter of hours or days rather than weeks and months.

The Army will reach "end strength" this fiscal year, and the drawdown will be behind us. Properly managed, the drawdown's end and 21st century personnel management innovations will fill NCOs' and enlisted soldiers' futures with great expectations.

Soldiers, America's Heartbeat!

Jeffery G. Jordan
Command Sergeant Major

How do NCOs deal with issues such as promotions, smaller units and reduced budgets? Open communication is the best answer. If we are informed, we can inform our soldiers. They, in turn, will take that information and use it to help decide which path to take.

— Gene C. McKinney
Sergeant Major of the Army

[Brig. Gen. John J.] Pershing permitted [Lt. George S.] Patton to keep the saddle and saber. But something had to be done about burying the three bandits who were beginning to decompose disagreeably in the steamy late afternoon heat. Against the backdrop of a blood-red sunset, graves were hastily dug, but no one seemed to know the words to the burial service. Finally a veteran sergeant spoke up and said he knew what to do. Raising one hand, he intoned: "Ashes to ashes and dust to dust, if [Pancho] Villa won't bury you, Uncle Sam must."

— Patton: A Genius For War
Carlo D'Este

Missile Defense Symposium

Three-day AUSA symposium attracts high-level military and industry leaders to El Paso

The Association of the U.S. Army (AUSA), in cooperation with the U.S. Army Space and Strategic Defense Command, sponsored an unclassified symposium on "Missile Defense — A Global Challenge," Dec. 3 through 5 at the El Paso Civic and Convention Center, El Paso, Texas. The unclassified symposium focused on critical issues surrounding the Army's commitment to counter the missile threat.

Army Chief of Staff Gen. Dennis J. Reimer, in delivering the symposium's keynote speech, warned that the United States currently has "no defense against missiles aimed at our homeland." He described the risk of limited or accidental missile attack against the U.S. heartland as "unacceptable." He said the "Army is ready to do its part" as the "lead service" in fielding a national missile defense system. "No magic — no new technology — is required," he said. "It's 'doable' now." Reimer traced the history of the Army's contribution to continental air defense back to the Cold War and the inactivated Army Air Defense Command. He said names of Army Air Defense Command weapon systems, such as Nike, Zeus, Skysweeper and Safeguard, probably have little meaning to today's soldiers, but that these systems, which were once deployed throughout the United States, provided comfort to the nation's Cold War generation. "We have no greater responsibility to the people than to put in place a capable national missile defense." Alluding to the Army Air Defense Command's motto, Reimer said, "We must, once again, become 'Vigilant and Invincible.'"

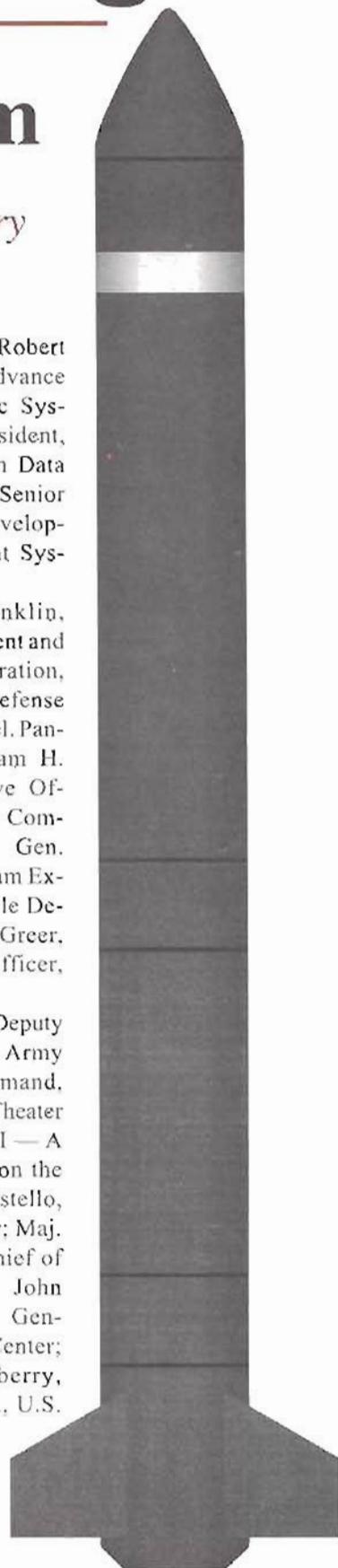
Lt. Gen. Edward G. Anderson III, Commanding General, U.S. Army Space and Strategic Defense Command, delivered the closing remarks. Other speakers were Lt. Gen. Lester L. Lyles (U.S. Air Force), Director, Ballistic Missile Defense Organization; Brig. Gen. Alan D. Johnson, Director of Plans, U.S. Army Space Command; and Lt. Gen. William W. Hartzog, Commanding General, U.S. Army Training and Doctrine Command. The Honorable Gilbert F. Decker, Assistant Secretary of the Army for Research, Development and Acquisition, spoke as guest of honor at a dinner the second night of the symposium.

Maj. Gen. (Ret.) Donald R. Infante, of Hughes Aircraft Co., chaired the Future Acquisition Panel. Panelists were William A. Loomis, Vice President, Defense Missile Sys-

tems, Lockheed Martin Corp.; Robert M. Stein, Vice President of Advance Systems, Raytheon Electronic Systems; Frank L. Tullis, Vice President, Business Development, Litton Data Systems; and Dr. C. S. Wells, Senior Vice President, Business Development, Lockheed Martin Vought Systems Division.

Maj. Gen. Peter C. Franklin, Deputy for Systems Management and Horizontal Technology Integration, chaired the Current Missile Defense Technology Development Panel. Panelists were Maj. Gen. William H. Campbell, Program Executive Officer, Command, Control and Communications Systems; Brig. Gen. Daniel L. Montgomery, Program Executive Officer, Air and Missile Defense; and Col. Charles W. Greer, Deputy Program Executive Officer, Tactical Missiles.

Lt. Gen. John E. Miller, Deputy Commanding General, U.S. Army Training and Doctrine Command, served as panel chairman for Theater Missile Defense and Force XXI — A Branch Perspective. Serving on the panel were Maj. Gen. John Costello, Chief of Air Defense Artillery; Maj. Gen. Randall L. Rigby Jr., Chief of Field Artillery; Brig. Gen. John Smith, Deputy Commanding General, U.S. Army Intelligence Center; Brig. Gen. Burt S. Tackaberry, Deputy Commanding General, U.S. Army Aviation Center; and Col. David G. Harrison, Assistant Commandant, U.S. Army Chemical School.



THAAD Flight Tests Continue

Senior Army leaders are confident next round of tests will validate upper-tier missile defense system



The Army envisions THAAD as the upper tier of a layered theater missile defense.

Despite consecutive failures to intercept a target, contractors developing the Army's Theater High-Altitude Area Defense (THAAD) system remain confident the system's technology will work, while acknowledging that a lot is riding on the next test. "The THAAD program is right on track," said U.S. Air Force Lt. Gen. Lester L. Lyles, Director, Ballistic Missile Defense Organization, speaking at the Association of the U.S. Army's Missile Defense Symposium in December. "We expect an intercept when testing resumes."

Air Defense Artillery is counting on THAAD, frequently referred to as the "silver bullet" of theater missile defense, to serve as the upper tier of a layered defense against theater ballistic missiles. THAAD contractors — led by Lockheed Martin, the prime contractor — have blamed the system's lack of success on the failure of component parts rather than basic flaws in THAAD system technology. The initial flight test, for example, was marred by test instrumentation breakdowns.

System malfunctions have been corrected following each flight test, but in each of the last three tests, a new

problem occurred, preventing missile intercepts. THAAD missile flight tests have been on hold since July when a THAAD missile's infrared seeker failed to identify a target during an intercept test.

Until THAAD hits its target, the Army will not award Lockheed Martin a contract for the next phase of the program: engineering, manufacturing and development. Department of Defense officials have said that if upcoming tests are not successful, the early version of THAAD (slated to be deployed for evaluation by soldiers) may be delayed beyond FY98.

"It's frustrating from the standpoint we haven't hit the target," Bill Loomis, Lockheed Martin's Vice President for Defensive Missile Systems, said last week. "We know we can. We want to do it and get on with the program."

To date, the THAAD program has not suffered politically from its initial test failures. It still enjoys strong support in the Pentagon and in Congress, which appropriated \$344 million

for FY97 research, development test and evaluation of THAAD, \$75 million more than requested. No one is predicting that the THAAD system will suffer the same fate as the Sergeant York Gun. The controversial, self-propelled, anti-aircraft gun system was terminated in the mid-1980s following a series of poor test performances and a flurry of adverse publicity. Support for the Sergeant York Gun, however, had eroded as the Cold War attack helicopter threat it was designed to counter diminished with the collapse of the Soviet Union. By contrast, the rapidly proliferating theater ballistic missile threat that the THAAD system is designed to counter is perceived at all echelons as a top-priority threat.

Raytheon develops the THAAD ground-based radar (GBR), which has been a bright spot in THAAD testing. The Ballistic Missile Defense Organization conducted a successful THAAD GBR test in October against a complex ballistic missile target. "The THAAD radar detected, acquired and tracked its target objects throughout their flight," Army spokeswoman Sandra Trousedale said. "The test provided valuable data collection

on THAAD radar acquisition, tracking, and discrimination performance against a multi-object target," she added. In the Oct. 9 test, its most elaborate test to date, the GBR successfully discriminated a target from a cloud of highly reflective mylar balloons and tracked it. The THAAD radar tracked a guided re-entry vehicle, a Hera drone's second stage and 100 small balloons that reached a height of 150 miles.

The THAAD GBR test, conducted at White Sands Missile Range, N.M., was the first of two THAAD radar tests. The second radar test is scheduled for the spring of 1997 at Kwajalein Missile Range, Johnston Atoll. The GBR, however, will be used as THAAD's primary radar for the first time in the next flight test. Originally scheduled to take place last December, the flight test has recently been rescheduled for February.

Loomis said problems that have so far plagued THAAD test flights are not with the technology but with integrating the hardware and software and making the system work reliably. "What we're talking about now is getting the 'unk-unks' out of the system so it is reliable and can do the mission," Loomis said. Lockheed Martin has added more discipline to the engineering of THAAD and improved the THAAD system design in many areas. Loomis added.

The Nation's Force of Decision

Army chief of staff sees emergence of a full spectrum fighting force

by Gen. Dennis J. Reimer
Army Chief of Staff

Last April, Secretary [Togo] West and I published a white paper entitled "Force of Decision — Capabilities for the 21st Century." With all that has happened the past few months and the increasing public interest in our nation's future security strategy, many of the paper's key points are worth revisiting.

The white paper describes the enduring purpose of our Army in an era of epoch-making change. For our Army, the 21st century began in 1989 [the end of the Cold War]. Our challenge today is to harness the winds of this change, to ensure that our Army remains trained and ready to provide the nation the military power it needs for a wide variety of missions in peace and war in a world that promises to be vastly different. Truly an exciting challenge.

The Army is organized, trained and equipped to succeed across the full spectrum of military operations — providing the nation the full range of capabilities to meet its many threats and challenges and the endurance to remain for the long haul. Recent events with Iraq sharply focus the relevance of our Army. Saddam Hussein largely ignored the U.S. attack with cruise missiles and the tightening of the no-fly zone and proceeded to fire missiles on coalition aircraft. The announcement of our intent to deploy 3,500 soldiers from Fort Hood,

Texas, helped change his attitude instantly. High-tech weaponry, smart missiles, aircraft and ships didn't deter his actions; the simple awareness that American soldiers, trained to a razor's edge, would soon be on the ground to enforce the rules helped him understand that we were serious.

The Army's ability to respond to the nation's needs was immediate. In little more than three days the 3rd Brigade, 1st Cavalry Division, along with the 5th Battalion, 52nd Air Defense Artillery, from Fort Bliss, Texas, was on the ground in Kuwait prepared for action — more than 36 hours ahead of the planning timeline. Soldiers, with boots on the ground, provide an unmistakable message of the nation's intent.

The national military strategy structures the Army to compel America's enemies. Our experiences over the past years prove that the nation's military might is also defined by our ability to deter potential enemies, reassure friends and allies and support domestic emergencies. Securing peace and stability requires long-term commitment — the Army is not a



“touch and go” force. Daily, we meet the demands for forward presence while remaining prepared to project power into any situation threatening our nation’s interests.

The Army is deployed, as it has been every day for more than 50 years, in Europe, Korea, Panama and Japan. We also have substantial numbers of soldiers deployed in Kuwait, Haiti, Bosnia, Honduras, Macedonia and the Sinai. Today, the Army is engaged around the world with more than 30,000 soldiers deployed in 71 countries. Soldiers on the ground — the most visible sign of deterrence and reassurance — contribute directly to regional stability.

The challenges to our interests today may be less visible, but are much more diverse than they were during the Cold War. The nature of modern warfare is joint warfare with land forces at the core of our joint warfighting capability. The U.S. Army delivers decisive capabilities by providing superb light, heavy and special operations forces to the joint force commander to compel our enemies, to deter potential adversaries, to reassure friends and allies and to support the needs of the nation within its own borders.

Because of the increasing demands on our soldiers, the size of the Army — Active, Guard and Reserve — does matter. The capabilities we need to sustain fighting on the battlefield are also the capabilities needed to reassure our friends and allies and to support our own domestic needs. To meet the challenges, our Army is changing. We are challenging all the assumptions of the past, leveraging technology to become more efficient and effective to remain relevant. But change does not come without risk. The changes we make today must take us into the 21st century and remain relevant in a future environment that is difficult to predict. This process of adaptation is called Force XXI. We are leveraging technology to arm our soldiers with the finest, most lethal weapons and support systems in the world.

EXCERPTS

In mid-September Patton reported to Fort Bliss, which was located outside El Paso . . . Patton’s assignment to border duty in 1915 coincided with a period of increasingly turbulent relations between the United States and Mexico. Many times during his military career Patton found himself in the right spot at the right time. The southwestern United States in late 1915 was such a place. Although most of the western United States had been settled and tamed by the turn of the century, the Wild West — where colorful, independent, violent men still lived by the law of the gun — would continue to survive for another 20 years in such locales as southwest Texas.

Into this still untamed land came George Smith Patton. It was to prove a match made in heaven. He had always fancied himself a warrior hero in the mold of King Arthur, standing alone in majestic opposition to an evil force. On the Mexican border during the next year he would be provided with a unique opportunity to become that hero, and in the process to solidify his claim as a “comer” in the U.S. Army officer corps.

The Force XXI process will produce a versatile army with the capabilities that America needs for the next century. We call this army “Army XXI.” We are adapting our organizational structure, doctrine and equipment. We are organizing, training and equipping to ensure we have the capabilities the nation needs. We are exploiting our competitive advantages — quality people, advanced technology and proven joint warfighting doctrine. We are capturing emerging technology to give us a degree of precision, speed and battlefield awareness heretofore unknown. We will test the concepts and capabilities of this emerging force of the future, Army XXI, by pitting it against the world-class opposing force at the National Training Center in March 1997.

Tomorrow’s adversaries will no doubt be similar to the ones we face today; however, we must be prepared for asymmetrical warfare. Our armed forces must be able to defeat an enemy armed with machetes and rifles as well as those armed with tanks, planes and weapons of mass destruction. Whatever surprises the new millennium may have in store, one thing is certain — we can look to our roots, to our legacy as the “Sword of the Republic,” to help us prepare our Army for the future. We must have the capabilities required to win the nation’s wars, establish order, prevent conflict and sustain operations as long as required. Our ability to compel, deter, reassure and support is the essence of our capabilities-based Army — the nation’s force of decision.

Despite the ambiguity of future warfare and the many forms it may assume, the battlefield will always be a dangerous, frightening and lonely place. Only soldiers of character and courage, well trained, ably led, superbly equipped, and in sufficient numbers will survive there and win — tomorrow as they have in the past.

**Soldiers are
our credentials!**



Hughes Rolls Outs Sentinel

An impact similar to the moment in Genesis when God says Let there be light



Production-model Sentinels, formerly called ground-based sensors, began rolling off Hughes Aircraft Company assembly lines July 2. For short-range air defense units that have been operating "in the dark" with no effective early warning since the forward area alerting radar was taken out of inventory in 1990, the Sentinel will have an impact similar to the moment in Genesis when God says, "Let there be light."

The first two Sentinels were immediately fielded to the 1st Battalion, 44th Air Defense Artillery, 2nd Armored Division, Fort Hood, Texas, in August, prior to Sentinel production verification tests, for use in a Task Force XXI experiment and analysis conducted at Fort Hood. 1-44 ADA is the Force XXI test unit for the Bradley Linebacker. Once production verification tests are completed, the 6th ADA Brigade, Fort Bliss, Texas, will be next to receive Sentinels, followed by 4-5 ADA, 1st Armored Division, Fort Hood. The Army hopes to complete fielding of the 115 Sentinels called for in the production contract by FY03.

The Sentinel is an advanced three-dimensional battlefield air defense radar that provides enhanced capabilities against low-flying targets. It will make Air Defense Artillery a leader in battlefield digitization. It consists of a radar-based sensor system with its M-1097 Humvee prime mover; power unit; identification, friend or foe system; and forward area air defense command, control, communications and intelligence (FAAD C³I) system interfaces. The Sentinel automatically detects, tracks, classifies, identifies and reports cruise missiles and fixed- and rotary-wing targets.

The Sentinel is a prime contributor to the battlefield air picture. It provides air surveillance and target acquisition capabilities for divisional and corps short-range air defense systems. The highly accurate, quick-reacting Sentinel acquires targets forward of the forward line of own troops to improve reaction times and allow engagement at optimum ranges.

The Sentinel is funded separately from, but operates in conjunction with, the FAAD C³I system. FAAD C³I components have been fielded to A/1-44 ADA and 4-5 ADA. During 2QFY97, 4-5 ADA is scheduled to become the first unit to receive the new handheld terminal unit (HTU) with 4R software.

Some Army National Guard Avenger/Manportable Air Defense units will receive both FAAD command and control (FAAD C²) and the Sentinel because of the inactivation of the active Army corps Avenger battalions. Times and quantities are still being determined.

EXCERPTS

The Iraqis blow up civilian buildings in order to give the impression of a dirty war. The Americans disguise satellite information to give the impression of a clean war.... All this is no more than a stratagem and the war ended in general boredom, or worse, in the feeling of having been duped. Iraqi boasting. American hypocrisy. It is as though there was a virus infecting the war from the beginning which emptied it of all credibility. It is perhaps because the two adversaries did not even confront each other face to face, the one lost in its virtual war won in advance, the other buried in its traditional war lost in advance. They never saw each other: when the Americans finally appeared behind their curtain of bombs, the Iraqis had already disappeared behind their curtain of smoke.

**the
gulf war
did not
take place**

Jean Baudrillard

Soldiers Test Force XXI Gear

Series of digitization exercises will help write ADA doctrine for 21st century

In October, the 4th Battalion, 5th Air Defense Artillery, 1st Cavalry Division, Fort Hood, Texas, conducted the first of a series of digitization exercises that will help determine ADA doctrine for the 21st century. The battalion-size exercise used internal and external air pictures. Its purpose was to confirm the operability of all forward area air defense command, control, communications and intelligence (FAAD C³I) equipment from the engagement operations terminals down to the simplified handheld terminal units (SHTUs) via the enhanced position location and reporting system (EPLRS). The exercise was the first in a series of training events that will establish tactics, techniques and procedures for integrating FAAD C³I equipment into air defense doctrine.

The fielding of FAAD C³I equipment places 4-5 ADA at the forefront of ADA battalions. The ability to transmit early warning of enemy aircraft and cruise missiles from command and control cells to individual fire units using EPLRS greatly enhances the battalion's combat effectiveness and deployability. At battalion level, the FAAD C³I architecture provides the commander with redundant command and control cells: the air battle management operations center and the Army airspace command and control node. These command and control cells gather information from Sentinels (formerly called ground-based sensors), airborne warning and control systems, Patriot units and Navy Aegis cruisers and disseminate the data digitally to battery command posts. Since each fire unit has the EPLRS, fire units and battery command posts receive the digital data almost simultaneously, permitting synchronization of fires and early engagement of enemy aircraft. FAAD C³I replaces antiquated, time-consuming voice transmissions over command nets with the instant transfer of early warning, permitting units to engage targets at optimum ranges.

The SHTU is a laptop-size computer that enables each fire unit to receive real-time early warning with an update every

two seconds from Sentinels and slightly slower updates from other air picture sources. Crews use the EPLRS symbology displayed on their SHTUs to position their weapon systems for swifter engagement of enemy aircraft and cruise missiles.

During the exercise, the battalion deployed its command and control cells to Fort Hood Training Area 10 (TA-10), some of its M-2A2 Bradley Stinger Fighting Vehicles to TA-30, and some of its Avengers to TA-26. The remaining fire units participated from the battalion motor pool.

"The SHTU is a great tool for an Avenger crew," said Sgt. Calvin Smalley, a D/4-5 ADA Avenger crew chief. "It provides the team with exact track data, enabling proper engagement of enemy aircraft. Also, it enhances our identification, friend or foe, capabilities, reducing the incidence of fratricide."

Smalley's gunner, Spec. Michael Thoits, also praised the new equipment. "The SHTU gives me more confidence in my ability to react and engage enemy aircraft," he said. "The real-time data

received through the SHTU provides me with better early warning. As a result, I will engage enemy aircraft quicker with a higher probability of kill."

4-5 ADA's primary task is to ensure no one shoots or targets the 1st Cavalry Division from the air. The future of short-range Air Defense Artillery lies in the new FAAD C³I equipment. The battalion's first test will be the 1st Cavalry Division Warfighter Exercise in February. The hard work the battalion put forth in the digitization exercise will reflect positively as we develop into a 21st century fighting force ready for any challenge placed before us, whether in advanced warfighting exercises or actual deployments. 4-5 ADA stands ready to accept the digital challenge!



Spec. Michael Thoits, left, operates an Avenger remote control unit while Sgt. Calvin Smalley checks data on a FAAD C³I SHTU.

1ST LT. LARRY J. OSTENDORF

Top Air Defense NCO Visits Germany

Command sergeant major reassures ADA soldiers about Force XXI promotion opportunities



CSM Jeffery G. Jordan awards coins to 5-3 ADA Bradley Stinger Fighting Vehicle crewmen.

Air Defense Artillery's top NCO, CSM Jeffery G. Jordan, spent a week visiting soldiers at air defense commands throughout U.S. Army Europe. My first purpose is to get out there and visit units, letting them know who's the new branch command sergeant major, said Jordan. The second purpose of my visit is to talk to soldiers, NCOs and officers and give them some insight on future ADA developments. I am also gathering input from soldiers on what they feel and what ideas they have about Air Defense Artillery. It's a two-way communication process.

One of the ADA units he visited was the 5th Battalion, 3rd ADA, 1st Armored Division, McCully Barracks, Wackernheim, Germany. The unit is a short-range air defense battalion that consists of a headquarters battery, two Bradley Stinger Fighting Vehicle (BSFV) batteries and one Avenger battery. Since most of 5-3 ADA was deployed downrange in support of Operation Joint Endeavor in Bosnia, Jordan talked to 5-3 ADA rear detachment soldiers who are sustaining rear operations, including equipment and facilities maintenance, family support and training readiness. He expressed his concern about soldiers and the families of deployed soldiers.

During his session with 5-3 ADA soldiers, Jordan explained that the branch is going through many changes as it

begins the final year of the Army's post-Cold War drawdown. Soldiers expressed their concern about a slowdown in promotions. The two main problems we are facing are retention and promotions, Jordan explained. The Army has downsized and so has Air Defense Artillery. He pointed out that Army National Guard units now make up 51 percent of Air Defense Artillery, but he assured the soldiers that there is a lot of rearranging going on in an attempt to prevent, or at least alleviate, any promotion stagnation that an improperly managed drawdown might produce.

He pointed out that military occupational specialty (MOS) strength is 68 percent for MOS 14R and 83 percent for MOS 14S. This causes a great impact on the soldiers we now have. Our soldiers are conducting back-to-back training rotations and making

frequent rapid deployments to trouble spots on top of their other duties. Uncertainty and increased deployments are contributing factors to so many soldiers getting out of the Army. Our retention rate for first termers is 16 percent below objectives, he continued. At present, 14R has become priority one, and the Army is offering 14Rs \$4,000 bonuses to enlist. We should see more new soldiers coming into the MOS.

The problem in some other MOSs, Jordan explained, is overstrength. We opened up the Fast Track program for more than a hundred MOS 14S NCOs in an effort to prevent our NCOs from reaching the retention control point. The Total Army Personnel Command is also offering early retirement for E-6s and E-7s. NCOs in overstrength MOSs who don't qualify for early retirement should look at another MOS. We have good NCOs; we can't just let them go away. We must encourage them to move to MOSs where they are needed.

Jordan also updated 5-3 ADA soldiers on the encouraging progress that the Bradley Linebacker, the Sentinel and the new Stinger Block I missile are making toward fielding. I've really enjoyed my visit, Jordan said. This is a great unit with outstanding facilities. I'm looking forward to a return visit.

SFC JOSEPH A. STRUNZ

Patriot Deploys

5-52 ADA Responds to Crisis in Southwest Asia



**PFC Valdemar Gonzales
embraces his wife Maria
prior to 5-52 ADA's
departure.**

by Sgt. Forrest Vincent

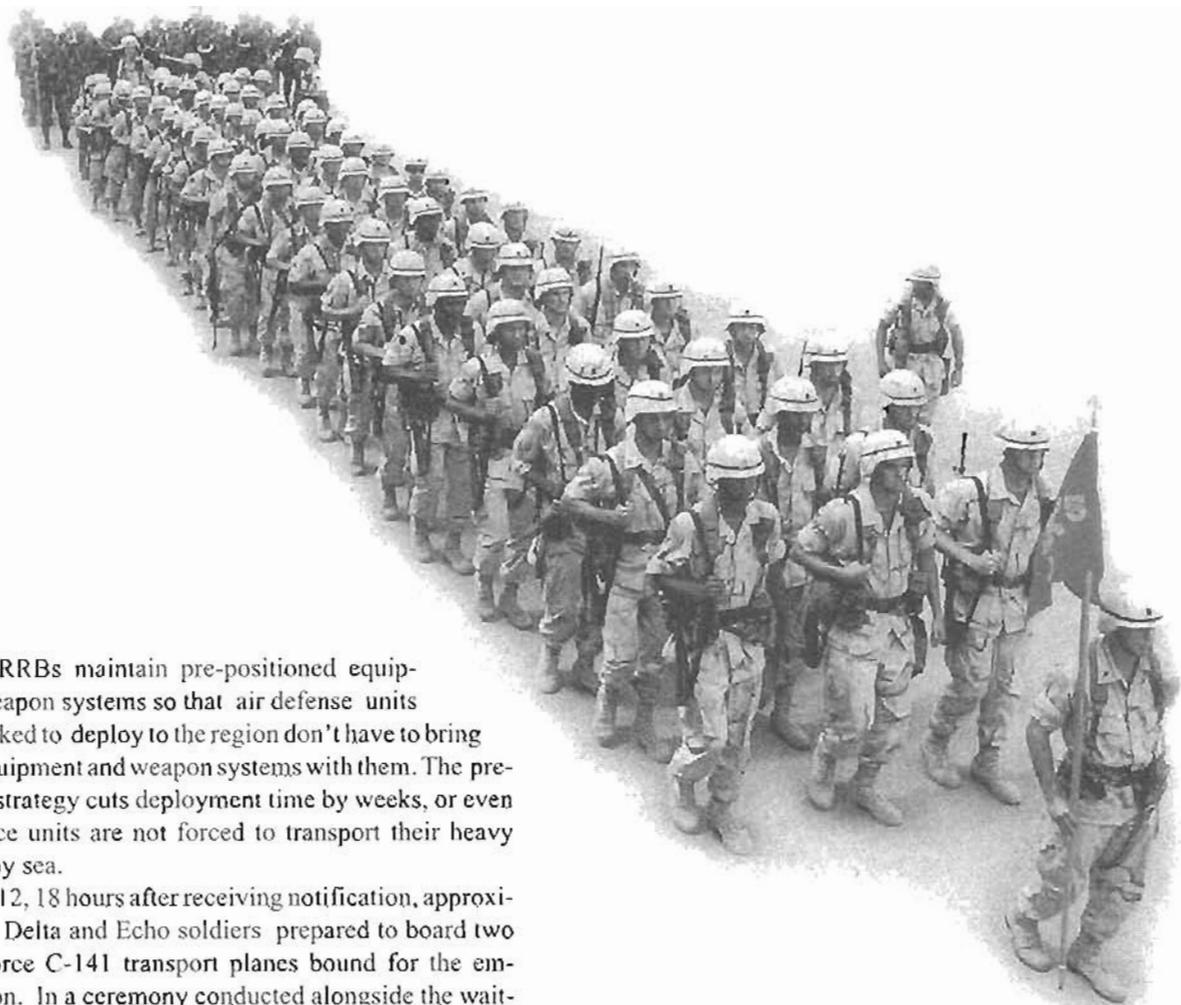
Our military forces face risk every day and in every mission. We do not envision the U.S. military should be risk free, but we have a responsibility when we take on a new mission to weigh the risks against the importance of the benefits of the mission.

— Secretary of Defense William Perry

The news from Southwest Asia was ominous. Iraqi president Saddam Hussein sent three divisions to the Kuwaiti border in a pattern similar to troop movements prior to the Gulf War in 1990. Other Iraqi troops maneuvered near the United Nations' protective zone in northern Iraq to support the side backed by Hussein in Kurdish faction fighting. To the south, Iraqi air defense batteries launched missiles at U.S. warplanes patrolling the no-fly zone.

The United States responded with a major deployment of forces to Southwest Asia. "The purpose of the buildup," said Secretary of Defense William Perry, "was to deter Iraqi invasion, but if the deterrence had failed, they were there to fight. We were prepared for military conflict." The Associated Press was soon reporting U.S. Patriot batteries were already on the move inside Kuwait. So, the soldiers of Echo and Delta Batteries, 2nd Battalion, 7th Air Defense Artillery, 11th ADA Brigade, Fort Bliss, Texas, were hardly surprised to receive rapid deployment orders.

The assignment to beef up air and missile defenses in Saudi Arabia fell to Echo and Delta because a handful of soldiers from the two batteries had recently deployed to SWA to take their turn manning reduced readiness batteries (RRBs), a responsibility the 11th ADA Brigade shares on a rotational basis with other Patriot brigades (see "Welcome to Khobar Towers," page 13). Soldiers who volunteer for duty in South-



west Asian RRBs maintain pre-positioned equipment and weapon systems so that air defense units suddenly tasked to deploy to the region don't have to bring their own equipment and weapon systems with them. The pre-positioning strategy cuts deployment time by weeks, or even months, since units are not forced to transport their heavy equipment by sea.

On Sept. 12, 18 hours after receiving notification, approximately 150 Delta and Echo soldiers prepared to board two U.S. Air Force C-141 transport planes bound for the embattled region. In a ceremony conducted alongside the waiting C-141s, the battalion was reflagged to 5th Battalion, 52nd Air Defense Artillery, in keeping with the Army Regimental System's campaign to preserve the most historical regiments during an era of force reductions. Dressed in desert camouflage, the soldiers marched confidently aboard the planes. Once in Saudi Arabia, they would provide air defense for critical U.S. assets and host population centers.

Their departure reaffirmed Fort Bliss' status as a unique power-projection platform, rapidly becoming the only U.S. military installation capable of projecting a fully capable theater air and missile defense force to contingency theaters of operation. Maj. Gen. John Costello, chief of Air Defense Artillery, spoke of the feelings of "excitement and pride" soldiers experience when "called by your nation."

Some of the Gulf War veterans who trooped aboard the big C-141s may have also experienced an intense sensation of *deja vu*, since Southwest Asia has practically become "home away from home" for frequently deployed Patriot soldiers. But as they boarded the transport, the Patriot soldiers had no way of knowing if Hussein would back down, as he had before, or if this time, push would actually come to shove.

"You soldiers now go abroad to accomplish a mission laid out by our commander in chief to show U.S. resolve and commitment in Southwest Asia," said Col. Michael A. Vane, commander, 11th ADA Brigade. "You have been well pre-

pared for this mission and all conditions for success are in place. You represent yourself and your families."

Friends and families expressed their goodbyes with tears and long embraces, as others waved balloons and good luck banners. "They have to do what they have to do," said Maria Gonzales, wife of PFC Valdemar Gonzales, D/5-52 ADA. "Hopefully they will solve everything quickly and come back to their families soon."

Faculty members from the El Paso Independent School District's Alta Vista Elementary, 5-52 ADA's "partner in education," also attended the departure ceremony to show their appreciation. Their presence on the tarmac was viewed as an early indication of success for Fort Bliss' newly initiated Partners in Education program. The program, which sends Fort Bliss soldiers into local school districts as guest instructors, is one of many Army Community of Excellence outreach initiatives designed to strengthen ties between the military and the communities it serves. The outreach programs are designed to counter the growing perception that the all-volunteer force's professionalism somehow sets it further apart from the civilian community than the largely conscript forces of previous decades.

The 11th ADA Brigade has the mission to be "wheels-up" within 18 hours and deploy anywhere in the world. Lt. Col.



Karl Davis, 5-52 ADA commander, said his battalion was ready for the call. "I am positive about the deployment from the perspective that Delta and Echo batteries are ready," he said. "Our soldiers will do well, based on their training."

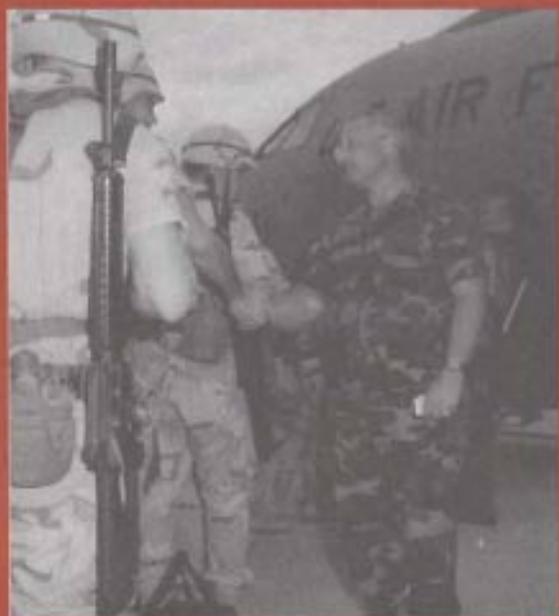
He said his soldiers welcomed the chance to begin adding new chapters to the history of 5-52 ADA, a unit originally activated June 6, 1916. "It is the first time 5-52 stood up as a Patriot battalion," he said, "so in that respect I'm looking forward to making it the best Patriot battalion in the Army. I think we have the opportunity to improve on the history and to keep it alive as long as possible."

The brigade's family support group, a major player that is vital to deployment planning, swung into action as the C-141s lifted off the runway. The group lends a helping hand to the families of deployed soldiers faced with legal, financial and other stressing problems. "It benefits everyone in the military to be involved with the family support group," said Becky Candiloro, family support group leader and wife of Pvt. 2 Joe Candiloro, E/5-52 ADA. "You have more support and strangers become friends. You need a lot of them," she added.

"High-tech weaponry, smart missiles, aircraft and ships didn't deter his [Hussein's] actions," pointed out Gen. Dennis J. Reimer, Army chief of staff, in a message issued shortly after the September deployments. "The simple awareness that American soldiers, trained to a razor's edge, would soon be on the ground to enforce the rules helped him understand that we were serious."

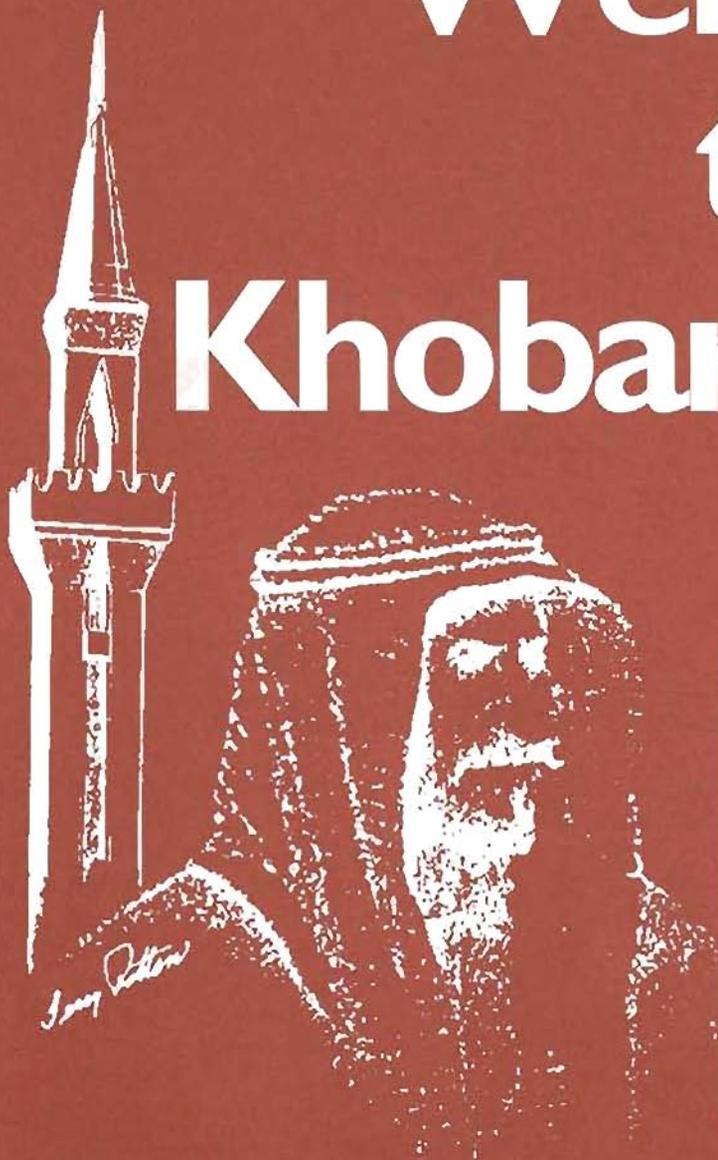
Their rapid deployment mission accomplished, 5-52 ADA soldiers begin returning to Fort Bliss on Dec. 11. Task Force 2-43 ADA, 108th ADA Brigade, along with an RRB contingent from E/1-1 ADA, 31st ADA Brigade, deployed from Fort Bliss to take up the distant vigil in Southwest Asia.

Col. Michael A. Vane, commander of the 11th ADA Brigade, bids 5-52 ADA soldiers farewell as they board planes bound for Saudi Arabia.



Sgt. Forrest Vincent is the 11th Air Defense Artillery Brigade public affairs officer.

Welcome to Khobar Towers



**Tougher
Security Measures
Increase Soldier
Safety**

by Cpl. Jeff Adams

A terrorist truck bomb that in June demolished an eight-story building in Dhahran's Khobar Towers housing complex and killed 19 U.S. airmen has turned up the heat in Saudi Arabia where temperatures regularly soar above 120 degrees. The blast seriously injured at least 105 airmen and sent another 240 to medical facilities for treatment of minor wounds. It was particularly jarring since Saudi Arabia has long been considered the most stable and secure of Arab countries. Casualties would have been much higher except that a guard, who saw a truck parked suspiciously close to security barriers, sounded an alarm that permitted a partial evacuation.

The Khobar Towers incident was eerily reminiscent of the Beirut bombing in 1983 that killed 241 Marines. It serves as a reminder that American military personnel, including air defense artillerymen, are prime targets for terrorist attack. About 2,000 U.S. troops were, and still are, billeted within the Khobar Towers housing complex. Most belong to the U.S. Air Force's 4004th Composite Wing (Provisional), but U.S. Army personnel stationed at Dhahran include air defenders assigned to Patriot battalions and reduced readiness batteries (RRBs) that have been stationed in Saudi Arabia on a rotational basis since the Gulf War. The Khobar Towers complex, in fact, has become "home away from home" for U.S. Patriot soldiers.

Soldiers of the 6th Battalion, 52nd Air Defense Artillery, 69th Air Defense Artillery Brigade, V Corps, Wuerzburg, Germany, who were midway through their Southwest Asia rotation, were billeted in an adjacent building when the truck bomb exploded. Lt. Col. Marvin (Keith) McNamara, 6-52



A signpost welcomes ADA soldiers to Khobar Towers.

ADA commander, described his unit's participation in rescue operations following the blast.

"In the wake of the tragic explosion at Khobar Towers, it is clear that the task force's heavy emphasis on force protection was, and is, warranted," wrote McNamara. "Task force soldiers are billeted in the most secure portion of the Khobar Towers complex, and the fact that no soldiers were running on the road adjacent to where the explosion took place is as fortunate as it was unlikely. Glass and other flying objects narrowly missed many soldiers; it is inexplicable that none were killed or critically wounded.

"The response of task force soldiers to the deadly attack was something of which all members of the U.S. Army-Europe V Corps team should be extremely proud," he continued. "It was near exclusively 6-52 ADA leaders who led medics, combat lifesavers, and soldiers to the immediate scene and took charge of recovery, triage and aid station operations. Many soldiers calmly and bravely made repeated trips into the unstable rubble to pull out dead and wounded airmen. 6-52 ADA medics, combat lifesavers and attached doctors saved scores of lives, and leaders brought an element of order, prioritization and efficiency to a scene of utter chaos and horror.

"Numerous senior Air Force officials have had nothing but praise and admiration for the courage, competence and tenacity of task force soldiers during the crisis. The senior wing airman addressed the fact that, despite being outnumbered by approximately four to one in the Khobar community, Army soldiers outnumbered airmen in recovery and subsequent cleanup operations. Air Force leaders also noted the very strict

task force procedures that enabled the Army to gain swift and accurate accountability in the wake of the explosion.

"The 6-52 ADA Rear Detachment/Family Support Group Operations also rose to the occasion," he continued. "Upon notification by the task force commander, the family support recall was initiated and more than 90 percent of task force spouses were notified within four hours that their spouses were safe. Per direction, all task force soldiers made a two- to three-minute morale call to a family member within 24 hours of the incident. The 6-52 ADA rear detachment gathered the families the next evening, briefed them and mitigated their concerns for their spouses. The meeting also proved to be an environment that greatly relieved the stress associated with this incident.

"In summary," McNamara concluded, "Army, U.S. Army-Europe, V Corps and the 69th ADA Brigade soldiers led the way."

Following the bombing, Department of Defense officials pledged to increase security measures for U.S. military personnel assigned to Saudi Arabia. Security for U.S. soldiers in Saudi Arabia is better already and will continue to improve, said Secretary of Defense William Perry, who spoke at Fort Bliss, Texas, the home of the 11th ADA Brigade, in August. "The terrorist bombing attack on our troops in Saudi was a grim reminder of the risks our troops face," he said. "So I have sent specific instructions to our commanders in the gulf regions to improve force protection. Extra security measures include extended perimeters, extra guards and the eventual establishment of a remote desert base that would isolate a large portion of the force from inhabited areas. However,

since the mission of Patriot units in Saudi Arabia includes protecting population centers such as Dhahran, much of the Southwest Asian Patriot force seems likely to remain in place."

ADA soldiers recently rotated to Saudi Arabia who confessed, at first, to some nervousness and sleepless nights, have been reassured by tightened security measures and now say they sleep well.

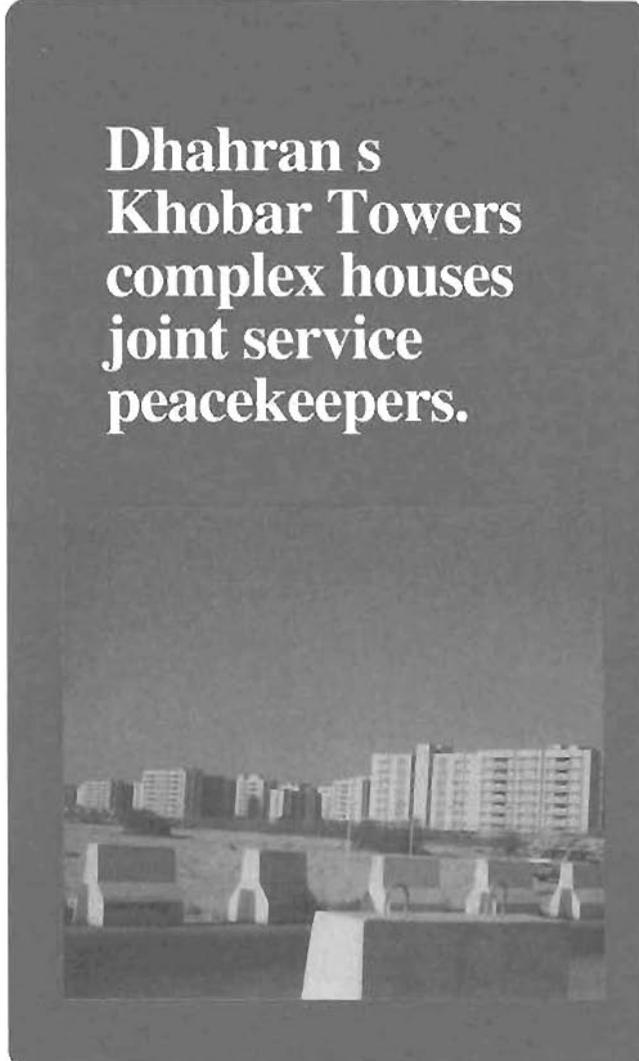
On July 12, a contingent of approximately 26 soldiers, hailing from two separate Patriot batteries of the 5th Battalion, 52nd Air Defense Artillery, 11th Air Defense Artillery Brigade, Fort Bliss, Texas, deployed to Saudi Arabia in support of the region's tactical ballistic missile defense. These soldiers, who make up two RRBs, are attached to the 2nd Battalion, 1st Air Defense Artillery, Fort Lewis, Wash., which, since the terrorist attack, has replaced 6-52 ADA as the battalion in charge of the region's tactical ballistic missile defense.

About 13 soldiers from D/5-52 ADA are now conducting RRB operations in the Saudi capital of Riyadh, while the same number of soldiers from E/5-52 ADA are conducting operations outside the city of Dhahran (site of the Khobar Towers housing complex).

The mission of the RRB soldiers is quite different from that of the battalion they support. According to 2nd Lt. David W. Costa, who commands E(RRB)/5-52ADA, the primary mission of RRB soldiers is to maintain a Patriot missile battery set of equipment. This equipment is kept in a storage facility and pulled out on a regular basis to ensure that it is working properly. In a crisis, RRB soldiers would roll out the equipment, deploy with it to predetermined sites, then man and maintain the systems until the arrival of a full complement of Patriot soldiers.

Pre-positioning equipment in volatile regions around the world is what makes the Army's power projection strategy, which has replaced the forward deployment strategy of the Cold War, work. The pre-positioning strategy was made possible when the end of the Cold War produced a surplus of equipment. Today, the United States stores battle tanks, Bradley Fighting Vehicles, field artillery howitzers, ammuni-

Dhahran's Khobar Towers complex houses joint service peacekeepers.



tion and fuel in various sites around the world. In Southwest Asia, for example, the Army maintains pre-positioned equipment for two "2x2" brigades (two armored battalions with 120 M-1A1 Abrams tanks and one battalion of 50 Bradley Fighting Vehicles). There are plans to pre-position equipment for another brigade somewhere in the Gulf region.

During a crisis, soldiers leave their heavy equipment behind them at their home stations and use pre-positioned equipment waiting for them in the area of conflict. The pre-positioning strategy permits the United States to send rapid deployment forces into action in a fraction of the time and at a fraction of the cost it would take if heavy equipment, as well as soldiers, had to be transported to distant battlefields.

"This military presence provides the deterrence that spares this region from another Gulf War," said Perry. "I believe that pre-positioning is key to our defense strategy in the gulf."

One disadvantage of the pre-positioning strategy is that it creates large stockpiles of weapon systems and munitions that can be targeted for air or missile attack. This makes Patriot air defense units, which have the means to stop air and missile attacks, cornerstones of the new national military strategy.

"The soldiers for this mission are all volunteers, and they are highly motivated," said Costa. He pointed out that his handful of soldiers must maintain and operate an entire Patriot battery set of equipment. "In taking on this mission we knew up front that we were going to have to do more with less. The soldiers made a commitment, and they are performing exceptionally."

According to SFC Robert E. Bean, E Battery's first sergeant, the soldiers' daily schedule is basically what it was at Fort Bliss.

"We are usually up by 0500 every morning," Bean said. "We conduct physical training, eat, shower, and then head to the equipment site."

Once on site, the soldiers conduct preventive maintenance checks and services on the equipment. They also check out the weapon systems by powering them up and performing system

validation checks. Costa said the soldiers periodically roll the equipment out to emplacement sites to work out any movement and emplacement glitches.

"The soldiers are getting a lot of training done," said Bean. "They are also doing a lot of cross-training on different MOS [military occupational specialty] skills."

Costa and Bean said living conditions for E Battery soldiers are quite acceptable. "We first arrived at the Khobar Towers complex approximately two weeks after the bombing," said Bean. "There was definitely a tense feeling in the air."

"I can't say that we all sleep very well at night," said Costa. He added, however, that "we are very confident in the security measures that have been taken to protect us while we are here." The soldiers moved into a housing complex about six blocks away from the bombing site. Costa said that constant communications between soldiers and leaders has eased the tension considerably.

Even though soldiers are not allowed to venture from the military housing compound, they are able to take advantage of many recreational activities designed to fill their nonduty hours. "We play volleyball and shuffleboard and go to the gym," said Costa. "There is also a mini-mall set up so the soldiers can do some shopping."

Bean said that all the soldiers' rooms have cable television hookups and the soldiers have access to headline news, sports and several movie channels. They also are entitled to one free 15-minute phone call per week and can use their own phone credit cards to call home whenever they wish.

"Things are going very well for all of us over here," said Costa. "The 2nd Battalion, 1st ADA, has treated us just like family. The soldiers and leadership of the battalion have let us know that we are an integral part of the team. Anything we have asked for, they have provided."

There's one thing that no Army can provide: a cure for homesickness. And 5-52 ADA soldiers have the same request homesick soldiers have made since time immemorial. Please write, said Costa and Bean.

On Sept. 12, as the United States reacted to renewed Iraqi provocations by increasing its troop strength, 5-52 ADA rapidly deployed about 150 Patriot soldiers from Fort Bliss to round out its RRBs in Saudi Arabia (see story, page 10). The battalion was reflagged 5-52 ADA as its soldiers waited on the tarmac to board C-141 transports. Thanks to RRB soldiers, their pre-positioned weapon systems were ready for action when they arrived.

The RRB soldiers at Khobar Towers were still homesick, but now, at least, they had plenty of company.

Cpl. Jeff Adams is a public affairs officer assigned to the 11th Air Defense Artillery Brigade, Fort Bliss, Texas.



U.S. Patriot launchers await rapid deployment forces in the Saudi Arabian desert.

Exercise Showcases 21st Century ADA

by Cpl. Jeff Adams

Only the blistering Desert Southwest's 100-plus degree heat could rival the fast-paced, sizzling action that took place during the world's largest air defense exercise, Roving Sands '96. The exercise, conducted over 14,000 square miles of the Desert Southwest, involved approximately 14,000 soldiers, airmen, sailors and marines from North America, Europe and other allied countries.

Roving Sands is an annual exercise sponsored by the U.S. Atlantic Command and executed by the U.S. Army Forces Command. Objectives for Roving Sands '96 were to plan, establish and operate a joint integrated air defense system; plan and execute the passive, active and attack pillars of theater missile defense (TMD); and exercise strategic and intra-theater deployment and redeployment while incorporating unit training objectives.

With coalition warfare expected to become the "warfare of the future," Roving Sands '96 permitted air defenders from different services and nations to jointly practice tactics, techniques and procedures to improve capabilities to first deter and then, if necessary, wage war. The exercise allowed personnel from different services and every level of command to use their training and experience to practice their unit's wartime



A soldier raises an antenna over the Roving Sands '96 battlefield.

mission. It also tested their survival skills under tough, realistic battlefield conditions and provided observers a preview of 21st century ADA operations.

The giant exercise showcased the U.S. Central Command's Joint Project Optic Cobra, which exercised and integrated ongoing services' TMD initiatives designed and tested by components of the Department of Defense to actively identify, target and destroy the theater ballistic missile (TBM) threat. Highlights of this year's exercise included the participation of the newly organized Army Air and Missile Defense Command, the debut of the U.S. Army Space and Strategic Defense Command's (SSDC) Aerostat sensor and highly successful Air Defense Lab demonstrations that revealed Bradley Linebacker's and Avenger's potential effectiveness against cruise missiles.

Soldiers from the United States, Canada, Germany and the Netherlands began arriving for Roving Sands '96 in early June. For the exercise, troops deployed to sites in and around Fort Bliss, Texas. Much of the action took place within the sprawling boundaries of White Sands Missile Range and the Roswell Industrial Air Center in New Mexico.

Roving Sands '96 was broken down into two opposing forces, the Red and the Blue, with a neutral White Force controlling the exercise. The exercise participants consisted of Navy, Marine and Air Force fighters with Army and coalition air defense units. The friendly force, or Blue force, consisted of an interconnected system of air defense missiles and early warning radar systems combined with tactical fighter aircraft from across the services. The Blue force was located in the Fort Bliss-Biggs Army Airfield area, McGregor Range, N.M., and White Sands Missile Range. The Red forces (labeled as the aggressors for the exercise) consisted of first-line attack aircraft from all U.S. services as well as participating German forces. More than 100 fighter aircraft and combat helicopters operated out of the Roswell Industrial Air Center and from Air Force bases throughout the Southwest. Pilots for the Red forces flew more than 150 sorties a day.

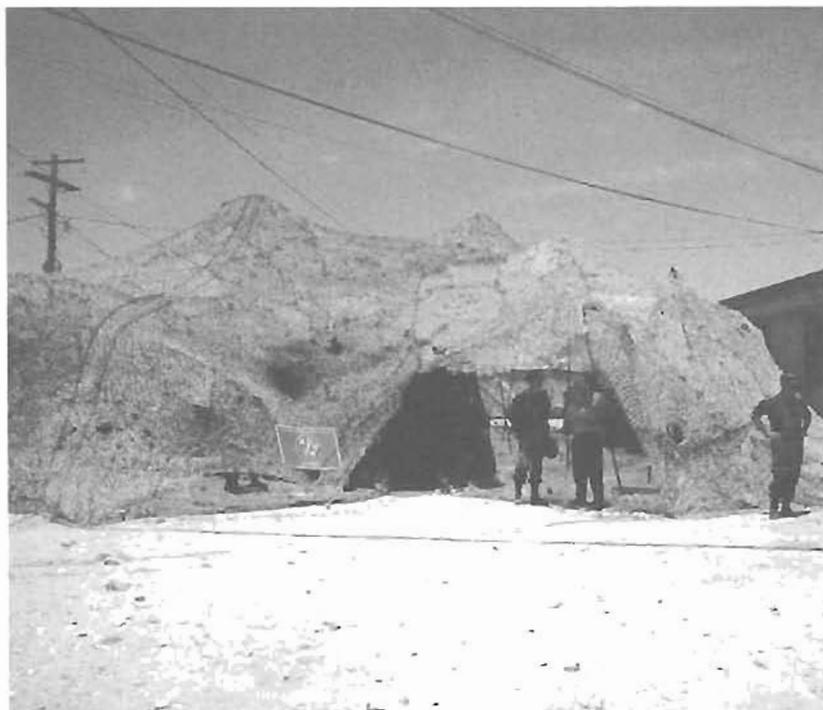
Navy Capt. Steven A. Kunkle, commander of Navy Carrier Air Wing Two and also commander of the Red forces participating in Roving Sands '96, said "Red forces pilots flew all the kinds of missions that they normally train for. They executed simulated bomb drops, fighter sweeps, radar jamming and anti-radiation missions (attacking antiaircraft radar sites). They also practiced airborne refueling, and the search and rescue helicopters practiced rescues from the desert."

The Blue forces were led by the major ground-based air defense unit of the exercise, the 11th ADA Brigade (Patriot), from Fort Bliss. The "Original Scudbuster" brigade of Operation Desert Storm commanded and controlled eight battalion-size ADA headquarters throughout the exercise. These eight battalions included two 11th ADA Brigade Patriot missile battalions and the brigade's Ordnance battalion. Also included were two Hawk missile battalions from the New Mexico and Ohio Army National Guards, along with a Chaparral battalion. A Canadian air defense battery and a German low-altitude air defense battery participated, along with 25 Dutch soldiers who were integrated throughout the brigade. In all, approximately 2,600 air defense soldiers fell under 11th ADA Brigade's command and control.

According to 11th ADA Brigade commander Col. Michael A. Vane, the training objectives for the brigade soldiers and units falling directly under it were to focus on planning and executing

integrated air and missile defense operations as an echelon above corps (EAC) ADA brigade, establish joint and coalition interoperability and develop and practice the tactics, techniques and procedures for operations between an EAC brigade and the Army Air and Missile Defense Command. "The brigade is working directly with counterparts from the Air Force and Navy, as well as other Army units, in trying to figure out the best tactics, techniques and procedures for tactical missile defense," said Vane at the beginning of the exercise. "A lot of tactical ballistic missile operations have been decentralized, so we will have to interface directly with the Air Force and the Navy on upper- and lower-level theater missile defense."

While the missile threat is well recognized, joint TMD doctrine and tactics, techniques and procedures for TBM engagements remain ill-defined and ambiguous. Vane described Roving Sands '96 as a tremendous opportunity for air defense soldiers to identify, define and begin perfecting joint tactics, techniques and procedures. "We are all willing to work together to optimize our capabilities to reduce the amount of missiles we actually have to fire, and increase the amount of engagements that we have," he said. "From an air defense perspective, we have tried to make this exercise as doctrinally correct as best we know a potential enemy could act. The use of TBMs and cruise missiles as strategic terrorist weapons does not have a strict set of guidelines. Optimally, we are trying to have a leakproof air defense system."



Exercise Roving Sands '96 featured the participation of the new Army Air and Missile Defense Command.

"The information we gather here at Roving Sands is used throughout the year and improved upon in every exercise," said Lt. Col. Raul Meza, deputy chief of current operations for Roving Sands '96. "This is an evolutionary process. The leadership is not interested in who wins or loses in the actual exercise, but in improving the operational systems of all sides involved. Meza emphasized the importance of the Roving Sands exercises. "With the growing world community, it is more important than ever that we are able to work together successfully with our allies," he said.

German soldiers participating in the exercise also stressed the need to practice working together as coalition forces. "Different equipment and language barriers show how difficult the exercise can be in communicating with our allies," said Lt. Col. Peter Fiolka, commander, German Air Force Fighter Wing 72, F-4 Detachment, working out of Cannon Air Force Base, N.M. "It is important that we all speak the same language, especially in terms of operational procedures." The Germans, with more than 2,300 participants, had the largest contingent of allied troops participating.

Participating for the first time in a Roving Sands exercise were members of Canada's 119th Air Defense Battery, Royal Canadian Artillery, from Canadian Forces Base, Gaagetown, New Brunswick. The unit was sponsored by the 11th ADA Brigade. Roving Sands '96 gave the unit its first chance to train as part of an air defense brigade.

As the Canadians expected, the hot desert sun melted the paint, formulated for colder, northern climes, on their non-air-conditioned Air Defense/Anti-Tank Systems (ADATSs). "This represents one of the toughest and most realistic training challenges the battery has ever taken on," said Maj. Steve

Strachan, commander, 119th Air Defense Battery. "This is the first time and the farthest the entire battery has deployed as a unit." During the exercise, the Canadian unit fired at a cruise missile-size target using a new 35mm bullet equipped with an electronic fuse. Detonating the fuse would allow the bullet to break up prior to impact, greatly increasing its chances for a kill. "To work alongside allied forces as part of the 11th ADA Brigade, against a sophisticated air threat, is an excellent opportunity for all," said Strachan.

SSDC played a major role in this year's exercise. The newly formed Army Air and Missile Defense Command operated out of the SSDC's force projection tactical operations center. The SSDC's Aerostat, a giant, sensor-equipped balloon that hovered above the Roving Sands '96 battlefield, provided "over-the-horizon" early warning and target data to the force projection tactical operations center.

The 11th ADA Brigade brought all Forces Command and coalition units together in the largest ADA live-fire exercise ever conducted. This event took place at the end of the exercise. Soldiers from more than four different countries fired six different weapon systems and a total of 108 missiles, plus some 400 rounds of 35mm Canadian Skyguard ammunition. The units fired U.S./German Patriot missiles, Army National Guard Hawk missiles, U.S./German Stinger missiles, Canadian ADATS missiles and Chaparral missiles. The tactical missile firing, which simulated combat conditions, was an invaluable experience for the German service members, according to German public affairs officer Capt. Michael Geiger. "We cannot fire any missiles in Germany," explained Geiger. "We would hit something and probably kill someone. The McGregor Range facility is ideal for the unique conditions of firing live missiles."

"What this does is allow all of the services in our military as well as those from allied nations to work and improve our capabilities; first to deter, then, if necessary, wage war against potential adversaries," said Lt. Col. Ted Goldsmith, Roving Sands '96 project officer. The exercise allows troops at all levels and from each service to use their training and experience to perform their units' individual wartime mission.

Kunkle summed up Roving Sands '96 by saying, "When some of the best air forces in the world test themselves against some of the best air defenses in the world, it is a great opportunity to keep both groups well ahead of the competition."

Cpl. Jeff Adams is an 11th ADA Brigade public affairs officer.



11th ADA Brigade soldiers move a Patriot launcher into its Roving Sands battle station.

CRUISE MISSILE SHOOT

Avenger and Linebacker score cruise missile intercepts

by Capt. Kathleen T. Gainey

Avenger and Bradley Linebacker crews successfully acquired, tracked and destroyed cruise missile surrogates during a recent air defense test and experimentation (ADTE). The ADTE was part of the Theater Missile Defense Advanced Warfighting Exercise conducted in June at Fort Bliss, Texas, in conjunction with Exercise Roving Sands '96, the world's largest air defense exercise. The first-of-their-kind engagements demonstrated that Air Defense Artillery's short-range air defense systems, when equipped with slew-to-cue capabilities and linked to the forward area air defense command, control, communications and intelligence (FAADC³) system with its associated Sentinel, can counter the cruise missile threat.

The Avenger intercept came on the morning of June 18 when a realistic, state-of-the-art missile surrogate swooped low over Fort Bliss' desert training ranges. Cued by a FAADC³ and its associated Sentinel, the Avenger slewed, acquired the target and launched a Stinger missile. The missile streaked from the Avenger launch pod, and shortly afterward, all that



SSgt. Wayne Schiele stands by his Avenger following the system's historic first intercept of a cruise missile surrogate.

was left of the cruise missile surrogate was a smudge of dark smoke on the desert floor.

Not to be outdone by the Avenger team, the Bradley Linebacker crew went into action the following morning. The scenario was identical. The cruise missile surrogate made its pass and, on cue, the Linebacker's turret slewed toward the target. "Target, cruise missile, hostile!" yelled SSgt. Duane Shaw. A Stinger missile erupted from the Linebacker's launch pod, and once again a surrogate cruise missile became a pile of debris.

A manportable Stinger team, led by Sgt. Eric Stanley, got in on the ADTE action. Cued by the FAAD C³I system and Sentinel, Stanley's Stinger missile gunner, Spec. Wade Willis, shot down a ballistic aerial target simulator.

The Cruise Missile ADTE incorporated some historic firsts. It was the first time the FAAD C³I system and Sentinel worked in tandem to detect a cruise missile and relay target data to an Avenger, Linebacker and Stinger team. It was the first time the very capable Stinger Block I missile intercepted a target. But most importantly, the Cruise Missile ADTE demonstrated, for the first time, the capabilities of Air Defense Artillery's system of short-range air defense systems working near the optimum level.

The 2nd Battalion, 6th Air Defense Artillery, Fort Bliss, furnished the ADTE manportable Stinger team and Avenger and Bradley Linebacker systems and crews. Soldiers of the 1st Battalion, 3rd Air Defense Artillery, 3rd Infantry Division, Fort Stewart, Ga., operated the Air Battle Management Operations Center, the FAAD C³I system and ground-based sensor.

The ADTE accurately portrayed the combat-multiplying effects of the FAAD C³I system and Sentinel, effectively demonstrated the lethality of the Stinger Block I missile and showcased the Bradley Linebacker. Perhaps most importantly, the ADTE emphasized the importance of slew-to-cue capabilities.

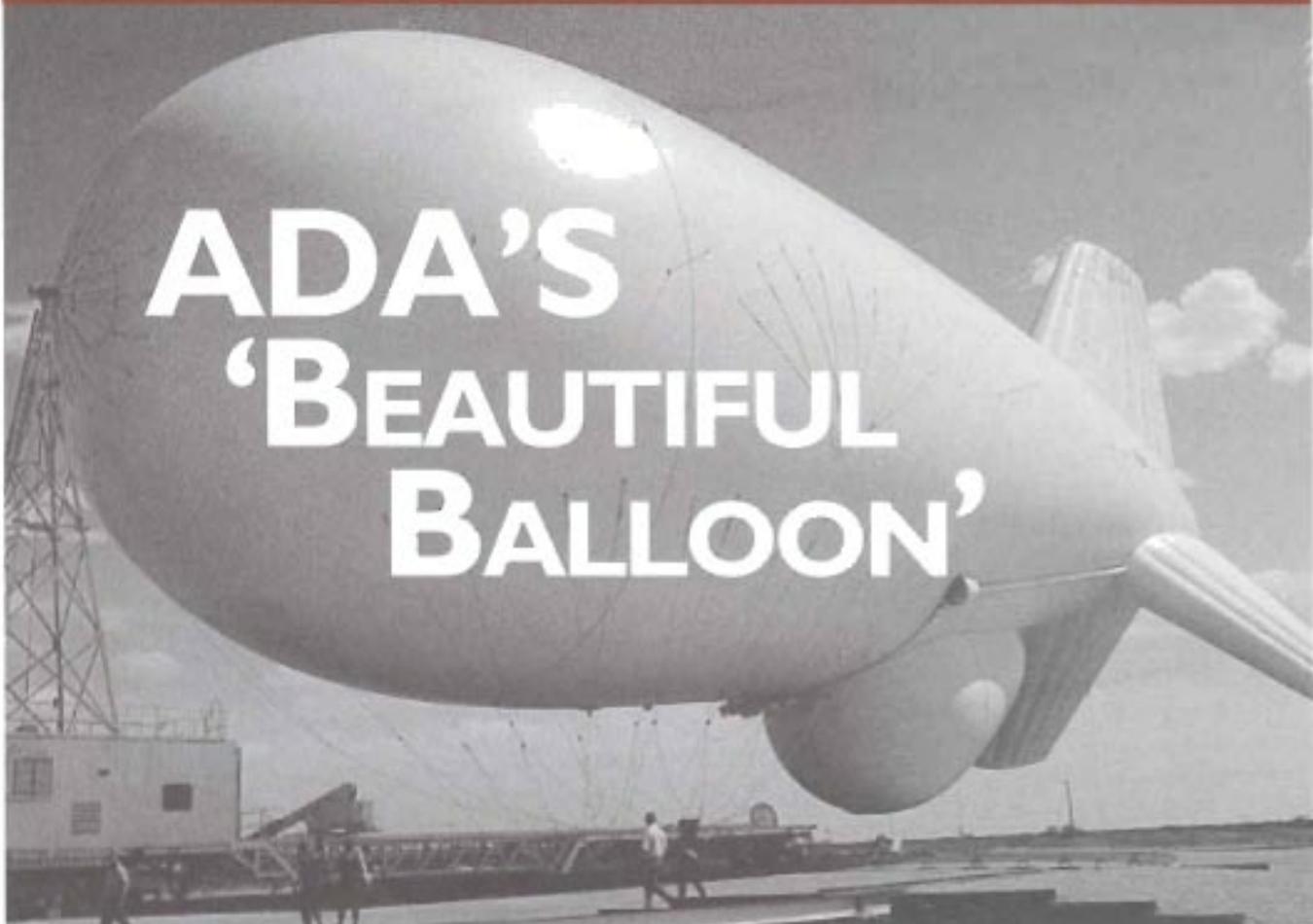
Slew-to-cue capabilities automatically rotate the Linebacker and Avenger turrets toward the targets, so that the targets appear in the gunners' sight reticles. Otherwise, it would have been impossible for the gunners to acquire and engage the fast-moving cruise missile surrogates. In addition to slew-to-cue capabilities, the two systems were equipped with enhanced position location and reporting systems (EPLRSs) that provided the fire units with an automatic interface with FAAD C³I, the air battle management operations center and the Sentinel. This integrated, automated network proved crucial in helping the gunners acquire the low-observable cruise missile surrogates. The cruise missile surrogate, an MQM-107D, flew fast and low, reducing reaction time for both Avenger and Linebacker crews.

"Cruise missile proliferation will increase as a result of the highly publicized operational debut of cruise missiles during Operation Desert Storm," said Lt. Col. Thomas Flynn, the chief of the Air Defense Lab, Fort Bliss. "Their low cost and high lethality makes proliferation inevitable. We therefore consider cruise missiles to be one of the most stressful near-term threats. The Cruise Missile ADTE demonstrated that short-range air defense can combat the cruise missile," he continued. "We are optimistic that the ADTE will encourage funding for slew-to-cue capabilities for Avenger and Linebacker. We expect to see new tactics and doctrine developed to effectively exploit this capability."

Capt. Kathleen T. Gainey is assigned to the Air Defense Lab, Directorate of Combat Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.



Spec. Larry Shelton follows SSgt. Duane Shaw out of their Bradley Linebacker as Sgt. Richard Bailey prepares to exit the vehicle. They had just become the first Bradley Linebacker crew to intercept a cruise missile surrogate.

A large, white, teardrop-shaped aerostat balloon is being inflated on a launch pad. The balloon is the central focus, with its tail section extending to the right. In the background, there are launch pad structures, including a tall lattice tower on the left and various support buildings. The sky is overcast with grey clouds. The text "ADA'S 'BEAUTIFUL BALLOON'" is overlaid in large, white, bold letters across the middle of the balloon.

ADA'S 'BEAUTIFUL BALLOON'

Roving Sands' 'Eye in the-Sky'

By Connie M. Davis & Mike Cochran

Today, when most soldiers think of balloons, they probably think of toy balloons children blow up for birthday celebrations or giant advertising blimps that hover over football stadiums. However, soldiers who participated in Exercise Roving Sands '96 think of balloons from a different perspective. Throughout the giant air defense exercise, which drew more than 14,000 troops from around the world to the desert training ranges surrounding Fort Bliss, Texas, a huge, white balloon called the "Aerostat" hovered 10,000 feet above the simulated battlefield.

The U.S. Army Space and Strategic Defense Command's Aerostat, a 233-foot-long, helium-filled balloon, was launched by the Joint Aerostat Project Management Office above McGregor Range, N.M. During Roving Sands, the Aerostat sensor detected, located and tracked approximately 65 targets each hour. The Aerostat transmitted target data to the force projection tactical operations center, located 60 miles away, which in turn relayed the data to the Army Air and Missile Defense Command center. The command center forwarded the data to alert Patriot and short-range air defense units.

"As it turned out," said Col. Herbert Carr, Aerostat project manager, "as soon as people knew we had it, everyone wanted it." He meant that players in the exercise wanted the Aerostat radar information sent to them directly.

The Aerostat provides the battlefield commander with a "new set of eyes" to see over the horizon. When flying at its highest altitude of 15,000 feet above ground level, the Aerostat sensor can locate and track targets within a 200-mile range. It gives the battlefield commander early warning of air and ground threats previously hidden from view. The Aerostat is particularly effective at detecting low-flying cruise missiles.

"Roving Sands was a golden opportunity for us to interface with military units and get early feedback from the soldier," said Maj. Matthew Warren, the Space and Strategic Defense Command's Aerostat test and plans officer and site director for the Aerostat's Roving Sands' demonstration.

The expense of using a single Aerostat platform to perform 24-hour operations is considerably less costly than using several manned aircraft to perform the same function. It is filled with 590,000 cubic feet of nonexplosive, nonflammable helium and has a hull volume two and a half times the volume of the largest advertising blimps flying today. The Aerostat's structure is made from highly durable laminated film and fabric that feels like a very strong piece of vinyl.

Aerostats differ from blimps, or air ships, in that blimps are powered and Aerostats are tethered, or anchored, to the ground. The Aerostat is anchored to its mooring system by a single tether cable that has a break strength of 75,000 pounds. The tether also supplies electrical power to the Aerostat. Radio frequency links allow operators to control the Aerostat from the ground station and to receive radar data. The Aerostat program is currently in the concept definition phase. The project office uses an Aerostat borrowed from the U.S. Air Force for experimentation and demonstration.

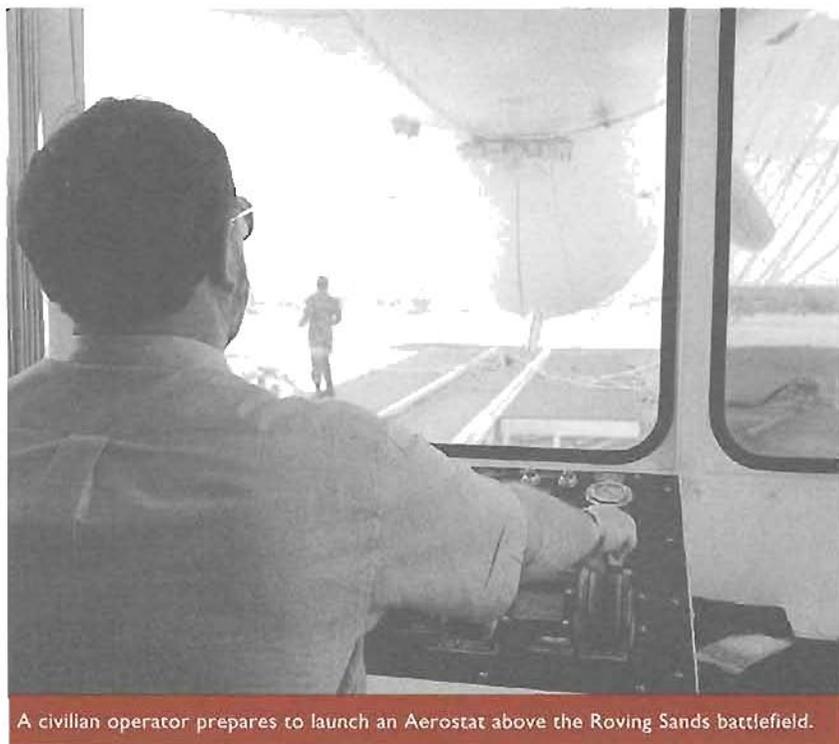
The Aerostat equipment employed during Roving Sands included a 71mm Aerostat system with an onboard AN/TPS-63B radar. Data was transmitted directly to a ground processing station via radio frequency links. At the ground station, radar data was converted to tactical data information link-B, or TADIL-B, track information and sent to the Army Air and Missile Defense Command's force protection tactical operations center via secure telephone unit (STU-III). The Aerostat radar and information distribution equipment used during Roving Sands were off-the-shelf surrogates, but the Army hopes to deploy a combat-ready system early in the next century.

Last fall, Undersecretary of Defense for Acquisition and Technology Paul Kaminski and Admiral William Owens, chairman of the Joint Chiefs of Staff, made Aerostat a near-term cruise missile defense priority. They created a joint program office, headed by Carr, that opened in Huntsville, Ala., in February. The Joint Aerostat Project Management Office is a component of the U.S. Army Space and Strategic Defense Command's Sensors Directorate. The U.S. Army Air Defense Artillery School, Fort Bliss, was named proponent for Aerostat.

Throughout FY97, the joint project office will focus on Aerostat demonstrations and the Aerostat acquisition program. Accordingly, the joint project office is establishing an Aerostat testbed at McGregor Range, N.M. McGregor Range is part of the Fort Bliss military reservation.

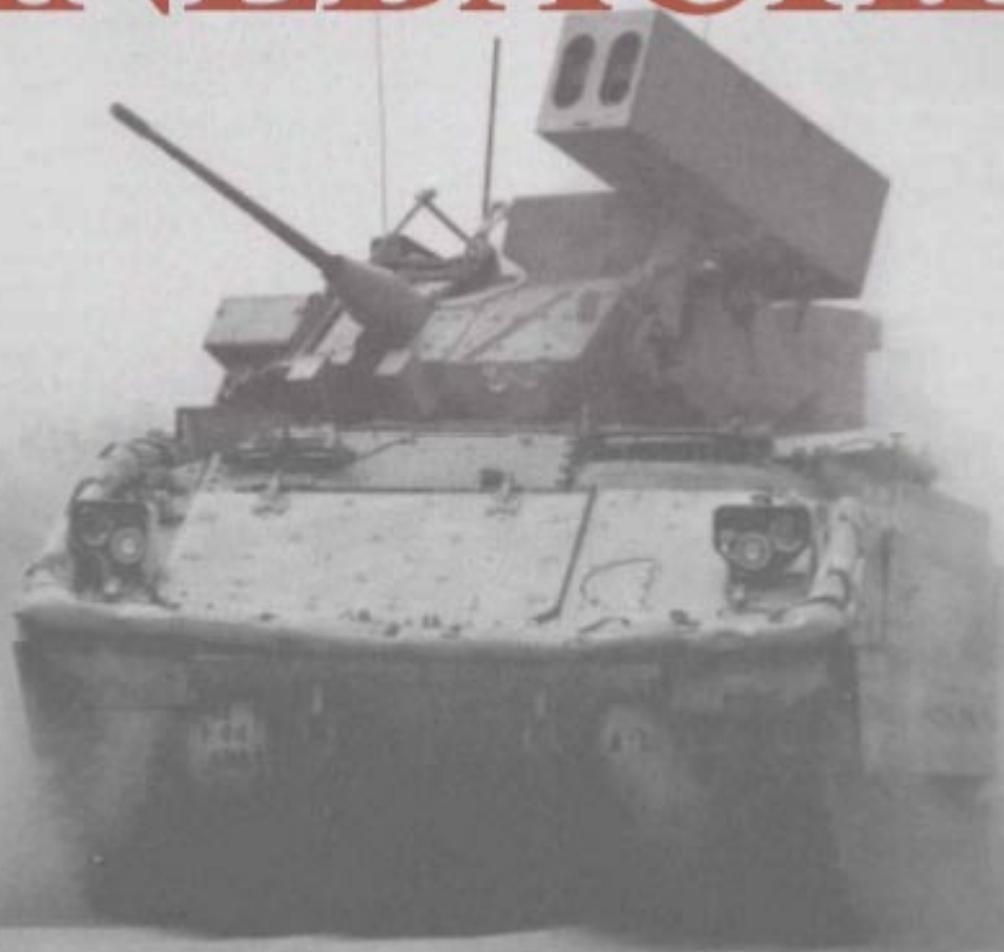
Military observation balloons floated over Civil War battlefields and above the trenches of World War II. Antiaircraft artillerymen who waded ashore at Normandy on D-Day, 1944, ignored mortars and machine-gun fire to launch barrage balloons to protect the invasion beaches. Now, the Aerostat promises to make the balloon a part of the Army's future, not just a relic of the Army's past. The Aerostat team, which has adopted the Fifth Dimension tune "Up, Up and Away in My Beautiful Balloon" as its theme song, hopes to have their first tactical Aerostat prototype "up, up and away" by 2001.

Connie M. Davis is editor of *The Eagle*, U.S. Army Space and Strategic Defense Command, Public Affairs Office, Huntsville, Ala. **Mike Cochrane** works for the Air Defense Lab, Fort Bliss, Texas.



A civilian operator prepares to launch an Aerostat above the Roving Sands battlefield.

BRADLEY LINEBACKER



**New ADA System Moves
Closer to Fielding**

A/I-44 ADA Tests Rapid Acquisition System

by 2nd Lt. Kenneth O'Donnel

While most of the media attention has focused on the debate over national and theater missile defense systems, Air Defense Artillery has made dramatic progress in short-range air defense (SHORAD). This past summer, soldiers of Alpha Battery, 1st Battalion, 44th Air Defense Artillery, Fort Hood, Texas, pushed Air Defense Artillery's newest weapon system — the XM-6 Bradley Linebacker — closer to eventual fielding. Milestones include a dramatically successful live-fire test; the incorporation of forward area air defense command, control and intelligence (FAAD C²I) interfaces; the integration of Force XXI applications; and the long-awaited linkup with the FAAD ground-based sensor (GBS).

The Bradley Linebacker, one of three weapon systems being fielded under the Army's new rapid acquisition program, has a complex lineage. Col. V. J. Tedesco, then deputy assistant commandant of the U.S. Army ADA School, first suggested "Linebacker" as the nickname for the Army's Air Defense/Antitank System (ADATS). His contemporaries figured he'd come up with the nickname only because he'd graduated from Penn State University, more popularly known (at least in sports circles) as "Linebacker U," but Tedesco disagreed. ADATS was conceived as the linchpin of Air Defense Artillery's FAAD system, a "system of systems" approach that the Army adapted to fill the gap left by the cancellation of the Sergeant York Gun program. ADATS was envisioned as the FAAD system's line-of-sight-forward (heavy) component. It was supposed to have rumbled into combat right alongside our M-1 battle tanks and Bradley Fighting Vehicles. Such a system, Tedesco argued, should be



a hard-hitting, mean machine with many of the characteristics attributed to football linebackers — speed, agility, strength, durability, lethality and the attitude of a more-ornery-than-ordinary junkyard dog.

The Army approved Tedesco's suggestion, but then scrapped ADATS along with many other proposed weapon systems that were unceremoniously dumped into the dust bin of the Cold War. Meanwhile, Tedesco retired and the term FAAD grew obsolete. (The Bradley Linebacker and Avenger are now properly referred to as SHORAD systems. The FAAD C²I suite maintains the "FAAD" nomenclature primarily to avoid inserting confusion into the ongoing acquisition and procurement process.) However, the Linebacker nickname survived, thanks to Maj. Gen. John Costello. The chief of Air Defense Artillery recommended that the Army name the Bradley Stinger Fighting Vehicle-Enhanced (BSFV-E) the "Bradley Linebacker." The system should always be referred to as the "Bradley Linebacker," in tribute to the revered World War II commander, Omar Bradley, never simply as the "Linebacker."

The Bradley Linebacker, originally scheduled for fielding in spring 1998, is now being fielded as a rapid acquisition

item. It owes its existence to post-Cold War force reductions that freed up Infantry and Cavalry Bradley Fighting Vehicles for conversion to Bradley Stinger Fighting Vehicles (BSFVs). Stinger teams traded in their Humvees for BSFVs. It was hoped that the BSFVs could keep up with the units they supported. The problem was that, to engage hostile aircraft, the BSFV crews had to lower the ramp and dismount Stinger teams. This maneuver exposed the Stinger team to indirect and direct fire. The supported task force either had to slow down or stop, while under air attack, or leave the BSFV and its dismounted Stinger teams behind. Most task force commanders sensibly chose the latter option. This caused the air defense coverage to lag because the BSFV could not maintain pace with the task force. The BSFV has other limitations, including inadequate target acquisition and identification, since it was not integrated into the FAAD C²I system. The Stinger teams aboard the BSFVs had no automatic target orientation and were "eyeball dependent."

The Bradley Linebacker, by contrast, is equipped with a standard vehicle-mounted launcher (SVML), or Stinger pod, that permits the crew to engage aircraft from inside the armored vehicle. A Stinger sight reticle has been added that permits the gunner to manipulate the four-missile SVML. All systems are integrated with FAAD C²I. Its shoot-on-the-move capability permits it to engage targets while keeping pace with supported units. The Bradley Linebacker's slew-to-cue capability permits it to counter cruise missiles and makes it even more effective against rotary- and fixed-wing aircraft. The system's shoot-on-the-move capability and ability to engage targets at night give the task force commander 24-hour air defense coverage.

The nickname Bradley Linebacker, therefore, fits the BSFV-E to a "T." The Bradley Linebacker is lethal, rugged, maneuverable, durable and survivable. Like a junkyard dog, its bite is even worse than its bark. It's a worthy successor to the "Triple A" half-tracks of World War II, the "Flak Wagons" of Korea and the "Dusters" of Vietnam.

For the past five months, A/1-44 ADA has been going through the initial stages of fielding the Bradley Linebacker. Testing and fielding any new weapon system is a challenge, but throw Task Force XXI exercises and



SSgt. Eugene Lumar of 1-44 ADA searches for aircraft during a test conducted by the Air Defense Test Directorate at Fort Bliss, Texas.

advanced warfighting experiments (AWEs) into the mix, and the task grows even more daunting. Still, when I-44 ADA was selected to be the first unit to field and test the Bradley Linebacker (then still known as the BSFV-E), we could not bottle up our enthusiasm. We knew what the new system meant to the Army and to the future of Air Defense Artillery as a combat arm, and we were proud to have been chosen to shoulder such an awesome responsibility. As Air Defense Artillery's newest system, the Bradley Linebacker will lead the "First to Fire" branch into the 21st century.

At the soldier level, Bradley Linebacker fielding to date has consisted of three stages: Force XXI modifications, modification classes and new equipment training (NET). The Force XXI modifications that turned our BSFVs into Bradley Linebackers were made at Fort Hood. In theory, the modification process was simple, but in practice, with an entire brigade sending weapon systems to the same facility for modification, it became frustratingly time-consuming.

Once the modifications were complete, our soldiers attended Force XXI classes on the new equipment. The first class, taught by instructors from TRW and the U.S. Army Air Defense Artillery School, introduced the FAADC² simplified handheld terminal unit (SHTU).

The SHTU establishes and maintains data and voice communication links through interfaces with single-channel ground and airborne radio systems (SINCGARSS) and Enhanced Position Location Reporting Systems (EPLRSs). Linked to a ground-based sensor (GBS), the SHTU provides early warning down to individual fire units. The SHTU, which resembles a laptop computer, is a prime example of how information technology is transforming the battlefield. Air tracks that appear on the SHTU display can be distinguished as rotary- or fixed-wing aircraft or missiles and can be identified as friendly, hostile or unknown.

The SHTU displays all available information. Once the data is distributed to a fire unit, the Bradley Linebacker's slew-to-cue capability permits the gunner to automatically slew the system onto the target that the commander has "hooked" and determined to be most dangerous. The SHTU has been fielded by other ADA units, but our training focused on its integration with other Force XXI systems such as the Applique User NET. The Applique laptop provides soldiers in the field with a degree of battlefield situational awareness that would have been unimaginable a few years earlier. The system has built in overlay functions, prefabricated skeleton orders, map graphics and many other timesaving features.



Sgt. Cedric Gray checks his SHTU for hostile aircraft.

The Force XXI training certified that our soldiers were trained on these new systems that are so vital to the Bradley Linebacker's effectiveness. The classes helped build our soldiers' confidence in themselves and in the new equipment.

In April, members of the 2nd Platoon ("Cold Steel"), A/1-44 ADA attended the Bradley Linebacker Operator NET Course conducted by Boeing at Redstone Arsenal, Huntsville, Ala. A 60-hour course trained platoon members on every aspect of the system and its operation. The most difficult portion of the training was learning the system initialization procedures. Getting the Bradley Linebacker up and ready for action was complicated by the integration of so many new components.

Boeing has designed a new Bradley Linebacker virtual prototype simulator (VPS) that incorporates the SVML into training simulations. It replaces the Bradley Fighting Vehicle unit conduct-of-fire trainer, which was designed chiefly for ground engagements and fire-command evaluation. The VPS incorporates each Bradley Linebacker crew member into training simulations and trains them in their battlefield responsibilities.

The 2nd Platoon also served as the "prove-out" unit for the Bradley Linebacker force-on-force trainer (FOFT). Their objective was to determine the FOFT's ability to operate successfully in a tactical environment and to perform laser

operational and system retention checks while engaging targets flying differing mission profiles at various ranges.

The Operator NET provided our soldiers their most valuable training. It also produced vital operator feedback to the contractor, Boeing, for further system improvements.

In July, A Battery conducted the first Bradley Linebacker gunnery, consisting of Tables V-X. The system stood tall during the rigors of live-fire training. Table X, aerial gunnery, included a Stinger live-fire. The crews were filled with anticipation and exhilarated at the dramatic results. The battery scored six direct hits and one tactical kill with eight missiles.

Later the same month, the battery's "connectivity trials" coincided with the long-awaited arrival of the FAAD GBS. The main focus of the exercise was on the integration of the Force XXI systems, particularly the Applique computer. After days of troubleshooting, the system was finally operational. At the end of the week, all the elements — situational awareness and slew-to-cue capabilities — came together, and our soldiers operated the Bradley Linebacker, for the first time, at near its full operational capabilities.

A/1-44 ADA's training will continue at a high tempo. Only time will tell how the Bradley Linebacker will hold up under the stress of day-to-day train-

ing. At present, it appears to be an outstanding system that will permit Air Defense Artillery to match the progress it has made in theater missile defense in SHORAD. With all systems "go," there should be no stopping the Bradley Linebacker or the soldiers of A/1-44 ADA. They have met every challenge with the adaptability, tireless effort, skill and motivation characteristic of ADA soldiers. They will do their part to keep Air Defense Artillery "First to Fire" in the 21st century.

2nd Lt. Kenneth O'Donnell is platoon leader, 2nd Platoon, A/1-44 ADA, Fort Hood, Texas.



The responsibility for testing and evaluating the Bradley Linebacker belongs to the Air Defense Artillery Test Directorate (ADATD), U.S. Army Test and Experimentation Command, Fort Bliss, Texas. "Operational testing — testing with trained soldiers manning the weapon system under realistic tactical conditions while defending against a realistic air threat — is critically important to the Army and to the Department of Defense leadership," said Col. Enrique A. Janer, ADATD director. He said that only under these conditions can new equipment be judged effective and suitable for 21st century soldiers.

The Bradley Linebacker's selection as a rapid acquisition product makes it a high-profile system. Soldiers test-

ing the equipment know the eyes of the Army are upon them, and they appreciate the importance of their mission.

"We are definitely more confident than we were before. All we had before was the main gun, and the rest of the time we were just taxis for Stinger crewmen," said Sgt. Cedric D. Gray of A/1-44 ADA, the Bradley Linebacker test unit. "It's great being able to test something that hasn't been fielded yet and be able to affect the results. There aren't many soldiers who can say they tested such-and-such equipment. I can say, 'I remember when the Army didn't have this.'"

— Spec Michael Scott
Fort Bliss Public Affairs Office

**Avenger
never sleeps,
but Avenger
crewmembers,
sooner or
later, must.**



*Closing the gap between Avenger system
performance and crew capabilities*

Avenger Sustainment

by 2nd Lt. Stephen D. Terstegge

According to Army lore, the surest way for a second lieutenant to get a laugh, or evoke outright derision, is to preface a sentence with the phrase, "Based on my experience . . ." Nevertheless, I have observed, during my past 10 months as an Avenger/Stinger platoon leader, that the Avenger's around-the-clock operational capability creates a significant gap between system capabilities and crew capabilities. We must close this gap if Avenger is to be employed at its full potential.

In concept and in theory, Avenger is a superior system. No air defense platform matches Avenger's ability to deliver low-altitude air defense under a variety of conditions. Its high mobility, forward-looking infrared (FLIR) system and M-3P machine gun are a lethal combination. The Avenger's FLIR cuts through smoke, fog and other obscurants, and permits Avenger gunners to acquire and track targets at night and during adverse weather conditions. In an era when global

advances in night-fighting capabilities are placing increased stress on all battlefield operating systems, the Avenger is touted as a 24-hour-a-day system that can get the job done.

Within computer matrices, on a computer-simulated battlefield, Avenger operates around the clock at peak efficiency. It operates less efficiently with a crew of flesh and blood in the dirt and dust of combined arms training centers. Avenger never sleeps, but Avenger crewmembers, sooner or later, must. Avenger's two crew members must both be fully alert to operate the system at its full potential. Unfortunately, they can stay awake only so long before fatigue and the "zombie-like effects" of sleep deprivation degrade, and finally destroy, their combat effectiveness.

The gap between Avenger system capabilities and Avenger crew capabilities seems obvious. Most newly assigned Avenger platoon leaders probably wonder, as I did, why personnel experts failed to foresee the problem when they

first allotted Avenger two-man crews. The answer, it turns out, is that the Army knew all along that the two-man crew configuration wasn't optimal. Prior to Avenger's initial fielding, the Office, Chief of Air Defense Artillery (OCADA), U.S. Army Air Defense Artillery School, which functions as the proponent office for Air Defense Artillery, fought a sustained battle to place three-man crews on Avenger. The problem is that there wasn't enough force structure to go around. Air Defense Artillery abandoned its campaign for a three-man Avenger crew after Department of the Army force structure decisions made the two-man Avenger crew a "take it or leave it" proposition. The branch's decision to take it rather than leave it is one with which no Avenger platoon leader, aware of the system's vast potential, would disagree. It is up to us to devise tactics and techniques that narrow the system/crew capability gap and permit us to employ Avenger at or near its peak performance level.

At present, there is little doctrinal guidance to assist us in this task. FM 44-16, *Platoon Combat Operations: Chaparral, Vulcan and Stinger*, was published in May 1987. Chapter 4, Section IV, "Sustained Operations," provides the only presently fielded guidance for sustained operations.

"... units must be well trained to adapt to the concept of around-the-clock operations. Unit leaders must understand the psychological and physiological effects that sustained operations will have on their soldiers. Loss of sleep reduces both physical and mental effectiveness. Soldiers become less alert, have trouble focusing on a task for more than a brief period, and experience short-term memory loss, making it difficult to learn new information or to remember new orders or missions."

Chapter 4 says soldiers should get at least four hours of sleep every 24 hours and that "acceptable performance can be sustained on this amount of sleep for several weeks." However, it warns that anything less can result in "serious performance degradation." The field manual advises units to enforce sleep rotation schedules, rotate tasks between cross-trained crew members and put crews on lower states of alert at night if the situation permits.

FM 44-16, however, was written for air defense systems that have very limited (Chaparral) or no (Stinger and Vulcan) night capabilities. FM 44-64, *SHORAD [Short-Range Air Defense] Battalion and Battery Operations*, which is scheduled for publication within a few months, makes only passing reference to the Avenger sustainment problem. Oddly, this reference occurs in a short section titled "Soldier Care" in a paragraph subtitled "Health." "Health concerns can play a major role in how successfully air defenders can take the fight to the enemy," FM 44-64 advises. "For example, the limitations of an Avenger two-man crew might give serious consideration to sleep rotation plans. Given the 24-hour capability of the system, degraded operations will be clearly evident within 48 hours of the start of the operation." Although it's comforting to know doctrine writers assume that today's SHORAD soldiers can do without sleep 12 hours longer (48 hours vs. 36) than SHORAD soldiers of a decade ago, there is still no set doctrine (although doctrine writers are working on the problem) that specifically addresses sustained Avenger operations in a manner helpful to Avenger platoon leaders.

It has been my observation that most Avenger platoon

leaders, in the absence of specific doctrine, select options that inevitably produce disastrous results. An Avenger crew consists of only two soldiers. Since they are responsible for monitoring the air and ground situation around the clock, fatigue sets in fairly quickly once operations are underway. Typically a crew will reconnoiter, surveil and select primary and alternate firing positions within the first six to eight hours.

Next, the crew usually opts for one of two modes of operation, and this is where the trouble begins. The first option is a rest/security plan.

Concern about the Avenger's two-man crew surfaced prior to system fielding.



Two fully alert crew members are required to operate the Avenger air defense system at its full combat effectiveness.

One crew member rests while the second stays alert and performs all necessary functions. The second option is simultaneous operations. Both crew members stay fully alert.

A crew that selects the first option might immediately put its rest/security plan into effect, leaving one crew member "on the system" while the other crew member rests or sleeps. The problem is that the active crew member, "remoted out" in a fighting position with the remote control unit, cannot by himself effectively track early warning, monitor the platoon radio net, scan for targets and provide his own ground security. Since the Avenger is a high-priority target, the lack of adequate security is a major concern. The combat vehicle crewman's helmet degrades his hearing, making it unlikely that he would detect the approach of anything less stealthy than an armored brigade. Combat effectiveness is reduced when less experienced crew members take their turns on alert. Both crewmen can rest during the hours between dusk and dawn provided they are protecting a static target, the air threat suspends operations for the night, and there is no threat of a nighttime ground attack. Usually — almost inevitably — the crew repositions itself or conducts a survivability relocation at night, necessary tactics that increase fatigue.

Since Avenger crews recognize that two pairs of eyes and ears are better than one, some crews may opt to conduct continuous operations with both members alert at all times. This increases their probability of aircraft engagement and provides better situational awareness, thereby increasing their odds for survival. This option is optimal for wars that last no more than 36 hours. After 36 hours, according to my observations, fatigue sets in, mental alertness slips and performance levels significantly decline.

Any Avenger crew that exercises either option in sustained Avenger

operations is doomed. A crew that exercises the rest/security plan option may physically be able to sustain operations longer, provided they are not constantly moving, but inadequate security makes the crew highly vulnerable. A team that exercises the second option is highly effective for about 36 hours, but then sleep deprivation and prolonged mental and physical exertion take their toll. They may still be awake, but they will no longer be alert or capable of making the right decisions quickly. It is my belief that in a prolonged conflict either crew will quickly become a casualty of war.

Fortunately, trial and error have produced other options, or mixes of options, that can sustain Avenger crew capabilities without sacrificing Avenger system capabilities. These options are available to Avenger platoon leaders willing to embrace acceptable degrees of risk.

To determine the extent to which he can downgrade his crew's state of alert, an Avenger platoon leader must first determine the enemy's night-fighting capabilities. He can make this determination by developing a night intelligence preparation of the battlefield (IPB) that defines the courses of action and air avenues of approach available to the enemy after dark. Of course, the greater the enemy's night capability, the greater are his possibilities for courses of action at night. The platoon leader should base his night IPB on the night capabilities intelligence sources attribute to the enemy, his knowledge of opposing force doctrine and the enemy's demonstrated course of action during daylight hours.

Once the night IPB is completed, the platoon leader has several options. First, he may elect to leave all his fire units in place, thereby keeping his "air defense umbrella" over his protected assets. This option briefs well, but over time degrades the platoon's ability to provide air defense.

Second, the platoon leader may elect to conduct survivability moves or reposition fire units during the night. This degrades the air defense umbrella while fire units are on the move, but will increase their long-term survivability. After several moves, however, crew performance becomes severely degraded.

Third, the platoon leader may choose to augment fire units positioned along the most likely nighttime air avenues of approach by col-

Sustainment techniques frequently impose varying degrees of acceptable risk.

Spec. Michael Gurlea of D/3-4 ADA digs himself and an Avenger remote control unit into a remote fighting position.



locating another Avenger crew or Stinger For purposes of augmentation, he should select an Avenger or cross-trained Stinger team that has been covering an air avenue of approach that he has templated as unlikely to be used during hours of darkness. In this way, a full crew can man an Avenger system covering an important air avenue of approach while the other crew rests. The augmentation option, which requires units with Stinger sections to cross-train Stinger teams on the Avenger, ensures continuous security for the supported unit or defended assets while sustaining crew combat effectiveness.

The fourth option, available only when the air threat is minimal, is for the platoon or section to establish a night defensive position (NDP). An NDP affords great ground security, but continual advances in capabilities to wage war around the clock have, for the most part, made them a thing of the past. An Avenger platoon leader should establish an NDP only when the fatigue factor makes it absolutely necessary, and even then he should push air guards out along likely enemy air avenues of approach.

A fifth technique a platoon leader can employ to sustain his Avenger teams is a relief-in-place after dark. Fire units simply switch out positions during the night. A benefit of the relief-in-place technique is that the fire unit itself never has to move; it can be accomplished simply by rotating crews. A relief-in-place can be used in conjunction with an NDP, permitting a full, cross-trained platoon to monitor three main air avenues of approach during hours of darkness.

No matter which option he chooses, the Avenger platoon leader should take advantage, when possible, of manpower available from supported units. This can mean either requesting personnel to support a fire unit at its position or integrating Avenger positions into established assembly areas and battle positions.

In selecting a sustaining technique, the platoon leader must keep in mind that each fire unit must be in its assigned position, emplaced and prepared for action, prior to stand-to. Above all, the platoon leader must keep the current enemy situation and his battery commander's and his supported unit commander's intent in mind when choosing which sustainment option to exercise.



Sustainment techniques can close the gap between system capabilities and Avenger crew capabilities.

Units with Stinger sections can augment Avenger crews with cross-trained Stinger teams.

Sustainment techniques that create potential gaps in nighttime air defense coverage are based on acceptable risk. On a map, they do not create the sort of range rings that a maneuver commander is used to seeing, but they still afford him the promised degree of protection. By sustaining Avenger crew combat effectiveness, they provide the maneuver commander force protection throughout sustained operations.

Nighttime engagement technology cuts both ways. In the future, advances in night vision technologies and their proliferation will permit

the air threat, appearing more and more frequently in the form of unmanned aerial vehicles and cruise missiles, to operate around the clock. Since firing expensive Patriot missiles or Theater High-Altitude Area Defense missiles at inexpensive unmanned aerial vehicles or cruise missiles is not cost effective, Avenger will bear the primary responsibility for countering them.

Air Defense Artillery's Avenger soldiers, therefore, must shoulder an ever-increasing responsibility. The Army is asking a lot of Avenger, but the system is fully capable of meeting the demands placed on it by evolving air threat technologies, the changing nature of warfare and the accelerating tempo of combat operations. Innovative, carefully employed sustainment techniques will permit us to accomplish the mission by matching peak system performance capabilities with peak crew performance.

2nd Lt. Stephen D. Terstegge is an Avenger/Stinger platoon leader assigned to D Battery, 3rd Battalion, 4th Air Defense Artillery, 82nd Airborne Division, Fort Bragg, N.C.



Apaches & Dragons

ADA
in
Bosnia

River crossings have been considered among the riskiest of military operations since 49 B.C., when Julius Caesar led his legions across the Rubicon into Italy (an act, under Roman law, tantamount to treason) and started the civil war that was to make him emperor. "The die," said Caesar, "is cast." The Sava River crossing, which, at the beginning of 1995, introduced U.S. combat forces into Bosnia-Herzegovina, was not nearly so dramatic. The mission of U.S. soldiers headed into the Balkans was to maintain a fragile truce, not start a civil war. Still, the Sava River crossing was a significant roll of the dice. Across the river lay the Balkans, the scene of carnage, atrocities and "ethnic cleansings" that produced video clips that looked like outtakes from old newsreels of the Holocaust. Across the river lay the answer, or at least a part of the answer, to the question of whether the "new world order," so optimistically forecast at the end of the Cold War, would instead degenerate into "new world disorder." "5-3 ADA in Operation Joint Endeavor," appearing in the July-August 1996 issue of ADA magazine, told the story of 5-3 ADA in the Balkans from a battalion perspective. The following articles tell portions of the same story from the perspective of, first, an ADA platoon and, second, an ADA battery.



No bridge since World War II's famed "Bridge at Remagen" had attracted so much attention as the bridge across the Sava River. Bridging the Sava was, in fact, the Army's largest river crossing operation since World War II. Floodwaters turned what would have been simply a major engineering feat into a monstrous undertaking.

On the far side of the river, an army of reporters and cameramen impatiently awaited their first big photo opportunity — the moment when Army engineers would complete the bridge across the swollen river and the first U.S. battle tanks would roll across into Bosnia. The decision to put U.S. combat forces between the Balkans' "previously warring factions" had already generated plenty of dire predictions, and here we were, stuck on the wrong side of a raging river.

Apaches

by
1st Lt. Michael A. Tacto



A D/5-3 ADA Avenger crosses the Sava as A/5-3 ADA stands guard.

The soldiers of A Battery, 5th Battalion, 3rd Air Defense Artillery, thought it unlikely that aircraft would attack the bridge, or that any aircraft that did attack would last very long. Still, the threat of an air attack was a real concern. We knew that Task Force Eagle would be particularly vulnerable as it crossed the Sava, and that the river crossing offered any faction leader hoping to turn American public opinion against the controversial Balkans intervention an opportunity that might seem too good to pass up.

So we took the air threat very seriously, and had been taking it seriously long before we arrived on the banks of the Sava River. At 2030 on Dec. 14, 1995, I was in my office at McCully Barracks, Germany, going over load plans when I heard a soldier running down the hall. He was screaming: "They signed it! They signed it! We are going to Bosnia!"

Representatives of the warring factions in the Balkans had signed the Dayton Peace Accord, clearing the path for U.S. intervention. I knew all of our training the past two years, especially the last two months of pre-deployment training, was going to finally pay off. Task Force Eagle was deploying to Bosnia-Herzegovina.

Deploying with A/5-3 ADA as a Bradley Stinger Fighting Vehicle (BSFV) platoon leader involved much more than going to the railhead site and moving out. It entailed planning and rehearsing every possible course of action.

My platoon had the mission to support 1st Brigade, 1st Armored Division (1-1 Cav), by providing air and ground defense of the bridge crossing site on the Sava River. Prior to the deployment, I spent hours planning and coordinating the river defense at brigade headquarters. Thanks to a video that Col. John Batiste, the brigade commander, made during a leader's reconnaissance, I knew the layout of the Sava River bridgehead. I used this knowledge to plan and conduct rehearsals for the upcoming deployment.

My plan was to deploy the heavy BSFV section (three BSFVs) with the two companies covering the near side. My light BSFV section (two BSFVs) was to raft across the river with the element tasked to secure the far side. This plan was very flexible. We rehearsed different scenarios daily at the platoon and squad levels.

The battery planned and coordinated the deployment. Flexibility was the key to success. We planned ammunition receipt and upload in detail. The battalion did not initially know which railhead we would use, or the schedule for movement to the railhead. So we rehearsed options that covered two different railhead sites and three different ways of getting there. Thanks to prior planning, we had no problems deploying when orders to proceed to a railhead arrived.

On Dec. 7, 1995, A Battery moved to the Bad Kneuznach Storage Site, where we uploaded the vehicles with their basic loads of ammunition. Then we proceeded to the railhead site and loaded the weapon systems onto rail cars. Experience in rail operations gained during combat maneuver training center rotations paid off. Our soldiers handled the railroad safely and smoothly; however, due to delays in procuring German railcars, we waited three days for the sleeper car to arrive.

We were off to Bosnia on the 20th! We deployed straight to Zupanja, Croatia, bypassing the intermediate staging base in Hungary and arriving on Dec. 23. We downloaded and set up a nighttime defensive position in the railhead staging area.

Our mission on Dec. 24 was to verify load plans and link up with 1-1 Cav. At this time, the brigade had only one company in country, although the original mission had called for the entire squadron to be in Zupanja prior to our arrival.

I briefed the brigade commander on the air defense coverage plan. The next day was Christmas. I conducted a leader's reconnaissance along with the heavy section squad leaders I had assigned to the Sava River bridgehead. My light section moved to 1-1 Cav's forward area refueling point to provide ground and air defense of this asset. With the reconnaissance conducted, we developed primary and alternate positions.

We moved to the river on Dec 27. I placed A-12, my most experienced squad, 400 meters east of the bridge to cover the most likely air avenues of approach. It could also cover a civilian ferry in operation 600 meters from the bridgehead. I positioned my track about 400 meters west of the bridge.

The next day snow covered the ground, and we discovered that the river had risen dramatically during the night. A-12 was safe; however, the route A-11 and my track had taken was covered with water. Rather than wait to be surrounded by the floodwaters, a reconnaissance team from A-11 found a safe way out. We took a four-mile detour around the flooded area back to our alternate positions, which were located about 300 meters behind our primary positions. These alternate positions allowed us to provide air defense of the crossing site, but they did not afford optimum area ground defense. As night set in, my heavy section set up a nighttime defensive position at A-12's primary position. At 0430 the next morning, all three BSFVs moved to their alternate positions, set up and prepared to engage. We celebrated New Year's Eve in our alternate positions.



D/5-3 ADA air defenders string concertina wire along a base camp perimeter.

We defended the bridgehead until Jan. 4, 1996, as 1-1 Cav moved past us into Bosnia. We received a fragmentary order to cross the river on the 5th. We linked up with the 3rd Brigade headquarters and crossed the river, ending our Sava River bridgehead defense. Looking back, I can trace the success of the battery and platoon to the fact that we rehearsed every aspect of the operation. We did not just rehearse the big movements; we rehearsed the small ones. When we entrained on Dec. 20, 1995, we knew we were unlikely to face

any challenge we had not trained to meet or encounter any situation we had not rehearsed. Rehearsals made us flexible, and enabled us to make last-minute changes without compromising the mission. To be well-prepared and flexible is to be successful.

1st Lt. Michael A. Tacto, a former platoon leader, is now the D/5-3 ADA executive officer.

As usual, the German weather was lousy. It was a typically foggy October evening at Range 206 in Grafenwoehr, Germany, when the commander in chief U.S. Army Europe's message warning of the imminent deployment to Bosnia was disseminated to the soldiers of America's Tank Division. The warning order for the deployment came at a perfect time in the training cycle of D Battery, 5th Battalion, 3rd Air Defense Artillery.

The Dragons had recently successfully completed firing Air Defense Table XII at Putlos, Germany. They were wrapping up a rotation at Grafenwoehr, where they had won their fourth consecutive small arms streamer, and they were preparing to shift focus to Baumholder, where they would receive pre-institutional Stinger crewman (14SY2) training. All of these events culminated in live-fire training, which served to sharpen Delta Battery's warfighting edge and raise soldier confidence in themselves and their weapon systems.

This confidence would prove priceless as the battery prepared to deploy into a threatening environment. In a worst-case scenario, the air threat posed by the former warring factions was significant. They possessed both rotary- and fixed-wing aircraft capable of inflicting great damage.

To help counter this threat, Delta Battery was tasked to deploy a headquarters element and two reinforced platoons in conjunction with other assets from the battalion. Each of the reinforced platoons was comprised of five Avengers, two Stinger teams and an organic maintenance team. The normal

Dragons

by
1st Lt. Steven C. Rice



A D/5-3 ADA Avenger crew stands guard at Comanche Base.

two-man Avenger crew was increased to three to improve the platoon's force protection posture and increase the Avenger's continuous operation capabilities. To facilitate the changes in crew manning, 1st Platoon was combined with 5th Platoon and 2nd Platoon merged with 3rd. After the battery reorganized, it began preparations to execute the air defense mission to provide coverage for river crossing operations, aviation assets and logistics centers.

The preparation included training at all levels. Exercise Mountain Eagle was a month-long command post exercise initiated at the division level.

This training event allowed Delta Battery to integrate liaison teams with the units with which they expected to work closely. These units included the Aviation Brigade, Engineer Brigade and the division rear command post (DREAR). Exercise Mountain Eagle provided the battery with the opportunity to wargame logistical requirements for the upcoming mission, as well as improve their battle tracking and reporting procedures. Lessons learned during this multi-echelon training event helped to synchronize the command and control of units at all levels. The battery also spent four days navigating situational training exercise lanes set up by the division. These lanes trained soldiers how to react to mines and mine strikes, as well as how to set up and run checkpoints.

Deployment preparations at the battalion level included planning and executing the fielding and new equipment training for the single-channel ground and airborne radio system and the global positioning unit. Fielding these new



5-3 ADA Avengers and crews provided the "core" defense for Eagle Base.

The FSG had a history of doing a great job of helping families to help themselves. To keep the families informed, the command team attended the FSG meetings to provide information on services available to the families, and to answer any questions that the spouses might have. Delta Battery also established a first-class rear detachment to assist families with any problems and to act as the vital link between the deployed soldiers and their families. With the preparation phase now complete, it was time to deploy.

The Dragon vanguard deployed by rail on Dec. 20, 1995. It consisted of six hand-picked soldiers who were selected to act as the battalion liaison team with the DREAR. They also worked as a recon element for the battalion and battery, providing much-needed information

systems prior to deployment multiplied the combat capabilities of the entire battalion. The battalion also took the lead in ensuring soldiers completed their pre-deployment preparations. This included storing privately owned vehicles and household goods; updating legal documents, medical records and dental records; and issuing Implementation Force identification cards. Concurrent to the personnel preparation, the battalion conducted a maintenance rodeo to ensure that all of our equipment was ready to go. The result of this thorough inspection was Delta Battery deploying with all equipment fully mission capable.

Battery-level preparations were also in full swing. They included training 4th Platoon soldiers on railroad and air load operations. Since they were not initially scheduled to deploy with Task Force Eagle, 4th Platoon had been put in charge of helping prepare the rest of the battery for movement. The first sergeant and his NCOs inspected the soldiers to ensure that they had all of their TA-50s and equipment. Shortages were identified and corrected quickly. Training continued as the battery executed several emergency deployment readiness exercises to update the recall roster and load plans.

The Dragons rolled out on one last battery-level field training exercise to rehearse and validate their contingency operation standing operating procedures. Once that exercise was completed successfully, the soldiers were certified as trained and ready.

Ensuring that the soldiers' families were also trained and ready for the deployment was the command team's next mission. Luckily, the spouses of Delta Battery already had a fantastic family support group (FSG) that was very active.

tion on what the unit could expect upon arrival in country. These six soldiers endured many hardships without complaint. The cramped train ride to Tactical Assembly Area Harmon took three and a half days. Upon arrival, the six soldiers took charge of all the Army airspace command and control operations in the DREAR area of responsibility. It would be weeks before their counterparts in the Field Artillery and Aviation liaison teams would arrive to help lighten their load. Three days into the operation, the DREAR was hit by a flood that forced the command post to relocate to higher ground. Although they were cold, wet and tired, the air defenders maintained their focus and sense of humor. This helped them to successfully accomplish all missions asked of them.

3rd Platoon was the next Delta Battery unit to deploy. Their train left Mannheim, Germany, on Jan. 11, 1996. Three days later the train arrived at the intermediate staging base (ISB) located in Taszar, Hungary. After several days of logistical preparation, 3rd Platoon conducted a 432-kilometer tactical road march from the ISB to the city of Tuzla. When they arrived in Tuzla, they linked up and integrated with 3rd Battalion, 325th Infantry, and elements of 4th Brigade. The infantry unit had been sent in early during the operation to secure the air bases designated Comanche Base and Eagle Base. 3rd Platoon immediately conducted their reconnaissance, surveillance and occupation of position and set up air defense coverage for both base camps.

The 1st Platoon and the battery headquarters deployed on Jan. 30, 1996. 1st Platoon traveled by rail while the headquarters soldiers rode the bus to the ISB. After linking up in the ISB, the Delta Battery soldiers continued to train for their upcoming mission while they waited to be called forward by

the Task Force Eagle movement officer. It was during this time that the division leadership made the assessment that the air threat had diminished significantly. This assessment was based on the fact that the former warring factions had complied with the peace agreement, and that a large portion of the division had already passed through the critical chokepoints and was now widely dispersed. Based on this assessment, the commander of Task Force Eagle decided that 5-3 ADA's primary mission would be to relieve 3-325 Infantry as the security force for the U.S. headquarters in Bosnia. Delta Battery would play a large role in this mission. Shortly after receiving word of their new mission, the soldiers of Headquarters and Headquarters Battery and 1st Platoon were ordered to cross the Sava River and head to Tuzla. They found themselves tracing the route that 3rd Platoon had traveled just a few days before.

Dragon convoy arrived at Eagle Base late in the evening of Valentine's Day. The next morning the battalion S-3 explained that 5-3 ADA would be transformed into Task Force Striker to accomplish the security mission. Task Force Striker's task organization included HHB/5-3 ADA, D/5-3 ADA, 212th Military Police Company, 5-25 Chemical, and C/1-1 Cav. Task Force Striker would relieve 3-325, an infantry battalion with more than double the number of soldiers of the newly formed task force. A warning order was immediately sent back to Germany for Delta Battery's 4th Platoon and additional elements of Headquarters and Headquarters Battery to prepare for deployment. The S-3 also explained that the Aviation brigade needed an Avenger platoon to help defend Comanche Base against ground and air attack. This mission went to Delta Battery's 3rd Platoon. The rest of the battery would form the core of Team Dragon with responsibility for securing the northwest sector of Eagle Base.

Team Dragon was made up of D/5-3 ADA(-), 5-25 Chemical(-), 1/212 Military Police and 1-1 Cav(-). This combined arms team was forged into an effective fighting force with amazing speed. The soldiers of all branches proved to be flexible and were determined to accomplish their mission. The air defenders and chemical soldiers began training with 3-325 Infantry on patrolling techniques. They also started to co-occupy many of B/3-325's bunkers and observation posts. After a few days of training, Team Dragon began to conduct joint patrols with infantry in the northwest sector. At 0705 on Feb. 18, 1996, Team Dragon assumed control of their sector. 4th Platoon flew into Bosnia to join Team Dragon just 10 days after receiving their warning order. Since these soldiers were coming to execute infantry-type operations, they traveled light and left their vehicles in Germany.

Team Dragon employed both active and passive measures to ensure Sector Northwest remained secure. Internal foot patrols maintained the integrity of the perimeter and acted as

a visible deterrent to anyone conducting surveillance of the base. External foot patrols in the surrounding area provided a show of force, conducted reconnaissance, gathered intelligence information and gauged the local reaction to the Implementation Force's presence. As a rule, the populace's reaction was very positive. Team Dragon also manned checkpoints, searching vehicles and personnel entering the main gate to the air base; executed quick reaction force drills; and carried out illumination exercises.

Passive security measures made it more difficult to penetrate the perimeter. Team Dragon strung concertina wire along several hundred meters of the perimeter. They laced the wire with trip flares to alert the guard force to any intruders. They employed small remote sensors along the perimeter to give advance warning of unwanted visitors. Large light sets and thermal devices from the M-2 Bradleys used in conjunction with the Avengers' forward-looking infrared sensors made the perimeter as formidable at night as during the day. Leveraging technology allowed Team Dragon to accomplish the same mission as the original infantry company with far fewer soldiers. Additional improvements to Sector Northwest included guard towers and bunkers built as remote sites for the Avengers. Work to improve perimeter fortifications continues. Many areas have been identified as future sites for tangle-foot and other obstacles.

Delta Battery has contributed to Operation Joint Endeavor in many ways. As soon as they linked up with the Aviation Brigade, the soldiers and Avengers of 3rd Platoon became the core element of the Comanche Base defense. They set the standard in motivation and force protection efforts. They built "world class" bunkers. As the base's model platoon, they were visited by Gen. John Shalikoshvili, chief of the Joint Chiefs of Staff, and many other VIPs. Dragon soldiers also assisted Task Force Eagle by inspecting the former warring factions' air defense depots to ensure compliance with the Dayton Peace Accord.

The Dragons have contributed significantly to a winning team that includes the 1st Armored Division and Task Force Striker. They have gained great confidence in the Avenger, which they have deployed for four months without a system failure. The soldiers have proven themselves a versatile fighting force capable of accomplishing previously unforeseen missions. They have demonstrated their technical and tactical expertise and have proven that air defense soldiers are a vital member of the combined arms team. The Dragons can take great pride in knowing that they have contributed to the superb reputation and fine tradition of the U.S. Army.

1st Lt. Steven C. Rice, author of "Dragons," is the D Battery, 5-3 ADA, executive officer.



Florida Guardsmen Tackle Corps Avenger Mission

by
Capt. John Daigle Jr.

No one can accuse Brig. Gen. John Bridges of downplaying the introduction of the Avenger air defense missile system to the Florida Army National Guard's arsenal. "This is the most unique opportunity that a combat arms unit in the National Guard has had since World War II," says Bridges, commander of the Florida Guard's 164th ADA Brigade.

Bridges' enthusiasm is sparked by plans for the three battalions (1-265 ADA, 2-265 ADA and 3-265 ADA) under his command, once destined for inactivation, to assume one of the most critical combat roles ever assigned to the Army National Guard. The conversion of the state's Hawk and Chaparral missile battalions to the Avenger system means the units will have an unprecedented high-priority wartime mission. That's because, in the past, when the Army was called to war, the National Command Authority could choose between taking Reserve components or calling other active component units with similar equipment. However, now that the Army has turned the entire corps Avenger air defense mission over to the National Guard, only National Guard units can assume the Avenger corps air defense mission, a critical element in any ground force commander's defense.

"If the United States has to fight a regular contingency, the corps commander has no choice," Bridges said. "If he wants SHORAD [short-range air defense] at the corps level, he has to call a National Guard battalion, and I am sure he will not go to war without SHORAD."

Florida is one of four states converting to the Avenger system. New Mexico, Ohio and Mississippi are also switching from the Hawk and Chaparral systems to the modern, light-weight and extremely mobile Avenger system. Avenger has proven extremely effective at bringing down rotary- and fixed-wing aircraft and during Exercise Roving Sands '96 was successfully tested against incoming cruise missile surrogates.

The Army National Guard will eventually have eight Avenger battalions, three of them in the Florida Army National Guard. Still to be decided is which battalions will be directly assigned to support certain high-priority Army corps. All units will have an extremely short fuse — 30 days in most cases — for deployment to war. Bridges takes the early deployment mission very seriously. At a time when retention and recruiting are critical issues in the Guard, he has given all members of the 164th ADA the chance to leave the Guard or transfer to another unit before the Avenger transition is complete. There can be no nondeployable soldiers in any of these units, he explained. "This early deployment mission goes beyond the normal commitment soldiers make when they join the National Guard," Bridges said. "This is a very serious warfighting commitment."

Despite that, the new mission has "excited rather than deterred unit members," said Sgt. John Vinson, an A/1-265 ADA, squad leader. "This is the greatest thing that could have happened to our units," Vinson said. "The new weapon system

is high-tech, [requires] less maintenance and [is] less expensive. We can get more realistic training, and the idea that we are more likely to be called to war is a great motivator."

To get ready to accept the new mission, Florida's three ADA battalions have had to set a blistering pace in retraining all their soldiers. The 164th ADA Brigade set up its own Avenger training course. The program has been accredited and has also been complimented by officials at the U.S. Army Training and Doctrine Command, Fort Monroe, Va., and the U.S. ADA School, Fort Bliss, Texas.

This summer more than 240 soldiers completed the course, which includes classroom studies; training in a 360-degree electronic air battle simulation dome at Fort Stewart, Ga.; live tracking military aircraft; and a field training exercise. "The pace [of the course] is very challenging," said 1st Sgt. Rick Mendez, who manages the course for the 164th ADA Brigade. "The students have responded great. They seem to take whatever we throw at them."

Florida's transition program has received great reviews from senior officials who are watching all four states as they prepare to field Avenger. "I haven't seen a better program put together than what these guys have," said Bob Park, site manager for Fort Stewart's Improved Missile Targeting System (IMTS). The new \$4 million facility is where Avenger gunner trainees track and engage computer-simulated aircraft on virtual reality battlefields. The two-story domed computer theater places soldiers in a variety of battlefield situations and challenges them to shoot down different types of aircraft. Computers help evaluate the soldiers' abilities and offer tips for improvement.

Standing in the dark and silent center of the domed theater, gunner trainees are completely surrounded by a computer-

simulated desert scene. Included is every effect imaginable, except the dry desert heat and sand. The floor beneath them rumbles and the surround-sound stereo warns of enemy aircraft approaching over the hillside. Jets roar into the scene and race across the electronic landscape as the gunners attempt to lock on for a clean shot. The simulated pilots, controlled by an instructor, use evasive tactics and release flares to disrupt tracking.

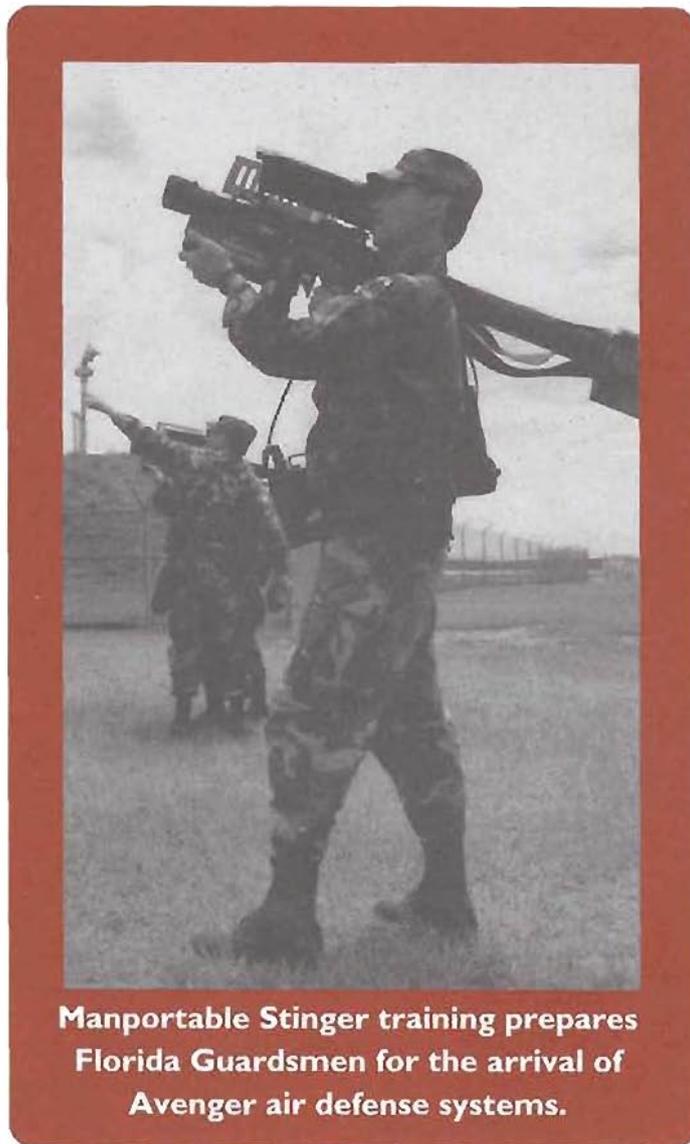
Each trainee gets five chances to engage an aircraft. Florida gunners took more than 800 shots during a recent trip to Fort Stewart. Similar live-fire training would have cost, at \$50,000 a shot, about \$40 million, Park said.

"You can't replace live fire, but I think you get better training here [at the IMTS]," said Sgt. Peter Leary, primary instructor for Florida's Avenger transition course. "In here, it makes you think. We can put the soldiers in all kinds of battlefield scenarios."

"If you can track aircraft in here, you are guaranteed to be able to track in combat scenarios," Mendez added.

"Florida has moved swiftly to prepare for the Avenger mission," Bridges said. He credits the professionalism of the brigade's soldiers for putting the state in the position to claim one of the highest priority Avenger assignments. Florida's three battalions have secured as good a chance as any (or better) at

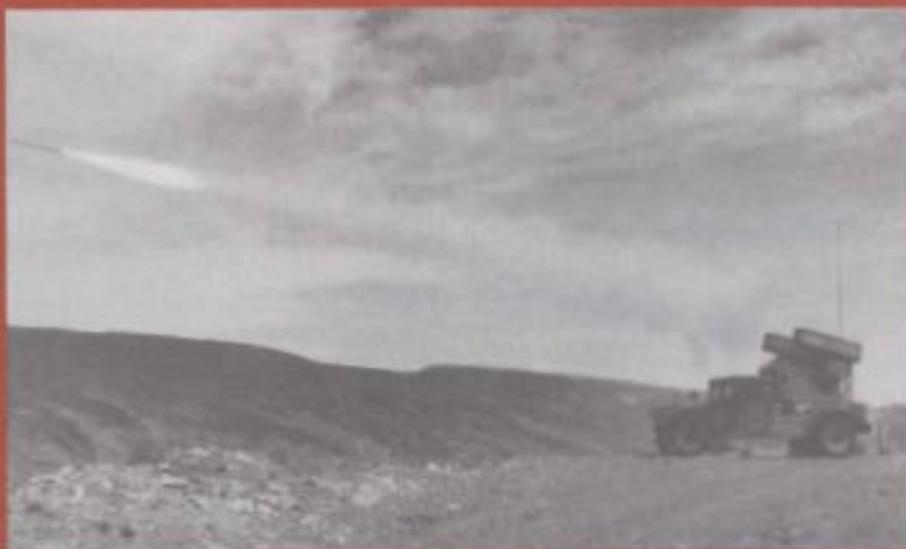
capturing key wartime missions, Bridges said. "Anyone who doubts that this train has left the station just isn't paying attention," he said. "This is a very ambitious mission, but we are capable of doing it. I have no doubt that we can get it done, and do it in an effective and impressive manner. We in Florida have been, and will continue to be, First to Fire."



Manportable Stinger training prepares Florida Guardsmen for the arrival of Avenger air defense systems.

Capt. John Daigle Jr. is the 164th ADA Brigade public information officer.

Range time is an often-squandered training commodity.



Getting the Most Out of Live-Fire Training

by Capt. Richard Wyatt

Range time and ammunition are precious training commodities frequently squandered by units that show up ill-prepared for live-fire training. However, a little foresight and some common sense can help you wring the most from your day at the range.

C Battery, 2nd Battalion, 6th Air Defense Artillery, Fort Bliss, Texas, manages more than 35 live-fire ranges per year for Avenger, manportable Stinger and the M-3P machine gun. Over the years, our soldiers have observed the minor mistakes units make that add up to big losses in training effectiveness. We have catalogued a number of hints that can help unit commanders improve the quality and efficiency of their live-fire training. Most of our helpful hints will seem obvious, but you'd be surprised how many commanders end up kicking themselves the next day for not thinking of them beforehand.

Stay flexible and always set up contingency training plans to avoid wasting time during range delays. We can no longer afford to ask soldiers to, "Hurry up and wait." Soldiers know when their time is being wasted, and when their time is wasted, they have every right to wonder, "Who's in charge?" Simple precautions can help you maintain training tempo, an

element as essential to effectiveness in training as it is to effectiveness in combat.

Sophisticated command, control, communications and intelligence systems are transforming the battlefield, and Air Defense Artillery is a leader on the digitized battlefield. Yet, you'd be surprised how often live-fire training schedules go down the tubes simply because key players can't talk to one another and can't pass information back and forth.

Ensure that all of your key range personnel maintain constant communication. This includes radio-controlled miniature aerial target (RCMAT) operators, ballistic aerial target system (BATS) personnel, medics, combat lifesavers, mechanics, officers-in-charge, range safety officers (RSOs) and range control personnel. Often, the best means of communications between the tower and RCMAT operators, mechanics, ammunition personnel or combat lifesavers is a hand-held "walkie-talkie" type radio. These radios are also very effective as backup communications with the RSOs.

Complete detailed checks the day prior to live-fire execution. To apply a standard cliché, anything that can go wrong will go wrong. And it will always go wrong at the worst

possible time. Pre-execution checks are crucial. To simplify the planning process, draw up a standardized checklist. Prepare a range briefing outline that merely requires leaders to fill in blanks.

Simple preventive measures will decrease major range difficulties with the M-3P machine gun. Most units are new to the M-3P machine gun. Make sure the correct ammunition (A555 .50-caliber) is issued and make sure that the ammunition is both clean and dry. Any lubrication will cause the brass to swell during firing and create jams. Make sure that the M-3P is lubricated only with the lubricant specified in the Avenger technical manual. Check to see that the ammunition is properly loaded in the ammunition cans and inspect the feed chute to ensure free flow of rounds. To reduce wear and tear on machine guns, leave them mounted while traveling to and from ranges, if local laws and policies permit.

For stationary firing, place fire units within 20 meters of each other and remote all systems to a central location. Remoting permits the RSO to maintain positive control of all systems simultaneously. When operating under time constraints, machine guns can be fired from the remote, which actually cuts firing time in half. During firing, machine gun cool down will come up on the control display terminal, preventing further firing; however, this can be overridden, if necessary, and firing can continue. Finally, emphasize that the M-3P will jam if gunners release the firing trigger before a preset burst is complete.

Organize training to make the most of your time at the ranges. You can fire Stinger trainer launch simulators (STLSs) prior to range "green" time because STLS firing does not require downrange clearance, only coordination with range control. Use the "two coach and two loader method" to accomplish STLS firing quickly. One soldier holds the launcher while a loader inserts and secures the round. The

soldier then "range walks" to a coach who waits at the firing point. RCMATs can add realism; however, the coach must ensure left and right tracking stay within limits.

When conducting Avenger missile firings, always have a backup system ready in case the first system malfunctions. The popular notion that primary systems are less likely to break down when backup systems are available may be only superstition, but that's the way things seem to work. Additionally, we recommend that units take a gripstock to every range. This allows units to go to degraded operations and fire the missile from the manportable launcher, if necessary. If you have to fire into the sun, fire as early or as late in the day as possible, while the sun is low on the horizon. Gunners tracking BATs while looking into the sun frequently lose lock.

Conduct after-action reviews. As with any training event, it is important to conduct action reviews following live-fire training. Only in this way can we correct the mistakes of the past and improve the quality of future training.

Never sacrifice safety for speed. Above all, make safety the number one priority. Commanders agonize over combat casualties, but training casualties, because they are almost always avoidable, are worse. You may think it's tough to write a letter to a soldier's parents that says, "Your son sacrificed his life for his country," but try writing one that begins, "Your son was killed in a senseless and easily preventable tragedy."

In this era of budget constraints, it is every commander's responsibility to stretch training dollars to the maximum. Foresight and common sense are the keys to efficient, cost-effective training.

Capt. Richard Wyatt commands C/2-6 ADA, U.S. Army ADA School, Fort Bliss, Texas.

Backup systems are one of the keys to maintaining training tempo.



Putting Quality Management Theory to Work in the Battery

by Capt. Russell Bodine

Today's Army is marching to a different drumbeat, the drumbeat of quality management, and the Army's senior leadership is counting cadence. For example, during a recent outreach session, Lt. Gen. Eric K. Shinseki, deputy chief of staff for operations, cited the frequent deployment of Patriot air defense battalions to Korea and Saudi Arabia. Quality of force allows us to do this, Shinseki said. Greater efficiencies allow us to modernize while the Army's buying power shrinks. From their vantage point, our senior leaders see the force shrinking while its commitments multiply and, therefore, appreciate the absolute necessity of change. They recognize that quality management theory can best serve as a catalyst of change.

Numerous organizations and commands within the Department of Defense have devoted significant resources toward instituting the principles of quality management. There is no better example than the Joint Staff, which now requires newly assigned personnel to attend a three-day quality seminar. All members of the staff are highly encouraged to participate in quality initiatives throughout their tenure. Furthermore, the Joint Staff maintains an office responsible for coordinating quality issues. Regardless of how well the premier staff in the world executes control philosophies, its commitment in time and money is significant.

The Army Communities of Excellence process, to cite another example, is putting quality management theories that

are revitalizing American industry to work at the installation level. The ACOE process is already transforming the U.S. Army Air Defense Artillery Center, Fort Bliss, Texas, producing increased efficiencies that will eventually benefit every ADA soldier and unit.

Not everyone, however, has fallen into step. The Army's quality management campaign has made major headway at the major command and installation levels, but continues to meet sporadic resistance at certain echelons, including brigade, battalion and, sometimes, battery levels, where tendencies to cling to outdated paradigms are deeply ingrained.

A reluctance to adopt quality management principles can usually be traced to misconceptions. Many people, for instance, think quality management is a Japanese philosophy, but quality management techniques are as American, to borrow a cliché, as apple pie.

Scholars most readily associate quality management with the work of Dr. W. Edwards Deming and his 14-point management method. The actual term quality was linked to Deming's work by Armand V. Feigenbaum in his 1961 book, *Total Quality Control: Engineering and Management*. Deming, with an assist from the U.S. Army, earned tremendous respect for teaching the Japanese management principles after World War II. His methods are arguably one of the most significant factors in Japan's great economic rise after the war. In the United States, however, the misconception

persisted that quality management techniques are somehow "foreign" and that "what works with Japanese workers wouldn't work with American workers." This type of chauvinistic thinking helped make Hondas and Toyotas as American as apple pie.

During the late '70s and early '80s, the American automobile industry set out to determine why Japan was outperforming the United States in so many facets of the industry. While embarked on this quest, a few large companies discovered Deming's philosophy. These companies instituted quality management programs and were able to rebound during the '80s. Many other American companies, having witnessed the Detroit turnaround, sought to adopt the new philosophy. Today, Deming's principles are sweeping American industry. The Deming Prize, established by a Japanese union, is now a highly coveted set of awards for which private and public institutions compete worldwide.

What does this mean to the air defense battery commander? Unless battery commanders have a degree in a business-related discipline, chances are that the term *quality* needs to be placed in context. Quality theory involves improving our systems through process analysis and sound measurement systems. The best source for process analysis is the personnel involved in the process. In the case of a battery commander, this means his soldiers. A good definition of quality can be found in Mary Walton's book, *The Deming Management Method*. Walton quotes a consultant named Kaoru Ishikawa who stated that "Quality means quality of work; quality of service; quality of information; quality of process; quality of division; quality of people, including workers, engineers, managers and executives; quality of company and quality of objectives." At first, this may seem simple, nomothetic, or even "touchy feely." A battery commander's initial reaction may be to wonder how quality management techniques can affect his DA Form 2406, or help him find out if somebody somewhere is "finger drilling" preventive maintenance and services. But after further study, most commanders will find the link.

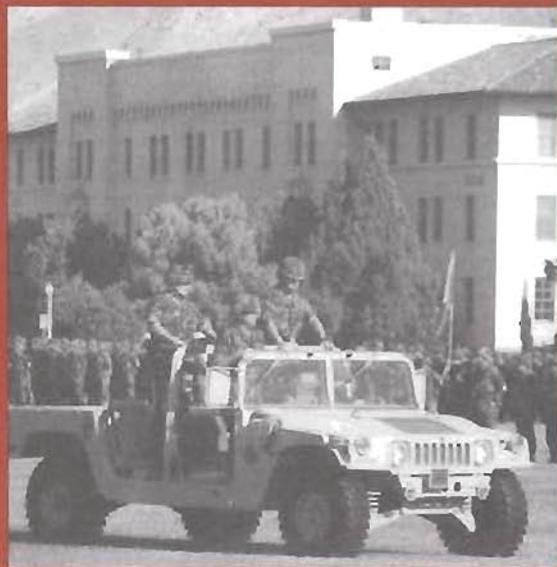
Quality is not an absolute science. Organizations approach

the issue differently with varying degrees of success. There are many learned quality scholars in the public and private sectors who differ on a variety of points. For example, Deming promoted the abolition of performance appraisals. This left many quality-seeking organizations wondering how to promote personnel, so they abandoned this idea. The battery commander certainly does not have to subscribe to all of Deming's ideas. However, there comes a moment when every battery commander asks himself the same question: "Why is this a continual problem?" This moment, when the opportunity to break down an outdated paradigm is at hand, is a good time to institute quality control.

The gist of quality management is streamlining the transition from old methods to new methods. Imagine the difference it would have made to "Johnny Reb" and "Billy Yank" if Civil War generals had listened to soldiers who said, "Hey Sir, the bayonet charge is an antiquated idea!" At Gettysburg, Gen. James Longstreet did his best to persuade Gen. Robert E. Lee that "Pickett's Charge" had no chance of success, but Lee didn't listen, and neither did many generals on either side. Blinded by outdated notions, perversely proud of their troops' willingness to absorb catastrophic casualties, they rode to glory over the backs of their fallen soldiers. Quality management permits junior leaders, NCOs and enlisted soldiers, who

are aware that "what should work" often doesn't work, to affect the decision-making process. Quality management improves situational awareness at "echelons above reality." It facilitates soldiers letting generals know what works and what doesn't work.

Paramount to a battery commander's quality initiative is instilling the will to change in all his leaders. The old answers, "We've always done it this way" or "If it isn't broken don't fix it" are insufficient. For many years, soldiers ran in combat boots while the technology of the modern tennis shoe was readily available. What mindset allowed us to do that? There are many subtle barriers that inhibit willingness to change. For example, a soldier who works in the battery command post suggests a design for a new battle tracking chart. The battery executive officer, aware that the battalion commander



From their vantage point, senior Army leaders recognize the absolute necessity of change.

is emotional about standardized battery command posts, replies, "Hey, that's good, but this is the way the colonel wants it, and besides, it's in the battalion TACSOP [tactical standing operating procedure]." How many times will a soldier hear such an answer and continue to advance new ideas? Not all new ideas are good, but if we can't address each one properly, good ones may go unrecognized.

Worker or soldier input, as previously mentioned, is a major principle of quality management philosophy. The Army has already instituted "open door" policies and AARs, and these can and frequently do serve as excellent quality tools. But many "open doors" might be better characterized as "slightly ajar" while others slam shut the moment an innovative idea crosses the threshold. People feel more like making a contribution when they feel they have some control of events around them. The trick is to find a catalyst that encourages soldiers to contribute. Battery commanders could start by involving soldiers in the publication of a "grassroots" battery TACSOP. The first step would be to circulate chapter outlines to each soldier. At their squad or team AARs, soldiers would discuss issues and record ideas relevant to each chapter. Next, platoon leaders would discuss soldier input at their platoon AARs and package the information for presentation at the battery AAR. The commander could then capture the information and prepare a "consensus" battery TACSOP that reflects the expertise of the entire battery. The end product would be a document by which the unit evaluates itself. It would be hard for soldiers to resent or ignore a document they helped write; those who chose not to contribute would have no rationale for objections.

The TACSOP process can spin off benefits. A soldier may identify an information management technique to prevent more than one Avenger from being destroyed twice in the same Joint Readiness Training Center (JRTC) minefield. A soldier may break down a platoon sergeant's paradigm related to missile resupply procedures. The process should encourage soldiers, working through platoon sergeants, to contribute quality input to unit training meetings. The battery maintenance officer may want to imitate the TACSOP process by developing a maintenance SOP. Each instance enhances quality.

A recent example of soldier input to a battery TACSOP that provides measurable results is the development of the Avenger hide-shoot-hide technique. Soldiers were discouraged because their Avenger systems had suffered discouraging fatality rates during the low-intensity conflict portion of their last JRTC rotation. "Our system was destroyed while we were putting up the camouflage net," said one soldier. The Avenger crewmen felt they were doing the things they were supposed to do. They had been trained to "dig in" for protection against indirect fire and had also been trained that emplacing their system on high ground would maximize their fields of fire.

They thought the standard, not their execution, was the problem. They recognized that a well-prepared firing position increased their chances of surviving indirect fire; but figured their chances would be even better if they were not seen at all. In the light intensity combat environment, noncombatants often observed Avenger crews occupying and preparing a position to standard and provided intelligence to the enemy. This allowed the enemy to target the positions.

To counter this problem, soldiers developed and tested a technique of occupying a hide position that sacrificed fields of fire and protective cover. The hide position was usually in a wooded or low-lying area located within 200 meters of a good firing position. Upon receiving early warning, they immediately moved to occupy the firing position. Once the threat was eliminated, they returned to their hide position. As long as the early warning system was functional this technique proved viable and was incorporated into the TACSOP. During their next JRTC rotation, the hide-shoot-hide technique, when executed correctly, proved very effective in the light intensity conflict environment. Not only were there improvements in negating the indirect fire threat, the enemy also had trouble targeting Avengers for suppression of air defense missions and ground attacks. This was a perfect example of improving a battery process by listening to the soldiers involved. If no one had listened, the crew would have performed "by the book," at least until real casualties on a real battlefield forced them to disregard both the book and their chain of command.

Deming believed that eliminating fear was paramount to achieving quality improvements. Surely it is extremely rare that a soldier in today's Army fears his chain of command in the classical sense, but fear can be more subtle. For example, air defense liaison officers of all ranks tend to gloss over bad news and brief the good news.

At the JRTC a typical platoon leader's brief to his support battalion commander might sound like this: "We destroyed six out of nine enemy aircraft today. We are Green in Personnel, Yellow in Systems, Yellow in Missile Count, and two Avengers are expected to arrive in the Brigade Staging Area tomorrow. We destroyed four Hinds, one Colt and a Hoplite." This brief sounds positive, but leaves out the bad news. The bad news is usually what the commander needs to make a good decision. The platoon leader would have better served his battalion had he presented the following brief: "Nine aircraft penetrated the battalion area of operations within the last 24 hours. One Hip reached the hilltop above Huffin. We believe it successfully resupplied the templated cache in the area that is a likely supply point for enemy mortar crews. Several Hinds conducted armored recon throughout our area of operations. They most likely relayed the positions of our attached field artillery battery and our field trains prior to being destroyed. We destroyed seven aircraft."

The above examples are intended only to represent excerpts from a liaison briefing and are certainly not inclusive;

however, the second briefing clearly presents the day's events in much more useful fashion than the first. The second briefing gives the battalion commander information that can help him determine which way to recommend orienting the brigade's counter-mortar radar, where to target enemy caches and what units to move in response to the changing situation.

Quality management philosophy encourages leaders to place the right person in the right job. The battery commander assigns soldiers to duty positions within the battery, and there are only a handful of positions that can be assigned to personnel, regardless of their military occupational specialty. These positions include orderly room personnel, commander's driver, armorer and a variety of detail duties.

Soldiers pride themselves on being able to handle any task that comes to hand, but this does not mean that they are all similarly suited for a task. Bright officers would say this is restating the obvious, but cannot everyone recall examples of the following scenario? Against an NCO's protest, the battery commander insists that the NCO serve as armorer. The armorer and the battery commander subsequently clash on many issues. Eventually the commander has his first sergeant work with the battalion command sergeant major to have the NCO transferred to a sister battery. Within six months, the NCO wins the battalion best crew competition and helps his new battery earn a superior result on an arms room inspection.

What went wrong between the NCO and his original commander? The first commander turned the battalion's best Avenger squad leader into a second-rate armorer. Granted, many factors impact a battery commander's decision to assign personnel to positions, but these decisions cannot be made lightly. You can't always give a soldier the assignment he or she wants, but think twice before attempting to pound square pegs into round holes.

Training is a cornerstone of quality management, and no corporation emphasizes training more than the Army. New

Make long-term rather than short-term investments in soldiers.



equipment training, common task training, combat training centers and other training programs (such as the Primary Leadership Development Course) that the battery commander does not control are examples of the Army's commitment to training. Battery commanders are constantly challenged to make sure to send his or her soldiers to the right school at the right time. When soldiers are scheduled to attend a school at the same time a significant battery training event is to take place, commanders find themselves trapped in a short- vs. long-term investment dilemma. Everyone knows about the "super soldier" — the guy whose battery couldn't get along without him — who is so dedicated to his unit that he sacrifices his career. This soldier passes up career-enhancement opportunities, putting in extra hours at the battery rather than attending civil school. He simply nods when his battery commander explains how badly the unit needs him for the upcoming JRTC rotation, and sends less deserving soldiers — guys the battery could get along without — to civil school. They write him super NCO evaluation reports (NCOERs), but the great NCOERs are never enough to

make up for the promotion points his peers — guys the battery could do without — pile up by attending courses. Since soldiers are promoted to E-5 and E-6 based solely on points, the good NCOERs do the super soldier no good. And when the guys batteries could do without, but not the super soldier, sew on their E-5 or E-6 stripes, it isn't just the super soldier who gets cheated; the Army also gets cheated.

Battery commanders, in their quest for quality, naturally want their best personnel in the lineup during high-profile training events, but they must find a correct balance between their unit's short-term needs and the Army's long-term needs. They cannot devise their own promotion system; they must work within the existing system. The short-term sacrifice required to send quality soldiers to the right schools at the right time is essential to achieving the Army's long-term objectives. Battery commanders should also recognize that

the temptation to hold a soldier back because "you can't do without him" as a danger signal. Since casualties in any major conflicts are a certainty, the idea that people exist whom we can't do without is a concept that combat quickly quashes; it is an attitude that the Army can't afford. As Gen. Charles DeGaulle once observed, "Graveyards are full of indispensable men."

To facilitate quality improvements, battery commanders must dedicate themselves to long-term investments. This is probably a hard sell to battery commanders who average 18 months in command.

Have you ever observed instances when a commander facing a major training event, such as a trip to the National Training Center (NTC), delayed key personnel from rotating to their next assignment? His unit held their own against the NTC's opposing force, but the moment the training event ended, several key soldiers rotated at the same time, and many of the lessons learned during the training event disappeared with them. Might not the unit and the soldiers who remained in it have been better served if new, inexperienced NCOs and officers had rotated in as scheduled and had received the benefits of the training event? The commander met his short-term goal — looking good at the NTC — and could look forward to his Officer Evaluation Report, but his unit, following the sudden and wholesale departure of veteran soldiers, was back to where it started in terms of training.

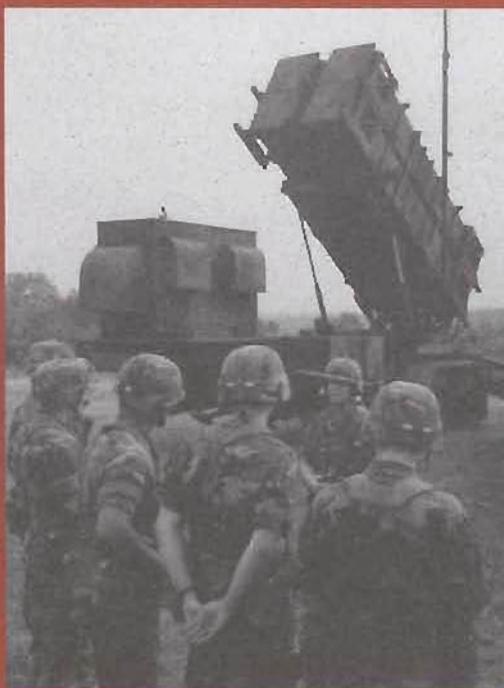
In pursuit of quality, large and small businesses throughout the United States are trying to break down barriers to effective interface between staffs. Usually the lack of effective interface between manufacturing, sales, purchasing and other corporate hierarchies produces gross inefficiencies, even though the cause may be traced to minor problems. Case histories from the corporate world would sound familiar to most soldiers. All air defense batteries, at some time, have had at least some mild disconnect between the headquarters platoon and line platoons. Often the commander doesn't understand why everyone is upset. Since the commander usually under-

stands every subunit's system, he doesn't see a problem. A commander well-versed in quality management theory fully understands that effective interface between subelements can't be taken for granted; that interchangeable parts frequently aren't. He will have numerous techniques at his disposal to break down barriers. He will sometimes discover that small problems require only simple adjustments — such as changing supply room hours — but quality techniques will also help the commander solve big problems, such as determining the "real" reason battery shortage annexes are never updated.

ADA officers and NCOs should invest their personal time to the study of quality theory. The time spent could pay huge dividends to their soldiers, their command and even the Army as a whole. They will find that they have already been exposed to many quality techniques. Many quality techniques, such as "training to standard rather than time" and "tasks, conditions and standards" for training events are already embedded in the Army systems.

There is nothing ambiguous or "mystic" about quality management; it consists of processes, skills and techniques that can be learned and applied. Mastering these processes, skills and techniques will permit today's junior leaders to serve as master architects of Force XXI and the "Army After Next."

The principles of quality management apply to all organizations, military as well as corporate. They work as well in a battery command post as they do in an executive suite. It's time we all fall in step with the quality management drumbeat. It is said that nothing is certain in war, but one thing is sure: quality management principles, properly applied, will help us make the Army a better fighting force.



Improve a process by involving the soldiers.

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NATIONAL MISSILE DEFENSE DEBATE

by Maj (P) Keith D. Emberton

"If we had possessed a deterrent, missiles that could reach New York, we would have hit it at the same moment [as the 1986 U.S. raid on Libya]. Consequently, we should build this force so that they and others will no longer think about an attack."

Col. Qadhafi, 1990

Today Air Defense Artillery is fully engaged in its vital force protection mission as it fulfills, alongside the rest of the Army, the transformation to Force XXI force projection operations. In the midst of this, I am convinced, like many ADA soldiers, that we must actively prepare for the day that our nation is targeted by ballistic or cruise missiles. Deploying a national missile defense (NMD) system is a challenge that some would like to postpone for another decade or more. So why commit the effort and expenditures?

Libyan leader Mu'ammarr Qadhafi has threatened to use ballistic missiles without hesitation against the United States. Iraqi leader Saddam Hussein asserted in 1990 that he would strike Washington, D.C., with missiles if Iraq had the capability to reach that distance. The head of the Palestine Liberation Front, Abu Abbas, declared that "if not my son, then the son of my son will kill yours. Someday we will have missiles that can reach New York."

In light of this, one thing seems certain: the threat isn't going to go away anytime in the near future. Near-term hostile-nation or terrorist capabilities and intentions necessitate our deployment of an effective NMD capability. I further believe that we need to seek to remove the limitations to erecting

a robust NMD shield posed by the Anti-Ballistic Missile Treaty through at least treaty modification.

While a strong argument exists to refute the credibility of the ballistic and cruise missile threat, equally compelling arguments enhance their legitimacy. Debate rages in Washington over the degree of risk that ballistic and cruise missiles and weapons of mass destruction (WMD) pose to U.S. interests and territory; however, the National Military Strategy contains the following security objective: "we will maintain and strengthen our defensive capabilities against such weapons." The Department of Defense (DoD) establishes military requirements from the national military strategy and, within resource constraints, selects military forces to meet them. Given the potential threat and the fact that the continental United States has no antimissile defenses today, what are the current perspectives and future prospects for strategic employment of an NMD capability in the United States?

In May, House Republican leaders decided to pull a bill to build an NMD system because of a disagreement over cost. The Defend America Act was scheduled to have reached the House floor for debate on May 24. Instead, Republicans decided to delay action on the bill so they could settle a cost dispute. The decision came days after a Congressional Budget Office estimate placed the cost of developing and constructing an NMD system capable of protecting all 50 states at \$60 billion. The White House, which opposes the bill, had estimated

We must prepare for the day our nation is targeted by ballistic or cruise missiles.



costs at \$23 billion, a figure that included operational costs over 20 years in addition to development and construction. The Associated Press viewed the Congressional Budget Office estimate as a setback for presidential candidate Bob Dole, who, prior to his retirement as Senate majority leader to run for president, proposed the Defend America Act in the Senate.

Later in the month, however, the Senate defeated (53-44) an attempt to cut the \$300 million that the Senate Armed Services Committee had recommended adding to the administration's \$508 million request for research and development of an NMD system. The amendment to the FY97 Defense Authorization Bill was offered by Sen. Byron Dorgan (D-N.D.), who argued that accelerating the NMD program could jeopardize existing nuclear reduction agreements with Russia. The \$300 million added to the bill largely goes for an additional four flight tests of an exoatmospheric kill vehicle and an upgrade of a payload launch vehicle to provide a more realistic test environment.

Democrats argue that commitment is premature, saying the emergence of a likely threat is 10 to 15 years off, that defense dollars could better be spent on procurement of other weapons, and that rushing to deploy technology may mean a less-capable system. They warned that building an NMD system could cost as much as \$60 billion over the next 15 years. Republicans disputed the figure and argued that even a substantial investment would be worth the cost.

Later the same month, Lt. Gen. Jay M. Garner, then U.S. Army Space and Strategic Defense commander, told the House Committee on National Security that the Army could deploy a fully compliant NMD system that would provide a "highly effective" defense of the continental United States against limited attacks. Garner, a former chief of Air Defense Artillery, said the Army's principal near-term deployment option consists of an initial NMD system of 20 ground-based interceptors and associated battle management and command, control, communications and intelligence assets deployed at a single site within six years. The proposed NMD system would be supported by existing space-based sensors, advanced and upgraded early warning radars and upgraded command and control capabilities. The initial system, Garner said, would interoperate with future space-based early warning and tracking systems (such as the Space-Based Infrared System) as soon as they become available. Garner estimated the cost of such a system at \$5.2 billion, including 69 ground-based interceptors, the ground-based radar and associated



House Republicans withdrew the Defend America Act bill but the Senate voted to add \$300 million to the administration's \$508 million request for NMD research and development.

upgrades. For \$4.8 billion, Garner told committee members, the Army could field a higher-risk, emergency deployment in about four years. Such a system, said Garner, would include 66 ground-based interceptors, a ground-based radar, three advanced early warning radars and associated upgrades.

Secretary of Defense William Perry holds that theater missile defense, not NMD, is the Pentagon's top priority. He told June graduates at

Georgetown University that 75 percent of DoD's ballistic missile defense budget for the next fiscal year will be spent on the "here-and-now threat," short-range theater missiles such as the Iraqi Scuds launched during Desert Storm. "Today, only the established nuclear powers have strategic missiles, and we do not believe that these nations threaten us today," he said.

The secretary described future theater missile defense systems that will protect an area 10 times as large as the area protected by Patriot, currently the only air defense system that can intercept and destroy theater ballistic missiles. But, he added, the United States is also developing a missile defense system to protect the continental United States from strategic ballistic missiles.

"The United States continues to maintain a powerful strategic nuclear force to serve as a deterrent to any major nuclear power that turns hostile," he added. "But that might not be enough to deter some rogue nations or terrorists," Perry said. "We must be prepared to defend ourselves." He said a U.S.-based defense system is needed to intercept and destroy missiles directed at the country. "Our plan is to complete the development of a national missile defense system over the next three years."

The NMD debate is not limited to Congress. Other players, including defense contractors whose livelihoods depend on military contracts and nongovernmental organizations—the various Washington Beltway "think tanks" and national associations that tend to approach the NMD problem from varying ideological directions—have relative interests at stake in the debate. Removed from partisan politics, the debate basically boils down to differing stands on whether and when the United States should field an NMD capability and what type of NMD capability, if any, should be deployed. Framing the debate are the following criteria: the missile threat, technological and operational feasibility, compliance with the 1972 Anti-Ballistic Missile (ABM) Treaty, effectiveness and cost.

The United States has three NMD general alternatives. The first alternative is not to field, or deploy, an NMD capability. Those favoring it hold that the United States has little or no need for NMD and should not plan to deploy it, but should continue research and development. Others view our need for NMD with greater urgency. They favor the second alternative, which is to deploy a limited NMD capability in the near term; i.e., the next six years, or the third alternative, which is to field a robust NMD system during the first decade of the next century.

CRITERIA

What are the general parameters and importance of the above criteria for selection of an NMD alternative? What comprises the three alternative approaches? What conclusions can be drawn from an analysis of the alternatives using the criteria? Finally, what are the prospects for fielding an NMD capability and what approach is recommended?

Threat. The current threat to civilian and military assets in the continental United States, non-contiguous states and territories from ballistic or cruise missiles capable of delivering WMD is expected to grow in the near term and into the next decade. Intelligence estimates show the near-term and future threat varies from remotely possible to probable or imminent. The threat emerges from either a nonaligned, hostile or rogue state, while an attack stems from accidental, unauthorized or deliberate missile launch. The sources of the greatest current and likely future threat are North Korea, Iraq, Libya, and potentially, states of the former Soviet Union. While there is general consensus in the debate on threat capabilities, there is significant disagreement over threat intentions.

The need for NMD varies based on the vulnerability of strategic, political, economic or countervalue (civilian) assets, including military bases, government facilities and industrial or population centers. The United States determines which assets are priorities for NMD protection based on their strategic importance as well as their vulnerability to the threat. Threat intentions, as well as our strategic vulnerability and priorities, are significant aspects of the debate over the need for fielding an NMD system.

Technological and Operational Feasibility. Both sides in the debate generally agree that the United States possesses the technological capability to operationally field a limited NMD capability in the near term. Thus, recent heated debate centers

around other criteria such as the threat, effectiveness and cost. Future debate will probably focus on the technological and operational feasibility of fielding a robust NMD system in the next decade, how elaborate and effective it needs to be, and its cost effectiveness.

ABM Treaty Compliance. Those who favor establishing ABM defenses hold that the 1972 ABM Treaty signed by the United States and the Soviet Union is no longer in U.S. interests. Fundamental to this position is the argument that the offensive nuclear deterrent that the treaty provides is insufficient in the face of future rogue or terrorist missile threats. Those opposed to fielding an NMD capability contend that it would undermine the ABM Treaty and also set back progress on Strategic Arms Reduction Treaty I and II (START) arms reductions. Significant debate between Congress and the administration over NMD largely orients on whether the United States should withdraw from, modify or preserve the ABM Treaty.

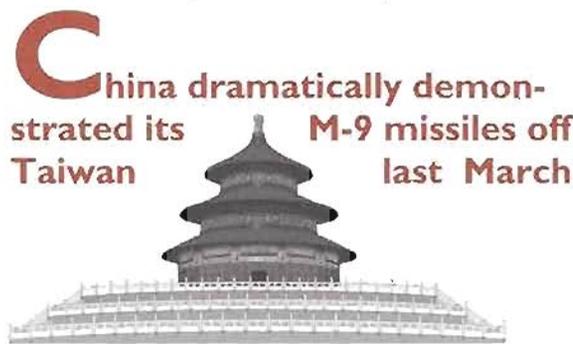
Effectiveness. Of central importance in the NMD debate is the effectiveness of potential missile defenses. NMD advocates support a range of capabilities extending from a limited capability with single-tiered ABM defenses effective against a minimum number of missiles to a robust capability with a layered NMD system effective against most conceivable future threats. Those opposed to fielding some type of NMD capability for the most part expound upon the effectiveness of our offensive strategic deterrence. They also believe that NMD will not be effective because of the randomness of possible ballistic or cruise missile attacks or the insufficiency of asset coverage.

Cost. In an era of budget cuts, force reductions, declining infrastructure and program cutbacks, the budget is one of the NMD debate's most contentious issues. Some factions are resistant to even modest funding, due to a fear of returning to the excessive budgets of the Star Wars program. Others push for near-term deployment at moderate cost, while others favor fielding a robust NMD system in the next decade at great cost.

ALTERNATIVES

Defining alternatives is key to resolving the NMD debate. As previously mentioned, the United States has three general NMD alternatives. The nation can simply decide not to field an NMD capability, but NMD is not an all-or-nothing proposal. The United States can opt to deploy a limited NMD capability in the near term or it can elect to field a robust NMD system in the next decade.

Do Not Field an NMD Capability. This alternative means canceling plans to operationally deploy any NMD capability, but continuing technological development on NMD systems. It may involve possessing a nominal capability; i.e., in name



only, that is not fielded as an NMD system but could be fielded for ABM defenses in crisis situations if summoned by the National Command Authority. Ground-based nominal NMD capabilities include the Patriot Advanced Capabilities-3 (PAC-3) system for lower-tier coverage and the Army Theater High-Altitude Area Defense (THAAD) system for upper-tier, wide area coverage. Hereafter this alternative is called "no NMD capability."

Deploy a Limited, Near-Term NMD Capability. This involves technically refining and operationally deploying, within about six years, a layered NMD capability consisting of about 100 ground-based interceptor missiles that could be deployed at a single or small number of additional sites, plus ground-based radars, space-based surveillance and tracking sensors, and battle management, command, control, communications, computers and intelligence (BM/C⁴I) systems. This so-called

"thin defense" would be two-tiered. Near-term capable ground-based missile systems include batteries of PAC-3 and THAAD missile systems. Hereafter this is called "limited NMD capability."

Field a Robust NMD System in the Next Decade. This alternative includes operationally deploying between about 2000 and 2010 a layered NMD system of systems comprised of an expanded ground-based NMD capability integrated with sea-based interceptors, aircraft and space-based defenses, plus ground-based radars, space-based "Brilliant Eyes" sensors and BM/C⁴I.

Fielding may involve incremental fielding of systems beyond the limited NMD capability in the near term, introducing advanced capabilities once technology becomes sufficiently mature for operational deployment. Some proposals call for four to six ground-based sites having batteries comprising about 1,000 PAC-3 and THAAD missiles in multi-tiered defenses, Navy Aegis cruiser sea-based lower- and upper-tier (Navy theater-wide) missile systems, and an Air Force boost phase intercept capability configured on manned or unmanned aircraft or possibly on space-based kinetic energy or directed energy platforms. Hereafter this is called "robust NMD capability."

Analyzing the NMD alternatives against the NMD debate criteria can help us evaluate and assess the alternatives.

More than
20 countries
have
developed
ballistic
missile
capabilities.

As previously mentioned, the criteria that frame the NMD debate are the missile threat, technological and operational feasibility, compliance with the 1972 ABM Treaty, effectiveness and cost.

MISSILE THREAT

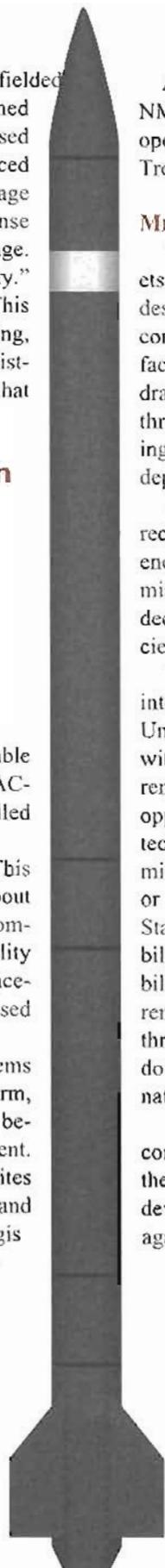
The German rocket scientists who launched V-2 rockets at London during World War II were working on a new design that could hit New York City, but were unable to complete the project before Allied forces overran their factories. Today, the ballistic missile threat is off the drawing boards and on the launchers. Assessments of threat capabilities will play an important role in determining what sort of NMD system should, or shouldn't be, deployed.

No NMD Capability. While those opposing NMD recognize current threat capabilities, most refute the existence of threat intentions to attack with ballistic or cruise missiles, with or without WMD, for at least the next decade. They ostensibly believe our nation is not at sufficient risk to warrant deploying an NMD capability.

With the end of the Cold War, the Russian deliberate intercontinental ballistic missile threat to the continental United States is vastly diminished. U.S. ability to retaliate with overwhelming nuclear force provides credible deterrence against Russian or Chinese missile attacks. Those opposed to NMD deployment presume that states with the technical capability to develop intercontinental ballistic missiles (ICBMs) in the near future, including Israel, India or Pakistan, are unlikely to pose a threat to the United States. However, the number of states with ICBM capability could change with the proliferation of ICBM capabilities from China or states of the former Soviet Union. It remains to be seen if U.S. efforts to curb proliferation through arms control (banning U.S. corporations from doing business with nations that sell arms indiscriminately) and diplomacy will succeed.

Many stand behind the credible deterrent effect of U.S. conventional weapons superiority as well. In their view, the threat of U.S. retaliation will deter nations capable of developing sophisticated ICBMs from deploying them against the United States. They contend rogue states or Third World terrorists, whose fanaticism might negate fear of retaliation, are liable to deliver WMD in relatively simplistic ways, such as by small craft or over land, that would render an NMD system irrelevant.

Limited NMD Capability and a Robust NMD System. Those favoring fielding a limited NMD capability in the near term or a robust NMD system in the next de-



cade ostensibly hold that a possible, probable or imminent threat of missile attack exists to U.S. territory from the accidental or deliberate launch of a handful of ballistic or cruise missiles, but that a massive strike is unlikely. A so-called "thin attack" could involve missiles launched from air, ship or submarine platforms close to U.S. shores as conceivably as it could from distant ground platforms.

Currently, at least 20 countries (nearly half of which are Middle Eastern or South Asian countries) possess or are seeking to acquire ballistic missile delivery systems. Ballistic missiles are becoming a weapon of choice for nations. Seventy-seven countries currently possess cruise missiles. In addition, about 25 countries either possess or are attempting to develop WMD (nuclear, biological or chemical). Five of these (North Korea, Iraq, Libya, Iran and Syria) pose a significant threat because they are pursuing particularly aggressive WMD programs. To counter the seemingly irrational intentions of rogue states or terrorists, those favoring NMD are pushing to deploy at least a limited NMD capability in the near term, as well as to bolster U.S. counter-proliferation efforts.

North Korea is developing the Taepo-Dong 2 missile, which could be deployed as early as 2000 and potentially reach Guam, Alaska or Hawaii. In light of its economic struggles, North Korea could try to sell its missiles for hard currency or oil, as it did in the past to Iran and Syria. While China and several states of the former Soviet Union have ICBMs that could reach the continental United States, as well as submarine-launched missiles, they are not perceived as an immediate threat. Moreover, no new states are expected to develop that capability until the 2005 to 2015 time frame. There is concern, however, over accidental or unauthorized launch of former Soviet or Chinese nuclear missiles. Russia will possess approximately 3,500 nuclear warheads in 2003 while China is increasing its supply of roughly a dozen ICBMs and has two ballistic missile submarines. Strategic nuclear weapons are located in the republics of Ukraine, Byelorussia and Kazakhstan. Despite Russian claims that the weapons are under centralized control, prevailing economic and political conditions warrant U.S. concern over proliferation. Additionally, Russia is marketing its formerly nuclear-tipped SS-25 missiles on the international arms market as space-launch vehicles for satellites. These missiles would no longer be subject to the controls of Russian nuclear forces, and

Some say only a madman would risk massive retaliation by launching missiles at the United States.



could be transferred and reconverted to military use by states possessing sufficient technology, such as Iraq or Iran. Supporters of NMD advocate that either a limited or robust NMD capability should be deployed to protect against both the short- and long-range threat to the United States and its territories through the next decade.

TECHNOLOGICAL AND OPERATIONAL FEASIBILITY

Almost everyone agrees that the United States possesses the technological and operational capability to deploy an NMD system. The question is whether we, at tremendous cost, should deploy an NMD system immediately or wait for the technological and operational capabilities to mature.

No NMD Capability. Those opposed to deploying an NMD capability in the near term apparently do not oppose it on the basis of technological and operational feasibility. While they generally support continued research and development on NMD systems, they doubt threat intentions to attack and the cost-effectiveness of NMD. Some question the technological and operational feasibility and effectiveness of deploying a robust capability in the next decade, and cite insufficient threat capabilities and intentions and prohibitively high costs. Others simply dismiss fielding a robust NMD system on those grounds. The United States can choose to announce that it possesses a nominal NMD capability consisting of the Army Patriot system, which is not fielded as an NMD system, but could be deployed for selective ABM defense as a hedge against threats or in time of heightened threat.

Limited NMD Capability. Advocates of NMD also believe that the United States now has the technological capability to operationally deploy a limited NMD capability in the near term. With system refinements, a limited NMD capability could be deployed as early as 2000. Alternatively, a limited NMD system could remain in a deployment readiness posture and deploy as a hedge against threats, or if and when a dangerous missile threat arises. Lt. Gen. Malcolm O'Neill, former director of the Ballistic Missile Defense Organization, states that the United States is about four years away from deploying an NMD capability.

Robust NMD System. Some advocates of NMD believe that the United States will possess the technological capability to make the transition to a robust multi-tiered NMD system of systems within the next decade. One approach to fielding a robust NMD capability would be to operationally deploy the entire system in the next decade, once it becomes as technologically advanced as possible. Critics might argue against this method of fielding, holding that it would stifle the development of advanced capabilities and that emerging technological capabilities would rapidly render the system outdated.

Another approach would be to deploy a system in increments, building upon a limited capability in the near-term and expanding it over the next 10 to 15 years as advanced systems become technologically and operationally feasible. A robust capability would be similar to U.S. President George Bush's administration's Global Protection Against Limited Strikes program, which consisted of ABM systems and space-based interceptors and sensors.



Russia will still possess about 3,500 nuclear warheads in 2003.

growth of the worldwide ballistic and cruise missile threat. They are concerned that our offensive strategic deterrence capability will fail to deter seemingly irrational fanatics from rogue states or terrorist elements who neither fear conventional retaliation nor believe the United States would be sufficiently provoked to retaliate with nuclear weapons. The United States and Russia would have to accept NMD as a partial substitute for offensive deterrence. However, since offensive strategic forces have diminished in their significance on both sides, NMD advocates say that employing limited ABM defenses should not threaten strategic stability nor the long-term arms reduction process.

The ABM Treaty restricts fielding of an NMD system to one site and limits interceptor missiles to 100. The employment of NMD in several sites, possibly along the periphery of the United States, is prohibited by the treaty but is consistent with the U.S. strategy of nonproliferation. Many advocate amending or modifying the treaty to accommodate NMD. Russia's apparent willingness to agree to this masks their attempts to limit the capabilities of U.S. ABM programs. If the treaty was modified, proposals for employment of a limited NMD capability would still be open to possible rejection by opponents who subjected the proposals to the interpretation of a modified treaty. Supporters of modifying the treaty claim that those favoring the treaty would rather defend it than the country.

Robust NMD System. Perhaps the largest hurdle is that a robust system, including the deployment of space-based interceptor missiles, is prohibited by the ABM Treaty. The United States would therefore need to abandon the ABM Treaty altogether. This will put an end to the strategy relying on the notion that, as long as the United States and Russia are vulnerable to one another's nuclear arsenal, mutually assured destruction will ensure neither will initiate strategic attack. This also provides a hedge against future ballistic missile threats by potential peer competitors, balances the strategic offensive-defensive mix and serves as a deterrent against possible strikes by rogue states or terrorists.

Amending the ABM Treaty and employing an NMD system could undermine a potential peer competitor's confidence in its retaliatory capability, thereby possibly fueling an offensive nuclear arms race. Abrogating the treaty would be a political challenge, as many of the factions that oppose

ABM TREATY COMPLIANCE

Some think we should ignore the ABM treaty signed with the Soviet Union, especially since the USSR no longer exists. Others think the United States remains morally obligated by the agreements and that the treaty works to its benefit.

No NMD Capability. Those opposing NMD believe it undermines the 1972 U.S.-Soviet ABM Treaty. They apparently believe the treaty is a better instrument to deter attack on the United States than an NMD system. They argue that preservation of the ABM Treaty maintains control of the arms race, ensures progress in arms reduction and limits our need to pursue an ABM capability. They contend that deploying NMD may lead to another offensive nuclear arms race with Russia. Moreover, they argue that employing NMD now would undermine full implementation of the START I Treaty and ratification and implementation of the START II Treaty, whereby the Russians would eliminate an additional 3,200 nuclear warheads. Instead, they argue that the United States should pursue a joint ABM defense program with Russia. This would reassure Russians that U.S. intentions are peaceful. The downside is that the United States would remain hostage to Russian intransigence over amending the treaty, which would severely limit our ability to respond to emerging missile threats.

Limited NMD Capability. Those favoring NMD deployment ostensibly hold that the ABM Treaty is a relic of the Cold War and is no longer in the national interests of the United States. They contend the treaty inhibits the employment of ABM defenses, and it fails to distinguish between an NMD system, which is covered in the treaty, and increasingly capable theater ballistic missile defense systems. They argue that the U.S. rivalry with the Soviet Union is no longer relevant and that the United States needs NMD to counter the

NMD deployment have become convinced of the treaty's inviolate nature. But those in favor of abolishing the treaty contend that the United States would be naive to ignore the threat represented by countries that are not subject to the treaty and are rapidly developing offensive ballistic and cruise missile capabilities that will soon pose a threat to the U.S. homeland. In conjunction with modifying or abandoning the treaty, the United States could share ABM technology with other nations as part of a cooperative security arrangement.

EFFECTIVENESS

During World War II, the United States poured billions of dollars into the Manhattan Project with no guarantee that the atomic bomb it was designed to produce would work. But, in the 1940s, the United States was involved in a life-or-death struggle that made the risk worth taking. Will an NMD system work? Is it a gamble worth taking?

No NMD Capability. There is much opposition to NMD on grounds that it will not be effective. Because enemy ballistic or cruise missiles would be randomly launched and therefore too difficult to kill, critics argue that a limited NMD capability cannot achieve sufficient asset coverage to make it worthwhile. Alternatively, supporters might justify not fielding an NMD capability because the United States possesses a nominal capability consisting of PAC-3 or THAAD systems. U.S. announcement of the possession of a nominal NMD capability would bolster U.S. counter-proliferation efforts by deterring potential proliferation of missiles or WMD. The presumption is that deterrence is achievable without investing in a limited NMD system.

Limited NMD Capability. Those favoring a limited NMD capability in the near term hold that the United States needs to avoid being outpaced by the rapid proliferation of ballistic and cruise missiles by potential aggressors. NMD would contribute to credible deterrence and serve as a hedge should deterrence fail. Advocates contend the United States needs only a system capable of destroying a few ballistic or cruise missiles at a time. The Army's Patriot has demonstrated the capability to kill both ballistic and cruise missiles in addition to aircraft. Layering or tiering provides increased effectiveness. A single-tier, 90-percent effective ABM defense (a challenging but not improbable level of effectiveness) would be able to stop nine in 10 attacking missiles, minimizing leaker missiles. Two independent, 90-percent effective defensive layers could reduce lethal leakage to one in a 100.

Additionally, the adversary's potential employment of countermeasures challenges NMD effectiveness. A single-tier capability is more vulnerable to sophisticated offensive missile countermeasures, such as submunitions or decoys, that could be available on the

world market within five years. A two-tier defense provides greater assurance that the capabilities of the ABM defenses will not be negated. A limited NMD capability can achieve effective coverage of a small number of assets. However, it would barely begin to cover all the targetable assets, leaving many critical assets vulnerable.

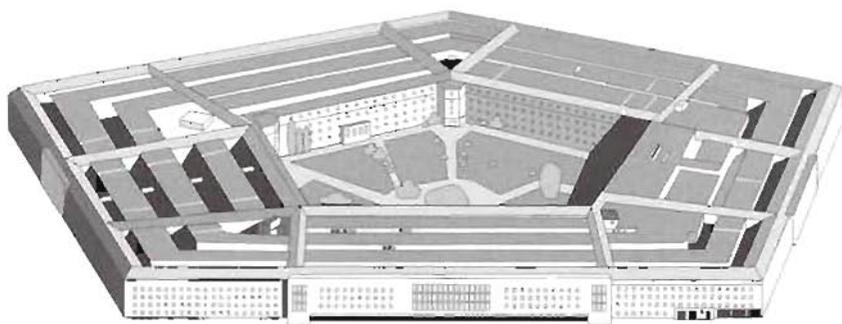
Robust NMD System. A multi-tiered robust NMD system is an added hedge in achieving effective defenses against the likely future threat, hypothetically protecting against all but leaker missiles. A robust NMD system protects significant portions of the country while overlapping vulnerable high-priority assets. Considering the future threat, a robust NMD system is an essential and effective means of defense against both ICBMs and random ballistic or cruise missile launches by a rogue state or terrorist element. Multiple tiering optimizes effectiveness. A three-tier, 90-percent effective ABM defense would be able to reduce hostile missile leakage to one in 1,000. With the expectation that offensive ballistic missiles will employ countermeasures consisting of submunitions or decoys, a multi-layered defense is optimally effective against them. Moreover, a boost-phase intercept capability, which destroys ballistic missiles in ascent, reduces the effects of submunitions or WMD. Conversely, is it necessary or cost effective to achieve such extensive asset coverage? When is coverage sufficient? What is the acceptable level of risk such that the one leaker missile will not make the whole ABM system seem ineffective?

COST

Today, the cost of federally mandated entitlement programs dwarfs post-Cold War military expenditures, which have been rapidly shrinking. Yet the American public continues to perceive that the defense budget is the prime cause of the budget deficit. No matter how you cut it, cost is a decisive factor in the NMD debate.

No NMD Capability. Those opposing NMD are greatly concerned over a return to the excessive budgets of the Strategic Defense Initiative (Star Wars) program. Moreover, the Star Wars

Today, the cost of federally mandated entitlement programs dwarfs post-Cold War military expenditures.



budget was slashed year after year in the 1980s by a Congress reluctant to fund a program that appeared to yield little substantial technological or operational return. With the ongoing downsizing of budgets, force structure and programs, committing great expenditure to a program that some believe has only marginal utility makes little sense. Those opposed to NMD believe an NMD system that costs billions of dollars over the next few years is too expensive, especially given defense budget constraints.

Limited NMD Capability. Many supporters are pushing to deploy a limited NMD capability in the near-term at a relatively moderate cost. Current cost projections for a limited NMD system range from approximately \$500 to \$850 million per year. Considering that the United States spends billions of dollars every year for conventional defense, when the probability of attack by ballistic or cruise missiles against the continental United States is increasing, and given that the consequences of destruction would be more severe if WMD were involved, there is a strong case to be made in support of the cost effectiveness of a limited NMD system.

Robust NMD System. This is an expensive alternative that would cost billions of dollars. Where is the line drawn on costs and cost effectiveness? The American people are unlikely to support an extremely costly program unless there is a payoff in defense effectiveness or deterrence. During the Reagan administration, more than \$38 billion went into the Strategic Defense Initiative program without deploying a system. The U.S. budget realistically cannot accommodate a comprehensive defense against all types of missile threats. However, a missile shield of sorts can vastly reduce our vulnerability to some of the most predictable types of threats.

CONCLUSIONS AND RECOMMENDATIONS

The National Military Strategy establishes our need for defense against the growing near-term threat of WMD. There should be no denial of the future risks posed by proliferation of missiles, the possibility of catastrophic destruction somewhere in our homeland from unauthorized launch of an ICBM, or the insidious threats and intentions of rogue states or terrorists. The threat necessitates our deployment of an effective NMD capability that concurrently fits present fiscal realities. The conceivable damage caused by one or two

ballistic or cruise missile strikes on a U.S. city, not to mention the civic implications, would likely cost more than the deployment of a limited ABM capability. Deploying PAC-3 and THAAD in a limited capability configuration is the most feasible and treaty-compliant near-term measure to provide both a deterrent and an effective hedge against such anticipated threats. Recently, Congress and the administration achieved a general consensus that this limited NMD capability should be technologically ready in three years, with approval for deployment contingent on an assessment of the threat during the following three years.

For the next decade and beyond, the United States must expand its NMD capability to deter and defend against the growing missile threat. Expanding our capability is predicated on continued negotiations with Russia over the deployment of ABM defenses. Because the ABM Treaty is bilateral with the former Soviet Union, it constrains U.S. defensive strategy in a global security environment that has dramatically changed, particularly regarding the emergence of multiple, often unpredictable and aggressive proliferants of missiles and WMD. It is in our near- and long-term national interests to remove the limitations on ABM defenses of the continental United States by either modifying or eliminating the ABM Treaty. Thereafter, the United States should pursue the incremental deployment of a robust NMD system that builds upon the foundation of the near-term limited capability.

Maj.(P) Keith D. Emberton's article is a byproduct of a research paper he prepared at the Naval Command and Staff College. He has commanded an ADA battery in the 2nd Infantry Division in Korea; has served as S-3 of the 35th ADA Brigade, Fort Lewis, Wash.; and is currently chief of Contingency Plans and Programs, J-1, United States Pacific Command.

Army May Field Anti-Satellite System by End of Century

The Army moved a step closer to fielding the Kinetic Energy Anti-Satellite (KE-ASAT) in July when Congress agreed to set aside \$75 million in FY97 for the program. The Clinton Administration's FY97 defense budget did not include funding for KE-ASAT. "With proper funding, we will be ready to intercept orbiting satellites in 1999," said Steve Tiwari, the KE-ASAT program manager at the U.S. Army Space and Missile Defense Command. The Army plans to request an additional \$75 million in FY98, and then \$5 million in FY99 to finish KE-ASAT's flight tests.

Air Defenders on the Army's Toughest Training Battlefield

Going Beyond Duty's Call

For the past two years I have spent 14 days each month, 10 months a year, observing and controlling air defense units at the Joint Readiness Training Center (JRTC), Fort Polk, La. Air defense units deploy to the JRTC as part of a brigade combat team assigned to airborne, air assault and light divisions. A normal JRTC rotation consists of two infantry task forces in the maneuver box and one command post exercise battalion. This force array allows the air defense commander the opportunity to command and control his entire battery and the heavy team's organic air defense assets.

During my tenure at the JRTC, I have coached and mentored newly assigned ADA platoon leaders, senior platoon leaders, newly assigned battery commanders and some senior battery commanders. During 20 rotations I have observed more than 60 iterations of the planning process, from the planning and preparation phases through the execution of brigade- and battalion-level operations. I have observed air defenders participating in the tactical decision making process (TDMP) and planning air defense operations in support of a task force.

The main challenge facing task force air defense officers (ADOs) is to integrate and synchronize the air defense battlefield operating system (BOS) throughout brigade- and battalion-level operations. The JRTC has provided many lessons learned on integration of air defense in support of light and

special divisions and the role of ADOs. Even though the JRTC's primary focus is on light and special divisions, I truly believe the following lessons learned by short-range air defense units apply to all air defenders and will greatly assist our branch in accomplishing any assigned mission.

Intelligence

As air defenders we often measure our success or failure by the number of aircraft, theater ballistic missiles or unmanned aerial vehicles that we destroy with organic air defense assets. This mind-set often creates a narrow focus. Air defenders do not maximize ADA capabilities or the capabilities of the supported unit. Air defense mission statements often contain terms such as "destroy all," "deny" and "prevent losses due to enemy air attack." Yet we believe the only way of achieving success is to launch missiles and destroy enemy aircraft. This belief often focuses subordinate leaders on active air defense measures only.

When planning air defense to support a maneuver commander's plan, the development of the intelligence preparation of the battlefield (IPB) is critical to the success of air defense operations. Battery commanders and platoon leaders understand the IPB process, but do not use the IPB products as the basis for developing their air defense plans or advising their task force commanders on air defense operations. Air defenders are fully capable of identifying air

avenues of approach, but platoon leaders do little more than this when conducting IPB. Several areas of the IPB process that are often overlooked are identification of key terrain, effects of weather on air operations, enemy capabilities and threat analysis. All of these elements are critical to air defense planning, and when they are ignored, the result is often an ineffective air defense.

IPB integration is a trend that has improved throughout my assignment at JRTC. However, the refinement of IPB and adjustment of the air defense plan to defeat the threat continues to be a problem. IPB must be an aggressive, integrated process that allows the ADO to get inside the enemy's decision-making cycle and force him to fight on our terms. Knowing the enemy is very important and developing plans that exploit his vulnerabilities is critical to our success as air defenders.

Staff Integration

Despite the ever-changing threat and the improvements in systems designed to defeat the threat, the one constant is the ADO's role on current and future battlefields. First and foremost, ADOs must understand their role as members of the battle staff. They must be active participants in all phases of the TDMP. Two negative trends I have observed at the JRTC are the lack of a clear understanding of the ADO's responsibilities and integration of the ADO with all members of the battle staff during the planning, preparation and execution of operations. Young lieutenants and battery commanders have a difficult job integrating and synchronizing the air defense BOS at home station. Most battalion-level training exercises are executed with little or no air threat. This is often due to the lack of aircraft; a multiple, integrated laser engagement system; and other resources that impact

war is simulated hell

air defense force-on-force training conducted at home station. As a result, units deploy to the JRTC with an ADO, a key member of the battle staff, who has not been integrated during home-station training.

Integration means playing an active role in all phases of an operation. It requires a viable air threat that will affect brigade and battalion task force operations when air defense is not properly planned at every level. There are limited training opportunities that can realistically portray the threat and allow air defenders to synchronize the air defense BOS at every level. Command post exercises are an effective means of training a battalion or brigade staff, but they are normally conducted in a sterile environment and the staff does not conduct the TDMP under combat conditions. The ADO rarely has the opportunity to plan air defense operations while being decisively engaged in the execution of current operations. This may seem insignificant, but it is very important to train under conditions that closely replicate combat. Combat training centers are the only place to train and assess all elements of the task force as it conducts operations against an uncompromising enemy. The JRTC allows Stinger and Avenger teams to fight against threat aircraft they have been training to defeat since advanced individual training. Additionally, they begin to see their role on the battlefield and how important their individual efforts are to the success of brigade and battalion operations.

Planning

Most air defense planning conducted at the JRTC does not consider the factors of mission, enemy, terrain, troops and time available (METT-T) throughout the planning, preparation and execution phases of the operation. Units often rely solely on standing operating procedures with no regard to the factors of METT-T. As a result, dismounted operations are often conducted with the

Stinger teams carrying too much equipment, rendering the teams combat ineffective. Teams are often positioned to cover main air avenues of approach but have poor fields of fire, and often teams receive movement orders rather than operation orders.

The most significant shortcoming I have observed is the poor application of the five-paragraph operation order. The ADOs at brigade and battalion levels are normally active participants in the planning process. Throughout the TDMP, several tools (such as the situation template, the execution matrix, IPB, warning orders, and the operation order with annexes) assist the task force in the execution of the mission. The ADO plays a role in creating these products, but often disseminates very little — if any — of the available information to his subordinates. This shortcoming is typically observed at battalion level on the part of platoon leaders who use incomplete air defense annexes as the platoon operation order. Platoon leaders must not forget the five-paragraph operation order and the importance of each paragraph to subordinates. Additionally, leaders must practice issuing operation orders over radio nets and have a procedure to conduct backbriefs over the radio as well. Paragraphs three, four and five continue to be weak at platoon level and do not provide Stinger and Avenger teams with needed information. The command and signal paragraph is extremely important for air defenders due to the distances between assets and the necessity to maintain communication. This is especially true due to the fielding of the forward area air defense command, control, communications and intelligence system.

The JRTC is a great place to prepare soldiers for combat. It provides ADOs the chance to plan air defense operations in a difficult environment and gives leaders the chance to assess their unit's ability to support a task force under extremely difficult conditions. Most importantly, the JRTC teaches soldiers

the skills to fight and win on any battlefield. It forces soldiers to consider civilians on the battlefield and forces leaders to plan air defense in a hostile environment. It also shows leaders the difficulties in maintaining situational awareness and planning air defense operations to support a task force.

I have given more than 60 after-action reviews that focused on errors that units must fix. Most errors involve command and control, staff integration, air defense planning, situational awareness and soldier skills. Since this is my final rotation at JRTC, I would like to tell leaders and soldiers that we have some outstanding air defenders at every level who are doing an outstanding job. I have often seen young soldiers go beyond the call of duty to accomplish their missions. Below are just a few examples:

- A Stinger gunner defends his position, kills three opposing force soldiers and evacuates his wounded team chief.
- An air defense battery commander conducts battlefield circulation, runs into an ambush and suffers 22 casualties. He secures the area and organizes aerial medical evacuation.
- A Stinger team chief and an early-warning team call for indirect fire, killing four opposing force soldiers and one SA-14 team.
- An Avenger team chief encourages a convoy to disperse and orient fires during Red/Tight conditions. The convoy destroys a hostile UH-1 with small arms during an air attack.

Watching soldiers work hard and improve during a 14-day rotation is gratifying. The observer/controller experience is second to none. The opportunity to teach, coach and mentor soldiers, along with others who serve as NTC observer/controllers, has made this my most rewarding assignment.

MAJ. MIKE HENCHEN

Sentinel Proves Effective

We are extremely excited here at the National Training Center (NTC), Fort Irwin, Calif., about the many uses and effectiveness of the Sentinel. The Sentinel is normally a division-level asset, but we see many varied and extremely important applications at brigade level. Together with the outstanding officers and NCOs of the 1st Battalion, 3rd Air Defense Artillery, Fort Stewart, Ga., we have learned valuable lessons that we hope will help doctrine writers decide how this great asset should be employed.

Properly positioned, the Sentinel significantly increases the lethality of all ADA systems against the threat to forward maneuver forces, particularly the Hind helicopter, in both offensive and defensive operations. For example, the Sentinel has proven effective during a deliberate attack, if commanders and liaison officers do a good job of analyzing the S-2's enemy template and deciding where they believe Hind helicopters will position themselves to stop any friendly penetration. At the crucial moment, when the Hinds take up positions, ADA units must focus their Sentinels toward the Hind's location. With information from other assets feeding into the forward area air defense command, control, communications and intelligence (FAADC³I) system, we get a "picture" of any fixed-wing aircraft. Focusing the radar into the templated Hind locations and using the "hover-helo" mode increases our chances of detecting and destroying helicopters before they bring their weapons to bear.

The smoke and confusion that prevails during simulated combat makes knowing which direction to orient ADA weapon systems crucial. In a recent ro-

tion, ADA units did this to perfection. The commander and liaison officer worked closely with the brigade S-2 and correctly predicted when and where the Hinds would be committed. At the predetermined "trigger," Sentinel operators switched to "hover-helo" mode and pointed the radar toward the predicted Hind location. As the commander's Bradley Stinger Fighting Vehicle moved through the breach, the crew saw a Hind on their simplified handheld terminal unit (SHTU). Orienting in that direction, they destroyed the Hind before it killed friendly vehicles.

The Sentinel has been just as effective in defensive operations. When positioned properly, according to templated landing zones, it has detected opposing force (OPFOR) air assaults. This helps the task force counter this lethal asset with direct and indirect fires. Again, the key is a good analysis of when and where the enemy will use his air assault assets and focusing the radar at that location at the right time.

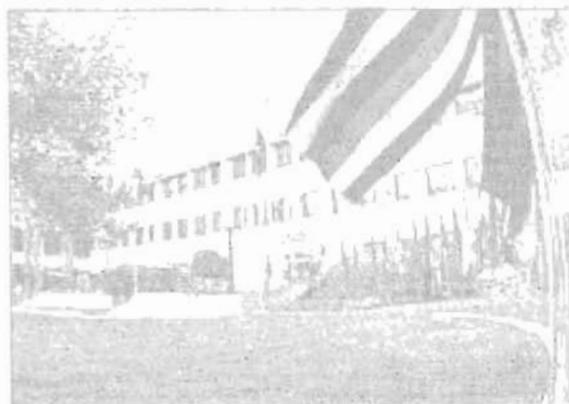
The Sentinel can also meet the priority information requirements of commanders at any level. Commanders, for example, are always concerned about the OPFOR emplacing reconnaissance elements in their sector. The OPFOR frequently inserts reconnaissance elements by helicopter. A GBS tasked to search for OPFOR helicopters traveling in and out of sector could alert commanders to the possibility, or probability, that the OPFOR has inserted reconnaissance teams.

When the air threat is low, the Sentinel should become a significant player in Army airspace command and control

operations. For example, it allows ADA units to track friendly aircraft in corridors or airspace coordination sectors on their simplified handheld terminal units, thereby reducing fratricide. A Sentinel could also track air insertion of friendly reconnaissance elements and display the information on the screen inside the battery tactical operations center in the brigade main command post. This would reduce the need for radio transmissions and allow the command post to monitor mission progress and accomplishment. As soldiers grow familiar with the Sentinel, it will become a much-sought-after battlefield asset, not just by friendly forces but also by the OPFOR, which will seek to detect and destroy it.

A lack of concern about GBS vulnerability has proven a significant weakness. Units do not take time to position the GBS in a location that reduces its vulnerability. They do a poor job of camouflaging equipment and reducing radiating time to crucial moments. Commanders and LNOs also seem unsure of how much time the GBS crew needs to break down the equipment and begin movement. As a result, the OPFOR sometimes overruns GBSs. ADA units will become more expert at employing the GBS as they gain experience with the equipment. We look forward to seeing the GBS working with the full complement of FAADC³I equipment in the upcoming Advanced Warfighting Experiment.

CAPT. TAYLOR S. NEELY



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