January 1999/$3

# AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

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## Mission to Mach 5

## The Disaster at Desert One

## The Integration of Aerospace

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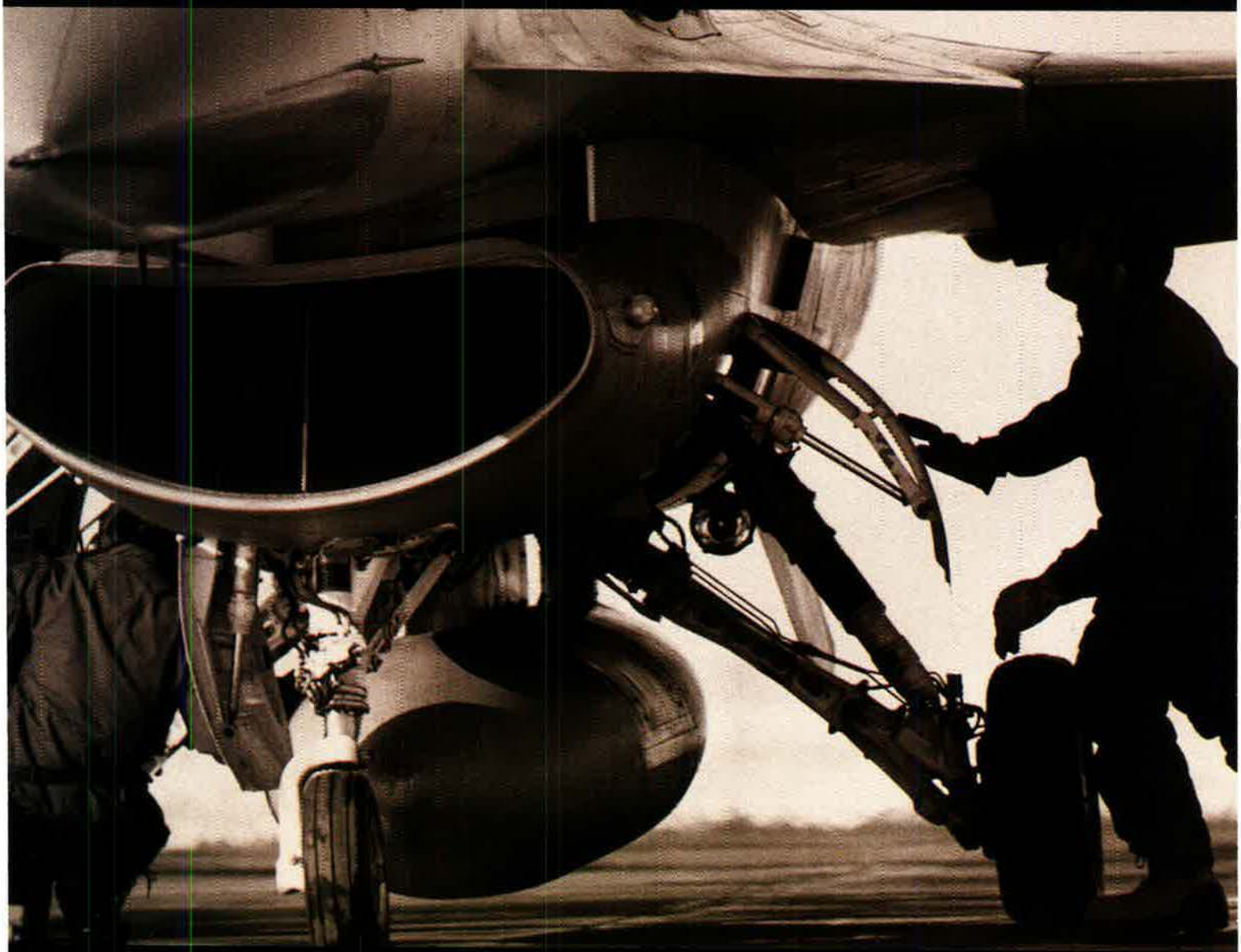

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January 1999, Vol. 82, No. 1

# AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

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**About the cover:** This F-117 Nighthawk fighter with 8th Fighter Squadron, Holloman AFB, N.M., prepares for departure from Al Jaber AB, Kuwait, in support of Operation Southern Watch. See "On Course for Global Engagement," p. 22. USAF photo by TSgt. James D. Mossman.



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**AIR FORCE Magazine** (ISSN 0730-6784) January 1999 (Vol. 82, No. 1) is published monthly by the Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Phone (703) 247-5800. Second-class postage paid at Arlington, Va., and additional mailing offices. **Membership Rate:** $30 per year; $75 for three-year membership. **Life Membership (nonrefundable):** $450 single payment, $475 extended payments. **Subscription Rate:** $30 per year; $25 per year additional for postage to foreign addresses (except Canada and Mexico, which are $9 per year additional). Regular issues $3 each. Special issues (USAF Almanac issue and Anniversary issue) $5 each. **Change of address** requires four weeks' notice. Please include mailing label. **POSTMASTER:** Send changes of address to Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Publisher assumes no responsibility for unsolicited material. 

# Editorial

**By John T. Correll,** Editor in Chief

# The Integration of Aerospace

In November 1996, the Air Force brought forth, with considerable fanfare, a new vision statement. It said that "we are now transitioning from an *air* force into an *air and space* force on an evolutionary path to a *space and air* force." Amazingly, this declaration aroused virtually no controversy or dissent. Almost everybody signed up to the new vision in routine fashion.

Beyond the exuberant basic proposition, though, few details were given. What did the vision really mean? For the past two years, the Air Force has been working behind the scenes to answer that question and figure out how to integrate air and space.

The vision statement depicted an "air and space" force giving way to a "space and air" force. The implication was that the rise of space power meant a corresponding decline in airpower.

Clearly, that is not the case. Airpower is becoming more important to military operations, not less so—and that is unlikely to change anytime soon. Airpower and space power are complementary rather than competitive. The sensible direction is to integrate them, not to pit one against the other.

Last year, Air Force Chief of Staff Gen. Michael E. Ryan said that "aerospace" was the term preferred over "air and space." He told an Air Force Association symposium in Orlando that "because of our commitment to integrate all the elements of aerospace force, I am not satisfied that the only thing that holds air and space together is a conjunction."

Even so, the old argument lives on about whether an "aerospace" regime actually exists, and if it is "seamless." It is said, for example, that the physics of flying through the air and orbiting in space are entirely different. The point is mechanically correct, of course, but how relevant is it?

More important, air and space share common operational characteristics that include elevation, perspective, speed, range, and freedom from the geographic constraints of the Earth's surface. Within this realm, which Ryan calls "the vertical dimension," military operations are blended and interdependent.

"A B-2 feeding target information from satellites to its precision weapons is conducting an aerospace operation," says Dr. Rebecca Grant, who has studied aerospace integration for the Air Force. "Today, aerospace operations are carried out by vehicles optimized for air *or* space. Soon, technology may provide vehicles optimized for air *and* space, leading to a leap in effectiveness in aerospace operations."

**The last thing we need is another wedge between airpower and space power. It is not sensible to pit one against the other.**

Resistance to aerospace integration has arisen on two fronts. Hardcore traditionalists do not recognize the importance of space power. They want to keep space—and the "space cadets"—in a secondary role. On the other hand are the space zealots, who would like to break free of the airmen and set up shop on their own. In both instances, however, these opinions appear to be distinctly in the minority.

The debate heated up in November when Sen. Bob Smith (R–N.H.) announced that if the Air Force does not "step up to the space power mission," Congress may establish a space force as a separate service. Smith is chairman of the Armed Services strategic forces subcommittee.

Smith said the Air Force devotes its space budget to information and support capabilities rather than working on the delivery of force from space. The Air Force is not building "the material, cultural, and organizational foundations of a service dedicated to space power." It must embrace space power by "shedding big chunks of today's Air Force" to pay for tomorrow's space force, he said.

Several points, all of them directly relevant to the aerospace integration issue, should be noted in response to Senator Smith. First, national policy precludes force application with weapons from space. Smith is on the right track in challenging that policy, but his disagreement should be directed at the White House, the Department of Defense, and Congress.

Second, all of the services depend on space, but even though the Air Force carries nearly the full load in the military space program—about 90 percent of the people, systems, and money—its relative share of the defense budget has not been adjusted to reflect that. Yet the perception persists that space power can be advanced only by further eviscerating Air Force airpower.

Third, Smith wants the Air Force to burn its other bridges and commit primarily to a mission that the Department of Defense, the Administration, and Congress have refused to give it. It would be at least as easy for Congress to assign the Air Force clear title to the space mission as it would be to create a new military service.

The last thing we need is another wedge between airpower and space power. In many areas—Intelligence, Surveillance, and Reconnaissance being the leading example—it is already difficult to say where the air operation ends and the space operation begins. The dividing lines between airpower and space power will continue to blur in such missions as global power projection and long-range precision strike. It is inevitable that air superiority and space superiority will eventually merge.

If aerospace integration succeeds, it will overcome the fractionalization of air and space. As a paper circulating in the Pentagon last fall put it, the mission that the Air Force must now advocate and pursue is "command of the aerospace medium and operations in it, from treetop level to High Earth Orbit." ■


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# Letters

### Beware "Chest Beating"

I was pleased to read of the continuing senior level attention, as well as money, being spent on force protection *["To Protect the Force," November, p. 30]* following the "unprecedented" terrorist attack at Khobar Towers in June 1996.

I did, however, consider the statement by a current CINC that he "now felt pretty confident that when we send our troops into harmful situations, the commander himself focuses on the force protection issue" to be both cavalier and divisive. While such a statement may contain the appropriate current political sound bites, it does a disservice to our nation to suggest previous military commanders responsible for troops in harm's way did not.

I would also caution those currently holding staff responsibilities for force protection against "chest beating" about how far force protection measures have come since the attack on Khobar Towers. The two terrorist attacks against American embassies in August—and, once again, the resulting deaths of American soldiers—using what appears to now be a very familiar methodology—and quite possibly a familiar perpetrator—tell me we still have a very long way to go.

Brig. Gen. Terryl J. Schwalier,
USAF (Ret.)
Coupeville, Washington

■ *Schwalier was the commander of the 4404th Wing (Provisional) at Dhahran, Saudi Arabia, at the time of the Khobar Towers bombing.*—THE EDITORS

### A-Frayed

I found it interesting in the "Aerospace World" section (November, p. 13) that Secretary of Defense [William S.] Cohen and Chairman of the Joint Chiefs of Staff [Army Gen. Hugh] Shelton have supposedly cautioned the President that American military readiness is "fraying." I assume they are using the word "fray" to mean "worn or ragged." However, with aging, broken aircraft sitting on the ramp and trained people leaving the military in droves, maybe they really mean an alternative definition of the word: "to frighten or terrify." Or, perhaps they feel as I do—a-frayed.

Lt. Col. E.T. Van Keuren,
USAF (Ret.)
Bellevue, Neb.

### MiG Sweep, Plus

I want to correct an erroneous impression that may have been made in Walter J. Boyne's article "MiG Sweep" *(November, p. 46]*. Boyne states the 366th Tactical Fighter Wing, in its participation in Operation Bolo, "had flown up the coast to a point off Haiphong, evaluated the weather, and elected not to participate in the western part of the mission."

The 366th was not assigned a mission in the western part. It has always been my understanding that the 366th was included in the operation at Gen. [William W.] Momyer's insistence and as a consequence, the F-4s from Da Nang [South Vietnam] were assigned the mission of blocking MiGs that might attempt to escape to refuge bases in China.

My assignment, as squadron commander of the 390th Tactical Fighter Squadron, 366th TFW, was to prevent MiGs from escaping to China via Long Son on the northeast railroad out of Hanoi. I set up a CAP with my F-4s just south of Long Son and remained there until we reached bingo fuel. Unfortunately, the only non-squadron aircraft we saw turned out to be a single F-4, flown by [then–Col.] Chappie James, who had popped up through the clouds below us, apparently separated from the rest of his flight. I never let my old friend forget how lucky he was we identified him before he was blasted for a MiG!

The 366th F-4s from Da Nang, although assigned a less glamorous Bolo task, performed their assigned mission competently and professionally.

Maj. Gen. Hoyt S. Vandenberg Jr.,
USAF (Ret.)
Tucson, Ariz.

[The author] stated that by late 1967 more than 325 F-105s had been lost over North Vietnam. Although the "Thud" and its crews paid a terrible price in Southeast Asia, the number is not correct. By the end of 1967 a total of 307 F-105s had been lost in SEA because of hostile action and major accidents, of which 251 [were] in North Vietnam, one in South Vietnam, 23 in Laos, and 32 in Thailand. Altogether, 399 F-105D/F/Gs were lost in the air war.

As to the use of QRC-160 pods by the F-4Cs, I'd like to add: It was decided that every aircraft in Bolo's counter air force was to be equipped with a QRC-160 ECM pod to (partially) neutralize North Vietnam's SAMs and radar controlled AAA batteries and accordingly minimize possible US losses.

At the same time, this requirement became the limiting factor in the size of the counter air force because of the limited number of pods available in SEA—57, of which 32 [were] at Korat [Thailand] and 25 at Takhli [Thailand]. This number became the basic planning factor for the order of battle and force structure.

However, the F-4C had never used the QRC-160 operationally. There were no provisions at either Ubon [Thailand] or Da Nang to adapt the pods to the F-4C. There was no test equipment: there were no [technical orders] for loading or checkout. In a Dec. 22, 1966, message to CONUS, PACAF [requested] 48 adaptor kits on an operational priority without disclosing the nature of the mission.

Three days later a C-141 departed the US with the 48 kits and an engineer from the Ogden Air Materiel Area

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[Utah], providing a capability of 96 pods. Korat's pods with 12 support people were sent to Ubon, while Da Nang received Takhli's pods. The QRC-160 was loaded on the right outboard pylon, which was the only station capable of handling the pod on the F-4C. The pods were 100 percent operationally ready on initial loading and demonstrated a remarkable 90 percent reliability during the mission.

Theo Van Geffen
Utrecht, Netherlands

As maintenance supervisor of the 355th Armament and Electronics Maintenance Squadron, the precious QRC-160 electronic countermeasures pods of the 355th were part of my responsibilities. I was directed to get our QRC-160s together, select a crew of maintenance technicians and resources needed to keep QRC-160s running, and meet a C-130 to support a classified mission—not to be discussed until airborne.

My assignment was to install modification kits on our QRC-160s to change them from F-105 to F-4C configuration and to take these QRC-160s to Da Nang and install them on F-4Cs. Secrecy was paramount, so the modifications had to be made while airborne en route. The mod kits came with the C-130, whose flight crew wouldn't know their destination until I told them.

A selected small crew of the most highly qualified QRC-160 technicians in Southeast Asia (and in my opinion in USAF), all from the 355th, was led by the master sergeant shop chief, one of the most innovative and capable QRC technicians I have ever served with and an enviable supervisor/leader.

These men, not unaccustomed to emergency responses or long and late hours, accepted the urgency and secrecy without comment or question. They had everything ready and waiting when the C-130 backed into the loading area in the dark of early night. They loaded the QRC-160s and equipment, assisting the loadmaster as if they did it every day. After takeoff they checked the mod kits and tech data and immediately started the required work.

En route we landed at Nakhon Phanom [Thailand], I suppose as a ruse to make our flight appear as a routine shuttle run around the SEA stations. Virtually all required retrofit work was finished by the time of arrival at Da Nang, around midnight, where several of this dedicated group continued working with F-4C personnel to prepare to upload the QRC-160s on the F-4s.

The remainder of the crew got to sack out for a couple of hours to be fresher for the mission launch phase of the operation. Everyone got to rest, some while the mission was being flown. When the F-4s got back, these men assisted in the QRC-160 download and then reloaded them on the C-130 to head back to Takhli. En route they restored the QRC-160s to the F-105 configuration and off-loaded them when we arrived back at home base.

The MiG Sweep mission was an artful deception which the QRC-160 made happen, and those few men on a C-130 through the night of Dec. 31, 1966, made the QRC-160 happen. I am grateful for the privilege of having served with people of their caliber.

Lt. Col. S.R. Tait,
USAF (Ret.)
Shelbyville, Ill.

In "MiG Sweep" you mistakenly stated that F-4D tail #66-7601 *[caption, p. 50]* was the same kind of F-4 that participated in Operation Bolo. All the Bolo aircraft were F-4Cs, which resembled the later F-4D but were less capable in many respects. However, this is an interesting picture in its own right as it was apparently taken between 601's first two kills on Nov. 6 and its final kill on Dec. 19, 1967, all of which were scored using a SUU-23 20 mm gun pod.

Maj. Jim Rotramel
USAF (Ret.)
Lexington Park, Md.

Thanks for recalling Robin Olds' leadership of the 8th TFW, the "Wolfpack," at Ubon RTAB. A member of a tenant unit, the 374th TAW Blind Bat mission, I arrived at Ubon on the night of Jan. 2, 1967, just after recovery of the Bolo forces which had killed seven MiGs.

Party? I recall a conga line snaking through the base. For the next 10 months I was able to watch a combat leader "lead." I was in the crowd that met Olds' airplane after his additional two MiG kills. I heard him say things as profound and relevant as the motto painted across the front of the briefing room: "Your mission is to fly and fight and don't you forget it." He made our five airplane C-130 unit his own.

I recall that 7th Air Force wanted to move the Bats to another base to make room for a "higher priority" unit. We were at the time working with Wolfpack crews, trying (rather unsuccessfully) to slow things down on the Ho Chi Minh Trail. Olds simply said, "No," and Blind Bat stayed.

As his tour neared the end, he was rarely seen out of a flight suit. I believe he flew wing as often as not, to observe and teach—and, I think, al-

AIR FORCE MAGAZINE
PUBLISHED BY THE AIR FORCE ASSOCIATION

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BPA Circulation audited by Business Publication Audit

**Air Force Association**
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## Letters

ways hoping to bag that fifth MiG which would have made him an ace in two wars. At his farewell bash, I stood with the folks of the Wolfpack and applauded for what seemed to be hours. At that time, and to this very day, I felt that I had been in the presence of a true warrior and heroic leader. [I] had never seen one before and never saw one after.

Lt. Col. Joseph W. White II, USAF (Ret.)
Germantown, Md.

The article "MiG Sweep" brought to mind another, somewhat similar, mission in which I was engaged as a U-2 reconnaissance pilot in about the same time frame. While I don't remember the year (I had multiple TDY tours there from 1964 through 1970), I do remember being briefed by our intelligence officer that North Vietnam had dedicated a small number of MiG-21s to shoot down our high fliers. The MiGs had been stripped down to lighten them and had been trained to accelerate to Mach 2+ to make a "dynamic zoom" and launch heat seeking missiles at us. We were also told that the pilots of these special MiG-21s could be Russians.

An additional area of concern was that the enemy had apparently broken into our message system and knew the preplanned routes sent by top secret message from the recon center in Omaha [Neb.]. Those who covered our missions by radar noticed that the MiGs were vectored so as to start their dynamic zoom just after we rolled out on a new heading and would be wings level for several minutes. To counter this threat to the U-2 mission, the 555th TFS "Triple Nickel" was tasked with providing air "cover"—from several thousands of feet below! We in the U-2 made contact with our fighters on a discreet frequency and the EC-121 "Big Eye" was to call out the location of the MiGs by a specially concocted grid reference given to us and the F-4 crews. If we were attacked, the F-4s were supposed to intercept the MiG before he released missiles at us. The Triple Nickel crews liked the opportunity to possibly bag a MiG and we enjoyed the company on a normally very lonely mission.

Lt. Col. Ward G. Graham, USAF (Ret.)
Manns Choice, Pa.

### Sharp Eyes Needed

Is there a misprint [in] "Heavy Lifters" *[November, p. 22]*? On p. 26, the last paragraph of the first column, [it refers to] "the C-17s that have already retired." This would be a surprise for such a new airplane.

Wayne Haile
Roseville, Calif.

I suppose that I'm bringing up the rear on notifying you that the 8th Fighter Wing is not at Holloman AFB, N.M., but at Kunsan AB, Korea *[p. 23]*. I think you meant the 8th Fighter Squadron.

Dave Grindle
IT Systems Programmer
Idaho Dept. of Water Resources
Mountain Home, Idaho

■ *Readers: 2. Editors: 0. We should have caught the errors. We did mean the 8th FS at Holloman.—THE EDITORS*

### It Was Longer

"The Track to Survival" *["Valor," November, p. 53]* was well-written, but the correct length of the Edwards AFB [Calif.] sled track is actually 20,000 feet, not 2,000. The ISTRACON Handbook 60-1, dated Dec. 1, 1961, p. 3–12, is a good reference for this data.

The Holloman AFB rocket sled track in 1961 was 35,071 feet long. Later on when the Edwards sled track was shut down, the rail was sent to Holloman. Over 15,000 feet of track was welded to the Holloman track, which is now 50,788 feet long.

Ed Drumheller II
Boeing Phantom Works
Kent, Wash.

### Access and Jointness

As a former [Navy] aviator, I read "The Access Issue" *[October, p. 42]* with great interest and some empathy. Empathy in that undoubtedly there is no easy substitute for land-based aviation in great numbers from multiple bases when a large and prolonged land campaign is envisioned. Certainly that was the case in Europe during the Cold War and remains the case in Korea today. In Desert Storm, both land-based and sea-based aircraft were well-utilized, including those from six carriers in the Gulf and Red Sea.

But as your article acknowledges in quoting Gen. [John P.] Jumper (referring to the Air Force): "We've had access problems." And we will have them again. The "lockout" by Saudi Arabia in early 1998 will not be the last instance. Your authors agree: "Allies can deny access or impose operational limitations and have done so." But whenever US vital interests diverge from those of our friends, we don't want our freedom of action stymied by our friends! We must be able

to act unilaterally. I regard both naval aviation and the entire US Air Force (not merely Air Combat Command) as essential elements of US national security, vital to the execution of US foreign policy.

Yet some misconceptions in the article need clarification. The statement that carriers "can fight for two or three days, then they have to stand down to replenish" might mislead a reader unaware that modern large-deck carriers have fought for more than 60 days at a time, delivering combat sorties on each of those days. Replenishments at sea take a few hours a week out of the cycle of sustained combat operations and never require a reduction of defensive posture. When there are two or more carriers on station (as there usually are for combat operations) there is no letup in strike sorties even for those few hours.

Further, the minuscule air logistics support provided for some distant battle group operations have been located 2,000 miles from the operating area, for example, using S-3 aircraft to the Arabian Sea from Diego Garcia. If necessary, battle groups can operate without such air logistics support for weeks or months, receiving *all* resupply from other ships. Been there, done that.

Over the years, as crises have arisen, forward deployed carriers have reached station well within the decision-making cycle of national command authorities; they are there when needed.

With respect to the emerging chemical/biological ballistic missile threat: In 2003 fast-moving Navy battle groups will bring to bear a new ballistic missile defense capability, on cruisers and destroyers, with the Navy Standard Missile, Block IVA, for area defense of the entire battle group; a follow-on system will provide theater-wide ballistic missile defense for protection of large land masses. Both systems can help protect air bases and other fixed, land targets.

The bottom line is that the US needs both land- and sea-based aviation and needs to employ them synergistically by cooperating in a joint partnership. Each has inherent strengths. It will take the hard work and honest efforts of both services to ensure that both serve the country well.

Capt. Hugh F. Lynch,
USN (Ret.)
Newport, R.I.

**State of the Force**

Your November [issue] gives a clear picture of "The State of the Force" *[p. 76].* Please continue your valuable revelations of the service's shortcomings.

The ever increasing, backbreaking, and extended demands on the Air Force without adequate compensatory resources is a disservice. By disservice, I mean [that done] by the President and Congress of the United States. As we all know, it is their sworn responsibility to do exactly what is needed for national security. In the main, they give little or no effort to these urgent needs. Mostly it's lip service on their part.

What is needed is aggressive, positive leadership—and this on a continuing basis—to correct any and all serious and dangerous flaws in our national defense establishment, now and forever more.

Lt. Col. Wayne J. Guidry,
USAF (Ret.)
Sun City West, Ariz.

**Do It Cheaper and Better**

[The] "Aerospace World" article *["T-3A Firefly Out for Two Years," November, p. 15]* on the grounding of T-3A aircraft for two or more years because of engine problems, resulting in 66 failures and three deaths, was of great concern.

First of all, it is difficult to believe the T-3A engine problems cannot be resolved for more than two years with all the aircraft engine specialists the Air Force has and has access to. Secondly, if according to Air Education and Training Command, there is a rising pilot training attrition rate due to a nonexistent pilot screening program, then the solution is obvious. If AETC is planning to reinstitute the pilot screening process by sending pilot candidates to civilian flight schools, why not do it cheaper, better, and more efficiently by utilizing the many Air Force aero clubs?

These Air Force monitored flying schools are FAA Part 141 approved and graduate hundreds of pilots annually. In my tenure as Eglin Aero Club manager, we historically sent six to 10 students (pilots) to undergraduate pilot training annually. These aero club pilots were expertly trained and the transition to Air Force pilot standards was extremely easy. There was no washout rate because these students already knew how to fly.

I would strongly suggest AETC consider using Air Force aero clubs as a screening source in the first step of fulfilling our future pilot requirements.

Lt. Col. John A. Bobel,
USAF (Ret.)
Fort Walton Beach, Fla.

**Not Quite First**

The second [of the] "News Notes" *["Aerospace World," November, p. 20]* stated that the F-117A is the first stealthy aircraft able to use an [Air Force Mission Support System]–based system. That is not quite true. The B-2A has been using AFMSS since the first delivery of a Block 30 modified B-2, aircraft No. 20, delivered Aug. 1, 1997.

Lt. Col. Kenneth E. Charpie Jr.,
Chief, B-2 Branch
ACC Systems Office
Wright–Patterson AFB, Ohio

**Optimistic?**

["Congressional News" on] p. 17 *["Aerospace World," November]* seems to present a guardedly optimistic view of future defense spending. I hope that the long decline in military readiness is about to end.

The defense budget for the next year will still account for only about 3 percent of the country's gross domestic product. This is the smallest percentage since 1940. We have not only been continually cutting defense spending and reducing personnel strength in recent years but also have been putting our vital defense industrial base out of business.

At the same time the military threat to the United States and its overseas interests is growing rapidly. According to *Seapower,* the official publication of the Navy League of the United States, more than 20 countries possess or are developing nuclear, biological, or chemical weapons. At least 20 nations have theater ballistic missiles and 75 countries already possess anti-ship missiles.

Peter Kenney
Birmingham, Ala.

**Strela or Not?**

"The Easter Halt" *[September, p. 60]* and the letter [headed] "First Loss?" *[November, p. 9]* brought back vivid memories. Concerning the November letter, unless I missed seeing the missile (I had seen many Strelas fired), the AC-119 Stinger gunship shot down over An Loc [South Vietnam] during the 1972 Easter Offensive was shot down by 37 mm fire and not by an SA-7 Strela.

I was the Forward Air Controller (Sun Dog 29, nicknamed "Terrible Tom") working with the Stinger that afternoon. I was flying wide on the AC-119's wing as we both tried in vain to find a battery of 37 mm Anti-Aircraft Artillery that had us under heavy fire. The sky around us was filled with bursting flak and I feared that our luck would shortly run out. Because we could not locate the AAA battery, I

recommended to the Stinger crew that we depart the area for a few minutes as the battery was rapidly zeroing in on us both. The Stinger pilot acknowledged and was going to make one or two more turns in hopes of finding the gun before moving out of 37 mm range. It was only a few moments later when the Stinger took a heavy hit and [its] wing suddenly became a mass of flames. I called out on the radio a heading for him to get clear of the An Loc area and watched as he turned in that direction and rapidly began to lose altitude.

I immediately launched the Search and Rescue force from Bien Hoa [South Vietnam] and watched the crew members begin to bail out of the burning AC-119. The aircraft fell not far from An Loc into an area full of North Vietnamese soldiers. Using my grease pencil, I was able to map the location of the survivors on my canopy as they landed in the dense jungle. I spoke with each surviving crew member on the ground as we waited for the Sandys and Jolly Greens to arrive. When the SAR force arrived, the Sandys, Jollys, and I worked together to locate and rescue each survivor. I will always remember that mission and meeting the survivors at the hospital at Tan Son Nhut [South Vietnam] later [on] the evening of their rescue. (Today, I have their photo displayed on the wall in my office.)

The very next morning I returned to the area before sunrise, determined to find that gun battery. Those guns had to be found before we put more aircraft into their zone of deadly fire. I had a pretty good idea as to where the 37 mm battery was located and after several hours, by watching the early morning shadows, I was finally able to pick out the guns from the surrounding vegetation. As I was low on fuel when the airstrikes arrived, I helped my replacement FAC locate the guns and instructed him to destroy the site which had taken down our Stinger.

Lt. Col. Tom Milligan,
USAF (Ret.)
Beaverton, Ore.

**How to Build a Pallet**

[A] photograph on p. 40, part of the "Pressures on the Guard and Reserve" *[November, p. 36]* depict[s] several Maryland and Michigan Air National Guardsmen packing a 463L pallet for their return home. Even if this photograph was staged, it was shameful. Do the Air National Guard and Air Force Reserve have their own regulations and/or instructions that are completely different from the active duty Air Force? I have only been building pallets for deployments for the past 15 years, and I have never seen the like of this.

1. Since when is a pallet, empty or full, allowed to [lie] on the ground without there being some type of dunnage, or equivalent, under it? First, the bottom skin of the pallet may be rendered unserviceable by being impaled by a stone or other foreign object. A pallet [with a hole in it] may be subject to water intrusion, causing the plywood to expand and warp the pallet. The pallet will then be unable to sit in the aircraft rail system. Also, a torn [underside] may damage the aircraft rails. How do these individuals expect the forklift (in the background) to pick up the pallet?

2. The wheels of the equipment were not offset 90 degrees from each other, to prevent in-flight rolling. One of the wheels does not appear to be locked. They are in the process of tying down the rolling stock with the cargo straps, yet they have not even finished chocking the wheels. Since they appear to be using only cargo straps, they did not include the use of 3/4-inch ply to displace the wheel PSI. I know that the requirement is for 3/4 ply at around 250 PSI, but since they are using straps to tie the stock down onto the pallet, they will increase the PSI of the rolling stock to the pallet.

3. No one [is] wearing gloves to protect against pinching, cuts, etc. To top it off, here they are on the flight line, building this pallet, and the senior NCO on the left is wearing a hat (great FOD potential).

This solitary photograph has put the hardworking men and women of the ANG and AFRC in a negative spotlight.

MSgt. Gerald R. Prosser
Kelly AFB, Texas

**Two Views of the Cover**

Shame on you for this travesty of a cover *[November]*. As a USAF retiree working with US Army infantry combat weapons, I feel like a laughingstock. A soldier's first look at this photo says, "If the Air Force doesn't know enough for its 'soldiers' to keep their weapons clean, then they could have a lot of them on the scene of battle as cannon fodder with inoperative weapons." If that were an Army picture the weapon would be clean and the soldier would have the mud.

Lt. Col. J. Russ Currey,
USAF (Ret.)
Huntsville, Ala.

The stunning picture on the cover of a mud-soaked airman holding his gun as he protects an air base overlooks one important point. The attacks on our military forces that will cause the most damage and for which we have no defense will be from ballistic missiles. We have no defense against long- or intermediate-range ballistic missiles. Until we have such defenses, the primary threat we face will be from those missiles. We have an Achilles' heel.

It's no secret that North Korea's Taepo Dong 1 can strike the United States or that Iran is building a long-range ballistic missile to attack our cities. Your October "Russian Military Almanac" [p. 52] lists Russia with 756 ICBMs and 424 SLBMs. Those are 756 ICBMs and 424 SLBMs for which we have no defense.

While the picture of a Space Based Laser or Brilliant Pebbles (for ballistic missile defense) will never be as warm or personable as a mud-covered soldier, Marine, or airman, those are the types of defenses we will need, in addition to the warrior on the ground. We need to protect our air bases and country not just from ground threats but from the technological terror of the long-range ballistic missile.

James H. Hughes
Englewood, Colo.

**Just Let Me Fly**

I don't want to belabor this, but in this case a statement was made by retired Lt. Col. Don Taylor *[November, "Views of Retention Woes," "Letters," p. 10]* which sounds, in no small amount, absurd. He opined that, just after World War II, [by far the opinion of] combat-type fighter pilots was: No way would they fly without flight pay. The Air Force should have fired the lot if that were true.

I was one of the luckiest guys in the world, flying first-line aircraft from 1951–71 and getting paid to do it. I would have flown without pay, but I needed to buy food, shelter, and clothing for my family. My highlight was flying the RF-101 in combat over North Vietnam. While I was on active duty I sometimes wished those in power would take away flight pay and put those guys who wouldn't fly behind a desk or boot them out. Then later, flight pay could be restarted to the deserving—the warriors. I won't apologize if I come on patriotic. I was proud and thrilled to fly for my country and the Air Force.

Lt. Col. Tony Weissgarber,
USAF (Ret.)
San Antonio

**A PGM, by Any Other Name**

[In] reference [to] your news item in

"Aerospace World" *["A-10s To Get PGM Capability," November, p.17],* concerning the addition of precision guided weapons to the A-10 aircraft, the "Warthog" now employs, to great effect, the AGM-65 Maverick (both TV and IR guided) air-to-ground missile as well as the Paveway Laser-Guided Bomb family of weapons. Eighty-five percent of all Mavericks hit within one meter of the intended target. The circular error probable for LGBs is less than three meters. If these aren't "precision guided weapons" I don't know what they are.

What you should have said is that the A-10 is adding capability to deliver INS/GPS guided munitions such as the Joint Direct Attack Munition and the Joint Stand-off Weapon. The jury is still out on whether GPS will deliver sufficient accuracy in real world conditions to classify these systems as precision guided weapons. Until, and after then, the Warthog will continue to kill targets using its current precision guided weapons.

Lt. Col. Nelson E. Cobleigh
USAF (Ret.)
Tucson, Ariz.

**Blackbird Retort**

Because of historical accuracy, the record has to be set straight regarding the recent calls to send the two reactivated SR-71s into theater operations. *[See "Not So, Blackbird," October, p.7, and "Blackbird Rising," August, p. 8—both in "Letters."]*

The two reactivated SR-71s of Det. 2, 9th Reconnaissance Wing [Beale AFB, Calif.], were capable of carrying traditional film, an improved ASARS-1 (equal to ASARS-2), and an Electro-Optical system, with the ASARS and EO capable of direct data link to their own or other sister services' ground stations (a joint system). And each could carry all three sensors at one time! The SR-71 complemented the U-2, which has tremendous loiter time; however, the SR-71 could penetrate hostile airspace, still an untouchable platform [despite] today's air defense systems. The reactivated Blackbirds were tactical warfighting collectors, not the strategic systems of the past. They could provide targeteers with that critical EO or ASARS "last look" on demand before the "shoot," via any theater ground station, while still providing film products (still superior in resolution, quality, and broad area coverage) with the intelligence data needed for our ground forces to prepare the battlefield (IPB). And the new mission planning system enabled quick changes to mission profiles; for example, hours before launching to support [US] Central Command's Roving Sands '97, we reprogrammed the mission to fly to New Mexico via Colorado to search for that lost A-10. Finally, the SR-71 was unpredictable!

As the commander of the 9th Intelligence Squadron during the short-lived SR-71 reactivation, I saw great value to this warfighting platform for IPB, targeting, and battle damage assessment; aircraft launched on demand, folded into the timing of any ATO! Unfortunately, even the meager $39 million a year was too rich in a military in search of JSTARS, more U-2 support, and the unmanned aerial vehicle programs. Historians and those who did not support the reactivation must keep the facts in mind: The reactivated aircraft were unique warfighting systems that supported the contemporary missions of mobile targeting, cruise missile execution, and the war on terrorism.

Col. Joseph F. Reich,
USAF
Collection Manager,
US Forces, Korea

# Aerospace World

**By Peter Grier**

### F-22 Passes Test Goal

The Air Force reached an important flight test hour goal for the F-22 prior to a critical Pentagon review of the program.

Through late November the two F-22s at Edwards AFB, Calif., had accumulated 160 flight test hours. Air Force Chief of Staff Gen. Michael E. Ryan had set 184 flight test hours—4 percent of the planned total—as a goal for the aircraft by Thanksgiving. Release of money for purchase of the first two production aircraft could not occur until the goal was reached.

The F-22s hit the mark with 184.4 hours Nov. 23, beating the Thanksgiving Day target and ensuring the program was ready for a Pentagon review scheduled to begin Dec. 1. The review will determine whether Secretary of Defense William S. Cohen approves purchase of the two production aircraft.

So far the test program has resulted in only a few minor changes to the aircraft, such as a new fuel pump design, said officials. The F-22 has gone supersonic (1.4 Mach), reached 40,000 feet, and flown at up to 26 degrees angle of attack, said officials.

***The F-22 Raptor met a flying-hour goal of 184 hours on Nov. 23, three days ahead of schedule. Congress set 183 hours as a minimum that had to be met before DoD could release funds for the advance buy of the first six production versions of USAF's next-generation air superiority fighters.***

### Meteoroid Shower Leaves Satellites Unharmed

Air Force satellites appear to have escaped the Leonid meteoroid shower unscathed, said service officials Nov. 17.

Space operations crews had not known what to expect during the height of the Leonid storm and had spent months preparing to limit possible shower damage through such techniques as powering down unnecessary onboard electronics and reducing a satellite's cross-section.

"We prepared for the worst and were pleased the shower did not directly threaten our space assets," said Maj. Gen. Gerald F. Perryman Jr., commander of 14th Air Force and Air Force Component–Space Operations of US Space Command.

The Leonid shower occurs every 32 to 33 years, when the Earth passes through the densest portion of the debris trail of the comet Tempel–Tuttle. The last time around for the shower was 1966, when there were not as many satellites orbiting the planet.

### Pay a Top Priority, Says Pentagon

Department of Defense leaders say that a quality pay and retirement package will be the top item on their legislative agenda in 1999.

In an Oct. 22 interview with Armed Forces Radio and Television, Secretary of Defense William S. Cohen said he will ask for a 4.4 percent across-the-board wage hike. He indicated that DoD is also considering a targeted pay boost for mid-career officers and NCOs whose salaries lag particularly far behind those of their civilian counterparts.

Chairman of the Joint Chiefs of Staff Army Gen. Hugh Shelton, in the same interview, said that it is his intention that any change in retirement funding will cover everyone who has entered the military since 1986. "It's too early to tell exactly how this will shape up, but that would be the intent," he said.

Meanwhile, Congressional leaders are warning that the Pentagon needs to thoroughly analyze any pay or retirement proposals to determine their significant long term costs.

In an Oct. 8 letter to Cohen, Senate Armed Services Committee Chairman Sen. Strom Thurmond (R) of South Carolina and ranking minority member Sen. Carl Levin (D) of Michigan said that any such proposals "must be fully supported by careful analyses justifying the costs and providing assurance of measurable increases in recruiting, retention, and military readiness."

### Mountain Home Wing To Be Full-Time AEF

The 366th Wing at Mountain Home AFB, Idaho, will become a permanent Air Expeditionary Force, according to service officials.

If deployed, it will be bolstered as needed by B-2s or other aircraft from

units not directly under its control, Maj. Gen. Daniel M. Dick, vice commander of Air Combat Command's 12th Air Force, said in late October.

The Air Force's original plans had called for 10 AEFs, all made up of units from different bases. Now there will be nine such distributed AEFs, said the general. The 366th will be AEF No. 10.

He also said that the Expeditionary Force Experiment held by the Air Force last fall was a success, in everything from transmission of target data to en route aircraft to use of Special Operations Command air-delivered acoustic sensors.

### C-17 Tries Dual-Row Airdrop Capability

Air Force testers recently tried out a new C-17 dual-row airdrop capability that could double the aircraft's capacity to carry certain kinds of cargo.

When set up for airdrop delivery, current practice calls for C-17s to carry only one row of cargo—leaving wasted space on the sides. Certifying Globemasters to carry and drop two rows at a time could solve this problem and reduce the number of aircraft needed to support an Army strategic brigade drop by 20.

"The dual-row airdrop capability should result in a more efficient use of C-17s," said Alec Dyatt, 418th Flight Test Squadron dual-row airdrop project engineer.

The recent testing took place at Edwards AFB, Calif., and focused on using gravity, instead of parachutes, to pull cargo from the plane.

One big step was determining the proper aircraft deck angle for gravity dropping of cargo. Too shallow, and the pallets are spread too far over the drop zone. Too steep, and locks that hold the pallets in place won't retract properly.

Cargo dropped included mock-up Humvees and howitzers. Attempts to drop the rows simultaneously resulted in collisions between platforms forced into each other by the convergence of airflow off the back of the plane. Dropping rows one after the other proved more successful.

"Once we found the problem with simultaneous drops, we went back and perfected the sequential drop," said Dyatt.

### C-141 Tested in Chemical Environment

A first-of-its-kind field test at the Army's Dugway Proving Ground in Utah gave Air Mobility Command a look at

USAF photo by MSgt. Kevin Hoeth

***At Hurlburt Field, Fla., SrA. Chris Mann (left) and TSgt. Jim Burt identify targets during Lightning Challenge, a competition for tactical air command and control specialists. SSgt. Sean O'Neill and SrA. Jason Quesenberry from Ft. Benning, Ga., were the overall winners among 33 two-man teams that competed.***

## Expect More Force Cuts, Warns NSC Official

US armed services—still reeling from earlier cuts in force structure—now face additional reductions. The reasons: Windfalls from budget reforms have not materialized, and unexpected, high-cost personnel requirements have.

So says Robert G. Bell, a presidential assistant and the senior director for defense policy and arms control at the National Security Council.

Noted specifically as vulnerable items in a new squeeze: The Navy's 12 aircraft carriers; 100,000-strong troop deployments in Europe and Asia; and forces needed to cover the second conflict in the nation's two–Major Theater War strategy.

In its 1997 Quadrennial Defense Review, DoD said it would harvest savings from reforms and divert the funds to vital needs, financing an otherwise underfunded program. Bell, however, laid that idea to rest in a November speech in Cambridge, Mass.

He blamed Congress, saying it had not, as asked, closed bases, stopped diverting money to unwanted and unneeded projects, or properly funded contingencies. Failure to execute the reforms drained money for readiness and modernization, Bell said.

Also, DoD confronts unanticipated costs. The services, worried about recruiting and retention, want to close a military–civilian pay gap and provide more lucrative retired pay. Bell said doing this could cost $30 billion over six years.

All told, these problems have blown a $86 billion hole in the program, said Bell, raising the question: How to fix it?

The White House official said the Administration would go after force structure "if at the end of the day we cannot assume that we're not going to have much more success ... on the Hill ... and a topline increase is not available."

DoD has decided to cut readiness of "lower priority forces," and more readiness cuts would be "a sure prescription for a ... crisis," said Bell. Yet he said "stretching out" modernization would have a grave impact on future capabilities.

"My sense is that ... your only choice is to come back to force structure: Downsize the force to save dollars that you can't otherwise capture," Bell said. "It means revisiting 100,000 troops in Asia and Europe, ... revisiting carrier levels, ... revisiting the second [MTW] requirement."

Skeptics noted that, even at the time, the QDR's savings projection was considered fantasy, and virtually no one took it seriously. Moreover, some asked, why doesn't the White House simply propose a bigger DoD budget?

Bell left the impression that defense was just another claimant for federal money. Defense, he said, must be considered "alongside other national issues." He declared, for example, "the President has a very clear priority for fixing the Social Security system and for doing that first."

W. Va. ANG photo by Maj. Mike Pitzer

***Hurricane Mitch relief efforts in Honduras involved more than 1,000 US service personnel, including West Virginia Air National Guardsmen, here with personnel from the Netherlands. Below, an Air Force C-27 Spartan refuels at an airstrip near Mocoron, Honduras, before continuing its mission of delivering food and medical supplies to remote areas.***

how to conduct airlift operations in a chemical warfare environment.

The autumn experiment involved a full-scale air mobility launch and recovery process, plus air bursts of a simulated chemical agent.

"The overall objective was to take existing contamination control procedures, refine them as necessary, and then test them so that we can provide a report containing valid information for the unified CINCs to make decisions," said MSgt. Todd Herzog, test manager for AMC's directorate of test and evaluation.

Sixty-eight airmen from McGuire AFB, N.J., Scott AFB, Ill., Andrews AFB, Md., and Grand Forks AFB, N.D., took part in the tests. During the trial, canisters containing a blue-dyed chemical simulant were launched from the ground. They exploded in the air, creating a mist that drifted down over personnel bunkers, cargo, equipment, and a C-141 from the 305th Air Mobility Wing at McGuire.

"When we came out of our shelters to examine the aircraft after the aerial burst, we could see puddles of the simulant in the engine intake and had to clean simulant from places you never thought it would get to," said Capt. Timothy Bailey, a C-141 maintenance officer from the 305th.

Following ground contamination cleanup, the C-141 was loaded up with passengers and cargo and flown depressurized for two hours, as the crew vented the interior of the aircraft to purge it of simulated chemicals.

While the full results are not in yet, the test seemed to go well, said officials. "After the two-hour flight, our chemical agent monitors displayed a zero vapor level," said Herzog.

Army photo by Spc. Jeremy Ausburn

### Global Hawk Hits Six

A Global Hawk long-distance Unmanned Aerial Vehicle successfully completed its sixth test flight Oct. 29 at Edwards AFB, Calif.

The nine-hour, 33-minute mission reached an altitude of 60,000 feet and included a preplanned landing wave-off before touchdown on the desert runway.

The UAV covered roughly 3,100 nautical miles following its early morning takeoff as it flew a figure eight track above the Mojave Desert.

"This flight test was a big confidence-booster," said Lt. Col. Pat Bolibrzuch, Global Hawk program manager. "All test objectives were exceeded, and no anomalies were found."

### Predator Roams Kosovo Skies

A USAF Predator UAV is helping NATO commanders watch over the tinderbox Balkan area of Kosovo. The one-ton propeller-driven UAV from the 11th Expeditionary Reconnaissance Squadron has flown several missions, making sure that the Yugoslav government lives up to its agreement to end police provocations against ethnic Albanians in the region.

In total, the Predator flew more than 100 missions in 1998 in the Balkans. A pilot and sensor operators work from a ground control station at Taszar AB, Hungary, to fly the 27-foot-long craft. NATO commanders see television-quality video from the Predator less than two seconds after it is recorded. The video is then transmitted to some 35 stations around the world.

### Anti-Drug Radar Airmen Redeploy

The final redeployment of Air Force personnel who ran the original US counterdrug ground radars in South

## The Battle of Arlington Ridge

ARLINGTON, VA., Nov. 25—In the waning hours of the 105th Congress, Rep. Gerald B.H. Solomon (R–N.Y.) and others mounted a legislative power play, ultimately unsuccessful, to stop the construction of an Air Force Memorial on Arlington Ridge, overlooking the Potomac River.

Solomon—a former Marine and until recently, chairman of the House Rules Committee—holds that the Air Force Memorial would encroach on the "hallowed ground" of the Iwo Jima Memorial, which occupies eight of the 25 acres on Arlington Ridge.

His proposal would have moved the Air Force Memorial off Arlington Ridge and given it tentative claim on a hill south of Arlington Cemetery, with a sweeping view of the Pentagon and the nation's capital. At present, however, the US Navy Annex is located there, and federal plans for use of this land are uncertain. Other members of Congress have also taken an interest in the idea of moving the Air Force Memorial there. Among them is Sen. John Warner (R–Va.), chairman-designate of the Senate Armed Services Committee.

There were unofficial suggestions that it might be possible for the Navy Annex buildings to "come down" in the reasonably near future, but other sources said the Department of Defense might require use of the buildings for another 10 years. A related proposal would extend Arlington Cemetery south—perhaps wrapping it around the proposed new site for the Air Force Memorial—but that is not for certain either.

In a parallel move to delay the Air Force Memorial, Solomon introduced a bill that would have required the project to conduct an Environmental Impact Statement, rather than an Environmental Assessment, which is about 90 percent complete.

Solomon's tactic was to submit his site-switch proposal as a late addition to the 1999 Omnibus Spending Bill. Congress does not consider such measures individually. The Appropriations Committee chairmen decide administratively which of the dozens of add-ons to keep in the House–Senate conference bill, which then goes to Congress for a yes or no vote. The tactic failed when Sen. Ted Stevens (R–Alaska), chairman of the Appropriations Committee, did not include Solomon's gambit in the final bill. The Environmental Impact Statement also fell out.

Some of Solomon's aides and colleagues took their dissatisfaction to the *Washington Times* newspaper ("Air Force Memorial Left Grounded After Lone Senator's Veto"), which depicted Stevens as having killed a "compromise" and said that his action "means the dispute [between the Marines and the Air Force] may never be settled."

The Air Force Memorial project, begun in 1992, has carefully followed all of the rules prescribed by Congress. The site is two acres, 500 feet down a hill and screened from the Iwo Jima Memorial by a stand of mature trees. The commandant of the Marine Corps was informed of the plans in 1994 and did not state any objections. Opposition did not arise until 1997 when a neighborhood group became concerned about an increase of automobile traffic and visitors to the area. Within a few months, Marine veterans and the Marine Corps had joined in the opposition.

Last July, a federal judge dismissed "with prejudice" a lawsuit by Solomon and his colleagues to stop the Air Force Memorial. In a summary judgment, the court ruled that there was "no genuine issue for trial." Solomon introduced a number of bills in Congress to block the project, but none of them was successful.

The newspaper account of the omnibus bill maneuver reported, erroneously, that "backers" of the site switch included "a reluctant Air Force [Memorial] Foundation." Retired USAF Maj. Gen. Charles D. Link, president of the Air Force Memorial Foundation, said that he had provided Solomon and Warner language that would have moderated the legislation, making the switch an option rather than a directive. The foundation had in no way "backed" the legislation. Its actions were an attempt to modify the effects of the bill, should enactment of it become inevitable.

Solomon, who did not seek re-election to Congress last year, has said he will remain in the Washington metropolitan area and will no doubt continue in his efforts to move the Air Force off Arlington Ridge.

Link said that the site on the south side of Arlington Cemetery had not been available when locations for the memorial were originally considered. While it is a potentially attractive site, it does not appear to be available in an attractive configuration within a reasonable time frame. The foundation remains well pleased with the presently approved location on Arlington Ridge.

America occurred Nov. 9 at Howard AFB, Panama.

The Vietnam–era radars used to track the flights of suspected cocaine aircraft remain. Their operators are now contractor personnel from Northrop Grumman, who replaced the old mix of active duty, Air National Guard, and Air Force Reserve forces.

The anti-drug emitter mission began as a 90-day requirement for National Guardsmen in 1993 and grew from there. Some Guardsmen went on annual orders and ended up returning regularly to South America over five years—averaging 200 days of deployment per year.

Air Force people will continue to support the on-the-scene contractors. "We have 12 people at the Regional Operation Center in Panama, a 10-person contingent at Dobbins ARB, Ga., ... and five officers working with US Customs [Service at] the Domestic Interdiction Center at March ARB, Calif.," said Lt. Col. Don Hamblett, National Guard Bureau chief of radar deployments.

### Russian Engine Roars in Alabama

On Nov. 4, Lockheed Martin Astronautics successfully completed the third test firing of an entire launch vehicle stage with a Russian rocket engine at NASA's Marshall Space Flight Center in Huntsville, Ala.

The Russian RD-180 engine will power Lockheed Martin's new Atlas III rockets and the firm's Evolved Expendable Launch Vehicle family. The engine is both powerful and simple: It reduces from nine to two the number of engines needed to power an Atlas and cuts the number of engine parts by more than 15,000.

The first RD-180 test, July 29, lasted 10 seconds. The second, Oct. 14, was scheduled to run for 56 seconds but shut down after 2.7 seconds when a monitoring computer misread engine data.

November's test run roared for the full 56 seconds. A fourth test, planned to last 70 seconds, is next on the schedule.

### Micro Air Vehicle Could Carry Many Payloads

A micro air vehicle the length of a pencil, being developed by Lockheed Martin under a Defense Advanced Research Projects Agency contract, could carry a wide array of payloads—from day imaging sensors to radar jammers to a signals intelligence or communications relay system.

That is what company officials said at the annual Lockheed Martin Technology Symposium in Washington, at least. Current plans call for the tiny craft to carry the day imager, but "it's very simple to put in other sen-

## A New Service for the Space Mission?

Sen. Bob Smith (R–N.H.), chairman of the Senate Armed Services strategic forces subcommittee, warned Nov. 18 that if the Air Force does not "truly step up to the space power mission," Congress may create a new military service for space.

Smith recognized that "the Air Force has played the dominant role in military space matters for decades" and that "a significant portion of its budget has gone toward developing and operating the nation's military space systems."

However, he made his opinion clear that the Department of Defense and the Air Force are shortchanging space power and that "America's future security and prosperity depend on our constant supremacy in space."

"The Air Force's space budget is dedicated almost entirely to the maintenance and improvement of information systems, as a means of increasing the effectiveness of existing forces here on Earth," he said. "If we limit our approach to space to just information superiority, we will not have fully utilized space power."

He chided the Air Force for not moving out on such initiatives as a military spaceplane. "Does the Air Force really want to stand idle while NASA develops a follow-on to the space shuttle that may contribute only marginally to meeting the requirements of military space power?" he asked.

He also recalled the Air Force's "New World Vistas" report in 1995, which cited the coming need "to project power from space directly to the Earth's surface or to airborne targets with kinetic or directed energy weapons."

Reviewing the way the Air Force is organized, trained, and equipped, Smith does "not see the Air Force building the material, cultural, and organizational foundations of a service dedicated to space power. Indeed, in some respects, we are moving backward. Three years ago the Air Force published *Global Engagement,* which spoke of a transition 'from an air force to an air and space force on an evolutionary path to a space and air force,' " but last year "the Air Force uniformed leadership replaced the vision laid out in *Global Engagement* with the concept of an 'aerospace force.' "

Smith said the Air Force has reached a fork in the road. "The Air Force must truly step up to the space power mission or cede it to another organization." Embracing space power, he said, "will mean shedding big chunks of today's Air Force to pay for tomorrow's and it will be very painful. ... But if such a change proves impossible, then we in Congress will have no choice but to consider another alternative."

One choice might be to follow the model of US Special Operations Command, vested by Congress with some control over development, acquisition, promotions, and assignments, in its mission area.

"Ultimately—if the Air Force cannot or will not embrace space power and if the SOCOM model does not translate—we in Congress will have to establish an entirely new service," Smith said.

"Creating a new military service to exploit a new medium is not without precedent," he added. "Indeed, if any of our services should understand this point of transition, it should be the Army Air Corps. ... I mean the Air Force."

Smith also recognized tacitly that while the demand for support from space has grown, the Air Force has been left to fund nearly all military space programs without financial contributions from the other services or an increase in its share of the defense budget.

"A separate service would allow space power to compete for funding within the entire defense budget, lessening the somewhat unfair pressure on the Air Force to make [the] most of the trade-offs and protecting space power from being raided by more popular and well-established programs," Smith said.

"Space dominance is simply too important to allow any bureaucracy, military department, service mafia, or parochial concern to stand in the way," he declared.

sor technology," said Jeffrey D. Harris, advanced program manager for Lockheed's Sanders unit.

The design calls for a micro vehicle some six inches in length, that weighs about 85 grams, fully loaded. Its speed is predicted at 30 knots, with an initial endurance of 20 minutes and altitude ceiling of 300 feet.

Use of an electric motor will make the craft virtually undectable beyond 100 to 200 feet. Projected per-unit cost in a large procurement would run $3,000 to $5,000.

Wind represents one potential problem. Micro air vehicles may not be able to operate with wind speeds much above 30 knots, said Harris.

### Name of Father, Son To Be on Memorial

The Department of Defense has told the family of Air Force TSgt. Richard Bernard Fitzgibbon Jr. that his name will be added to the Vietnam Veterans Memorial in Washington.

Fitzgibbon died in the line of duty in Vietnam June 8, 1956, while serving as a military advisor. Past Pentagon policy has held Jan. 1, 1961, as the starting date for inclusion of casualties in the Southeast Asia Casualty Database. A high-level review of the circumstances of Fitzgibbon's death decided that he belonged on "The Wall," however.

Eight other pre–1961 casualties have been similarly added in years past.

Fitzgibbon's son, Marine Corps Lance Cpl. Richard Fitzgibbon III, was killed in action in Vietnam Sept. 7, 1965. They are thought to be the only father and son US service members to die in the Vietnam War.

### B-2 Comm Systems Fine, Pentagon Says

The Department of Defense says that contrary to some published reports the B-2 stealth bomber can be recalled if sent over the North Pole toward its targets in a nuclear conflict.

The B-2 currently uses the Milstar UHF satellite communications systems as its primary means for receiving emergency action messages from National Command Authorities, said DoD spokesman Navy Capt. Mike Doubleday Nov. 5. "It is a nuclear survivable global capability that gives Air Force bombers the connectivity they need to conduct their worldwide business," he said.

Published reports indicated that internal Pentagon budget documents hint that the B-2 needs to be outfitted with Extremely High Frequency capability to ensure communications in time of war. The Air Force must allocate $2.8 million to a B-2 EHF risk reduction study in 2000, according to the documents.

An EHF system for the B-2 is part of planned future stealth upgrades, said Doubleday. But the change would be aimed at maintaining current communication standards.

"The future requirement for EHF or other nuclear survivable communications is due to planned discontinuation of the current Milstar system in favor of a constellation of EHF [satellites]," said the Pentagon spokesman.

### USAF Looks for More Reserve Cops

The Air Force hopes to offset a

## From the Desk of James Schlesinger

The fall 1998 issue of *The National Interest* contained "Raise the Anchor or Lower the Ship," an article written by James R. Schlesinger, one of the foremost US strategic thinkers. In his government career, Schlesinger served as Secretary of Defense, Secretary of Energy, and Director of the Central Intelligence Agency, working for both Republican and Democratic presidents. He is now chairman of MITRE Corp. What follows are brief excerpts from his essay.

**The "Burden" of US Defense**

"Currently, the United States spends barely more than 3 percent of its Gross Domestic Product on defense. There is no way that the United States can sustain over time the forces that the Clinton Administration states to be essential—or the foreign policy that those forces support—on 3 percent of the GDP. That is not a matter of analysis; it is simple arithmetic. To continue to fulfill our present commitments and to re-equip the approved force levels for the more challenging years of the next century would require roughly 4 percent of the GDP. That should not appear as a surprising figure for a nation that aspires to be the sole universal power. Even before Pearl Harbor, in Fiscal Year 1941, the United States spent 4.1 percent of its GDP on defense."

**The Procurement Shortfall**

"The United States now spends just over $40 billion a year on procurement. Yet depreciation on our military equipment (at replacement cost) runs to over $100 billion per year. Moreover, there is the additional cost of building an appropriate inventory of sophisticated munitions and, in the longer run, the need to maintain, and ultimately update and replace, hardware-related facilities for development and testing."

**"Contamination" of Warriors**

"There is a fundamental disparity between 'operations other than war'—notably peacekeeping—and the qualities and readiness essential for warfighting. In peacekeeping operations, one must hesitate before using force, one should not be quick on the trigger. In combat a belated response means casualties or an overrun position. Officers who show the restraint and sensitivity desirable in peacekeeping operations—and thereby gain promotions—may be the very ones who lack the capacity for command in combat. Troops who have been trained for restraint in peacekeeping operations are likely to be unready for warfighting. Therein lies the potential for trouble, and yet, given our dual responsibilities, there is no way wholly to avoid such trouble. All that one can do is to be aware of the dilemma—and never to forget that peacekeeping and warfighting are in some sense in conflict. Since the ultimate mission and the ultimate test for the armed forces is warfighting, we must strive to reduce the penalties imposed on our warfighting capacity by peacekeeping. Ideally we should keep the forces designated for these distinct missions separated and thereby minimize the contamination of our forces' warfighting readiness by peacekeeping operations. Still, as the force structure shrinks, such separation becomes increasingly difficult."

**Pre-eminence of Airpower**

"The lessons drawn from the [1991] Gulf War have not been absorbed into military strategy and doctrine. I find it curious, if not ironical, that the United States, which developed and then exploited these new military technologies in the Gulf War, has failed fully to grasp one of the principal lessons from that war. I refer to the immense success of the air offensive prior to and during the 100-hour ground war. The six weeks of coordinated air attacks prior to the launching of the counteroffensive on the ground significantly reduced the combat power of Iraq's forces—and continued to do so during the four days of the ground war. Nonetheless, to date the US military establishment has yet to absorb the lessons of the immense success of the air war into either doctrine or war plans. The potential of the air campaign in most if not all military campaigns is central to adjustments of strategy. Airpower is not just ancillary to the ground counteroffensive. When we have air superiority, it too can systematically destroy enemy ground forces. And it can do so at a far lower cost in American blood. And that may be essential for retaining public support for America's expanded international role."

**Limits (So Far) of Jointness**

"Despite all our current talk of 'jointness,' the services have yet to formulate a sufficiently shared vision of our military future. In part, the Air Force itself has been remiss. Thanks to so many years of treating 'strategic' and 'nuclear' as synonymous, it has failed to analyze and articulate the strategic role that [tactical aircraft] can play. The Army, too, has been resistant. In part, it is correct in pointing out that the success of airpower in the Gulf is not necessarily repeatable, or repeatable to the same extent, under different conditions. To be sure, it is also in part in the service's interest. Still, the Army has been slow to accept the enormous potential of airpower in grinding down enemy ground forces—thereby reducing Army casualties and easing the Army's task. It remains true that airpower 'cannot do the job alone.' That is right—but irrelevant. In most military operations, it can do a substantial job in obtaining a quick victory with low casualties. While that is crucial to America's international mission, some Army officers have been reluctant to accept the altered role that airpower can play."

**"Alternative Strategies"**

"Congress in this new era has repeatedly sought alternative strategies from the Pentagon. Its motive may have been to achieve greater military effectiveness without providing additional resources. To be sure, the hope that we can preserve our present military preponderance without a substantial increase in defense spending is unsustainable. ... There is no strategic gimmick that will permit us to maintain military dominance in the absence of superior forces."

**Need to Fund Airpower**

"The effectiveness of airpower has increased so much in degree that it has almost become a difference in kind. In a sense it has finally achieved the attributes that airpower enthusiasts prematurely claimed over the years. So long as the United States retains air dominance, we can damage or destroy the enemy's combat power at a low cost in casualties. The altered strategic role that airpower can play must, however, be understood and appreciated. It is ironic that those who comment—and regularly complain—that roughly 40 percent of the future procurement budgets would go to [tactical airpower forces] have not fully grasped the potential advantages that airpower confers. It is also true that, if we are to exploit those advantages, airpower needs to be amply funded. If airpower is to play a crucial role in American strategy, it is doubtful whether we should allow our inventories of precision guided munitions to remain as low as they are. It is a simple fact ... that, in so far as inventories are constrained, and are expected to remain constrained, an alteration of military plans will be required—and of a kind that will make such plans less effective. ... In a sense, the size of the inventories is, in itself, a strategic choice."

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decline in the retention rate for enlisted security forces by signing up Reservists for extended active duty tours of 12 to 15 months.

Specifically, the Air Force is looking for Air Force Reserve Command security force members in grades E-2 through E-6, as well as a limited number of E-7s, for active duty service.

Qualifications necessary include a commander's recommendation and a secret clearance. Reservists can apply for five stateside locations and can request overseas duty.

### USAF, USMC Lead in Recruiting

Both the Air Force and the Marine Corps achieved 100 percent of their numeric recruiting goals for Fiscal 1998, according to Defense Department officials.

The Army reached 99 percent of its numeric goal. The Navy achieved 88 percent, with a shortfall of 6,892 recruits.

Overall, the Department of Defense enrolled 186,131 recruits in Fiscal 1998—97 percent of the goal of 192,332 active duty accessions.

Recruitment for all services exceeded quality benchmarks. Department-wide, 94 percent of all recruits without prior military service had high school diplomas. Sixty-eight percent scored above average on the Armed Forces Qualification Test.

The new accessions also showed diversity. Twenty percent were African–Americans, a number unchanged from Fiscal 1997. Twelve percent were Hispanic, up from 10 percent in 1997.

Eighteen percent of recruits were women, the same as last year.

"Recruiting has been challenging for several years, but it was especially so this past year because of the robust economy, the lowest unemployment in 29 years, and increased interest among potential recruits in attending college immediately after high school rather than earning money for college through military service," said acting Assistant Secretary of Defense for Force Management Policy Frank Rush.

Looking toward next year, the Pentagon has put a number of incentives in place in an effort to guarantee continued recruiting success. They include higher enlistment bonuses, increased college tuition assistance for those enlisting in some critical job specialties, and more money for advertising.

### Air Force Grounds Titans

Air Force Space Command officially grounded all USAF Titan launch vehicles in late October. The standdown was a reaction to the failure of a Titan IVA launch vehicle Aug. 12. It was not issued earlier because no Titans were in line for launch, said an AFSC spokesman.

Until the cause of the August failure is determined all Titan IVB and Titan II launches are on indefinite hold. Among the shots possibly affected are Titan mission B-27 (a Defense Support Program payload), B-32 (a Milstar satellite), and B-12 (a National Reconnaissance Office payload).

NASA, out of reliability concerns, had already delayed a Titan launch that was to carry its QuikSCAT ocean scatterometer spacecraft.

The launch schedule will be reevaluated once an accident board completes its work and recovery actions are identified, said AFSPC officials.

### USAF Launches Commercial Space Study

The US Air Force Space and Missile Systems Center wants input from commercial firms for a study that could lead to a greater service reliance on the private sector for space operations.

Top Air Force leaders have asked the center to weigh the utility of commercial space systems and develop an investment strategy before a meeting of four-star Air Force officers next June.

The Commercial Space Opportunities Study has five study areas: remote sensing, surveillance, and meteorology; launch services; navigation; communication; and range and satellite command and control. A Nov. 13 *Commerce Business Daily* notice asked interested firms to provide information for the effort.

The study is part of a "Doable Space" plan meant to improve how the Air Force handles both space operations and space-related acquisitions.

### JASSM Moves Into Development

On Nov. 9, Department of Defense acquisition chief Jacques S. Gansler authorized the transition of Lockheed Martin's Joint Air to Surface Standoff Missile into the development phase of the program.

The move included the award of a $132.8 million contract increase to Lockheed Martin for JASSM's engineering and manufacturing development phase. Production is currently set to begin in January 2001.

JASSM is an autonomous long-range cruise missile designed to destroy high-value and well-defended targets. The stealthy weapon will be carried on a variety of USAF and Navy fighters and bombers.

"We're very pleased to move forward into the heart of this important development effort," said Dick Caime, Lockheed Martin's vice president of strike weapon systems.

## Pentagon Unveils Possible Missile Defense Sites

On Nov. 17, the Department of Defense made public a list of locations in Alaska and North Dakota where it intends to conduct environmental impact studies, as a precursor to possible deployment of a National Missile Defense system.

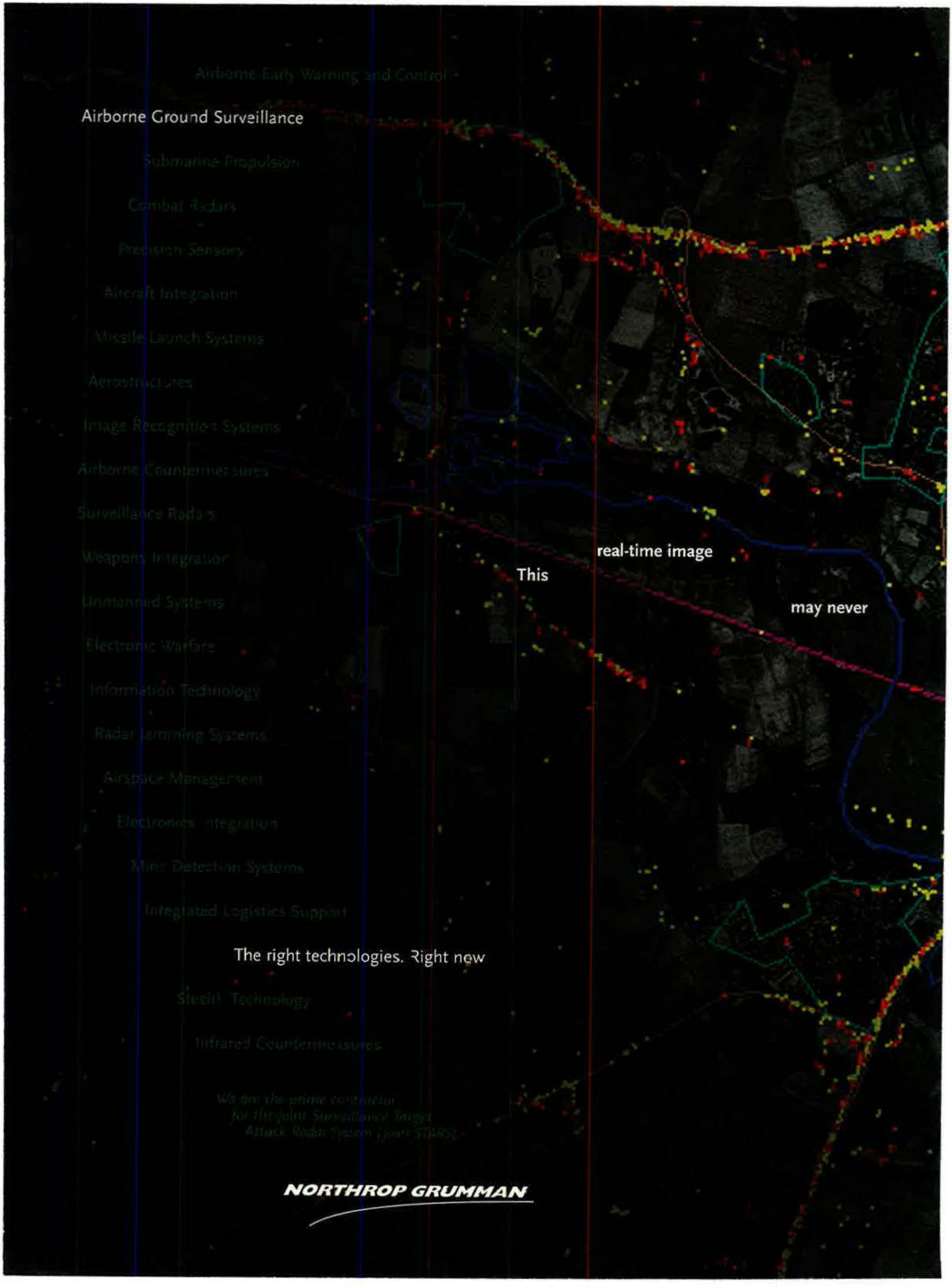
The list does not mean the Pentagon has decided to deploy such a system, officials stressed. Use of some of the sites, particularly those in Alaska, would likely constitute a violation of the 1972 Anti–Ballistic Missile Treaty, as it now stands.

But the announcement does give an indication of where NMD assets might be posted and could help prepare the way for a go or no go decision by US political leaders in 2000.

"The purpose of the environmental scoping is to solicit inputs from the public, interest groups, and federal, state, and local government agencies with regard to specific environmental concerns," a DoD statement said.

Candidate locations are:

- Ground-Based Interceptor: Clear AS, Eielson AFB, Ft. Greeley, and Yukon Maneuver Area (Ft. Wainwright), Alaska; and Grand Forks AFB and Stanley R. Mickelsen Safeguard Complex, N.D.
- Battle Management Command and Control: Clear AS, Eielson AFB, Ft. Greeley, and Yukon Maneuver Area, Alaska; and Cavalier AS, Grand Forks AFB, and an SRMSC site, N.D.
- In-Flight Interceptor Communication: Clear AS, Eareckson AS, Eielson AFB, Ft. Greeley, and Yukon Maneuver Area, Alaska; Grand Forks AFB, Minot AFB, Missile Alert Facility Echo (near Hampden), and an SRMSC site, N.D.; and a site in the western Aleutians.
- X-Band Radar: Eareckson AS, Alaska; and Cavalier AS and four SRMSC sites in North Dakota.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**News Notes**

■ The US Air Force and Army have together delivered more than 2.5 million pounds of relief supplies to Hondurans whose lives have been devastated by Hurricane Mitch. Reserve C-130 crews on two-week annual training with the 171st Airlift Squadron, Selfridge ANGB, Mich., have been among the Air Force personnel helping in the effort.

■ Lockheed Martin Tactical Aircraft Systems recently made an on-schedule delivery of the first major production component for Japan's F-2 fighter. The part, an aft fuselage section, was accepted by officials of Mitsubishi Heavy Industries, the prime contractor for the F-2, at Lockheed's Fort Worth, Texas, plant Nov. 10.

■ On Nov. 10, Vice President Al Gore announced the creation of a new virtual Vietnam Wall—a web site that will allow computer users to call up names from the Vietnam Veterans Memorial and hear audio remembrances from family members or friends.

## When Clinton Didn't Pull the Trigger

US forces were only hours—perhaps only minutes—away from striking Iraq when President Clinton ordered them to stand down Nov. 15, following an Iraqi diplomatic initiative, defense officials said.

Few held out hope that an armed confrontation with Saddam Hussein had been permanently averted, despite his agreement to allow UN weapons inspectors back into his country. The next time Saddam interferes with the UN's free and unfettered access, an attack could come without advance notice, they warned.

"Iraq has backed down, but that is not enough," President Clinton told the nation Nov. 15. "Now, Iraq must live up to its obligations."

White House advisors were reportedly split on the decision to call off planned massive airstrikes. Some, such as Secretary of Defense William S. Cohen, favored proceeding with the attack. They argued that the time for hitting could hardly be better, as US allies had issued assurances of support. Standing down, they said, could damage US military morale and further drain readiness.

Others—including, in the end, the President—felt that to proceed with bombing runs in the face of an apparent Iraqi cave-in, however deceptive it may prove to be, would appear overly provocative and perhaps finally shatter the post–Gulf War world consensus on containing Saddam's ambitions.

Meanwhile, Western government assertions about the state of Iraq's weapons of mass destruction capability are only becoming more dire.

According to a recent report from the British Ministry of Defense:

■ Iraq could regenerate its ability to produce chemical warfare within months, absent Western threats. Some 4,000 metric tons of chemical weapon precursor agents remain unaccounted for.

■ Iraq "almost certainly" retains some biological warfare capability.

■ Iraqi work on a missile with a 650-kilometer range may have already begun.

■ Except for the defeat of the Gulf War in 1991, Saddam Hussein might have been able to develop a nuclear weapon by 1993.

"Saddam has proved that he is ready and willing to use [weapons of mass destruction]," said the report, "and is the only leader in world history to have authorized the use of nerve agents."

# Index to Advertisers



■ On Oct. 22, an Air Force B-1B bomber made a precautionary landing at the Colorado Springs Airport, Colo., due to a partial electrical system malfunction. Five tires blew out upon landing. There were no injuries or interruption in normal airport activities due to the incident.

■ On Oct. 22, a single-seat F-16 from Luke AFB, Ariz., crashed approximately 10 miles north of the base. The pilot, Lt. Col. Mike L. Bartley, ejected safely. He was on a routine training mission at the time of the accident.

■ Amn. Marcus A. Zaharko of Helena, Mont., died in an explosion at the White Sands Missile Range, N.M., Oct. 19. Zaharko, who had been a seismic analyst with the Air Force Technical Applications Center at Patrick AFB, Fla., was part of a group preparing for field tests when unexploded ammunition accidentally detonated.

■ Sens. John McCain (R–Ariz.) and Max Cleland (D–Ga.) and Reps. Sam Johnson (R–Texas) and Jack Murtha (D–Pa.) have sponsored a new bill that would establish a national memorial in Washington, D.C., to honor disabled veterans. The memorial would be the first such national monument dedicated to disabled vets who are still living and would be paid for by private contributions.

■ Retired Army Air Corps SSgt. Edward Barton, of Camarillo, Calif., received a long-overdue Purple Heart medal at a Vandenberg AFB, Calif., ceremony Nov. 4. Barton's daughter Jacqueline, herself an Air Force veteran, researched and gained the belated award for her father. Barton, a flight engineer on a B-24 Liberator based in England during World War II, had his part in the war ended by a shell burst from an anti-aircraft gun.

■ Airmen who are residents of Minnesota and served in the Persian Gulf War may be eligible for a bonus. The state legislature has passed a law calling for special stipends for Minnesotans who were on active US duty from Aug. 2, 1990, to July 31, 1991, and participated in the effort to drive Saddam Hussein out of Kuwait.

■ USAF Chief of Staff Gen. Michael E. Ryan presented the 1997 Koren Kolligian Jr. Trophy to Capt. Jeffrey B. Samuel of the 493d Fighter Squadron, RAF Lakenheath, UK, in a Pentagon ceremony in October. Samuel earned the award, which is given every year to the member of the Air Force who best manages an in-flight emer-

## For US and Germany, Déjà Vu All Over Again

The German nuclear allergy is back, fueling tensions between NATO's two biggest nations. When the last outbreak occurred, the White House was occupied by Ronald Reagan, Germany was divided into a democratic West and communist East, and the Soviet Union was a world power.

It was in the early 1980s that German anti-nuclear opposition nearly derailed NATO's decision to deploy US Pershing 2 missiles on German soil to counter Soviet SS-20 weapons. The government in Bonn solidly backed the plan and the missiles went in on schedule, but years of street protests and acrimony caused severe strains in the Alliance.

Now, the United States and Germany may be headed for a struggle over a more basic issue—NATO's central strategic belief that it has the right, under certain circumstances and in self-defense, to initiate use of nuclear weapons. This time, the German government itself is questioning NATO's doctrine. In a surprise, Germany's new left-wing government has suggested NATO adopt a "no-first-use" policy—pledging never to be the first to go nuclear.

German officials contended that, with the Soviet Union gone and the Cold War a distant memory, change in NATO nuclear doctrine is overdue. They say initiatives such as a no-first-use pledge will help deter non-nuclear nations from acquiring atomic arms.

The mid-November German initiative shocked and angered the Clinton Administration. The government of Gerhard Schroeder's Social Democrats and the Green Party evidently had given Washington assurances that, on major issues of defense policy, Germany would maintain continuity with the past and not seek change.

German officials were themselves taken aback by the vehemence of Washington's reaction. Senior US officials warned bluntly, publicly, and often that such a shift in deterrence strategy—one that has kept the nuclear peace for more than 50 years—could gravely undermine NATO's military credibility.

Said Defense Secretary William S. Cohen: "We think that the ambiguity involved in the issue of the use of nuclear weapons contributes to our own security, keeping any potential adversary who might use either chemical or biological [weapons] unsure of what our response would be. We think that it is a sound doctrine. ... It is an integral part of our strategic concept, and we think it should remain exactly as it is."

State Department spokesmen said that Secretary of State Madeleine K. Albright relayed the same message. The *Washington Post* quoted a US official as accusing Germany of using "flawed logic and phony arguments" to reach its conclusions.

Faced with such US displeasure, Schroeder's government backed away somewhat from its earlier threats to press the matter in NATO councils. After a Nov. 24 meeting with Cohen at the Pentagon, Defense Minister Rudolf Scharping said, "There is no intention in my government to question any core element of NATO strategy, including the fact that nuclear forces play a fundamental political role."

Even so, Scharping noted that Germany "is following the vision of a nuclear-weapons free world," virtually assuring that the German proposal would provoke acrimonious trans-Atlantic debate for months to come.

# Senior Staff Changes

**RETIREMENT:** Brig. Gen. Gary M. **Rubus.**

**CHANGES:** Brig. Gen Howard G. **DeWolf,** from Dir. Jt. Interagency Task Force South, USSOUTHCOM, Howard AFB, Panama, to Asst. Dep. Under SECAF for Intl. Affairs, Arlington, Va. ... Brig. Gen. James A. **Hawkins,** from Cmdr., 319th ARW, AMC, Grand Forks AFB, N.D., to Cmdr., 89th AW, AMC, Andrews AFB, Md. ... Brig. Gen. Charles L. **Johnson II,** from Prgm. Dir. for C-17 Sys. Prgm. Office, ASC, AFMC, Wright–Patterson AFB, Ohio, to Dir., Log., AMC, Scott AFB, Ill. ... Brig. Gen. Arthur J. **Lichte,** from Cmdr., 89th AW, AMC, Andrews AFB, Md., to Mission Area Dir., Global Reach, Asst. SECAF for Acq., Arlington, Va. ... Brig. Gen. Timothy A. **Peppe,** from Cmdr., 31st FW, USAFE, to Dir., Jt. Experimentation, USACOM, Norfolk, Va. ... Maj. Gen. James E. **Sandstrom,** from Prin. Asst. Dep. Under SECAF for Intl. Affairs, Pentagon, to Dir., Ops., USCENTCOM, MacDill AFB, Fla. ... Maj. Gen. Tome H. **Walters Jr.,** from Mission Area Dir., Global Reach, Asst. SECAF for Acq., Pentagon, to Prin. Asst. Dep. Under SECAF for Intl. Affairs, Pentagon.

**SENIOR EXECUTIVE SERVICE CHANGE:** Dennis H. **Alvey,** to Exec. Dir., AIA, Kelly AFB, Texas.

gency, by landing his F-15C despite two explosions caused by an AIM missile breaking apart immediately after launch and a massive fuel leak.

■ Boeing's Airlift and Tanker Programs component has won a 1998 Malcolm Baldrige National Quality Award for manufacturing from the Department of Commerce. President Clinton and Commerce Secretary William M. Daley will present the award to David Spong, vice president and general manager of airlift and tankers programs, at a Washington ceremony early this year.

■ The Tunner, the Air Force's newest cargo loader, reached initial operational capability Nov. 6, according to Air Force officials. The loader, named after Lt. Gen. William H. Tunner who was a commander of the Berlin Airlift, has a total loading capacity of 60,000 pounds. It will replace older, 40,000-pound capacity loaders in the Air Force inventory.

■ The 99th Airlift Squadron at Andrews AFB, Md., recently received its first C-37A in a formal arrival ceremony. The C-37A, based on the Gulfstream V business jet, will replace aging 707-based C-137s.

■ The 44th Boeing C-17 Globemaster III was delivered to USAF in a short ceremony in Long Beach, Calif., Nov. 9. It was the 32d consecutive C-17 delivered ahead of schedule.

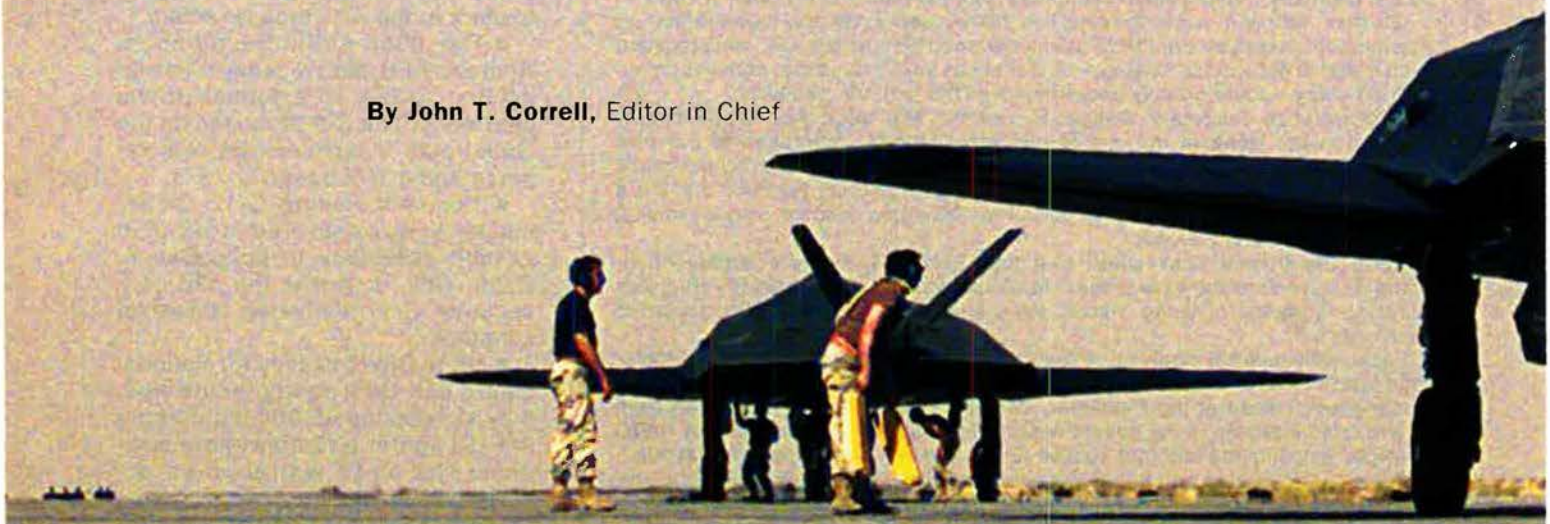
■ North Dakota's only Air National Guard unit set a safety record Nov. 3 by surpassing 40,000 flight hours in F-16 fighter aircraft without accident. The unit's last accident occurred 25 years ago, when it was flying the F-101B Voodoo fighter.

■ The Air Force will stop maintaining 150 Minuteman launch silos at Grand Forks AFB, N.D., due to the service's decision to select off-the-shelf commercial boosters instead of Minutemen for the national missile defense ground-based interceptor role. The silos will be destroyed in accordance with arms treaty and base closure requirements.

■ On Nov. 12, acting Secretary of the Air Force F. Whitten Peters opened the door of a new Air Force Outreach Program Office at Brooks AFB, Texas. The office, the first of its kind, is intended to improve service liaison with small businesses.

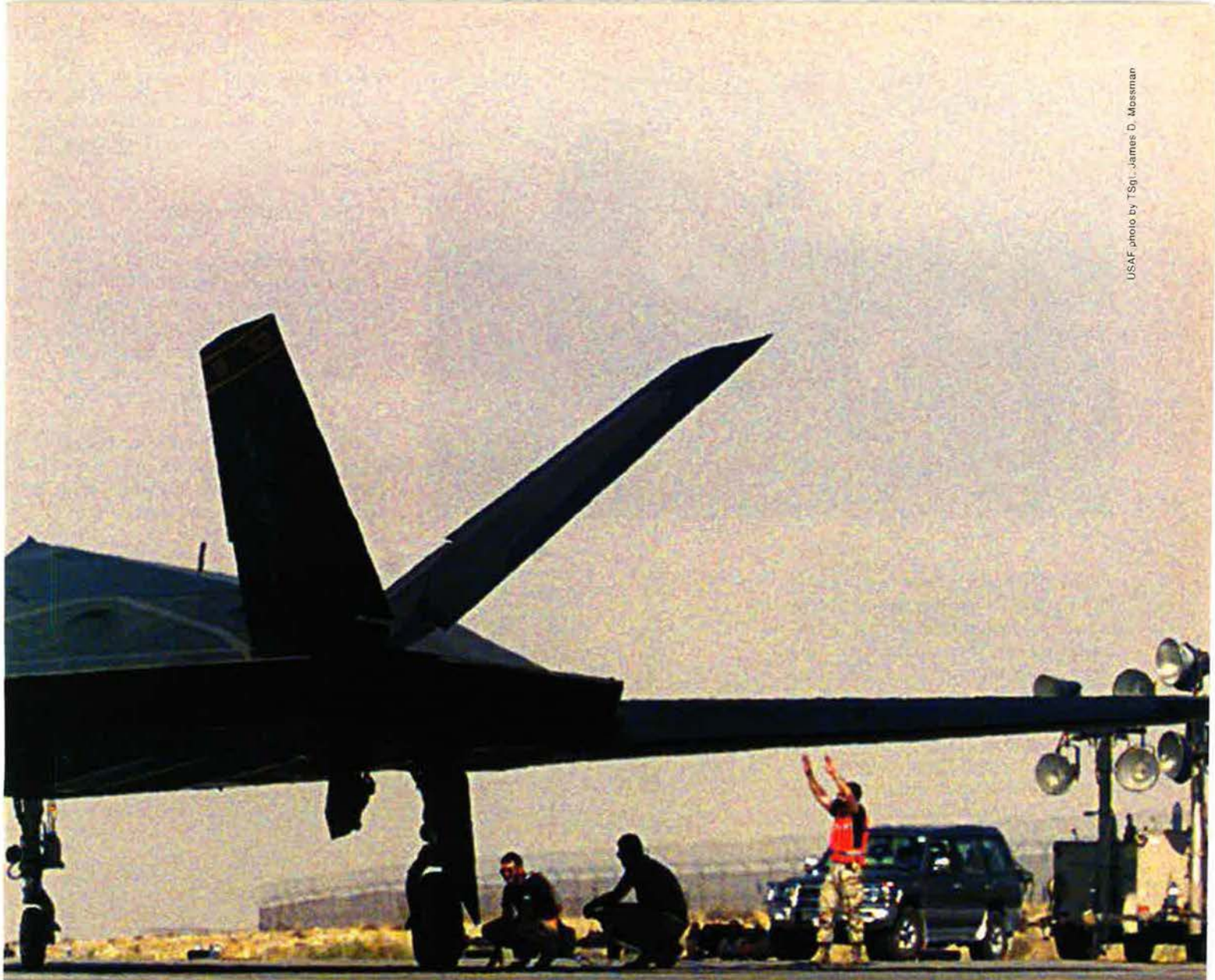
■ Air Combat Command has released an accident report on a March 23 incident in which the landing gear of an F-16C collapsed on the runway at Hill AFB, Utah. The report concluded that the accident was caused by the pilot, Lt. Col. John Burgess Jr., failing to properly control his descent rate during landing. ■

**The Air Force's new strategic concept explains the advantages of airpower in a manner that is cooperative, not confrontational.**



**By John T. Correll,** Editor in Chief

# On Course for Global Engage



USAF photo by TSgt. James D. Mossman

# ment

THE Air Force often seems to fare better in battle than it does in peacetime in the corridors of power in the Pentagon. War plans and joint doctrine emphasize ground operations. Not even the Gulf War, in which it was generally agreed that airpower was the decisive element, managed to change that.

The joint planning models in use today discount the effectiveness of airpower. Air Force operations not in support of surface forces are considered "unjoint."

Part of the problem may be that the other services have had a better explanation—or a better-accepted one, at any rate—of their operational capabilities.

***F-117s from the 8th Fighter Squadron, Holloman AFB, N.M., taxi out for another mission from Al Jaber AB in Kuwait. Airpower was the decisive element in the Gulf War and the capability has increased considerably since then. The irony is that joint doctrine and war plans discount the value of airpower. The Air Force hopes to forge a more positive relationship with its concept of Global Engagement Operations.***

USAF photo by SrA. Greg L. Davis

The Air Force hopes to plug that gap with "Global Engagement Operations," a comprehensive new formulation of its capabilities and strategy in the post–Cold War environment.

An important characteristic of GEO is that its framework is linked explicitly to the three elements of the National Military Strategy: shaping the international environment, responding to the full spectrum of crises, and preparing for an uncertain future.

GEO casts the Air Force strategic concept into five stages: *shape, deter, halt, win,* and *re-shape.*

The direct hook to the National Military Strategy is one of several steps the Air Staff is taking to make GEO as "joint friendly" as possible. The Air Force is trying its best to explain the advantages of aerospace power in a manner that is cooperative rather than confrontational.

"GEO is about joint aerospace power in all its forms, from all the services," said Lt. Gen. Marvin R. Esmond, USAF deputy chief of staff for air and space operations. "Some estimate that spending by the services for aerospace power amounts to 60 to 70 percent of the entire Department of Defense budget—from Air Force aerospace expeditionary forces to Navy carrier battle groups and Army aviation and missile units. If we can make the obvious case that every service makes contributions to deterring, halting, and winning, GEO will gain acceptance on its own."

DoD photo by Lance Cpl. D.R. Storms

***In the "halt" phase, airpower will attempt to stop the enemy and strip him of his operational initiatives. That would give the joint force commander a full range of options. The attack can continue with a traditional all-arms counteroffensive, if that proves necessary. In some cases, though, rendering the enemy incapable of further action may be enough.***

Not every crisis scenario will include all five phases. In the traditional model, early-arriving airpower might hit the enemy hard, but its role was to buy time for the Army to get there. GEO makes provision for a classic joint force counteroffensive but it proposes more options—including some that are airpower intensive—for the national command authorities and the theater commander.

For example, if airpower can stop the enemy force, fix it in place, and deprive it of strategic and operational initiatives, there may not be a need to proceed with a ground battle and take the casualties that go with it. That depends on whether it is necessary to destroy the enemy or if it is enough to render him incapable of further action.

## A Task From Fogleman

The roots of GEO go back to the spring of 1996. Increasingly concerned about the "ground-centric" use of airpower in joint operations plans, Air Force Chief of Staff Gen. Ronald R. Fogleman directed the Air Staff to develop a strategic analysis that was "air-dominant rather than land-centric."

About the same time, in a speech to an Air Force Association symposium in Orlando, Fla., Fogleman said that a "new American way of war" was making it possible to break free of "brute force" attrition campaigns and move toward "a concept that leverages our sophisticated military capabilities to achieve US objectives by applying what I'd like to refer to as an asymmetric strategy."

In November 1996, Fogleman and Secretary of the Air Force Sheila E. Widnall announced "Global Engagement: A Vision for the 21st Century Air Force," which emphasized the core capabilities of the force and predicted a greater emphasis on space operations in years ahead.

Reporters asked Fogleman about an assertion in the new "Army Vi-

sion 2010" that land power makes permanent "the otherwise transitory advantages achieved by air and naval forces." Fogleman replied that "those who say only ground forces can be decisive" in conflicts of the future "are clearly wrong."

Operational concepts with airpower in an expanded role were field-tested in the Quadrennial Defense Review in 1996–97 and in National Defense Panel deliberations in 1997. Two of the main concepts of "Joint Vision 2010," put out by the Joint Chiefs of Staff just before the QDR got under way, were "dominant maneuver" and "precision engagement."

In the big defense reviews, dominant maneuver became associated with the Army and was pitted, in the bureaucratic infighting that ensued, against precision engagement, which was associated with the Air Force. The real sticking point, though, was the halt phase.

The idea had sprung from the Bottom–Up Review of 1993, in which Secretary of Defense Les Aspin said that the first phase of US combat operations would typically be to halt a moving enemy in a distant theater where the United States did not have sufficient forces in place to do the job.

That requirement had airpower written all over it. Moreover, in the interval since the Bottom–Up Review, the Air Force had made considerable progress in long-range strike capability—and in the attendant effects it could wreak on an invasion force.

### The QDR–NDP Split

In the spring of 1997, the Quadrennial Defense Review recognized the value of the halt phase. The QDR said that a prime operational requirement was halting an enemy force rapidly, short of its objective, and perhaps avoiding a costly and bloody ground campaign to evict the enemy from captured territory.

However, the National Defense Panel report later that year excluded any mention of the halt phase. Its exclusion was largely due to behind-the-scenes work by the Army, which was opposed to giving airpower (obviously pivotal to the halt phase) too prominent a role.

Interservice differences are still pronounced, but GEO explores for points on which both sides can agree.

USAF photo by SSgt. Debbie Hernandez

***An F-15E pilot checks his aircraft prior to a sortie. The weapon at top right is a Laser-Guided Bomb. Improvement in capability for precision attack is a cornerstone of the Revolution in Military Affairs.***

For example, an early-arriving aerospace expeditionary force may get to the crisis quickly, within days of unambiguous warning but before the enemy invasion force gets rolling. Its arrival may dissuade the enemy from making an attack. This situation—"enhanced deterrence" in GEO parlance—is comparable to an existing Army concept.

"The Army has a term called 'strategic pre-emption' where one side can act so quickly that the other side's options or potential for success are nil," Esmond said. "Essentially, under GEO, the growing expeditionary capability and lethality of all the services will contribute to the capabilities of the 'deter' phase and the 'halt' phase. The joint capability to 'halt' may stop an invasion, and the perception of that capability may prevent an enemy from even trying to invade."

### GEO Across the Spectrum

GEO goes all the way across the spectrum of conflict, applying to peacetime operations and Smaller-Scale Contingencies as well as to Major Theater War. Although the emphasis is on the response to conflict and the contribution of aerospace forces to deterring, halting, or winning it, the "bookends" of the concept—shape and re-shape—get serious attention.

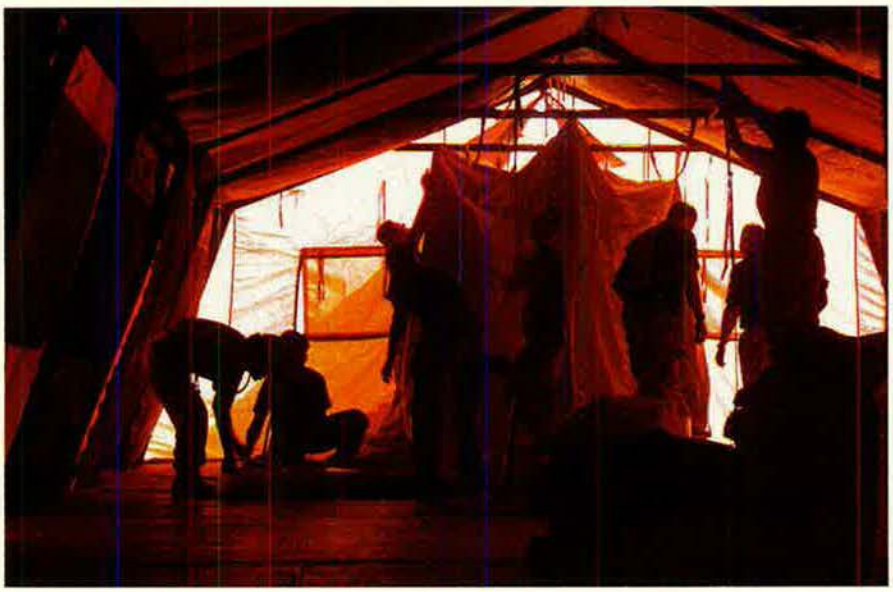
"Shaping the international environment" is the continuous effort to maintain security and stability and to head off situations that lead to crisis. It includes building trust with friendly nations, contributing to alliances, sustaining regional stability, demonstrating commitment, and showing resolve.

Among the Air Force efforts in the shape stage are the peacetime deterrence of both nuclear and conventional war, global awareness from air and space, air mobility to underwrite global presence, and air expeditionary forces for contingency deployments and operations short of war.

The deter phase of GEO is the lowest level of response to crisis. It may include the live demonstration of military power. The lean, lethal aerospace expeditionary forces into which the Air Force is organizing its combat units are ideally suited for such missions.

As the Air Force concentrates its intelligence, surveillance, and reconnaissance capabilities in the deter stage, it establishes a dominant situational awareness in which a close watch is kept on the adversary's movements and order of battle. Deployment of combat forces in the deter phase can help to reassure coalition allies and create for the enemy a perceived fait accompli of defeat.

Operation Vigilant Warrior some four years ago was an example of the deterrent capabilities of aerospace power in a peacetime engagement. On Oct. 6, 1994, US Air Force satellites and U-2 aircraft detected two



USAF photo by TSgt. James D. Mossman

*Air Force members from Holloman AFB, N.M., and Nellis AFB, Nev., dismantle hospital tents in Southwest Asia prior to redeployment. The Air Force's new emphasis on expeditionary operations is basic to the GEO concept.*

Iraqi Republican Guard divisions moving south toward Kuwait. USAF fighters deployed from the United States and US–based B-52s struck targets in view of the Iraqi army. On Oct. 10, Iraq announced that its troops would be withdrawn from border areas.

### If Deterrence Fails

If deterrence doesn't do the job, affairs move on to the halt phase, in which the objective will be to gain control and fix the enemy's forces in place so that he can no longer mass combat power.

An example of halting the enemy in a small-scale conflict was Operation Deliberate Force, the three-week air campaign in Bosnia in 1995 that was the decisive factor in bringing the Bosnian Serbs to the peace talks in Dayton. Earlier use of airpower had been sporadic, incremental, and ineffective, but on Aug. 30, NATO began sustained and serious airstrikes against Bosnian Serb military positions. By Sept. 14, the Serbs had had enough. They agreed to agree to comply with UN demands and enter the negotiations at Dayton.

The Battle of Khafji, in January 1991, was an instance of airpower halting an armored advance in a Major Theater War. On the night of Jan. 29, Iraq launched its only offensive of the Gulf War, moving armored divisions against the lightly defended town of Khafji, just across the border in Saudi Arabia. Their intent was to lure coalition forces into a ground battle. What they got was more coalition airpower, which hammered the oncoming tanks, turned them, and harried them relentlessly during their retreat. One tank brigade, caught in the open, was practically destroyed from the air.

"In the context of a Major Theater War, we would hope that at the end of the halt phase—with the adversary's objectives denied and a US–led coalition in control of air, space, land, and sea—that a rational enemy would conclude that continuing military operations is senseless," said Esmond. "Unfortunately, even rational enemies will sometimes continue hostilities, and that is where the 'win' phase comes in."

The win phase continues the effort without a break in the action and with whatever force is required to defeat the enemy decisively. Among the joint force commander's options are to intensify operations against the adversary's remaining capabilities with precision attack and information warfare. Another option is to integrate aerospace forces into an all-arms combined counteroffensive.

Once the enemy is defeated, operations would move into the re-shape phase, in which the objectives will be to consolidate the victory, stabilize the situation, and take measures to prevent the crisis from breaking out again.

### GEO Goes On From Here

Air Force Chief of Staff Gen. Michael E. Ryan has signed off on GEO, and it was briefed to the service's three- and four-star generals at their Corona Top conference last June.

The Air Staff has used the "Thunder" campaign model to run a computer analysis of GEO against scenarios in the Defense Planning Guidance, with good results. Even more encouraging, GEO simulations run by 7th Air Force have led to modification of the joint operations plan for the Korean theater to include provision for a halt phase.

USAF photo by SSgt. Efrain Gonzalez

*These B-52s are just back from a mission over Iraq in 1996. The big bombers have been used not only on strike sorties but also in highly persuasive live fire demonstrations within sight of Iraqi forces.*

In November, the Air Force's premier wargame, held at Maxwell AFB, Ala., used GEO as the "operational template" for a week of simulated and computerized conflict in which three "blue" teams took on three "red" teams. The basic scenario tested the response of aerospace expeditionary forces to a Smaller-Scale Contingency that escalates to include an enemy cross-border incursion.

Another application coming up for GEO will be the Air Force's use of it in the debate on revision of Joint Pub 3-0, "Doctrine for Joint Operations," the top-rung statement of joint operational policy, this year. Last summer, Joint Pub 3-09, "Doctrine for Joint Fire Support"—a new product, and lower on the policy ladder

USAF photo by SrA. Greg L. Davis

***The mechanized column at top right was taken apart by US airpower at Khafji in January 1991. Here, an A-10A taxis by the remains of a wartime shelter in Kuwait. Airpower has proved its point in battle—and now seeks a better reception in the peacetime Pentagon.***

than Joint Pub 3-0—was published with the provision that the surface commander holds "primacy" over operations and control of "fires" within his area of operations, which may reach for a considerable distance. Questions about the relationship of air forces and land forces have flowed forward to consideration for Joint Pub 3-0.

There is missionary and diplomatic work to be done on other joint fronts as well. The joint simulation model, Tacwar, rates the effectiveness of airpower at less than a third of its actual effectiveness demonstrated in combat. It also throttles airpower back arbitrarily in the early part of theater conflict.

A Tacwar simulation of a theoretical future conflict in Korea, run for the Deep Attack Weapons Mix Study in July 1996, for example, allocated about 3,000 air attack sorties a day to halt the enemy in the first two weeks of conflict. That level of sorties in the simulation produced a sharp drop in the enemy's military capabilities.

But then Tacwar cut the sortie rate to 1,500 a day in order that the Air Force would not run out of preferred munitions before the joint counteroffensive could begin. The enemy's military effectiveness rate leveled out and did not begin falling again until weeks later, when sorties were again raised to 3,000 a day when allied ground forces were in place and ready.

Similarly, wargames at the Army training center at Ft. Irwin, Calif., and elsewhere routinely restrict air operations in the early parts of theater conflict scenarios, holding back until ground forces can arrive to begin an air–land counteroffensive with the Army taking the dominant role.

The Air Force has taken GEO concepts to the "Army After Next" wargame, where it generated interest, and has conducted several briefings for people from other services. The reception so far has been pretty good, according to people who were there.

If GEO lives up to expectations, it will be a strategic conception that helps make the case for airpower beyond the circles of those who are already convinced.

"The Army had Territorial Conquest and Clausewitz and the Navy had Sea Control and Mahan," said an Air Staff officer working on the issue. "At best, we had Desert Storm and Warden [USAF Col. John Warden, now retired, author of *The Air Campaign* in 1988], which was a start, but airmen were more defined by our stovepipes and controversies than by a unifying vision of aerospace power."

The Air Force believes that GEO is its best bet to improve that situation. ■

**The successor to the B-2 bomber could be a high-altitude hypersonic aircraft.**

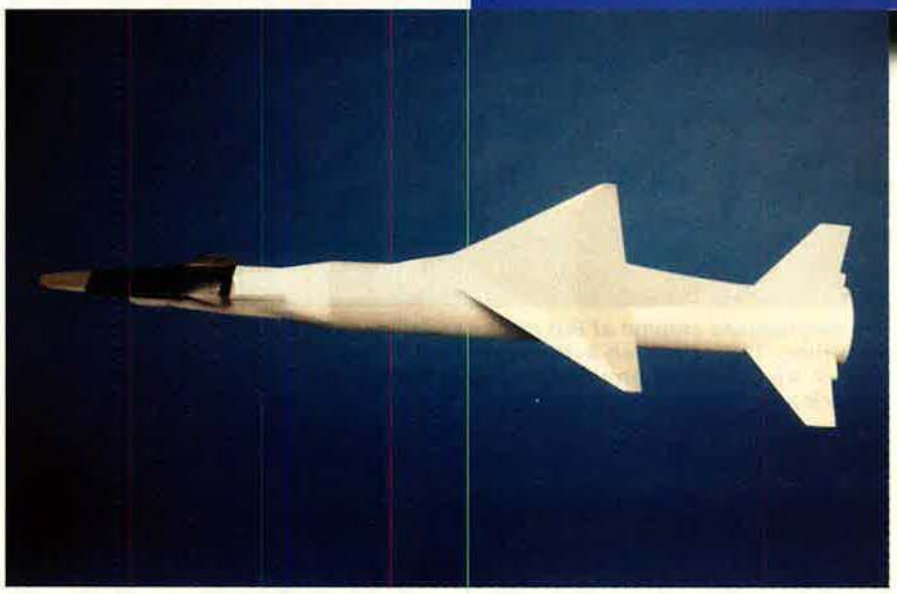
# Mission to M

**By John A. Tirpak,** Senior Editor

DURING the next few months, the Air Force will deliver to Congress a bomber roadmap, describing in detail how USAF plans to perform and equip for the long-range strike mission in the next century. The new plan likely will describe a successor to the B-2 stealth bomber, and it probably will represent a shift away from the tradition of building big aircraft.

The new program is expected to tilt toward heavy reliance upon smaller, hypersonic vehicles, both manned and unmanned, with air-breathing engines. If the US succeeds in perfecting the critical building-block technologies, these new kinds of aerospace systems could be in place around 2010.

The term "hypersonic flight" means traveling faster than five times the speed of sound. Working hard to make these Mach 5–plus vehicles a reality are the Air Force, NASA, and Defense Advanced Research Projects Agency. The three agencies are pursuing complementary projects to investigate separate elements of the air-breathing hypersonic flight problem.



***Hyper-X, shown above right in an artistic concept, is NASA's next push toward air-breathing hypersonic flight. The small-scale Hyper-X will advance engine, aerodynamics, and materials science for travel above Mach 5 and ride to high altitude and hypersonic speeds on the nose of an Orbital Sciences Pegasus–type booster, as shown in the model here.***


NASA is focusing on characteristics of hypersonic flight, which will be tested and measured on a small demonstrator vehicle set to fly in 2000. DARPA is seeking an "affordable" hypersonic missile able to zoom more than 400 miles in under seven minutes. For its part, the Air Force is investigating the critical engine technologies that will be needed to make both types of vehicles work while, at the same time, studying slow-speed characteristics of a hypersonic airplane.

The missile project could reach prototype form in four years and be operational in 10 years. The larger manned vehicle is not likely to appear until around 2015 at the earliest.

### The Payoff

Hypersonic flight offers obvious military utility for reconnaissance and strike. Such vehicles would allow US forces to operate farther than they do now from enemy lines, reducing their exposure to enemy fire, without paying a penalty in reaction time or effectiveness. The inherent kinetic energy of a hypersonic missile would magnify its penetrating power, particularly against deeply buried facilities, which are among the toughest targets to destroy. Reconnaissance aircraft would be able, within three hours, to provide imagery of any place in the world. Such speed would make aircraft reconnaissance competitive with satellites not already over the area of interest, because the spacecraft would have to change orbits.

The term "air breathing" is important in the context of these vehicles. The craft envisioned would use the oxygen in the upper atmosphere to carry out the combustion of their fuel. Rockets routinely fly at hypersonic speeds but must carry their oxygen with them, making them large, bulky, and expensive. The goal of the ongoing hypersonics programs is to sharply reduce the cost of extremely high-speed flight and make it routine and reliable.

Gen. Michael E. Ryan, the Air Force Chief of Staff, said that the bomber roadmap deliberations have focused mainly on near-term weapons and improvements for the existing fleet of aircraft. Congress, however, insisted that the roadmap specifically address what USAF has in mind for the long-range strike mission in the B-2's twilight years, and that's where the potential of hypersonics comes into play.

When "time is of the essence" and the platform—either for an attack or with a sensor—"positively has to be there overnight, I think we need to look at faster ways to do it," than are now extant, Ryan said. The product could be a "high-Mach" craft or a spaceplane. In any event, he said, "I think we have to have something that does that mission, sometime in the future."

The Air Force likely will state a requirement for a vehicle or system that can deliver "rapid response at intercontinental ranges," Ryan added.

***The National Aerospace Plane project was to have delivered a manned, hypersonic craft by the end of the 1990s, but its budget didn't match its ambitious scope. NASP technologies provide the jumping-off point for today's hypersonic research.***

Once such a requirement is formally stated, the Air Force would carry out "trade studies" as the first step toward building such a system. These analyses would consider the available—or imminent—technologies that could enter service in the "desired time frame," though what that time frame may be is as yet undefined.

"We have to get started on it now," warned Ryan, "because our acquisition system takes a long time to produce brand-new things." He noted that only now is the B-2 beginning to offer a full combat capability, "and we started that back in 1981."

How badly will the Air Force need replacements for its existing long-range systems? USAF has said it believes the B-52H fleet is "technically capable" of lasting beyond the 2020s, but if the Air Force could field a system that was faster to target, more effective when it got there, and cheaper to operate—which a senior USAF official said has risen to "paramount importance among the considerations"—the service would give a serious look at retiring the BUFFs much earlier.

The B-1B fleet starts running out of its planned life expectancy in the late 2010s, with the exact year depending on how heavily they are used in the 2000s.

The B-2's service life has not been calculated, but the bomber conceivably could last into the 2040s, if the example of the B-52 is any indicator. Unlike the B-52, which is chiefly built of well-understood metal alloys, the B-2 is largely made of nonmetallic composite materials, the longevity of which has not yet been established.

## New World Vistas

The idea of air-breathing hypersonic vehicles as the next step for USAF was prominently voiced in the Air Force Scientific Advisory Board's "New World Vistas" technology forecast of three years ago. In it, SAB Chairman Gene H. McCall focused on the "striking increases in effectiveness" the Air Force would reap if it succeeded in developing hypersonic systems.

New World Vistas planners saw unpiloted, Mach 15 hypersonic missiles and airplanes attacking enemies a world away, possibly with lasers, maneuvering at 20g's, and agile enough to elude most missiles.

The issue bubbled to the surface in a big way again last fall when Hans Mark, the Pentagon's director of defense research and engineering (and a former Secretary of the Air Force) told reporters in Washington that "there are things on the horizon" in aerospace technology that could lead to "an air-breathing, high-altitude aircraft." He predicted that the successor to B-2 would "probably ... be hypersonic." He cautioned, though, that this exotic new aircraft "probably ... will be far in the future."

Hypersonic vehicles typically have "a really marginal payload," Mark explained, adding, "That's [their] big problem."

It is difficult to acquire a large payload in a hypersonic vehicle because of the fineness ratio required of most designs: Because they are typically long and skinny, hypersonic craft don't have an obvious place to put supplies of fuel and weapons, and increasing the payload and/or range usually means making a larger vehicle. An informed decision about the military utility of hypersonic vehicles is a decade away, Mark speculated.

The National Aerospace Plane project, inaugurated in the mid-1980s, was to have developed a hypersonic, air-breathing vehicle by the late 1990s, but the decline and fall of the Soviet Union, coupled with greater-than-expected technical challenges, inherent difficulties in an interagency project, and an on-and-off funding commitment from Congress led to the project's demise in 1994. According to NASA's former NASP program manager Vincent L. Rausch, NASP died "when the threat went away." Rausch, a retired USAF colonel, now serves as program manager for NASA's Hyper-X, a follow-on project that will fly three small-scale hypersonic research vehicles.

## Waning Interest

"Military interest waned" in NASP when the Soviet Union collapsed, and as the program progressed, it became "clear that it was quite a big technical challenge," Rausch said. The X-30 vehicle, as NASP was known, would have required a "national effort" and "several billion dollars" to build. That kind of money became very scarce in the early 1990s.

After "13 separate reviews" by a host of government panels, it was decided that NASP was a "very laudable thing to do," Rausch asserted, but the question arose whether the program envisioned "was the right way to do it."

In 1995, NASA contemplated the technology and research data left over from NASP, looking for a way to move ahead. What it came up with was Hyper-X: a project to fly small-scale versions of a hypersonic craft to gather data and develop the basic

knowledge needed to make a full-scale version fly.

The key task in making hypersonic craft a reality, Rausch said, is "flight validation of a scramjet engine." Hyper-X, he said, is the "cheapest way to do it" and the logical first step before something as ambitious as NASP should be tried again.

In an ordinary jet engine, fan blades compress the incoming air, and, after combustion of fuel, the engine expels the air at greater pressure, producing thrust. In a ramjet, the air is compressed by the aircraft's own forward speed, and combustion occurs inside the engine in a subsonic flow of air.

In a scramjet—short for supersonic-combustion ramjet—the airflow inside the engine is supersonic. A scramjet is necessary if a hypersonic vehicle is to be "air-breathing"; a ramjet or turbofan would not be able to take air in fast enough to travel at high-Mach speeds.

*The celebrated X-15, shown here under the wing of its B-52 mother ship, reached Mach 6.7 and blazed a trail for the space shuttle. Hypersonic research is now aimed at reusable, more "operational" craft.*

*What comes around goes around. The very same B-52 that launched the X-15 will carry aloft the Pegasus/Hyper-X combination for three test flights, in 2000 and 2001. Pegasus is a proven launch capability, having put many small satellites into orbit.*

The X-15 series of test airplanes in the 1960s carried both fuel and oxygen, and achieved speeds of up to Mach 6.7, but offered little practical value as weapon systems, since they carried barely two minutes of fuel and had to be carried aloft by a B-52 mother ship. Having burned their fuel, the X-15s had to return to a dead-stick, unpowered landing. The data they generated, however, paved the way for the space shuttle's own high-Mach re-entry and dead-stick landings.

The demonstration of a scramjet is the "top priority" of Hyper-X, Rausch said. The craft will use liquid hydrogen as its fuel.

Three single-use craft, each 12 feet long, are being built under Hyper-X. Each, bearing the designation X-43, will be mounted on the front of an Orbital Sciences Pegasus–type booster rocket, which in turn will be carried to launch altitude by a NASA B-52. In three successive tests, the booster will be released from the bomber and accelerate a Hyper-X vehicle to its test speed and altitudes of about 100,000 feet, at which point the test airplane will separate and fly on its own power for about seven seconds, followed by about six minutes of hypersonic glide. Though brief, these flights will generate "an eternity of data," Rausch said.

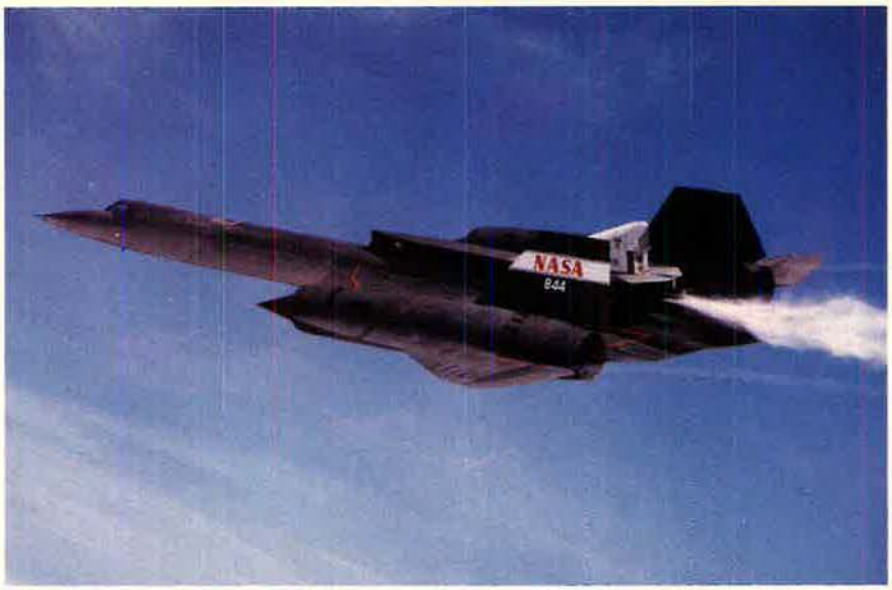
### "The Spatula"

The first two vehicles, to be flown in January and October 2000, will fly at Mach 7, while the third, slated to fly in September 2001, will fly at Mach 10. Each will resemble the last planned configuration of the NASP, called "the spatula" by Rausch, but each will have variations, particularly in the shape of the inlet, for the speed at which it will fly.

The three vehicles constitute Phase 1 of the program. If successful, Phase 2 would draw on the data obtained from Phase 1 to build a larger version, completely reusable. It would take off and land on a runway but operate on a preprogrammed course. How it will get from ground level to high altitude hasn't been decided yet, Rausch noted, and considerations include rockets, a pop-out turbine engine for lower altitudes, and "something called pulse detonator engines." The choice will depend on "what integrates best" with the rest of the vehicle.

After the scramjet, Rausch said, "thermal management"—resolving the problems of heat generated by friction

NASA photo by Carla Thomas




***To test fast, you have to go fast. This Mach 3–plus SR-71 is carrying a linear aerospike engine on its spine for high-speed evaluations. In larger form, the aerospike will power the X-33 and possibly offer a much cheaper way to orbit.***

at very high speeds—is the next-biggest challenge, followed by reliable fuel injection at high altitude.

"The rocket community was not very much in love with NASP," Rausch noted. Many in the NASA launch vehicle departments saw the project as a competitor and a drain on resources when rockets could be pushed to operate more efficiently. Now, though, "there is a growing awareness that in order to make the improvements that [the government] wants to see" in the responsiveness and cost of both getting to orbit and going long distances, "they have to be open to something different. They're looking for anything that will work."

The Air Force Research Laboratory is working on power plants and flight control systems that will make air-breathing hypersonic craft a reality. Under the HyTech program, scramjets that would use "ordinary hydrocarbon fuels" are being explored, according to Robert A. Mercier, chief of the hypersonic technology program at the AFRL's Propulsion Directorate.

The scramjets being designed "would work in the Mach 4 to 8 range," and part of the effort will be to develop engines that are not merely testworthy but which would have the durability for operational applications, Mercier said.

The AFRL also conducted flight tests of a vehicle called LoFLYTE, for Low Observable Flight Test Experiment. The vehicle is an example of what is called a "waverider"—a craft designed to ride its own bow shock wave, much as a surfboard rides on top of an ocean wave. The 8.3-foot vehicle has only flown at very slow speeds and altitudes, to test the basic airfield suitability of its broad, arrowhead-like shape.

### This and That

LoFLYTE is also a test platform for a flight control system with a neural network. Mercier explained that a neural network uses an adaptive logic that allows the program to "learn" how to control an unstable craft by "trying a little of this and that to see what works" to keep the vehicle stable. The neural network used in LoFLYTE will be transplanted into Hyper-X, and cooperation between the programs is strong, Rausch observed.

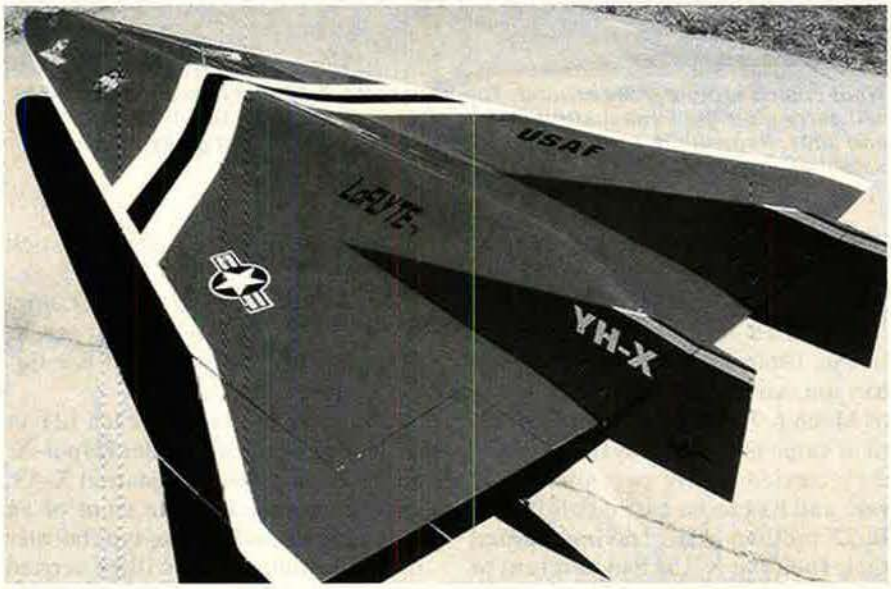
A 23-foot-long follow-on to the delta-shaped LoFLYTE would explore its performance at high subsonic speeds. Two different designs are being looked at, Mercier noted, but the task of his project is to provide basic technological data "to our product centers," who then decide whether to pursue the technology.

"As lab people, we have to look far downstream," he said. "Our brethren in the AFRL are looking very closely" at hypersonic applications in "unmanned aerial vehicles, uninhabited combat vehicles, and manned systems ... both for strike and reconnaissance."

He added, though, that "at this point, we are just looking at vehicle trade studies, looking to see where the gaps [in capability] are, and doing the groundwork" for future systems.

The HyTech project will produce a power plant by 2003 for demonstration with a "missile-size application," Mercier said, and the missile to take advantage of it will likely be a DARPA project called the Affordable Rapid Response Missile Demonstrator.

Boeing is developing two differ-




***Another concept in the push to go hypersonic is LoFLYTE, an Air Force effort to evaluate the benefits of waverider technology; such craft "surf" on their own shock wave. So far, it has flown in the pattern to test basic handling.***

ent concepts for the ARRMD, which is envisioned as a Mach 6–cruising vehicle that would come in at under $200,000 a copy. Boeing is producing both vehicles because it acquired McDonnell Douglas, which was offering one of the two finalist concepts.

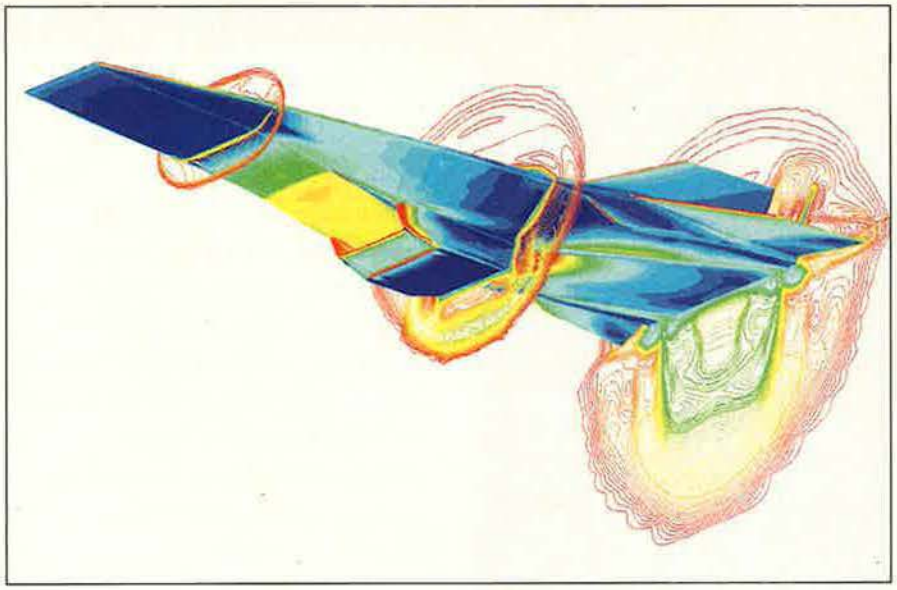
One of the vehicles is a waverider and the other is a spatula-type vehicle like Hyper-X and NASP, according to Boeing's program manager, John Fox. The operational concept, he said, is to produce a missile that could be launched from a platform as small as a fighter and as large as a bomber, as well as from a canister aboard Navy ships and submarines. The missile would be used against time-critical targets such as newly discovered mobile missile launchers or surface-to-air missile sites. It would also be useful to attack deeply buried bunkers.

The missile would have to fit inside the bomb bays of USAF's bomber fleet as well as in the Vertical Launching System canisters used by the Navy, meaning no more than 13 feet long. In order to be carried on the Navy's F/A-18E/F, the missile must not exceed 2,320 pounds in weight. A disposable solid booster would propel each missile to a speed at which its hypersonic engines could kick in.

The ARRMD has only a 250-pound warhead, a size driven both by the advances being made in the yield of explosives, as well as the functional payload limit on a hypersonic vehicle. The waverider version will be powered by USAF's HyTech scramjet engine, while the spatula type will be powered by a dual-combustion combination ramjet/scramjet built by the Johns Hopkins University Applied Physics Lab. Both versions would use an Inertial Navigation System/Global Positioning System guidance package, developed for Boeing's Joint Direct Attack Munition, to achieve a precision hit within 30 feet of the target.

There is "no preferred concept" at this point, Fox said. "Both designs are viable ... candidates."

One of the two concepts will be picked to go ahead by the end of next year, after which an engineering and manufacturing development effort will begin to produce flight test vehicles. If they work, and if they can be built at the required cost, the program could put missiles into the hands of operators by 2010, Fox said.



***A computer-generated image shows the multiple shock waves that Hyper-X must survive. Without modern superfast computers, it would take decades for engineers to handle the computational fluid dynamics needed to refine hypersonic craft.***

## "Hot Skins"

"The engines are the long pole in the tent," Fox said. "They are extremely related to the airframe. This is not like airplanes used to be designed, where you built an airplane around an existing engine. The airframe and engine are integral."

Keeping the vehicle from melting is the second biggest problem, given "the hot engine and hot skin" that will be encountered at high Mach numbers, he added.

The ARRMD is to fly at Mach 6.5 and fly at 90,000–100,000 feet. DARPA is giving Boeing leeway to "trade off anything we need to against the cost," which must come in under the $200,000 target, which Fox believes is possible.

The same kinds of hydrocarbon fuels found in serving aircraft today will be used in the ARRMD, Fox said. The Navy insisted that hydrogen not be used because it would be too hazardous to store and protect on an aircraft carrier. The use of JP-7 for the waverider and JP-10 for the dual-combustion ramjet will also simplify handling of the systems under wartime conditions.

As many as 3,000 ARRMDs are envisioned for the Navy and Air Force. The services are involved in the effort but will not become official "sponsors" of the program until after it has cleared the demonstration phase, Fox said.

France and Russia are known to be pursuing hypersonic weapons, but Rausch and Mercier guessed that their systems are not as well along as the US effort. A Japanese program is aimed at creating a spaceplane capable of Single-Stage-To-Orbit flight.

Rausch said the US could build a manned, Mach 5 craft "today, if we decided to" for SSTO operations, but "it would require the kind of national effort and investment" that was made on the space shuttle program. Building a vehicle that will exploit the knowledge gained from Hyper-X and the other hypersonic research projects "is not going to be cheap" but will pay back the investment handsomely, he said.

The level of effort being expended on hypersonics is "probably about right," Rausch asserted, given that the scramjet technology will make everything else possible and must, of necessity, "come first."

When the Air Force decided to retire the SR-71—with no obvious successor in sight—speculation raged that some sort of secret hypersonic reconnaissance airplane must have been nearing deployment. Rausch said, "I wish we had it" but noted that "in the '80s, when we were working on NASP, we pretty much knew everybody who was working on this technology." None of them, he said, knew of any program that had magically leaped ahead of the state of the art. ■

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**The new DDR&E brings bold thinking and decades of experience to the job.**

# Hans Mark Looks Ahead

By Robert S. Dudney, Executive Editor

HANS Mark, the Pentagon's newly appointed director of defense research and engineering, believes the United States stands at the beginning of another great leap forward in military technologies.

The possibilities, he said, include electromagnetic guns for aircraft and land vehicles, airborne lasers to blast missiles and hostile aircraft, transport airplanes capable of taking off and landing like helicopters, and advanced unmanned air vehicles for strike missions and reconnaissance.

"This is all long time-scale stuff," said Mark. "It's not going to happen tomorrow."

That's only to be expected, he went on. "We need a long-range view—20 years into the future," he remarked at a Nov. 4 session of the Defense Writers Group in Washington, D.C.

On other topics, Mark said he believes the Joint Strike Fighter will be an enormous, long-running program, would like to see the US build "a lot" of F-22 fighters, and has "no worries" about the ultimate success of USAF's airborne laser project. Mark also said he doubts that the Air Force's B-2 stealth bomber will be the last of its venerable breed. *[For Mark's comments about bombers, see "Mission to Mach 5," by John Tirpak, p. 28.]*

Mark in July became DDR&E, making him the chief technical advisor to the Secretary of Defense and Undersecretary for Acquisition and Technology. He oversees the priorities, programs, and strategies of Pentagon research, development, test, and evaluation.

A veteran scientist and engineer, Mark has seen more than a few high-technology weapon cycles come and go.

Mark graduated from the University of California, Berkeley, in 1951

with a degree in physics. He immediately entered national security research and engineering—first at MIT (1951–54), where he received a Ph.D., and then at Berkeley and Lawrence Livermore National Laboratory (1955–69). He served as director of NASA Ames Research Center in California (1969–77), where he supervised the Pioneer planetary exploration program and launched the Bell XV-15 tilt-rotor aircraft program.

Mark's Washington service began in 1977, when he became undersecretary of the Air Force and, at the same time, director of the National Reconnaissance Office. As head of NRO, he managed the nation's classified satellite reconnaissance program. He then served two years as Secretary of the Air Force (1979–81), then became deputy administrator of NASA. From there, he went on to become chancellor of the University of Texas System in 1984.

Thus, for nearly half a century, Mark has had a ringside seat for some of the nation's greatest technological triumphs—and he has been in the ring for more than a few of them.

### Science and Technology Research

Mark believes the United States, by embracing emerging technologies and properly funding their development, could again enjoy dramatic advances in military capabilities.

The goal: Ensure that the United States retains worldwide technological supremacy and acquires weapons that can be used in a wide variety of operations.

He warned that paying for such developments will be a grave challenge given the Pentagon's limited funding and its wide range of priorities. Congress boosted the Pentagon budget for this year but the services are struggling to meet their needs.

Mark believes it's time for a shift in science and technology emphasis.

"Information technology is obviously something that has enjoyed a great deal of attention in the last 15 years," he said, pointing out that he was personally engaged in early work in the field during his stint at NASA–Ames. "I've watched this thing grow for a long time. However, I think that we now need to change some priorities. ... The commercial sector does a lot of information technology that we can use. My own feeling is that we need to look at new weapons—particularly weapons for troops in the field. ... And we need to do that with a long-range view."

Mark pointed out that some of the most vital weapons are quite old. Case in point: thermodynamic military guns.

"I believe that electromagnetic guns could very well be a decisive weapon 20 years from now," said the DDR&E. "We are not anywhere close to fielding any, but ... trying to define the problems and then solve them is what [the Defense Advanced Research Projects Agency] and the military services should be sponsoring."

Why would the US military want electric guns?

"The normal [gun] is ... a thermodynamic engine. ... You can't shoot a bullet out of the barrel at a velocity much faster than the speed of sound inside the barrel. ... In order to get higher muzzle velocities, you can't use a thermodynamic engine. Electromagnetic acceleration doesn't have that limit."

Why would one want higher muzzle velocities?

Today, said Mark, the international market can provide tanks bearing explosive-reactive armor that can defeat current anti-tank weapons. The way to defeat this armor will be with hypervelocity rounds with enough energy to pierce it in milliseconds, said Mark. Researchers are now engaged in high-profile work to develop a workable rail gun for armored vehicles and even aircraft, a task that requires major breakthroughs concerning power sources and rail life.

"We now have a gun that can do 10 shots," said Mark. "You want guns that have 100 or 200 shots."

### Heavyweight VTOL?

Mark said that, in the US research base, there are "probably half a dozen weapons developments" he would like to bring higher in priority.

Among them: research aimed at developing a transport with Vertical Takeoff and Landing capabilities. Essentially, said Mark, the aim is to create a giant tilt-rotor, a larger version of the V-22 Osprey now being built for the Air Force, Navy, and Marine Corps.

"I would put the air transportation at a very high level of priority," said Mark. "One of the things we are looking at over a very long time scale is ... a Vertical Takeoff and Landing airplane that is the same size as a C-130 or C-17. Right now, we don't know how to do that."

Such an aircraft would need highly advanced variable-length propellers made of superstrong and superlight materials.

"Is that possible?" he asked. "Sure; we didn't know how to put slats on wings either in the early days of aviation and today it is done as a matter of course. It is a lot of hard materials research, basic research, how do you move the blade in and out? How do you do it reliably and how do you do it 100,000 times?"

Mark also noted that the basic M-16 rifle actually was designed in 1945 and has been in wide use for three decades. Mark said US troops need a more accurate, longer-range weapon.

"Can we build an infantry weapon today that is lighter than the M-16, has double the range, and better accuracy?" Mark inquired. "I asked that question four years ago at the Army Science Board, we did a study, and the answer is, 'Yes, you can,' and there are now people looking at advanced concepts. I think something is going to happen in that area in the next five years. That could be a decisive advantage."

### Joint Strike Fighter

Mark, who has decades of experience with tactical fighter aircraft programs, said he is optimistic the Joint Strike Fighter will live up to advance billing.

"We have many missions for airplanes," said Mark. "You can design a program—not an airplane, a program—that can do all of those missions.

"Now, you remember we did that back in the 1960s with something called TFX [Tactical Fighter Experimental] that became the F-111. There, the notion was, 'Is there one airplane that can do all the missions?' And we got the answer to that one: There is not. That is why I use the word *program* rather than *airplane*."

Mark thinks the JSF will succeed because times have changed.

"The question you should ask is: 'What can we do now that we couldn't do in the 1960s?' " said Mark. "That

is the real issue, and the answer to that is the following: We now have four or five orders of magnitude more in computer capacity than we had then.

"If you apply that to the design process of airplanes, you can do many, many [more] design iterations than we used to have. So, you can, from a common framework, put together, in a modular manner, different kinds of airplanes. ...

"We have a carrier version, a land-based version, and [a] VTOL [version]. When I first saw this, I said, 'Gee whiz, can you guys really do this?' It took me awhile to come to the conclusion that you indeed can make a good stab at it."

Mark referred specifically to a common cockpit for three different configurations, common engines, and so forth. However, he said the key is more sophisticated design engineering.

"When I was supervising things like that," said Mark, "you couldn't do as many trade-off analyses as you can do now. Literally, today, one engineer, sitting at a computer screen, can do trade-offs that it took 100 people to do 20 years ago, when I was in the business. That is a major difference."

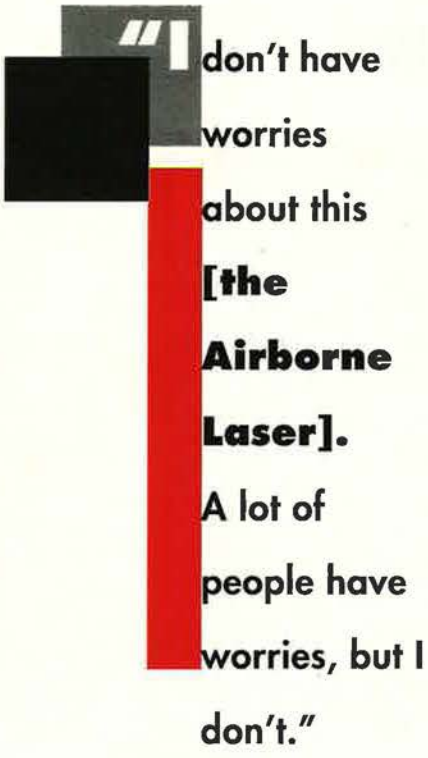
### F-22 Fighter

Mark is impressed with the capabilities of the new Air Force air superiority fighter, the F-22 Raptor, and would like to see the US build "a lot" of them, but he cannot confidently predict a final outcome regarding the size of the program. The production run will hinge to some extent on the success of the JSF program, he observed.

"We have two airplanes flying," Mark said. "We are learning about how that machine works. I hope we build a lot of them, but I don't know right now. There obviously have to be trade-offs between the F-22 and the JSF. But none of these things are firm yet because they are still 10, 12, 15 years in the future.

"History says that all these things [completion of the current fighter programs] will get done. When we started the F-4 [Phantom fighter], it started out as a carrier airplane. We were going to build 500 because, at that time, the Navy had enough carriers to handle 500. [Does] anybody know how many we finally built? ... I remember when they rolled out the 4,000th airplane in St. Louis. I can't predict what will happen." [Production actually surpassed 5,000.]

Mark turned aside criticism of the F-22's currently high unit cost. He suggested that the number had been artificially inflated by political decisions reducing the numbers of aircraft to be purchased.




"When you look at ... cost per aircraft, you have both a numerator and a denominator," he said. "You can run the cost per aircraft up by changing the numerator or ... the denominator. I would guess that the cost per aircraft of the original F-4 was pretty high, [but,] by the time we shut down the line, we could stamp them out like cookies and they were cheap."

### The Airborne Laser

Mark said he believes a bright future lies ahead for the Air Force's Airborne Laser, one of the service's top programs.

Fueling Mark's optimism about the system are a number of major advances in adaptive optical technologies. These new types of technologies, when incorporated in actual systems, will allow operators to finely focus powerful laser beams on a moving target and thereby destroy it. The problem in the past always has been that atmospheric turbulence would disturb the beam being propagated.

Indeed, Mark embraced the airborne laser concept decades ago. In 1967, as a member of the Air Force Scientific Advisory Board, he and others promoted the idea, and the Air Force did put a large carbon dioxide laser on a KC-135.

"Basically, we solved part of the atmospheric turbulence problem," said Mark. "We did the wind tunnel tests on that airplane at Ames. ... We learned how to shoot the beam through the boundary layer on the airplane and that was really the biggest problem that we had in the beginning. So we solved that problem."

Mark asserted that engineers long ago solved the airborne laser's fire control problems, noting that, in 1983, "we shot down five Sidewinder missiles with it."

The real remaining issue, said Mark, is making sure that a laser has sufficient range to be militarily useful. Here, he said, there is great cause for optimism.

"What has happened since 1983 to give us confidence that we can get the range?" asked Mark. "The answer is: adaptive optics. We are now in a position where we can structure the mirror—which is really the [basic] element of the gun—to be compatible with the atmospheric turbulence along the path.

"The way you do that is you shoot out a laser beam to measure the turbulence, and you adjust the mirror so it gives you a plain wave front which keeps the beam together.

"We have just finished, in Texas, at the McDonald Observatory, a large telescope, 10 meters in diameter, which uses adaptive optics to do astronomy. I was out there in July when we turned it on. ... There is a little switch on the console that controls the telescope. We focused it on a star and [we got] a fuzzy image, ... and then you tweak the switch and turn on the adaptive optics and it focuses on the point.

"That is the secret. Adaptive optics will make this thing work. No matter what the atmospheric turbulence is, you will know how the beam has to be shaped in order to beat it. ... I don't have worries about this. A lot of people have worries, but I don't, because I've seen it." ■

# Bits and Pieces


USAF photo

*Before the development of jets, this General Motors XP-75 was born from a single overarching plan: Use proven components from aircraft already in production to reduce development costs. It was an amalgam of existing aircraft. The first on-paper versions of the XP-75 had inverted gull wings and P-51 outer panels, F4U landing gear, and A-24 empennage—parts that worked well on their original airframes but not necessarily when mixed together. The design underwent adjustments—including a change in role from interceptor to long range escort. The XP-75 first flew in 1943, but a combination of problems, including a miscalculated center of gravity, led to more changes. The P-75A Eagle production version was virtually a new aircraft. Yet it still did not meet requirements. The Air Force canceled the production contract in October 1944 with only six aircraft delivered.*

**The government has held down active duty base pay to keep retirement pay in check.**

# How Compensation Got Complicated

**By Bruce D. Callander**

IN 1986, Congress passed the Military Retirement Reform Act, reducing the annuities of any newly entering US serviceman or -woman retiring with less than 30 years on active duty. The only real motivation was fiscal—to cut federal outlays.

Politicians said the annuity was "too generous." *The Wall Street Journal* derided it as "a gravy train." Rep. Les Aspin, the Wisconsin Democrat who later became Secretary of Defense in the Clinton Administration, deemed it "a boondoggle."

The system had been under assault for decades, but huge federal deficits made it highly vulnerable. J. Peter Grace, head of a presidential cost-cutting commission, provided political impetus. In one odious comment, Budget Director David Stockman claimed: "Institutional forces in the military are more concerned about protecting their retirement benefits than they are about protecting the security of the American people."

## Soldier's Pay: The Early Years

History's earliest warriors weren't paid at all and relied on pillaging their enemies for compensation. It was not until the fifth century B.C. that Athens decided it needed to pay its troops to maintain a peacetime army. Compensation still was lower than that in the private sector, but, at the time, most soldiers had no civilian skills and were attracted by military life.

Over the centuries, service pay remained low and often was uncertain. During the American Revolution, Gen. George Washington spent much of his time fighting Congress for pay for his troops. In 1933, at the depth of the Great Depression, President Franklin D. Roosevelt ordered a 15 percent cut in service pay to reduce federal spending.

By World War II, service pay had been restored, but it was still meager. Enlisted base pay ranged from $50 per month for privates to $138 for master sergeants. Five percent longevity increases came every three years, but, during the war, few troops remained long enough to claim more than one such "fogy."

Officers fared slightly better. Their annual pay ranged from $1,800 per year for new lieutenants to $8,000 for major generals and above, and there also were allowances for members not furnished meals and quarters and additional payments for flying and foreign duty.

There were few monetary incentives to join or to remain in service during the war but few were needed. Those who didn't volunteer for service were impelled by the draft, and retention was no problem because terms of service covered "the duration of the emergency plus six months."

Not everybody thought cutting military retirement was a great idea. The Air Force Association said that a strong defense of the existing 20-year system could be made and that Congress was giving no consideration to the impact such action would have. Senior service leaders warned that change to retirement was the No. 1 concern of the troops.

Today, all signs are that the change has backfired badly. By reducing annuities of future 20-year retirees to just 40 percent of base pay—down from the traditional 50 percent—the new system is causing younger members to question the value of service careers.

The Air Force, as a result, is asking the lawmakers to undo the changes which, they claim, have damaged the service's ability to hold onto sufficient numbers of valuable mid-career members. Retirement improvements, in fact, top USAF's compensation wish list, with major pay reform running a close second.

"What we have experienced is a devaluation of about 25 percent in lifetime value of retirement," said Col. Steven Tindell, chief of USAF's Military Compensation and Legislation Division, who entered well before the 1986 demarcation date. "There is a big difference between what I will be getting and what somebody coming in today will get. It becomes an equity issue."

Recent quality-of-life surveys bear out that contention, said Lt. Col. Susan Cooley, chief of the Air Force's Compensation and Entitlements Team. Traditionally, members ranked retirement first or second among their reasons for staying in service. Among those mid-career members who will come under MRRA, however, it has slipped to fifth or sixth place. Asked recently if they considered the retirement system fair and equitable, only about 26 percent of enlisted members said they did.

Improvements the Air Force wants in other compensation categories are designed, in part, to improve retirement benefits. Take base pay for example. Recent raises have eased the effects of inflation, officials say, but not narrowed the gap between military and civilian wages. That discrepancy now is about 13.5 percent overall and considerably more in some specialties, said Tindell.

### The Magic Year

Now, the Air Force's aim is to close or at least substantially reduce the breach by 2003. It's no coincidence that 2003 also is the year when the first members affected by MRRA will complete 17 years of service. Under MRRA, retired annuities are based on the average of the member's highest three years of base pay. Thus, if the Air Force can win substantial increases in base pay, starting in 2003, then at least the annuities will be based on a higher final pay amount.

The Air Force also would like to restructure its current pay scales to reward promotion more than longevity, particularly in the upper enlisted grades. Again, the change would boost not only active duty pay but the retired annuities.

In 1998, Congress approved only a small cost-of-living raise and made some modest improvements in incentives. Although they rejected proposals to restore the 50 percent retirement formula, the lawmakers said the retirement changes and other pay matters should be included in a full-dress review of military compensation next year.

Given the complexity of today's pay systems, a really comprehensive review could prove to be an ambitious undertaking. Traditionally, service compensation has depended less on long-range decision making and more on the tendency to make tactical responses to the needs of the moment.

This has created problems. In recent years, service pay has been tailored increasingly to specific purposes, the object being to maintain a reasonable overall level of compensation and apply additional incentives only as needed to meet special circumstances.

That approach, officials argue, is much the same as that followed by civilian employers. Companies offer a living wage to all workers and special inducements only to those with skills that are in demand at a given time. To compete, the services now extend bonuses and special pays not only to aviators, for one example, but also to medical, scientific, and engineering officers and a variety of enlisted specialties.

The Special Duty Assignment Pay program for enlisted members has become particularly complicated.

In that program, the Air Force now offers six levels of monthly pay (ranging from $55 to $375) to enlisted specialists such as recruiters, military training instructors, flying crew chiefs, pararescuers, and weapons directors. The list of eligible members is reviewed at least biennially, and skills can be added, dropped, or given different rates of SDAP based on the Air Force's needs and the availability of specialists.

This trend toward using compensation to "manage" the force has led to some ironic consequences. During the recent drawdown, for example, the Air Force was paying some members extra money to stay, while it was offering others bonuses or early retirements to leave.

### Excluded Factors

Until recently at least, the one constant in the otherwise fluid compensation system was the retirement formula. For years, members leaving after 20 years of active service have claimed annuities equal to half their base pay at separation and 30-year members have received 75 percent of base pay at separation.

In addition, retirement annuities have been raised regularly by Cost of Living Adjustment increases.

Though a succession of base pay raises put some upward pressure on retirement annuities, other factors have reduced the actual value of retired pay as a percentage of active duty income.

One of these factors has been the historic exclusion from the retirement formula of allowances, bonuses, and specialist pays. Consider, for example, the case of a master sergeant in aircraft maintenance who entered the Air Force in 1979 and is set to retire with 20 years of service. His total income, including various special pays, is pretty good—$40,663 a year. However, his retired pay spins off of his base pay, which is only $28,731. Fully 29 percent of his income comes from special pays; none of it counts in calculation of retirement benefits.

This master sergeant's annuity, figured at 50 percent of final base pay, is just $14,365. That is only about 35 percent of his total active duty "salary" at the end of his service time.

That disparity between total income and base pay is nothing new. In fact, some analysts say there is no doubt that defense authorities have tended to hold down base pay deliberately in order to keep retired pay in check.

Recently, however, Congress has changed the retired pay formula twice and, in effect, further widened the gap. Service members now face three different retirement formulas, depending on when they entered service.

Those who entered before Sept. 8, 1980, still figure their retirement at 50 percent of their final pay. This is the formula that gives the master sergeant in the illustration 35 percent of his total active duty income.

Those who entered service on or after Sept. 8, 1980, but before Aug. 1, 1986, will find their retired pay figured not on their final pay but on the *average of their highest three years of base pay*. Under this formula, the master sergeant in the example would receive $14,052, or 34 percent of his active duty income. The difference is just over $300 per year.

Those who entered service on or after Aug. 1, 1986, come under the Military Retirement Reform Act, and they take a harder hit by far.

### $3,000 Per Year

This plan, known by the name "Redux," uses the high-three-years formula and allows 2.5 percent of pay per year as a multiplier. Then, however, it subtracts 1 percent for each year less than 30 years. Under this plan, the same master sergeant in the example would receive retired pay of only $11,242 per year, or about 28 percent of his total service income. The difference between that and the pay he would have received under the old final-pay formula is more than $3,000 per year.

All three plans provide retirees periodic cost of living increases based on the Consumer Price Index. However, MRRA bases its COLA on the CPI minus one percentage point until age 62. At that point, retired pay will be adjusted to reflect the full cost of living increase since retirement. But, thereafter, retirees will receive only partial COLAs again.

The retirement changes have been a setback, but there have been some recent improvements in the compensation system.

On Jan. 1, 1998, for example, a new Basic Allowance for Housing system took hold, replacing what had become a cumbersome system of quarters and variable housing allowances.

The new BAH system bases its rates on the cost of adequate housing in a given area for civilians with income levels comparable with those of the military members. A civilian contractor will survey housing costs nationwide, and the military salaries used for comparison will include base pay, quarters and subsistence allowances, and the military tax advantage.

Officials said that at Pope AFB, N.C., a typical Air Force installation, the 1999 BAH rates will range from $464.52 per month for an E-1 to $692.16 for an E-9. In most grades, this is more than the member would draw under the basic allowance for quarters/variable housing allowance system. Where that is not the case, a protection clause will assure that the member draws the higher rate.

The aim of the plan is to assure that members pay no more than 15 percent of their housing costs out of pocket. For Fiscal 1998, this "absorption" rate was about 19.8 percent, but officials hope to reduce the differential in the future.

A similar change now ties subsistence allowances to the food index supplied by the US Department of Agriculture rather than to fixed tables. The new quarters and subsistence rates will be phased in over the next five or six years, and officials said they will be watching closely to see how they are accepted.

Despite such reforms, military compensation remains a complicated tangle of pays, allowances, bonuses, incentives, and differential pays. Some critics suggest that if the object is to make service pay more visible and more competitive with that in the private sector, it would be

## Military Pay and Retired Pay

| Specialty | Grade | YOS | Total Pay | Base Pay | Final | High 3 | Redux | % of Pay | Loss |
|---|---|---|---|---|---|---|---|---|---|
| Pilot | Lt. Col. | 20 | $82,906 | $61,135 | $30,568 | $29,131 | $23,304 | 28% | $7,264 |
| Support Officer | Lt. Col. | 20 | $76,966 | $61,135 | $30,568 | $29,131 | $23,304 | 30% | $7,264 |
| Combat Controller | MSgt. | 20 | $50,263 | $28,731 | $14,365 | $14,052 | $11,242 | 22% | $3,123 |
| Loadmaster | MSgt. | 20 | $42,463 | $28,731 | $14,365 | $14,052 | $11,242 | 26% | $3,123 |
| Aircraft Maintainer | MSgt. | 20 | $40,663 | $28,731 | $14,365 | $14,052 | $11,242 | 28% | $3,123 |

***Today, the profusion of special pays has distorted military retired pay, with retirees receiving far less than half of final pay, as many believe. They receive 50 percent of base pay. The two columns on the far right indicate the true percent of final pay under the Redux plan and the actual as well as the difference compared to the Final plan.***

## The Birth of Incentives

Although the military draft continued to spur enlistments until 1973, the draft-era US armed services periodically had problems holding needed people. One early retention tool was the enlistment allowance which paid re-enlistees small bonuses based on past service. Later refinements tied the bonuses to the length of the new contract and to how critical the member's skill had become.

The idea of skill pay itself was considerably older than that, however. As early as 1914, Congress authorized substantial allowances for both enlisted and commissioned aviators (from 25 percent of basic pay for aviation students to 75 percent for military aviators). The same act authorized a year's pay for the widows of members killed in an aviation accident.

Early flight pay was justified by the fact that flying was risky and many fliers could not afford life insurance. It was only recently that such pay has been seen as an incentive for members to enter and remain in flying careers.

Through World War II and beyond, flight pay was set at one-half of base pay. By 1974, however, it was getting out of hand. A succession of base pay raises had upped the rates and the senior officers who did the least flying were collecting the most. Congress and the services worked out a compromise that unlinked the aviation incentive from base pay and set up rates that favored fliers in mid-career.

By then, other specialty pays had evolved. One was in reaction to problems that had surfaced as early as World War I, when the Air Corps promoted technicians into the NCO grades to give them more pay even if they often lacked leadership qualities.

The solution adopted in World War II was to establish separate technician grades paralleling the NCO ranks. Technicians received the pay of noncoms but wore a "T" on their stripes to show they weren't really sergeants.

The Army continued to use a specialist system after the war, but the Air Force went back to a single rank system and rewarded specialists with special pays and bonuses.

better to put the military under a straight salary system.

Tindell thinks not. "You have to be careful when you are talking about the responsibility and authority that goes with grades," he said. "I don't think you want to mess too much with the service culture. If you can get a base pay that is competitive with the private sector and use that as your base, then you can make better decisions about your bonuses and incentives pays."

### Keeping the Best

In any case, officials insist, the civilian world doesn't work on a straight salary system, either. Companies offer a variety of fringe benefits, such as free medical insurance and bonuses. Often they negotiate higher wages for people they want, pay bonuses to those with special skills, and make lucrative counter offers when workers threaten to go elsewhere.

The services now can offer an impressive array of incentives to talented people, but they still can be outbid in today's labor market. In earlier decades, unemployment in the private sector helped military recruiting, but, as jobs have become more plentiful, the labor market has tightened and the services have struggled to get and hold good people, particularly in the high-tech skills. Despite recent raises, there still is that gap between military and civilian income.

To find out how big the actual difference is in specific skills, the Air Force recently used figures from the Bureau of Labor Statistics to make job-by-job comparisons, said Maj. Justo Rivera, chief of pay and allowances policy. It included military base pay, subsistence and housing allowances, tax advantages, and, where applicable, Selective Re-enlistment Bonuses and at typical civilian salaries in comparable fields. Here are some of the comparisons:

- USAF vehicle maintenance personnel vs. civilian auto mechanics: The civilian starting salary was only about 16 percent higher than the $22,571 for an E-2. At seven years and grade E-5, however, the typical salary of the civilian mechanic—$38,494—exceeded that of the military mechanic by 26 percent. At the 14-year point, the gap had widened to 29 percent, with the civilian making $47,663.
- USAF communications–computer systems operator vs. civilian computer worker. Here, the gap was wider—70 percent. Even with a substantial SRB figured in, the salary of an eight-year staff sergeant—$36,278—could not come close to that of the civilian counterpart—$61,646. At the 16-year point, the gap widened to 84 percent.
- USAF mid-career security policeman vs. a civilian police supervisor. The Air Force policeman (a married E-5 with nine years of service) made about 22 percent less than a policeman in civilian work, even with the Air Force member's SRB included.
- USAF aircraft maintainer vs. civilian airline mechanic. Starting salary for a young E-2 maintainer was some 40 percent lower than that for beginning civilians. The gap narrowed at the seven-year point to about 21 percent, but it then gaped open again to 32 percent at 14 years.

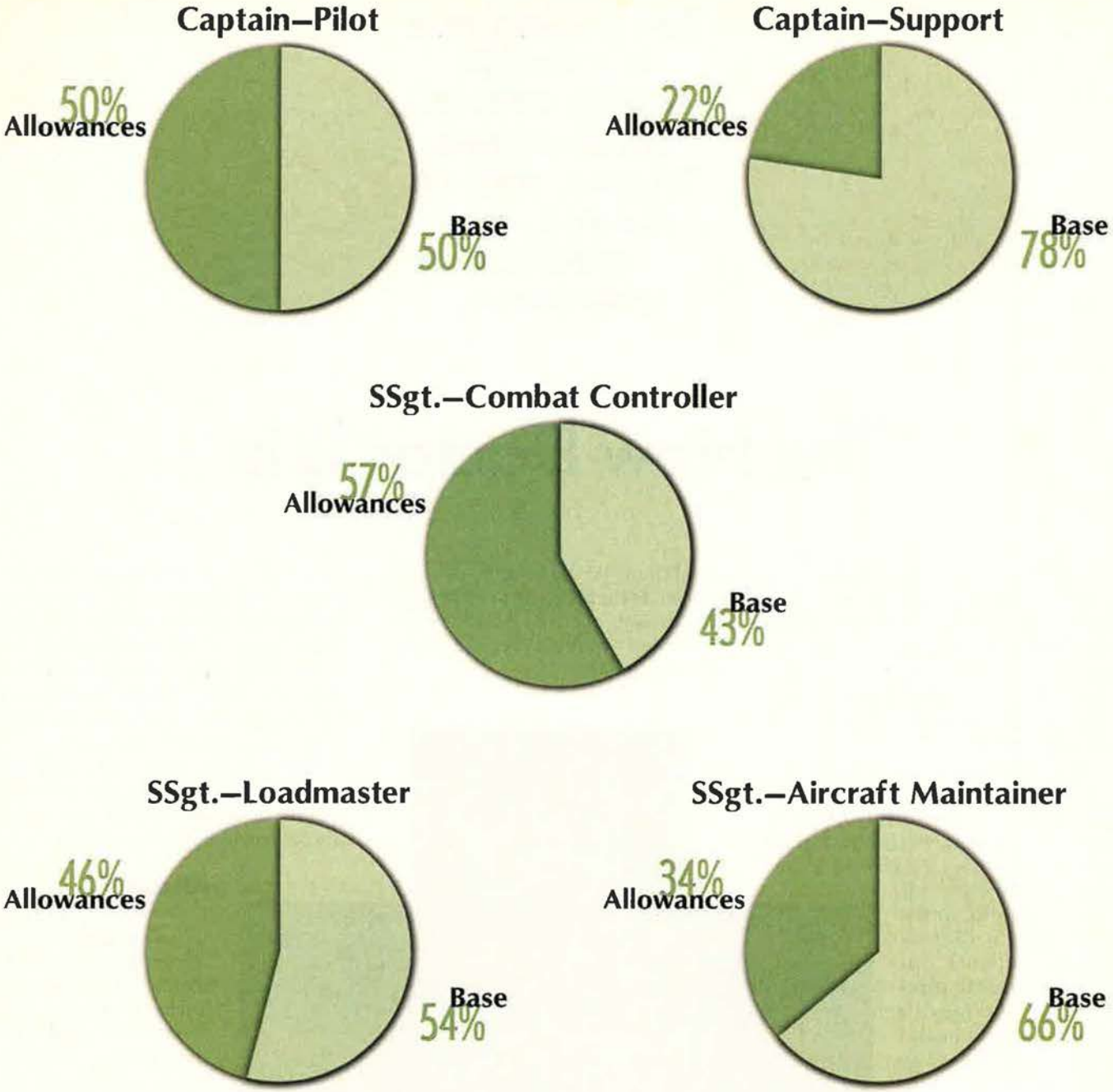
While officials have welcomed recent pay raises, they note that their main effect has been only to offset rises in the cost of living and keep the gap between military and civilian income from getting wider. Until the gap is gone or substantially reduced, the services will be at a disadvantage in the labor market.

The Air Force looks not only to close the pay gap but also to restructure the military pay table, which has not changed significantly since 1949. The system is designed to reward both seniority (longevity increases) and performance (promotion increases), but the effect is different for different grades and lengths of service.

Under the current system, for example, a typical airman could receive as many as seven raises during his first three years in the Air Force—made up of longevity and promotion increases and annual raises. Over this period, he would get an almost 50 percent increase in pay. By contrast, an enlisted member with more than four years of service would receive only annual raises and one or, at most, two longevity increases over those same three years.

The Air Force's strategy thus is (1) to smooth out the longevity points to give members about the same percentage increases across the board and (2) to provide more significant increases for promotion, particularly in the top three enlisted grades. The idea, officials said, is to encourage members to progress rather than stay in grade and wait for their next two-year "fogy" raises.

Rebuilding the pay table still also is a long-range goal, however. It would require agreement of the other services and Congressional approval. At the moment, officials are giving




more attention to efforts to return to a 50 percent retired pay formula.

The Air Force would like to restore a system in which the annuity provided after 20 years is half the member's final pay or at least of his high-three average. If the price of either option proves too high, a third possibility would be to retain some features of the MRRA approach but use a 50 percent multiplier and link COLA increases to other federal retirement plans.

Any approach that raises substantially the cost of retirement will encounter political obstacles. In recent years, the services' retirement system has been a popular target for federal budget cutters. In the last four years alone, critics have made 17 proposals to cut retirement. Such proposals, even if they are not enacted, tend to undermine the confidence of career-minded members.

The services' hope now is that they can make the case that the erosion of retirement benefits and the military–civilian pay gap are not only costing the forces needed people but threatening overall readiness. ■

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*Bruce D. Callander, a regular contributor to* Air Force *Magazine, served tours of active duty during World War II and the Korean War. In 1952, he joined* Air Force Times, *serving as editor from 1972 to 1986. His most recent story for* Air Force *Magazine, "Pressures on the Guard and Reserve," appeared in the November 1998 issue.*

**The Pentagon's top health affairs official talks about Tricare, retiree issues, and medical readiness.**

# The New Doctor Is In

By Peter Grier

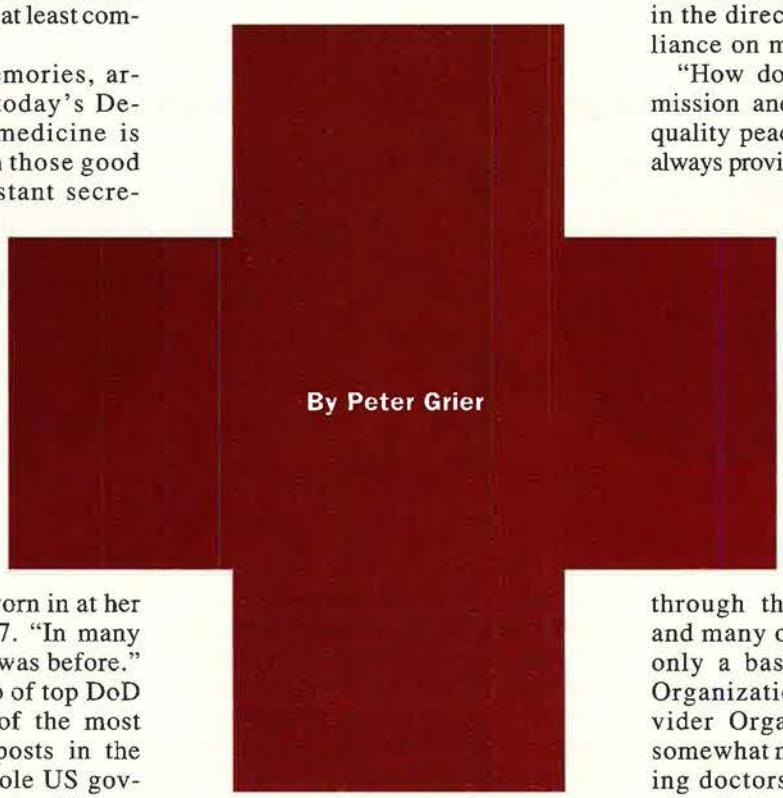
MANY American military personnel are nostalgic for the way their health care used to be delivered, admits the Pentagon's top doctor. They remember the halcyon days of easy access to base hospitals and clinics. Paperwork was minimal, at least compared to today.

Despite pleasant memories, argues Dr. Sue Bailey, today's Department of Defense medicine is not worse than it was in those good old days. Bailey, assistant secretary of defense for health affairs, noted that today's military health network includes disease prevention services, a wide choice of health plans, and access to specialists and techniques undreamed of only a few years ago.

"So I think in fact our system is better," said Bailey, who was sworn in at her current position June 17. "In many ways, it is better than it was before."

In many ways, the job of top DoD health official is one of the most difficult management posts in the Pentagon, if not the whole US government. That is because health care in general and military health care in particular are at a crossroads. None of the pathways lead outward to a certain future.

The population served by military health services is becoming markedly older, as is the nation's general population. At the same time, the rush of technological development is creating exciting—and expensive—new health care equipment and treatments.



Costs are exploding, with the money the US spends on health care predicted to double in the next decade. Beneficiaries have both greater expectations for and more knowledge about their problems and care.

Given all these forces, the Defense Department is having to restructure its health care system, just as the general US health care system is struggling to adapt to the new realities. Both systems are moving in the direction of much greater reliance on managed care.

"How do we meet our readiness mission and still provide the same quality peacetime health care we've always provided?" asked Bailey.

## Adaptation?

The military is probably ahead of the civilian world in terms of its adaptation to the new forces. DoD also provides more health care choices than many civilian employers, insists Bailey.

The majority of Americans now receive their health care through their private sector job, and many of them have a choice of only a basic Health Maintenance Organization or a Preferred Provider Organization, which offers somewhat more flexibility in choosing doctors in exchange for somewhat higher cost-sharing and fees.

The Defense Department, by contrast, offers Tricare Prime, the HMO–like option; Tricare Extra, a PPO plan; and Tricare Standard, a fee-for-service option that costs enrollees more and is similar to the old-style, choose-any-doctor-you-want system.

"There is less choice in some parts of the private sector than there is in our system," said Bailey. "In the military, you may say you want to go to Johns Hopkins [University medical facilities] because there is a particular specialist there whom you think may be beneficial for your child, and we want to assure that that kind of access continues."

Bailey is a Navy veteran whose active duty assignments included stints at the National Naval Medical Center, Bethesda, Md., and Philadelphia Naval Hospital. She rose to the rank of lieutenant commander in the Navy Reserve prior to her being appointed as deputy assistant secretary of defense for health affairs (clinical services), a post she filled from 1994 to 1995. A board-certified psychiatrist, she also served as the spokesperson for the President's health care reform campaign in 1993.

The previous assistant secretary for health affairs, Dr. Stephen C. Joseph, left the Pentagon job in early 1997. Thus, DoD's top health post had been officially vacant for more than a year prior to Bailey's spring Senate confirmation.

As to her priorities, Bailey said that her primary responsibility is to active duty forces and their families. Among other things, that means urging health protection for troops via such procedures as vaccinations against anthrax and wellness programs urging proper diet and exercise.

Bailey added that, secondarily, she is "very in tune to our retiree population" and the problem of providing health care services to Medicare–eligible military retirees. DoD has several programs under way to explore innovative means of delivering and financing health care options for older retirees.

"I'm pleased with the demonstration projects that are under way that allow us to explore our options to continue to provide care for them," she said.

Thirdly, there is the continuing challenge of Tricare. The final contracts providing for a complete nationwide system had just been completed when Bailey assumed her current job. One of her focuses, she said, will be to stabilize the current Tricare system, to simplify it so it is more easily understood, and to satisfy Tricare customers.

USAF photo by MSgt. Val Gempis

***Capt. (Dr.) Melia Cox makes her rounds in the Scott AFB, Ill., hospital where Mildred Dodds (background) was in recovery. According to the Pentagon, military medicine is in many ways better than ever.***

## "Wonderful" Health Care

"Tricare, by the way, is a new name for the same military health care system that we've all known," said Bailey. "Yes, it's been reorganized, but we are still treating the entire military family with wonderful health care that is delivered in many ways ... and on bases and on posts around the country and the world."

The need for stabilization applies not to the health care itself but to the business practices of some of the contractors who provide the care in regions around the US, according to Bailey. Answering phones, making appointments, delivering bills, and other administrative aspects of Tricare have been problematic in many places.

"We find that in our mature regions on the West Coast—California, Oregon, Washington—with systems that have been in place for a while, we work out those initial bugs and people are very pleased with the Tricare system," she said.

This does not mean that the military will just wait for the other regions to pass beyond the stage of growing pains. According to Bailey, it means picking lessons learned and applying them to the regions that have just started up.

Some of stabilization is as simple as hiring the right number of employees to answer phones in a reasonable period of time, she said.

"We've found that assuring [patients] have access to urgent care within a day, routine care within a week, and special referral care within a month, has worked remarkably well and that we've been able to meet those standards," said Bailey.

The need for Tricare simplification, meanwhile, stems from the fact that many military personnel do not understand their benefits and options. Bailey maintains that this is not a problem limited to just the military's managed care health plan.

"If you read the fine print of almost any health care plan, it is incredibly confusing and not user friendly," said the Pentagon's top doc.

Many Tricare beneficiaries probably do not have even a basic understanding of the difference in the plan's three levels—HMO, PPO, and fee-for-service.

"The more that we can help people understand our program, the better choices they will make," said Bailey.

In bygone days, providing health care for retirees age 65 and older did not strain the military system. There were plenty of space-available slots at base hospitals and clinics and lots more bases, period. Doctors could easily squeeze Medicare–eligible retirees in amongst their other patients.

## Another View of Tricare

*The following letter was written by Brig. Gen. Thomas E. Carpenter III, USA (Ret.), following a particularly annoying encounter with the Tricare system.*

July 26, 1998
Health Benefits Advisor
US Army Medical Department Activity
West Point, NY 10996-1197

Thank you for your letter of March 13th in response to my letter of Feb. 8, 1998, regarding my CHAMPUS and Tricare situation. I also appreciate your call back to help clarify a number of points regarding CHAMPUS and Tricare services for military retirees. ...

Here is my understanding of the medical benefit available to my wife and me:

1. Because a corner of the zip code in which we live (06880) is within 50 miles, as the crow flies, of West Point, a Non-Availability Statement is required, even though we are 90 road miles and 80 minutes away from West Point. ...

2. Since my wife and I are enrolled in the Defense Enrollment Eligibility Reporting System, I understand that I can get an NAS by a telephone discussion with you regarding the type of treatment required.

3. However, even if I did not need an NAS based on the distance criterion, in effect, I would be required to get one, as a condition of CHAMPUS and/or Tricare Standard coverage, because:

a. The NAS is valid for only 30 days.

b. The 14 outpatient procedures on pages 81 and 82 of the *Tricare Standard Handbook*, dated September 1997, the advance authorization requirement for the three procedures on p. 83, and all elective inpatient care require an NAS.

c. Each time I call West Point, a "determination of the moment" will be made as to whether medical services are available there and, if that is the determination, I would be required to use those services, even though we are 90 miles away.

d. You strongly advise me to call each and every time we need medical services because the foregoing list of procedures is a dynamic one and the government will deny coverage if a change has been made to the procedure list unbeknownst to me or the provider.

4. While your letter indicates that the requirement for the provider to submit claims was rescinded after only one year, that change is, in reality, not a major one as regards Tricare because:

a. Providers under Tricare Prime and Extra still must file claims.

b. Under Tricare Standard, the provider decides, on a case-by-case basis, whether he or the patient must file claims.

5. Here is the provider situation for me in Westport, Conn., and surrounding areas, based on the "Health Care Finder List," dated January 1998, provided to me by CHAMPUS:

■ 910 doctors of all types and locations (some a full day's drive away) are on the list.

■ 12 doctors have offices within 45 minutes of my home (Westport, Southport, and Fairfield). Of these 12:

–One of the 669 doctors who practice medicine in Westport is listed, but he is a dermatologist.

–One is a pediatrician (we have no dependent children).

–Six are in OB/GYN.

–Three are in family medicine.

–One is in internal medicine.

■ Of the three in family medicine:

–Two are not accepting new patients.

–One has moved and is no longer accepting CHAMPUS.

■ [T]he one in internal medicine ... moved about 12 months ago and left no forwarding address. ...

In any case, even if a current and accurate list of providers were made available, it would be of limited value, since the *Tricare Standard Handbook* advises on p. 91 that doctors "participate on a case-by-case basis. That is, they may participate one time, and not the next time."

6. Of the several doctors I know personally in this area, none will agree to participate in CHAMPUS because, in their view, the government has imposed cumbersome and burdensome procecures that are unacceptable to them.

7. Tricare is, in your words, "scheduled" for implementation in our region on June 1, 1998, after previously announced implementation dates of Oct. 1, 1997, Jan. 1, 1998, and April 1, 1998 have been delayed.

I conclude from the foregoing that, as a military retiree, my wife and I are effectively without government-sponsored medical care in any form until we reach age 65. This letter may help explain why so many military retirees feel that the government they have served faithfully over the years has broken faith with them.

### Anxious, Resentful

Those days are long gone. Sharply reduced numbers of both military medical facilities and providers have left many of the nation's military retirees anxious about their future and resentful about the nation's reneging on a promise of lifetime medical care to those who spent a full career in uniform.

In response to their concerns, Congress has authorized the Pentagon to oversee several tests of ways of bolstering care for the retirees 65 and over. Tricare Senior Prime is a demonstration program that will allow enrollees to use Medicare to pay for treatment at military facilities. FEHBP–65 will explore opening the Federal Employees Health Benefits Program to these older retirees.

"I am looking to all the demonstration projects to glean information about the best way to provide health care for those who are over 65," said Bailey.

Senior Prime is already up and running. The first site to begin operations, Madigan Army Medical Center, Ft. Lewis, Wash., began providing health care under the plan on Sept. 1, 1998. Five other sites, some with more than one facility participating, will follow. The demonstration runs through Dec. 31, 2000.

Bailey cut the ribbon opening Senior Prime—also known as "Medicare Subvention"—at Madigan. She said it was an exciting day. "People were clearly ready for the program to begin," she said.

Earlier this year Bailey won plaudits from retiree groups by quickly changing some of the co-payment rules of Senior Prime. Initial plans called for Tricare Senior enrollees to pay steep co-payments if they needed skilled nursing care for more than 20 days or if they needed durable medical equipment such as dialysis machines.

Whether the prospective costs were at first hidden or not is still debatable. In any case, Bailey quickly ordered the nursing care co-pay decision reversed, as it represented the largest potential financial strain.

"One of the highlights of a job like this is to be able to listen to an advocacy group, hear a problem, see a solution, and implement it," she said.

It is difficult to compare Tricare Senior co-payments with those that face retirees in the civilian world.

In general, concludes an analysis provided by Bailey's staff, "We anticipate that out-of-pocket costs for enrollees in Tricare Prime will be dramatically lower than in fee-for-service Medicare and considerably lower than in most Medicare HMOs."

In years past, Pentagon officials have been less welcoming of the concept of opening the generous Federal Employees Health Benefits Program to military retirees age 65 and over. It is true, they have said, that FEHBP–65 could bolster the health care of those retirees who live far from any defense health installation, but the system is expensive, to both enrollees and the government.

## FEHBP "Possible"

Congress finally approved a modest FEHBP experiment last year. Bailey said she is reserving judgment about this option until she sees what information comes from it. "It's possible," she said, that an FEHBP plan could fit in with the military's approach to its older retirees' health care.

Still, "I think that we're going to find that Tricare Senior, in terms of our retiree health care needs, will probably provide us with the best answer that will be most affordable," she said.

The Pentagon is running yet another test that is looking at ways to expand space-available slots at military hospitals. This demonstration, at MacDill AFB, Fla., addresses the fact that many retirees generally want to come back to military treatment facilities, according to Bailey.

Some military facilities have already been successful at finding ways to squeeze in more openings for retirees. Bailey said she was fascinated by a trip to NAS Jacksonville, Fla., where officials told her they were "overwhelmingly able to provide space-available care" for the area's large retiree population, even while continuing to meet their primary mission of peacetime health care delivery to active duty folks.

Jacksonville's techniques included everything from expanded hours to new ways of parceling out physician services.

"That's what we're looking at the MacDill test for," said the Pentagon's health chief. "Let's try to understand what those variables are, what is different about any place that is able to do that."

As to prevention, Bailey said she is very interested in making it a real part of military medicine. She specifically cites the example of the Air Force for already having moved in this direction, emphasizing changes in diet, exercise, and management of stress.


USAF photo by MSgt. Val Gempis

***DoD is struggling with the task of providing a war-ready medical force as well as peacetime care. Capt. Anne Harvey, a 43d Aeromedical Evacuation Squadron flight nurse at Pope AFB, N.C., poses during a Southwest Asia rotation.***

Simply convincing more people to stop smoking and reduce drinking of alcohol could save the Pentagon big dollars and head off untold personal suffering. In 1996, the Department of Defense paid $2.9 billion on the direct and indirect costs of tobacco and alcohol-related health problems, Bailey said.

By spring, all military health care facilities will be surveying patients to understand each person's health history, lifestyle behaviors, and risk factors.

"There is so much that people can do about their activities of daily living ... that is so important to their health and longevity," said Bailey.

The Pentagon–wide move to vaccinate personnel against the biological warfare agent anthrax is another prevention effort.

The first phase of the anthrax program focuses on immunizing forces that have been or will soon be deployed to the high-threat areas of Korea and Southwest Asia. Phase two will focus on units that would be planned as early deployers in the event of conflict in those areas. The final phase, scheduled to begin in 2003, will include the remainder of the force.

Well over 50,000 people have now begun the multishot immunization process. Bailey herself has had three of the basic six shots already.

There have been a few high-profile cases of personnel refusing the shots on grounds that the immunization itself could pose a danger. In fact, adverse reactions numbered only 10 through mid-October, according to Bailey.

"It's proceeding very, very smoothly so far," she said.

The Pentagon's top health official recalled that, not long into her tenure, she traveled to Germany and met with Air Force and Army medical teams that cared for people injured in the twin bombings of US embassies in Africa in August. These teams, from the people who flew the airplanes, to those who worked on patients en route, to those who manned the intensive care units back in Europe, should be a source of pride for Americans, said Bailey.

"I want to commend the Air Force and all the services that took part," she said. "It was military medicine at its very best. When you see an American team in uniform carrying the gurney, you know that patient is in good hands." ■

*Peter Grier, the Washington bureau chief of the* Christian Science Monitor, *is a longtime defense correspondent and regular contributor to* Air Force Magazine. *His most recent article, "Readiness on the Line," appeared in the December 1998 issue.*

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**The Rumsfeld Commission said rogue nations could pose a ballistic missile threat to the US within a few years. The Joint Chiefs disagreed.**

# Missile Controversies

Do rogue nations now pose a "no-warning" ballistic missile threat to the United States? The question shapes up as one of the critical security issues of 1999 for the Clinton Administration, Congress, and the armed services.

How it is answered could determine whether the US gives a hard push to a multibillion-dollar homeland defense effort anytime soon.

The controversy flared in July when a blue-ribbon commission led by former Defense Secretary Donald H. Rumsfeld warned that North Korea, Iran, and Iraq are developing long-range missiles faster than expected and in ways US intelligence might not detect. Panel members said the rogues import technology from Russia and China and avoid long US–style development and test cycles—factors that greatly compress acquisition times and increase secrecy.

The panel's bleak outlook clashed with that of the Joint Chiefs of Staff, whose Chairman, Army Gen. Hugh Shelton, expressed deep skepticism of the report on nearly every key point. In addition, he indicated that the Chiefs saw no need to accelerate the current measured US missile defense program.

The Central Intelligence Agency, for the moment, continued to maintain that such a threat probably won't emerge for a decade and that it would be able to provide adequate warning. However, the CIA's missile specialist, Robert D. Walpole, said the agency is preparing a new National Intelligence Estimate on the matter. The classified document is to be completed in early 1999.

The intensified political debate on rogue missiles and missile defense will be shaped to a large extent by the positions staked out by various officials and agencies in a recent series of public hearings, reports, and speeches.

## Rumsfeld Commission Final Report

***(Released July 15, 1998)***

■ "Concerted efforts by a number of overtly or potentially hostile nations to acquire ballistic missiles with biological or nuclear payloads pose a growing threat to the United States,

its deployed forces, and its friends and allies. These newer, developing threats in North Korea, Iran, and Iraq are in addition to those still posed by the existing ballistic missile arsenals of Russia and China, nations with which we are not now in conflict but which remain in uncertain transitions. The newer ballistic missile–equipped nations' capabilities will not match those of US systems for accuracy or reliability. However, they would be able to inflict major destruction on the US within about five years of a decision to acquire such a capability (10 years in the case of Iraq). During several of those years, the US might not be aware that such a decision had been made."

- "The threat to the US posed by these emerging capabilities is broader, more mature, and evolving more rapidly than has been reported in estimates and reports by the [American] Intelligence Community."
- "The Intelligence Community's ability to provide timely and accurate estimates of ballistic missile threats to the US is eroding. This erosion has roots both within and beyond the intelligence process itself. The community's capabilities in this area need to be strengthened."
- "The warning times the US can expect of new, threatening ballistic missile deployments are being reduced. Under some plausible scenarios—including re-basing or transfer of operational missiles, sea- and air-launch options, shortened development programs that might include testing in a third country, or some combination of these—the US might well have little or no warning before operational deployment."

### Army Gen. Hugh Shelton, Chairman, Joint Chiefs of Staff

***(Aug. 24, 1998, letter to Sen. James Inhofe, R–Okla.)***

- "After carefully considering the [Rumsfeld] report, we [the Joint Chiefs of Staff] remain confident that the Intelligence Community can provide the necessary warning of the indigenous development and deployment by a rogue state of an ICBM threat to the United States."
- "The commission points out that, through unconventional, high-risk development programs and foreign assistance, rogue nations could acquire an ICBM capability in a short time and that the Intelligence Community may not detect it. We regard this as an unlikely development."
- "These rogue nations currently pose a threat to the United States, including a threat by weapons of mass destruction, [only] through unconventional, terrorist-style delivery means."
- "The current [Clinton Administration] National Missile Defense policy and development readiness program ... is a prudent commitment to provide absolutely the best technology when a threat warrants deployment."
- "Under current conditions, continued adherence to [the 1972 Anti-Ballistic Missile Treaty] is still consistent with our national interests. The treaty contributes to our strategic stability with Russia. ... For the immediate future, [the ABM Treaty] does not hinder our development program. We currently intend and project integrated system testing that will be both fully effective and treaty compliant."
- "The Chiefs and I believe all [the] threats must be addressed consistent with a balanced judgment of risks and resources."

### Robert D. Walpole, CIA

***(Sept. 17, 1998, speech in Washington, D.C.)***

- "We do not expect countries to follow any specific pattern for missile development. In fact, the United States, the former Soviet Union, and China all took different approaches. ... Just because the United States, Russia, or China was able to accomplish certain feats certain ways in a specific period of time—short or long—does not mean another country will."
- "We recognize that foreign countries can hide many activities from us. These countries are generally increasing their security measures and are learning from each other and from open reporting of our capabilities."
- "Theater-range missiles already in hostile hands pose an immediate threat to US interests, military forces, and allies. The threat is increasing. More countries are acquiring ballistic missiles with ranges up to 1,000 kilometers and, more importantly, with ranges between 1,000 kilometers and 3,000 kilometers. ... This is not a hypothetical threat. It is a reality that has to be dealt with now."
- "Foreign assistance is fundamental to the growing theater missile threat. ... Iran received important foreign assistance in developing its Shahab 3 [Medium-Range Ballistic Missile]. Moreover, countries are seeking the capability to build these missiles independently of foreign suppliers. The growth in the sharing of technology among the aspiring missile powers is also of concern."
- "We judge that an unauthorized or accidental launch of a Russian or Chinese strategic missile is highly unlikely, as long as current security procedures and systems are in place. Russia employs an extensive array of technical and procedural safeguards and China keeps its missiles unfueled and without warheads mated."
- "Among those countries seeking longer-range missiles, we believe North Korea is the most advanced. Its Taepo Dong 2, which we judged will have a range between 4,000 and 6,000 kilometers, could reach mainland Alaska and the Hawaiian islands. ... We judge it unlikely, despite the extensive transfer of theater missile technology, that other countries ... will develop, produce, and deploy an ICBM capable of reaching any part of the United States over the next decade."
- "We identified several alternative scenarios for a country to acquire an ICBM capable of reaching the United States sooner than 2010. These include buying an ICBM or SLV [Space Launch Vehicle] to convert into an ICBM, or buying a complete production facility for either. We judge that the current policies of Russia and China make these scenarios unlikely, given potential political repercussions, the creation of a self-inflicted threat, and China's own military needs. Our report points out that we cannot be certain that this will remain true over the long term. Indeed, the further into the future we project the politico–economic environment, the less certain we would be that the 'value' of the sale would not outweigh these factors in foreign thinking."
- "A number of countries have the technological wherewithal to develop the capability to launch ... missiles from a forward-based platform, such as a surface ship. Forward-basing

from dedicated vessels or from freighters could pose a new threat to the United States in the near term—well before 2010."

■ "We could provide five years' warning before deployment that a potentially hostile country was trying to develop and deploy an ICBM capable of hitting the United States, unless that country purchased an ICBM or SLV; ... had an indigenous SLV; or purchased a turnkey production facility. We could not count on providing much warning of either the sale of an ICBM or the sale and conversion of [an] SLV. (Conversion could occur in as little as two years.)"

■ "The threat is real and growing. The MRBM threat to US interests in the world is already upon us. Missile forces of Russia and China pose a significant threat to the United States and this threat will continue to exist for the foreseeable future. Our reports also agree on North Korea's capabilities."

■ "There are plausible scenarios that could result in an increased missile threat to the United States for which there would be little or no warning."

■ "We are in basic agreement with the commission on North Korea. ... The commission considers Iraq to be behind North Korea and Iran relative to ballistic missile technology. We view Iraq as further along in some ways. Iraq was ahead of Iran before the Gulf War. They have not lost the technological expertise and creativity. If sanctions were lifted and they tried to develop indigenously a 9,000-kilometer-range ICBM to be able to reach the United States, it would take them several years. If they purchased an ICBM from North Korea or elsewhere, it would be quicker."

■ "The commission considers Iran to be as far along in its technological development efforts as North Korea. In our view, that is not the case. The recently tested Iranian Shahab 3 is based on the No Dong and followed North Korea's test, even with foreign assistance, by several years. Iran will likely continue to seek longer range missiles and would need to develop a 10,000-kilometer-range ICBM to be able to reach the United States. If they follow a pattern similar to the Shahab 3 time frame, it would take them many years. On the other hand, if they purchased an ICBM from North Korea or elsewhere, it would be quicker."

## Donald Rumsfeld

***(Sept. 24, 1998, Senate Armed Services Committee)***

■ "He [JCS Chairman Shelton] says we have had some different perspectives on likely development [of rogue nations' missiles] and associated warning times. ... We do. We differ from his assessment, which I understand from this letter is the [Joint] Chiefs' assessment."

■ "It says, 'After carefully considering the report, we remain confident that the Intelligence Community can provide the necessary warning of the indigenous development and deployment by a rogue state of an ICBM threat to the United States.' We don't disagree with that—that is to say, *if* there were such a thing as an *indigenous* development program, we probably would be able to track it and provide adequate warning. The problem with it is an indigenous development program doesn't exist. What is stated here is an illogical premise. It can proceed perfectly logically to an illogical conclusion. That's where that would take you."

■ "Next section ... says, ... 'The commission points out that, through unconventional, high-risk development programs and foreign assistance, rogue nations could acquire an ICBM capability in a short time and that the Intelligence Community may not detect it. We feel this is an unlikely development.' We do not view it as unlikely. We view it as a fact. It's all happened."

■ "First of all, an *'unconventional development program'* is what all those countries are doing. It's all unconventional. No country is going to do what we [the United States] did. We have totally different interests in accuracies and survivability. ... Second, *'high-risk development programs.'* They couldn't care less about safety. Naturally, it's high risk. To characterize it as high risk and imply that, therefore, it doesn't exist or isn't a threat, ... well, they're wrong. Next, it says *'and foreign assistance.'* Of course there is foreign assistance. It's going on. It's happening every day. It's happening as we sit here."

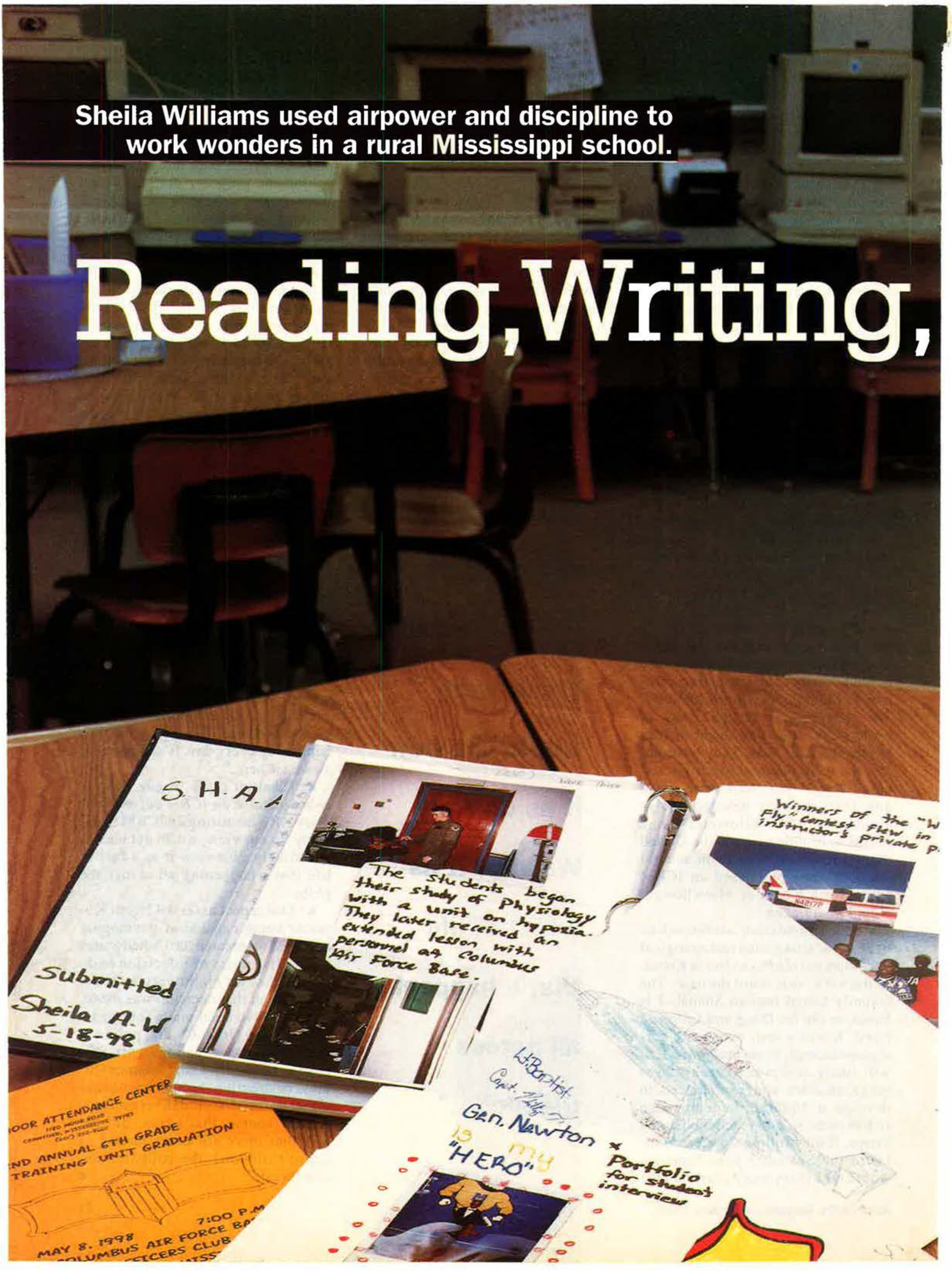
■ "[Shelton says] *'rogue nations could acquire an ICBM capability.'* They ARE acquiring an ICBM capability. In our view, we do not view it as unlikely. We view it as a fact of life that's happening all across the globe."

■ "Our report assessed North Korea as being capable of developing an ICBM to threaten the United States within five years of a decision to do so and that we might very well not know when that decision was made. It could have been made four years ago. ... They [Joint Chiefs] point out that these rogue nations currently pose a threat by using weapons of mass destruction through unconventional terrorist-style delivery means. And of course, that's true. But the fact that there are other threats ... doesn't diminish the ballistic missile threat." ■

**"They ARE acquiring an ICBM capability. In our view, we do not view it as unlikely. We view it as a fact of life that's happening all across the globe."**

**Sheila Williams used airpower and discipline to work wonders in a rural Mississippi school.**

# Reading, Writing,



# and Aerospace

By Stewart M. Powell

TIQUITA Wilson, a promising sixth-grader at a troubled elementary school in an impoverished corner of rural Mississippi, used to scoff whenever her teacher raised the possibility that she might be well-suited to a career in aviation. The teacher, Sheila A. Williams, raised this topic often—and not just with Tiquita.

Like so many of the nearly 500 students at B.L. Moor Attendance Center in Crawford, Miss., Tiquita just never gave the idea much thought. The dream of flight seemed pretty far out of reach for someone attending a resource-starved school in an isolated town surrounded by cotton fields, a school in which most students had never even seen the inside of an airplane.

Air Force pilots operating chunky T-37 and sleek T-38 trainers from Columbus AFB, Miss., near the Alabama border might fly overhead once in a while. Townsfolk might spot USAF personnel in their uniforms if they ventured some 30 minutes up the narrow country road to Columbus, where training operations have been under way since 1941. Other than that, there was no contact.

"It's a very rural area," said Williams, "and the students do not have access to things that most of us would take for granted."

But Sheila Williams—the Aerospace Education Foundation's outstanding teacher for 1998—is a contagiously enthusiastic educator who had a childhood longing for a career in aviation but found her first love was working with kids in classrooms. She set a challenge before Tiquita, who took it up.

She was challenged to participate in a demanding nine-week, classroom-based "pilot training" program for students. Created by Williams, the course blended a no-nonsense, boot-camp atmosphere with study of aviation to spark students' interest in math, science, history, and social studies.

## Winning Her Wings

Tiquita Wilson did not only take up the challenge; she triumphed. She won her "wings" in the exacting program and also emerged as the "Top Gun," edging out classmates with her higher grade point average and better performance in the personal pilot interview—sessions conducted in many cases by active duty Air Force personnel.


***Aerospace Education Foundation's Teacher of the Year, Sheila Williams, in her flight suit. Over the years, she transformed her youthful interest in aviation into a one-woman crusade that has brought benefits to every student in her classes.***

On the mock "assignment day" staged by Williams for each student aviator, Tiquita chose one of the most demanding aircraft of all—the F-117A stealth fighter aircraft.

"I'd been encouraging her all along the way," Williams recalled. "I'd tell her, 'You need to be an aviator.' " Tiquita always shied away, replying: "No way."

It took a spin in the civilian Cessna of Air Force Capt. Frank DuCharme, a member of the 37th Flying Training Squadron at nearby Columbus AFB, to change Tiquita's mind. Williams had arranged with DuCharme to give her top four students their first flight.

"When she landed and got off that plane that day, I asked her, 'Do you still feel the same way about flying?' " Williams recalled.

"No," Tiquita replied. "I want to fly."

"She had blossomed," Williams said. "That really touched my heart."

Williams has transformed her own youthful interest in aviation into a one-woman crusade that has benefited almost every student who has passed through her classroom door in the last six years.

"I wanted to be an aviator—the first female in my family to fly," recalled the 34-year-old dynamo, "but coming from a family of teachers, that was a field my family wanted me to follow. My eyesight wasn't that wonderful either by the time I hit the 11th grade, so I realized that being a pilot was not an option."

Williams attended Mississippi State University and then transferred to the University of Mississippi to graduate in 1986. She attended graduate programs at both the University of Mississippi and Mississippi State University before embarking on a full-time teaching career.

She won successive permission from school administrators in Columbus; Fayetteville, N.C.; Crawford; and now back in Columbus, to create a military-style atmosphere in her classrooms. The program provides hard-pressed students a structure, code of conduct, and predictable series of rewards that has helped many avoid waywardness.

Williams happened upon the idea while serving as a fifth-grade teacher in the early 1990s at New Hope Elementary School, in Columbus. Williams' students were studying flight.

"I called Columbus AFB and asked if they could send over a pilot," Williams recalled. "The pilot came; he talked; the next day my kids were motivated. So I said to myself, 'Why not integrate this into my classroom?' "

Williams turned to the Federal Aviation Administration for help developing an aviation-oriented, real-world curriculum that would satisfy the grade-level requirements of the school districts.

Williams devoted classes to Charles A. Lindbergh, the first pilot to fly solo nonstop across the Atlantic; Amelia Earhart, the aviatrix lost over the Pacific in 1937 while trying to fly around the Earth at the equator; and Chuck Yeager, the Air Force test pilot who in 1947 first broke the sound barrier.

## Spotlight on Heroes

With her classes made up of mostly African–American students, Williams delved into aviation lore to spotlight contributions by black aviators who also had helped America become the premier aviation nation in the 20th century.

In customary fashion, Williams peppered her students with examples of blacks who triumphed in aviation. Eugene J. Bullard, an early aviation pioneer, traveled to France to join the French air corps in order to fly combat missions in World War I. The highly decorated African–American aviator became known to his French comrades as the "Black Swallow of Death." The students also learned about Bessie Coleman, the first African–American licensed to fly in the United States.

"Many of my kids didn't even know that black people were allowed to fly airplanes when they started my program," Williams said. "I want my students to know that aviation isn't a black thing or a white thing—it's for everybody."

Williams' approach was well under way by the time she transferred from Columbus to a teaching job as a seventh-grade teacher at South View Middle School in Fayetteville, N.C., in 1994.

With typical gusto, Williams suggested to the school principal, Jim Surles, that she implement her pilot training with the school's 150 seventh-graders. The school operated with the motto, "Making a difference, one child at a time."

"Do you think you can get 150

seventh-graders to march, salute, and walk down the hallway in a line?" Surles asked.

"Sir, I'd really like to try," Williams replied.

"Go for it," Surles said.

Of the 150 students in the seventh-grade program that year, 123 went through Williams' program to earn pilot wings. Williams' efforts won the praises of her new principal, who recommended her for teacher of the year. Williams was a "conspicuously dedicated" educator, Surles wrote, adding, "She is a student advocate who will go beyond the responsibilities of teaching to assure success for her students."

It wasn't long after that that Williams got a call from home—from her mother, Lillian Thomas, now 61, a career educator who was serving as principal of B.L. Moor Attendance Center in Crawford. Thomas' school served a community without stores that was huddled around a post office and a classroom-sized library. Families were broken. Incomes were irregular. Dreams were a luxury few could afford. Many students came from single-parent families. Student test scores were so dismal that state authorities were on the verge of taking control.

### "I Need Someone"

"The disciplinary problems were so bad that my mother had already lost two of her teachers when she called me in the middle of the school year," Williams said.

"I need someone to get this under control," Thomas told her daughter.

"I said, 'Okay, Mom, I'm on my way,' " Williams recalled.

Williams launched her pioneering program in earnest. She insisted parents get involved, by sending her students home with a contract that had to be signed by parents and students alike, stipulating that if the student failed to complete course work, they would not earn their wings.

Williams required students to wear jumpsuit-style uniforms. Salutes became standard. She took the rank of major; her students were lieutenants. Her students learned cadences and close order drill, albeit the amateur version.

Williams imposed a scaled down version of the armed forces' dreaded PT. As punishment for infractions, she used push-ups rather than the paddling that is still permitted in Mississippi public schools.

"We got smoked this week because people were acting up in the lunchroom," the students wrote in their graduation class book at the end of Williams' course. "We spent a long time doing exercises we had never heard of. We never wanted to get smoked again."

Williams decided that nothing was out of reach for her kids. She challenged them to learn 101 words in the aviation glossary provided by the FAA, from "aerodynamics" to "zoom."

"Some educators said, 'They can't even spell 'school'; how do you expect them to spell 'aerodynamics'?" Williams said. "These kids had been told for most of their lives that their test scores were so low that they couldn't achieve anything."

Williams continued: "Well, you know what I told my kids? 'You have to spell 101 terms and you have no choice.' I just didn't give them the option to fail."

Williams used every inspirational trick in the book. A banner stretched across the blackboard at the front of the classroom, declaring: "Attitudes are contagious. Is yours worth catching?"

Williams brought in well-paid commercial pilots, like Northwest Airlines 1st Officer Jill McCarthy, to address her class.

Williams made arrangements for her students to attend pilot graduation ceremonies at Columbus AFB one month into her program. None of her students had ever visited the air base just 30 minutes away.

"I wanted my kids to feel what a graduation ceremony was like," Williams said.

### Shakedown

She had her students carry out community service as a unit. They picked up litter around the school weekly for a semester. Her class sponsored an anti-drug program dubbed "Shakedown" for students from kindergarten through 12th grade. The "pilots" presented a drug-free rap and performed drill and ceremony.

*Got a letter in the mail.*
*Do drugs and you go to jail.*
*It'll be so long*
*Till you get on back home.*

Williams created a cadre of second-year participants, making them "instructor pilots" if they maintained a spotless disciplinary record and an 85 average—well above the C average required of her other students. Her instructor pilots made a presentation and won the hearts of local community leaders, who quickly donated $250 to the program.

"My students are learning that people out there care about them," Williams said. "And now they know there's another world out there to explore."

Her students, gaining pride and a sense of accomplishment in a school system where both had been hard to find, gave Williams' program a


***Many doubted that the children were up to the task she set, but "I just didn't give them the option to fail," said Sheila Williams. She required students to wear jumpsuit-style uniforms and salutes became standard.***

*Sheila Williams, center, with her mother, Lillian Thomas, and friend Lottie Ware. Thomas persuaded her daughter to go into "the family business" and pursue a career in education.*

distinctive name: SHAKER—Student Helper Aviators Keeping Everything Right.

Williams steeled her students against criticism and teenage temptations by instilling "unit" pride.

"A lot of the things my students had to do made the other kids laugh," Williams recalled. In the school cafeteria, for example, her students had to stand at attention in chow formation, chant, "Ready to eat," and wait until "Major" Williams got her tray before sitting down to eat lunch.

"They don't know it yet but they are learning to take pride and to resist peer pressure," said Williams.

Williams credits many for her success. Sherry Medders, a civilian public affairs officer at Columbus, helped her forge her initial ties with the sprawling air base. Medders, who has since transferred, helped Williams track down Air Force pilots at the base who would be willing to serve as "flight buddies" with the students, corresponding and coming out to the school to help in the classroom.

Capt. Gil Williams, a T-37 instructor at Columbus AFB, taught flight plans to the class and never forgot it. "When I come out here, I feel like a big brother coming home from college," the pilot said.

Still the founder of the program had to work hard to stay one step ahead of her inquisitive students. She had never flown an aircraft before launching her students on the aviation adventure of their lives.

Air Force Capt. Robert Ivy offered to fix that.

Ivy arranged for Williams to spend an entire day with pilots at the air base. She flew in a flight simulator. She went through pilot briefings. She did everything except actually fly an airplane.

Williams' aviation studies proved to be "a good motivational tool" for her students, said Ivy, who has since left the Air Force to fly for Delta Airlines. "It teaches kids that you have to work hard for what you get."

## That'll Teach Her

When her students challenged her credentials to conduct a military-style program without ever having served in the armed forces, Williams transformed their challenge into her classroom incentive.

"If everybody in the classroom gets promoted to seventh grade," Williams told her sixth-graders in 1997, "I'll join the Army."

They did; and she did. One sixth-grade student who had been held back three times finally passed sixth grade.

"They all just wanted to see me suffer," Williams recalled, laughing. "They all passed and I enlisted."

Williams completed the grueling nine-week basic training course in the Army National Guard at Ft. Jackson, S.C. She returned to school in August 1997 just four days before the start of the school year.

She kept her sense of humor throughout. An instructor sergeant at grenade training saw Williams, twice the age of the rest of his trainees, and demanded, "My God, how old are you?"

Williams replied: "Sergeant, don't you know you should never ask a woman holding grenades how old you are?"

Williams cherishes the experience. "I came back to school with hands-on experience," Williams recalled. "I'd say, 'Don't mess with me.' And they wouldn't."

Her students flourished. Courtney Kemp, 13, came away from her year with Williams convinced that she could fulfill her dreams. "I know now that whatever I want to do in life can come true if I set goals, learn the skills, and study hard," Kemp said.

Jermaine Spencer, who turned 13 in October, said he liked being in Williams' pilot training because "it lets you see how it feels to be in a real military."

Attia Watt submitted a book report during her studies with Williams that examined the book *Wright Brothers at Kitty Hawk* by Donald J. Sobol. Watt not only praised the book, she illustrated the Wright brothers' historic first flight in 1903 with a drawing that featured Wilbur shouting, "Hey, Orville. Come on, let's get the plane started, man!"

"OK, man!" replies Orville, standing in the doorway of the shed the brothers used to house their aircraft.

Williams capped her program with an overnight survival course that included a 10-mile road march. She also staged a three-day field trip to Ft. Rucker, Ala., the 63,000-acre home of Army helicopter aviation. She kept her students busy on the eight-hour bus trip, reading maps, estimating mileage, and doing drill and ceremony routines at rest stops. The students toured Rucker, met helicopter pilots, and spent the night, much to their delight, billeted on the base.

They went on the next day to visit Tuskegee University, where they toured the George Washington Carver Museum and Booker T. Washington's former residence. On the way home, they stopped in Montgomery, Ala., the hotbed of civil rights activities in the 1960s, where they got a break with a "shop op" at a mall, ice skating, and laser tag before returning to Crawford.

## A Family Tradition

Williams credits much of her suc-

cess in the classroom to her religious faith and her family. Her mother helped persuade her to follow in "the family business" and pursue a career in education.

Her father, James T. Thomas, played professional football as a running back with the National Football League's Dallas Cowboys and Los Angeles Rams as well as the Canadian Football League's Edmonton Eskimos before suffering a career-ending injury. Thomas coached football at the University of Mississippi and served as head coach at Mississippi Valley State, recruiting NFL star Jerry Rice.

Williams' brother, Darryl, with whom Sheila shared her childhood dreams of flight, played football for the University of Mississippi before taking up coaching. He now serves as head football coach at B.L. Moor. Her youngest brother, James Terryl, is a Navy lieutenant, stationed in Japan.

Williams' two children, Phillip, 13, and Kristin, 9, continue the family tradition. Her son gave a hint of his mother's determination in an autobiographical essay he wrote when he participated in her pilot program at school.

Phillip, vowing a career in aviation, declared: "Daring careers have always been a way of life in my family."

Williams left B.L. Moor Attendance Center in 1998 to take up teaching duties at West Lowndes Middle School, back in Columbus, where her teaching career began. Once again, the newcomer stirred things up. School administrators asked her shortly after her arrival to provide her classroom discipline plan.

"There's no paddling in your plan," officials told Williams.

"That's because I don't paddle," Williams replied. Other teachers on the faculty looked at her skeptically.

"What do you do?" they inquired.

"My students do push-ups or they jog around the building a couple of times," Williams continued.

"If you think you can make it through the year without paddling, I'll be surprised," one colleague told Williams.

"I have yet to paddle my kids," Williams said, well into the school year. "But they're getting in shape!"

At Lowndes, Williams modified her program to reach 88 students in the sixth, seventh, and eighth grades. She and her faculty colleagues are carrying out the effort through a school-hours club that met every Tuesday in the fall and will meet daily in the second half of the year. "The kids are going to learn everything, but it's going to be more

## The 101 Terms They Had to Know

Sheila Williams challenged each student to learn 101 terms contained in "An Elementary Aviation Glossary," prepared by the FAA. She told them, "You have no choice."

**Aerodynamics:** Study of the forces of air acting on objects in motion relative to air.
**Aileron:** Control surfaces hinged at the back of the wings which by deflecting up or down help to bank the airplane.
**Air:** A mixture of gases making up the atmosphere which surrounds the Earth.
**Airfoil:** A streamlined surface designed in such a way that air flowing around it produces useful motion.
**Airplane:** A mechanically driven, fixed-wing, heavier-than-air craft.
**Airport:** A tract of land or water for the landing and takeoff of aircraft. Facilities for shelter, supply, and repair are usually found there.
**Airspeed:** Speed of the aircraft relative to the air through which it is moving.
**Airway:** An air route marked by aids to air navigation, such as beacons, radio ranges, and direction-finding equipment, and along which airports are located.
**Altimeter:** An instrument for measuring in feet the height of the airplane above sea level.
**Altitude:** The vertical distance from a given level (sea level) to an aircraft in flight.
**Amphibian plane:** An airplane that can land on both land and water.
**Anemometer:** Instrument to measure speed of wind.
**Ascend:** Climb.
**Atmosphere:** Blanket of air surrounding the Earth.
**Attitude:** Position of the airplane relative to the horizon, i.e., a climbing attitude, straight-and-level attitude, etc.
**Aviation:** A term applied to all phases of the manufacture and operation of aircraft.
**Bank:** A flight maneuver in which one wing points toward the ground and the other to the sky.
**Barometer:** An instrument to measure pressure of the atmosphere.
**Beacon:** A light or other signal indicating direction.
**Ceiling:** Height above ground of cloud bases.
**Chart:** An aeronautical map showing information of use to the pilot in going from one place to another.
**Cirrus:** Type of high, thin cloud.
**Cockpit:** The portion of the inside of the airplane occupied by the person(s) operating the airplane and containing the instruments and controls.
**Compass:** An instrument indicating direction.
**Contact:** Switching on the ignition of an aircraft engine. "Contact" is the word of warning that someone is about to turn on the ignition.
**Control tower:** A glassed-in observation tower on the airport from which control tower operators observe and direct airport air and ground traffic.
**Course:** The direction over the Earth's surface that an airplane is intended to travel.
**Crosswind:** Wind blowing from the side, not coinciding with the path of flight.
**Cumulus:** Type of cloud formed in puffs or dome shaped.
**Current:** Stream of air; also, up-to-date.
**Dead stick landing:** Landing made without the engine operating.
**Degree:** Percent of a circle or percent of a right angle.
**Dive:** A steep angle of descent.
**Drift:** Deviation from a course caused by crosswise currents of air.
**Elevation:** The height above sea level of a given land prominence, such as airports, mountains, etc.
**Elevators:** Control surfaces hinged to the horizontal stabilizer which control the pitch of the airplane or the position of the nose of the airplane relative to the horizon.

**Engine:** The part of the airplane which provides power, or propulsion, to pull the airplane through the air.
**Fin:** A vertical attachment to the tail of an aircraft which provides directional stability. Same as vertical stabilizer.
**Flaps:** Hinged or pivoted airfoils forming part of the trailing edge of the wing and used to increase lift at reduced airspeeds.
**Flight plan:** A formal, written plan of flight showing route, time en route, points of departure and destination, and other pertinent information.
**Force:** A push or pull exerted on an object.
**Freight:** Cargo.
**Front (weather):** Boundary of two overlapping air masses. When cold air is advancing on warm air, it is said to be a cold front; warm air advancing on cooler air is a warm front.
**Fuselage:** The streamlined body of an airplane to which are fastened the wings and tail.
**Gear:** The understructure of an airplane which supports the airplane on land or water; wheels, skis, or pontoons. Retractable gear folds up into the airplane in flight. Gear that does not retract is called "fixed."
**Glide:** A motion of the airplane where the airplane descends at an angle to the Earth's surface.
**Glider:** A fixed-wing, heavier-than-air craft having no engine.
**Gravity:** Force toward the center of the Earth.
**Hail:** Lumps or balls of ice falling to the Earth out of thunderstorms.
**Hangar:** Building on the airport in which airplanes are stored or sheltered.
**Hazard:** Obstructions or objects or threats to the safety of the passenger and aircraft.
**High pressure area:** Mass of air characterized by high barometric pressure.
**Horizontal:** Parallel to the horizon.
**Humidity:** Amount of invisible moisture in a given mass of air.
**Instruments:** Dials or gauges by which information about the flight, airplane, or engine is relayed to the pilot. When the pilot flies the airplane solely by reference to the gauges, he is said to be flying "on instruments."
**Knot:** A measure of speed, one knot being one nautical mile per hour.
**Land:** The act of making the airplane descend, lose flying speed, and make contact with the ground or water, thus ending the flight.
**Landing pattern:** A set, rectangular path around the airport which airplanes follow to land.
**Lift:** An upward force caused by the rush of air over the wings, supporting the airplane in flight.
**Low pressure area:** Mass of air having low atmospheric pressure.
**Meteorology:** The scientific study of the atmosphere.
**Moisture:** Water in some form in the atmosphere.
**Monoplane:** An airplane having one set of wings.
**Multiengine:** Having more than one engine.
**Parachute:** A fabric device attached to objects or persons, to reduce the speed of descent.
**Pedals:** Foot controls in the cockpit by which the pilot controls the action of the rudder.
**Pilot:** Person who controls the airplane.
**Precipitation:** Any falling visible moisture; rain, snow, sleet, or hail.
**Pressure:** Force in terms of force per unit area.
**Propeller:** An airfoil which the engine turns to provide the thrust, pulling the airplane through the air.
**Radar:** Beamed radio waves for detecting and locating objects. The objects are "seen" on the radar screen or scope.
**Ramp:** Area outside of airport buildings where airplanes are parked to be serviced or to pick up and discharge passengers and cargo.
**Rudder:** Control surface hinged to the back of the vertical fin.
**Runway:** A surface or area on the airport designated for airplanes to take off and land.
**Seat belt:** Belts attached to the seat which fasten around the pilot and passengers to hold them firmly in their seats in bouncy air and during takeoffs and landings.
**Seaplane:** An airplane that operates from water.
**Slipstream:** Current of air driven back by the propeller.
**Stabilizer:** Horizontal surface which stabilizes the airplane around its lateral axis.
**Stall:** The reduction of speed to the point where the wing stops producing lift.
**Stationary:** Something that does not move is said to be stationary. A front along which one air mass does not replace another.
**Stratus:** Layered clouds.
**Streamline:** An object shaped to make air flow smoothly around it.
**Tachometer:** Instrument which measures the speed at which the engine crankshaft is turning, hence the propeller speed in rpm (rounds per minute).
**Tail:** The part of the airplane to which the rudder and elevators are attached. The tail has vertical and horizontal stabilizers to keep the airplane from turning about its lateral axis.
**Takeoff:** The part of the flight during which the airplane gains flying speed and becomes airborne.
**Terminal:** Building on the airport where people board airplanes, buy tickets, and have their luggage handled. Flight services are frequently located at the air terminal.
**Thrust:** Forward force.
**Transmitter:** Microphone, or part of the radio that sends the message.
**Tricycle landing gear:** Airplane's landing wheels, two under the wings and one under the nose.
**Turbulence:** Irregular motion of air; uneven currents of air.
**Turn:** Maneuver which the airplane makes in changing its direction of flight.
**Updraft:** Vertical currents of air.
**Velocity:** Speed.
**Vertical:** Ninety degrees from the horizon.
**Visibility:** Distance toward the horizon that objects can be seen and recognized. Smoke, haze, fog, and precipitation can hinder visibility.
**Vortex:** A circular, whirling movement of air forming a space in the center, toward which anything caught in the vortex tends to move.
**Weather:** Condition of the atmosphere at a given time with respect to air motion, moisture, temperature, and air pressure.
**Wind:** Air in motion, important to aviation because it influences flight to a certain degree.
**Wind sock:** A cone-shaped, open-ended cylinder of cloth to catch the wind and show its direction.
**Wings:** Parts of the airplane shaped like airfoils and designed in such a way to provide lift when air flows over them.
**Zoom:** The climb for a short time at an angle greater than the normal climbing angle, the airplane being carried upward at the expense of airspeed.

demanding because I don't have them in class every day."

### Talking With T-Birds

Williams got the kids invited to a VIP exhibition at Columbus AFB by the Air Force's demonstration flight team, known as the Thunderbirds. The 78 students who took part that day got the autographs and personal attention of the pilots.

"I'm already making progress," Williams said proudly. "One of my kids says, 'I'm going Air Force.' These are nontraditional students who never looked at aviation as a possible career. They just never thought about it."

If history is any guide, Williams' commitment and her enthusiasm promise to pay dividends for her new students just as much as they benefited her class last year in Crawford. Williams gave as much attention to honoring her students' accomplishments with a memorable graduation as she had given to preparing their program.

She arranged with Columbus AFB to use the Officers' Club as the site for her students' graduation May 8, 1998. Starkville Mayor Mack Ruthledge and School Superintendent Walter Conley gave awards to the students.

Sinbad, the well-known comedian and actor, wrote, "Each and every one of you represent the future. ... Success is out there. It is up to you all to make it happen."

Senate Majority Leader Trent Lott (R–Miss.) wrote the graduates to say that he hoped Williams' program "sparks many careers in aviation or the functions that relate to flying."

Rep. Charles W. "Chip" Pickering Jr. (R), the local member of Congress, congratulated Williams and her students upon graduation, adding: "This achievement is a tribute to your outstanding leadership."

Even President Clinton wrote from afar. "Young people like you represent the future of our country," Clinton's letter said. "I hope that you will continue to work hard in school, help out in your community, and pursue your education to prepare for the challenges ahead. You can make a real contribution if you always do your best."

***Kinetic education: Some of Sheila Williams' pupils study Newton's third law of motion—"For every action, there is always opposed an equal reaction."***

Each graduate received a certificate of achievement.

Williams crowned the ceremony with an address by an African–American hero—Gen. Lloyd W. "Fig" Newton, commander of Air Education and Training Command, headquartered at Randolph AFB, Texas. Newton, who overseas 13 bases, 43,000 active duty forces, and 14,000 civilians, accepted Williams' invitation as soon as it hit his office door.

### "Fig Facts"

True to fashion, Williams seized upon Newton's visit to give her students just one last challenge before graduation, insisting they learn "Fig Facts" about the visiting general. Her students scored well on a test that questioned them about Newton's distinguished career, including his 4,000 flying hours, his 269 combat missions from Da Nang AB, South Vietnam, including 79 missions over North Vietnam, and his service with the Thunderbirds.

"We're talking about tomorrow's leaders, here; we're talking about tomorrow's United States capabilities here," the four-star officer told the students and guests at the graduation ceremony. "Don't be afraid of tomorrow," Newton continued. "It is what you learn today that will allow you to walk through the door to tomorrow."

Williams' work came to the attention of the Air Force Association's Golden Triangle Chapter in Mississippi. It selected Williams in June as a candidate for AFA's Christa McAuliffe award, given each year to an outstanding teacher in honor of the New Hampshire schoolteacher who died in the explosion of space shuttle *Challenger* in 1986.

Billy M. Boyd, AFA state president for Mississippi, wrote to the national organization that Williams had surmounted every conceivable obstacle to forever widen the horizons of her students.

"If we had more energetic, dedicated teachers like Williams in our classrooms, we would not have to worry about the future of our children, our Air Force, or our nation," Boyd declared.

AFA's affiliate, the Aerospace Education Foundation, awarded Williams the national award on Sept. 13, 1998, at a ceremony in Arlington, Va.

"I did it all for my kids," Williams explained. "As a classroom teacher you're always trying to motivate your kids. I'm reaching out to touch the lives of my kids and shaping their future. I'm still getting my aviation in there, too. I'm happy." ■

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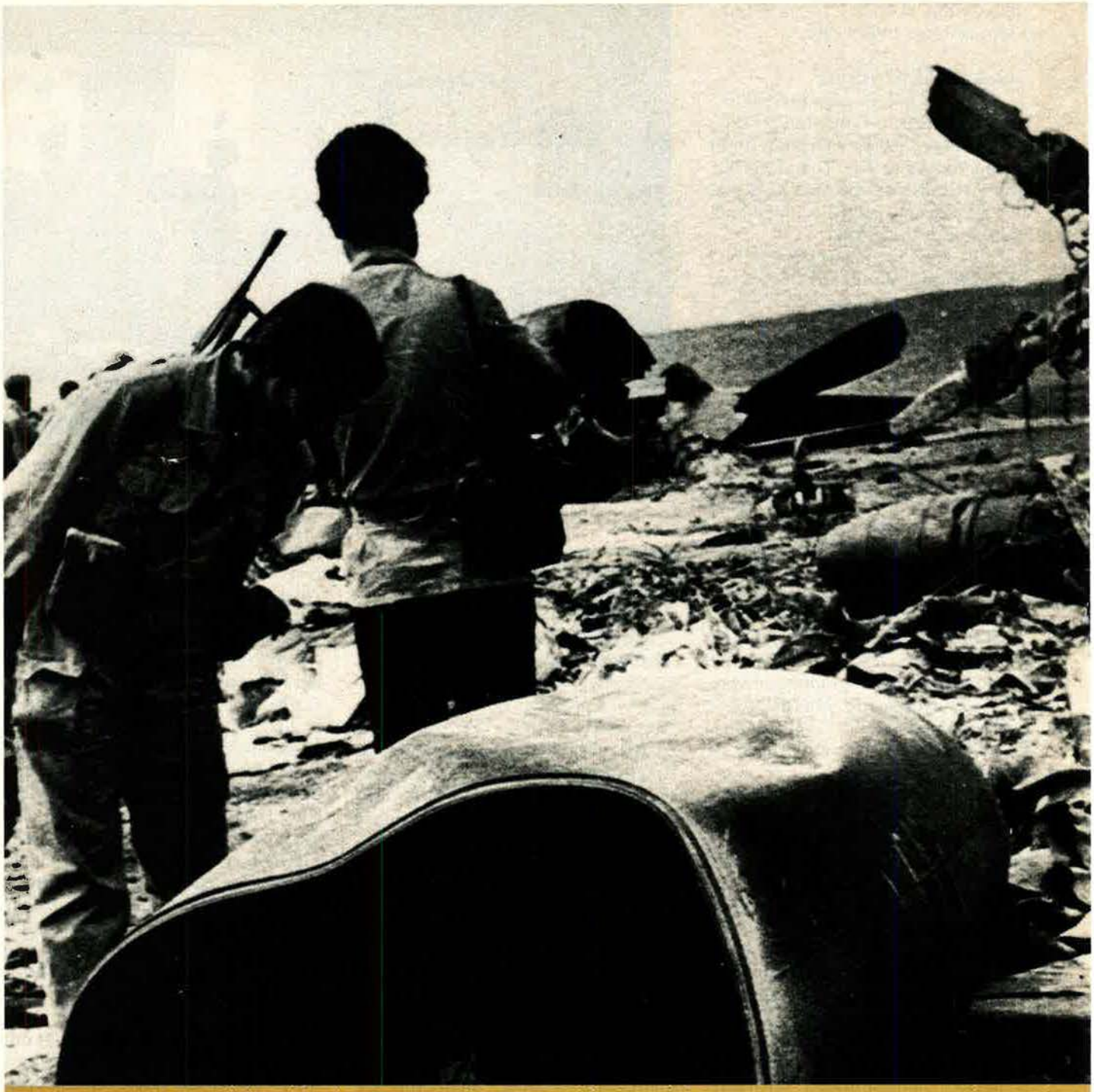
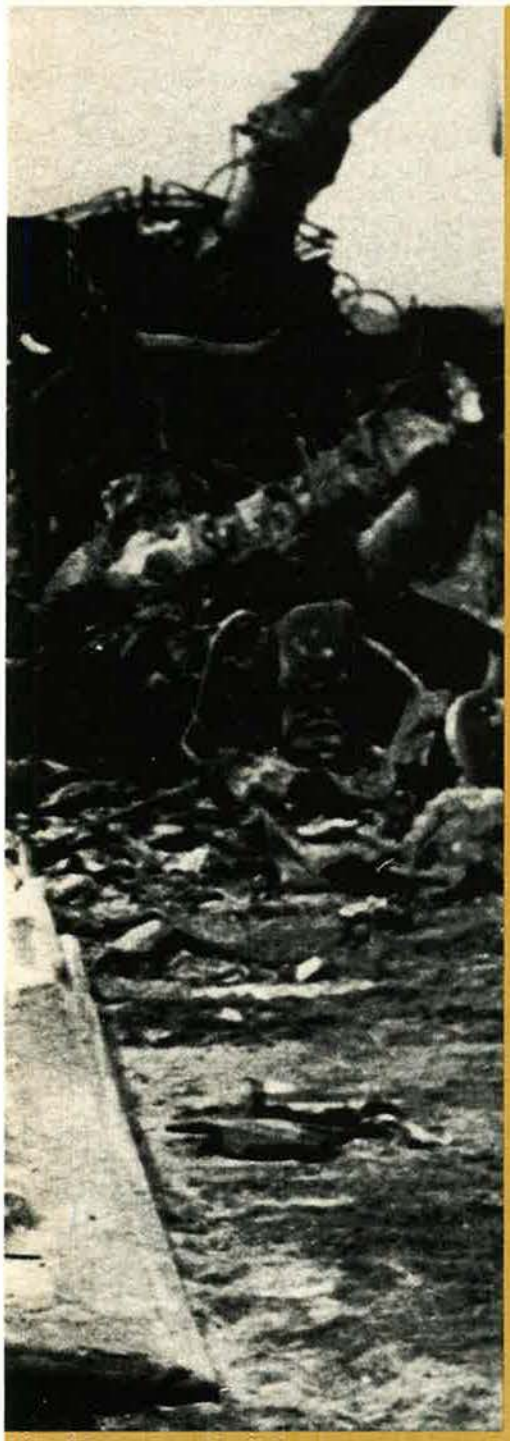
*Stewart M. Powell, White House correspondent for Hearst Newspapers, has covered national and international affairs for 28 years, based in the United States and abroad. His most recent article for* Air Force *Magazine, "The Berlin Airlift," appeared in the June 1998 issue.*



Wide World Photo

**The mission was to rescue the hostages held in Iran, but it ended in disaster.**

# Desert



*Iranian soldiers survey the wreckage of the aborted US military attempt to rescue hostages in the US Embassy in Tehran. Eight American servicemen died in a disastrous accident as the rescue forces pulled back from the mission.*

# One

**By Otto Kreisher**

For some, the current political debate over the combat readiness of today's American military stirs memories of a long-ago event that, more than anything else, came to symbolize the disastrously "hollow" forces of the post–Vietnam era.

It began in the evening of April 24, 1980, when a supposedly elite US military force launched a bold but doomed attempt to rescue their fellow American citizens and their nation's honor from captivity in Tehran. In the early hours of April 25, the effort ended in fiery disaster at a remote spot in Iran known ever after as Desert One.

This failed attempt to rescue 53 hostages from the US Embassy in Tehran resulted in the death of five US Air Force men and three Marines, serious injuries to five other troops, and the loss of eight aircraft. That failure would haunt the US military for years and would torment some of the key participants for the rest of their lives.

One, Air Force Col. James Kyle, called it, "The most colossal episode of hope, despair, and tragedy I had experienced in nearly three decades of military service."

The countdown to this tragedy opened exactly 20 years ago, in January 1979. A popular uprising in Iran forced the sudden abdication and flight into exile of Shah Mohammed Reza Pahlavi, the longtime ruler of Iran and staunch US ally. Brought

Photo via D.M. Giangreco

*This secretly taken photo shows how Iranian troops blanketed the streets, making it difficult for the US to obtain intelligence. The CIA's spy network had been dismantled, one of many problems facing the rescue planners.*

to power in the wake of this event was a government led, in name, by Shahpur Bakhtiar and Abolhassan Bani Sadr. Within months, they, too, had been shoved aside, replaced by fundamentalist Shiite Muslim clerics led by Ayatollah Ruhollah Khomeini.

On Nov. 4, two weeks after President Jimmy Carter had allowed the shah to enter the US for medical care, 3,000 Iranian "student" radicals invaded the US Embassy in Tehran, taking 66 Americans hostage. Chief of Mission L. Bruce Laingen and two aides were held separately at the Iranian Foreign Ministry.

The students demanded that the shah be returned for trial. Khomeini's supporters blocked all efforts to free the hostages.

Thirteen black and female hostages would be released later as a "humanitarian" gesture, but the humiliating captivity for the others would drag on for 14 months.

## Rice Bowl

Carter, facing a re-election battle in 1980, strongly favored a diplomatic solution, but his national security advisor, Zbignew Brzezinski, directed the Pentagon to begin planning for a rescue mission or retaliatory strikes in case the hostages were harmed. In response, the Chairman of the Joint Chiefs of Staff, Air Force Gen. David C. Jones, established a small, secretive planning group, dubbed "Rice Bowl," to study American options for a rescue effort.

It quickly became clear how difficult that would be.

The first obstacle was the location. Tehran was isolated, surrounded by more than 700 miles of desert and mountains in any direction. This cut the city off from ready attack by US air or naval forces. Moreover, the embassy was in the heart of the city congested by more than four million people.

A bigger hurdle, however, was the condition of the US military, which had plummeted in size and quality in the seven years since it had staged a near-total withdrawal from Vietnam. Among the casualties of the post–Vietnam cutbacks was the once-powerful array of Army and Air Force special operations forces that had performed feats of great bravery and military skill in Southeast Asia.

The one exception was an elite unit of soldiers recently formed to counter the danger of international terror. This unit, called Delta Force, was commanded by Army Col. Charles Beckwith, a combat-tested special forces officer. Delta, which had just been certified as operational after conducting a hostage rescue exercise, was directed to start planning for the real thing at the Tehran embassy.

The immediate question was how to get Delta close enough to do its job. Directing the planners who were trying to solve that riddle was Army Maj. Gen. James Vaught, a veteran of three wars, with Ranger and airborne experience but no exposure to special operations or multiservice missions. Because of the need for extreme secrecy, he was denied the use of an existing JCS or service organization. Vaught had to assemble his planning team and the joint task force that would conduct the mission from widely scattered sources.

One of the early selections was Kyle, a highly regarded veteran of air commando operations in Vietnam, who would help plan the air mission and would be on-scene commander at Desert One.

When Beckwith ruled out a parachute drop, helicopters became the best option for reaching Tehran, despite the doubts Beckwith and other Vietnam veterans had about their reliability. Navy RH-53D Sea Stallions, which were used as airborne minesweepers, were chosen because of their superior range and load-carrying capability and their ability to operate from an aircraft carrier.

Even the Navy Sea Stallions could not fly from the Indian Ocean to Tehran without refueling. After testing and rejecting alternatives, the task force opted to use Air Force EC-130 Hercules transports rigged with temporary 18,000-gallon fuel bladders to refuel the helicopters on their way to Tehran.

## Finding the Spot

However, that decision led to the requirement of finding a spot in the Iranian desert where the refueling could take place on the ground. That required terrain that would support the weight of the gas-bloated Hercules.

US intelligence found and explored just such a location, about 200 miles southeast of Tehran. In planning and training, this site was known as Desert One.

Because the RH-53s were Navy aircraft, the Pentagon assigned Navy pilots to fly them and added Marine copilots to provide experience with land assault missions.

That combination soon proved unworkable, as many of the Navy's pilots were unable or unwilling to master the unfamiliar and difficult tasks of long-range, low-level flying over land, at night, using primitive night vision goggles.

In December, most of the Navy

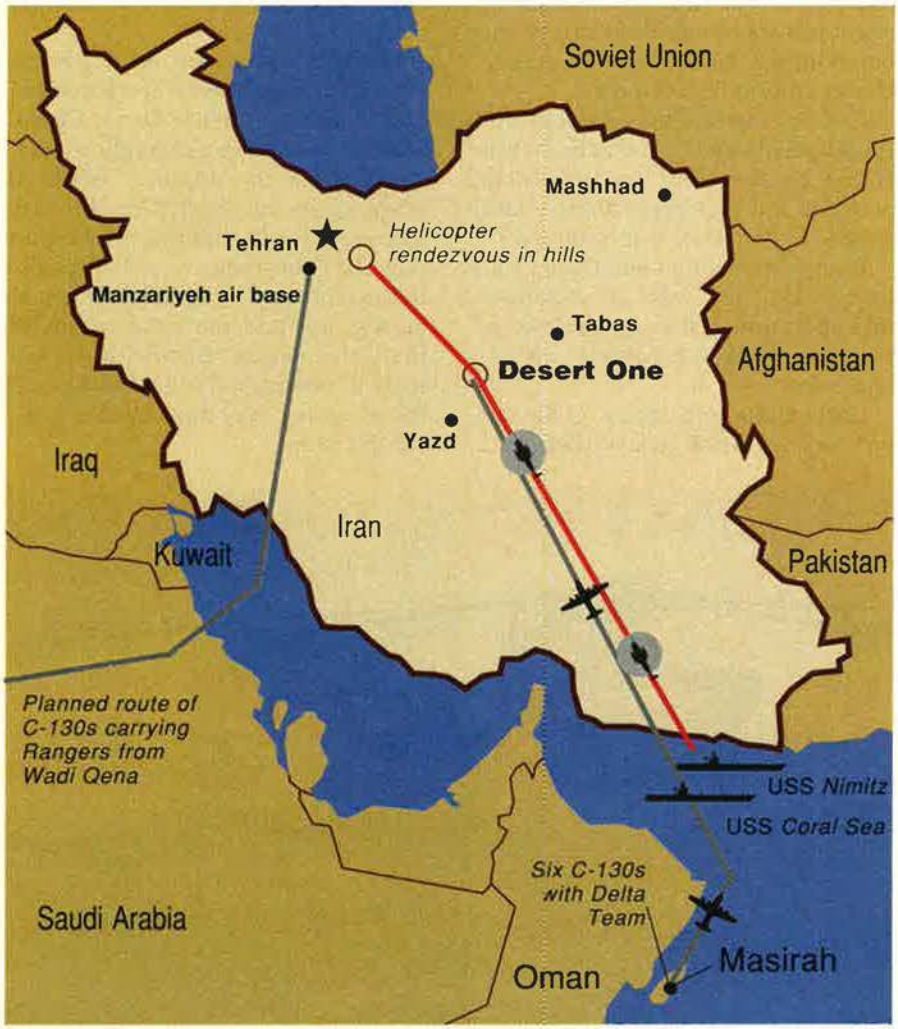
pilots were replaced by Marines carefully selected for their experience in night and low-level flying. The mission ultimately had 16 pilots: 12 Marine, three Navy, and one Air Force.

Selected to lead the helicopter element was Marine Lt. Col. Edward Seiffert, a veteran H-53 pilot who had flown long-range search-and-rescue missions in Vietnam and had considerable experience flying with night vision goggles.

Beckwith described Seiffert as "a no-nonsense, humorless—some felt rigid—officer who wanted to get on with the job."

Delta and the helicopter crews never developed the coordination and trust that are essential to high-stress, complex combat missions. Possibly, this was caused by the disjointed nature of the task force and its training.

*The complex rescue plan involved thousands of troops from four services, scattered around the world, and scores of aircraft, including three AC-130s to protect the rescue force from Iranian counterattack.*




*C-130s were to fly the rescue force from Masirah to Desert One. Helicopters, flown from* Nimitz, *would carry the rescuers to a hideout near Tehran. The next night, the commandos were to drive to the embassy to release the hostages. The helicopters then were to carry the rescuers and hostages to the abandoned Manzariyeh air base, where C-141s would fly them to Egypt.*

While the helicopter crews worked out of Yuma, Ariz., the members of Delta Force did most of their training in the woods of North Carolina. Other Army personnel were drilling in Europe. The Air Force crews that would take part in the mission trained in Florida or Guam, thousands of miles away in the Pacific.

The entire operation was being directed by a loosely assembled staff in Washington, D.C., which insisted that all the elements had to be further isolated by a tightly controlled flow of information that would protect operational security.

"Ours was a tenuous amalgamation of forces held together by an intense common desire to succeed, but we were slow coming together as a team," Kyle wrote in his account of the mission.

Meanwhile, Beckwith and his staff were desperate for detailed information on the physical layout of the embassy, the numbers and locations of the Iranian guards, and, most important, the location of the hostages.

### Six Buildings

Without that data, Delta had to plan to search up to six buildings in the embassy compound where the hostages might be held. That required Beckwith to increase the size of his assault force, which meant more helicopters were needed.

No intelligence was coming out of Iran because Carter had dismantled the CIA's network of spies due to

the agency's role in overthrowing governments in Vietnam and Latin America.

It would be months before agents could be inserted into Iran to supply the detailed intelligence Beckwith said was "the difference between failure and success, between humiliation and pride, between losing lives and saving them."

Despite all the obstacles, the task force by mid-March 1980 had developed what they considered a workable plan, and all of the diverse operational elements had become confident of their ability to carry it out.

The plan was staggering in its scope and complexity, bringing together scores of aircraft and thousands of men from all four services and from units scattered from Arizona to Okinawa, Japan.

The plan was this:

On the first night, six Air Force C-130s carrying 132 Delta commandos, Army Rangers, and support personnel and the helicopter fuel would fly from the island of Masirah, off the coast of Oman, more than 1,000 miles to Desert One, being refueled in flight from Air Force KC-135 tankers.

Eight Navy RH-53Ds would lift off the aircraft carrier USS *Nimitz,* about 50 miles south of the Iranian coast, and fly more than 600 miles to Desert One.

After refueling, the helicopters would carry the rescue force to a hideout in hills about 50 miles southeast of Tehran, then fly to a separate hiding spot nearby. The C-130s would return to Masirah, being refueled in flight again.

The next night, Delta would be driven to the embassy in vehicles obtained by the agents. A team of Rangers would go to rescue the three Americans held in the foreign ministry.

As the ground units were freeing the hostages, the helicopters would fly from their hiding spot to the embassy and the foreign ministry.

Three Air Force AC-130 gunships would arrive overhead to protect the rescue force from any Iranian counterattack and to destroy the jet fighters at the Tehran airport.

The choppers would fly the rescue force and the freed hostages to an abandoned air base at Manzariyeh, about 50 miles southwest of Tehran, which was to be seized and protected by a Ranger company flown in on C-130s.

The helicopters would be destroyed and C-141s, flown in from Saudi Arabia, would then fly the entire group to a base in Egypt.

### "Now a Reality"

After five months of planning, organizing, training, and a series of increasingly complex rehearsals, Kyle recalled: "The ability to rescue our people being held hostage, which didn't exist on Nov. 4, 1979, was now a reality."

The team still needed Carter's permission to execute.

Although the shah had moved to Panama and then to Egypt, the 53 Americans remained hostages and the public was getting impatient. Finally, in a White House meeting of his top advisors on April 11, Carter gave up on diplomacy. "I told everyone that it was time for us to bring our hostages home; their safety and our national honor were at stake," Carter said in his memoirs.

Five days later, Jones, Vaught, and Beckwith briefed Carter at the White House on the plans for the rescue mission and expressed their confidence in their ability to pull it off.

Beckwith recalled that Carter told them: "I do not want to undertake this operation, but we have no other recourse. ... We're going to do this operation."

Carter then told Jones, "This is a military operation; you will run it. ... I don't want anyone else in this room involved."

The audacious operation was codenamed "Eagle Claw." The target date was April 24–25.

Almost immediately, forces began to move to their jump-off points. By April 24, 44 aircraft were poised at six widely separated locations to perform or support the rescue mission. The RH-53s already were on *Nimitz,* where they had been stored with minimal care for months, but a frantic effort brought them up to what Seiffert and Navy officials insisted was top mechanical condition by launch day.

Beckwith and Seiffert had agreed that they would need a minimum of six flyable helicopters at Desert One for the mission to continue. Beckwith had asked for 10 helos on the carrier to cover for possible malfunctions, but the Navy claimed they could not store more than eight on the hangar deck.

Delta and many of the Air Force aircraft staged briefly at a Russian–built airfield at Wadi Qena, Egypt, which would serve as Vaught's headquarters for the mission. While at Wadi Qena on April 23, the task force received an intelligence report that all 53 hostages were being held in the embassy's chancery. Because he was not told the solid source of that information, Beckwith did not trust it enough to reduce his assault force, which may have been a critical decision.

***RH-53s being preflighted aboard USS* Nimitz *before launching on the mission where they would be stymied by dust clouds and various systems failures. Eagle Claw was aborted when three helicopters could not complete the mission.***

The next day, with Delta Force and support elements on Masirah and the helicopter crews on *Nimitz*, Vaught received the final weather report. It promised the virtually clear weather that the mission required.

### "Execute Mission"

Vaught sent a message to all units: "Execute mission as planned. God speed."

"There was cheering, and fists were jammed into the air with thumbs up. ... This was an emotional high for all of us," Kyle wrote.

That emotional high would crash into despair in about 12 hours.

The mission started in the twilight of April 24 with barely a hitch. Kyle and Beckwith flew out of Masirah on the lead MC-130 Combat Talon with some of the Delta troopers and an Air Force combat controller team. At about the same time, Seiffert led the helicopter force—given the call sign of "Bluebird"—from *Nimitz* and headed to the Iranian coast, 60 miles away.

The choppers had been fitted with two advanced navigation systems, but the pilots found them unreliable and were relying mainly on visual navigation as they cruised along at 200 feet. "We were fat, dumb, and happy," Seiffert recalled.

About 100 miles into Iran, the Talon ran into a thin cloud that reduced visibility but was not a problem at its cruise altitude of 2,000 feet. The cloud was a mass of suspended dust, called a "haboob," common to the Iranian desert. Air Force weather experts supporting the mission knew it was a possibility but apparently never told the mission pilots. Kyle said he considered sending a warning to the helicopters but decided it was not significant.

When the MC-130 ran into a much thicker cloud later, he did try to alert Seiffert, but the message never got through. It was just one of the communications glitches that would plague the mission.

The dust cloud that was a minor irritation to the Combat Talon became an extended torture for the helicopter pilots, who were trying to fly formation and visually navigate at 200 feet while wearing the crude night vision goggles. Visibly shaken Marine fliers later told Beckwith and Kyle the hours in the milk-like dust cloud were the worst experience of their lives, which for some included combat in Vietnam.

***USAF Col. James Kyle, mission planner and on-scene commander, and Army Col. Charles Beckwith, Delta Force commander, flew to Desert One in an MC-130, like this one, with Delta troopers and an Air Force combat controller team.***

Things had started to go wrong even before the dust cloud.

Less than two hours into the flight, a warning light came on in the cockpit of Bluebird Six. The indicator, called the Blade Inspection Method, or BIM, warned of a possible leak of the pressurized nitrogen that filled the Sea Stallion's hollow rotors. In the H-53 models the Marines were used to flying, the BIM indicator usually meant a crack in one of the massive blades, which had caused rotor failures and several fatal crashes in the past. As a result, Marine H-53 pilots were trained to land quickly after a BIM warning.

The Navy's RH-53s, however, had newer BIM systems that usually did not foretell a blade failure. To that date, no RH-53 had experienced a blade break and the manufacturer had determined that the helicopter could fly safely for up to 79 hours at reduced speed after a BIM alert.

### Down to Seven

However, the pilots of Bluebird Six did not know that. Thinking the craft unsafe to fly, the crew abandoned it in the desert and jumped aboard a helicopter that had landed to help.

The mission was down to seven helicopters.

Further inland, the remaining choppers were struggling with the dust cloud, which dropped visibility to yards and sent the cockpit temperature soaring. Although all the pilots were having difficulty, Bluebird Five was really suffering as progressive electrical system failures took away most of the pilot's essential flight and navigation instruments. The pilot, Navy Lt. Cmdr. Rodney Davis, "was flying partial panel, needle-ball, wet compass—a real vertigo inducer," Seiffert said.

Fighting against the unnerving effects of vertigo—when your inner ear tells you the aircraft is turning while your eyes tell you it is not—and unaware of the location of the other helicopters or the weather at Desert One, Davis decided to turn back.

Davis did not know that he was about 25 minutes from clear air, which prevailed all the way to Desert One, because everyone was maintaining strict radio silence to avoid detection.

The mission now was down to the minimum six helicopters.

Meanwhile, the lead C-130 had landed at Desert One, and Beckwith's commandos had raced out to block the dirt road that traversed the site.

Within minutes, they stopped a bus with 44 persons at one end of the site and at the opposite end had to fire an anti-tank round into a gas tanker truck that refused to stop. The driver of the tanker leaped from his burning vehicle and escaped in a pickup that was following.

Despite fears the mission might be compromised, the combat con-

Photo via D.M. Giangreco

***Delta Force trained in North Carolina, Army personnel in Europe, helicopter crews out of Arizona, and Air Force crews in Florida or Guam. Isolated for operational security, they were slow to come together as a team.***

trollers quickly installed a portable navigation system and runway lights to guide the other mission aircraft to Desert One.

Soon, the remainder of Delta Force was on the ground and the three EC-130s were positioned to refuel the helicopters, which were supposed to arrive 20 minutes later.

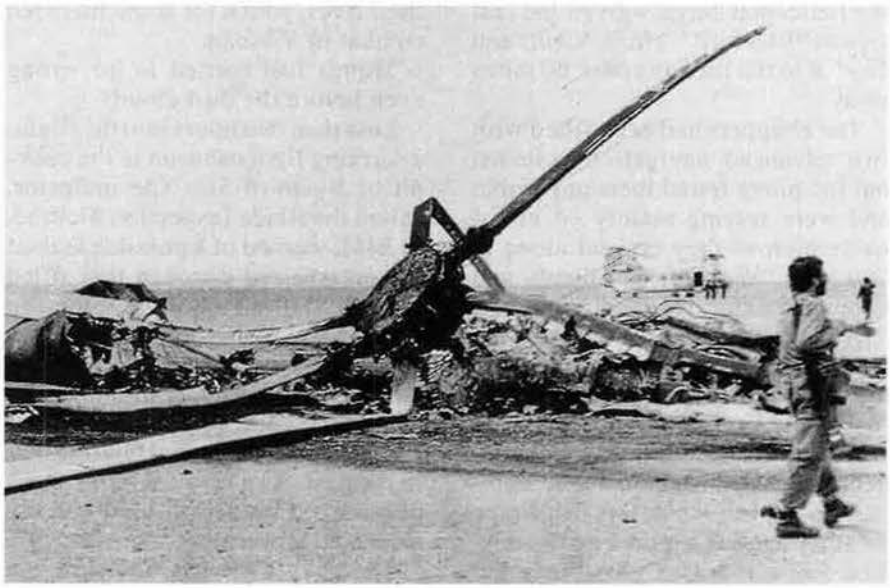
But, as Kyle discovered months later, someone had miscalculated the choppers' flight time by 55 minutes and the first Bluebird was more than an hour away. Finally, the Sea Stallions lumbered in from the dark, coming in ones and twos, instead of a formation, and from different directions.

After considerable anxiety, the count was up to six helicopters on the ground at Desert One and the hopes for a successful rescue soared again.

But as the helicopters struggled through unexpected deep sand to get into position behind the tankers, one shut down its engines.

Bluebird Two had suffered a complete failure of its secondary hydraulic system, which was unrepairable and left it with minimal pressure for its flight controls. Although the pilot appeared willing to try taking his sick bird on to the hideout, Seiffert overruled him.

Kyle tried to talk Seiffert into taking the helo on, but he refused, warning that flying with the one system at such heavy weight and high temperature could result in a control lockup and a crash that would kill not only the crew but the Delta commandos on board. Kyle then asked Beckwith if he could reduce his assault force to go with five choppers, but he was equally adamant about not changing his plans.



Wide World photo via D.M. Giangreco

***Two inquiries looked into the factors that left at Desert One burnt out hulks like the one above. (Note: The US-built Chinook in the background was not part of the rescue mission.) A Pentagon report blamed the helicopter failure rate and low-visibility flight conditions.***

## Failure of Eagle Claw

It seemed clear the mission had to be aborted.

Kyle informed Vaught of the situation by satellite radio and the task force commander relayed that to Jones and the Secretary of Defense, Harold Brown, at the Pentagon. When the word got to the White House, Carter asked Brown to get Beckwith's opinion. Told that Beckwith felt it necessary to abort, Carter said: "Let's go with his recommendation."

Eagle Claw had failed and the tense anticipation of success drained into frustration and anger.

Now Kyle was left with the unrehearsed job of getting everyone out of Iran. Because of the extended time on the ground, one of the C-130s was running low on fuel and had to leave soon. To allow that tanker to move, Kyle directed Marine Maj. James Schaefer to reposition his helicopter. With a flattened nose wheel, Schaefer could not taxi and tried to lift off to move his bird, stirring a blinding dust cloud.

As Kyle watched in horror, the helo slid sideways, slicing into the C-130 with its spinning rotors and igniting a raging fire. Red-hot chunks of metal flamed across the sky as munitions in both aircraft torched off.

Some of the Delta commandos had boarded the C-130 and they came tumbling out the side door as the Air Force loadmasters and senior soldiers tried to stop a spreading panic. Men were helping the injured away from the inferno.

The projectiles ejecting from the flaming wreckage were hitting the three nearby helicopters and their crews quickly fled.

Many of the people at Desert One that night credit Kyle with restoring order to the chaotic scene and getting all the living men and salvageable equipment out safely. But in the flaming funeral pyre of Eagle Claw's shattered hopes, they left the bodies of eight brave men.

On the departing C-130s, Delta medics treated four badly burned men, including Schaefer, his copilot, and two airmen. "We left a lot of hopes and dreams back there at Desert One, but the nightmares and despair were coming with us ... and would continue to haunt us for years, maybe forever," Kyle wrote later.

### Holloway's Investigation

Although Carter went on television the next day to announce the failure of the mission and to accept the blame, Congress and the Pentagon launched inquiries to determine the reasons for the tragedy. The Pentagon probe was handled by a board of three retired and three serving flag officers representing all four services; it was led by retired Adm. James L. Holloway III. The commission's report listed 23 areas "that troubled us professionally about the mission—areas in which there appeared to be weaknesses."

"We are apprehensive that the critical tone of our discussion could be misinterpreted as an indictment of the able and brave men who planned and executed this operation. We encountered not a shred of evidence of culpable neglect or incompetence," the report said.

The commission concluded that the concept and plan for the mission were feasible and had a reasonable chance for success.

But, it noted, "the rescue mission was a high-risk operation. ... People and equipment were called upon to perform at the upper limits of human capacity and equipment capability. There was little margin to compensate for mistakes or plain bad luck."

The major criticism was of the "ad hoc" nature of the task force, a chain of command the commission felt was unclear, and an emphasis on operational secrecy it found excessive.

The commission also said the chances for success would have been improved if more backup helicopters had been provided, if a rehearsal of all mission components had been held, and if the helicopter pilots had had better access to weather information and the data on the RH-53s' BIM warning system.

And it suggested that Air Force helicopter pilots might have been better qualified for the mission.

However, the report also said, "The helicopter crews demonstrated a strong dedication toward mission accomplishment by their reluctance to abort under unusually difficult conditions." And it concluded that, "two factors combined to directly cause the mission abort: an unexpected helicopter failure rate and the low-visibility flight conditions en route to Desert One."

Beckwith openly blamed the helicopter pilots immediately after the mission. However, in his critique to the Senate Armed Services Committee, he attributed the failure to Murphy's Law and the use of an ad hoc organization for such a difficult mission. "We went out and found bits and pieces, people and equipment, brought them together occasionally, and then asked them to perform a highly complex mission," he said. "The parts all performed, but they didn't necessarily perform as a team."

He recommended creating an organization that, in essence, was the prototype of the Special Operations Command that Congress mandated in 1986.

Kyle, in his book on the mission, rejected the Holloway commission's conclusions and basically blamed Seiffert and the helicopter pilots for not climbing out of the dust cloud, for not using their radios to keep the formation intact, and for the three helicopter aborts.

He argued that the task force never had less than seven flyable helicopters. All that was lacking, he wrote, was "the guts to try."

Seiffert praised Beckwith and Kyle as professional warriors but disagreed with their criticism of him and his helicopter pilots. He equated his decision to ground the chopper with the failed hydraulic system to Beckwith's refusal to cut his assault force, and he refused to second-guess the two pilots who had aborted earlier.

Seiffert said he was confident that, had they gotten to Tehran, the mission would have succeeded. Kyle was equally certain, writing that: "It is my considered opinion that we came within a gnat's eyebrow of success."

Beckwith wrote in his memoirs that he had recurring nightmares after Desert One. However, he noted, "In none have I ever dreamed whether the mission would have been successful or not." ■

***The hostages were released in January 1981 after the US and Iran reached an accord involving release of frozen Iranian assets. Lt. Col David Roeder, left, and Col. Thomas E. Schaefer were two of the USAF servicemen who were among those freed.***

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*Otto Kreisher is the national security reporter for Copley News Service, based in Washington, D.C. His most recent article for* Air Force *Magazine, "To Protect the Force," appeared in the November 1998 issue.*

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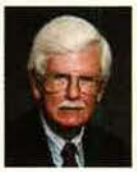

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# Valor

**By John L. Frisbee,** Contributing Editor

# The Long Road to Freedom

Bud Day escaped from his captors in North Vietnam with nothing on his side but faith and boundless courage.

On Aug. 26, 1967, Maj. George E. Day punched out of his disabled F-100F some 35 miles north of the DMZ in Vietnam, opening a saga of unremitting valor that was to last for more than five years.

If any man could be prepared for the ordeal that lay ahead, it was Bud Day. He had served 30 months in the Pacific with the Marines in World War II. After the war, he earned a doctor of law degree, joined the National Guard, was called to active duty in 1951, and completed pilot training that year. During the Korean War, he flew two tours in F-84s. Later, while based in England, he bailed out of a burning jet fighter at 300 feet, too low for his parachute to open, landed in trees, and survived. He arrived in Vietnam in early 1967 with a finely trained mind, a wealth of experience in fighters, devout faith in God, and an unshakable devotion to country.

After several weeks of combat flying, Day was picked to organize the F-100 "Misty" Forward Air Controllers, known as Commando Sabre. Their operations were in the hot areas north of the DMZ where slow-moving FAC aircraft couldn't survive. Bud Day was on his 67th mission in the North when communist guns brought him down.

Day landed in enemy territory with his right arm broken in three places, a badly injured knee, and a damaged eye. He was captured immediately, interrogated under torture despite his injuries, and imprisoned in a bunker until the North Vietnamese could move him to a prison near Hanoi.

Realizing that if he were to escape, it had to be now, before he was behind bars, Day tricked his youthful guards into believing he was unable to move. Shortly after nightfall, he worked free of his bonds, slipped out of the bunker, and began an incredible 12-day journey toward freedom.

Twice in that nightmarish passage he was caught in the midst of B-52 attacks. On the second night an incoming artillery round threw him into the air, ruptured his eardrums, and left a deep gash in his right leg. Violent nausea and dizziness prevented his traveling for two days after that. It was not until the fifth day that he was able to catch his first meal—a frog, which he ate raw. After that, it was nothing but water, a few berries, and some fruit.

Despite frequent periods of delirium brought on by injuries and lack of food, he reached the Ben Hai River at the north edge of the DMZ and swam it with the help of a bamboo log. By that time, his bare feet were cut to ribbons and the wound in his leg had become infected. Then came the most agonizing moment of the escape. A US helicopter landed within half a mile of him, but before he could drag himself through the brush it was gone.

Still fighting his way south, Day was within two miles of the US Marine base at Con Thien when he was recaptured by two young enemy soldiers who shot him in the left leg and hand. The long, painful trek to Hanoi began for the only American POW to escape and make it south to the DMZ.

During the brutal punishment that followed his recapture, Day's arm was broken again. He arrived at "Little Vegas," one of the prisons near Hanoi, completely unable to care for himself but denied medical treatment. Later he was transferred to "The Zoo," a bad treatment camp, where he was the senior officer. As the months dragged by, he was tortured many times for alleged transgressions by officers under his command. During frequent interrogations, he steadfastly refused to give information that would endanger American aircrews or could have been used by the North Vietnamese for propaganda purposes. Thirty-seven months of his 5.5-year imprisonment were in solitary confinement.

For his long-sustained heroism, Day, who previously had earned more than 60 decorations, including the Air Force Cross, was awarded the nation's highest decoration, the Medal of Honor.

No words can recreate the horror of the long, calculated attack on mind and body suffered by Day. That he survived with his honor intact and continued to serve his country until retirement from the Air Force as a colonel in 1977 is testimony to the unconquerable spirit that dwells in the best of men. ■

*First appeared in February 1994 issue.*

***Bud Day gets a long awaited hug when he greets his family upon return to the States in 1973—after more than five years in North Vietnamese prisons.***

# AFA/AEF National Report

**By Frances McKenney,** Assistant Managing Editor

## AFA State Presidents Receive Orientation

At the annual orientation meeting in Arlington, Va., of Air Force Association state presidents, National President Thomas J. McKee introduced the 33 state leaders in attendance to AFA's strategic goals, as well as the national headquarters' departments and programs. This year, about half of AFA's 47 state presidents are new to the position.

McKee explained the association's goal of expanding its sphere of influence on national defense and aerospace power issues. One method to do this, he said, is to speak out through various media and before a variety of audiences, including Congress.

He also provided suggestions on how to strengthen AFA's membership base, such as tapping the potential of AFA's Industrial Associates. He encouraged a strong awards program and reminded the state presidents that a chapter may raise its profile through photos in the base newspaper whenever it presents scholarships. One of his practical tips: "Wear your [AFA] badge proudly; wear it up high," he said. Wear it on your right lapel, so when people shake your hand, they can read it.

In remarks after McKee's presentation, AFA's Chairman of the Board Doyle E. Larson pointed out that "the grassroots run this organization." As an example of the effectiveness of organized volunteers, he cited the work of the national vice presidents in the past year, who spearheaded the reorganization of AFA regions.

"You're part of this organization," Larson told the state presidents. "Take charge."

The state presidents later participated in a planning and operations practicum, moderated by Robert E. Patterson, a former Florida state president, and a leadership and chapter development session, led by John J. Politi, national director and a former Missouri state president. In addition, AFA's National Defense Issues staff and the Aerospace Education Foundation held panel discussions with the group.

Photo by Paul Kennedy

***AFA National President Thomas McKee chats with David Cummock of Florida, one of the state presidents who attended orientation and information sessions on the association's operations and programs.***

### Secretary Peters in Hawaii

While on a tour of Pacific Air Forces bases in October, acting Air Force Secretary F. Whitten Peters found time between a luncheon and an evening luau to hold a late afternoon town meeting–style gathering at the Hickam AFB (Hawaii) Officers' Club. It was one of several significant activities sponsored this fall by the **Hawaii Chapter.**

Peters spoke about the Expeditionary Aerospace Force concept and the challenges facing USAF, reported Richard M. May Jr., chapter president. Questions from the audience covered "people issues," May said—optempo, pay, Tricare, retirement, and other benefits.

Peters spoke to an audience of 500 and conveyed his personal interest in these topics and "detailed knowledge of the issues," said May.

The chapter had come up with the format for the town meeting, held on the O Club's patio, publicized it, arranged for the venue, and provided hors d'oeuvres.

In a September meeting with a group of Hawaii's AFA leaders the new Pacific Air Forces commander, Gen. Patrick K. Gamble, described senior-level PACAF plans and issues.

In addition to quality-of-life issues and their effect on recruitment and retention, Gamble and the AFA group talked about the proposal for a Pacific Airpower Museum on Hickam, planned as an adjunct to the USAF Museum. The museum is still in the feasibility-study stage but is expected to feature period displays on airpower in the Pacific. It will be housed in a hangar on base.

Rounding out a busy fall season, the Hawaii Chapter spent an hour each Saturday morning in October cleaning the Hawaii Korean and Vietnam War Memorial.

The memorial is a series of black polished granite blocks, inscribed with the names of Hawaii residents who were killed in those wars. It is located in a highly visible location, on the lawn

of the state capitol, facing the governor's home.

Each month, a different local group has responsibility for cleaning the monument, with the Office of Veterans Affairs coordinating the overall effort. For its assigned month of October, the Hawaii Chapter pulled together about a dozen volunteers—including University of Hawaii AFROTC and Civil Air Patrol cadets—to pick up debris and sweep the area, then hose down and dry off the memorial with a squeegee.

May said this work was especially gratifying when passersby stopped to thank the group.

**Elections in the UK**

The **United Kingdom Chapter** at RAF Lakenheath, UK, helped host a visit to the base by retired CMSAF Paul W. Airey.

He was at the base in late October to dedicate Airey Hall, a 1 + 1 dormitory for airmen.

The first Chief Master Sergeant of the Air Force (1967–69), Airey last year told Air Force News Service that as an airman he lived in tents, double-decker bunks in barracks, and almost always in open bays—a vastly different quality of life compared to the 1 + 1 corm with its individual bedrooms and shared kitchen and bathroom.

The chapter elected new officers in October, following delays brought on by increases in the threatcon level and operations tempo as the US prepared for airstrikes in Kosovo, Yugoslavia.

Members re-elected Stephen A. Michael as president. A liaison schools officer, he is also a Reserve major.

Other chapter officers are SMSgt. Kelvin A. Hales, vice president; MSgt. Danette M. Hales, treasurer; TSgt. Todd W. Edeker, secretary; 1st Lt. Wesley P. Cox, vice president of government relations; Capt. C.J. "Chris" Urdzik, vice president of communications and membership; and Charles D. Poynor, vice president for veterans affairs.

The United Kingdom Chapter was chartered in May 1997, with 54 members. Today, the chapter newsletter boasts of over 180 members.

**Road Trip!**

They've taken to the road each year since 1995, always enjoying the fellowship and opportunity to learn about military history.

This fall, 45 members and friends of the **Chautauqua (N.Y.) Chapter** boarded a chartered bus and headed off on a four-day trip to military facilities in southeastern Connecticut.

First stop: Naval Submarine Base New London at Groton, Conn., where US Navy submariners receive training. On base, the group visited the Nautilus Memorial Submarine Force Library and Museum, the Navy's official submarine museum. Displays include several midget subs, working periscopes, and a submarine control room.

At the culmination of the museum tour, some chapter members visited USS *Nautilus,* the first nuclear powered sub. Its keel was laid by President Harry S. Truman in June 1952, and the ship served until decommissioning in March 1980.

The Chautauqua Chapter next headed for the US Coast Guard Academy in New London where its museum features 200 years of the service's history.

The group spent a day in the waterfront town of Mystic, at a 40-acre outdoor maritime museum called Mystic Seaport, which presents a recreation of a New England fishing village.

John A. Dunderdale, chapter president, and Barbara Dunderdale, New York state secretary, arranged this bus trip. The annual jaunts began in

Photo by Paul Kennedy

***Capt. Clare Reid (center), Maryland state president, William Cocke (left), Louisiana state president, and Coleman Rader Jr. (right), Minnesota state president, participate in the state president's orientation. Reid is the commandant of cadets at the University of Maryland, College Park. The Richard S. Reid (Ariz.) Chapter is named for her late father, and her mother, the late Sally Reid, served as Arizona state president.***

*Allan Van Wickler (center), then president of the William A. Jones III (Va.) Chapter, and Col. Kermit Boschert, chapter vice president, presented an AFA award honoring the top AFROTC unit in Virginia, accepted by Cadet Matthew Bartlett (left).*

1995 with a trip to the US Air Force Museum at Wright–Patterson AFB, Ohio. The next year, the chapter traveled to the National Air and Space Museum in Washington. Last year, it was Dover AFB, Del., and the US Naval Academy at Annapolis, Md.

Commenting on the camaraderie developed on these trips, Barbara Dunderdale said, "You hear war stories like you wouldn't believe." The Dunderdales credit the trips with spurring interest in joining the chapter.

**Viewpoint on the Balkans**

Former Secretary of State Lawrence S. Eagleburger was guest speaker at a dinner in Charlottesville, Va., sponsored by the **William A. Jones III (Va.) Chapter** and local chapters of The Retired Officers Association and the Navy League.

A veteran of more than 30 years in the State Department, Eagleburger was appointed to serve in President George Bush's cabinet in 1992 and was President Jimmy Carter's ambassador to Yugoslavia.

At the dinner meeting Eagleburger warned of the potential around the world for situations of ethnic and religious warfare similar to what is happening today in the Balkans, reported Allan M. Van Wickler, then chapter president. Van Wickler said Eagleburger also emphasized the importance of remaining the foremost military power in order to be able to implement our national policy and commented that Congress and the American people need to step up their support for the military services.

Earlier in September, Van Wickler presented the 1998 Virginia State AFA Award to Cadet Wing Commander Matthew A. Bartlett of the University of Virginia in Charlottesville. The award honors the state's leading AFROTC unit.

More than 100 cadets watched the presentation, made at the unit's Leadership Laboratory. Their professor of aerospace science is Col. Kermit V. Boschert, now the chapter vice president. Bartlett is also an AFA member.

**Outstanding**

The **Monterey Bay Area (Calif.) Chapter** presented its first Outstanding Air Force Student Citation to Capt. David R. Toni at a recent Naval Postgraduate School graduation ceremony in Monterey, Calif.

Rear Adm. Robert C. Chaplin, NPS superintendent, presented the award.

*Capt. David Toni (right) receives the first Outstanding Air Force Student award given at a Naval Postgraduate School graduation, from Rear Adm. Robert Chaplin. A Monterey Bay Area Chapter initiative led to creation of the new award.*

Toni, a chapter member, also received a tray, inscribed with the AFA emblem.

Now stationed in Turkey, he had completed a course in Persian/Farsi at the Defense Language Institute, while attending the NPS. He was also active on the local World Affairs Council, among several other community activities.

A chapter committee headed by Donald S. MacKinnon selected Toni for the award, based on his community involvement, plus his 3.9 grade point average and leadership.

The award was the initiative of Harold Oberg, vice president for aerospace education, who had noticed that top students from other services received awards at NPS graduation ceremonies, but no one had sponsored an Air Force award.

### All Signed Up

In one fell swoop, the **C. Farinha Gold Rush (Calif.) Chapter** gained 126 members when it signed up cadets from C.K. McClatchy High School in Sacramento, Calif.

The students' instructor, Lt. Col. Billy Lakes, USAF (Ret.), said he and fellow teacher, retired CMSgt. Robert Sully, felt the cadets would gain solid information on Air Force issues by joining AFA. Not only would they be able to read *Air Force* Magazine, Lakes said, but the move would also strengthen the cadets' ties to the chapter.

The cadets, who range from freshmen to seniors, already support the chapter by helping the members wash the airplanes on display at the McClellan Aviation Museum on McClellan AFB, Calif. The students also support chapter events, such as the state convention, with a drill team and color guard.

When Lt. Col. Michael T. Rooney, chapter vice president for membership, learned that Lakes and Sully had boosted the chapter's numbers in such a big way, he donned his Class As and headed to the school to speak to the newest members.

Rooney said it was an opportunity for the JROTC cadets to ask Air Force questions from someone who doesn't prepare their report card. The students were intrigued by the awards and decorations on his uniform and asked him where he received pilot training, if he'd ever bailed out of an airplane, how they could become an astronaut, and what they should be studying to reach that goal. The cadets also asked more serious questions about McClellan AFB's future, since it is scheduled for base closure.

"I saw a bunch of bright-eyed, eager, respectful kids," commented Rooney. "I'm not as worried about the future as I was."

### Recruiting

**Lloyd Schloen–Empire (N.Y.) Chapter's** William G. Birnbach, president, and Maxine Donnelly, vice president, arranged for two USAF service members to speak about Air Force security forces to students in a business law class at Bethpage High School in Bethpage, N.Y.

2d Lt. Stephen J. Dawson, from the 314th Air Force Recruiting Squadron in Burlington, N.J., and SSgt. Keith J. Lundberg, from the Levittown, N.Y., USAF recruiting office, showed the students a video that introduced the typical lifestyle and facilities on an Air Force base. They also showed Air Force News Service video clips on military working dogs and on security forces training.

Dawson covered ROTC scholarships, pointing out how a student selected for a scholarship could major in law or business before pursuing an Air Force career.

Lundberg, who is in the security forces and also was a civilian policeman in Layton, Utah, said the students asked if military policemen actually apprehended real criminals on base. He said they also expressed surprise to learn that people as young as 17 could begin training for a security forces career.

### Honors for a Volunteer

At the October meeting of the **Maj. Gen. Oris B. Johnson (La.) Chapter,** retired Maj. Gen. Oris B. Johnson presented an award in his name to chapter member Ralph W. Stephenson Jr.

The award recognizes Stephenson's service to AFA. He has been a member since 1961 and has served two terms as chapter president. Current chapter president Michael F. Cammarosano noted that Stephenson has volunteered hours of time, effort, and dollars to AFA, the AFROTC detachment at Louisiana State University in Baton Rouge, the Silver Wings program, and a local veterans home.

This is only the second time the award has been given, Cammarosano said—the last awardee being himself in 1995.

Johnson is a Louisiana native and entered the Army Air Corps in 1940. He served in World War II as commander of the 422d Night Fighter

***Ralph Stephenson Jr. (left) received the Maj. Gen. Oris B. Johnson Award from the general himself (center) at a meeting of the Louisiana chapter named for Johnson. At right is Michael Cammarosano, chapter president.***

# It's like a roll of the dice...

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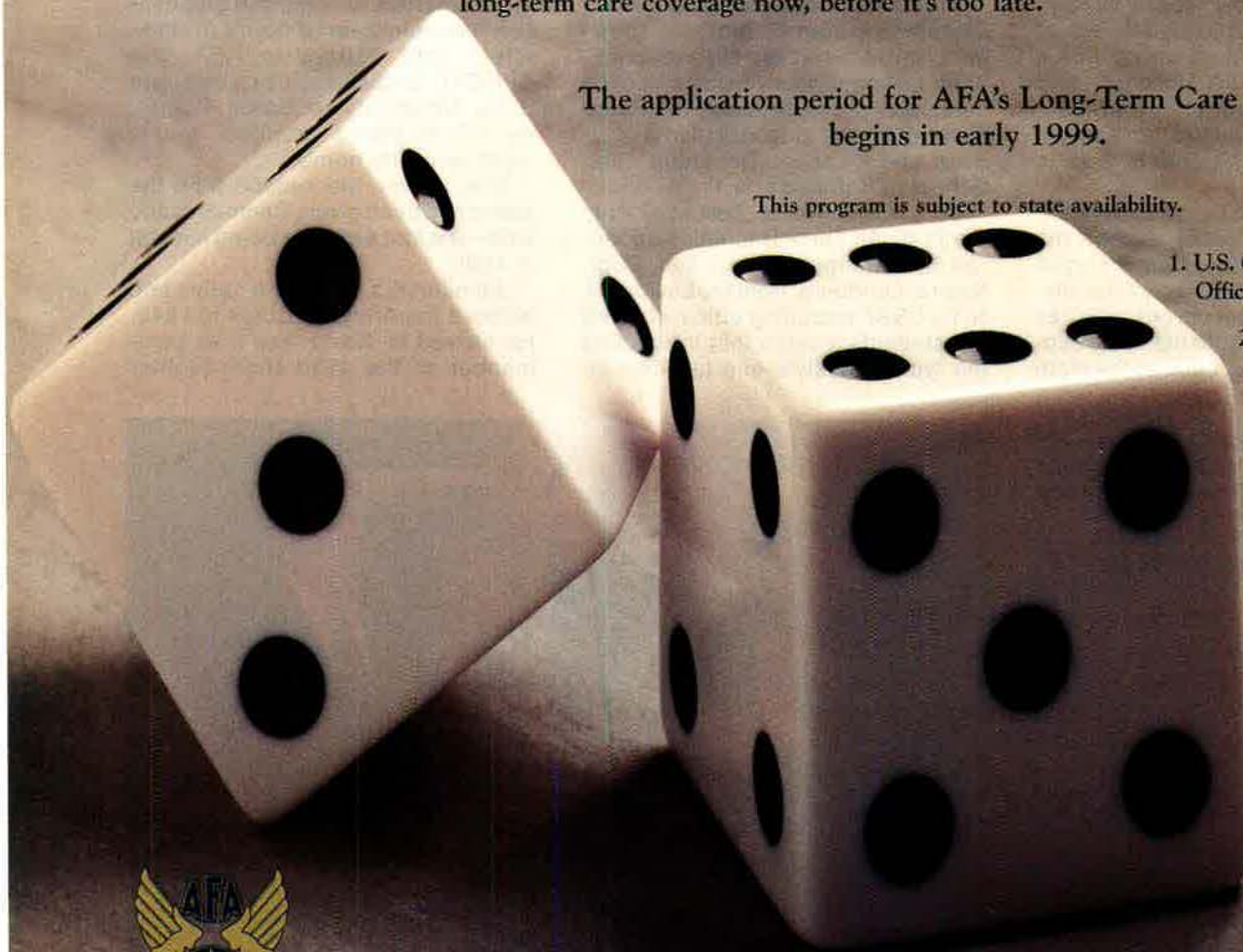
The application period for AFA's Long-Term Care Program begins in early 1999.

This program is subject to state availability.

1. U.S. General Accounting Office, 1995.
2. Project Report for HIAA, 1990.
3. Health Insurance Association of America, 1997.



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*Rep. Ray LaHood (R–Ill.) was keynote speaker at a Land of Lincoln (Ill.) Chapter luncheon at the 183d Fighter Wing (ANG), Capital MAP, Ill. With him are (l–r) SSgt. Philip Schumer, chapter treasurer; SMSgt. Frank Wombwell, vice president; Maj. Gen. Richard Austin, Illinois National Guard adjutant general; John Bailey, state president; Col. John Newman, secretary; and Capt. Richard Neely, president.*

Squadron and served at Far East Air Forces headquarters in Tokyo during the Korean War. He retired in 1973 as deputy chief of staff, logistics, at Aerospace Defense Command, Ent AFB, Colo. Johnson regularly attends chapter functions and ROTC events.

On hand at the award presentation were the newly elected chapter officers: Cammarosano, president, Darren H. Eskind, vice president, Rodney L. Breland, treasurer, and Stephenson, secretary.

**New Leadership**

The **Richard I. Bong (Minn.) Chapter** elected Bernie E. Tanski as chapter president, Donald Solwold, vice president, James W. Greenfield, treasurer, and Keith M. Bischoff, secretary, at a recent quarterly meeting.

Guest speakers for the event were chapter member Raymond T. Klosowski and Lt. Col. Marshall C. Miller Jr., commander of AFROTC Det. 420 at the University of Minnesota Duluth.

Klosowski is a retired ANG brigadier general and former commander of the 148th Fighter Wing (ANG), Duluth IAP, Minn. He is now manager of Duluth IAP and spoke to the chapter about its development and expansion.

During the awards portion of the meeting, Miller received an AFA Medal of Merit, recognizing his effort to expand the local AFROTC program, which now includes The College of St. Scholastica and Lake Superior College, both in Duluth, and the University of Wisconsin in Superior, Wis. Miller was also lauded for helping expand locally the *USA Today*–Aerospace Education Foundation Visions of Exploration program that encourages elementary school students' interest in math and science.

Other awards that evening went to James A. Armstrong and Greenfield, who have held chapter offices for the past two years, and Bischoff, who has served as chapter secretary or treasurer for the past 16 years. Past presidents receiving awards were Armstrong, John R. Hed, Curtis P. Jones, and John C. Seely.

Minnesota State President Coleman Rader Jr. attended the meeting, along with Victor C. Seavers of the AFA/AEF 2010 Committee, who provided an update on the Air Force Memorial as well as on the future roles of AFA and AEF.

***The Klamath Basin (Ore.) Chapter formally presented Vernon R. "Dick" Quick (center) with his AFA Medal of Merit at a chapter dinner. Chapter President Curtis Ritchie (left) said the award was likely a first for the small chapter, which has just over 100 members. John Lee, Oregon state president, is at right.***

### Thanks, AFA

**Montgomery (Ala.) Chapter's** eighth annual golf tournament fundraiser brought together more than 80 players from the chapter, the local business community, and Maxwell AFB, Ala., including Col. Albert A. Allenback Jr., the 42d Air Base Wing commander and a chapter member.

Proceeds from the event fund the chapter's participation in the *USA Today*–Aerospace Education Foundation Visions of Exploration program; aerospace education programs at area schools; and awards programs for the military personnel at Maxwell and Gunter Annex.

The base didn't hesitate to acknowledge the Montgomery Chapter's efforts, either. After the golf tournament, it posted a sign on the marquee at the entrance to Maxwell, reading, "Thank you, Air Force Association."

### More AFA/AEF News

■ His Czechoslovakian heritage came in handy when National Director Emeritus Jan M. Laitos of the **Rushmore (S.D.) Chapter** traveled to Eastern Europe and met with military leaders in the Czech and Slovak republics and Hungary. At Zvolen, Slovak Republic, Laitos presented Maj. Gen. Jozef Pivarci, commander in chief, 3d Air Force and Air Defense Corps, with a copy of *Air Force* Magazine and information on AFA. He also emphasized how AFA and USAF work together to maintain a strong Air Force. Laitos also helped at AFA's recent National Convention as an unofficial interpreter for Lt. Gen. Ladislav Klima, Czech Republic air chief, who participated in the international aerospace symposium.

■ The **Dacotah (S.D.) Chapter** welcomed Gene Smith, former AFA national president and chairman of the board, as guest speaker at their October meeting. Smith spoke about his more than five years as a POW in the "Hanoi Hilton" during the Vietnam War. He also described how the experience changed his priorities and reaffirmed his pride in being an American, said Chapter President Brian L. Vognild. George E. Masters, national vice president (North Central Region), and Charles A. Nelson, state president, were among the 50 guests at the dinner meeting.

■ Joseph A. Zaranka, national director; Joseph R. Falcone, national director emeritus; Ronald E. Palmer, former national vice president (New England Region); and Craig Hancock, president of the **Flying Yankees (Conn.) Chapter,** were among the huge crowd celebrating the 75th anniversary of the 103d Fighter Wing (ANG), at Bradley ANGB, Conn. Lt. Gen. David L. Vesely, assistant USAF vice chief of staff, and Brig. Gen. Craig R. McKinley, ANG deputy director, served as guest speakers. AFRES Col. Walter L. Burns, commander of the 103d FW and a chapter member, was master of ceremonies for the formal military ball.

■ The **Leigh Wade (Va.) Chapter** honored Melinda Kelley as Regional Teacher of the Year at an awards banquet held at Ft. Lee, Va. Kelley is a seventh-grade teacher at Colonial Heights Middle School in Colonial Heights, Va. John E. Craig II, national vice president (Central East Region), and Glen Thompson, chapter president, made the presentation. The chapter's 21 Community Partners were also honored that evening.

■ AFA National President McKee announced in October the appointment of three additional members to AFA's national board of directors, Edward C. "Pete" Aldridge Jr., Rep. Sam Johnson (R–Texas), and Roy A. Boudreaux. Aldridge served as Secretary of the Air Force from 1986 to 1988 and is president and CEO of The Aerospace Corp. in Los Angeles. He is a member of the **Gen. B.A. Schriever Los Angeles (Calif.) Chapter.** Johnson was re-elected in November for a fifth term and has been on the House Ways and Means Committee. He is also a member of the Air Force Caucus. Boudreaux is Alabama state president and has been president of the **Montgomery Chapter.**

■ Retired **Maj. Gen. Charles I. Bennett Jr.,** for whom an AFA chapter in California is named, died Oct. 16 at his home in Jacksonville, Fla., at age 75. A native of Chattanooga, Tenn., he enlisted in the Army Air Corps in June 1941 and became the personal pilot for Gen. of the Army Dwight D. Eisenhower. In his 33-year USAF career, Bennett also served in Vietnam as chief of staff, 7th Air Force, before retiring in 1974 as deputy director of plans.

■ **Louise B. Timken,** a longtime AEF trustee, died in October. She had been on AEF's board from 1986 to 1995. Timken had earned her pilot's license in the early 1940s and was active with the Civil Air Patrol in World War II. AEF has established a memorial fund in her name. ■

# AFA's National Committees and Advisors for 1998–99

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# Unit Reunions

**2d BG and 2d Wg.** Sept. 16–19, 1999, at the Ramada Plaza Hotel and Inn Gateway, Kissimmee, FL. **Contact:** Robert F. Amos, 10321 E. Michigan Ave., Sun Lakes, AZ 85248-6868 (602-895-0231).

**4th FIS** pilots, Misawa AB, Japan, 1955–56. April 16–17, 1999, at the Ramada Beach Resort in Fort Walton Beach, FL. **Contact:** Chuck Dildine (850-897-5271).

**5th BG (H) Assn.** March 25–28, 1999, at the Holiday Inn Express Biloxi in Biloxi, MS. **Contact:** Lee Benbrook, 39685 Ramshorn Dr., Murrieta, CA 92563-5563 (phone or fax: 909-677-3853).

**7th BW B-36 Assn** and all others assigned to Carswell AFB, TX, 1948–58. April 22–25, 1999, at the Ramada Plaza Hotel Fort Worth Convention Center, in Fort Worth, TX. **Contact:** Richard S. George, PO Box 330279, Fort Worth, TX 76163 (817-292-4932) (b36assn7bw@aol.com).

**18th FIS (1954–56).** Sept. 9–12, 1999, at the Holiday Inn North in Dayton, OH. **Contact:** Roger Labrie, 270 Malletts Bay Ave., Colchester, VT 05446 (802-655-7846), or Warner Hehart, 204 Gardener Dr., Hartsville, SC 29550 (803-332-5374).

**38th Tactical Missile Wg,** USAFE. June 1999 in Las Vegas. **Contact:** James Andrews, 1763 Taylorsville Rd., Lenoir, NC 28645 (828-754-4826).

**58th FG (WWII) and 58th Fighter–Bomber Gp** (Korea), 69th, 310th, and 311th FSs. June 23–27, 1999, in Dayton, OH. **Contact:** Bob James, 13083 Ferntrails Ln., St. Louis, MO 63141 (314-878-5953).

**364th FG** (WWII), Eighth AF, and support units. Sept. 20–26, 1999, at the Fairfield Inn by Marriott, Albuquerque, NM. **Contact:** Dan Leftwich, 6630 Caldero Ct., Dayton, OH 45415 (937-890-3641).

**444th FIS.** April 8–11, 1999, at the Holiday Inn Airport in North Charleston, SC. **Contact:** Wallace Mitchell, 535 Mimosa Rd., Sumter, SC 29150 (803-469-3297).

**464th TCW,** including Pope AFB, NC, personnel, 1954–71. April 21–24, 1999, in Fayetteville, NC. **Contact:** Bob Straub, 1225 5th St. SW, Winter Haven, FL 33880-3278 (941-299-3596).

**465th/19th Airborne Missile Maintenance Sq.** April 30–May 2, 1999, at Robins AFB, GA. **Contact:** Carl Tischer (912-922-3745) or Jerri Lewis, 205 Biltmore Ter., Warner Robins, GA 31088 (miminol@aol.com).

**567th Strategic Missile Sq** (SAC). Jan. 15–16, 1999, at the Doubletree Hotel Spokane, City Center, in Spokane, WA. **Contact:** Richard Mellor (phone: 509-327-2879 or fax: 509-323-1875).

**622d Air Refueling Sq** (TAC), England AFB, LA. April 29–May 1, 1999, at Four Points Hotel by Sheraton, Fort Walton Beach, FL. **Contact:** Mauri Ray, 2428 Edgewater Dr., Niceville, FL 32578 (850-678-3078).

**6555th Aerospace Test Gp.** March 12–13, 1999, in Cocoa Beach, FL. **Contact:** Craig McAlister, 1523 Stafford Ave., Merritt Island, FL 32952 (407-452-4073).

**Mail unit reunion notices well in advance of the event to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.**

**Nagoya/Komaki AB Reunion Assn.** June 17–20, 1999, in Indianapolis. **Contact:** Ted Eaton, 7860 Prairie Rd., Springport, IN 47386 (765-755-3587)

**Pilot Class 54-Q,** Marana AB, CA, and Williams AFB, AZ. March 15–18, 1999, at Harrah's Laughlin in Laughlin, NV. **Contact:** Daniel Riley, 14 Maple Ave., Shalimar, FL 32579 (850-651-1998).

**Ramey AFB Historical Assn,** 1939–73. March 10–14, 1999, in Aguadilla, PR. **Contact:** Carlos Ruiz (787-868-2794), or Garred Giles (RameyAFBHA@juno.com) or PO Box 250165, Aguadilla, PR, 00604.

**WWII personnel,** Bergstrom Field, TX, 1942–45. April 16–20, 1999, in Austin, TX. **Contact:** Wayne Taylor, 5105 SW 20th Ter., Topeka, KS 66604-3576. ■

# Bulletin Board

Seeking **patches** from the 28th Strategic Recon Wg and the 77th Recon Sq in the RB-36, 1942–52. **Contact:** Richard Hurd, 102 Broadway, Goodland, KS 67735-1821.

Seeking **Lts. Robert Armstrong and Maurice D. Cashman,** both basic training flight instructors at Coffeyville AAF, KS, in 1943. **Contact:** Lester K. Glaze, Box 309, Broken Bow, NE 68822 (home: 306-872-2896 or office: 308-872-2842).

Seeking information on and photos of any of the 40 USAAF aircraft that crashed or were forced to land in neutral **Ireland** during WWII. **Contact:** Donald M. MacCarron, 4 The Chyne, Gerrards Cross, Buckinghamshire, UK, SL9 8HZ (01753-8838812) (johnm@bga.co.uk).

Seeking contact with **John P. Wollam,** Class 44-D, Pampa, TX. **Contact:** Dale E. Wyatt, 609 Willow Ridge Rd., Fort Worth, TX 76103-1231.

Seeking **Maurice J. MacDonald,** tail gunner–armorer, 575th BS, 391st BG, Ninth AF, on a B-26 Martin Marauder, 1944–45, in France. **Contact:** Bill Fagan, 203 Priscilla Dr., Fort Walton Beach, FL 32547 (850-862-3705).

Seeking contact with members of the **15th Sq, 346th CTD,** Moorhead State College, Moorhead, MN, 1944. **Contact:** George J. Pattison, 199 Reed Rd., Avella, PA 15312-2043.

Seeking **memorabilia** for museum exhibit at the Royal Australian AB, Garbutt, Australia, dedicated to Fifth AF. Also seeking contact with the president of the Fifth AF Assn. **Contact:** Flt. Lt. John LeRoy, No. 35 Squadron Operations, Royal Australian AFB, Garbutt, Townsville, N. Queensland, Australia, 4814.

Seeking stories, maps, photos, and other information from anyone who attended **P-38 training** at Ontario AAF, CA, during WWII. **Contact:** Paul Hofer, 11248 S. Turner Ave., Ontario, CA 91761-7660 (909-390-2551).

**If you need information on an individual, unit, or aircraft, or want to collect, donate, or trade USAF–related items, write to "Bulletin Board," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Items submitted by AFA members have first priority; others will run on a space-available basis. If an item has not run within six months, the sender should resubmit an updated version. Letters must be signed. Items or services for sale, or otherwise intended to bring in money, and photographs will not be used or returned.**

Seeking members of Williams AFB, AZ, **Pilot Training Class 80-06** for a reunion in 2000. **Contact:** Craig Wallace, 1184 Dejoan Ct., Columbus, OH 43228 (614-878-5871) (cwallace@ohsgh.ang.af.mil), or J.R. Dallas, 11048 Candlelight Ln., Dallas, TX 75229 (214- 358-6510) (jdallas@arfsm.ang.af.mil).

Seeking contact with or information on **Col. Charles H. Holm Jr.,** of Alabama, who served with Eleventh or Thirteenth AF in the Pacific Theater, 1943–46, and was a commander at Pusan AB, South Korea, in 1955. **Contact:** William Kuss Jr., 4860 Rolando Ct., Apt. 74, San Diego, CA 92115 (619-229-1162).

Seeking **Capt. William Mooney,** B-25 pilot in the China–Burma–India Theater, and brother of Capt. Robert C. Mooney, KIA on low-level attack on Ploesti, Romania, Aug. 1, 1943. **Contact:** Rockly Triantafellu, 157 Nawiliwili St., Honolulu, HI 96825.

Seeking photos and contact with former flight and ground crewmen of **Fairchild C-82s** flown by ATC/MATS, TAC, SAC, ARS, AACS, and others. **Contact:** Nick Williams, 1002 Ridgewood Blvd., Waverly, IA 50677-1114.

Seeking **Cpl. Albert E. Coker,** who stood guard with Sgt. Ira Fair Lord at 5th AF HQ (Advance), Pyongyang, North Korea, Nov. 6, 1950. **Contact:** John W. Brokaw, 5706 Trailridge Dr., Austin, TX 78731-4227 (gael@mail.utexas.edu). ■

# Verbatim

**Neglected and Sometimes Denigrated**

"I believe it is time to abandon unhelpful *'history shows ...'* arguments. They typically go as follows: 'History shows that airpower overpromises what it can do. In too many cases at too many times it has failed to deliver on those promises, and we expect that trend to continue in the future.'

"Now, I will be the first to admit that aerospace power let others down from the Peloponnesian through Spanish–American wars. And I am certainly ready to admit that we did overpromise in one particular activity: We overpromised survivability to some 23,000 [US Army Air Forces] crew members lost during World War II in the combined bomber offensive. The ... sacrifices of those crew members remain largely neglected—and sometimes denigrated."

***Gen. Michael J. Dugan (Ret.), former Air Force Chief of Staff, in a Nov. 24, 1998, speech in Cambridge, Mass.***

**Translation: No Pacific Drawdown**

"The 1995 East Asia Strategy Report stated that the United States will maintain approximately 100,000 US military personnel in the Asia–Pacific region. This report reaffirms that commitment. We will sustain our presence with contributions from all military services, ensuring that we have maximum operational flexibility in the event of a crisis.

"This force level in the region is based on our analysis of the strategic environment for now and in the future, and the military capabilities needed to achieve our goals. The presence of 100,000 US military personnel is not arbitrary."

***From the Defense Department's 1998 East Asia Strategy Report, made public in November 1998.***

**Urban Myths**

"If you're fighting me, and you have this great Air Force and this great Navy with all these precision weapons, I'm going to find a way for you not to use them. I'm going to fight you in the city so you're going to have to kill the city to kill me. Or, I'm going to take refugees [and put them on tanks and similar potential targets]. I'm going to let you kill civilians and see how that flies on CNN. Doing that gives you a big problem. You've got to send some infantrymen in there and separate people from weapons platforms in order to kill the weapons platforms. You've got a tough, tough game. These asymmetries are not being considered adequately as the Department of Defense divvies up the money. The Army is being shortchanged."

***Army Lt. Gen. Jay M. Garner (Ret.), as quoted by George C. Wilson in the Nov. 9, 1998,* Army Times.**

**Trading Places**

"It now appears possible to halt a large-scale, combined arms offensive with forces that can be brought to bear within a matter of days rather than months. ... Systems to provide these capabilities either exist today or are in advanced stages of development. If fielded in sufficient numbers, they would allow US forces to halt armored invasions promptly, even under the stressing circumstances of a short-warning attack supported by concerted efforts to deny US expeditionary forces access to the region of conflict.

"But investments in key elements of this halt capability are lagging. ... [For example] US inventories of advanced anti-armor munitions will be significantly smaller than those needed for two plausibly stressing major conflicts. ... Investing adequately in these and other critical capabilities will require cuts in other accounts. Because it is so important that US and allied forces prevail in the opening phase of a major conflict, if cuts must be imposed upon deployable forces, they should, in general, come from systems and units that are not available for the halt phase—that is, from later-arriving forces intended for use in a counteroffensive. ...

"Heretofore, longer-range firepower systems, such as aircraft, missiles, and artillery, were seen primarily as delaying and disrupting attacking enemy ground forces, whereas heavy ground forces and supporting fires were relied upon to play the leading role in destroying and halting the enemy. Henceforth, longer-range firepower will be increasingly relied upon to bear the greatest share of this burden."

***From the fall 1998 RAND study "To Find, and Not to Yield: How Advances in Information and Firepower Can Transform Theater Warfare."***

**Sleepwalking in Sarajevo**

"Although [Richard] Holbrooke is rarely accused of excessive modesty, his achievement [in brokering the Bosnian peace accords] is actually understated in [his] book, simply because he is careful not to draw attention to how little active support he got from his own President. In fact, up until the convening of the Dayton conference, President Clinton seems hardly to have been paying attention to Bosnia; his main intervention was to question the continuation of NATO's bombing campaign in mid-September, at a time when Holbrooke and his team believed that the bombing was essential for the success of their diplomatic efforts.

"In one of the book's most revealing passages, Holbrooke recounts how he informed Clinton that his publicly announced promise to provide US troops if needed to help extract [United Nations] peacekeepers had produced a NATO contingency plan that called for the use of 20,000 American troops to assist in the extraction. Although President Clinton had never approved or even been briefed on the plan, it had already been approved by the NATO council. ... [T]he President began to 'press his advisors for better options.' Apparently, Holbrooke implies, Clinton finally acted in Bosnia only when told that he had lost the option of inaction."

***Former Undersecretary of Defense for Policy Paul Wolfowitz, in the fall 1998 issue of the magazine* The National Interest.** ■

# Pieces of History

**Photography by Paul Kennedy**

## Colors


*With cartoon characters or more abstract symbols, Air Force military members have often promoted esprit de corps and proclaimed their lineage through a unit patch of striking design sewn on to their uniforms. Heraldic emblems for the Air Force had their beginnings in World War I, when Benjamin D. Foulois, then a brigadier general, established a policy for the insignia of aerial units. Patches now are highly prized by collectors, especially as the Air Force has reorganized in post–Cold War years. Skilled artists as well as amateurs have created unit patches. But the Office of Heraldry at the Air Force Historical Research Agency at Maxwell AFB, Ala., is where unit emblem requests ultimately get processed and registered. Brightly colored or subdued patches tie today's active duty airmen to veterans who will always be able to identify their old units by the lineage depicted in these pocket-sized pieces of unit history.*

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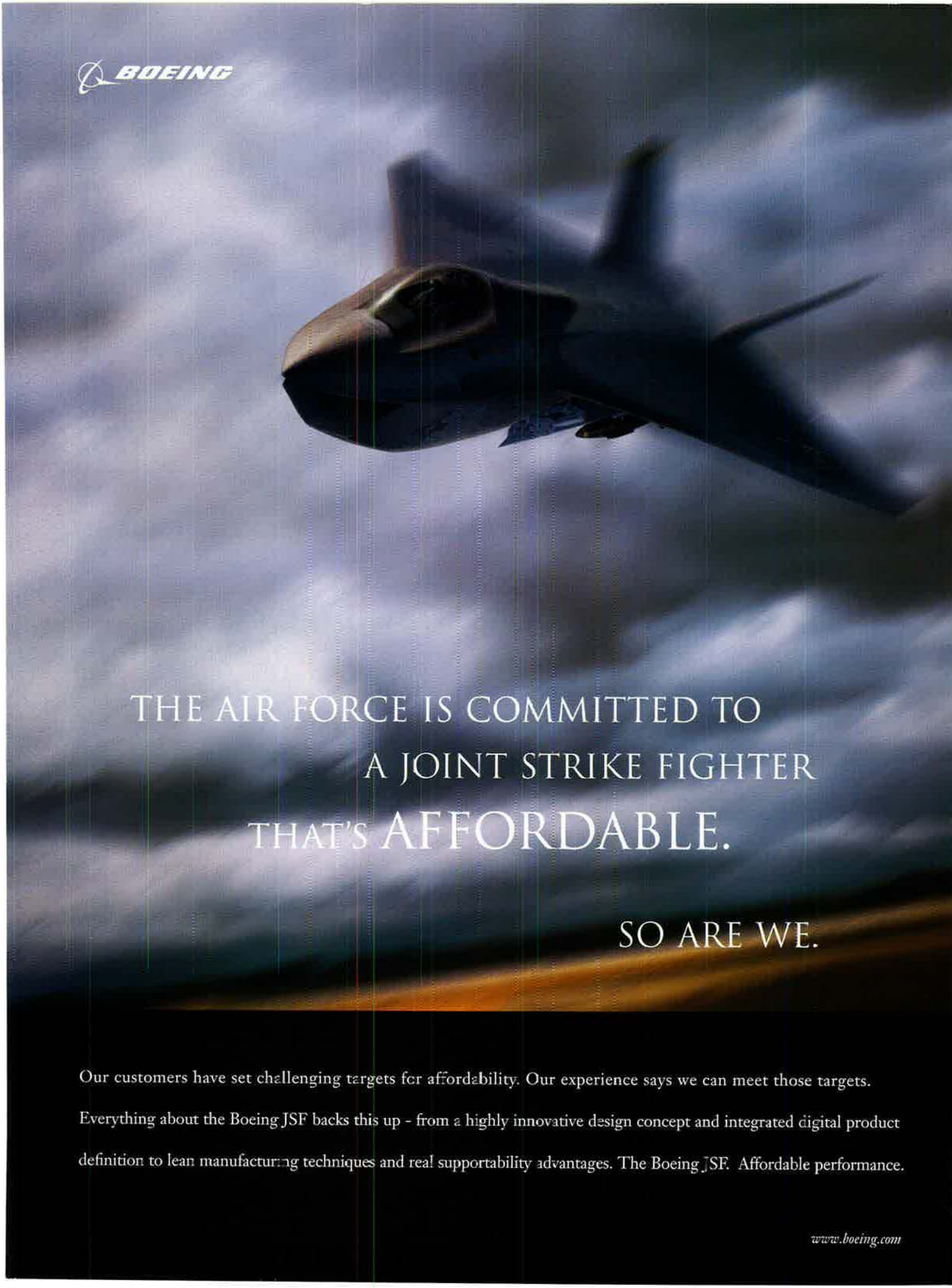
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