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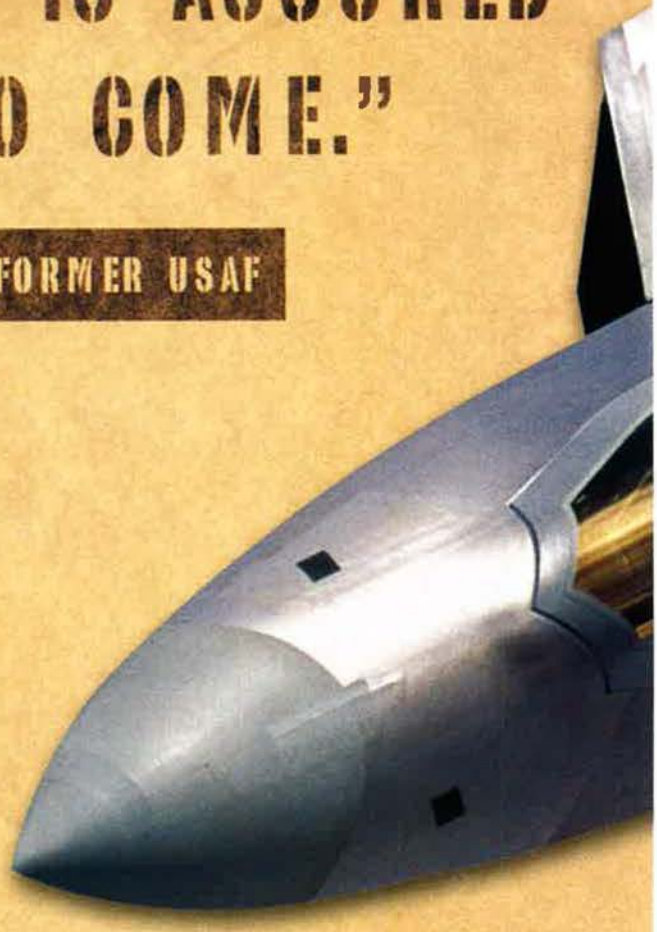

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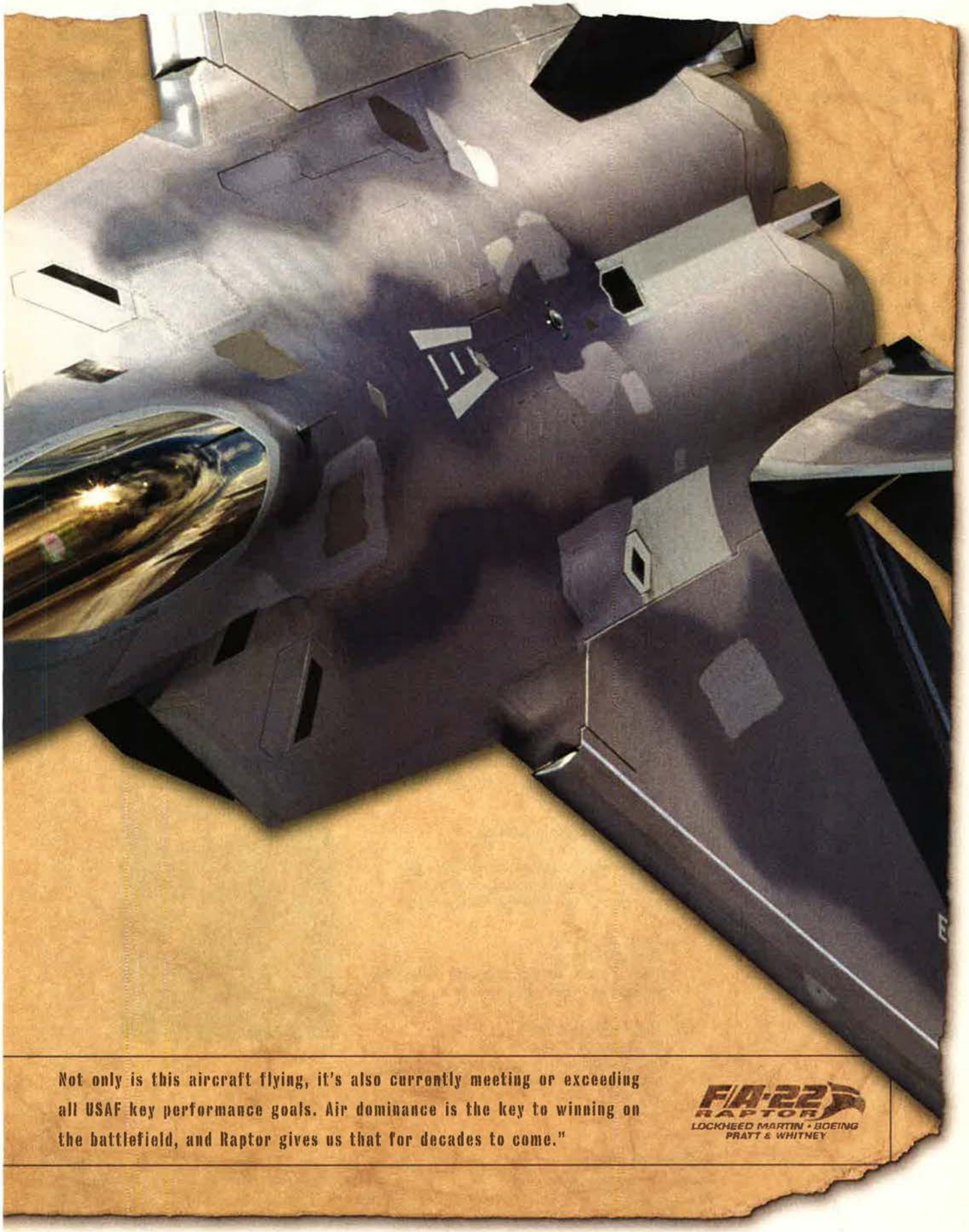

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September 2003, Vol. 86, No. 9

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Editorial

By Robert S. Dudney, Editor in Chief

Framework for Victory

For all practical purposes, the verdict is in: The decisive military factor in Gulf War II was "jointness." It is agreed that the US was able to pulverize Iraqi defenses because air, space, land, and sea forces worked together as never before.

Gen. Tommy R. Franks, the war commander, and Donald H. Rumsfeld, the Secretary of Defense, say US forces did more than simply stay out of each other's way. They achieved true "integration" of their efforts. Victory stemmed from joint power—not any single service.

Franks and Rumsfeld are clearly correct. It has never made sense to assert that one service is more "decisive" than another.

However, this does not mean the debate has ended. New lessons-learned reports regularly appear. (Example: A June 23 paper by the Center for Army Lessons Learned says the war "validated ... the continuing relevance of the Army's heavy forces.") Such analyses are bound to stir new controversies.

These postwar reviews—especially DOD's main report, now in preparation at US Joint Forces Command—are important. Rumsfeld says the JFCOM study "will most certainly affect how the armed forces ... organize, train, and equip for many years to come."

JFCOM's final review may not be out for a while, but some general conclusions about air and space power already can be reached.

For instance, no one seriously questions the enormous value of strategic and tactical airlift or the advantage conferred by air superiority in the most recent war. Likewise, space power is widely recognized as a critical force multiplier, as is the Air Force's unmatched air refueling capability. Stealth proved itself once again.

As for precision guided weapons, all signs are that Iraqi forces took so much damage from the air that they often could not engage US ground forces. "Shooters" dropped 29,199 bombs and missiles, two-thirds of them precision guided. Rumsfeld called it "the most powerful and precise air campaign" ever.

Some believe that the impact of airpower is felt in deeper and even more important ways.

In a new study for the Aerospace Education Foundation, Rebecca Grant, a top airpower analyst, concludes that Gulf War II was "an airpower war." She does not claim USAF won the war. Rather, she reports, airpower created a "framework for victory."

Air and space power set the conditions for success in Iraq.

Airpower, Grant writes, set the conditions for success. It made it possible to: destroy Iraqi air defenses and communications in advance of war; reshuffle, at the last minute, the order of opening attacks; wipe out much of the Republican Guard before US forces came into contact; sustain the war even when the ground force was not moving; and wage simultaneous and very different wars in the south, north, and west of Iraq.

This framework, Grant argues, afforded coalition forces unprecedented flexibility, power, speed, and surprise. It allowed a relatively small coalition ground force to handle potential threats ranging from armor attack and Scud launches to terrorism and oil field sabotage, while opening the way for a rapid advance on Baghdad.

In Senate testimony, Rumsfeld offered his own view of the war's key lessons. He noted (besides jointness) three factors: speed, intelligence, and precision.

He said "overmatching power"—power delivered precisely and at precisely the right moment—is more important than "overwhelming force," and that while the US once defined force in terms of mass—the number of troops on the ground—"mass may no longer be the best measure of power in a conflict."

Rumsfeld's words echo "Joint Vision 2010," a 1996 Joint Chiefs of Staff paper that held that information technology and precision strike—hallmarks of airpower—made it possible to produce the "effects" of mass without actually massing troops and equipment.

Rumsfeld's remarks suggested endorsement of "effects-based operations"—attacks designed not to destroy a target but rather to produce a desired effect. Careful targeting and precision munitions lessened the danger to noncombatants, producing fewer civilian casualties. Today, EBO is largely an airpower domain.

A fundamental difference between Gulf War I and Gulf War II was use of information to dramatically compress the time required for an attack. The infrastructure that made the difference—mobile intelligence-surveillance-reconnaissance systems, powerful and reliable voice and data communications—was provided by air and space forces.

Maj. Gen. David A. Deptula, Air Combat Command's director of plans and programs, and Lt. Col. Sigfred J. Dahl, wrote recently that the wars of the 1990s, and Gulf War II especially, saw "the use of airpower as a distinct maneuver element against enemy ground forces." He predicted more of these "battlefield air operations" in which ground forces will support air operations.

Gen. T. Michael Moseley, the Gulf War air boss, recently concluded his own lessons-learned report, which, according to the various press accounts, noted not just successes but also a number of shortcomings, such as weak battle damage assessment and shortages of electronic bandwidth.

Those specific problems, however, certainly are negligible compared to the magnitude of airpower's contribution to the joint fight in Iraq.

We repeat: This war was won by the Joint Force, not the Air Force. Given different circumstances, airpower might not look as dominating as it did last spring in Iraq. However, it's hard to deny that, in Gulf War II, airpower made it happen. ■







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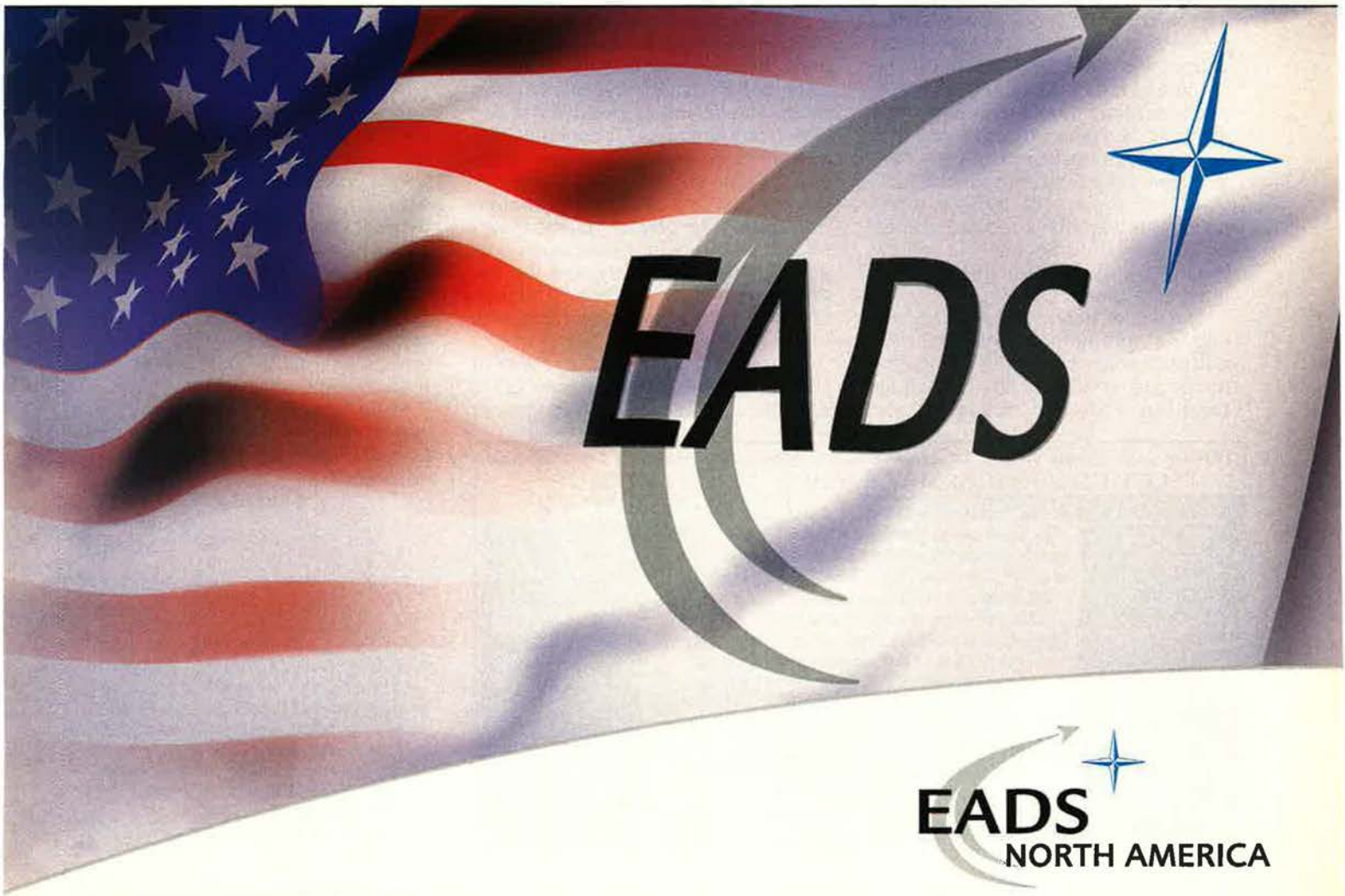

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Letters

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A Cohesive Plan

I read Mr. [John T.] Correll's article about the proposed Civil Service reforms. *[See "Rumsfeld Tackles the Civil Service," July, p. 56.]*

As someone who has served and supervised in both military and Civil Service capacities, I share [Defense Secretary Donald H. Rumsfeld's] concerns about the way present laws encumber personnel management for civilians serving in DOD. At the same time, I gathered the author [believes] Mr. Rumsfeld was racing into a call for reform without a cohesive and executable plan to make it happen, which does concern me.

We need personnel reform in DOD but not just in Civil Service. Unfortunately each component of that personnel system—military, civilian, and contract—developed within their own stovepipes. That separation of standards and expectations is now a source of culture shock as these components are called to share similar obligations, risks, and liabilities. The outcomes are confusion, frustration, and resentment that so little in these systems is standardized. Yes, that type of complexity robs us of ideal and agile responsiveness in the fast-changing climate of today's world politics. It begs for a radical change not only in Civil Service but in how the military and contractors do business as a team.

The issues at stake go beyond putting the right person in the right job and performance incentives. They are numerous, detailed, and also beg for balanced study that staves off rash solutions. There are many inequities and complexities in job classification; how education and training may or may not be conducted; leave and time-off administration; line of duty death or injuries; and disability compensation. There are legal inequities in who can obtain free legal advocacy or defense; rights to due process and privacy; what defines a hostile work environment; complaint management and investigation; and, finally, what defines harassment on the basis of sex, religion, race, age, or physical limitations. I could go on, but I think the point is made.

If we want to demand that so many traditionally diverse elements of our nation's labor resources team up, then we really need a holistic solution that makes the idea digestible and doable for everyone.

Patricia A. Watson
Del Rio, Tex.

Never in the history of our government has such enormous stupidity been exercised and praised as a great thing. The history of the Civil Service is long and complex. Throughout time, sweeping changes have had to be employed in the system to make it as fair and just as possible. The system may be far from perfect, but the rhetoric and changes that have been proposed recently will only take the entire system back in time. It makes absolutely no sense to just throw all that out the window.

First of all, if only 30 percent of federal civilians are in grades GS-7 and below, it's due to the [reductions] that have already been performed and the abolishment of positions all over the government. The fact that 70 percent are GS-8 and above goes to show just how top heavy the government has become.

The next issue is "pay for performance." I completely disagree with this proposed system [and] truly believe it's a total mistake. It's stated as a fact that the best performers love it: Show us how you determined that fact! I certainly was never asked. I receive the highest marks every year on my appraisal, so I believe I am qualified as one of the best performers. In fact, I don't know a single person who's said they support it.

One thing you said is an absolute truth: The union does see all of this as an attempt to bust the unions. They believe it, for that is just what it is. This is an all-out war to throw away employees' rights that were fought for over so many decades.

Joseph Carroll
Ft. Bragg, N.C.

The inane whining and hand-wringing of [union president Bobby L.] Harnage and the American Federation of Government Employees leadership is, unfortunately, typical of those in top positions in today's so-called "labor movement." These commissars have shown repeatedly—most recently with the formation of the Department of Homeland Security—that their narrow and selfish interests are more important to them than national security.

Let's hope Secretary Rumsfeld is successful in protecting our country from its enemies both foreign and domestic.

Lt. Col. Frank Howe,
USAF (Ret.)
Denver

Do you have a comment about a current article in the magazine? Write to "Letters," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. (E-mail: letters@afa.org.) Letters should be concise and timely. We cannot acknowledge receipt of letters. We reserve the right to condense letters. Letters without name and city/base and state are not acceptable. Photographs cannot be used or returned.—THE EDITORS

Views on Mobility

Thank you for a simply outstanding article in the July edition on Air Mobility Command's role in Operation Iraqi Freedom. Your thorough research was evident throughout. *[See "The Squeeze on Air Mobility," July, p. 22.]*

The future security of our nation depends on a robust and responsive defense transportation system. By helping both the public and our leaders understand those requirements, you play a key part in making that security a reality.

Great work!

Gen. John W. Handy,
USAF, Commander,
US Transportation Command
and Air Mobility Command
Scott AFB, Ill.

In the article "The Squeeze on Air Mobility," General Handy stated that if another major contingency (i.e., North Korea) had arisen, AMC would not have been able to handle it. Considering that Operation Iraqi Freedom was fought at a time and place of our choosing, it would seem that decision was irresponsible. Did the Air Force clearly make it known how tight the squeeze was going to be before we commenced hostilities, or did Secretary Rumsfeld simply go ahead and roll the dice?

Sean M. Mallory
Edinboro, Pa.

The Remembered War

As I recall it, President Truman sacked Gen. Douglas MacArthur for advocating a greater war under the Korean "police action." *[See "The Remembered War," July, p. 68.]*

The truth of the matter was that just five years previously, America and her Allies won World War II with the concept of "unconditional surrender."

Since this was so, why did we not win in either Korea or Vietnam? If you consider the Gulf War in 1991 then look at our Operation Iraqi Freedom just several months ago, it seems that history has taken a new turn—what you didn't get the first time, you can get later.

I did not serve in Southeast Asia but I am a Vietnam-era veteran of USAF. I was proud to raise my hand and serve my country. The scars of Vietnam (and Korea) are addressed by what General MacArthur stated with his famous remark: "There is no substitute for victory."

For Korea to be called the "Forgotten War" is to insult every soldier, sailor, and airman who has ever been in combat.

William Reid
Essexville, Mich.

As a member of the 475th Fighter Squadron (433rd Fighter Group) stationed in Korea in 1946, [I found] your article very interesting.

We were part of the occupation troops stationed there at that time. We were scared to death. We had World War II P-51s and P-38s. The Seventh Division had a base outside of Seoul—and that was our defense!

I got home and was asked where I was stationed. I told people "Korea," and they said: "Where is that?" I told them they would hear about it sooner than they wanted because there would be the equivalent of a second Dunkirk, and possibly World War III, there.

The attack on June 25, 1950, as you can tell from above, was not a shock to a lot of people. The United States should have been ready for Korea.

E.G. Parsons
Rockport, Tex.

I have a gripe with the July issue. I am the corresponding secretary of

the USAF Pilot Training Classes 52-G and 52-H Association. There were more 52-G pilots who flew the F-84 Thunderjet as their first operational plane than any other aircraft. Many of us in both classes went to Korea during the last months of the Korean War. Personally, I flew 55 combat missions in the F-84G before the shooting stopped.

In the July issue—with the exception of one picture of two F-84s of the 430th FBS doing a [jet assisted take-off]—F-84s were never mentioned anywhere else in the magazine, except for one sentence on p. 74. The editorial "Why Korea Mattered" *[July, p. 2]*; "The Remembered War" *[p. 68]*; and "Pieces of History: The Workhorse" *[p. 88]* would lead one to believe that the F-86 and maybe the F-82 and F-80 were the only fighters in that war. I think that an examination of the records might show that more fighter-bomber missions were flown in the F-84 aircraft than any other fighter-bomber in the Korean War.

The F-86 was a great airplane that got all the publicity because its air-to-air combat with the MiG-15 was so outstanding. It deserved the publicity, but we flew the down and dirty missions in the F-84 and took a lot of losses early in the war. The North Koreans could rarely move anything in daylight hours without being hit by F-84s or at night by the B-26s. The article states that Gen. [Otto P.] Weyland "would rate the Toksan raid, along with a similar one against the Chasan Dam, as one of the two most spectacular fighter-bomber strikes of the war." I think I am correct that it was an F-84 effort that broke these dams and brought the enemy to getting serious about a truce. I was there on the Chasan mission and took an anti-aircraft hit in the wing. I remember it well.

Not only was the Korean War known as the "Forgotten War," but the F-84 Thunderjet was known as the "forgotten fighter." The F-86A will be displayed in the new Udvar–Hazy addition to the Smithsonian [National Air and Space Museum] but only the Republic XP-84 (forward fuselage only). Other [aircraft of the] Korean War era that can be seen are the B-29, L-19, B-26, AD, F9F, T-33/F-80, F-86A, F-51, T-6, L-5, and F4U, but we didn't rate enough to get more than a cockpit for my grandkids to see. They can see two MiGs, two Messerschmitts, and two Focke–Wulfs, so it's not hard to see why we former F-84 pilots are hurt.

Not to take anything away from the F-86 "workhorse," but it wasn't the only one.

Lt. Col. Randy Presley,
USAF (Ret.)
Mt. Pleasant, Tex.

The 4th Fighter–Interceptor Wing was headquartered at New Castle County Airport, Wilmington, Del., not at Langley AFB, Va.

CMSgt. Ed Blackburn,
ANG (Ret.)
Forest Hill, Md.

■ *Chief Master Sergeant Blackburn is correct.*—THE EDITORS

Nothing is said about Far East Air Forces' only B-29 group at the start of the conflict. You will recall the 19th Bomb Group was based on Guam and was transferred to Okinawa in June or July of 1950 to fly interdiction missions over the Korean peninsula. My records indicate I flew my first combat mission in July 1950 under, to say the least, confusing guidance.

We even flew low-level close air support missions to help the Army. I recall we lost at least one aircraft to ground fire. SAC's bombers did not lend a hand to the war effort until months later.

If there is a history written of the 19th Bomb Group during the Korean War,

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AFA's Mission

To advocate aerospace power and a strong national defense.

To support the United States Air Force and the Air Force family.

To promote aerospace education to the American people.

I'm not aware of it. If not, there should be, as we lost some great guys.

Brig. Gen. Eugene W. Gauch Jr., USAF (Ret.)
Sarasota, Fla.

I was a B-29 pilot with 15th Air Force, 98th Bomb Wing, 345th Bomb Squadron, flying 31 night raids (plus three classified missions) against North Korea from Yokota AB, Japan, starting Jan. 17, 1952, until July 6, 1952. All these combat missions were without fighter support. My brother was an engineer on B-29s flying from Okinawa during this same time period. The 98th Bomb Wing had been flying many sorties before I was assigned there; they continued after I returned to fly B-50s in the States. Therefore I cannot understand [the] statement [in a caption, p. 72], "MiG 15s, however, posed a lethal threat, and USAF soon retired the Superfortess." As far as I know, the B-29s were flying missions against North Korea until the war ended. My B-29 was shot down on the next raid after I completed my tour.

Cecil Davis
Apple Valley, Calif.

■ *The B-29 was retired by the end of 1954. The caption should not have implied that it did not fly throughout the Korean War.—THE EDITORS*

Chicken and the Egg

In *Air Force* Magazine, July, p. 43, "No Pork, No Promotions" *["Verbatim"]* and p. 63, "It Means 'We Didn't Buy Enough' " are the statement and the answer. The operational types have one idea; others in the process do not always agree. Getting the people doing the work the right things at the right time and the right quantity can be a challenge. It is already becoming more interesting, especially for those who are involved in our future and current energy requirements.

Hugh Coleman
Kelso, Wash.

Jet to Jet

The words that accompanied the "Pieces of History" in the July issue *[p. 88]* seemed to say that the first encounter with a MiG-15 was by an F-86A. In fact, the first jet-to-jet encounter was on Nov. 8, 1950, when an F-80C shot down a MiG-15.

G. Robert Veazey Sr.
Wilmington, Del.

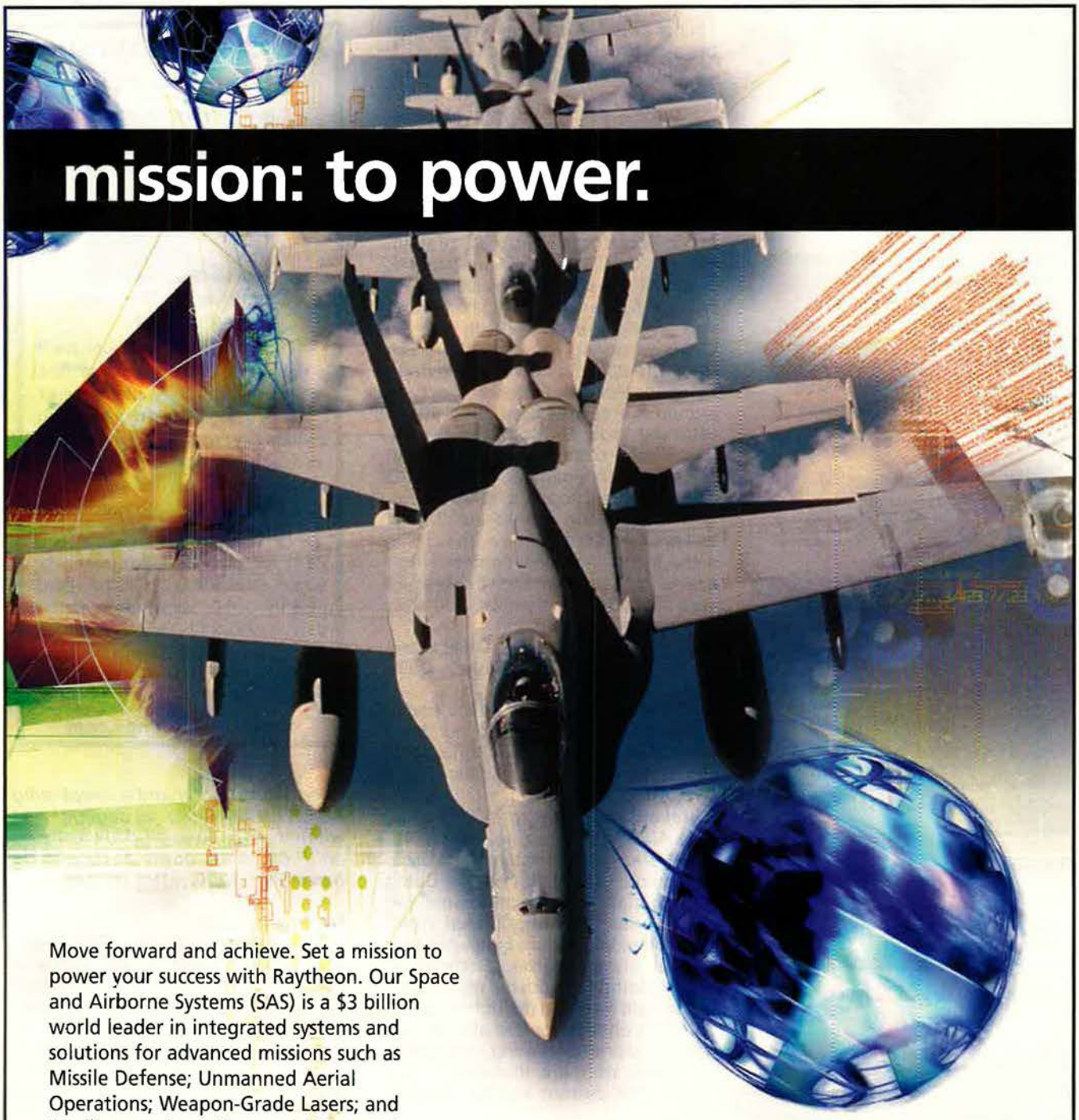
■ *Thanks for your letter, pointing out a possible misreading of the caption. It was intended to relay the first encounter between USAF's first swept-wing fighter and a swept-wing MiG. The first jet-to-jet dogfight was when 1st Lt. Russell Brown, flying an F-80, shot down a MiG-15 in November 1950.—THE EDITORS*

No Dumb Luck

I just finished reading "The Baghdad Strikes" *[June, p. 46]* and was filled with pride over the 49th Fighter Wing's success in getting the job done. I do have one [point]—the certification of the EGBU-27 was not a coincidence or dumb luck. The men and women of the F-117A Combined Test Force worked hard to get what we knew would be an exceptional tool for our warfighting brethren. The F-117A System Program Office and the CTF's engineering staff pressed to get priority scheduling of weapons, aircraft, and range time to complete the certification process. Once Air Combat Command elevated the EGBU-27 to a priority, we completed the accelerated test within three days—a phenomenal response for a weapons test.

This was only one example of accelerated tests that were performed by 412th Test Wing's squadrons in preparation for Operation Iraqi Freedom.

SMSgt. Rich Dobbin
Rosamond, Calif.



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Washington Watch

By John A. Tirpak, Executive Editor

Bombers in the Spotlight; Rumsfeld and the Reserves; the Boeing Case ....

BUFFs and Bones

Heavy bombers, among the most successful weapons in Gulf War II, are back in the spotlight. There are concerns about the fleet's size and longevity.

Two primary issues have surfaced. First, the Air Force has decided to reconsider the question of putting new engines in its venerable B-52H bombers. USAF earlier had said no. Second, lawmakers want the service to bring back some of the B-1B bombers it just retired in a cost-saving move.

Seven years ago, the Air Force considered the B-52 re-engining option but dropped the idea as it retooled its long-range bomber roadmap. At the time, officials thought putting new power plants on the 41-year-old bomber would cost too much when compared to marginal gains in fuel efficiencies and reduced maintenance.

A recent Defense Science Board report recommended that the Air Force take a second look at that earlier decision. The DSB found that the service had underestimated the maintenance savings that would result from re-engining the BUFF fleet.

In its 1996 analysis, the Air Force had looked at replacing the B-52's eight engines with four commercially derived turbofans. Now, say service officials, there could be substantive performance benefits from going to a newer eight-engine configuration that would enable the bomber to take off from shorter runways, climb faster, and carry a heavier payload.

The Air Force expects to complete a new re-engining study effort and define the program cost sometime this fall.

Meanwhile, service officials are in a quandary about the B-1B bomber. Two years ago, USAF announced the retirement of 32 B-1Bs to free up enough money to fund upgrades and spare parts for the 60 remaining B-1Bs. Now, some or all may return to active service.

Rep. Duncan Hunter (R-Calif.), chairman of the House Armed Services Committee, inserted $20 million in the Fiscal 2004 defense authorization bill to start the process of bringing back to service 23 of those 32 B-1Bs. The measure passed the full House on July 8.

The committee noted that the B-1B was "crucial to the success of recent combat operations." The panel further maintained that long-range strike capabilities are "critical" when access to overseas bases is limited or under political threat.

However, the Air Force dispatched only a handful of B-1Bs to Operation Iraqi Freedom, and, while they performed well, service officials said there was no need to use all that were in the theater. Officials also noted that $20 million is not nearly enough to support the return of 23 aircraft. The Congressional action, they added, would leave the service with an unfunded mandate which could be fulfilled only with additional appropriations totaling more than a billion dollars.

The Senate's version of the defense bill did not include a B-1B buyback.

USAF photo by SSgt. Charlene Franken

A B-52 and B-1Bs—stars of the wars.

Rumsfeld Rethinks the Reserves

In early July, service leaders in Washington got orders to rethink how and when they employ National Guard and Reserve forces. Defense Secretary Donald H. Rumsfeld told them in a July 9 memo that the current capabilities balance between active and reserve components is "not the best for the future." He wants change.

Half a world away, President Bush declared, responding to a reporter in South Africa, "We won't overextend our troops, period."

Many lawmakers are worried about possible overuse of US forces—particularly in regard to Guard and Reserve forces.

Several US Senators, returning from a visit to Iraq, predicted a very long stay for American troops. Sen. Carl Levin (D-Mich.), ranking member of the Senate Armed Services Committee, asserted that US forces were "stretched very thin." The committee chairman, Sen. John Warner (R-Va.), did not go that far, but he did say that, while US forces overall are at levels "able to carry out the missions ... we must look very prudently when we ask more of them."

Rumsfeld's directive puts him somewhat at odds with 30 years of Total Force policy, which had long called for mobilization of large numbers of reserves in the event the US conducts a major operation. This was a deliberate move, taken in the wake of Vietnam, to make sure that the US public would be engaged in decisions about any future war. After the end of the Cold War, moreover, the Pentagon emphasized a growing reliance on reserve forces and, during the downsizing of the 1990s, shifted some duties from the active forces to the reserves.

At issue, as well, is whether the new direction would inevitably bring about an increase in active duty end strength, something Rumsfeld has steadfastly opposed.

In his memo, Rumsfeld declared that he wants to limit

USAF photo by MSgt. Michael E. Best

Now hear this: Active-reserve balance must change.

involuntary mobilizations of individual reservists to "not more than one every six years." Moreover, he wants to ban any involuntary mobilizations in the "first 15 days of a rapid response operation."

Rumsfeld instructed Pentagon leaders to give reservists "meaningful work" that cannot be accomplished by other "readily available" manpower. He also wants reserves to remain on active duty "only as long as absolutely necessary."

The Pentagon chief called execution of these measures "a matter of utmost urgency."

Rumsfeld asked each service to produce, by July 31, an assessment outlining its plans to correct imbalances between active and reserve forces and to reduce dependence on reserves in early deploying units. He pointed specifically to capabilities that reside exclusively or predominantly within the reserves and that have been in high demand for the war on terrorism.

The Air Force, which is considered the service model for the Total Force policy, believes it already has about the right balance of active to reserve forces. However, service officials do admit to some problems. For instance, the US military's only EC-130 Commando Solo psychological warfare aircraft unit—a high-demand capability—falls under the Air National Guard. (See "Total Force in a Search for Balance," p. 32.)

The Boeing Case

The Air Force has punished Boeing in ways that will cost the company about $1 billion in lost business and penalties. This is a result of what the service called "serious violations" of contracting rules that occurred during the Evolved Expendable Launch Vehicle competition in October 1998. The sanctions could threaten Boeing's survival in the space launch market.

Peter B. Teets, undersecretary of the Air Force, announced the penalties at a Pentagon press conference July 24.

Teets said a service investigation found that some Boeing officials possessed 25,000 pages of stolen Lockheed Martin EELV proprietary information. That information could have helped Boeing win the lion's share of the first EELV contract, he said.

Moreover, maintained Teets, "Boeing was not forthcoming with the Air Force about the amount of Lockheed data in its possession, and it took approximately four years for them to provide us with all of it."

Teets declared that three Boeing divisions and three Boeing employees were suspended from doing business with the government for an "indefinite" period. He also said DOD would transfer to Lockheed Martin seven EELV contracts previously awarded to Boeing. Teets granted Lockheed Martin permission to establish a launchpad capability at Vandenberg AFB, Calif., providing $200 million in Air Force funds to help it do so. (After the original competition, Lockheed decided that it was not worth the investment to develop a launch capability at Vandenberg.)

The case is not closed. Teets noted that the Justice Department has opened a criminal investigation into the case and that Lockheed Martin has launched a civil suit.

Boeing CEO Philip M. Condit, in a written statement, apologized for the company's actions and said that, while the company is "disappointed" by the Air Force action, Boeing understands the service's position that "unethical behavior will not be tolerated."

Teets acknowledged he is "concerned" that the stiff

Photo by Carleton Baillie © The Boeing Company

Boeing's Delta IV EELV. Sanctions may hurt.

sanctions might drive Boeing from the launch services market. However, he said, the Air Force cannot "tolerate breaches of procurement integrity" and must "hold industry accountable for the actions of their employees."

Teets explained, though, that one of his highest priorities as DOD's top space executive is to ensure the nation has "two healthy families of launch vehicles" to maintain assured access to space. Because of that, he said the structure of the penalties will enable Boeing to continue competing for new launch business.

If Boeing demonstrates that it has moved quickly and decisively to curb unethical practices in its rocket business, Teets said, the Air Force can lift the suspensions—possibly in as little as 60-90 days. That would mean Boeing could compete, later this year, for the next round of 15 to 20 EELV launches.

However, Teets said, if Boeing fails to "respond strongly" and show its serious intent to fix its corporate culture, the suspensions could become debarments.

Perry: North Korea an "Imminent Danger"

North Korea's nuclear weapons thrust has created a crisis which could result in war only a few months from now, according to former Defense Secretary William J. Perry.

Perry drew attention from all quarters when he told the *Washington Post* in a July interview, "The nuclear program now under way in North Korea poses an imminent danger of nuclear weapons being detonated in American cities." Later, on PBS's "Newshour With Jim Lehrer," Perry explained that he referred not to a North Korean nuclear missile attack but to a suitcase-type nuclear bomb that North Korea would either dispatch itself or sell to a terrorist group bent on attacking America.

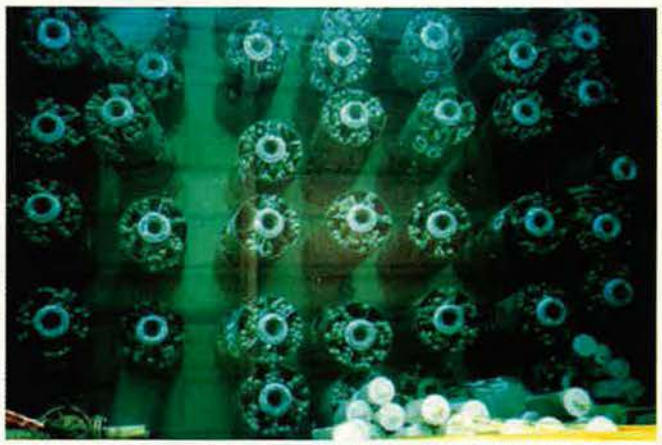
In July, North Korean officials claimed Pyongyang had reprocessed 8,000 nuclear fuel rods into plutonium—enough for a half-dozen nuclear weapons.

Chinese intelligence officials confirmed that reprocessing was under way, but they estimated a lower number of rods than claimed by the North Koreans. US intelligence reported that Krypton-35—a gas by-product of fuel rod reprocessing—had been detected near the demilitarized zone and probably emanated from a previously unknown facility.

As Defense Secretary in the Clinton Administration, Perry oversaw plans for air strikes on North Korean nuclear facilities during a standoff on its weapons program. Clinton opted instead to cut a deal that provided North Korea with aid, including nuclear power-generation technology, in exchange for North Korea's assurances that it would halt its weapons program. Last year, Pyongyang announced it had gone ahead with its nuclear weapons program.

Perry said that Bush should engage in direct talks and "coercive diplomacy," which he defined as negotiation "backed up by a credible threat" of military action.

Bush has consistently said that a nuclear-armed North Korea is "unacceptable" but that the US would prefer a multilateral solution to the situation, which the Administration refuses to describe as a "crisis." Three-way talks have taken place between North Korea, China, and the US, but the talks have not proved productive.



AP photo/Yonhap

Will spent fuel rods lead to "detonations" in US cities?

The ABL Meets the Physicists

USAF's Airborne Laser probably will work against liquid-fueled theater-range ballistic missiles, but its prospective use against ICBMs, particularly those having solid propellants, could be much less successful, according to a report of private experts that was released in Washington in July.

The finding was part of a 400-page technical report prepared by the American Physical Society, a group of 40,000 physicists. The report identified a number of technical challenges within the Administration's proposed missile defense program that now includes the ABL.

The report, which dedicated about 80 pages to the ABL issue, found an audience on Capitol Hill, and lawmakers pressed the Missile Defense Agency for a thorough response.

MDA said the report was under review and would not comment on it directly, except to say that MDA officials believe the current boost-phase architecture is sound and that the missile defense program is "headed in the right direction."

MDA declared that it would conduct a thorough review of boost-phase progress and problems by December, "before any investments are made in a development activity." Agency officials emphasized that they "continue to believe that boost-phase technology has great potential for playing a vital role in a layered missile defense."

The Airborne Laser was intended originally only to shoot down theater missiles as a means to protect US and allied forces during overseas operations. (See "Setting a Course for the Airborne Laser," p. 46.) The ABL still enjoys support on Capitol Hill.

The physicists believe that the ABL can perform its original mission—that is, it likely will work against short-range, liquid-fueled rockets, if the ABL achieves projected power levels with its high energy laser. However, they maintain that distance to the target is critical. If the distance is too great (more than 372 miles on the ground), they say, the laser's power will fade, causing the ABL to have to focus the laser on the target for longer periods of time to achieve a kill.

A longer attack duration will use more laser fuel—reducing the number of shots the ABL can make and the number of targets it can engage. The report concluded that the ABL, to counteract the range problem, would have to orbit very close to enemy territory, putting it at risk from attack by enemy air defenses.

The physicists argue that solid-fueled ICBMs present an even greater challenge. There are two main obstacles: the ICBM's tougher "skin" and greater speed.

The ABL works by heating up a missile's skin and causing its fuel tank to rupture. Thus, say the physicists, it would be less effective against a solid-fueled booster, which has a stronger body to withstand its own internal fuel combustion. They estimate the ABL would need to be within about 190 miles (ground range) to be effective against a solid-fueled ICBM.

Solid-fueled rockets also fly faster than liquid-fueled rockets and over longer ranges. The targeting task would be much more difficult and require much more precision, said the report.

Patrick P. Caruana, an executive with Northrop Grumman, which is a principal ABL contractor, told *Air Force* Magazine that targeting is an issue, but it is a manageable one.

He pointed out that a related program, the Army's Tactical High-Energy Laser, has proved effective against live-fire incoming artillery shells. "And that's not a thin-skinned fuel tank," said Caruana. "That's a stainless steel casing."

Northrop Grumman determined, after much research, that there was a vulnerable point on the artillery shell. The THEL was able to maintain the laser on that point and destroy the artillery shell.

However, the shell was tracked and lased at fairly close range. ■


C-17


F-15


F-16


F/A-22


F-35


767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EA-6B


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Aerospace World

By Adam J. Hebert, Senior Editor

F/A-22 Software Gets Thumbs-Up

The Air Force recently met a Pentagon-imposed requirement that F/A-22 software reliability improve to 20 hours between system restarts. As a result, the Defense Acquisition Board gave the software a thumbs-up. Then it imposed a stiffer goal.

Last February, the new fighter's software needed a restart every two to three hours. By July, the reliability rate had improved to 21.2 hours.

However, the software that will be used for a data link between four fighters and for the Joint Tactical Information Distribution System still requires improvement, said Maj. Gen. (sel.) Richard B.H. Lewis, USAF's program executive officer for fighters and bombers.

The new goal levied by the board incorporates a more demanding software reliability metric. The new metric measures restarts in conjunction with subsystem resets and hardware failures. It is known as the "mean time between avionics anomaly" rate, or MTBAA rate. In July, that rate was about five hours.

USAF photo by TSgt. Justin D. Pyle

An HH-60 Pave Hawk from the 56th Rescue Squadron, NAS Keflavik, Iceland, lines up for refueling from an MC-130 Combat Shadow, with the 352nd Special Operations Group, RAF Mildenhall, UK, following a July 28 mission in Liberia. Various USAF forces were deployed to provide airlift and security.

Congress Reviews Tanker Lease

USAF on July 11 sent Congress its report on the proposed lease of 100 Boeing 767s to be modified for use as aerial refueling aircraft. The report said that leasing will cost about one percent—roughly $150 million—more than buying tankers outright but that it will provide new aircraft sooner.

Service leaders consider time to be the critical factor. Ninety percent of USAF's refueling capability currently resides in KC-135s that average 43 years in age. These older aircraft are becoming costly to maintain, said USAF, and there is an "increasing probability" the fleet could "encounter a fleet-grounding event, crippling our combat forces."

The lease would provide 60 aircraft by 2009 and all 100 by 2011. Under a standard purchase, the first aircraft would be delivered in 2009 and the remainder by 2016—at least five years later than with the lease.

In the 2002 defense appropriation bill, lawmakers authorized the service to undertake a lease arrangement for up to 100 767s, despite criticism from some—most notably Sen. John McCain (R-Ariz.). The 2003 defense authorization bill called for authorization and appropriation of funds or a request for new-start funds before USAF could enter into the lease.

The lease plan submitted by the

USAF Drops "EAF," Goes With "AEF"

The Air Force has officially stopped using the term "Expeditionary Aerospace Force," or EAF, to refer to its expeditionary organizational concept. Supplanting EAF is the acronym AEF, currently defined as "Air and Space Expeditionary Force."

Top Air Force leaders with great fanfare rolled out the EAF concept in 1998, holding a press conference to do so. In 1998, EAF was described as the overarching concept that employed, as its operating structure, 10 AEFs (or air expeditionary forces) made up of a cross-section of active, Guard, and Reserve personnel, units, and weapons from around the Air Force.

Over time, EAF fell into disuse. Then came a little-noticed change to Air Force Instruction 10-400, "Aerospace Expeditionary Force Planning," issued on Oct. 16, 2002. The instruction's glossary included this information: "Expeditionary Aerospace Force (EAF)—No longer used—'Aerospace Expeditionary Force (AEF)' replaces all references to 'Expeditionary Air Force (EAF).' "

The 2002 instruction, however, is itself already out of date. Air Force leadership no longer uses the term "aerospace," preferring to use "air and space." Hence, the new formulation: Air and Space Expeditionary Force.


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Fleet Viability Board To First Evaluate C-5A

The Air Force has charged its new Fleet Viability Board, which begins work this month, with the complex task of objectively determining the collective health of USAF's older aircraft. The first order of business will be a look at the health of the C-5A Galaxy airlifter.

There are currently 76 older C-5As in the C-5 fleet. They first entered service in 1969.

The new board was the brainchild of Air Force Secretary James G. Roche, a retired Navy officer. Roche decided that USAF should adopt a system akin to the Navy's 100-year-old process for determining whether a ship continues to be seaworthy.

Roche and other Air Force leaders realized earlier this year that the service did not have a definitive process to determine whether an aircraft should remain in service.

According to Maj. Gen. (sel.) Elizabeth A. Harrell, Air Staff director of maintenance, the service needed a definitive, repeatable process for determining the health of such aircraft. Harrell said one challenge facing the new board is to balance the competing concerns of the logistics and operational communities. Logisticians might favor safety and supportability in evaluating aircraft, but operators might emphasize the need to keep an aircraft in service.

Consequently, board recommendations will go directly to the Secretary of the Air Force and Air Force Chief of Staff.

After the service reaches a conclusion on the health of the C-5A airlift fleet, the board next will focus on the E-8 Joint STARS aircraft.

Air Force already has passed three of the four Congressional committees that must approve the deal. The fourth, the Senate Armed Services Committee, was slated to hold a hearing on the lease this month.

Bush Forwards Roche Nomination

Months after announcing his intent to do so, President Bush on July 7 formally nominated Air Force Secretary James G. Roche to be the next Secretary of the Army.

The Senate was expected to consider the nomination this month.

Several Senators, including Sen. John McCain, have criticized Roche for his handling of the sexual assault allegations at the Air Force Academy. However, even Sen. Wayne Allard (R-Colo.), the leading critic of USAF's handling of the academy sex scandal, has said he supports Roche's efforts to overhaul academy policies.

The Army position came open in May when Defense Secretary Donald H. Rumsfeld forced out Army Secretary Thomas E. White, with whom he had numerous philosophical differences. (See "Washington Watch," August, p. 7.)

Air Force Removes Stop-Loss

USAF officials on July 23 released the last of the career fields still held under the most recent Stop-Loss order. The Air Force had enacted the order in early March to stop active and reserve personnel in selected fields from leaving the service during Operation Iraqi Freedom.

The order initially covered 43 officer and 56 enlisted specialties. After President Bush on May 1 announced the cessation of major operations in Iraq, the service released more than half those career fields. The July 23 order released the rest.

USAF Names Top 12 Airmen

The Air Force on July 10 announced the 12 Outstanding Airmen for 2003. The 12 will be recognized at the Air Force Association's 2003 National Convention in Washington, D.C., and will serve on AFA's Enlisted Council.

The selectees and their assignments at the time of the award were: SMSgt. Thomas O. McConnell, 39th Wing, Incirlik AB, Turkey; MSgt. Douglas A. Ackerman, 726th Air Mobility Squadron, Rhein–Main AB, Germany; MSgt. Keith D. Finney, 51st Civil Engineer Squadron, Osan AB, South Korea; TSgt. James H. Coffey III, 50th Security Forces Squadron, Schriever AFB,

Task Force Finds 22,277 Possible Conversions

An Air Force task force has identified 22,277 uniformed members performing jobs that could be done by civilians. The task force is part of the service's effort to identify efficiencies that could help it meet post-9/11 manpower demands.

Defense Secretary Donald H. Rumsfeld directed each service to review its force structure for personnel and technology efficiencies. He has steadfastly refused to consider end strength increases until all other avenues are examined.

The Human Capital Task Force Report, approved by the Secretary of the Air Force and Chief of Staff, identified many such efficiencies. However, converting them would require hiring roughly 14,000 new civilian employees. As yet, Pentagon leaders have not guaranteed that they will fund any new civilian employees, even if the move would free uniformed members to shift to core military work. But even before the war on terror began, the report noted, "Manpower was 'stressed.' Estimates of additional manpower requirements ranged as high as 10,000."

"At the most basic level," the report stated, the Air Force "has a content/skills mix problem. Resolving this problem determines whether or not we have an end-strength problem."

The task force identified 16 initiatives to correct the workforce imbalances, but "workforce substitution"—civilian for military—will cost about $5 billion through Fiscal 2009.

Some changes have been made. For example, to meet its post-9/11 force protection demands, the Air Force has increased the number of personnel headed to the security field. "We knew we had a security forces problem—that's pretty obvious," noted William H. Booth, senior civilian in the Air Force manpower and organization office. The service is working on 3,700 realignments right now, said Booth. However, two-thirds of them are going to fields other than security forces.

So far, the Air Force has been unable to obtain money from DOD to pay for such changes and will have to pay for much of the realignment out of existing funds. USAF officials are concerned that, if they convert the 22,277 military positions to civilian posts, DOD might simply zero out the military positions and not shift them to other highly stressed fields.

"If you gave me $100 million to buy civilians," Booth said, "I'd move $100 million worth of military into stressed [Air Force specialty codes] tomorrow."

Instead, the service is taking a phased approach to the changes. The cost of the next 1,000 realignments was added to the Fiscal 2005 budget plan, with the hope that the shift will be approved and signed into law, setting a precedent. The next goal is to realign 7,000 new positions in the 2006 budget.

Colo.; TSgt. Tara A. Marta, 932nd Air Control Squadron, NAS Keflavik, Iceland; TSgt. Kevin D. Vance, 17th Air Support Operations Squadron, Hunter Army Airfield, Ga.; SSgt. Omar Ali Abed, 37th SFS, Lackland AFB, Tex.; SSgt. Jason R. Blodzinski, 23rd Special Tactics Squadron, Hurlburt Field, Fla.; SSgt. Christopher D. Tuck, 325th Contracting Squadron, Tyndall AFB, Fla.; SrA. Hector G. Bauza, 18th Medical Group, Kadena AB, Japan; SrA. Nathan H. Summers, 317th Aircraft Maintenance Squadron, Dyess AFB, Tex.; SrA. Harold J. Tolbert II, 9th Civil Engineering Squadron, Beale AFB, Calif.

GAO: Strykers Will Overtax Airlift

Transporting the Army's fledgling Stryker brigades will take longer than planned and under some circumstances could tie up a third of the Air Force's strategic airlift fleet, according to a new report from the General Accounting Office. The Army set a goal of being able to deploy a Stryker brigade anywhere in the world within four days.

GAO, the Congressional watchdog agency, claims the task may take 14 days, depending on the location, and require use of more than 30 percent of USAF's C-17 and C-5 airlifters.

The Strykers—smaller and lighter than Abrams tanks or Bradley fighting vehicles—are a key component in the Army's plans to transform itself into a lighter, more mobile force. Each Stryker brigade will comprise roughly 3,600 soldiers and 1,000 vehicles—300 of which are Strykers.

The Army maintains it would only deploy about a third of a brigade by air—using USAF C-17s and C-5s. The rest would travel by sea.

In its response to the GAO report, DOD said it intended to keep the four-day worldwide deployment goal, which it called a target rather than a standard.

Global Hawk Led Eyes Over Iraq

The Air Force's RQ-4A Global Hawk unmanned aerial vehicle generated 55 percent of the targeting data used to destroy time sensitive targets in Iraq during Gulf War II, said Maj. Gen. Joseph P. Stein, director of aerospace operations for Air Combat Command.

Global Hawk enabled the service to shorten the "kill chain"—the time it takes to find and destroy a target. The time required to pass intelligence from the UAV to Stateside analysts and back to "shooters" over Iraq sometimes dipped under 10 minutes.

Imagery from the UAV led to the destruction of 13 surface-to-air mis-

US Raids Hit 18 US Companies

The Departments of Defense and Homeland Security announced in July they had raided the offices of 18 US companies for allegedly supplying military equipment that was bound for Iran, in violation of the Arms Export Control Act.

The investigation was spread over 10 states and centered on a London-based company, Multicore.

According to DHS, the export control items included components for Hawk missiles, F-14 Tomcat fighters, F-4 Phantom fighters, F-5 Tiger fighters, C-130 airlifters, military radars, and other equipment. The investigation dates to 1999, when a look at Multicore revealed that F-14 parts were being purchased for shipment from California to Iran, via Singapore. A 1999 raid of Multicore's Bakersfield, Calif., office yielded documents showing that parts had come from a host of US companies.

According to the Associated Press, the US companies raided were: Aerospace Technologies Intl., Boulder, Colo.; Alamo Aircraft, San Antonio; Assorted Hardware, Wichita, Kan.; Brandex Corp., Sunrise, Fla.; Continental Industries, Hinsdale, N.H.; Centerfield Pump, Tomball, Tex.; DG Air Parts, Jacksonville, Ore.; Harry Krantz Co., Garden City Park, N.Y.; Instrument Associates, Port Washington, N.Y.; Instrument Support, Holbrook, N.Y.; Island Components Group, Bohemia, N.Y.; Jay Tex Inc., Mount Pleasant, Tex.; Jet Midwest, Kansas City, Kan.; Orion Intl., Charleston, S.C.; Quintron Aircraft Parts, Waukesha, Wis.; Space Age Supply, Crowley, Tex.; Sunrise Helicopter, Spring, Tex.; and Talon Aviation, Lake Charles, La.

USAF photo by SSgt. Aaron D. Allmon II

A Connecticut Air National Guard A-10 stands by for a close air support call during a recent joint exercise in Nevada.

As Time Went On, A-10s Dominated CAS Mission

The 110th Fighter Wing, a Michigan Air National Guard unit that flew A-10s out of Talli A r Base in Iraq during Gulf War II, found that ground commanders grew to love the Warthog during the war. They said that early requests for close air support aircraft tended to be generic, but, by the second week, commanders asked specifically for A-10 support.

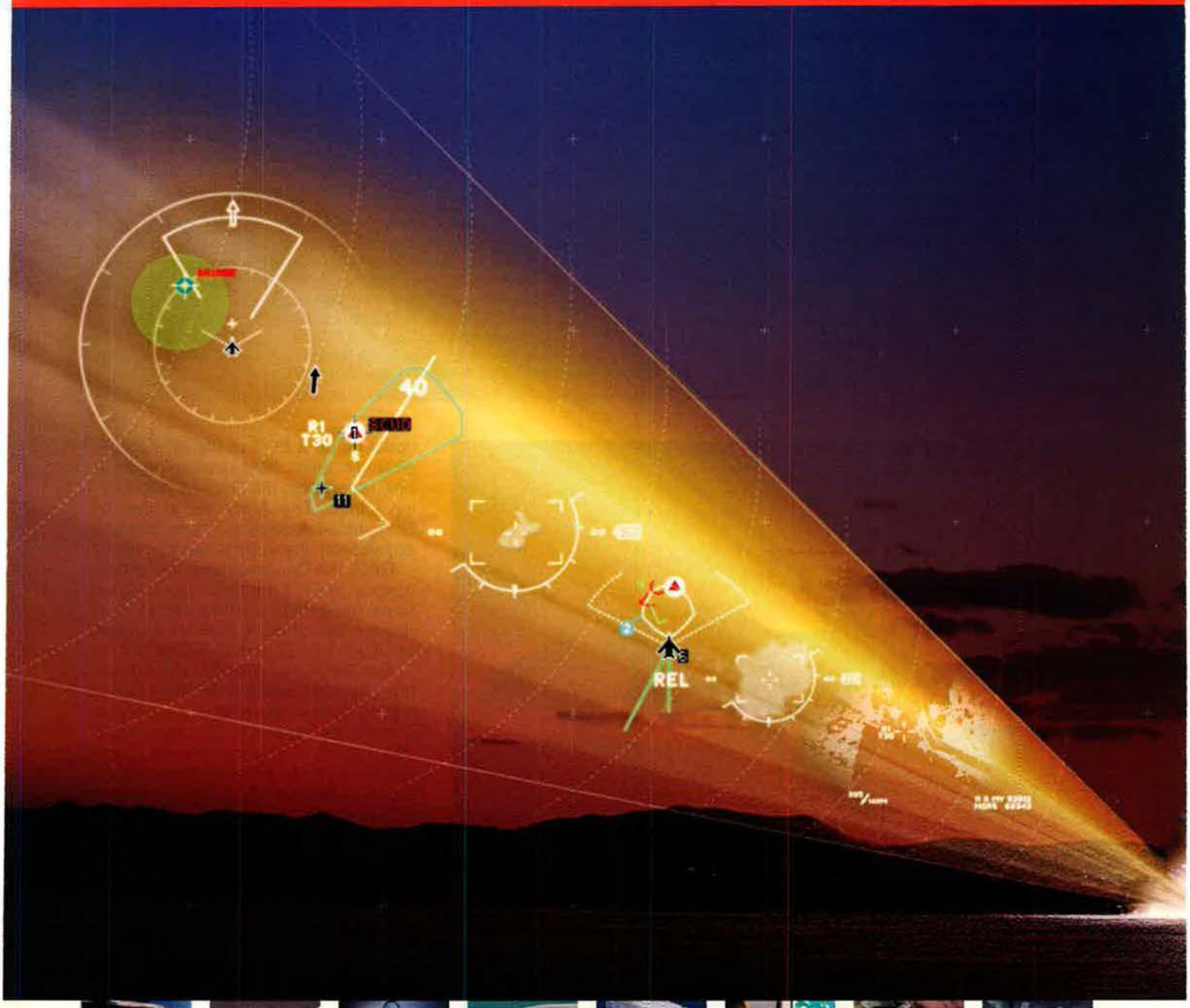
Up to 90 percent of the CAS requests identified A-10s as the aircraft of choice, the wing officials said at a July 16 Pentagon briefing.

A-10 units train for CAS constantly, said Lt. Col. Dave Kennedy. While other aircraft, even B-52s, can perform close air support for ground units, it "takes time" for pilots not trained in the mission to master CAS.

The A-10's durability proved to be an asset during the low-level CAS runs. In one 24-hour span, three Warthogs were hit by Iraqi fire, but only one went down, and no pilots were killed.

Maj. Jim Ewald, whose A-10 was hit by a surface-to-air missile over western Baghdad, said he was able to fly his crippled aircraft 30 to 40 miles to a safe area, before one engine failed completely and he had to "punch out." Ewald was quickly recovered by an Army unit that saw his airplane go down.

Precision Engagement










Access

AIM-9X
AMRAAM
ALR-67 (V)3
ALR-69
ALE-50
HARM

Locate

ASARS-2
Global Hawk Sensors and Ground Segment
Space Based Radar
HARM Targeting System

ID

APG-79 AESA
APG-73
APG-63 (V)1
APG-63 (V)2
APQ-181

Track

AAS-52 Multispectra Targeting System
ASQ-228 Advanced Targeting FLIR
AAQ-16
AAS-44

Navigate

MAGR 2000
GPS Digital AE
Raptor GEAM
Lightning Strike SAASM
GAINS
DAGR

Communicate

SADL
CEC
Radar link
GBS
EPLRS
AT3

Attack

Tomahawk
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sile batteries, 70 SAM transporters, and 300 tanks, said Stein.

Global Hawk's success prompted Army Gen. Tommy R. Franks, then commander of US Central Command, to tell lawmakers that DOD planned to add "laser designation and delivery of precision weaponry" to the RQ-4. That testimony appeared to be news to the Air Force.

According to *Aerospace Daily*, the service said no such plans exist. USAF has "no plans to weaponize Global Hawk now, or in the future," the *Daily* quoted from a written response to a query.

Belgium Mends War Crimes Law

Belgium's new government changed a controversial war crimes law that allowed charges to be brought against officials with no connection to Belgium. The 1993 law had been used to charge officials such as President Bush, British Prime Minister Tony Blair, and US Defense Secretary Donald Rumsfeld with war crimes.

Belgium amended the law to limit its use to charges against Belgian citizens and residents.

Continued on p. 25

News Notes

By Tamar A. Mehuron, Associate Editor

■ USAF presented Airman's Medals July 14 to eight service members who risked their lives to help soldiers injured in 1994 when an F-16 collided in midair with a C-130, then crashed at Pope AFB, N.C., and skidded into a parked C-141 and a large crowd of paratroopers. Twenty-four soldiers died and about 100 were injured. Airmen receiving the medal were: Capt. Lori E. Katowich; retired CMSgt. Thomas R. Bridgers; retired SMSgts. John J. White, Eric Truesdale, John P. Elskamp, and Michael E. Hyers; MSgt. Robert G. Miller; and retired TSgt. Robert F. Baker.

■ The Senate on July 31 confirmed Air Force Gen. Richard B. Myers for a second two-year term as Chairman of the Joint Chiefs of Staff. His first term began on Oct. 1, 2001.

■ The Administration wants to eliminate the current requirement that a former POW must have been detained for at least 30 days to qualify for full POW benefits. The change recognizes the short duration of current operations such as Gulf War II.

■ The Senate on June 30 approved a change in the Presidential line of succession. The aim was to better prepare the nation for a possible catastrophic attack in Washington. Pending approval in the House, Homeland Security Secretary Tom Ridge would move from 18th up to eighth place. The line of succession established in 1947 ranks Cabinet members according to the date their offices were created.

■ Edward C. Aldridge, recently the Pentagon's top acquisition official, became a Lockheed Martin board member on June 26.

■ The RAF on June 30 received its first Eurofighter—about five years after originally planned. Developed jointly by Britain, Germany, Italy, and Spain, the aircraft program suffered years of delays because of political and technical problems.

■ The Air Force version of the V-22 Osprey, the CV-22, on July 14 flew for the first time in more than two years. The aircraft flew at Edwards AFB, Calif., with a reconfigured tail and antenna attachment.

■ Air Force Undersecretary Peter B. Teets, DOD executive agent for space, approved the Space Based Radar program's initial concept definition phase during a July 10 Defense Space Acquisition Board meeting. Studies conducted during this phase will focus on cost factors and cost/performance trades across SBR system concepts.

■ A six-month Pentagon study shows that DOD's large-scale smallpox vaccination program produced few adverse effects. From Dec. 13, 2002, through May 28, 2003, DOD administered 450,293 vaccinations. The number of adverse reactions was below historical rates.

■ The 2003 promotion rates to master sergeant and technical sergeant were down compared to last year. USAF said that the rate for masters was 25.56 percent, down 7.67 percent, and for techs was 21.89 percent, down 11.62 percent. Officials attributed the drops to a higher retention rate, possibly due to the service's Stop-Loss order for Operation Iraqi Freedom.

■ An accident report, released July 23, revealed no single primary cause for the fatal crash of an HH-60G from Moody AFB, Ga., during refueling on March 23 in Afghanistan. It said there

The Fiscal 2004 Budget at Midyear

$378 Billion Defense Budget Moving Forward

The House and Senate each overwhelmingly passed $378 billion defense appropriations bills in July. The military construction portion totaled $9 billion.

The money bills basically matched the Administration's Fiscal 2004 request, which sought nearly $380 billion. Lawmakers explained that the topline reduction was tied to increased 2003 supplemental contingency funding previously provided but not yet spent by DOD.

Completion of the 2004 appropriations bills means the Administration's request is largely on track. House and Senate authorizing committees, which set budget policy, previously approved similar totals. Any differences between the House and Senate appropriations and authorization bills will be resolved in conferences this fall.

The Senate's defense appropriations bill passed unanimously July 17. In addition to the $9 billion for military construction (including family housing), it provided $99 billion for personnel expenses; $116 billion for operations and maintenance; $74 billion for procurement; $64 billion for research, development, test, and evaluation; and $16 billion for defense health and other programs.

F/A-22 Fighter Dispute

While lawmakers funded most of USAF's high-priority procurement programs near the requested levels, the F/A-22 was an area of contention. Both appropriations committees approved the Air Force request to buy 22 Raptors next year, but the two authorization committees cut the quantity to 20.

Authorizers removed savings the Air Force expects to accrue from new program efficiencies, rather than letting the service apply that money toward additional aircraft. The service had counted on using savings to buy more F/A-22s, as long as it stayed within its total program budget. (See "Aerospace World: Raptor Cuts Undermine 'Buy to Budget' Plan," August, p. 11.)

Three Committees Favor B-1B Reconstitution

By mid-July, a plan to bring some B-1Bs back from retirement had picked up steam. Three of the four defense oversight committees approved a plan to give the Air Force $20.3 million in Fiscal 2004, to return to service 23 of the 32 B-1B bombers that are being retired this year.

The Air Force opposes the plan, noting in a formal appeal to lawmakers that the B-1B is now experiencing its highest mission capable rates since 1996. The service attributes the higher rate to the consolidation of support at two bases (down from five) and to the relative increase in parts availability from supporting a smaller number of aircraft.

The Air Force maintains that lawmakers failed to provide the $1.1 billion it would actually cost to support the aircraft through 2009. (See "Washington Watch," p. 11.)

Nuclear Weapons Programs Debated

By mid-June, the fate of proposed changes to nuclear weapons research was far from settled. House and Senate appropriators came to different conclusions on the merits of studying nuclear bunker busters and improving nuclear test readiness.

The House panel proposed eliminating the $6 million sought for research into low-yield nuclear weapons and the $25 million needed to improve nuclear test readiness. President Bush wants to halve the time required to resume nuclear tests, if a decision were made to test again. Currently, the time lag is 36 months.

House appropriators also cut $10 million from the Administration's request of $15 million for research into a Robust Nuclear Earth Penetrator that would be used to target hardened, underground facilities.

The same week, Senate appropriators fully funded each of the above accounts, setting up a showdown over nuclear issues in the conference committee.

were three contributing factors: The tanker was flying 150 feet below the required altitude of 500 feet; the helicopter crew suffered spatial disorientation and loss of situational awareness; and the high altitude (9,000 feet above sea level) and the refueling aircraft's 30-degree bank during its climbing turn prevented the helicopter crew from maintaining their position. All crew members were killed. (See "Aerospace World: Seven Airmen Die in Afghan Ops," May 2003, p. 48.)

■ The addition of wings and GPS for the CBU-103 sensor fuzed weapon and the CBU-105 combined effects munition will extend their range and standoff capability. USAF plans to buy 7,500 dispenser kits, with delivery beginning in late 2006, for use on the B-52, F-15E, and F-16.

■ Officials at Luke AFB, Ariz., grounded F-16s with a certain type of engine July 2 after investigations of a June 10 crash found a fleetwide engine-related problem.

■ Tire failure caused a T-38 trainer to crash at Randolph AFB, Tex., March 19, concluded a July 1 accident investigation report. AFRC Maj. Peter Jahns, in the front seat, was killed after the aircraft crashed into a barrier support stanchion when the right main tire failed and disintegrated. AFRC Lt. Col. Frank Gebert suffered minor injuries. (See "Aerospace World: T-38 Pilot Dies in Crash," May, p. 48.)

■ Northrop Grumman and Lockheed Martin will team up to work on DOD's new joint unmanned combat aerial vehicle program. The Pentagon plans to merge the DARPA-USAF and DARPA-Navy UCAV projects into a single program by Oct. 1.

■ A US board of inquiry has exonerated the operators of a US Army Patriot missile battery who mistakenly shot down an RAF Tornado GR4 on March 23 in Iraq, reported the *London Daily Telegraph* on July 16. Both GR4 crew members were killed.

■ USAF noncommissioned officers will induct James G. Roche, Air Force Secretary, into the Order of the Sword Sept. 13 at Andrews AFB, Md. The award is their highest honor.

■ Combat controller SSgt. Gabriel Brown, Little Rock AFB, Ark., was named the 2003 Pitsenbarger award recipient by the Air Force Sergeants Association. Brown handled the close air support assets for more than 15 hours during the March 2002 battle at Takur Ghar, Afghanistan, in support of Operation Anaconda.

■ USAF on July 8 announced its top combat controllers for 2002: Capt. Patrick Ward, 23rd Special Tactics Squadron, Hurlburt Field, Fla., and MSgt. Michael Lamonica, TSgt. Jason Hill, and SrA. Seth Marinaccio, all from the 24th STS, Pope AFB, N.C.

■ Five tactical air command and control airmen received the Air Force Association's Team of the Year award July 14. They are: TSgt. Scott J. Grotbo, 169th Air Support Operations Squadron, Illinois ANG; TSgt. Shawn J. Minyon, 13th ASOS, Ft. Carson, Colo.; SSgt. Scott T. Ball, 2nd ASOS, Wuerzburg, Germany; SSgt. Joseph S. Hren, 25th Fighter Squadron, Osan AB, South Korea; and TSgt. Kevin D. Vance, 17th ASOS, Hunter AAF, Ga.

■ NATO announced July 16 that it was a year ahead of schedule in its plans to develop the wherewithal to deploy a rapid response brigade of about 6,000 troops. The new date was mid-October.

■ The Air Force has implemented a name change for its legal field from Judge Advocate General's Department to Judge Advocate General Corps. Along with the name change, USAF shifted legislation and standards of conduct from the JAG to the Air Force General Counsel, while the JAG Corps acquires contractor bid protests.

Senior Staff Changes

CHANGES: Lt. Gen. (sel.) Roger A. **Brady,** from Dir., Ops., AMC, Scott AFB, Ill., to DCS, Personnel, USAF, Pentagon ... Lt. Gen. Richard E. **Brown III,** from DCS, Personnel, USAF, Pentagon, to Vice Cmdr., AETC, Randolph AFB, Tex. ... Lt. Gen. John D. **Hopper Jr.,** from Vice Cmdr., AETC, Randolph AFB, Tex., to Asst. Vice C/S, USAF, Pentagon ... Brig. Gen. (sel.) Stephen J. **Miller,** from Cmdr., 1st FW, ACC, Langley AFB, Va., to IG, ACC, Langley AFB, Va.

SENIOR EXECUTIVE SERVICE RETIREMENT: Frederic C. **Schwartz.**

COMMAND CHIEF MASTER SERGEANT RETIREMENT: CMSgt. Daniel M. **Keane.**

CCMS CHANGE: CMSgt. Rodney **Ellison,** to CCMS, ACC, Langley AFB, Va. ■

Gulf War II: The Story Continues

US Forces Kill Hussein Sons

Uday and Qusay, two sons of former Iraqi dictator Saddam Hussein, were killed by US forces July 22. The sons were slain after refusing to surrender and engaging in a protracted battle with US forces in the town of Mosul in northern Iraq.

US forces were tipped to their location by an informant described as a "walk up."

The informant could receive up to $30 million because the two sons, missing since the beginning of Operation Iraqi Freedom in March, each had a $15 million reward on his head.

After Saddam himself, Uday and Qusay were the biggest Iraqi fugitives, considered No. 2 and No. 3 on US Central Command's wanted list of former regime fugitives.

CENTCOM Undergoes Change of Command

Army Gen. John P. Abizaid took command of US Central Command on July 7, succeeding Gen. Tommy R. Franks, who retired. Abizaid had been CENTCOM deputy commander.

Franks, a 38-year veteran, had led CENTCOM since June 2000. During his tenure, he oversaw Operation Enduring Freedom in Afghanistan as well as Operation Iraqi Freedom.

Abizaid Describes Guerilla Campaign

At a July 16 Pentagon briefing, Abizaid created a stir when he described the ongoing situation in Iraq as a "classical guerilla-type" war.

Abizaid added that the troops were doing a "magnificent job" dealing with this particular style of threat.

The US is fighting remnants of Saddam Hussein's forces that are conducting "what I would describe as a classical guerilla-type campaign against us," said Abizaid. "It's low-intensity conflict, in our doctrinal terms, but it is war, however you describe it."

Abizaid's comments were notable because it was the first official declaration that the repeated attacks against US and coalition forces in Iraq were not isolated events but part of a concerted, probably organized, campaign.

Gulf War II Deaths Surpass Gulf War I Total

On July 17, the US suffered its 147th combat death in Gulf War II, thereby equaling the total from the 1991 Persian Gulf War. According to Pentagon data, 32 of the deaths took place after May 1, when President Bush declared major combat activities to be over. Sporadic fighting has continued since that time.

Counting deaths caused by accidents, the US had suffered a total of 224 deaths in Gulf War II by July 17.

Rumsfeld Doubles Iraq Cost Estimate

Defense Secretary Donald H. Rumsfeld informed a Senate committee in July that ongoing Iraq operations will likely cost $3.9 billion per month for the foreseeable future. That figure nearly doubled a previous Administration estimate of roughly $2 billion per month.

The military cost includes food, fuel, transportation, weapons, and personnel costs associated with keeping a force of about 145,000 troops in Iraq.

Continuing operations in Afghanistan cost an additional $900 million to $950 million monthly, Rumsfeld added.

Continued from p. 22

Rumsfeld had indicated that Belgium's law could make the United States unwilling to send officials to the country, which is home to NATO headquarters.

Iran Deploys Shahab-3 Missile

Iran earlier this summer conducted its final test of a medium-range missile capable of hitting Israel or other targets throughout the Persian Gulf region, Iranian government officials announced in July.

The missiles officially entered service with Iran's Revolutionary Guards on July 20. At a televised deployment ceremony, at least five of the missiles were seen mounted on portable launchers.

The Shahab-3 is reported to have a range of at least 800 miles and to carry a 2,000-pound warhead. The missile was first flight-tested in July 1998.

New Academy Leader Takes Over

Lt. Gen. John W. Rosa Jr. on July 10 took over as commandant of the Air Force Academy. His confirmation had been held up in the legislative roadblock set up by Idaho Sen. Larry E. Craig (R). (See "Aerospace World: Promotions Imbroglio Ends," August, p. 12.)

Air Force Secretary James G. Roche announced the same day that Rosa's predecessor, Lt. Gen. John R. Dallager, would be retired as a major general, not as a lieutenant general. The service said Dallager "did not exercise the degree of leadership in this situation we expect of our commanders." (See "Aerospace World: Report: Academy Lost Focus on Assault Problem," August, p.12.)

Rosa was the last of four new leaders installed at the academy after the Air Force removed the previous officials in the wake of the sexual assault scandal.

USAF Details Structure Changes

The Air Force announced on July 23 several force structure changes for 2004, among them a formal notice of retirement for its fleet of 20 C-9 Nightingale medical evacuation aircraft and 44 KC-135E tankers.

Officials said the service faced rising costs to support the C-9 aircraft. They also maintain the mission can be handled more efficiently without a dedicated fleet of medevac aircraft.

USAF is replacing the Air National Guard and Air Force Reserve Command KC-135Es with 24 KC-135Rs.

The announcement also stated the service would cut 2,260 military positions, 2,839 civilian positions, and

1,055 part-time reserve authorizations. Some of the cuts are related to the aircraft retirements, while others are part of "workforce reshaping." Many of the positions had been identified for elimination in prior budgets but were never removed from USAF books. They had been unfunded and unfilled.

Boeing, Loral See Space Losses

In mid-July, space powerhouses Boeing and Loral announced that the collapse of the commercial space market had hit them hard. Loral filed for bankruptcy protection, and Boeing said it would no longer market its Delta IV launch vehicle for commercial use.

Launch and orbital systems have become a "terrible marketplace," said Boeing chairman Philip M. Condit in a conference call with financial analysts. Boeing will instead focus efforts on the government launch business—even though the Air Force just cut Boeing's share of current launches. (See "Washington Watch," p. 11.)

Overall, the number of commercial space launches has fallen by more than 50 percent since 1998.

The Air Force has said it remains committed to assured access to space, meaning the nation needs to preserve at least two heavy-lift launch providers—Boeing and Lockheed Martin. Boeing would not be allowed to fail as a government launch provider, if that would leave the government with only one viable launch option, say USAF officials.

US Public Thinks War Was Right

Despite pundit claims about American unease, a July Gallup poll determined that only 27 percent of Americans believe it was a mistake to send US troops to Iraq.

According to Gallup, "Concern about the validity of the war in Iraq this spring is somewhat higher" than the concern about Gulf War I at a comparable time, but it is "nowhere near" the percentage of people who questioned US involvement in Vietnam.

In July 1991, only 15 percent of Americans considered Gulf War I a mistake; by May 1971, more than 60 percent of the US considered the Vietnam War to be a mistake. ■

Photo via Warren Thompson

Bob Hope, taking a break on one of his tours during the Vietnam War, sits in a trailer featuring a model USAF F-4 Phantom.

Bob Hope, 1903-2003

Bob Hope, the beloved comedian who entertained American forces for some 50 years, died July 27 at his home in Toluca Lake, Calif.

Hope was born May 29, 1903, in Eltham, England, but moved to the US with his family when he was four years old. He appeared in vaudeville, radio, and numerous movies. He also had a long career in television. Hope has been described as being "a part of American folklore."

Hope was the first and only American to be made an honorary veteran of America's armed forces. He began entertaining US troops during World War II and continued over the years, making his last tour in 1991 to the Persian Gulf during Operation Desert Storm.

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Action in Congress

By Tom Philpott, Contributing Editor

Major Pay and Other Gains Certain; Congress and the Commissaries; No Luck for Survivor Benefit Reforms ....

Compensation Gains

House and Senate negotiators meet this month to reconcile their versions of the 2004 defense authorization. Both bills have key personnel provisions that guarantee service members major compensation gains in January. Among them:

- **Pay Raises.** On Jan. 1, pay will go up by an average of 4.15 percent. It is the fifth straight year Congress has boosted pay by a little extra, trying to close a gap between the military and the private sector. Both chambers accepted a Bush Administration plan to vary basic pay gains by grade. Midgrade and senior enlisted members would see increases of 4.6 to 6.25 percent. The Senate would boost everyone's pay by at least 3.7 percent, but the House made no such provision.
- **Future pay.** Current law sets pay raises through 2006 at one-half percent above private sector wage growth, as measured by the government's Employment Cost Index. Under the Senate plan, subsequent raises would match ECI changes to keep the gap from returning. The House bill has no such provision.
- **Basic Allowance for Housing.** Both the House and Senate plan to increase the Basic Allowance for Housing. In January, with the new increase in force, the portion of rent paid out of pocket by the average US-based service member would fall from 7.5 percent to 3.5 percent. Another boost in 2005 would end out-of-pocket payments. When Congress began boosting BAH a few years ago, the average military member living off base was absorbing 19 percent of his or her monthly rental cost.
- **Wartime pays.** Both chambers agreed to extend beyond Sept. 30 two wartime pay raises enacted in a defense supplemental bill signed last April. The Senate would make permanent a $150-a-month raise in Family Separation Allowance and a $75-a-month jump in Imminent Danger Pay. The House wants the increases to expire at the end of US operations in Iraq and Afghanistan.

USAF photo by SSgt. Matthew Hannen

Air Guardsmen in Iraq. We're too generous toward these guys, says OMB.

OMB's Different Drum

Though the Guard and Reserve are heavily engaged in overseas operations, the Office of Management and Budget warned that Congress is being too generous with these components.

The green-eyeshade unit criticized the House and Senate authorization decisions. It took exception to a Senate provision that would double—to $12,000—the military's death gratuity for members who die on active duty, retroactive to Sept. 11, 2001, and a $100-per-month incentive payment for members deployed to South Korea. OMB also criticized language found in both bills to give drilling Guard and Reserve personnel unlimited commissary privileges.

OMB declared that such Congressional initiatives "divert resources unnecessarily."

Food Stamp Families

Three years ago, amid a rash of press reports that some military families were eligible for—and even using—food stamps, Congress enacted the Family Subsistence Supplemental Allowance. It raised by up to $500 the monthly food allowances for low-income and large military families. The intent was to eliminate the stigma of their eligibility for food stamps.

Has it been effective?

FSSA payments began in May 2001. Roughly 650 families participate, but the extra pay has not wiped out food stamp usage by service members. An estimated 2,400 junior enlisted families have so many dependents that FSSA alone doesn't work. DOD says many would fall off the rolls if the Department of Agriculture, which runs the food stamp program, includes the value of on-base housing in calculations of income.

DOD officials argue that recent raises in pay and housing allowances have been more effective than FSSA in getting families off food stamps. A decade ago, almost 9,500 service members received food stamps.

Commissary Support

Air Force Maj. Gen. Michael P. Wiedemer, director of the Defense


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Commissary Agency (DeCA), says Congressional support for commissaries is as good as—or better than—it ever has been.

Some believe that, were that support not so strong, the Pentagon would already have contracted with a commercial grocer, on a test basis, to run some Army and Marine Corps stores. The concept interests Secretary of Defense Donald H. Rumsfeld.

Wiedemer, in an interview, said he had "no knowledge" of an "active proposal" to privatize base grocery stores. However, he argued, "I have never seen a business case to justify privatization."

Among prized benefits, the right to shop at a commissary ranks behind only health care. DeCA reports that a typical four-member service family using commissaries saves $2,400 per year.

Rumsfeld says commercial grocers might be able to run commissaries more efficiently. Opponents fear such an experiment would lead to full privatization and, ultimately, a decline in the value of the benefit.

Wiedemer says DeCA has $5 billion in annual sales but is under "constant pressure" to reduce an annual $1 billion taxpayer subsidy.

Homeowner Tax Breaks

Congress left town for the summer with another critical piece of legislation awaiting final action, this one important to military homeowners and drilling reservists.

Both the House and Senate had passed a long-awaited Armed Forces Tax Fairness Act with language to extend to members of the armed forces and Foreign Service the same capital gains tax exclusions on proceeds from home sales that have been available to other taxpayers for six years. The change would be retroactive to home sales since May 1997. (See "AFA In Action," p. 116.)

Under current law, profits on home sales can be sheltered from taxes only if the owner has resided in the home two of five years preceding the sale. The tax fairness bill would allow military members and Foreign Service Officers to exclude from the five-year residency rule any time away for official extended duty.

The bill also would allow drilling Guard and Reserve members new tax deductions of up to $1,500 a year for lodging and travel expenses when serving, and staying overnight, more than 100 miles from home. Another provision would make the military death gratuity of $6,000 fully tax exempt. Survivors now pay taxes on half of it.

Finally, the bill also would raise the value of the military's Homeowner's Assistance Program. Under HAP, the Defense Department reimburses service members for drops in home values tied to base closings and realignments. Such payments now are taxable income. The bill would make them tax free.

A House–Senate conference committee needed to resolve only minor differences between the two bills when Rep. Bill Thomas (R-Calif.), chairman of the House Ways and Means Committee, combined the House military tax package with legislation to protect child care tax credits. He called the new bill the All-American Tax Relief Act of 2003.

Sen. Charles Grassley (R-Iowa), chairman of the Senate Finance Committee, sent a letter to Thomas seeking a conference on the child tax credit legislation, but the conference won't begin until September.

Concurrent Receipt Limbo

The House went on summer recess July 26 before Republicans and the White House reached what was expected to be a compromise on further relaxing the ban on concurrent receipt of full military retirement and VA disability pay for service-connected illnesses or injuries.

Proponents hoped the White House, at a minimum, might be persuaded to allow payment of Combat-Related Special Compensation to retired reservists. CRSC was a "first step" on concurrent receipt enacted last year.

House Republicans are pressing Speaker Dennis Hastert of Illinois and other leaders to urge President Bush to drop a veto threat and allow easing of the ban on concurrent receipt. "High-level talks," said one Congressional staffer, occurred in July.

Retirees now forfeit part or all of their earned annuities to draw tax-free VA disability pay.

With surprising effectiveness, some of those 710,000 retirees in recent months have been threatening House Republicans with electoral defeat if they fail to back up words of support with real action.

Specifically, they want Republicans who signed on as co-sponsors of HR 303—a bill to lift the ban on concurrent receipt—to join Democrats in signing a discharge petition that would force a recorded vote on the bill.

Rep. Tom Tancredo, a Colorado Republican, signed the Democrat-inspired petition. Other Republicans warned Hastert that they, too, might break ranks.

Rep. Michael Bilirakis (R-Fla.) pushed to revive a compromise that House members had reached last year before Bush's veto threat. It called for a five-year period to phase in full concurrent receipt for 90,000 seriously disabled retirees—those with disability ratings of 60 percent or higher.

In a July 8 letter to the House Armed Services Committee, Rumsfeld again expressed opposition to concurrent receipt, saying the Senate plan to end the ban would cost $57 billion over 10 years and drain resources from more critical personnel programs.

SBP Gains Still Stalled

The House and Senate disappointed Survivor Benefit Plan participants—again—by ignoring bills to reform the program. No measure to improve SBP was included in either the House or Senate 2004 defense authorization bills, despite long and active lobbying by service associations.

Several measures sought to:

- Eliminate the reduction in survivor benefits that takes place when covered spouses turn 62 and become eligible for Social Security.
- Repeal an offset from surviving spouse annuities that is paid as dependency and indemnity compensation.
- Move up by five years, to Oct. 1, 2003, the effective date for a "paid-up" coverage provision to take effect under SBP.

Activists claim the US needs to enact reforms to restore SBP's value and reverse the trend in which participants shoulder more of their costs. When SBP began in 1972, the subsidy amounted to 40 percent of the cost. With beneficiaries living longer, the percentage has fallen to 17 percent.

The most controversial feature of SBP is a reduction in benefits—from 55 percent of the covered annuity down to as low as 35 percent—when a surviving spouse turns 62. Like concurrent receipt legislation, bills to phase out the offset have broad co-sponsorship but not enough active political support to trigger real change. ■

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Allocation of active, Guard, and Reserve missions and forces is under scrutiny once again.

Total Force In a Search for Bo

IN THE two years since the Sept. 11 terrorist attacks, the Air Force's Total Force concept has been sternly tested by a series of worldwide demands. The force has not only survived but prospered, and has proved invaluable. Officials say the integration of active duty, Air National Guard, and Air Force Reserve Command forces made possible Operations Noble Eagle, Enduring Freedom, and Iraqi Freedom.

With so much of the Air Force's combat power placed in the reserve components, the nation simply could not have gone to war the way it did—on short notice and with unexpected demands—without the Guard and Reserve contributions.

The Total Force arrangement is not perfect, however. USAF officials feel force structure, staffing, and mission adjustments are needed, primarily at the margins. They do not expect to make a drastic overhaul of a system generally regarded as the Defense Department's best example of effective active-reserve integration.

Thomas F. Hall, assistant secretary of defense for reserve affairs, noted in April that "the Air Force has always been a model and a leader with the way it uses its Guard and Reserve."

The Air Force's Total Force concept of operations has enabled the service to make the most of the Guard and Reserve. Reserve component forces have a hand in nearly every mission, and, when the requirements

USAF photo by MSgt. Ronny Przysucha

ılance

By Adam J. Hebert, Senior Editor

The Total Force (and some friends) go into action in April in support of Operation Iraqi Freedom. Pictured in the middle of the trio of aircraft at the top is a South Carolina Air National Guard F-16CJ, assigned to the 379th Air Expeditionary Wing. It was part of a coalition package that included not only active duty Air Force KC-135, F-15E, F-16, and F-117 aircraft, but also British GR4 Tornado and Australian F/A-18 fighters.

have surged, the "part-timers" have also surged to meet the challenge.

"We are no longer a force held in reserve solely for possible war or contingency actions," Lt. Gen. James E. Sherrard III, commander of Air Force Reserve Command, told a Senate panel in May. "We are at the tip of the spear."

For Operation Iraqi Freedom, AFRC forces, said Sherrard, flew about 45 percent of the C-17 missions, 50 percent of the C-5, and 90 percent of the C-141. They also flew one-fourth of the air refueling sorties and nearly half of the aeromedical evacuations. The Air Guard flew 43 percent of Air Force fighter sorties and 86 percent of the refueling sorties.

The Guard and Reserve provide 25 percent of the aviation assets in each of USAF's 10 rotating air and space expeditionary forces (AEFs).

When necessary, these ratios go even higher. ANG and AFRC have more than 65 percent of the Air Force's tactical airlifters, 60 percent of its aerial refueling, 38 percent of its fighters, 35 percent of its strategic airlifters, and 20 percent of its combat search and rescue capability.

Part-timers add the equivalent of 10,000 full-time personnel to the Total Force in a "normal" year—and even more when units are called up to meet wartime demands. By June 25, well after the end of major combat operations in Afghanistan and Iraq, more than 34,000 Guard and Reserve airmen remained on active duty.

This heavy load has created concern that the part-time force is being overused. There is ample anecdotal evidence that some reservists have had enough of the call-ups and that some employers are asking Guardsmen to "reconsider" their military service. These incidents have not yet developed into large-scale problems, officials report. The Guard is "holding up well" under the demands and expects to maintain its traditional retention level of about 90 percent, Lt. Gen. Daniel James III, ANG director, told *Air Force* Magazine.

Air Force leaders are aware of the implied contract that Guardsmen and Reservists have with their communities and families. Reservists signed up for occasional weekend service plus two weeks of duty a year, except in times of national need. To keep segments of the part-time force from becoming de facto full-time airmen, USAF leaders are looking for ways to prevent the same individuals from being repeatedly mobilized.

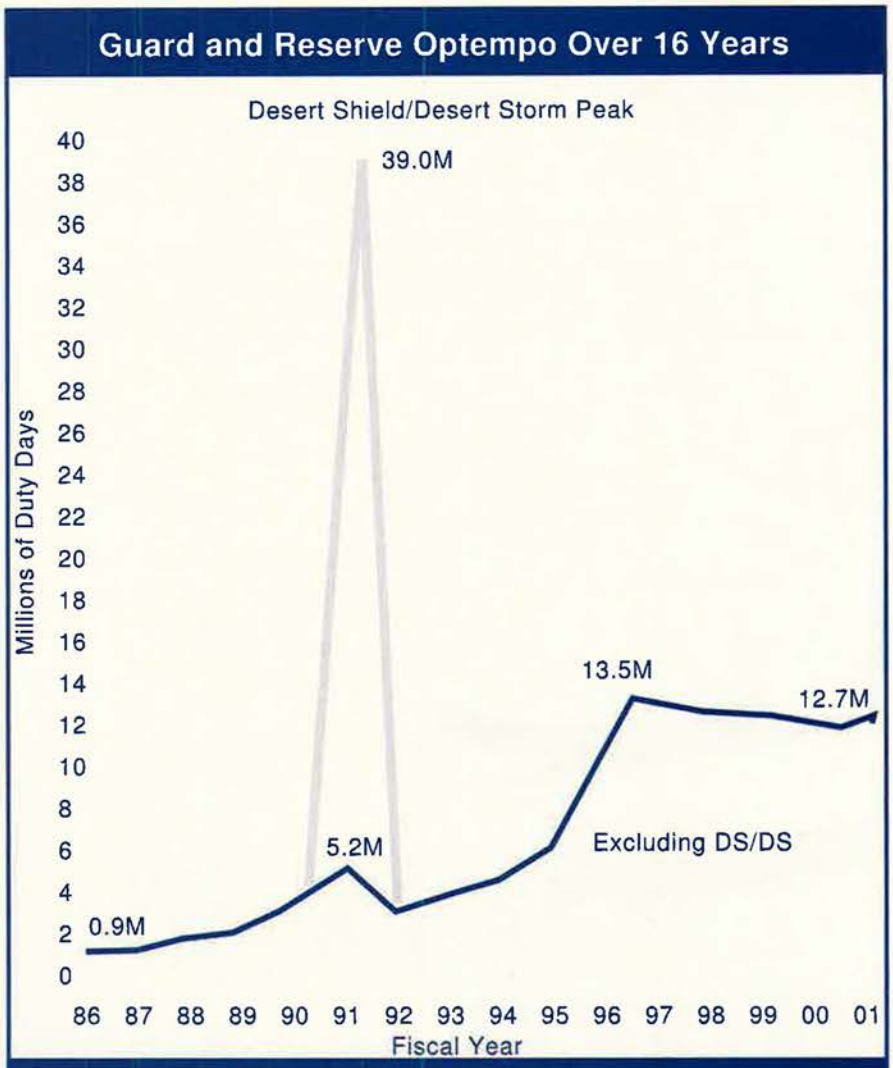
One obvious solution is to shift high-demand reserve capabilities to the active force. That would reduce the mobilizations, but there is a downside. Air Force reservists are very good at what they do, and they would be difficult and expensive to replace.

Creating a seamless Total Force, in which part-timers are considered interchangeable with full-timers, takes a commitment to training, modernization, and readiness. The Air Force has made this commitment. Moving more capability to the active force to minimize reserve call-ups creates a full-time cost and offers a debatable benefit.

Michael L. Dominguez, assistant Air Force secretary for manpower and reserve affairs, identifies the key problem. "If you think we are going to be in a big fight and not bring the part-time force along, then you are talking about a much more expensive Department of Defense," he said.

Staffing a Total Force

Some of the existing reserve component arrangements have come under question by DOD's leadership. Defense Secretary Donald H. Rumsfeld has questioned whether the correct missions have been assigned to the active duty and reserve components and whether it is appropriate to draw upon part-time forces every



To cope with high active duty optempo, DOD in the 1990s turned more and more to the Guard and Reserve. Their duty days, of course, skyrocketed during the Gulf War I period (light blue line). This chart shows that, even excluding Desert Storm, the trend (dark blue line) is up dramatically over the past 10 years. Source: DOD's "Review of Reserve Component Contributions to National Defense."

USAF photo by TSgt Michael R. O'Halloran

Active and Reserve C-5 airlifters wait at Stewart ANGB, N.Y., for their loads during Operation Iraqi Freedom. Guard and Reserve air mobility units provided a major portion of the forces for the air bridge to Southwest Asia.

time a conflict erupts. He wants to re-evaluate the mission areas, stating in a July 9 memo that "the balance of capabilities ... is not the best for the future."

Rumsfeld called for rebalancing the active and reserve forces to more efficiently meet demands. In the memo, he called for the Pentagon's senior leadership to devise plans to reduce the need for involuntary mobilizations, especially during the first 15 days of combat operations. Rumsfeld's guidance calls for mobilized forces to be given "meaningful work and work for which alternative manpower is not readily available." Mobilized forces should also be sent home as quickly as possible, he said. (See "Washington Watch," p. 11.)

Explaining the concern earlier this year, Air Force Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, said DOD "can't even do some of the things ... day to day without calling up the reserves."

While the Army needs to mobilize large numbers of Guardsmen and Reservists just to deploy an active duty division overseas, the Air Force does not have that same kind of problem, Dominguez said.

For the Air Force, said Dominguez, the question is, "On the margin, ... what size of an initial response do you want? How quickly? And are you prepared to pay for it?"

Moving missions to the active force makes them more expensive because they become full-time capability. Leaving capabilities in the reserve components, however, means more mobilizations are required.

Rumsfeld's memo directs the rebalancing effort to "specifically address capabilities that reside exclusively or predominantly in the RC and are in high demand."

USAF officials have been looking at manpower priorities since 9/11, attempting to find ways to meet increased demands through more efficient use of "human capital." The ANG's James said that volunteers have helped ease the "repetitive use" burden—the problem of some airmen being kept disproportionately busy. Large numbers of Guardsmen signing up for mobilization mean fewer have to be called involuntarily.

At one point after 9/11, more than 6,000 Guardsmen were voluntarily serving on active duty. By the middle of this summer, more than 1,200 remained in this status.

The Guard and Reserve are composed of volunteers, as is the active force—a fact that many people fail to recognize. While it is universally accepted that DOD needs to be careful not to mobilize reservists unnecessarily, mobilizations can in no reasonable way be called involuntary conscription.

Meeting with defense reporters in June, Pentagon personnel chief David S.C. Chu pointed out that reservists choose military service. Calling the all-volunteer force a triumph, Chu said, "I am not sure I understand the distinction between sending an active unit to do the nation's business and sending a reserve unit. ... They are all part of a volunteer force. It is all one force."

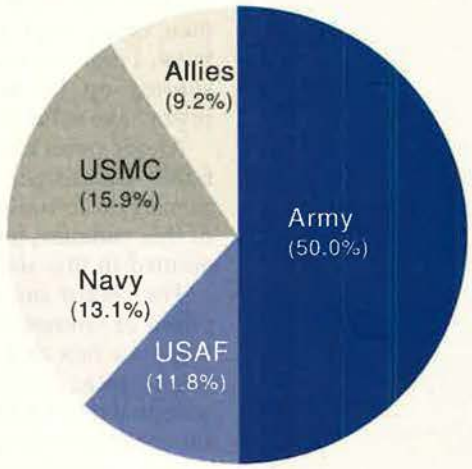
Chu added, however, that DOD has tried to spread the burden of deployments to Iraq. Some reserve units had not been used in a long time. "We deliberately, in this mobi-

People and Airplanes

As of Sept. 30, 2002

Category	ANG	AFRC
Personnel strength	108,485	76,680
Bombers	0	8
Fighter/Attack	648	104
Helicopters	15	21
Recon/BM/C3I	5	6
Special Operations	4	12
Tanker	211	74
Airlift	261	168
Total aircraft	**1,144**	**393**

Total Force in Gulf War II



	Active	Guard	Reserve	Total
USAF	45,664	7,207	2,084	54,955
Army	213,793	8,866	10,683	233,342
USMC	64,904	0	9,501	74,405
Navy*	59,240	0	2,056	61,296
Allies	42,987	0	0	42,987
Total	426,588	16,073	24,324	466,985

*Navy number includes 681 Coast Guard.

During Operation Iraqi Freedom, coalition forces deployed almost 467,000 active, Guard, and Reserve personnel. Almost 10 percent of the total US contribution came from the Guard and Reserve. Within the Air Force, ANG and AFRC accounted for 13 percent and nearly four percent, respectively.

ANG and AFRC Aircraft

	ANG	AFRC	Total
A-10	47	12	59
B-52	0	6	6
C-130	72	6	78
E-8	9	0	9
EC-130	1	0	1
F-16	45	6	51
HC-130	0	4	4
HH-60	3	6	9
KC-135	57	22	79
MC-130	2	6	8
Total	236	68	304

The Air National Guard and Air Force Reserve Command accounted for more than 300 of the coalition total of 1,801 combat and support aircraft (not counting US Army helicopters).

lization, tried to share that burden better," Chu said.

The Air Force and DOD both have been studying possible changes to maximize reserve component effectiveness. Chu said the conclusions from these reviews will be reflected in the Fiscal 2005 budget request, due early next year.

Officials are keeping an eye on reserve recruitment of prior-service personnel. The preferred "harvest" for the ANG and AFRC, said Dominguez, is "people who are already skilled in the actives, as opposed to kids off the street whom you have to train." Relying on this pool of personnel is challenging "because we have a smaller active force, and it has been under Stop-Loss for a long time," he explained.

The Stop-Loss instituted for Operation Iraqi Freedom ended in July, and officials said they saw no reason to expect a mass exodus. Also encouraging is the fact that retention was solid when the Stop-Loss for Enduring Freedom was lifted in 2002.

Fear of Repetitive Overuse

Evaluating morale and job satisfaction across the Total Force, however, can mask pressure points in specific career fields that have indeed been overused. These low-density, high-demand specialties cause concern because they are in short supply, and, if their airmen get "burned out" and want to leave military service, the problem would rapidly grow worse.

"Our challenge is really the one of repetitive use, which is a different challenge [from those] the other services face," Dominguez said. "If we have to keep pulling in part-timers on a repeated basis and dribble into a full-time employment, well, that is going to be a problem."

For some specialties such as intelligence, combat search and rescue, and pararescue, USAF is finding "we are a little thin, and the repetitive use or the extended use is a challenge," Dominguez said. "We'll have to fix that ... a number of different ways. You can shift capabilities between Guard and Reserve and active. You can expand the capabilities that you have, [or] you can substitute capital for labor."

The Air Force is attempting to do all of these things. Some CSAR units have transferred to the active force,

USAF photo by SSgt. Cherie A. Thurlby

TSgt. Wendell Witt, an AFRC pararescueman from Oregon, waits at Baghdad Airport for his next mission. Currently, the Guard and Reserve provide 20 percent of USAF's combat search and rescue forces.

the number of Total Force security personnel is being increased, and the service is looking hard at new technologies to reduce the number of people needed for force protection.

Easing the strain on part-time units by transferring missions to the active force is not always a good solution. "As you move things between active and reserve status, you are going to create a set of expenditure needs," Chu noted. "You are going to have to train people differently. Units are going to need to change the equipment. And some of that will cost money. So there is a resource aspect to this that has to be dealt with."

The Pennsylvania Air National Guard's EC-130 Commando Solo wing is one place the Air Force must solve both resource and repetitive use problems.

The six EC-130s used to jam enemy communications and broadcast US messages are unique; they are the only assets of their kind. The Commando Solo Guard unit has been mobilized repeatedly since Operation Desert Storm.

"Commando Solo is a troubling [case] because it is a really unique capability, really important capability," Dominguez said.

The Air Force will "probably" need to expand the capability at that unit, he said, but "whether it is grown in the active or reserve, ... a lot of factors will go into that."

James said, "You start looking at that tempo, and you make a decision as a Total Force." The question is whether the Commando Solo unit should be different, not if it needs to be on active duty, he said. "Does it need to be an associate unit, a reverse associate unit, a blended unit? These are the ways we will approach our force structure rather than rushing to put everything on active duty."

USAF has also been at the forefront of organizing unique basing and command arrangements. Through blended and associate units that combine active and reserve forces, the Air Force has always been out on edge in creative force structure arrangements, Hall said.

Nontraditional arrangements, such as colocating active and reserve airlift components, have been "very successful for the Air Force," Hall added.

Officials tout the success of the 116th Air Control Wing at Robins Air Force Base in Georgia as an example of how scarce assets can be maximized. This wing, which contains active duty and ANG personnel, maximizes the availability of high-demand E-8 Joint STARS aircraft by increasing the number of people assigned to the system.

However, Dominguez said, "You've got to have the right mission, the right systems, and the right opportunity with [a] local population that can support" a part-time workforce supporting the active duty. Blended and associate wings are not one-size-fits-all cures for situations like that of the Commando Solo unit in Pennsylvania.

"It doesn't do you any good to increase the crew ratio on, say, a C-5, because you can't keep it flying to use that [additional] crew," he added.

Officials say USAF will continue to look for innovative ideas. Some bases, such as Fairchild AFB, Wash., have reserve and active units colocated and flying the same types of aircraft. The service will look at locations like

USAF photo by SMSgt. Edward E. Snyder

A South Carolina ANG crew chief on a flight line in Southwest Asia stands ready to taxi an F-16CJ. USAF's reserve components provide 25 percent of the airpower in each of the service's 10 air and space expeditionary forces.

that as possible candidates for new Total Force arrangements.

James suggested using "reverse associate" units, ones in which active duty personnel are assigned to ANG units. "This will take advantage of the operational infrastructure savings ... while broadening assignment opportunities" for the active duty, he testified before the Senate appropriations defense subcommittee.

Noble Eagle: A Guard Domain

More active duty participation could strengthen the homeland air defense mission, which has been dominated by the Guard. ANG leaders told Congress in May that Guard forces are the "backbone" of Operation Noble Eagle, for which Guard units fly about 75 percent of the combat air patrol missions and 62 percent of the refueling sorties. By May, the Guard had executed more than 29,000 ONE sorties since Sept. 11, 2001.

Further, the Guard has "maintained almost 100 percent of the alert sites," James said. Officials note that, for the air defense mission, the Guard has largely shifted from surge mode to sustaining mode. The around-the-clock CAPs flown after 9/11 have given way to greater reliance upon aircraft and bases on alert.

"At the current alert levels," Dominguez said Noble Eagle is "a sustainable mission," so long as Guard units continue to be supplemented by active duty forces.

The Guard is ideally suited for the Noble Eagle mission because of its "geographic dispersion," Dominguez said. A Guard pilot flying a CAP over Salt Lake City, for example, can take two days off from an airline job, fly the mission, and "go back to the airline job."

Therefore, officials feel there is no need to hand the homeland air defense mission to the active force, so long as the Guard has the resources to perform the mission.

James would like to see actual combat air patrols become the responsibility of active duty forces and their larger pool of fighter aircraft, leaving the Guard to concentrate on maintaining the alert bases and forces. He noted that active duty Navy and Marine Corps units can also contribute aircraft and pilots to the CAP mission.

Creating a Total Security Force

After 9/11, the Defense Department's security requirements skyrocketed. Suddenly, force protection at every military installation became critical, and many Air Force sites that primarily had been part-time Guard bases found themselves operating around the clock flying combat air patrols. There weren't enough security personnel to go around, especially when USAF began opening up new expeditionary bases overseas to support operations in Afghanistan.

After USAF Guardsmen and Reservists had shouldered this unexpected burden for a year, the Air Force "had to ask the Army for help, because we couldn't get fixes in place soon enough," said Michael L. Dominguez, assistant Air Force secretary for manpower and reserve affairs. The Army "very graciously joined in protecting US Air Force installations across the globe," he said.

The Army in September 2002 agreed to contribute Guardsmen for up to two years, while USAF worked on a long-term solution to its security problems. The commitment runs through September 2004. While local Army reservists provide security at Air Force bases nationwide, many of USAF's trained security forces have been freed to provide protection overseas.

"At the peak of [Operation Iraqi Freedom], we were operating in the neighborhood of 36 expeditionary air bases," Dominguez said. "We are talking about expeditionary in pretty unpleasant and unsafe parts of the world, so every one of those had to be secured."

USAF's reserve security forces are expected to head home by fall, Dominguez said, because USAF has "used them up" since 9/11.

The Air Force plans to shift additional personnel into security and has received Congressional approval to contract out some security functions. Dominguez said that USAF also plans "an aggressive program" to develop or procure new security technology to offset manpower demands, rather than "just throwing more bodies" at the problem.

The Air Force goal is to reduce security manpower requirements by 25 percent. Sensors, scanners, and commonsense modifications to roads and barriers can all reduce manpower demands, said Dominguez. The goal is to prevent reserve security personnel from becoming trapped in a never-ending mobilization.

Homeland air defense is "a Total Force challenge," Dominguez said, and the Air Force must approach it that way.

While the flying operations are largely under control, "the struggle is [in] combat service support," Dominguez said. Alert bases now are operating 24/7 when "they used to be bases we powered up on the weekend," he noted. Since round-the-clock air defense was an unexpected mission at most of the alert sites, the command posts, maintenance facilities, and ammunition storage sites are not up to requirements at many of these locations and need modernization.

For the Total Force, this is an ongoing challenge: Keeping the reserve forces engaged in the face of evolving requirements. As long as they are expected to remain on par with the active duty, Guard and Reserve forces must continue to receive the modernization and upgrade funding that accompanies that requirement.

James called funding "a continuous and serious challenge" because "it is increasingly difficult to keep [ANG] legacy systems relevant, given the transformation of the Air Force to better, more effective technologies."

Dominguez said a change in perception is in order. For the Air Force, he said, "it is probably best that people lose the term 'reserve' because it carries with it a lot of the baggage from the Cold War." Reserve forces are no longer backups, he explained, "they are full-time forces manned with part-time airmen." ■

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Republican Guard divisions looked pretty bold—until they got sliced and diced by coalition airpower.

Saddam's Elite In th

By Rebecca Grant

Boss Hogs. *USAF A-10s, such as these lined up at Tallil Air Base in Iraq, were key to the coalition air strikes that shredded Saddam's Republican Guard units.*

"I'LL TELL you up front that our sensors show that the preponderance of the Republican Guard divisions that were outside of Baghdad are now dead." That announcement, made on April 5 by Lt. Gen. T. Michael Moseley, the head of air operations for Operation Iraqi Freedom, was a significant moment.

It was barely two weeks into Gulf War II and airpower already had effectively neutralized Saddam Hussein's Republican Guard forces—the cream of the crop of Iraq's Army and the main military obstacle to the capture of Baghdad.

Guard forces outnumbered coalition forces at the start of the war. These elite, experienced, professional soldiers were willing and able to put up an organized fight. They had helped to keep Saddam in power for two decades. Destroying them signaled that Saddam's control over Iraq was about to collapse for good.

Early in their existence, Republican Guard units accepted only men from Saddam's hometown area of Tikrit and did not demand special military experience. That changed with the 1980-88 Iran–Iraq War, which was also the event that established Iraq as a menacing regional military power. The enemy was led by Ayatollah Ruhollah Khomeini, Iran's supreme Islamic authority.

In 1986, Iraqi forces captured the Iranian town of Mehran only to lose it again in a humiliating defeat. That prompted Saddam to replace the political hacks from Tikrit that infested his Republican Guard. In their place, he put battle-experienced commanders.

"The people at the top were military professionals, albeit with loyalty to Saddam," said Col. Charles M. Westenhoff, chief of the Air Staff's Checkmate operational assessment office. Soon, the most capable of Iraq's military forces were installed in the Republican Guards. This "accelerated Darwinian process," as Westenhoff called it, quickly delivered results in battle. Newly formed Republican Guard units sent to meet Iranian attacks in 1987 and early 1988 turned the tide.

"In a series of four major battles

e Meat Grinder

USAF photo by MSgt. Terry L. Blevins

in 1988, the Iraqis took the offensive," said Westenhoff, "and Khomeini threw in the towel."

The success of the revitalized Republican Guard gave it considerable stature in Iraq. Its soldiers were volunteers who got better military training and pay than the rest of the Iraqi Army. The elite force also got Soviet military assistance, including thousands of tanks, armored personnel carriers, and artillery pieces.

All that made the Republican Guard, in 1990, the leading force in Saddam's invasion of Kuwait. And the first tip-off of the impending invasion came in mid-July 1990 when a brigade of the Republican Guard's Hammurabi division marched south.

When Iraq invaded Kuwait on Aug. 2, 1990, Republican Guard forces spearheaded the main offensive. The Hammurabi and Nebuchadnezzar divisions attacked from the north. The Medina and Tawakalna divisions struck from the west. Once Kuwait fell, regular Iraqi Army divisions stocked with conscript troops moved forward to the Saudi border, while the Republican Guard divisions pulled back to consolidate a strategic line of defense farther north.

As the US and its coalition partners drew up plans to free Kuwait and reduce Iraq's offensive military power, the effectiveness of Saddam's key force was a prime concern.

Operation Desert Storm in 1991 called for intense air strikes on the Republican Guard. The Tawakalna division was hit hardest, and it quickly fell to the advancing US Army VII Corps.

However, elements of the Medina and Hammurabi divisions used short, sharp engagements with coalition ground forces to screen the retreat of the main body. Losses of high-quality T-72 tanks and other equipment were great, but significant elements

of the Republican Guard made it safely back to Iraq.

After the Storm

Military analyst Anthony H. Cordesman, in a 1998 Center for Strategic and International Studies report, said the Republican Guard after Gulf War I had as many as 600 T-72s and 300 T-62s, for a total of about 900 top-of-the line tanks. Soviet T-55s also remained in the arsenal. There was no doubt the Republican Guard remained a cohesive and comparatively well-equipped fighting force.

In fact, Westenhoff said before the start of Operation Iraqi Freedom that the Guard had more than twice as many tanks as coalition forces and probably about twice as many artillery pieces in the theater.

Military planners knew that Saddam's ability to preserve his regime rested with the Republican Guard. They alone had the means to organize and conduct counterattacks against coalition forces.

Lt. Gen. Daniel P. Leaf—the Air Force point man who worked directly with Army Lt. Gen. David D. McKiernan, the coalition forces land component commander—said that did not mean the coalition could dismiss the other Iraqi forces. However, Leaf explained, "It was clear that the main effort was going to be the defeat of the Republican Guard."

Before the coalition launched OIF, Republican Guard forces left their garrisons and took up positions roughly 30 miles outside the city of Baghdad. "They were put in blocking positions around Baghdad, essentially to the north, south, and west," said Westenhoff. All the Republican Guard units were combat ready. The strength of these divisions was at least 80 percent in all cases and as high as 90 percent in some units.

The coalition battle plan called for swift ground force advances toward Baghdad, from the north and south. Turkey's last-minute decision to prohibit ground operations from its soil left only a southern thrust, greatly simplifying the Republican Guard's job. And, while speed and lethality were bred-in-the-bone advantages for US and allied forces, the strategy of moving ahead fast with relatively few forces carried some risk—namely that the ground forces would move beyond their supply lines and expose their flanks. The Republican Guard might easily exploit such a vulnerability.

The Republican Guard "had the capability to counterattack, which I would not have credited to the other Iraqi forces," said Westenhoff. "One of the things I observed was that our forces, as they went into Iraq, were equipped for offense. They weren't as well-equipped for defense."

The US and its allies had a ground force smaller than that assembled for Desert Storm. In Gulf War II, US Army's V Corps and 1st Marine Expeditionary Force, along with British forces, were to lead ground operations. In Gulf War I, there were two Army corps, an MEF, and another corps of multinational Arab forces under Saudi and Egyptian leadership.

At the start of Gulf War II ground operations, V Corps was at less than full strength. The full V Corps would have had four artillery brigades; instead, said Westenhoff, "We had one and a bit of those artillery brigades." If V Corps had possessed its four artillery brigades, he said, they, along with available attack helicopters, would have been able to fight off a Guard assault.

USAF photo by SSgt. Cherie A. Thurlby

On Target. *Joint Direct Attack Munitions, such as this one being prepped for a B-1B bomber, provided the precision needed for B-1s and B-52s to fly close air support missions in Gulf War II.*

USAF photo by MSgt. Dave Ahlschwede

No Time to Hide. *USAF F-16s, such as these deployed from Spangdahlem AB, Germany, flew hundreds of strike sorties that helped destroy the unit cohesion of Republican Guard divisions.*

To counter that shortfall, coalition air attacks on Republican Guard units began on the first night of the war. On March 19 (Baghdad time), two USAF F-117 stealth fighters struck a Baghdad site where Saddam Hussein was thought to be hiding; at the same time, 40 carrier-launched Tomahawk Land Attack Missiles struck a Republican Guard facility and an intelligence headquarters in another part of Baghdad. The next night, 10 TLAMs hit several Republican Guard targets in Kirkuk.

Soon, hundreds of sorties were being flown daily against Republican Guard positions throughout Iraq. "The first area of concern was the Medina division because of their deployment south of Baghdad on a major avenue of approach" for V Corps, said Leaf. The Hammurabi division was tucked in behind Medina, he noted.

Some Republican Guard forces also were moving south—cautiously, and in small formations—ostensibly to meet the coalition advance. Leaf said that "some significant pieces" of the southern-deployed Republican Guard units were part of the initial element that met coalition forces around An Nasiriyah and Basra early in the war. At the land component headquarters, Leaf said, he also saw signs that some of the Republican Guard forces were moving into new positions to reinforce the defense of Baghdad.

Although air strikes had taken a toll, said Leaf, it was clear that the Republican Guard was still functioning.

Costly Mistake

It was at this point that the Army blundered. It decided to use some 30 of its AH-64 Apache helicopters to attack the Republican Guard. It didn't work. Instead, the Apaches "came under intense enemy fire," said Lt. Gen. William S. Wallace, V Corps commander, and had to retreat. Many of the aircraft were severely damaged.

The helicopter attack also had a limiting effect on other airpower operations. Sorties by fixed-wing aircraft were reduced to make way for the Apache action, and the fire support coordination line in the sector was moved dozens of miles farther out in front of coalition forces.

The decision to move the FSCL "cost us, basically, a full night of fixed-target strikes inside the FSCL," said Leaf. "We—the entire coalition team—had not hit our stride in achieving the command and control required to operate in volume effectively inside the fire support coordination line."

It became clear that fixed-wing attack aircraft—USAF bombers and Air Force, Navy, Marine Corps, and allied fighters—were the weapon of choice for destroying the Republican Guard. Leaf noted, too, that "FSCL placement became somewhat less of an issue," because the air-ground team got better at coordinating actions within the various kill boxes.

The weight of the airpower effort was such that it became hard to tell which Republican Guard units were taking the brunt of the coalition's attacks. Joint Chiefs of Staff spokesman Army Maj. Gen. Stanley A. McChrystal said on March 31 that coalition air had flown 1,000 sorties over Iraq that day—a typical day.

Fixed-wing air strikes simply shredded Republican Guard unit cohesion. And that became a problem in itself, according to Leaf.

"I think that one of the real challenges in doing our targeting of [Guard] units was their loss of unit identity," said Leaf. "We had a hodgepodge." He went on, "We couldn't really tell you we were attacking the Medina division; we could say we were attacking forces which were in traditional Medina division deployment locations, and in the vicinity, and therefore presumed to be dispersal or tactical sites, for the Medina division."

However, Pentagon officials noted that Republican Guard divisions were not sitting ducks. In an ABC TV interview on March 30, Secretary of Defense Donald H. Rumsfeld warned that, as coalition ground forces moved forward to deal with the Republican Guard, "that very likely will be the most difficult fighting days that the coalition will face."

As in Gulf War I, the Republican Guard always had a plan. Guard divisions were adept at small-unit defensive fights and demonstrated their prowess near Najaf, where they engaged US Army troops. Leaf noted that one American unit, C Troop of the 7th Cavalry's 3rd Squadron, suddenly found itself "surrounded and taking fire from three sides." So close was the fighting that Iraqi soldiers were being killed by ricochets of their own rocket-propelled grenades. Some US soldiers ran out of ammunition and left their vehicles to pick up AK-47s from dead Iraqi soldiers "so they had something to shoot back," said Leaf.

At the time, he continued, "I think it would have been reasonable for some Iraqi tactical leaders to think they were seizing an opportunity" to turn around the war.

Bombers Fly CAS

The action around Najaf contin-

USMC photo by MSgt. Buzz Farrell

The Remains. *A field near Najaf—the site of a three-day battle—is littered with the carcasses of Iraqi T-55 tanks. Coalition fixed-wing aircraft decimated Iraqi forces.*

USAF photo by 1st Lt. Daniel Triplett

BUFF on Call. *One B-52, working with information supplied by an E-8 Joint STARS, "summarily destroyed" Iraqi forces attempting to flank a US Army unit during the action around Najaf.*

ued for three days, during which two USAF bombers played a key role in turning the battle into a coalition victory. Leaf argued that one B-1B and one B-52 ensured "the Iraqi attacks were defeated in detail."

The air controller with C Troop called for assistance and relayed coordinates to the bombers, which were already airborne and on call to provide close air support. The B-1B crew targeted the Republican Guard forces with precision guided munitions, which were devastating in their effect. Then, a Joint STARS battle management aircraft picked up a second element of Iraqi forces moving down the highway from Al Hillah. They were engaged by the B-52 and "summarily destroyed," said Leaf.

The weight of the continuous air strikes was having a clear effect.

At the land component headquarters, Leaf and his staff officers were able to review and update Republican Guard targets using data collected by Joint STARS and Global Hawk unmanned aerial vehicle sensors. Leaf's staff displayed, on a three-dimensional map of the battlefield, the coordinates of each air weapon dropped.

"It wasn't full-blown [battle damage assessment]," Leaf said, but, within 24 hours, he could display for McKiernan's staff an "operational-level portrayal of the effects" of the air strikes. The rough BDA helped show the cumulative impact of the air strikes and demonstrated how responsive airpower had been against priority targets for the ground forces.

"The Republican Guard has been taking a pounding for some days now," Rumsfeld said in an April 1 press briefing, "and some of the Republican Guard units from up north have been brought down south to try and reinforce Republican Guard units in the south that have been badly weakened. That process goes on. They're being attacked from the air. They're being pressured from the ground. And, in good time, they won't be there."

On April 2, McChrystal announced, "I would say that the Medina and Baghdad divisions are no longer credible forces."

Leaf's reviews of aircrew mission reports confirmed those statements. "They [coalition crews] were finding so much to kill" that "there was a sense of both opportunity and effect coming across the wires." Leaf believed that most of the Republican Guards forces "were being ... decimated, to the point that the land advance could accelerate to Baghdad." He added, "And then it did."

Coalition ground forces picked up their pace and, by the evening of April 2, were within about 30 miles of Baghdad. Three days later, on April 5, the 3rd Infantry Division made its show-of-force "thunder run" into Baghdad.

"We're Killing Them"

Moseley, the air component commander, said of the airpower contribution: "I find it interesting when folks say we're softening them up. We're not softening them up. We're killing them."

Moseley went on, "I would not tell you the Republican Guard is 100 percent gone. I believe they are gone in organized division strength, corps strength, brigade strength, but I believe there are still some survivors out there that are still willing to fight." He added that the dispersed survivors would "continue to cause a problem for us."

His comments, however, left no doubt that the Republican Guard had come to the end of the road as an organized fighting force. No longer would Saddam's regime enjoy their protection. Small units might still resist, but the road to Baghdad was open, and coalition forces took control of the city on April 9.

Air commanders, in particular, were quick to credit all forces for the smashing coalition victory. Unlike in the 1991 war, Republican Guard forces did not escape destruction because of poor coordination between air and land forces. No such problem occurred this time.

Leaf pointed out that the effect of closely integrated airpower and land power was, at times, "absolutely devastating." He emphasized, though, that it was airpower that removed from the Republican Guard the ability to choose the "time and place" of engagement. "So the engagement came on our terms."

Airpower, because it was precise and persistent, wreaked maximum destruction on the Republican Guard units, breaking their military cohesion, and, ultimately, dissolving the divisions into knots of abandoned equipment. "In essence, in the last week of March and first week of April, the Republican Guard was neutralized," said Westenhoff. ■

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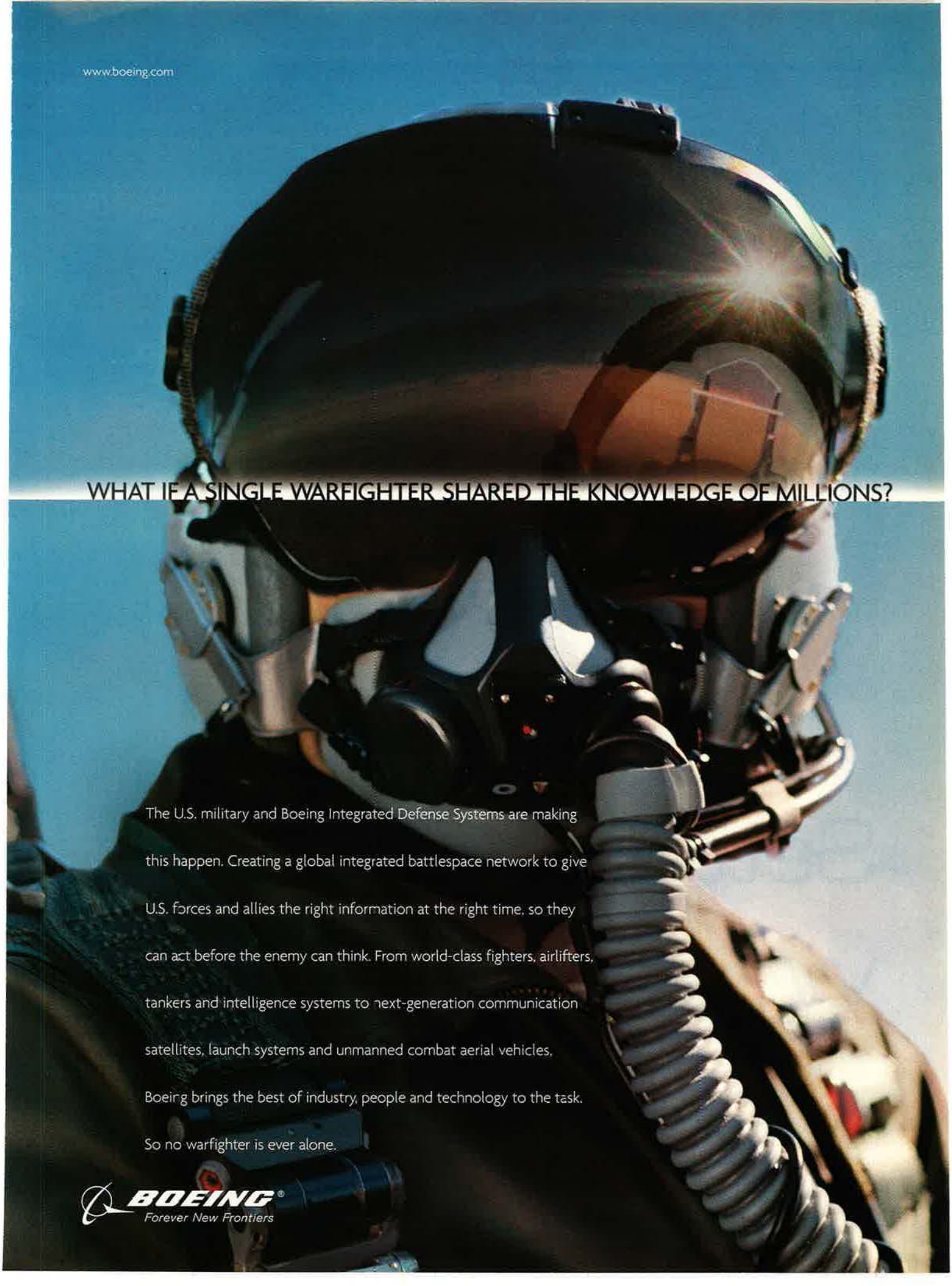
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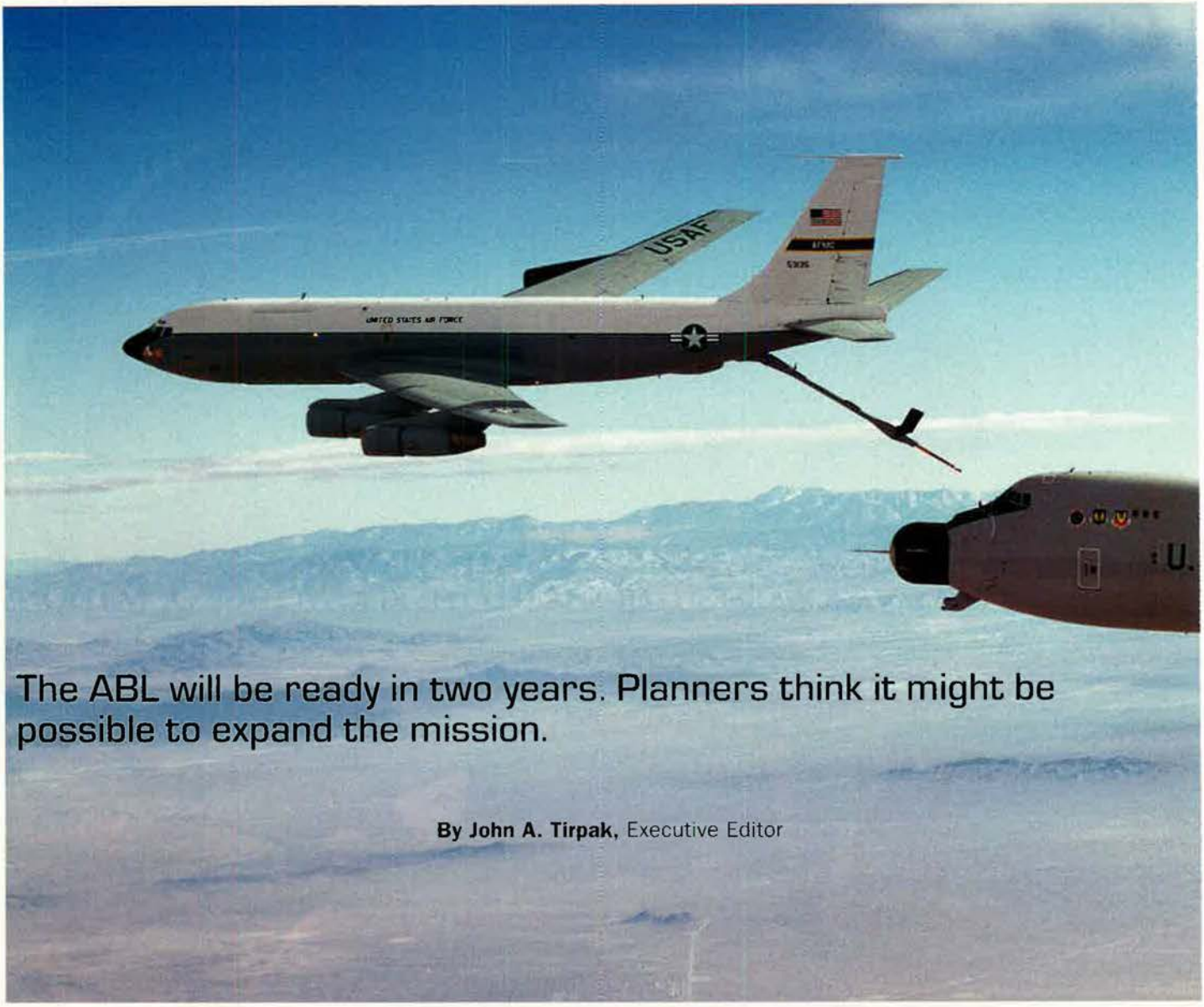


The ABL will be ready in two years. Planners think it might be possible to expand the mission.

By John A. Tirpak, Executive Editor

Setting a Course for

WITHIN two years, the first Airborne Laser is expected to shoot down a Scud missile and be declared ready for "emergency" duty overseas. At the same time, the ABL mission may expand to encompass not only theater missile defense but also defense against ICBMs.

ABL program officials predict that by early 2005 they will have the first aircraft fully configured, tested, and ready to take a shot at a live Scud missile. If it succeeds, the ABL will then be available for limited duty overseas to protect US or allied forces against theater ballistic missiles. As more ABLs are built, the capability would grow. Plans call for fielding a full seven-aircraft fleet sometime in the next decade.

Since its integration into the Missile Defense Agency in October 2001, the ABL program has been transformed in ways that may widen its portfolio beyond simple defense against theater ballistic missiles.

DOD has made no decision yet

the Airborne Laser

about "the full application of ABL," said program director Col. Ellen M. Pawlikowski. However, she added, the Airborne Laser is "being considered" not only for theater but also for national missile defense. "We can contribute to both of those missions, in the boost phase," she said.

The ABL is a system of lasers mounted on a 747-400 airframe. It will be able to detect the launch of a ballistic missile, track it, and shoot it down with a high energy laser. Orbiting just outside enemy territory, the ABL will spot a hostile missile launch by "seeing" the plume of the rocket engines and then employ its lasers to determine range to the target and the turbulence of the atmosphere. It will then use these data to fix a focused, high-power laser beam on the missile's skin, causing it to rupture and explode.

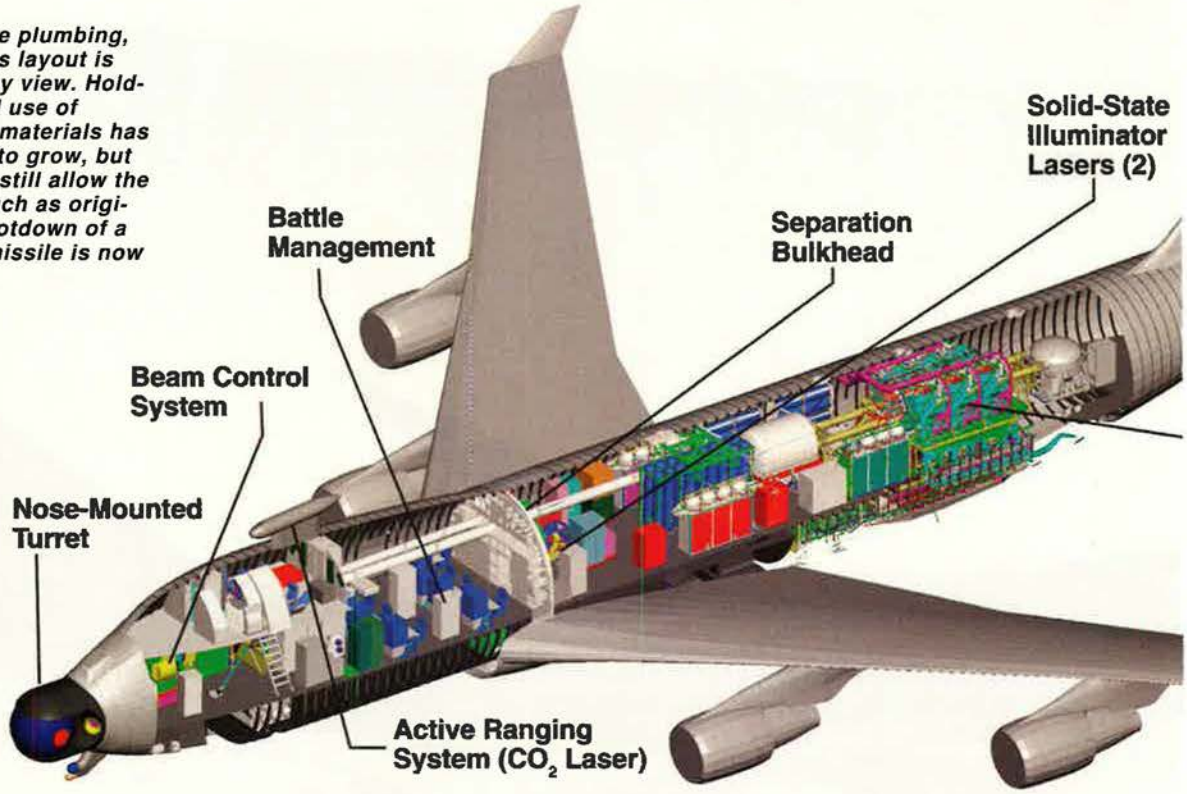
The ABL's actual power level is classified, but it is described as being in "the megawatt class."

Early plans envisioned ABL as a system to protect deployed US and allied forces in combat areas. Some number of ABLs could be deployed worldwide to watch for the launch of an ICBM, determine its intended point of impact, and destroy it before it even left the launching nation's airspace.

Powerful Deterrent

Such a capability would be a powerful deterrent since the missile and its warhead would fall back on the nation that launched it.

It is easier to track and destroy a ballistic missile in its boost phase.



The ABL's labyrinthine plumbing, optics, and electronics layout is evident in this cutaway view. Hold-downs, fasteners, and use of heavier-than-planned materials has caused ABL's weight to grow, but work-arounds should still allow the aircraft to perform much as originally expected. A shootdown of a live theater ballistic missile is now slated for early 2005.

Once it releases a warhead and that weapon reaches its terminal phase of flight, complications multiply. The target becomes smaller and faster and usually would be attended by decoys. The result is that an anti-ballistic missile system almost literally must "hit a bullet with a bullet." The first phase of the Administration's national missile defense system takes this terminal-phase approach.

Giving the Airborne Laser capabilities against ICBMs would chiefly require adding power to the system's destructive laser. Because ICBMs are faster than TBMs, the laser would have a shorter time to dwell on the missile's skin and thus have to be more energetic to pierce the booster skin.

In addition, the ABL as an ICBM interceptor would also likely be farther away from potential launch points deep inside the attacking nation's territory, meaning it would have to be more powerful to traverse greater distances with the same effectiveness.

To expand the ABL charter to include defense against ICBMs would require more aircraft. One Pentagon official who has examined various missile defense architectures said that a "highly capable" round-the-clock ABL deployment, covering most of the nations possessing ICBMs, could be achieved with 10-15 "orbits," each of which could comprise five airplanes. He said a "comprehensive" defense against nations with ICBMs could be achieved with 20-25 orbits, requiring about 100-125 aircraft. However, a report by the American Physical Society challenged whether ABL could be used as an ICBM defender. (See "Washington Watch," p. 11.)

The Pentagon's Fiscal 2004 budget request projects spending $3.4 billion on ABL through 2009, part of the $50 billion to be spent on missile defense collectively during the same period.

Stretching Technology

When USAF conceived the ABL program in 1994, officials acknowledged the project would be a technological "reach." They would be required to create laser hardware at power levels and a physical size not then possible. USAF has done tremendous work reducing the size and increasing the power output of the laser modules, developing lighter plumbing systems for the chemicals that power the high energy laser, and creating a battle management system that ties it all together.

Significant challenges persist, though.

The weapon system carried aboard the first ABL—designated YAL-1—was expected to weigh about 175,000 pounds at the time of its critical design review, which is the point in a program where hardware designs are finalized and major changes are locked out.

It has ballooned to more than 200,000 pounds.

"We have grown since our critical design review," Pawlikowski admitted.

The weight growth has taken place in two areas, she said. One was in the laser itself. The original plan called for some components to be made out of composite materials rather than metal alloys. However, said Pawlikowski, "We just didn't know enough about the composites"—how they would react with the types of chemicals to be used.

The mixing of oxygen and iodine creates a chemical reaction that yields large quantities of energy.

There was little data to show how the composites would hold up over time, so designers decided to add thicker layers of composites to pro-

High-Energy Laser Modules (6)

vide a greater safety margin. "The safety factors we were adding on ... got us close to the weight of ... titanium," said Pawlikowski.

USAF was uncertain about the long-term effect of using chemicals with composites. As a result, program officials switched to titanium, a proven alternative that is both strong and relatively light. However, titanium is heavier than the original composite materials.

There was a second factor that led to weight gain—the large number of fittings and components that were needed to mount everything inside the airplane, Pawlikowski explained. These ranged from fasteners to tubing to bulkheads, all of which had to be beefed up to keep the now-heavier laser system secure inside the aircraft.

Weight problems surfaced only when actual construction began. Previously, all weights were estimates. "We're getting 'actuals' in, as opposed to estimates," Pawlikowski said.

All this added up to a weight penalty "far more than we had originally anticipated at critical design review," she noted.

More weight translates to some operational limitations.

"There's little I can do in terms of redesigning things this late in the game," Pawlikowski pointed out, meaning there will be no redesign fix to drastically cut weight. Any offset will have to come in a reduced fuel load, she went on. "If the weight goes up a little bit, we just put a little bit less jet fuel in, at this point."

The changes will not affect the aircraft's ability to take off and reach cruising altitude expeditiously, she said, and there's no danger of exceeding the strength of the flooring or bulkheads within the aircraft.

"We're still within the bounds of where we need to be," she said.

The direct effect of the weight gain, though, will be to reduce unrefueled on-station time by 90 minutes. The actual on-station time is classified, but Pawlikowski observed that, with aerial refueling, the ABL could stay aloft as long as necessary.

Flight tests last year demonstrated the first aircraft's aerial refueling capability. The refueling receptacle is the same as that found on the E-4B, another 747-derived USAF aircraft.

It will take some skill to avoid the large turret on the front of the Airborne Laser aircraft, but, Pawlikowski said, "We have some pretty talented and skilled boomer operators in the Air Force." She noted that USAF tanker crews have no trouble with the B-2, which has super-sophisticated skin and composite materials and must not be damaged in the slightest.

To protect the exotic and expensive turret, crews will roll the ABL optics inward when they are not in use. The turret itself has been painted with a special flame-retardant paint.

Schedule Slip

USAF expected two program milestones set for this summer to slip until the fall. One was getting "first light" through six laser modules of the high energy laser. The other was integration of the beam control system.

Getting light out of the laser means "running all the plumbing lines that are needed in order to get all the chemicals flowing in all the right places and all the cooling material," said Pawlikowski. The program is progressing but "maybe not as fast as I had hoped," she said.

Because of the powerful nature of the laser, the presence of hazardous chemicals, and the delicacy of the system, safety is a priority.

Some systems are being checked for form, fit, and function on a 747 rather than on the YAL-1. By doing so, officials can engage in several types of integration and checks simultaneously and thus save time.

The difficulty in achieving first light likely means there will be a delay in the first live test. The plan had been to conduct the Scud test by the end of 2004. "It's on the ragged edge of getting it done by then," Pawlikowski acknowledged. She estimated that the shootdown would take place at least by early summer 2005.

Integrating the beam control sys-

USAF photo by Kristie Hogbin

ABL flight testing revealed the need to alter the shape of the active-ranging laser pod atop the fuselage. Otherwise, the airframe itself is considered good to go. The ABL handles basically like any other 747-400.

Photo illustration by Erik Simonsen

tem also has moved more slowly than anticipated. The ABL's target designator sits in a pod atop the cockpit area of the airplane. Flight testing last year showed rougher than expected turbulence and aerodynamic flow around the pod.

Wind tunnel tests and computational fluid dynamics modeling led to a redesigned pod, which will be tested once the aircraft takes to the air again next summer.

All the pieces necessary to fire the high energy laser will be installed, integrated, and tested this winter. In spring 2004, said Pawlikowski, "We'll have a ground test period in which we'll actually, for the very first time, fire the laser through the beam control system." By summer, the full system is to be up flying, and USAF will commence testing against instrumented targets designed to ascertain laser cohesion at various distances as well as the power with which the targets are being hit.

One such target, or "board," will be suspended below noted aircraft designer Burt Rutan's Proteus high-altitude aircraft. The manned Proteus can fly at 60,000 feet and loiter for up to 14 hours.

"We've contracted with him to fly at high altitude for us," Pawlikowski said. "That will be the first series of tests we'll do, and that gives us lots of opportunities. He can fly back and forth for us and it's a fully instrumented board."

To kill a Scud-type missile, the ABL must keep its high energy laser focused on the same spot of the missile's skin for 90 to 500 seconds, depending on the distance to the target.

Once the program obtains first light from the laser modules on the airplane, the Air Force will proceed to contract with Boeing for the second airplane, which would be available for modification in 2006.

The initial aircraft is referred to as the Block 04 airplane The second aircraft is called the Block 08 aircraft. It will feature advances developed from experience with the YAL-1. Officials expect that, by the time the Block 08 aircraft is ready for modification, lighter and more powerful laser modules will be available. While the Block 04 airplane is the prototype, the Block 08 airplane will be a production-representative version and feature a full suite of capability. Both, however, are considered test assets.

The Missile Defense Agency plans to obtain the Block 08 aircraft and five more production-representative aircraft. That would enable the US to put up a 24-hour-a-day capability in any given theater overseas. More would be needed to cover more theaters. The MDA has not stated any intention to deploy more than seven ABLs—so far.

Pawlikowski noted that, while the Air Force has contemplated assigning the ABL to a range of other missions such as cruise missile defense and direct attack against ground targets, those initiatives have been halted.

She said that she has been told by Chief of Staff Gen. John P. Jumper that the ABL, which is considered a pathfinder for directed energy systems, has tremendous potential for other applications. However, she added, "I believe that the current Air Force position is, 'Let's get that first mission down, and then we'll look at the others.' " What she described as "adjunct missions" will have to wait. ■

In an artist's concept (top) the ABL is shown destroying a missile as it breaks through the overcast. By 2008, USAF will have two ABLs: one developmental and one "production representative." A fleet of seven is planned.

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Modern airpower owes much to the elite USAF commandos who hang out with the ground forces.

Controllers

By Bruce D. Callander

USAF combat controllers, such as these participating in Operation Enduring Freedom, set up and control air assault zones for Special Operations Forces.

USAF photo by SSgt Jimmy T. Lisk

THERE is a touch of irony in the fact that in an era of smart bombs and stealth aircraft, the effectiveness of modern air operations often depends on a relative handful of Air Force specialists who spend most of their time on the ground. These airmen, mostly enlisted members, are USAF's commandos.

They often commute to work by parachute or other unusual means. Their job is to direct air operations, spot targets, suppress enemy forces, and help rescue downed aircrews. These operations fall to two groups of elite troops: combat controllers and enlisted terminal attack controllers.

While they share a general specialty, the two groups train and work separately.

Combat controllers are ground combat forces assigned to special tactics squadrons of Air Force Special Operations Command. They are schooled in unconventional warfare and operate in forward areas, where they control everything from assault landings to air strikes.

Enlisted terminal attack controllers, who fall under Air Combat Command, spend most of their time working with Army units. They, too, train in extreme tactics and operate with forward ground forces. Their primary job is to call in and then direct close air support aircraft.

Both specialties date back to the days of propeller-driven aircraft, but today's practitioners are among the most highly trained operators in any service, employing new technologies and equipment.

USAF photo by TSgt. Lance Cheung

Enlisted terminal attack controllers, assigned to ACC but stationed with Army units, call in close air support strikes. Here, an ETAC checks one of his radios during a field skills test in South Korea.

Combat controllers trace their history to World War II, when the Army Air Forces formed glider units to insert troops into combat quickly and quietly. The method had promise, but the glider pilots often got lost en route or missed their intended target areas.

Charting the Path

The solution, Allied leaders decided, was to train a small group of specialists to land first and guide the main assault force. These advance personnel, called "pathfinders," used lights, flares, and other devices to mark the landing zones, and they provided on-site weather information to the inbound aircraft.

Pathfinders had their debut in 1943 during the Allied invasion of Sicily. They participated in the Normandy invasion and airdrops into Holland. Their use continued after the war, and, in 1947, when the Air Force became a separate service, USAF kept the specialists but later dubbed them combat control teams, or CCTs.

This group of airmen—also known individually as CCTs—has overseen air operations in conflicts from the Korean War to the most recent action in Iraq.

In addition to training in ground combat, each CCT is a certified air traffic controller. The work includes setting up navigational aid equipment to guide aircraft to landings on makeshift runways. CCTs deploy into combat areas by air, land, or sea and set up bare bones airfield capabilities. The CCTs are trained in demolition work to clear obstructions and hazards from potential runways and landing zones. They manage parachute assault zones and aircraft landings and low-altitude airdrops for resupply—without air control towers or extensive communications systems. Once they have an "airfield" established, the CCTs control air operations, provide command and control, gather intelligence, and make weather observations.

However, said Maj. Jerry Kung, a combat controller now serving as commandant of AFSOC's Advanced Skills Training school at Hurlburt

Field, Fla., "The primary thing we do is air-to-ground interface."

Jack of All Trades

Kung explained that the manner in which a CCT provides air-to-ground interface varies with each mission. "Sometimes it's providing air traffic control," he said. "Sometimes it's doing tactical control or close air support, and sometimes it's placing navigation aids or actually controlling aerodromes."

He went on, "We are trained to take over an airfield and run it just as if it were right here at Hurlburt Field." That means directing airplanes during landing and instructing pilots where to taxi and where to off-load personnel or equipment. "Basically everything you would do at a normal airfield," said Kung.

Because their aircraft land in combat zones, he said, CCTs also must provide "the long-range coordination to get them out of the airfield" and on to their next mission.

Training is varied and usually beyond USAF's mainstream courses. There are two major elements: Air Education and Training Command handles the first and AFSOC the second.

AETC first provides a two-week combat orientation course at Lackland AFB, Tex. Students undergo flight physicals, receive initial shooting instruction, and learn about the history of the combat control specialty.

What's next on the agenda varies depending on Air Force and Army schedules. The prospective enlisted CCTs go through a four-month air traffic control school at Keesler AFB, Miss.; Army airborne school at Ft. Benning, Ga., which can last several weeks; and a 2.5-week survival school at Fairchild AFB, Wash. Following those three, the airmen must complete a three-month combat control school at Pope AFB, N.C.

The entire process takes about a year, said Kung, and prospective CCTs leave "the AETC pipeline with a three-level apprentice skill level from combat control school." They are ready then for the AFSOC portion of their training—another year during which they learn advanced skills at Hurlburt. "By the time they finish with this," he said, "they are five-level qualified controllers."

Officer combat controllers follow much the same process. One exception is that officers spend slightly less time on air traffic control, but they receive training in airfield management.

AFSOC's 720th Special Tactics Group, headquartered at Hurlburt, is home to combat controllers. Within the group, there are seven special tactics squadrons: six active duty and one Air National Guard. Of the six active units, one is located at Kadena AB, Japan, and one at RAF Mildenhall, UK.

Depending on the mission, Air Force CCTs operate with Navy SEALs, Army Rangers, and Special Forces. The mission also dictates whether the 720th STG's other special tactics airmen—combat weathermen and pararescuemen—deploy with the combat controllers. "There are instances when all three will be on the same mission," said Kung.

The weathermen can deliver time-sensitive forecasting, explained the major, and that can "affect a commander's decision on how to prosecute a coming mission or an ongo-

USAF photo by MSgt. Robert R. Hargreaves Jr.

This ETAC helps secure a road in Iraq after major operations ended for Gulf War II.

USAF photo by SSgt. Cherie A. Thurlby

Members of a combat control team walk through the rubble of one of Saddam Hussein's palaces. These CCTs were operating from Baghdad Airport, where, among their other duties, they perform air traffic control.

ing mission." The weather channel provides an overview of the weather situation, but in a combat situation, said Kung, "You don't know what's happening at that mountain pass." That is why, he added, "You need to send somebody out there to collect the data."

Combat controllers display a number of talents, not the least of which is their ability to recognize and sort out air traffic in the combat area—that includes rockets or artillery. Kung called it an "ability to see in three and four dimensions." The CCT must be able to "deconflict" air traffic in the area to prevent problems from developing. That is "really our core skill," he said. All the other specialty skills, such as free-fall parachuting and scuba diving, "just comes with the territory."

USAF photo by SSgt. Cherie A. Thurlby

A combat controller on a four-wheel off-road vehicle provides escort as the first civilian aircraft lands at Baghdad Airport after coalition forces secured the site in early April.

The CAS Controllers

The history of the other elite group of controllers dates to the Korean War when the Air Force sent fighter pilots to Army units to call in close air support for ground attacks. USAF deployed some enlisted airmen to operate the heavy communications gear needed by the officers. Only the officers were permitted to direct CAS air strikes. That practice continued through the Vietnam War.

By the 1980s, however, the Air Force could not afford to continue using pilots for these ground assignments, so it began to train enlisted men for the job. Today, USAF's enlisted terminal attack controllers (ETACs) work directly with Army combat forces to manage their close air support.

The Air Force awards the ETAC specialty (which has no officer counterpart) only after an airman has served a long apprenticeship and taken a variety of courses, many of them with the Army. Becoming an ETAC is an extended process, said MSgt. Charles Heidal, who has been in the career field since the 1980s. The first step is to gain basic credentials as a tactical air command and control specialist.

Staff photo by Guy Aceto

These combat controllers are setting up communications to guide in assault aircraft during training at Hurlburt Field, Fla. Their skills include the ability to "deconflict" various aircraft, rockets, and artillery in their combat area.

First, there's a 75-day technical school at Hurlburt. There, Heidal said, an airman receives training on ground maneuvers, handling weapons, and radio equipment—"the basics that you need to use just to wander around with the Army."

After this initial training, the airman may take a number of specialized courses with the Army or other services. Heidal, for instance, went through the Army's basic parachute course and pathfinder course. "I've also been through EIB [Expert Infantryman Badge] training and some sniper weapons stuff and miscellaneous courses that are available at various forts where I have been stationed," he added.

Heidal said that while the Air Force does not require such courses, they help the airmen to support the "Army customer." Airmen working with the airborne forces, for example, have to be jump-qualified, he explained.

However, the majority of training for airmen hoping to become enlisted terminal attack controllers comes from work in the field, serving as an assistant to an ETAC and as a member of a tactical air control party (TACP). After an airman has been working in the career field for approximately two years, said Heidal, he is sent to the Joint Firepower Course at Nellis AFB, Nev. That course provides training in advanced close air support tactics. On returning to his unit, the airman gets a "check ride" with an experi-

USAF photo by TSgt. Lance Cheung

Enlisted terminal attack controllers usually carry on their backs all their gear, which can weigh several hundred pounds. Here, an ETAC passes coordinates over one of his two radios during an exercise.

enced ETAC or air liaison officer. If he passes, Heidal said, he is qualified to handle CAS air strikes "without the direct supervision of an officer."

Once certified, an ETAC may spend most of his USAF career living and working with an Army unit. Frequently, a single ETAC is the sole Air Force representative with a small Army Special Forces or Ranger unit. At battalion level, Heidal said, an ETAC likely will be working with a younger tactical air command and control specialist trying to gain the experience needed to move up the TACP chain.

Weight Watching

Calling in close air support strikes is the primary mission, but an ETAC also winds up simply sorting out air traffic in a combat area. With his equipment mounted on a small vehicle, Heidal said, an ETAC "probably can control about 100 square miles of airspace by racking and stacking aircraft, watching fuel loads, and the whole bit." At the same time, the ETAC must keep in close contact with Army counterparts to let the "duck shooters"—the air defense troops—know that American aircraft are going to be in the area.

However, operating from a vehicle is a luxury rarely afforded USAF's enlisted terminal attack controllers. The ETAC works with what he can carry on his back. That includes several different heavy radio systems. The Air Force has been able to reduce the load somewhat. Heidal tries to find even more ways to "lighten that stuff" because "we're being one-pounded to death." There is always someone who "wants to hand me one more pound of gear," he said.

Heidal noted that, when he jumps out of an aircraft, he weighs 405 pounds. The only part he can dump quickly—the parachute—weighs just 65 pounds. The rest of the weight is on his back, which makes it "a significant issue," he said.

Body armor and tactical gear weigh close to 40 pounds. Then come a helmet with a night-vision kit, a rucksack with food and water, and the radios.

"We went from carrying four radios down to one," said Heidal. "Then they said, 'Well, we need you up on multiple channels,' so now we're carrying two radios."

The relationship between these special airmen and the Army has changed over the years. Heidal thinks the change has been for the better.

The Air Force began placing its tactical air control parties with the Army in 1977. Earlier, USAF tactical air support units were assigned to Air Force bases and farmed out to the Army. That was a problem, said Heidal, because the airmen had to work with different Army personnel on every mission. They could not establish a close rapport.

Today, that situation is reversed. The airmen, who wear Army badges and Army patches on their shoulders, are more accustomed to the Army way. "Most of my NCO experience is dealing with soldiers," said Heidal.

After the Air Force moved most of its ETACs directly onto Army posts, soldiers started viewing them as part of the Army team. Now, soldiers call Heidal by name and know that, when he talks about close air support, he knows what he is talking about.

Air Combat Command has three air support operations groups:

- 1st ASOG assigned to 12th Air Force and headquartered at Ft. Lewis, Wash.
- 3rd ASOG assigned to 8th Air Force and headquartered at Ft. Hood, Tex.
- 18th ASOC assigned to 9th Air Force and headquarterd at Pope AFB, N.C., adjacent to Ft. Bragg.

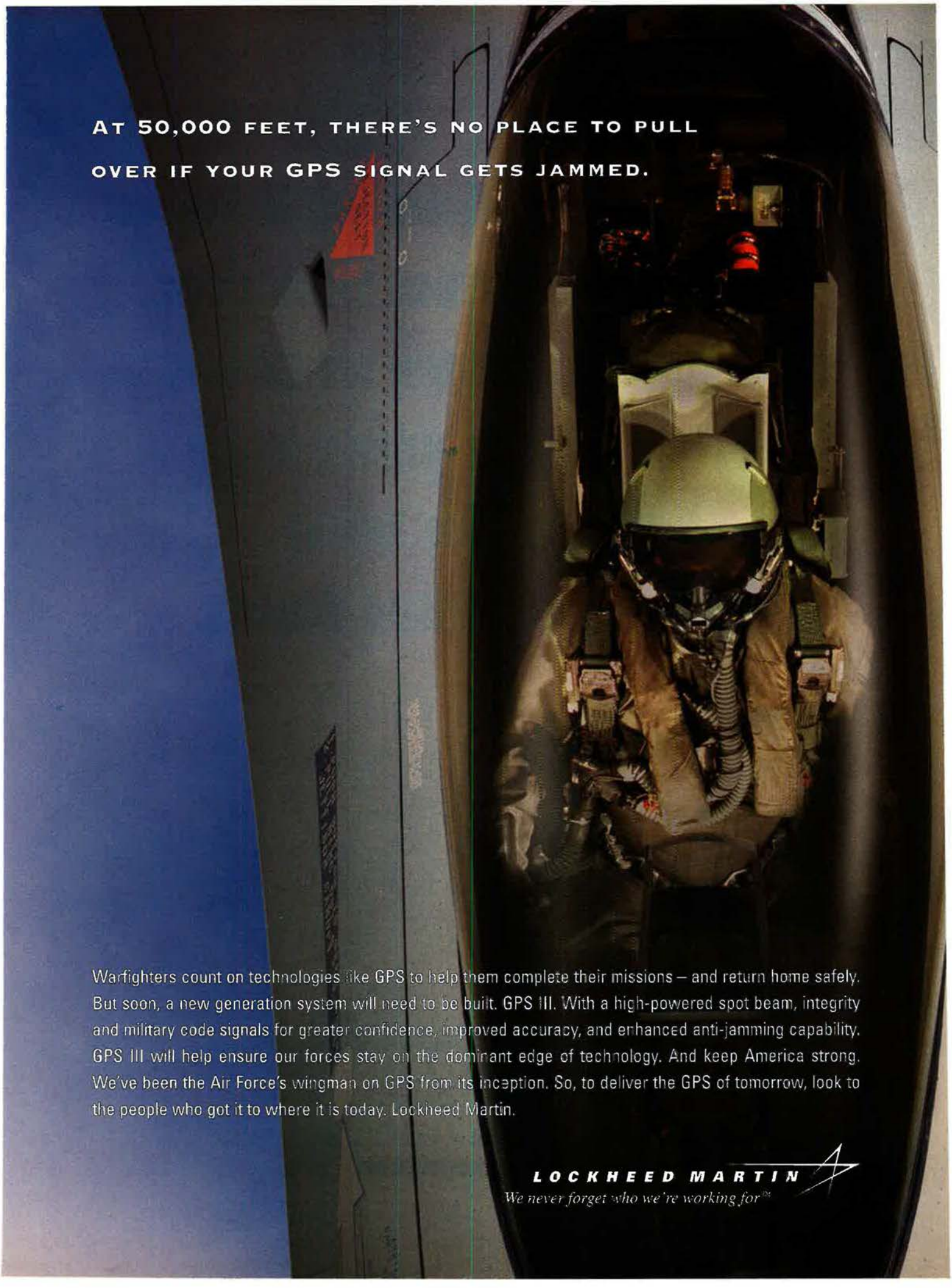
Each group has subordinate squadrons or flights stationed at various Army posts around the country.

Many ask why the Army has not developed its own ETACs. This issue surfaced most recently during Operation Enduring Freedom and Operation Iraqi Freedom, when ground units said there were not enough Air Force ETACs to go around. As a result, both the Army and Marine Corps have started pursuing their own programs. The Air Force has adapted some of its ETAC course material for a new joint terminal attack controller program.

Despite the rigorous training and long apprenticeship, the Air Force has no shortage of volunteers for enlisted terminal attack controller duty. "We have to turn people away," said Heidal.

"We have had to raise the bar at the tech school," he said. "This is not Rambo stuff." He explained, "I can take a very smart individual and make him an ETAC, but I cannot take an overly muscled individual who just wants to break things and make him one." ■

Bruce D. Callander is a contributing editor of Air Force *Magazine. He served tours of active duty during World War II and the Korean War and was editor of* Air Force Times *from 1972 to 1986. His most recent article for* Air Force *Magazine, "Masters of What They Survey," appeared in the July issue.*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Verbatim

By John T. Correll, Contributing Editor

Bring Them On

"My answer is, bring them on. We've got the force necessary to deal with the security situation. ... We're not going to get nervous, and we're not leaving until we accomplish the task."***—President Bush, on militants attacking US forces in Iraq, White House news briefing, July 2.***

Clinton Likes Clark

"While I cannot take sides in the Democratic primary, I believe Wes, if he runs, would make a valuable contribution because he understands America's security challenges and domestic priorities. I believe he would make a good President."***—Bill Clinton on retired Army Gen. Wesley K. Clark, Associated Press, June 27.***

Newt Strikes Again

"The State Department is far too busy being ineffective to bother fixing its internal structures in order to become more effective."***—Newt Gingrich, former speaker of the House,*** **Foreign Policy,** ***July/August 2003.***

Newt's Targets

"I have no idea what prompts those such as former Rep. Newt Gingrich to go after the people at State; maybe the President and Secretary of State proved too difficult as targets. I know our people well, both Foreign and Civil Service. But I don't recognize the people portrayed in Mr. Gingrich's attacks on State."***—Grant Green, undersecretary of state for management,*** **Washington Times,** ***July 6.***

His Favorite Headline

"Gen. Tommy Franks Quits Army To Pursue Solo Bombing Projects."***—Headline in*** **The Onion,** ***a satirical online newspaper, June 11. (Franks thought it was funny.)***

Misled on Iraq

"There is an abundance of clear and unmistakable evidence that the Administration sought to portray Iraq as a direct and deadly threat to the American people. But there is a great difference between the handpicked intelligence that was presented by the Administration to Congress and the American people when compared against what we have actually discovered in Iraq."***—Sen. Robert C. Byrd (D-W.Va.), in remarks on the Senate floor, June 24.***

Give It Time

"One of the challenges facing the coalition is finding Iraq's weapons of mass destruction programs. We are still early in the process, and the task before us is sizable and complex. Major combat operations ended less than 10 weeks ago. The Iraqi regime had 12 years to conceal its programs—to move materials, hide documents, disperse equipment, develop mobile production facilities, and sanitize known WMD sites—including four years with no UN weapons inspectors on the ground. Uncovering those programs will take time. The coalition did not act in Iraq because we had discovered dramatic new evidence of Iraq's pursuit of WMD; we acted because we saw the existing evidence in a new light—through the prism of our experience on 9/11."***—Secretary of Defense Donald H. Rumsfeld, Senate Armed Services Committee testimony, July 9.***

Which Wars Does He Watch?

"The Air Force has taken a starring role in recent years primarily through bombing missions in support of ground forces. ... Just as the Air Force is slowly weaning itself from the excitement of air-to-air engagements, so the Navy is learning to live in a world in which ship-to-ship battles are increasingly rare. Like that of the Air Force, the primary function of the Navy these days is support of ground operations."***—Journalist-author Max Boot,*** **Foreign Affairs,** ***July/August.***

Tiger Support

"I strongly support all of our troops, and my thoughts and prayers have been with them and their families from the outset. I'm extremely happy to have been able to be a part of this program to help the morale of the troops."***—Golfer Tiger Woods, participating in ESPN's "Jocks to GIs Direct" e-mail program, Air Force Print News, July 8.***

Not To Reason Why

"Even when the military is right, democratic theory intervenes and insists that it submit to the civilian leadership that the polity has chosen. Let civilian voters punish civilian leaders for wrong decisions. Let the military advise against foolish adventures, even advising strenuously when circumstances demand. But let the military execute those orders faithfully. The republic would be better served even by foolish working than by enlightened shirking."***—Peter D. Feaver,*** **Armed Servants: Agency, Oversight, and Civil–Military Relations.**

Breaking the Force

"After criticizing the Clinton Administration for overdeploying and overusing the country's military in the 1990s, the Bush Administration is now doing exactly the same thing—except on a much larger scale. Hordes of active duty troops and reservists may soon leave the service rather than subject themselves to a life continually on the road. Much more than transforming the armed forces or relocating overseas bases, Defense Secretary Donald Rumsfeld must solve this problem before the Bush Administration breaks the American military."***—Michael O'Hanlon, Brookings Institution,*** **Washington Post,** ***July 3.***

No Habeas the Corpus

"The fact that we have not yet located huge deposits of weapons of mass destruction does not mean they do not or did not exist. After all, we have not yet found Saddam Hussein or his remains—but not even Democratic Presidential candidates or the *New York Times* contend that he did not exist."***—Former Secretary of Defense Caspar Weinberger,*** **Wall Street Journal,** ***July 18.***


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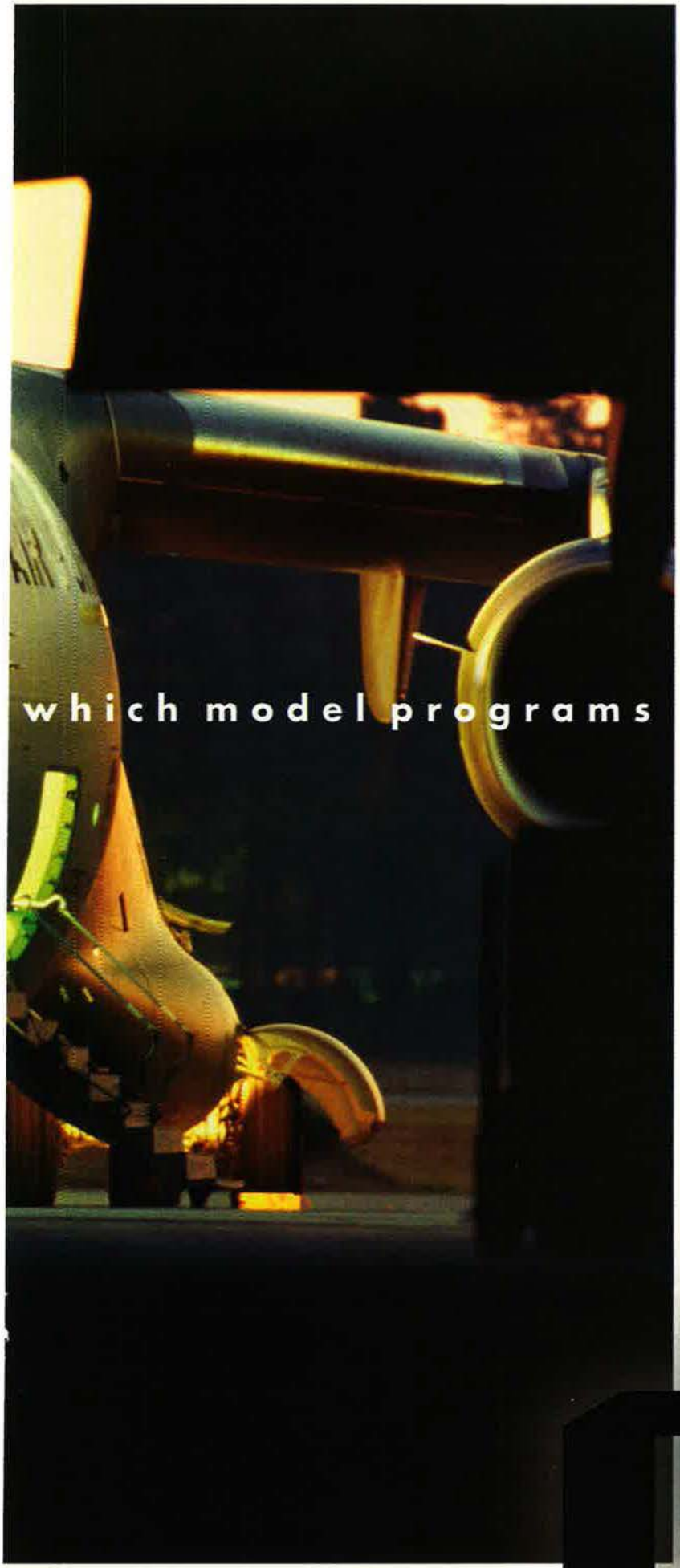


which model programs are measured.]

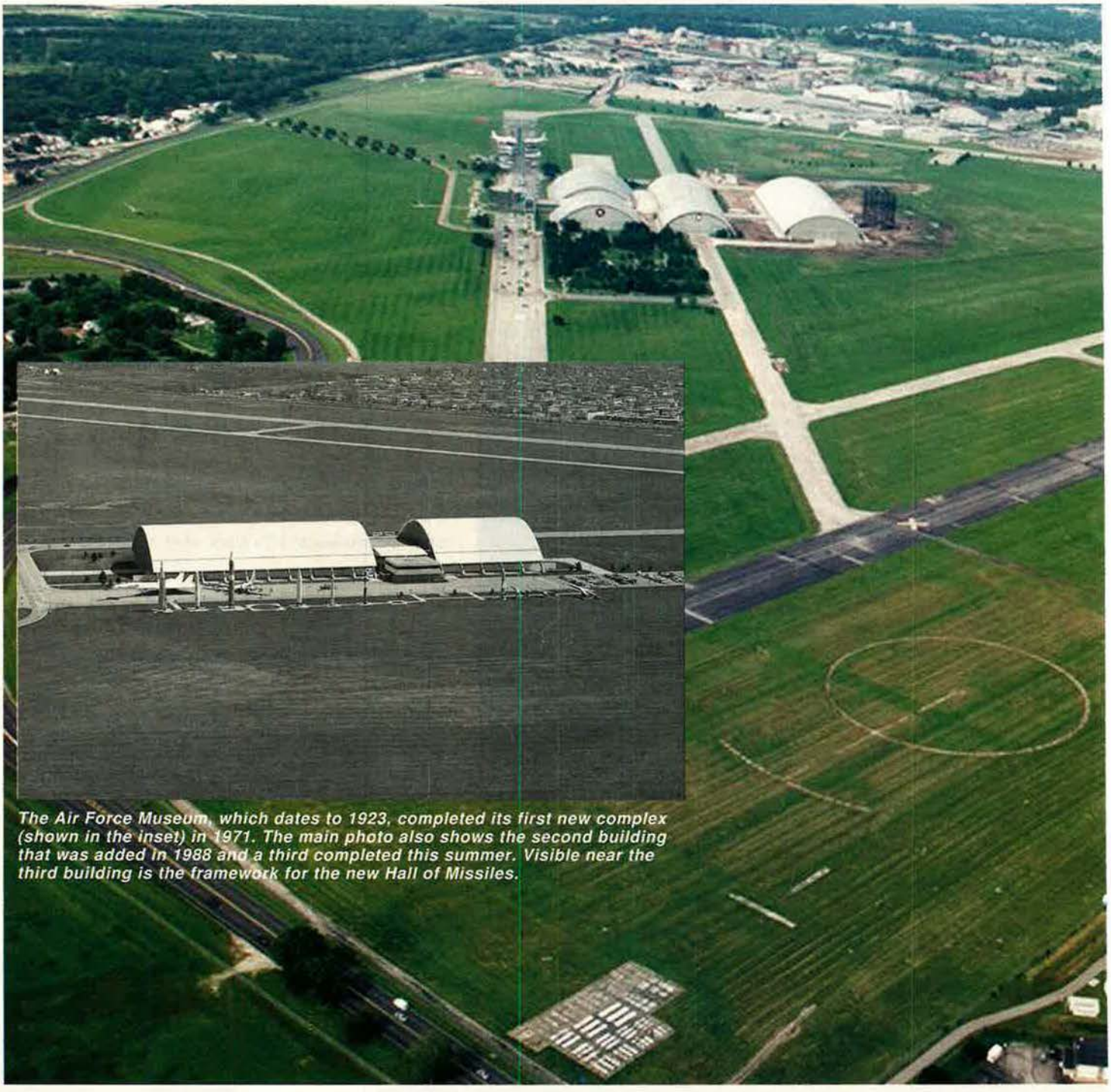
It starts with building the world's most capable airlifter. Next, comes a partnership between customer, manufacturer and suppliers that continually spurs innovation while it lowers costs. Add to that a commitment to quality and efficiency worthy of the Baldrige Award, the Collier Trophy and countless other accolades and it's clear what makes the C-17 Globemaster III one of a kind. It's miles ahead of anything else by any measure.

C-17

There's only one.

At the Air Force Museum, veterans are drawn to the vintage airplanes, but youngsters head straight for the F-16.

The Heritage



The Air Force Museum, which dates to 1923, completed its first new complex (shown in the inset) in 1971. The main photo also shows the second building that was added in 1988 and a third completed this summer. Visible near the third building is the framework for the new Hall of Missiles.

of the Force

By John T. Correll

THE US Air Force Museum at Dayton, Ohio, has become one of the top tourist attractions in the Midwest, drawing 1.2 million visitors a year.

On the approach from Interstate 675, the museum complex is visible—and impressive—from a considerable distance. Three enormous hangars, built in the style of aviation Quonset huts, dominate the view.

In the background are the buildings and runways of Wright–Patterson Air Force Base. The museum grounds are part of the base, but the big exhibition hangars are outside the gates, so the public can enter freely.

The airpower heritage is rich here. Dayton was the home of the Wright brothers. Huffman Prairie, where they worked and flew, is three miles away.

This is the oldest and biggest military aviation museum in the world. Visitors can see about 250 airplanes.

There is a replica of the 1909 Wright Military Flyer, a Sopwith Camel, the World War I biplane of Snoopy's comic strip daydreams, a shark-mouthed P-40 in the war paint of the Flying Tigers of the China Air Task Force, a B-17 Flying Fortress, an F-86 Sabre, a B-52, an F-105 fighter-bomber from the Vietnam era, a high-flying SR-71 spyplane, and much more.

Airplanes need not be ancient to have a place here. The YF-22, prototype for the new stealth fighter, is already on display, as is the Predator unmanned aerial vehicle, which achieved fame in Afghanistan.

Later this year, a B-2 bomber will go on display, the first permanent

public exhibit of a B-2 anywhere in the world.

Famous Airplanes

Some of the aircraft in the museum are individually famous:

- The B-29 *Bockscar,* which on Aug. 9, 1945, dropped an atomic bomb. After the war, a mistake in official records attributed the Nagasaki mission to a different B-29 and *Bockscar* was relegated to storage in the Arizona desert. The error was later discovered, and the museum obtained the historic aircraft in 1961.
- SAM 26000, the modified Boeing 707 that flew as Air Force One in 1963. It carried President Kennedy's body back from Dallas after he was assassinated. Lyndon Johnson was sworn in as President aboard this aircraft. (SAM is for "Special Air Mission"; 26000 is the tail number.)

Photos by Paul Kennedy

In 1961, the museum obtained the historic B-29* Bockscar. *This aircraft, which dropped the atomic bomb on Nagasaki on Aug. 9, 1945, had been languishing in storage in the Arizona desert.

This A-1E was flown by Medal of Honor recipient Maj. Bernard Fisher on his heroic mission to save a fellow pilot who had been shot down over Vietnam. The aircraft sustained serious damage, including 19 bullet holes.

- Maj. Bernard F. Fisher's A-1E Skyraider, a World War II-era attack bomber adapted for air commando work in Vietnam. On March 10, 1966, Fisher landed this A-1E on an airstrip, overrun by North Vietnamese regulars, in A Shau Valley, South Vietnam. Fisher taxied through fire, smoke, and battle debris to rescue a fellow pilot who had crash-landed, then fire-walled the throttle and took off with 19 bullet holes in his aircraft. He was awarded the Medal of Honor for this action.

The museum owns thousands of artifacts, including military uniforms dating back to World War I and earlier, a Glenn Miller trombone, and a bicycle manufactured by the Wright brothers in 1895. Some of the artifacts are on display, but many others are in storage.

There is also a 500-seat IMAX theater.

The museum has always been a popular site for special events, and more so than usual this year to commemorate the 100th anniversary of powered flight. The US Postal Service issued its Wright Brothers First Flight stamp at the museum on May 22, concurrent with issuance at Kill Devil Hills, N.C. The "Dawn Patrol Rendezvous" of authentic and replica World War I aircraft was scheduled to be held there in September.

Bigger by a Third

The AAA guidebook rates the Air Force Museum "a gem" and says it will take you four hours to see it, but that must have been before a new building opened this summer, expanding the indoor exhibit space by a third. If you're interested in airplanes and airpower, you will need a full day, at least.

The Hall of Missiles, a silo-shaped tower 140 feet tall, is still under construction alongside the new hangar. When completed early next year, it will house the extensive collection of ballistic missiles and launch vehicles.

The museum has come a long way since 1923, when it was established in the corner of a hangar at McCook Field near downtown Dayton. It moved to Wright Field in 1927 and has had several locations over the years. In 1941, its space was converted to wartime use, and its collection went into storage. It did not open again to the public until 1955.

It moved to its present location—and into the first of the huge Quonset hangars—in 1971. Even then, the collection was too big for the floor space available. Many airplanes were parked outdoors, vulnerable to the elements. Visitors had to go about a mile to a facility on the old Wright Field flight line to see some of the

aircraft. A second Quonset hangar was added in 1988.

With the third hangar that opened this summer, the indoor exhibits and displays in the museum's main buildings now occupy almost 17 acres. However, visitors must take a shuttle bus to see about 30 aircraft that are still at an auxiliary site inside the fence on the main base.

Among the attractions on the shuttle run are nine Presidential aircraft. The most notable is SAM 26000. Also on display is the VC-54 *Sacred Cow*, the first Presidential aircraft, which served both Roosevelt and Truman. It was aboard *Sacred Cow* in 1947 that Truman signed the National Security Act, establishing the Air Force as a separate service.

Eventually, all of the Presidential aircraft will move (along with spacecraft) into a fourth Quonset building yet to be built at the museum's main site.

The museum is under the operational control of Air Force Materiel Command at Wright–Patterson but gets its policy direction from the Office of the Air Force Historian in Washington. The staff of 96 Civil Service employees is augmented by 450 volunteers who greet visitors, conduct tours, work on exhibits, sand, paint, and polish artifacts, and take airplanes apart and put them back together.

A case in point is Robert Spaulding, who has racked up 26,000 hours as a volunteer. He was a sergeant pilot, flying L-4 aircraft, in World War II. After the war, he worked for McCall Printing Co. in Dayton until he retired in 1982. Ever since, he has been a volunteer in the museum's Restoration Division, where he now supervises 56 other volunteers. (Coincidental curiosity: Spaulding had the *Air Force* Magazine account at McCall's when the magazine was printed there in the 1960s.)

Visitor Mix Changes

Even though airplanes are parked wingtip to wingtip in the exhibition halls, the focus is not on airplanes alone.

"There are not enough pure aviation enthusiasts to support a museum of this magnitude," said retired Maj. Gen. Charles D. Metcalf, director of the museum since 1996. "We value the aircraft, but their greatest value is being able to engage an audience and make a point."

That philosophy is part of the museum's adjustment to change in the mixture of visitors. In times past—especially in the early days when the museum was much smaller and less renowned—Air Force veterans accounted for much more of the attendance than they do now.

That reflects, among other things, a decline in the population of veterans. Only six percent of the American public below the age of 65 ever served in the military, Metcalf pointed out.

Air Force veterans still come in large numbers to see the airplanes they knew and flew. They are often accompanied by their grandchildren and great-grandchildren.

But an increasing share of the visitors have nc direct ties with Air Force service. Thirteen percent of those who come are foreigners. Large numbers of schoolchildren come through on tours.

Whereas the P-51 and the P-47 would have been big magnets for earlier generations, young visitors today "don't even break stride going by on the way to see the F-16 or the F-15 or the F-22," said Terrill M. Aitken, senior curator. "That's what

Photo by Paul Kennedy

USAF photo

At top, workers shift a B-47 bomber to a new location. Above, the first aircraft specifically designed for Presidential use—SAM 26000—is one of nine Presidential aircraft displayed by the museum. It carried President Kennedy's body back to Washington after his Nov. 22, 1963, assassination in Dallas.

Photos by Paul Kennedy

Among the museum's many dioramas is this depiction of a World War II instructor lecturing a student pilot, who upended (or nosed) his BT-9 upon landing. Meanwhile, mechanics check the damage to the aircraft.

they've seen in video games and on TV and to finally see a no kidding, for real F-16 is really slick."

"Six years ago, our attendance was suffering," Metcalf said. "We changed our philosophy. Rather than being a museum of hardware, just airplanes sitting around staring at you, we shifted to people and events."

Attendance has since recovered to previous levels and is heading upward. Whereas some other museums have seen attendance decline with the falloff in air travel after 9/11, the Air Force Museum—most of whose visitors arrive by automobile—has not.

Teaching History

"We look at story lines," Metcalf said. "How can we make the heritage and tradition of the Air Force interesting to our visitors?"

That often means supplying background and context that earlier generations that came to the museum did not need. "We find we have to teach world history, military history, and even geography," Metcalf said.

Today, young visitors may have little or no knowledge of the Japanese attack on Pearl Harbor, he said. The exhibit of the P-36 fighter fills in that gap and, to boot, tells a story that even some veterans may not have known.

The strike at dawn Dec. 7, 1941, not only sank US ships at Pearl Harbor but also left many Army Air Forces aircraft on Oahu destroyed or burning. One of the few that did get in the fight was a P-36 from Wheeler Field, flown by 2nd Lt. Philip M. Rasmussen.

The exhibit has a mannequin representing Rasmussen, who did not take the time to dress, standing on the wing of the airplane in his pajamas, a gun belt strapped about his waist. Rasmussen and three other pilots engaged 11 enemy aircraft, and he shot one of them down before running into more Japanese Zeros than he could handle. He took considerable battle damage but managed to land, with more than 500 bullet holes in his P-36. In 1998, Rasmussen—a retired colonel—came to the museum to lecture.

Eventually, Metcalf said, "Every significant aircraft will have its own habitat." A good example of what he meant is the "Back to the Philippines" habitat in place around the exhibit of the A-20 attack bomber.

The A-20 diorama is extensive, situating the airplane amid coconut trees and jungle vegetation on New Guinea in 1944, with sound effects of aircraft flying overhead. Mannequins depict airmen working on an engine, and sign text, maps, and sound track explain the campaign to liberate the Philippines.

The story of the Doolittle Raid on Tokyo in 1942 is told at the B-25 bomber exhibit. The aircraft is situated in a life-size diorama, a simulation of the deck of the aircraft carrier *Hornet*. A mannequin portrays Lt. Col. Jimmy Doolittle, who will lead the raid, other members of the Raiders, and Army Air Forces and Navy crew members loading bombs into the bay of the B-25.

One of the more unusual presentations is the BT-9 trainer aircraft from the 1930s and early 1940s. It is depicted on its nose to illustrate the high washout rate (40 percent) of cadet pilots in World War II.

In this instance, the cadet pilot has applied the brakes too hard when the wind was at his back. The wind lifted the airplane's tail, causing the nose to hit the ground. In the diorama,

Continued on p. 68

Another diorama depicts 2nd Lt. Philip Rasmussen getting into a P-36 in his pajamas, wearing a gun belt. He was one of only a handful of pilots able to get an aircraft aloft to engage the enemy during Japan's 1941 attack on Pearl Harbor.

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Continued from p. 66

mannequins portray the hapless cadet getting a lecture from his instructor while mechanics check out the damage.

The museum also operates a Web site (www.wpafb.af.mil/museum), where visitors can find more information about what they saw at the museum after they return home. It has 3,000 pages and 1,500 photos. Metcalf predicted 95 million hits on the site this year.

The Large and the Rare

Opinions may vary about which of the aircraft in the museum is most interesting, but there's no argument about which one is the biggest. The B-36J bomber wins that contest with ease.

The mighty B-52 looks big, and it is. But the massive B-36, located in the newest exhibit hangar, is the largest bomber in the history of the Air Force.

Its wingspan is 230 feet—almost twice the distance of the Wright brothers' history-making flight at Kitty Hawk in 1903—and it has 10 engines, six of them reciprocating and four turbojets. The propellers are mounted behind the wings. The intercontinental B-36 was the mainstay of Strategic Air Command until it was replaced by the all-jet B-52.

There is a legend that when the museum's B-36 moved indoors, the building was constructed around it. That is myth. However, it is true that the end part of the building was not completed until the B-36 was wheeled into position.

The aircraft closest to the B-36 in its present location is an F-94C Starfire interceptor, and it looks very small by comparison.

One of the rare aircraft on display is the B-24 bomber, and that's a story in itself. During World War II, more than 18,000 were bought, more than any other bomber in US history. They were so common that, apparently, nobody noticed they were becoming rare until nearly all of them were gone.

The Smithsonian's National Air and Space Museum in Washington does not have one and rates the B-24 as its "most wanted airplane."

The B-24D at the Air Force Museum flew combat missions in North Africa in 1943 and 1944. The name painted on the fuselage, along with nose art of a recumbent lady, is *Strawberry Bitch*. The museum says that

Photo by Paul Kennedy

Much of the museum staff's effort goes into restoring aircraft, which often arrive at the facility in poor condition. Restorers are meticulous in following the original specifications—even on parts of the aircraft the public will never see.

Restoring History

The aircraft on the exhibit floor at the Air Force Museum are in pristine condition and look factory fresh, but they didn't arrive that way. Typically, they came here dilapidated, banged up, and missing parts.

About 20 percent of the museum staff's effort goes into restoring aircraft. Most of this work is behind the scenes, but tours of the restoration and exhibit facilities are offered once a week during the summer and once a month the rest of the year.

If original parts are not available, the restoration staff manufactures them. The museum's Sopwith Camel, for example, was built from scratch in the restoration hangar, following the original drawings from World War I.

"We try to restore all the aircraft to airworthy condition," said Myrl Morris, chief of the Restoration Division. "That is the ultimate goal. ... I estimate over half the aircraft on display are still serviceable. A very good example of the restoration standards would be the P-12, which was practically built from the wheels up and only needs fuel and oil to go flying. Our B-17 *Shoo Shoo Shoo Baby* did actually fly after restoration."

On a day in June, the principal activity in Morris's shop was on the B-2, which will go on display later this year. Waiting on the ramp outside, much in need of renovation, was the F-15 *Streak Eagle* demonstrator that broke eight time-to-climb records in 1975. Inside, work was in progress on a German V-2 rocket from World War II.

In the back of the hangar, a Spad XIII C.1 was beginning to emerge from extensive restoration. It was built in 1918, but had done most of its flying with Cole Palen's famed Old Rhinebeck Aerodrome in Rhinebeck, N.Y. (See "Dawn Patrol on the Hudson," December 2002, p. 54.) When Palen died, he bequeathed the Air Force Museum its choice of the vintage aircraft in his collection. The museum chose the Spad.

However, Palen's pilots at Rhinebeck had flown the Spad with an air-cooled Lycoming engine instead of the original water-cooled Hispano-Suiza engine. That was just one of the changes required to return the Spad to its World War I configuration.

Numerous parts had to be manufactured anew. Irish linen—used to cover the aircraft 85 years ago—was obtained from London's A.H. Vane and Co., Ltd., the sole source distributor for the Irish manufacturer of this fabric. The Research Division used all sorts of methods, including analysis of the original fabric from World War I aircraft to determine the proper colors for the Spad's insignia and other markings.

The restoration team also meticulously followed original specifications to make interior parts—such as the fuel pump and plumbing lines—which will not be seen by visitors when the Spad goes on display in the museum.

"But we would know," Morris said.

Photo by Paul Kennedy

Museum staffers carefully move the massive B-36 into a new building at the museum. The 10-engine bomber has a 230-foot wingspan and is the largest in USAF history.

"the aircraft was named, in part, because of the pinkish-tinted paint." This is the paint scheme and name it had in World War II. Museum tour guides sometimes refer to the airplane as the "Strawberry Lady."

Adding to the Collection

It might seem at first glance that the museum has one of everything, but that is not the case.

"We will never have all the aircraft we would like, and to have one each of everything that was ever flown by the Air Force is an unrealistic dream," senior curator Aitken said.

Even if it were possible to have every aircraft the Air Force ever flew, there would not be enough room to display, park, or store all of them. In fact, when the museum acquires a better or more historic example of an aircraft type, it may be necessary to let the model it held previously go. For example, when the museum in 2002 obtained a B-1B bomber with extensive operational experience, it released its B-1A, which had been a test model.

The Air Force Museum has first dibs on airplanes when they are retired from the operational fleet and tracks the ones it wants by tail number. The C-141 airlifter that will eventually join the collection (around 2006), for example, is presently flying with a Reserve unit at Wright–Patterson and got a new paint job when it went through periodic depot maintenance earlier this year.

This particular C-141 was chosen for the collection because it was the "Hanoi Taxi," the first aircraft out of Hanoi with POWs on board.

Metcalf said that a "big footprint yet to come" is the XC-99, the largest land-based reciprocating engine airplane ever built. (The Soviet AN-225, powered by six jet engines, was bigger.) The XC-99 was the transport version of the B-36, but was almost 10 feet longer and over 10 feet taller.

Only one of the giant airplanes was ever built, and it flew with the X (for experimental) designation from 1947 to 1957. It has been on display in San Antonio, for many years, but it is now being dismantled for shipment to the Air Force Museum and restoration and reassembly there.

When the Presidential aircraft move

Air Force Field Museums

A lesser-known mission of the Air Force Museum is to assist and support other museums. It presently has more than 32,000 items on loan to 12 Air Force field museums, 13 other Department of Defense museums, 79 US civilian museums, and 25 museums abroad.

Many of the aircraft on static display at museums, air parks, and bases around the country are the property of the Air Force Museum, which has let them out on long-term loan.

Some of the better collections are at the sites of former Air Force bases. The Octave Chanute Aerospace Museum, at Rantoul, Ill., has 34 historic aircraft that were static displays at Chanute Air Force Base before it closed. However, a B-36 that Chanute once had is no longer there. It was taken apart and moved by train to the museum at the former Castle AFB, Calif.

When a base closes, Metcalf said, the community usually has an interest in some of the static aircraft staying, but generally looks on the big ones as too expensive to maintain. It costs about $25,000 to paint the B-36, Metcalf said, and it has to be painted every five or six years.

Particularly good collections can be seen at the official Air Force field museums. They are:

- **Eighth Air Force Museum,** Barksdale AFB, La.
- **Air Mobility Command Museum,** Dover AFB, Del.
- **Air Force Flight Test Center Museum,** Edwards AFB, Calif.
- **USAF Armament Museum,** Eglin AFB, Fla.
- **South Dakota Air and Space Museum,** Ellsworth AFB, S.D.
- **Warren ICBM & Heritage Museum,** F.E. Warren AFB, Wyo.
- **Hill Aerospace Museum, Hill AFB,** Utah
- **History & Traditions Museum,** Lackland AFB, Tex.
- **USAF Security Police Museum,** Lackland AFB, Tex.
- **Air Force Space and Missile Museum,** Patrick AFB, Fla.
- **Peterson Air and Space Museum,** Peterson AFB, Colo.
- **Museum of Aviation,** Robins AFB, Ga.

into a fourth Quonset hut hangar, yet to be built, at the main museum site, the XC-99 will go into the facility they presently occupy on the main base, Metcalf said.

The museum is steadily collecting artifacts, including photographs, documents, clothing, and personal equipment of Air Force veterans. The search is always on for other kinds of artifacts as well. At the B-24 bomber exhibit, for example, visitors can see a sample of the pierced steel planking used for taxiways in World War II. (It was slightly different from the PSP used in later wars.)

Artifacts from current operations are collected as well. In June, aircrews that flew combat missions in Operation Iraqi Freedom presented the museum memorabilia from that conflict, including American flags, flight suits, boots, and dog tags.

The museum, one of the top tourist attractions in the Midwest, is clearly visible from a considerable distance as visitors approach Wright-Patterson Air Force Base from Interstate 675.

Photos by Paul Kennedy

Some artifacts in the museum's collection predate World War I, and the staff collects memorabilia from current operations as well. Many are on display, but some of the thousands of items are carefully stored.

Fiber optic lighting is used to preserve artifacts from deterioration after they are put on display.

"We have all seen how the ultraviolet radiation in sunlight bleaches out the paint on old automobiles, but many people are unaware that fluorescent lights emit the same UV radiation," said museum historian Jeffery S. Underwood. In museums, fluorescent light bleaches the color out of photographs, documents, wood, and textiles and hardens the softest leather. To protect its artifacts, the USAF Museum employs the latest advances in fiber optic lighting, which emits no harmful UV rays. For example, its displays of the four World War I Medals of Honor and World War II leather flight jackets use fiber optic lighting.

There's no telling how an aircraft or artifact obtained today might figure into an exhibit in the future. The museum built a reproduction of the Kettering Aerial Torpedo, nicknamed the "Bug," in 1964. It is a pilotless biplane, 12 feet long and with a wingspan of 15 feet, invented by Charles F. Kettering and Orville Wright in 1918. After a predetermined length of flying time, the engine shut off and the apparatus fell to earth, detonating 180 pounds of explosive when it hit. World War I ended before it could be used.

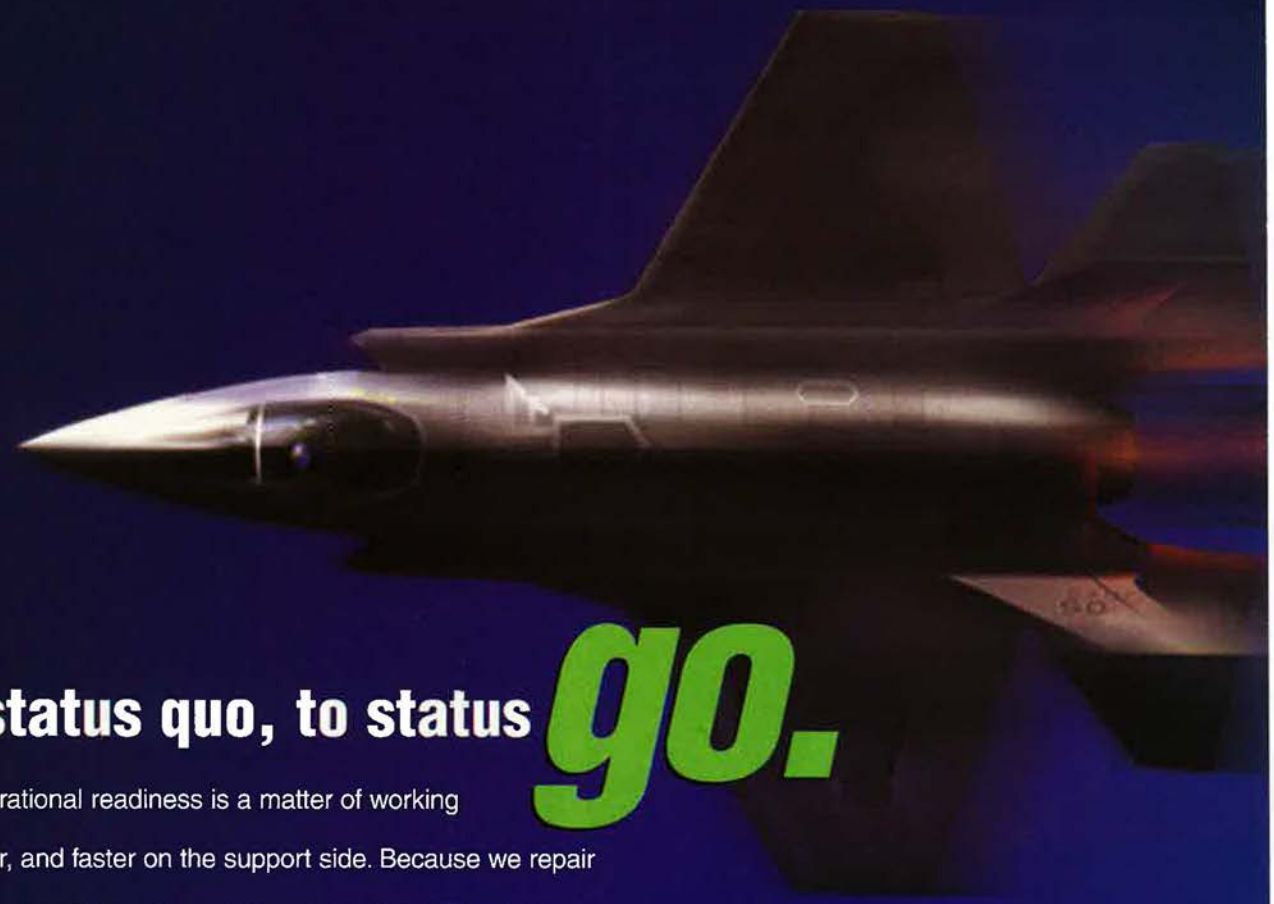
The Army Air Forces gave serious thought to reviving the Bug for use in World War II, but dropped the project because it did not have the range to take off in England and reach targets in Germany.

A number of radio-controlled airplanes were built as aerial targets and for other uses in the 1930s and 1940s, and the museum has examples of these.

With the passage of time, new possibilities emerged for pilotless aircraft. On display at the museum today are Predator and Global Hawk unmanned aerial vehicles used in Kosovo and Afghanistan. Nearby is the prototype for the X-45 unmanned aerial combat vehicle, which is still in the concept demonstration phase.

That's a lot of air machines orbiting around a central idea, and in time, the Kettering Bug could well move out of the "Early Years" gallery where it now appears to be the centerpiece of an exhibit telling the story of how unmanned flight evolved. ■

John T. Correll was editor in chief of Air Force *Magazine for 18 years and is now a contributing editor. His most recent article, "Rumsfeld Tackles the Civil Service," appeared in the July issue.*



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Jewel of the A

One hundred years on, the aura of the 1903 Wright Flyer is more powerful than ever.

By Peter Grier

UP CLOSE, the 1903 Wright Flyer looks as fragile as a child's kite. Its struts are sticks, its skin translucent, its controls pulleys and wire. The pilot's prone position is awkward and obviously hazardous. Its seemingly tail-first design manages to be both elegant and ungainly at the same time.

In flight, the Flyer was dangerously unstable. The Wright brothers continued to spend much time trying to solve the aerodynamic problems it posed.

Yet this unlikely contraption—

Air

which once blew away in a strong breeze—is the seminal artifact of the aviation age. Like the Rosetta Stone and the Mona Lisa, it is a historic object with an uncommonly powerful aura.

It hangs in the Smithsonian's National Air and Space Museum, where even those who see it every day can feel its pull. Three years ago it was taken down and placed on the ground for a night, while the museum underwent skylight repairs. Several docents asked the Smithsonian's curator in charge of Wright materials, Peter L. Jakab, to point out details they could mention in tours.

Word got out, and 75 employees showed up for the walk around. Jakab talked for two hours.

To Jakab, the 1903 Kitty Hawk Flyer is really two things: the world's first successful airplane and a powerful symbol of the Wrights' pioneering approach to research and design.

The Flyer was the descendent of generations of kites and gliders which the Wrights had used to test their ideas. They would try, fail, rebuild, and test again in a process of methodical improvement that today's aeronautical engineers would easily recognize.

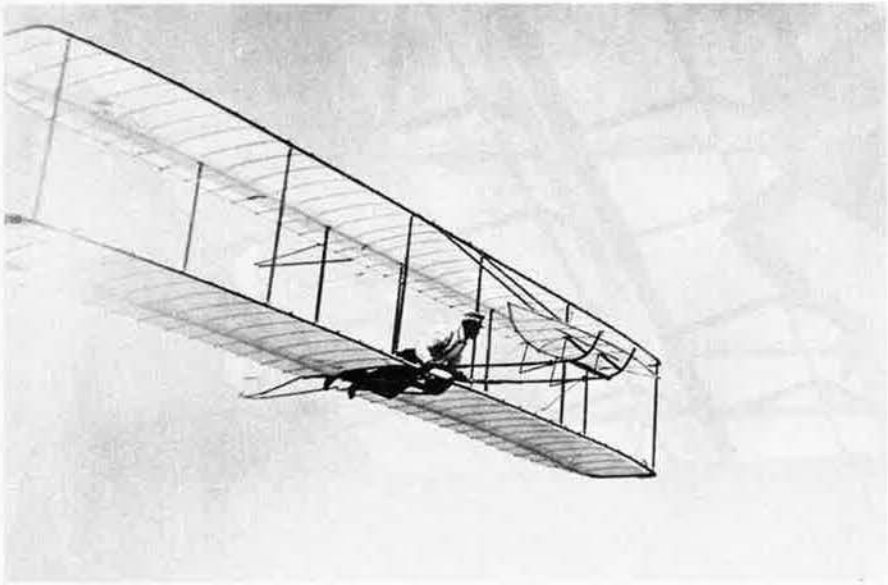
This intensity set the Wrights apart from their rivals and brought them to Kitty Hawk, N.C., on a fateful December day.

"They understood that an airplane was not just one invention but many inventions—all of which had to work in concert," says Jakab.

In the Beginning

Orville and Wilbur Wright would say that their interest in flight began with a toy.

In autumn 1878, their father—



The Wrights' 1902 glider was a breakthrough success. Changing the fixed vertical tails into a moveable rudder helped make it possible for the aircraft to glide 600 feet. The Wrights made nearly 1,000 flights in this machine.

Bishop Milton Wright of the Church of the United Brethren in Christ—came into their Dayton, Ohio, house one evening with something partially concealed in his hands. Before his boys could see what it was, he tossed it into the air. It flew up till it struck the ceiling, fluttered there a while, and then sank to the floor.

It was a toy helicopter with a cork and bamboo frame, with propellers at top and bottom driven by twisted rubber cords. Orville and Wilbur promptly dubbed it a "bat."

"A toy so delicate lasted only a short time in the hands of small boys, but its memory was abiding," they wrote in a 1908 *Century Magazine* article that still stands as the fullest personal account of their early motivations.

Years later their interest was piqued again, this time by a tragedy: the 1896 death of German flight pioneer Otto Lilienthal in a gliding accident.

By then Orville and Wilbur's bicycle business was a prosperous success. Eager to try something new, they pored over all available published works dealing with flight theory. They determined that there were two schools of thought regarding aviation: one that emphasized development of the power sources necessary for heavier-than-air flight and a second that focused on gliders, soaring, and the development of control.

"Our sympathies were with the latter school," the brothers wrote in *Century Magazine*.

Orville and Wilbur were enchanted by a vision of sailing through the air on fixed wings. They also thought it impractical to mount a costly engine on wings no one had learned to manage.

Yet the more they looked at it, the more they realized that control of these wings was no simple matter. Lilienthal had steered by simply swinging his weight, as do modern hang gliders—a crude method that works only with small craft. In addition, most experimenters of the time were trying to build inherently stable gliders, which would likely be difficult to actively maneuver in powered flight.

So the Wrights determined to build a system of mechanical controls and incorporate it into a machine that would not tend to right itself. It was a fateful decision that, by itself, gave them an enormous advantage over their rivals.

Achieving Control

"Technically, their greatest and fundamental achievement was their invention of three-axis aerodynamic control," concluded F.E.C. Culick, a professor of mechanical engineering at the California Institute of Technology and expert on the science of Wright aircraft, in a 2001 paper for the Society of Experimental Test Pilots.

The brothers started their flying experiments in 1899, using a kite. Continuity of design would be a Wright hallmark throughout their careers, and that first effort foreshadowed the 1903 Flyer design.

Like the Flyer, the kite was a biplane. Like the Flyer, the kite had an elevator for control of climb and descent mounted in the front.

Most importantly, the kite had the Wrights' first "wing warping" system. A series of lines enabled the person on the ground to twist the tips of one wing up, while simultaneously twisting the tips of the other wing down. This caused the wings to produce different amounts of lift, causing the kite to bank.

A famous story holds that the idea for this innovation came to Wilbur one day when someone entered the Dayton bicycle shop and asked for an inner tube. Wilbur took down a box, opened it, and gave the tube to the customer for examination; while waiting, Wilbur idly twisted the box in his hands.

He noticed that when he twisted one side down, the other went up. The box was roughly the shape of a biplane—so why shouldn't they try this motion in flight? Perhaps it would allow them a means of control, like the twisting of bird wings he and Orville had so often observed.

To their delight, the technique worked. The innovation allowed a means of lateral control and opened the way to control in all three dimensions. Being based on aerodynamic principles rather than the shifting of weight, it could be applied to wings of any size.

Encouraged by their success, the brothers moved on to full-size designs. In 1900 and 1901 they flew two piloted gliders over the sands of Kitty Hawk—a place identified by the US Weather Bureau as having lots of space and lots of wind.

They perfected airfoils and structural design. Their control systems worked well. But something was still missing—lift. Their wings did not produce the lift that their calculations, based on data from eminent scientists, predicted.

So they went back to the shop, where the Wrights produced another of their pioneering insights. The brothers decided that, to understand the aerodynamics of a large wing, they could simply make a small one of the same proportions and test it in a wind tunnel. They built such a tunnel in the back

of their shop, as well as tiny, ingenious instruments that could measure coefficients of drag and lift on model wings.

The Scientists Were Wrong

Their own experiments convinced them that the eminent scientists had figured things wrong. Their 1902 glider was a breakthrough success, proving that they were right. After they fixed one last control problem by making their fixed vertical tails into a movable rudder, they were able to glide as far as 600 feet. They made nearly 1,000 flights in this machine and were eventually able to keep it aloft for a minute.

"Little wonder that our unscientific assistant should think the only thing needed to keep it indefinitely in the air would be a coat of feathers to make it light!" they wrote in *Century Magazine*.

In the spring and summer of 1903, their shop in Dayton hummed with activity as they carefully constructed a machine that they believed stood a very good chance of being the first heavier-than-air machine to take flight.

There were no blueprints—or, at least, none that have survived. The brothers did make a preliminary drawing of the Kitty Hawk Flyer on brown paper. It consists of pencil sketches of the top, side, and front, with some computations in Wilbur's handwriting.

Given the power of their engine, which they estimated at eight horsepower, weight was to be saved at all costs. Spars were fitted through ribs, bolts were as small as possible, and the drive chain came from a bicycle. Wing covering was light, plain muslin—a variety known as Pride of the West, which was used primarily for ladies undergarments.

Even today the ingenuity of Wright engineering can be seen in such touches as the wire wrapped around the struts to enable them to flex.

"They recognized that, if you have a vertical beam with a compression load, that if you support that in the middle, you're essentially halving the length of the strut, and you can make it thinner and lighter," says Jakab.

They kept the forward-mounted, canard elevator. The brothers believed that design element made the airplane less likely to stall—and they were very aware that stalling had killed Lilienthal. They found the fact that they could see the elevator comforting, as they could spot a mechanical problem in an instant.

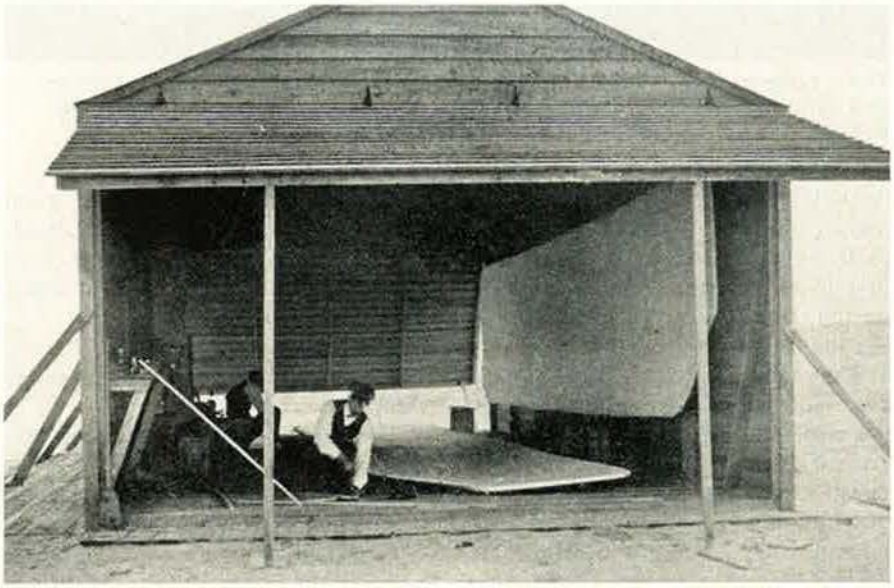
In fact, canard designs are not less likely to stall and are difficult to design correctly, due to their relatively forward centers of gravity. This was a flaw the Wrights did not fix until later in their careers.

"There is no evidence that the Wrights intentionally designed their aircraft to be unstable—they just turned out that way," wrote Culick.

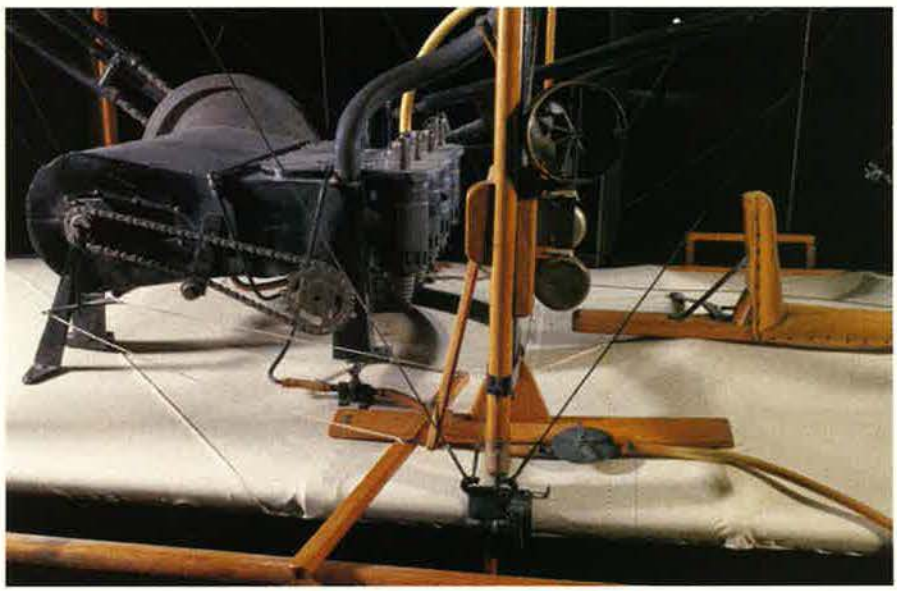
The Flyer was also designed with twin propellers, contra-rotating. The Wrights figured they could push a greater mass of air with large props, moving slowly.

In some ways, their propellers were more sophisticated than their aircraft. They approached their design scientifically, unlike almost all other aeronauts of the age. Deciding that the propellers were wings turned sideways, acting on the air, they gave them airfoils that maximized their efficiency. It was an insight others would not match for years.

When it was assembled at Kitty Hawk, the Flyer had a wingspan of 40



In this spartan shack on a North Carolina beach, the brothers assemble the Flyer. The intact airplane was 21 feet long and stood nine feet, four inches high. With a pilot on board, it weighed 750 pounds.



NASM photo by Eric Long

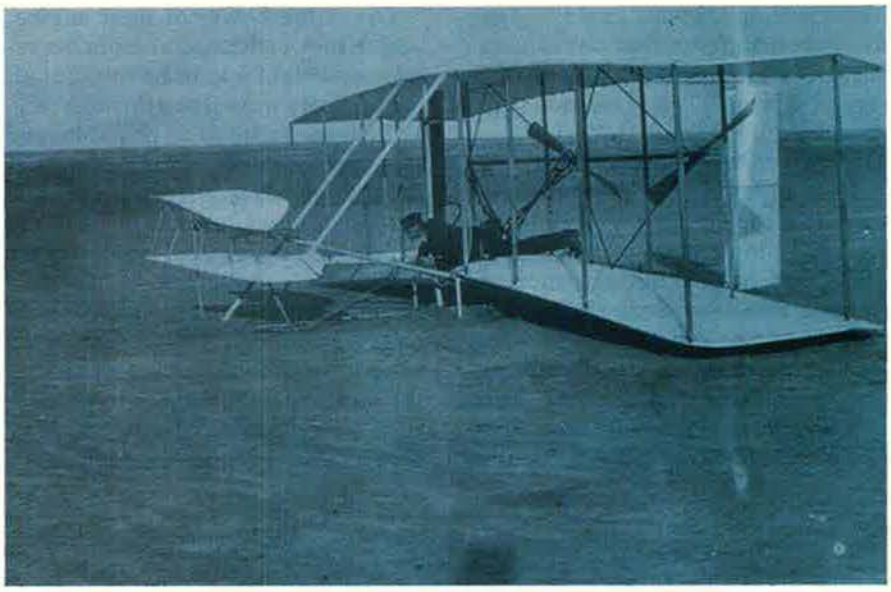
The Flyer engine generated eight horsepower, and the drive chain came from a bicycle. To the right of the engine was the "cockpit," an area where the pilot lay stretched out on his stomach.

feet, four inches. It was 21 feet long and nine feet, four inches high. With pilot, it weighed 750 pounds, giving it a wing loading of 1.47 pounds per square foot, about 75 percent greater than that of their 1902 glider.

Events of the fall of 1903 in Kitty Hawk are among the most historic in the annals of invention. Initially the brothers were seriously delayed by problems with their tubular propeller shafts, to the point that Orville had to return to Dayton to manufacture new ones, from solid tool-grade steel, that were smaller in diameter to provide some spring. They knew that their American rival Samuel Pierpont Langley, an eminent scholar and head of the Smithsonian Institution, was on the verge of launching his own Aerodrome airplane from a houseboat in the Potomac.

After winning a coin toss, Wilbur went first and made an unsuccessful attempt to fly on Dec. 14. On Dec. 17, knowing that Langley's Aerodrome had plunged into the drink, the brothers tried again. At 10:35 a.m., Orville took the Flyer down its wooden rail and took to the air for a 12-second flight, traveling 120 feet.

Wind speed at the time was 35 miles per hour or more, almost a gale. The Flyer was probably only traveling six to eight miles per hour when it reached the end of the track.



The tubular propeller shafts caused problems but they were finally resolved. In a coin toss, Wilbur won the oportunity to attempt the first flight, but the Dec. 14, 1903, effort (shown here) was unsuccessful.

The Big Day

The photograph of that moment, taken by helper John T. Daniels of the Kill Devil Life Saving Station, is one of the most widely reproduced pictures of all time. The Flyer has just lifted off and Wilbur is half-turned, body weight forward, having just released the wingtip.

They made three more flights that day, with the brothers alternating at the controls. The last, with Wilbur aboard, was of almost one minute duration and covered 852 feet.

After this last flight, the aircraft landed hard, damaging the elevator. As the Wrights discussed the situation, a gust of wind flipped the Flyer over and sent it tumbling across the sand. Daniels was trapped between the wings and was shaken about, "like a rattle in a box as the machine rolled over and over," the Wrights reported.

Daniels was not seriously hurt, but the aircraft was irretrievably damaged.

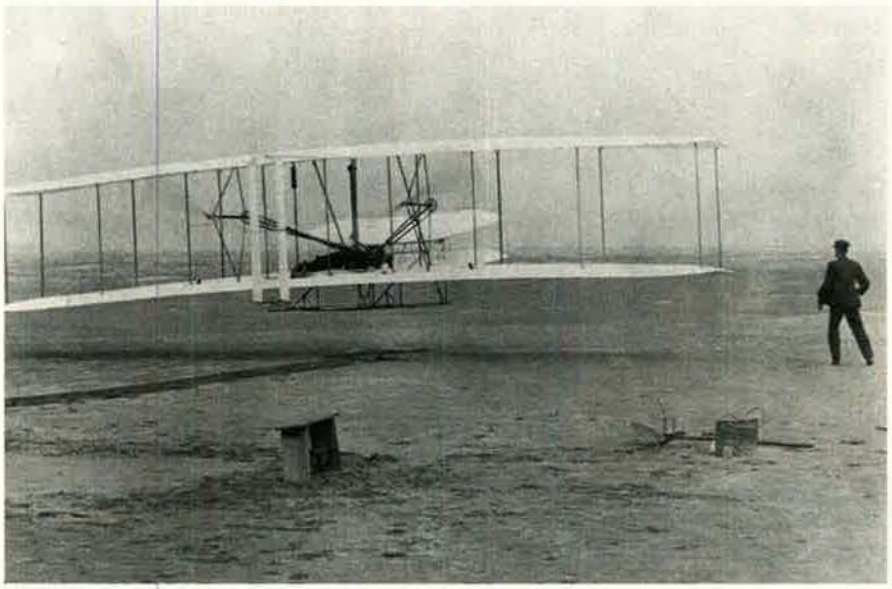
Unlike previous Wright experimental craft, however, the 1903 Flyer was saved. The brothers crated it up and shipped it back to Dayton.

Today the 1903 Flyer is one of the icons of the Smithsonian Institution. It has "flown" over the heads of visitors entering the National Air and Space Museum, next to *Spirit of St. Louis,* for decades. This October it will be taken down and placed at ground level, where it will be the centerpiece of a new exhibit honoring the Wrights' contribution to 100 years of flight.

The Flyer took a roundabout journey to Washington's Mall, however. In any case, replacements and reconstructions mean that the Flyer today may be only 60 to 70 percent original.

Following their triumph at Kitty Hawk, the Wrights focused on perfecting their designs and flying skills and profiting from their labors.

Their 1905 Flyer was their first practical flying machine, as opposed to the Kitty Hawk aircraft, which was more like a flyable test bed. The 1905 model had more power and an engine less prone to overheating. The canard was larger, and farther forward, providing more control. Wings

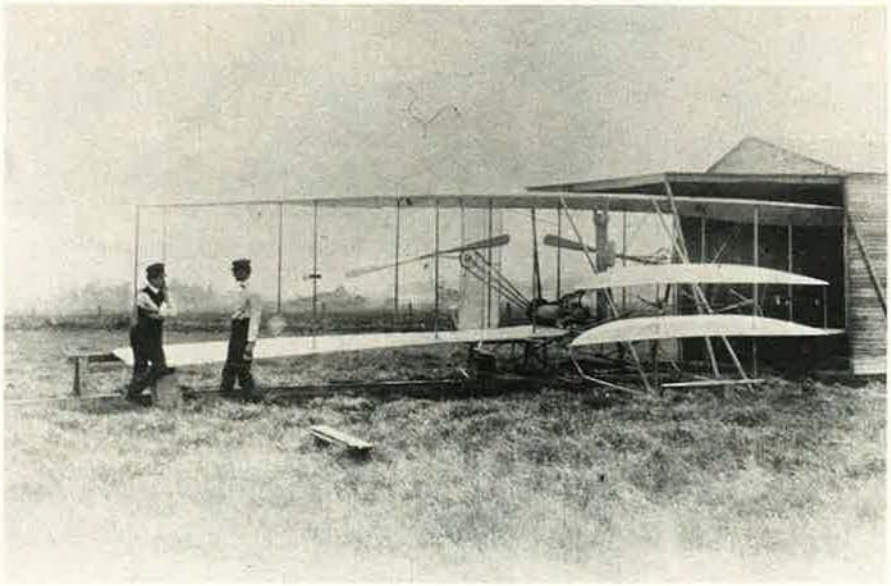


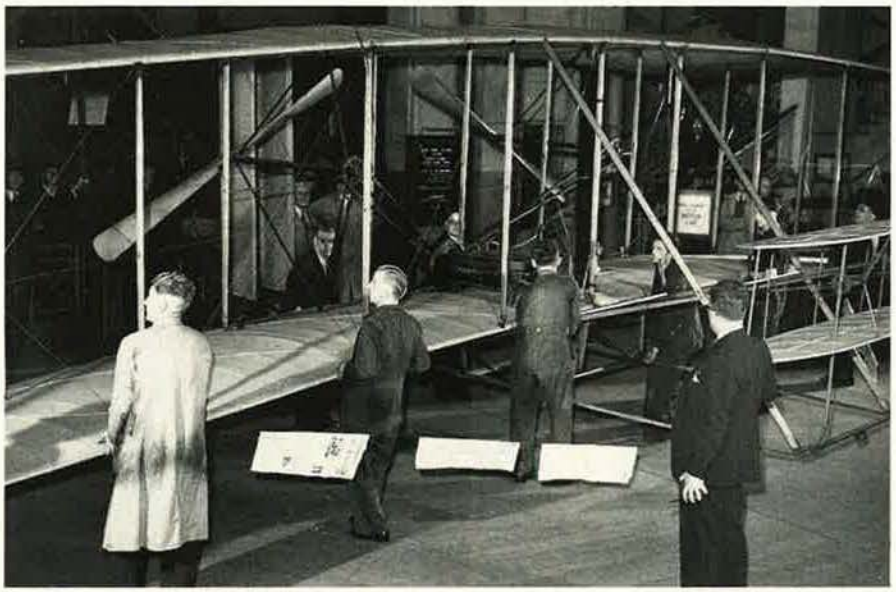
On Dec. 17, 1903, at 10:35 a.m., Orville Wright took the Flyer to the air for the first time. The flight lasted 12 seconds and covered 120 feet, but it was a monumental achievement. The Wrights made three more flights that day.

were flat across, as opposed to the 1903 aircraft's downward sloping anhedral, which had helped make that design unstable.

By the end of 1909, spectacular flights in Paris and New York had made Wilbur and Orville celebrities. They were also immersed in legal fights to protect their flight-control patents—fights that would drain them for years but most of which they would ultimately win.

The Kitty Hawk Flyer was not entirely forgotten. But for years it was stored, still in crates, in a shed behind the Wrights' Dayton bike shop. With it were all the brothers' research material and many of their early documents—a treasure trove of historical material.





At top, the Wrights continued to build airplanes, making improvements that brought more stability and control. Here, the original Wright Flyer is seen on display in London, where it remained until 1948 when it was moved to the Smithsonian, after a long-standing dispute over first-flight credit was resolved.

Then in March 1913, the most devastating flood in Dayton's history put the bike shop's West Third Street neighborhood under 12 feet of water. When the water receded, the crates were pried open. Miraculously, little was damaged. Mud had formed a sort of sealant on the outside of the boxes, preventing serious water damage.

In 1916, the Flyer was reconstructed for the first time, at the request of the Massachusetts Institute of Technology. It was put on public display for a brief two days. Even at this early date, the engine was not original, and much of the structure was new construction.

According to a label prepared for the exhibit, "the front and rear rudders had to be almost entirely rebuilt. The cloth and the main cross spars of the upper and lower center sections of the wings also had to be made new."

For the Flyer, a life as a sort of nonflying barnstorming curiosity followed. It appeared at the New York air exposition in 1917 and at a Society of Automotive Engineers meeting in 1918. In 1919, it was the New York exposition again. In 1924, it was shown at the National Air Races.

On Display—in London

In 1928, the world's first heavier-than-air flying machine finally went on constant display—but it was not at the Smithsonian. It was not even in the United States. Smithsonian officials of the time were unwilling to clearly credit the Wright brothers as the first to fly—so Orville, after years of frustration, loaned the 1903 Flyer to the Science Museum in London.

"No one can regret more than I the situation in the Smithsonian Institution which has made it impossible for me to place our first airplane in its care," wrote Orville in a 1925 letter to a New York museum president.

The problem revolved around one of the Smithsonian's own, Samuel P. Langley. Langley's Aerodrome did not fly before the Wrights did, but, in 1914, after extensive modification by inventor and Wright rival Glenn Curtiss, it did make a series of short hops at a New York lake.

The Aerodrome duly went on display at the Smithsonian, with a label dubbing it "the first man-carrying airplane in the history of the world capable of sustained free flight."

Unsurprisingly, Orville considered this an outrage. (Wilbur had died of typhoid in 1912.) It took years of negotiations before a newer generation of Smithsonian leaders in 1942 publicly retracted the museum's position.

The Flyer did not return to its native land until 1948, shortly after Orville's death. The director of the London Science Museum escorted the airplane as it crossed the ocean aboard the *Mauretania*. But a dock

NASM photo by Eric Long

The Wright Flyer has been one of the Smithsonian's most popular and inspiring exhibits for more than five decades. Below, a reproduction of the Flyer undergoes aerodynamic testing in a wind tunnel at Langley AFB, Va.

neously. In 2001, a group of Air Force test pilots from Edwards AFB, Calif., took turns at a ground simulator rigged to mimic the Flyer. Every one crashed their first time.

Yet the Wrights managed it. Their experience with their machine, plus the luck of ideal weather, got them into the air. Then they improved their aircraft bit by bit as they figured improvements to aerodynamic problems.

They were both the first fliers and the first flight testers of powered aircraft.

The evolution of their aircraft can be traced to the many photographs they took of their efforts, says Hyde. Viewed in sequence, the pictures reveal such changes as the lengthening of their elevator control for more leverage.

USAF photo by SSgt. Lavi Collins

strike prevented a New York arrival. The ocean liner diverted to Halifax, Nova Scotia, instead.

The Smithsonian curator entrusted with receiving the treasured exhibit was Paul E. Garber, a famous collector of air memorabilia since aviation's early days. Garber had known Orville personally. He also had served five years in the Navy in World War II.

Stuck in Halifax, his military experience came in handy. Garber called Navy headquarters back in Washington.

"This is Commander Garber. I'm in Halifax, Nova Scotia, with the most immortal airplane on Earth, and I need some help," Garber said, according to an interview he gave in 1986.

An aircraft carrier was diverted to help. On the 45th anniversary of the historic first flight, Dec. 17, 1948, the 1903 Flyer was finally presented to the Smithsonian. The formal acceptance speech was given by Vice President Alben W. Barkley, a Smithsonian regent.

Many groups and individuals have attempted to reproduce an airworthy 1903 Flyer in the years since it arrived back in the US. All have discovered the airplane's hidden secret—it is almost impossible to fly.

The Wright Experience, a Virginia-based group that intends to fly an exact reproduction of the Flyer at Kitty Hawk this Dec. 17, has discovered that training pilots to handle the unstable craft is one of their biggest challenges.

"Our pilots are going to have to unlearn everything they know to fly the Wright machine," says Ken Hyde, a retired airline pilot who is one of the driving forces behind the effort.

Trying to pilot the Flyer has been described as similar to balancing two yardsticks on two fingers, simultaneously. "Each time they learned, they changed something to make it better," says Hyde.

It was this practicality that enabled them to beat many of the world's eminent aeronautical theoreticians into the air and to create an icon of flight that still thrills millions of people every year.

"They had a powerful ability to move from the abstract to the concrete," says Jakab.

Seeing the airplane close up, as visitors will be able to do starting this fall, greatly maximizes its power, explains the Wright curator.

"It's a very compelling object," he says. "It does have the wowie zowie factor." ■

Peter Grier, a Washington, D.C., editor for the Christian Science Monitor, *is a longtime defense correspondent and a contributing editor to* Air Force Magazine. *His most recent article, "The Remembered War," appeared in the July issue.*

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The Tactical School

By Walter J. Boyne

In the years between the world wars, Army leadership expected the Air Corps Tactical School to produce air officers trained in the use of airpower to support ground troops. The airmen at ACTS, instead, developed a doctrine that envisioned strategic bombing to paralyze an enemy's industrial infrastructure and thus eliminate his war-making capacity.

It was not a readily accepted doctrine.

Most senior military leaders of the time agreed with retired Gen. of the Armies John J. Pershing, who had said: "An air force acting independently can of its own account neither win a war at the present time nor, so far as we can tell, at any time in the future. ... The military air force must be controlled in the same way, understand the same discipline, and act in accordance with the Army commander under precisely the same conditions as the other combat arms."

The airmen at the tactical school were dedicated to proving Pershing wrong.

Army Air Service leaders after World War I recognized that they needed to create a formal process to teach air tactics and develop principles of airpower. In February 1920, they authorized creation of the Air Service School at Langley Field, Va., and tasked Maj. Thomas DeWitt Milling to set it up.

The school's primary mission was simple: Teach air officers and selected officers from other services the strategy, tactics, and techniques of airpower. Its secondary mission—perhaps more critical than the first—was to develop doctrine for the new service. At that point, airpower doctrine, as such, did not exist.

Most of the school's early ideas on the use of airpower were derived from the thinking of Brig. Gen. William "Billy" Mitchell, with just a dash of the thought of Giulio Douhet thrown in. Mitchell championed an independent air force and the primacy of the bomber. It became impolitic to endorse his views openly after his court-martial in 1925 for speaking out against the control of aviation by nonflying officers and claiming their policies were responsible for a rash of air vehicle crashes.

Nonetheless, Milling injected Mitchell's ideas in the school's philosophy. He had been Mitchell's protégé and chief of staff during the war and believed in his ideas.

Mitchell-flavored thinking was in direct conflict with the official view of the War Department General Staff. Senior Army leaders still thought of aviation in terms of observation and attack, with scant emphasis on pursuit and almost none on bombing. All attempts—and there were many—to express the school's views in the form of regulations or field manuals were promptly squelched by the General Staff.

In the hot competition for the lim-

ited military budgets of the time, neither the Army nor the Navy wanted to give up roles and missions upon which their appropriations depended. It was more comfortable to regard the Air Service as just another Army combat arm, rather than as an independent, equal service. On this latter point, the Navy was even more adamant than the Army, for Navy leaders were convinced that an independent air force would always side with the Army in any dispute.

In its early days, the views of the school conflicted with those of top Air Service officials, who criticized the school's policies for being too conservative. A paper titled "The Doctrine of the Air Force," prepared by the faculty and submitted in 1928, was regarded as placing airpower in a subordinate role and not considering fully airpower's possible ability to overcome enemy opposition at the outset of a war.

In 1922, the school's name changed from Air Service Field Officers' School to the Air Service Tactical School. This photo shows the school's student barracks, built in 1924.

In the Beginning

When it opened its doors in 1920, the Air Service School had nine instructors and eight students. There were no texts or doctrine, and instruction was based on the experience gained during World War I. A year later, the Air Service changed the school's name to Air Service Field Officers' School to reflect its role in providing professional education for the service's more senior officers—those destined for future leadership roles. However, its utility as a school for field grade officers only was limited by the slow tempo of Air Service promotions to field grade status. It seemed probable that there would always be more company than field grade officers.

In November 1922, the service decided to change the school's name to the Air Service Tactical School. With the redesignation came a considerably enlarged and broadened curriculum, one that included coverage of tactics of the other services. The school's first text was written by Maj. William C. Sherman, Milling's assistant and another Mitchell disciple, and issued in 1921 in the form of a mimeographed training regulation. It was soon supplemented by more formal texts derived from lectures.

The school's nine-month curriculum included 1,345 hours of instructions on 20 different subjects and 126 hours of practical flying. Even nonrated officers from other services were placed on flying status for the course.

In 1926, when Congress redesignated the Air Service as the Army Air Corps, the school's name changed again, to the Air Corps Tactical School.

For the first five years of the school, instructors focused their lectures on the lessons learned from World War I. By 1928, however, the school began to adopt a forward look, with some lectures considering "what if" scenarios that investigated how more innovative use of airpower might have affected World War I battles.

Soon, the school was investigating ways airpower might influence future combat. By 1929, the switch from reviewing the past to planning for the future had become so ingrained in school thinking that it adopted this motto: *Proficimus More Irretenti,* meaning "We Make Progress Unhindered by Custom."

The tactical school remained at Langley until 1931. In that year an Air Corps expansion brought new units to Langley, prompting officials to move the school to Maxwell Field near Montgomery, Ala. The Montgomery community welcomed the school, and Congress proved to be unusually generous in providing funds for construction.

The "Bomber Mafia"

By the time of the move to Maxwell, the creation of doctrine had become the official goal of the vast majority of staff and students. There grew up a small circle of brilliant leaders whose names would figure prominently in the history of the service and who would retrospectively be called the "bomber mafia." They included many important future general officers, including Muir S. Fairchild, Harold Lee George, Haywood S. Hansell Jr., Laurence S. Kuter, Robert Olds, Kenneth N. Walker, Robert M. Webster, and Donald Wilson. Inspired by Mitchell's ideas and vision, their beliefs were reinforced by the anticipation of modern equipment that would replace the service's antiquated Keystone and Curtiss biplane bombers.

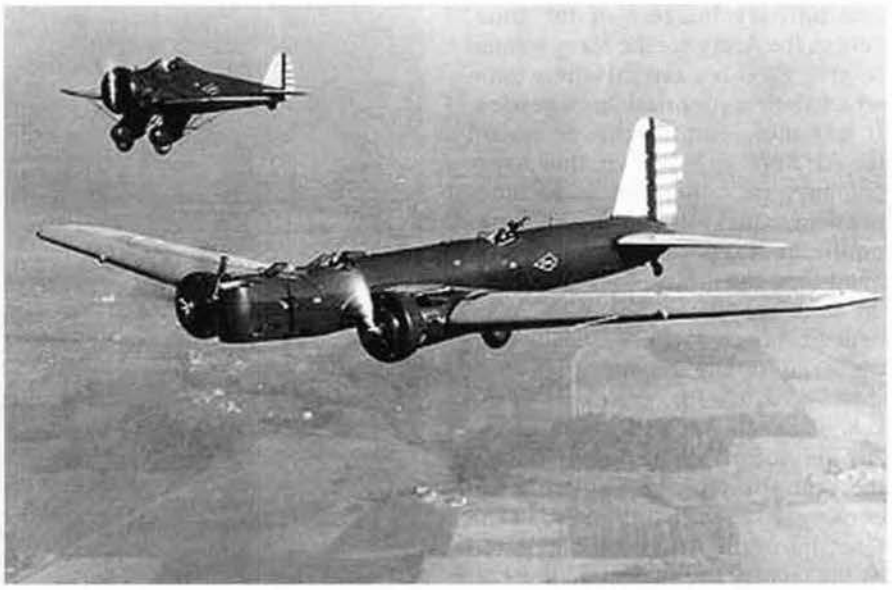
The bomber mafia believed that airpower would perhaps be the deciding factor in future wars. Reflecting Mitchell's influence, they saw airpower not as a new weapon but as a new service, one that should be equal to the Army and the Navy.

The difficulty, of course, was that such equality could not be obtained unless the Air Corps could alter its role within the Army. The Air Corps had to separate the Army's tactical objectives from strategic objectives. While it continued to furnish the Army observation and attack services, it needed to establish a long-range bomber capability. It also had to wrest away from the Navy one of its most cherished missions: The Air Corps needed to take over the role of hemispheric defense.

Air Corps proponents felt that it would be given equal status if the

public and Congress believed the Air Corps could defend American coastlines from enemy attack more effectively and more economically than the Army or the Navy. Yet for the bomber mafia, gaining the hemispheric defense mission was almost a ruse. Their goal was to create a long-range air force with the capability to attack and defeat an enemy by bombing its homeland.

This concept, so reflective of Mitchell's thought, became the guiding light of the tactical school. It was brought to fruition by members of the bomber mafia during the last 10 years of the school's existence.



The B-9 bomber (shown here with a P-26) was the first of several advanced aircraft introduced in the 1930s. The twin-engine, all-metal bomber featured retractable landing gear, cantilevered wings, and a top speed of 186 mph.

The Necessary Advances

Providing substance for the bombardment concept were three advanced aircraft, introduced between 1931 and 1935. The first was the Y1B-9 unveiled in 1931. The twin-engine all-metal bomber boasted a cantilever wing and retractable landing gear, but it still had open cockpits for its crew. With a maximum speed of 186 mph, the new bomber was almost as fast as the standard P-12E fighter. The year 1932 saw the appearance of the second new item, the B-10, which later added a radically new element of equipment—the Norden Mark XV bombsight. This combination of high altitude capability and bombing accuracy gave wings to the planning of the bomber mafia.

Experience in field maneuvers led some to the belief that the speeds and altitudes now achieved by bombers made them impervious to interception.

The third new aircraft was the B-17, first flown in 1935 and destined to become the backbone of the bomber force in World War II. As retired Gen. of the Air Force, Henry H. "Hap" Arnold would later call the first test batch of YB-17s the "first real American airpower." For those at the tactical school, the effect of the B-17 was intoxicating, for it seemed to the ACTS planners that they had, at last, a war winning weapon, one that would prove Pershing wrong.

The bomber mafia's doctrine—known as the "industrial web theory"—centered on use of high altitude, daylight, precision bombing of an enemy's industrial infrastructure. This type of bombing mission, they said, would not require fighter escort—an important claim, given that there were at the time no fighters with the necessary range.

Their view had at least one critic—Capt. Claire L. Chennault, the chief advocate of fighter aircraft at the tactical school. Chennault, who later would lead the legendary Flying Tigers in China, believed that unescorted bombers would become extremely vulnerable should the enemy combine a central fighter control system and technologically advanced fighters. In an extreme step, Chennault challenged a bomber-friendly report by then-Lt. Col. Hap Arnold. Arnold's report claimed that P-26 fighters could not intercept bombers during recent West Coast maneuvers.

Airspeeds had become so great, Arnold reported, that pursuit attacks were no longer feasible. In a rejoinder to Air Corps leaders, Chennault charged that the analysis was biased against fighters and that Arnold failed to draw the proper conclusions about improvements required for pursuit aviation. The letter probably contributed to their icy relations during World War II.

Then-Lt. Col. Henry H. "Hap" Arnold sits on the wing of a B-10. The B-10, which entered service in 1932, provided the high altitude capability and bombing accuracy needed by "industrial web theory" proponents.

Arnold and the bomber mafia prevailed. Because resources remained limited, the Air Corps shelved not only the acquisition of modern pursuit aircraft but also the whole concept of obtaining air superiority.

The Golden Egg

The high altitude, daylight, precision bombing approach and the industrial web theory formed the basic theoretical concept Air Corps leaders needed in their fight to establish an independent air force. It was a mechanism under which airpower could vanquish any potential enemy. This doctrine had no basis in practical experience, but depended on the inductive reasoning of the bright minds at the school.

The school's major thinkers, including Olds, Walker, and Wilson, believed that a modern nation's ability to supply its armed forces could be disrupted by massed air strikes on critical points within the system. These key nodes included railroads, petroleum refineries, electrical power systems, and water supply systems. The destruction of these and other elements of infrastructure would destroy the enemy's will and capability to fight.

Under this philosophy, air superiority would be achieved through the destruction of enemy capability rather than through combat attrition. It held that the number of losses that enemy fighters might inflict on bombers would not be decisive.

This new doctrine, developed by so many brilliant minds and believed in so fervently by so many, was proved to be dead wrong during the first years of US participation in World War II. Enemy fighters could and did inflict unsustainable losses.

The new doctrine could become effective only when the US at last established air superiority in early 1944 with large numbers of P-51 Mustangs. Once air superiority was established, bombing could take place almost, but not quite, as the bomber mafia had theorized.

The philosophy had a side benefit. It led directly to the creation of a bomber force so huge that, once the Allies had achieved air superiority, it could readily smash Germany and Japan.

After World War II, Army Air Forces leaders recognized the need to continue the tactical school tradition, so created Air University at Maxwell Field, Ala.

However, there is no denying that the school downplayed the need to establish air superiority and thus helped delay development of a long-range escort fighter. And the school's bomber proponent erred in other ways. They overestimated the navigational and bombing capability of heavy bombers and the destructive ability of their bombs. They did not sufficiently consider the effects of weather, which was so often bad over Europe and characterized by storms and jet streams over Japan. Compounding the problem was the fact that they did not foresee the development of radar, with all the advantages that it conferred upon the defense.

Some leading bomber proponents would end up in the Air War Plans Division. President Roosevelt, anticipating US entry into World War II, asked the Army and Navy in July 1941 for an estimate of the production that would be required to defeat the Axis. Arnold, now the Army Air Forces Chief, got permission to have his new Air War Plans Division prepare the air portion of this study. George, Hansell, Kuter, and Walker distilled seven years of tactical school thinking into what became known as Air War Planning Document 1, or AWPD-1.

AWPD-1 asserted that the Army Air Forces would require 251 combat groups, 105,467 aircraft, and 2,164,916 airmen to win the war. Had they submitted this estimate a year earlier, the ACTS alumni probably would have been thought insane. Yet in August 1941, AWPD-1 was immediately, almost automatically, accepted as the basis for planning the wartime air campaign.

By then, the tactical school had ceased operations. Faced with the nation's imminent entry into World War II, the Air Corps suspended instruction at the school on June 30, 1940. During its 20 years of operation, it produced 1,091 officer graduates. Out of that group came 261 of the 320 Army Air Forces general officers who were on duty at the end of World War II. On March 12, 1946, the AAF established Air University to carry on the tradition of the tactical school as a center for progressive thinking and development of doctrine.

The doctrine forged at the tactical school was flawed and required alteration, but it provided a solid basis for the development of modern airpower theory. ■

Walter J. Boyne, former director of the National Air and Space Museum in Washington, is a retired Air Force colonel and author. He has written more than 400 articles about aviation topics and 29 books, the most recent of which are The Influence of Air Power on History *and* Dawn Over Kitty Hawk: The Novel of the Wright Brothers. *His most recent article for* Air Force *Magazine, "Question Mark," appeared in the March issue.*

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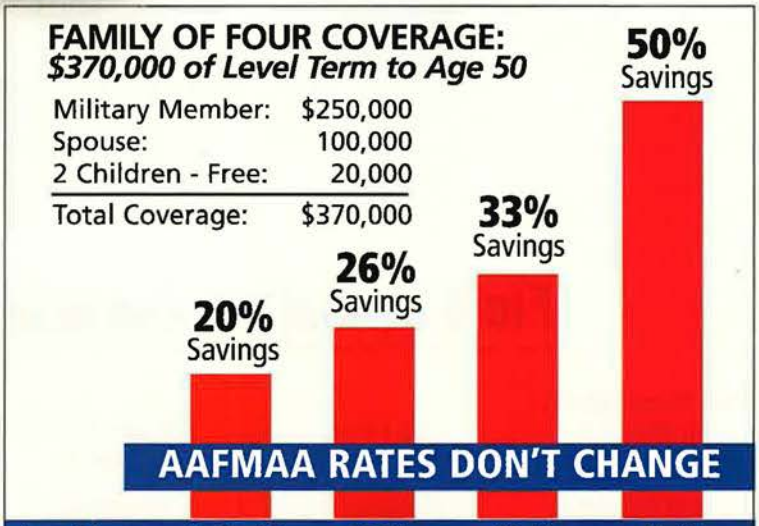

Age of Spouse	Under 35	35-39	40-44	45-49
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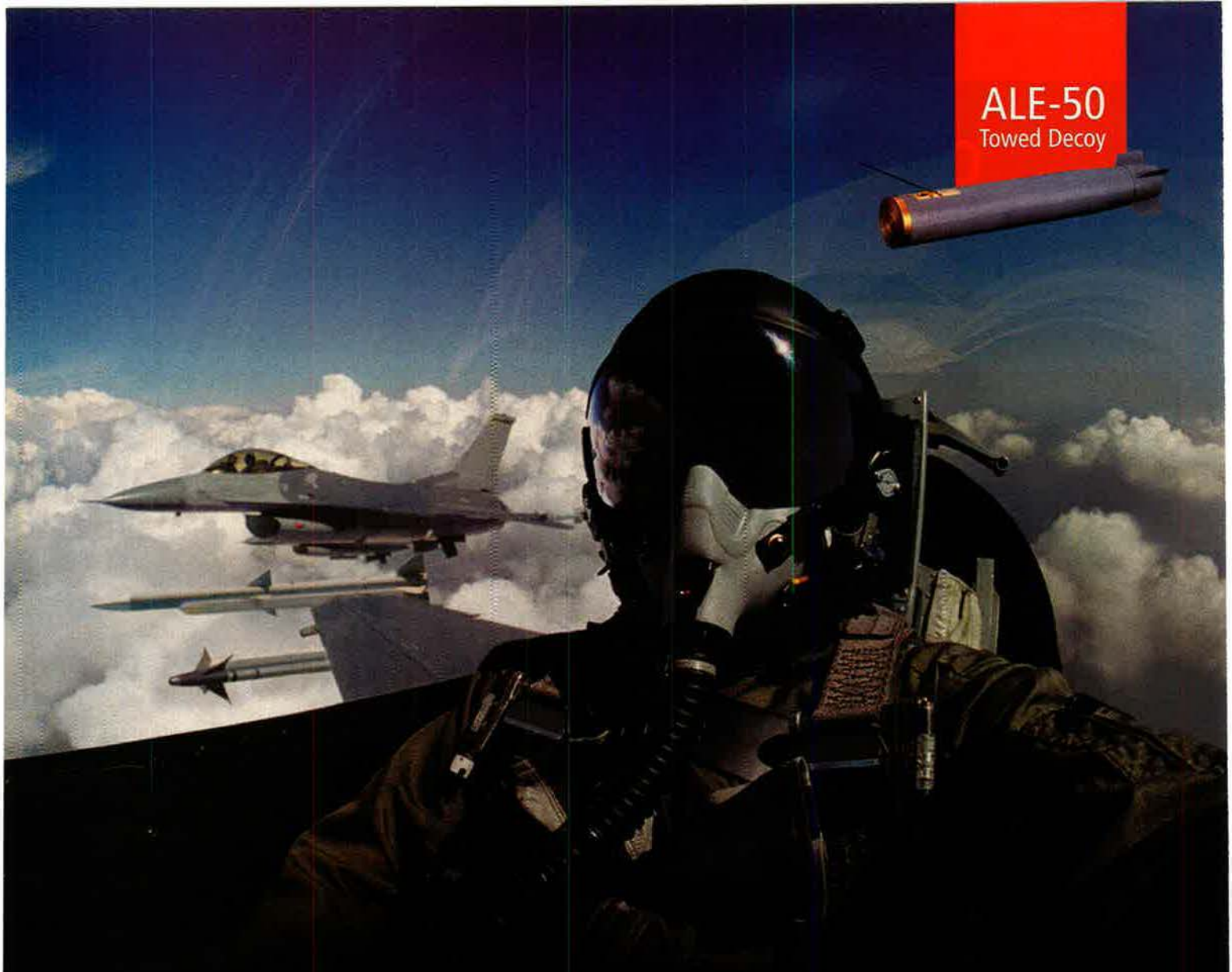

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AFA/AEF Almanac

By Frances McKenney, Assistant Managing Editor

Chapters of the Year

Year	Recipient(s)
1953	San Francisco Chapter
1954	Santa Monica Area Chapter (Calif.)
1955	San Fernando Valley Chapter (Calif.)
1956	Utah State AFA
1957	H.H. Arnold Chapter (N.Y.)
1958	San Diego Chapter
1959	Cleveland Chapter
1960	San Diego Chapter
1961	Chico Chapter (Calif.)
1962	Fort Worth Chapter (Tex.)
1963	Colin P. Kelly Chapter (N.Y.)
1964	Utah State AFA
1965	Idaho State AFA
1966	New York State AFA
1967	Utah State AFA
1968	Utah State AFA
1969	*(no presentation)*
1970	Georgia State AFA
1971	Middle Georgia Chapter
1972	Utah State AFA
1973	Langley Chapter (Va.)
1974	Texas State AFA
1975	Alamo Chapter (Tex.) and San Bernardino Area Chapter (Calif.)
1976	Scott Memorial Chapter (Ill.)
1977	Thomas B. McGuire Jr. Chapter (N.J.)
1978	Thomas B. McGuire Jr. Chapter (N.J.)
1979	Brig. Gen. Robert F. Travis Chapter (Calif.)
1980	Central Oklahoma (Gerrity) Chapter
1981	Alamo Chapter (Tex.)
1982	Chicagoland–O'Hare Chapter (Ill.)
1983	Charles A. Lindbergh Chapter (Conn.)
1984	Scott Memorial Chapter (Ill.) and Colorado Springs/Lance Sijan Chapter (Colo.)
1985	Cape Canaveral Chapter (Fla.)
1986	Charles A. Lindbergh Chapter (Conn.)
1987	Carl Vinson Memorial Chapter (Ga.)
1988	Gen. David C. Jones Chapter (N.D.)
1989	Thomas B. McGuire Jr. Chapter (N.J.)
1990	Gen. E.W. Rawlings Chapter (Minn.)
1991	Paul Revere Chapter (Mass.)
1992	Central Florida Chapter and Langley Chapter (Va.)
1993	Green Valley Chapter (Ariz.)
1994	Langley Chapter (Va.)
1995	Baton Rouge Chapter (La.)
1996	Montgomery Chapter (Ala.)
1997	Central Florida Chapter
1998	Ark–La–Tex Chapter (La.)
1999	Hurlburt Chapter (Fla.)
2000	Wright Memorial Chapter (Ohio)
2001	Lance P. Sijan Chapter (Colo.)
2002	Eglin Chapter (Fla.)
2003	Hurlburt Chapter (Fla.)

Profiles of AFA Membership

As of June 2003 (Total 137,035)

57%	One-year members
12%	Three-year members
31%	Life members
17%	Active duty military
49%	Retired military
17%	Former service
6%	Guard and Reserve
7%	Patron
3%	Cadet
2%	Spouse/widow(er)

Of AFA's service members (who account for about six percent of USAF total strength):

69% are officers

31% are enlisted

Of AFA's retired military members:

73% are retired officers

27% are retired enlisted

AFA "Member of the Year" Award Recipients

State names refer to recipient's home state at the time of the award.

Year	Recipient(s)
1953	Julian B. Rosenthal (N.Y.)
1954	George A. Anderl (Ill.)
1955	Arthur C. Storz (Neb.)
1956	Thos. F. Stack (Calif.)
1957	George D. Hardy (Md.)
1958	Jack B. Gross (Pa.)
1959	Carl J. Long (Pa.)
1960	O. Donald Olson (Colo.)
1961	Robert P. Stewart (Utah)
1962	*(no presentation)*
1963	N.W. DeBerardinis (La.) and Joe L. Shosid (Tex.)
1964	Maxwell A. Kriendler (N.Y.)
1965	Milton Caniff (N.Y.)
1966	William W. Spruance (Del.)
1967	Sam E. Keith Jr. (Tex.)
1968	Marjorie O. Hunt (Mich.)
1969	*(no presentation)*
1970	Lester C. Curl (Fla.)
1971	Paul W. Gaillard (Neb.)
1972	J. Raymond Bell (N.Y.) and Martin H. Harris (Fla.)
1973	Joe Higgins (Calif.)
1974	Howard T. Markey (D.C.)
1975	Martin M. Ostrow (Calif.)
1976	Victor R. Kregel (Tex.)
1977	Edward A. Stearn (Calif.)
1978	William J. Demas (N.J.)
1979	Alexander C. Field Jr. (Ill.)
1980	David C. Noerr (Calif.)
1981	Daniel F. Callahan (Fla.)
1982	Thomas W. Anthony (Md.)
1983	Richard H. Becker (Ill.)
1984	Earl D. Clark Jr. (Kan.)
1985	George H. Chabbott (Del.) and Hugh L. Enyart (Ill.)
1986	John P.E. Kruse (N.J.)
1987	Jack K. Westbrook (Tenn.)
1988	Charles G. Durazo (Va.)
1989	Oliver R. Crawford (Tex.)
1990	Cecil H. Hopper (Ohio)
1991	George M. Douglas (Colo.)
1992	Jack C. Price (Utah)
1993	Lt. Col. James G. Clark (D.C.)
1994	William A. Lafferty (Ariz.)
1995	William N. Webb (Okla.)
1996	Tommy G. Harrison (Fla.)
1997	James M. McCoy (Neb.)
1998	Ivan L. McKinney (La.)
1999	Jack H. Steed (Ga.)
2000	Mary Anne Thompson (Va.)
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2003	W. Ron Goerges (Ohio)

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1977-79

Daniel F. Callahan
1979-81

Victor R. Kregel
1981-82

John G. Brosky
1982-84

David L. Blankenship
1984-85

Edward A. Stearn
1985-85

Martin H. Harris
1986-88

Sam E. Keith Jr.
1988-90

Jack C. Price
1990-92

Oliver R. Crawford
1992-94

James M. McCoy
1994-96

Gene Smith
1996-98

Doyle E. Larsen
1998-2000

Thomas J. McKee
2000-02

John J. Politi
2002-

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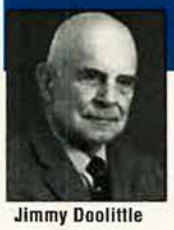

Jimmy Doolittle
1946-47

Thomas G. Lanphier Jr.
1947-48

C.R. Smith
1948-49

Robert S. Johnson
1949-51

Harold C. Stuart
1951-52

Arthur F. Kelly
1952-53

George C. Kenney
1953-54

John R. Alison
1954-55

Gill Robb Wilson
1955-56

John P. Henebry
1956-57

Peter J. Schenk
1957-59

Howard T. Markey
1959-60

Thos. F. Stack
1960-61

Joe Foss
1961-62

John B. Montgomery
1962-63

W. Randolph Lovelace II
1963-64

Jess Larson
1964-67

Robert W. Smart
1967-69

George D. Hardy
1969-71

Martin M. Ostrow
1971-73

Joe L. Shosid
1973-75

George M. Douglas
1975-77

Gerald V. Hasler
1977-79

Victor R. Kregel
1979-81

John G. Brosky
1981-82

David L. Blankenship
1982-84

Martin H. Harris
1984-86

Sam E. Keith Jr.
1986-88

Jack C. Price
1988-90

Oliver R. Crawford
1990-92

James M. McCoy
1992-94

Gene Smith
1994-96

Doyle E. Larson
1996-98

Thomas J. McKee
1998-2000

John J. Politi
2000-02

Stephen P. Condon
2002-


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Beer · Bier · Cerveza

AFA's Regions, States, and Chapters

These figures indicate the number of affiliated members as of June 30, 2003. Listed below the name of each region is the region president.

CENTRAL EAST REGION 12,501
Thomas G. Shepherd

Delaware 634
Delaware Galaxy 462
Diamond State 172

District of Columbia 631
Nation's Capital 631

Maryland 2,577
Baltimore* 774
Central Maryland 416
College Park Airport 101
Thomas W. Anthony 1,286

Virginia 8,300
Danville 59
Donald W. Steele Sr. Memorial 3,411
Gen. Charles A. Gabriel 1,280
Langley 1,649
Leigh Wade 163
Northern Shenandoah Valley 226
Richmond 589
Roanoke 312
Tidewater 368
William A. Jones III 243

West Virginia 359
Brig. Gen. Pete Everest 79
Chuck Yeager 280

FAR WEST REGION 14,292
Michael J. Peters

California 13,359
Antelope Valley 481
Bob Hope 977
Brig. Gen. Robert F. Travis 1,034
C. Farinha Gold Rush 1,687
Charles Hudson 132
David J. Price/Beale 496
Fresno* 375
Gen. B.A. Schriever Los Angeles 665
General Doolittle Los Angeles Area* 1,524
Golden Gate* 753
High Desert 276
Maj. Gen. Charles I. Bennett Jr. 325
Monterey Bay Area 305
Orange County/Gen. Curtis E. LeMay 914
Palm Springs 494
Pasadena Area 392
Robert H. Goddard 770
San Diego 1,016
Tennessee Ernie Ford 743

Hawaii 933
Hawaii* 905
Maui 28

FLORIDA REGION 11,395
Bruce E. Marshall

Florida 11,395
Brig. Gen. James R. McCarthy 412
Cape Canaveral 1,218
Central Florida 1,511
Col. H.M. "Bud" West 297
Col. Loren D. Evenson 574
Eglin 1,734
Falcon 441
Florida Highlands 341
Gainesville 317
Gen. Nathan F. Twining 486
Gold Coast 438
Hurlburt 687
Jerry Waterman 1,241
John C. Meyer 318
John W. DeMilly Jr. 314
Miami 355
Pensacola 161
Treasure Coast 190
West Palm Beach 360

GREAT LAKES REGION 9,294
James E. Fultz

Indiana 1,693
Central Indiana 436
Columbus–Bakalar 105
Fort Wayne 262
Grissom Memorial 175
Gus Grissom 141
Lawrence D. Bell Museum 251
Lester W. Johnston 28
Southern Indiana 208
Terre Haute–Wabash Valley 87

Kentucky 783
Gen. Russell E. Dougherty 498
Lexington 285

Michigan 2,147
Battle Creek 166
James H. Straubel 793
Kalamazoo 347
Lake Superior Northland 153
Lloyd R. Leavitt Jr. 187
Mid-Michigan 80
Mount Clemens 319
PE–TO–SE–GA 102

Ohio 4,671
Capt. Eddie Rickenbacker Memorial* 729
Frank P. Lahm 537
Greater Cincinnati 297
North Coast* 361
Steel Valley 229
Wright Memorial* 2,518

MIDWEST REGION 8,523
Keith N. Sawyer

Illinois 3,313
Chicagoland–O'Hare 1,315
Heart of Illinois 210
Land of Lincoln 381
Scott Memorial 1,407

Iowa 722
Gen. Charles A. Horner 279
Northeast Iowa 264
Richard D. Kisling 179

Kansas 899
Centrails 65
Lt. Erwin R. Bleckley 572
Maj. Gen. Edward R. Fry 262

Missouri 1,852
Earl D. Clark Jr. 343
Harry S. Truman 634
Spirit of St. Louis 875

Nebraska 1,737
Ak–Sar–Ben 1,458
Lincoln 279

NEW ENGLAND REGION 4,321
David T. Buckwalter

Connecticut 870
Flying Yankees 149
Gen. Bennie L. Davis 183
Gen. George C. Kenney 173
Lindbergh/Sikorsky 196
Sgt. Charlton Heston 169

Massachusetts 2,099
Boston 133
Maj. John S. Southrey* 170
Minuteman 340
Otis 193
Paul Revere 723
Pioneer Valley 180
Taunton 176
Worcester* 184

New Hampshire 827
Brig. Gen. Harrison R. Thyng 417
Pease 410

Rhode Island 295
Metro Rhode Island 244
Newport Blue & Gold 51

Vermont 230
Burlington 230

NORTH CENTRAL REGION 4,067
James M. Crawford

Minnesota 1,304
Gen. E.W. Rawlings 1,064
Richard I. Bong 240

Montana 327
Big Sky 327

North Dakota 526
Gen. David C. Jones 240
Happy Hooligan 130
Red River Valley 156

South Dakota 507
Dacotah 238
Rushmore 269

Wisconsin 1,403
Billy Mitchell 566
Capt. William J. Henderson 493
Madison 344

NORTHEAST REGION 8,474
Raymond "Bud" Hamman

New Jersey 2,256
Aerospace Founders 56
Brig. Gen. E. Wade Hampton 171
Brig. Gen. Frederick W. Castle 178
Hangar One 128
Highpoint 109
Hudson* 73
John Currie Memorial 84
Mercer County 209
Passaic–Bergen* 189
Sal Capriglione 129
Thomas B. McGuire Jr. 687
Shooting Star 243

New York 3,176
Albany–Hudson Valley* 402
Chautauqua 75
Forrest L. Vosler 376
Francis S. Gabreski 290
Gen. Carl A. "Tooey" Spaatz 222
Gen. Daniel "Chappie" James Jr. Memorial 121
Genesee Valley 233
Iron Gate 174
L.D. Bell–Niagara Frontier 401
Lloyd Schloen–Empire 129
Nassau Mitchel 331
Queens 230
Thomas Watson Sr. Memorial 192

Pennsylvania 3,042
Altoona 56
Brandywine 167
Eagle 72
Greater Pittsburgh* 414
Joe Walker–Mon Valley 134
Lehigh Valley 274
Liberty Bell 636
Lt. Col. B.D. "Buzz" Wagner 131
Mifflin County* 114
Olmsted 365
Pocono Northeast 212
Total Force 177
York–Lancaster 290

NORTHWEST REGION 5,385
Steven R. Lundgren

Alaska 921
Edward J. Monaghan 692
Fairbanks Midnight Sun 229

*These chapters were chartered prior to Dec. 31, 1948, and are considered original charter chapters; the Maj. John S. Southrey Chapter of Massachusetts was formerly the Chicopee Chapter; the North Coast Chapter of Ohio was formerly the Cleveland Chapter; and the Columbia Gorge Chapter of Oregon was formerly the Portland Chapter.

Idaho	**147**
Snake River Valley	147
Oregon	**1,162**
Bill Harris	158
Columbia Gorge*	787
Willamette Valley	217
Washington	**3,155**
Greater Seattle	1,114
Inland Empire	735
McChord	1,306
ROCKY MOUNTAIN REGION	**6,865**
Craig E. Allen	
Colorado	**4,845**
Gen. Robert E. Huyser	177
Lance P. Sijan	2,728
Long's Peak	291
Mel Harmon	148
Mile High	1,501
Utah	**1,590**
Northern Utah	604
Salt Lake	434
Ute–Rocky Mountain	552
Wyoming	**430**
Cheyenne Cowboy	430
SOUTH CENTRAL REGION	**7,486**
George P. Cole Jr.	
Alabama	**2,095**
Birmingham	422
Montgomery	1,309
Tennessee Valley	364
Arkansas	**1,163**
David D. Terry Jr.	790
Ouachita	127
Razorback	246
Louisiana	**1,251**
Ark–La–Tex	834
Maj. Gen. Oris B. Johnson	417
Mississippi	**1,093**
Golden Triangle	370
Jackson	181
John C. Stennis	542
Tennessee	**1,884**
Chattanooga	137
Everett R. Cook	465
Gen. Bruce K. Holloway	587
H.H. Arnold Memorial	174
Maj. Gen. Dan F. Callahan	521
SOUTHEAST REGION	**9,261**
Rodgers K. Greenawalt	
Georgia	**4,228**
Carl Vinson Memorial	1,842
Dobbins	1,687
Lt. Col. Philip Colman	54
Savannah	346
South Georgia	299
North Carolina	**2,845**
Blue Ridge	395
Cape Fear	215
Kitty Hawk	71
Piedmont	482
Pope	521
Scott Berkeley	522
Tarheel	639
South Carolina	**2,188**
Charleston	633
Columbia Palmetto	428
Ladewig–Shine Memorial	200
Strom Thurmond	401
Swamp Fox	526
SOUTHWEST REGION	**7,948**
William A. Lafferty Jr.	
Arizona	**4,230**
Barry Goldwater	191
Cochise	99
Frank Luke	1,099
Phoenix Sky Harbor	1,119
Prescott	213
Richard S. Reid	139
Tucson	1,370
Nevada	**1,954**
Dale O. Smith	448
Thunderbird	1,506
New Mexico	**1,764**
Albuquerque	1,208
Fran Parker	344
Llano Estacado	212
TEXOMA REGION	**14,810**
Michael G. Cooper	
Oklahoma	**2,783**
Altus	317
Central Oklahoma (Gerrity)	1,434
Enid	542
Tulsa	490
Texas	**12,027**
Abilene	363
Aggieland	242
Alamo	3,942
Austin	998
Concho	288
Dallas	996
Del Rio	139
Denton	408
Fort Worth	1,914
Gen. Charles L. Donnelly Jr.	396
Ghost Squadron	132
Heart of the Hills	158
Northeast Texas	434
Panhandle AFA	304
Permian Basin	118
San Jacinto	1,195

AFA's Overseas Chapters

CHAPTER	LOCATION
	United States Air Forces In Europe (USAFE)
Charlemagne	Geilenkirchen, Germany
Dolomiti	Aviano AB, Italy
Lufbery–Campbell	Ramstein AB, Germany
Spangdahlem	Spangdahlem AB, Germany
United Kingdom	Lakenheath, UK
	Pacific Air Forces (PACAF)
Keystone	Kadena AB, Japan
MiG Alley	Osan AB, South Korea
Miss Veedol	Misawa AB, Japan
Tokyo	Tokyo, Japan
	Supreme Headquarters Allied Powers Europe (SHAPE)
Gen. Lauris G. Norstad	Mons, Belgium

AFA's First National Officers and Board of Directors

This panel of officers and directors acted temporarily until a representative group was democratically elected by membership at the first National Convention, in September 1947.

OFFICERS

President Jimmy Doolittle
First Vice President Edward P. Curtis
Second Vice President Meryll Frost
Third Vice President Thomas G. Lanphier Jr.
Secretary Sol A. Rosenblatt
Assistant Secretary Julian B. Rosenthal
Treasurer W. Deering Howe
Executive Director Willis S. Fitch

BOARD OF DIRECTORS

John S. Allard
H.M. Baldridge
William H. Carter
Everett R. Cook
Burton E. Donaghy
James H. Douglas Jr.
G. Stuart Kenney
Reiland Quinn
Rufus Rand
Earl Sneed
James M. Stewart
Forrest Vosler
Benjamin F. Warmer
Lowell P. Weicker
Cornelius Vanderbilt Whitney
John Hay Whitney

The Twelve Founders

John S. Allard, Bronxville, N.Y.
Everett R. Cook, Memphis, Tenn.
Edward P. Curtis, Rochester, N.Y.
Jimmy Doolittle, Los Angeles
W. Deering Howe, New York
Rufus Rand, Sarasota, Fla.
Sol A. Rosenblatt, New York
Julian B. Rosenthal, New York
James M. Stewart, Beverly Hills, Calif.
Lowell P. Weicker, New York
Cornelius Vanderbilt Whitney, New York
John Hay Whitney, New York

H.H. Arnold Award Recipients

Until 1986, AFA's highest aerospace award was the H.H. Arnold Award. Named for the World War II leader of the Army Air Forces, it was presented annually in recognition of the most outstanding contributions in the field of aerospace activity. In 1986, the Arnold Award was redesignated AFA's highest honor to a member of the armed forces in the field of national security. It continues to be presented annually.

Year	Recipient(s)
1948	W. Stuart Symington, Secretary of the Air Force
1949	Maj. Gen. William H. Tunner and the men of the Berlin Airlift
1950	Airmen of the United Nations in the Far East
1951	Gen. Curtis E. LeMay and the personnel of Strategic Air Command
1952	Sens. Lyndon B. Johnson and Joseph C. O'Mahoney
1953	Gen. Hoyt S. Vandenberg, former Chief of Staff, USAF
1954	John Foster Dulles, Secretary of State
1955	Gen. Nathan F. Twining, Chief of Staff, USAF
1956	Sen. W. Stuart Symington
1957	Edward P. Curtis, special assistant to the President
1958	Maj. Gen. Bernard A. Schriever, Cmdr., Ballistic Missile Div., ARDC
1959	Gen. Thomas S. Power, CINC, SAC
1960	Gen. Thomas D. White, Chief of Staff, USAF
1961	Lyle S. Garlock, Assistant Secretary of the Air Force
1962	A.C. Dickieson and John R. Pierce, Bell Telephone Laboratories
1963	The 363rd Tactical Recon. Wing and the 4080th Strategic Wing
1964	Gen. Curtis E. LeMay, Chief of Staff, USAF
1965	The 2nd Air Division, PACAF
1966	The 8th, 12th, 355th, 366th, and 388th Tactical Fighter Wings and the 432nd and 460th TRWs
1967	Gen. William W. Momyer, Cmdr., 7th Air Force, PACAF
1968	Col. Frank Borman, USAF; Capt. James Lovell, USN; and Lt. Col. William Anders, USAF, Apollo 8 crew
1969	*(No presentation)*
1970	Apollo 11 team (J.L. Atwood; Lt. Gen. S.C. Phillips, USAF; and astronauts Neil Armstrong and USAF Cols. Buzz Aldrin and Michael Collins)
1971	John S. Foster Jr., Dir. of Defense Research and Engineering
1972	Air units of the Allied Forces in Southeast Asia (Air Force, Navy, Army, Marine Corps, and the Vietnamese Air Force)
1973	Gen. John D. Ryan (Ret.), former Chief of Staff, USAF
1974	Gen. George S. Brown, USAF, Chm., Joint Chiefs of Staff
1975	James R. Schlesinger, Secretary of Defense
1976	Sen. Barry M. Goldwater
1977	Sen. Howard W. Cannon
1978	Gen. Alexander M. Haig Jr., USA, Supreme Allied Commander, Europe
1979	Sen. John C. Stennis
1980	Gen. Richard H. Ellis, USAF, CINC, SAC
1981	Gen. David C. Jones, USAF, Chm., Joint Chiefs of Staff
1982	Gen. Lew Allen Jr. (Ret.), former Chief of Staff, USAF
1983	Ronald W. Reagan, President of the United States
1984	The President's Commission on Strategic Forces (the Scowcroft Commission)
1985	Gen. Bernard W. Rogers, USA, SACEUR
1986	Gen. Charles A. Gabriel (Ret.), former Chief of Staff, USAF
1987	Adm. William J. Crowe Jr., USN, Chm., Joint Chiefs of Staff
1988	Men and women of the Ground-Launched Cruise Missile team
1989	Gen. Larry D. Welch, Chief of Staff, USAF
1990	Gen. John T. Chain, CINC, SAC
1991	Lt. Gen. Charles A. Horner, Cmdr., CENTCOM Air Forces and 9th Air Force
1992	Gen. Colin L. Powell, USA, Chm., Joint Chiefs of Staff
1993	Gen. Merrill A. McPeak, Chief of Staff, USAF
1994	Gen. John Michael Loh, Cmdr., Air Combat Command
1995	World War II Army Air Forces veterans
1996	Gen. Ronald R. Fogleman, Chief of Staff, USAF
1997	Men and women of the United States Air Force
1998	Gen. Richard E. Hawley, Cmdr., ACC
1999	Lt. Gen. Michael C. Short, Cmdr., Allied Air Forces Southern Europe
2000	Gen. Michael E. Ryan, Chief of Staff, USAF
2001	Gen. Joseph W. Ralston, CINC, EUCOM
2002	Gen. Richard B. Myers, USAF, Chm., Joint Chiefs of Staff
2003	Lt. Gen. T. Michael Moseley, Cmdr., air component, CENTCOM, and 9th Air Force

John R. Alison Award Recipients

Established in 1992, the John R. Alison Award is AFA's highest honor for industrial leadership.

1992	Norman R. Augustine, Chairman, Martin Marietta
1993	Daniel M. Tellep, Chm. and CEO, Lockheed
1994	Kent Kresa, CEO, Northrop Grumman
1995	C. Michael Armstrong, Chm. and CEO, Hughes Aircraft
1996	Harry Stonecipher, Pres. and CEO, McDonnell Douglas
1997	Dennis J. Picard, Chm. and CEO, Raytheon
1998	Philip M. Condit, Chm. and CEO, Boeing
1999	Sam B. Williams, Chm. and CEO, Williams International
2000	Simon Ramo and Dean E. Wooldridge, missile pioneers
2001	George David, Chm. and CEO, United Technologies
2002	Sydney Gillibrand, Chm., AMEC; and Jerry Morgensen, Pres. and CEO, Hensel Phelps Construction
2003	Joint Direct Attack Munition Industry Team, Boeing

W. Stuart Symington Award Recipients

Since 1986, AFA's highest honor to a civilian in the field of national security has been the W. Stuart Symington Award. The award, presented annually, is named for the first Secretary of the Air Force.

Year	Recipient(s)
1986	Caspar W. Weinberger, Secretary of Defense
1987	Edward C. Aldridge Jr., Secretary of the Air Force
1988	George P. Schultz, Secretary of State
1989	Ronald W. Reagan, former President of the United States
1990	John J. Welch, Asst. SECAF (Acquisition)
1991	George Bush, President of the United States
1992	Donald B. Rice, Secretary of the Air Force
1993	Sen. John McCain (R-Ariz.)
1994	Rep. Ike Skelton (D-Mo.)
1995	Sheila E. Widnall, Secretary of the Air Force
1996	Sen. Ted Stevens (R-Alaska)
1997	William Perry, former Secretary of Defense
1998	Rep. Saxby Chambliss (R-Ga.) and Rep. Norman D. Dicks (D-Wash.)
1999	F. Whitten Peters, Secretary of the Air Force
2000	Rep. Floyd Spence (R-S.C.)
2001	Sen. Michael Enzi (R-Wyo.) and Rep. Cliff Stearns (R-Fla.)
2002	Rep. James V. Hansen (R-Utah)
2003	James G. Roche, Secretary of the Air Force

Gold Life Member Card Recipients

Awarded to members whose AFA record, production, and accomplishment on a national level have been outstanding over a period of years.

Name	Year	Card No.
Gill Robb Wilson	1957	1
Jimmy Doolittle	1959	2
Arthur C. Storz Sr.	1961	3
Julian B. Rosenthal	1962	4
Jack B. Gross	1964	5
George D. Hardy	1965	6
Jess Larson	1967	7
Robert W. Smart	1968	8
Martin M. Ostrow	1973	9
James H. Straubel	1980	10
Martin H. Harris	1988	11
Sam E. Keith Jr.	1990	12
Edward A. Stearn	1992	13
Dorothy L. Flanagan	1994	14
John O. Gray	1996	15
Jack C. Price	1997	16
Nathan H. Mazer	2002	17

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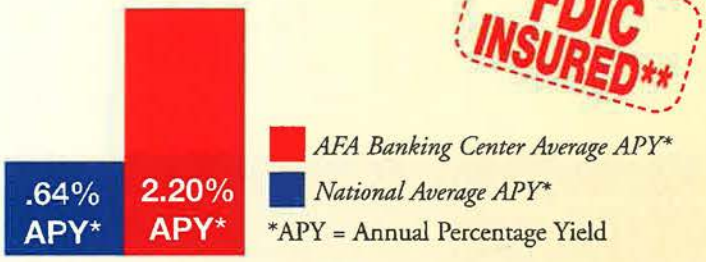
Compare the rate paid out by our High Yield Money Market Savings Account to the national average. Our rate is one of the highest in the country!



*APY = Annual Percentage Yield

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- Easy access to funds
- Unlimited transactions
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Please print clearly

Name _____

Address _____

City _____ State _____ Zip _____

Date of Birth ___/___/___ Social Security ___-___-___

E-mail _____

Home Phone (___) _____

Business Phone (___) _____

If you wish your account to be a joint account, please complete the following:

Name of Joint Account Holder _____

Date of Birth ___/___/___ Social Security ___-___-___

Consent Agreement: By signing below I agree to accept the Terms & Conditions/ Disclosures governing my account and consent to receive documents electronically at the time my account is opened by Union Federal Bank (the Bank) and at any time in the future for amendments made by the Bank. Alternatively, I can review this information online as well by visiting www.afabankingcenter.com and clicking on Rates, then Terms & Conditions. In connection with this application, I authorize the Bank to obtain my credit and employment history.

IRS W-9 Certification: Under penalties of perjury, I certify that: (1) the number shown on this form is my correct taxpayer identification (or I am waiting for a number to be issued to me), and (2) I am not subject to backup withholding, because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding, and (3) I am a U.S. person (including a U.S. resident alien). Certification Instructions: You must cross out item 2 above if the IRS has notified you that you are currently subject to backup withholding because of underreporting interest or dividends on your tax return. The IRS does not require your consent to any provision of this document other than certifications required to avoid backup withholding.

Your Signature _____ **Date** _____

Joint Account Holder's Signature _____ **Date** _____

AF018

Aerospace Education Foundation Chairmen of the Board


W. Randolph Lovelace II
1963-64


Laurence S. Kuter
1964-66


Walter J. Hesse
1966-69


J. Gilbert Nettleton Jr.
1969-73


George D. Hardy
1973-75


Barry M. Goldwater
1975-86


George D. Hardy
1986-89


James M. Keck
1989-94


Walter E. Scott
1994-96


Thomas J. McKee
1996-98


Michael J. Dugan
1998-2000


Jack C. Price
2000-02


Richard B. Goetze Jr.
2002-

Aerospace Education Foundation Presidents


John B. Montgomery
1963-64


Lindley J. Stiles
1964-66


B. Frank Brown
1966-67


Leon M. Lessinger
1967-68


L.V. Rasmussen
1968-71


Leon M. Lessinger
1971-73


Wayne O. Reed
1973-74


William L. Ramsey
1975-81


Don C. Garrison
1981-84


George D. Hardy
1984-86


Eleanor P. Wynne
1986-87


James M. Keck
1988-89


Gerald V. Hasler
1989-94


Thomas J. McKee
1994-96


Walter E. Scott
1996-98


Jack C. Price
1998-2000


Richard B. Goetze Jr.
2000-02


L. Boyd Anderson
2002-

AFA Executive Directors

Willis S. Fitch
1946-47

James H. Straubel
1948-80

Russell E. Dougherty
1980-86

David L. Gray
1986-87

John O. Gray
1987-88

Charles L. Donnelly Jr.
1988-89

John O. Gray
1989-90

Monroe W. Hatch Jr.
1990-95

John A. Shaud
1995-2002

Donald L. Peterson
2002–

AFA National Secretaries

Sol A. Rosenblatt	1946-47
Julian B. Rosenthal	1947-59
George D. Hardy	1959-66
Joseph L. Hodges	1966-68
Glenn D. Mishler	1968-70
Nathan H. Mazer	1970-72
Martin H. Harris	1972-76
Jack C. Price	1976-79
Earl D. Clark Jr.	1979-82
Sherman W. Wilkins	1982-85
A.A. "Bud" West	1985-87
Thomas J. McKee	1987-90
Thomas W. Henderson	1990-91
Mary Ann Seibel	1991-94
Mary Anne Thompson	1994-97
William D. Croom Jr.	1997-2000
Daniel C. Hendrickson	2000-

AFA National Treasurers

W. Deering Howe	1946-47
G. Warfield Hobbs	1947-49
Benjamin Brinton	1949-52
George H. Haddock	1952-53
Samuel M. Hecht	1953-57
Jack B. Gross	1957-62
Paul S. Zuckerman	1962-66
Jack B. Gross	1966-81
George H. Chabbott	1981-87
William N. Webb	1987-95
Charles H. Church Jr.	1995-2000
Charles A. Nelson	2000-

AFA Membership

Year	Total	Life Members
1946	51,243	32
1947	104,750	55
1948	56,464	68
1949	43,801	70
1950	38,948	79
1951	34,393	81
1952	30,716	356
1953	30,392	431
1954	34,486	435
1955	40,812	442
1956	46,250	446
1957	51,328	453
1958	48,026	456
1959	50,538	458
1960	54,923	464
1961	60,506	466
1962	64,336	485
1963	78,034	488
1964	80,295	504
1965	82,464	514
1966	85,013	523
1967	88,995	548
1968	97,959	583
1969	104,886	604
1970	104,878	636
1971	97,639	674
1972	109,776	765
1973	114,894	804
1974	128,995	837
1975	139,168	898
1976	148,202	975
1977	155,850	1,218
1978	148,711	1,541
1979	147,136	1,869
1980	156,394	2,477
1981	170,240	3,515
1982	179,149	7,381
1983	198,563	13,763
1984	218,512	18,012
1985	228,621	23,234
1986	232,722	27,985
1987	237,279	30,099
1988	219,195	32,234
1989	204,309	34,182
1990	199,851	35,952
1991	194,312	37,561
1992	191,588	37,869
1993	181,624	38,604
1994	175,122	39,593
1995	170,881	39,286
1996	161,384	39,896
1997	157,862	41,179
1998	152,330	41,673
1999	148,534	42,237
2000	147,336	42,434
2001	143,407	42,865
2002	141,117	43,389
2003	137,035	42,730

AFA/AEF National Report

afa-aef@afa.org

By Frances McKenney, Assistant Managing Editor

Politi Visits Alaska

Air Force Association Chairman of the Board John J. Politi headed to Alaska's Eielson Air Force Base, on the outskirts of Fairbanks, in June to learn about USAF's Alaska facilities and missions and listen to concerns of airmen.

Steven R. Lundgren, Northwest Region president, accompanied him during information briefings and orientation tours at the 354th Fighter Wing, which carries out F-16 and A-10 operations. Col. Tim Vigil, wing vice commander, was their host.

Col. Susan G. Wellner, commander of the 354th Mission Support Group and a **Fairbanks Midnight Sun Chapter** member, joined Politi for a briefing on the Arctic Survival School. TSgt. Keith Lasseigne, another chapter member, conducted this information session. Among other facilities in Politi's orientation tour: the Joint Mobility Complex, the 353rd Combat Training Squadron, and the base's new dormitory.

While in Fairbanks—where State President Barton LeBon served as AFA host—Politi spoke at a noontime meeting of Midnight Sun Chapter members. A luncheon gathering the next day at Eielson's Aurora Club introduced him to active duty and reserve airmen at the base. Politi was a VIP guest at Eielson's Northern Thunder Air Show, which took place during his visit. It gave him a chance to meet local business leaders.

At Elmendorf Air Force Base, located outside of Anchorage, Politi met with Lt. Gen. Carrol H. Chandler, 11th Air Force commander and head of Alaskan Command, Alaskan North American Aerospace Defense Command Region, who presented an orientation on the command. Politi toured the 3rd Wing's new dormitories and housing, accompanied by Brig. Gen. Robertus C.N. Remkes, wing commander, and met with the Chief's Group of senior enlisted members.

In Anchorage, Politi attended the Alaska State Convention, where Gary A. Hoff of the **Edward J. Monaghan Chapter** was elected state president.

USAF photo by Larry McTighe

AFA Board Chairman John Politi (left) and CMSAF Gerald Murray (right) join the AFA Team of the Year at a banquet for the group, held in Arlington, Va., in July. The Team of the Year for 2003 represents the tactical air command and control career field. Team members are (l–r) TSgt. Shawn Minyon, TSgt. Scott Grotbo, SSgt. Joseph Hren, SSgt. Scott Ball, and TSgt. Kevin Vance.

Other officers elected: Karen Washburn, vice president, from the Midnight Sun chapter, and MSgt. Stanley Gehl, secretary–treasurer, from the Monaghan Chapter.

Commenting on what he observed, Politi said, "Funding shortfalls have allowed infrastructure problems to go uncorrected, some quality of life issues remain, and aging systems and equipment continue to add to the challenge the airmen face every day."

Condon in the Pacific

AFA National President Stephen P. "Pat" Condon in July made an orientation and outreach tour of Pacific Air Forces bases in Hawaii, Japan, and South Korea.

His first stop was at Hickam AFB, Hawaii, where he met with Lt. Gen. Steven R. Polk, PACAF vice commander. The visit included tours of the Air Operations Center, Pacific Operations Support Center, and 154th Wing (ANG).

Jack DeTour, Hawaii state president, hosted an AFA breakfast at Hickam, where the **Hawaii Chapter** reported on the Aerospace Education Foundation's Visions of Exploration program in the 50th state. The chapter program has reached about 1,200 students in public schools.

Condon's next stop was at Yokota AB, Japan. While there, he visited the 374th Medical Group to learn about health care issues from Col. Margaret Matarese, the group's commander and a **Tokyo Chapter** member.

Condon also received a briefing on the 374th Airlift Wing from Col. Mark O. Schissler, the wing commander and a chapter member. Among his other visits was a session with Lt. Gen. Thomas C. Waskow, 5th Air Force commander, for an orientation on military and political issues in the region, a tour of a C-130 engine repair center, and a meeting with airmen at the First Term Airmen Center. The young troops were not familiar with AFA, making the visit "time well spent," said Condon.

At Misawa AB, Japan, Condon had lunch with the **Miss Veedol Chapter,** including SMSgt. John R. Bennett,

chapter president, and Maj. Anthony McGraw, treasurer. Condon toured Misawa facilities ranging from an F-16 munitions training area to the Grissom Dining Facility, run by the 35th Services Squadron. The squadron commander is chapter member Maj. Kari A. Mostert.

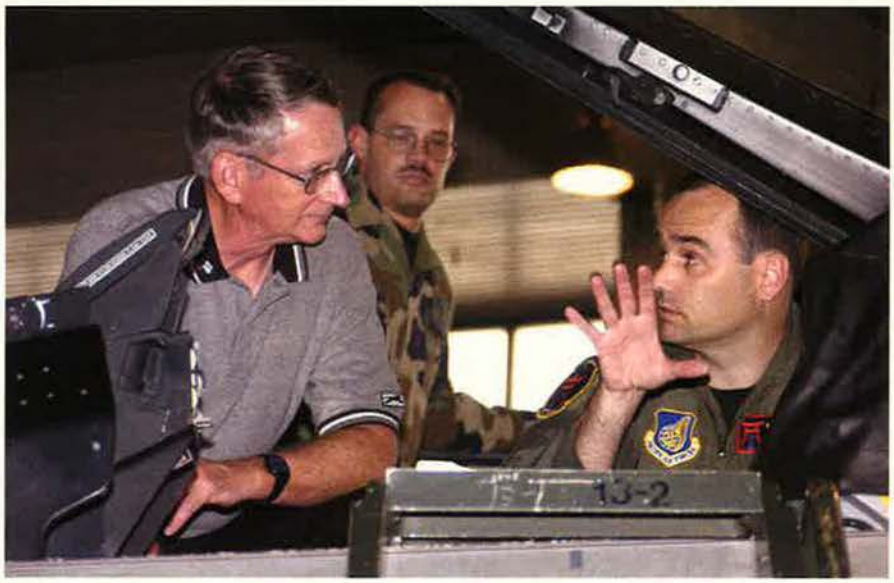
At Kadena AB, Japan, Condon attended a meeting of the **Keystone Chapter,** hosted by CMSgt. Stephen J. Pelham, chapter president. Condon was briefed by Brig. Gen. Jeffrey A. Remington, 18th Wing commander. He also visited the Mobility Processing Center, the 31st and 33rd Rescue Squadrons, and the NCO Academy and Airman Leadership School.

At Osan AB, South Korea, Condon met with Brig. Gen. Mark G. Beesley, 7th Air Force vice commander and member of the **MiG Alley Chapter (South Korea),** and Brig. Gen. William L. Holland, commander of the host 51st Fighter Wing.

Several 8th Fighter Wing members demonstrated force protection measures for Condon while he was at Kunsan Air Base.

At every PACAF base, Condon met with groups of USAF company grade and enlisted personnel. He said he gained "firsthand insights into the mission of our Air Force in the Pacific Rim" and a greater understanding of what AFA could focus on to improve the quality of life for the airmen there.

During this AFA outreach effort, Condon was interviewed by American Forces Network Korea, *Stars and Stripes,* Air Force Network News, and base newspapers.



USAF photo by TSgt. James R. Hart

At Misawa AB, Japan, AFA National President Pat Condon (left) listens as Lt. Col. Kevin Fowler explains an F-16's weapons system. Fowler is the commander of the 35th Operations Support Squadron. TSgt. Shane Hayes, 35th Maintenance Group, is in the background. Misawa was one of several bases Condon visited on a PACAF orientation and AFA outreach tour.

In Search of Inscriptions

A special committee has begun the task of collecting and recommending the various inspirational inscriptions, images, and messages to appear on the completed Air Force Memorial.

And it wants to hear from airmen.

The Inscription Committee held its first meeting July 15 at memorial headquarters, Arlington, Va. Members include Paul Airey, Trudy Clark, Rudy de Leon, Jim Finch, Ronald Fogleman, William Heimdahl, Michael Ryan, Pat Schittulli, and John Shaud.

Speaking to all airmen, the panel said it "invites your input to this extremely important phase of memorial development," which it believes will add the critical "human touch" to the memorial. It said it would like to receive specific ideas, images, quotes, and themes.

The panel asked that all suggestions be sent as soon as possible via e-mail to afmf@airforcememorial.org.

Plans call for incribing the messages or images on 10 massive surfaces: two horizontal granite walls, measuring 10 feet high and 50 feet long, and eight vertical glass panels measuring 11 feet high, 5.5 feet wide.

These surfaces will be erected in three areas across the three-acre site. The granite walls will rise behind the Honor Guard and the Contemplation Chamber. The glass walls will actually form the Contemplation Chamber, a place of meditation and remembrance.

At present, plans call for the memorial, situated on land adjacent to the Arlington National Cemetery near the Pentagon, to open in September 2006.

Membership Drive

The **Northern Utah Chapter** and **Ute–Rocky Mountain Chapter (Utah)** combined forces for an AFA membership drive in June that brought them more than 50 new members.

Helping generate interest in the drive was Air National Guard 1st Lt. Daniel Schilling from the state's third AFA chapter, the **Salt Lake City Chapter.** Schilling was a USAF combat controller in Mogadishu, Somalia, when Army Rangers got into a firefight with rebel forces in October 1993. Eighteen American soldiers died in the action. At the time, Schilling was a staff sergeant with the 24th Special Tactics Squadron, Pope AFB, N.C. He risked his life to rescue a wounded teammate and also saved the life of the NCO in charge of the Ranger task force convoy.

Schilling, who is now a special tactics officer with the 101st Combat Operations Group in Portland, Ore., has enlisted time in both the Army and Air Force. During his membership drive presentation, he mentioned that he had received an Eagle Grant from AEF. The grants, now called Pitsenbarger Awards, provide $400 to Community College of the Air Force graduates planning to pursue a bachelor's degree.

Dennis J. Guymon, chairman of the membership drive, said Gary A. Strack, then the Northern Utah Chapter president, signed up about a dozen newcomers. And one of the Community Partners issued a challenge: I'll sign up 10; you sign up 10. Community Partner Ed Kenley Ford of Layton, Utah, responded by bringing 12 members on board.

The Weather in Iraq

The weather forecast of a major sandstorm, whipped by winds of 60-70 mph, was one reason the US launched the Operation Iraqi Freedom ground war sooner than some expected, as **Tennessee Ernie Ford Chapter (Calif.)** members learned at their May meeting.

Guest speaker 2nd Lt. Troy Alexander, a USAF weatherman at Travis AFB, Calif., described how high temperatures affected some of the laser guided weapons and how thunderstorms had an impact on aircraft and troop movements. He told the group that forward deployed weather personnel and satellites provided much of the weather information.

AFA In Action

The Air Force Association works closely with lawmakers on Capitol Hill, bringing to their attention issues of importance to the Air Force and its people.

■ AFA sponsored a Congressional Education Program called "Technology to Warfighter: The Keys of Combat Capability." Display panels set up at a Senate reception area explained how developing technologies increase warfighting capability in an environment linking manned, unmanned, and space systems. **Sen. Byron Dorgan** (D-N.D.) and **Sen. Wayne Allard** (R-Colo.) were among those attending the program. **Lt. Gen. Steven R. Polk,** vice commander, Pacific Air Forces, and **Brig. Gen. Mark A. Welsh III,** mission area director of global power programs, represented the Air Force, while AFA Chairman of the Board John J. Politi and Executive Director Donald L. Peterson represented AFA. The Congressional Education Program is co-sponsored with the Air Force Office of Legislative Liaison. The series of programs provides an opportunity for AFA and Air Force leaders to discuss issues and concerns with Congress.

■ AFA has been working to secure enactment of the Armed Forces Tax Fairness Act of 2003. A significant provision of this legislation exempts military members from paying capital gains tax on the sale of their primary residence if they receive permanent change of station orders before the two-year point. The legislation passed the House (422-0) and the Senate (97-0) but has stalled in the conference process. AFA Executive Director Peterson contacted House Ways and Means Committee Chairman **Rep. William Thomas** (R-Calif.), urging him to seek passage of a unified bill reflecting the unanimous House and Senate votes. Peterson wrote to members of House Ways and Means Committee and the Senate Finance Committee, saying, "There is no doubt about the sense of Congress that military members deserve better treatment than to have this modest-cost proposal shelved." The letter also went to every member of Congress. It was posted on the AFA Website as a "Call to Action," and delegates to AFA state conventions were asked to weigh in as well. As a result, more than 1,400 AFA members contacted their representatives through AFA's "Contact Congress" program. Association leaders have held meetings with professional Hill staffers, including **Allison Giles,** chief of staff of the House Ways and Means Committee, to determine a follow-on course of action. (See "Action In Congress: Homeowner Tax Breaks," p. 28.)

■ AFA and the Air Force Office of Legislative Liaison hosted a Congressional Air Force Caucus Breakfast on Capitol Hill. The theme was "ACC Warriors on the Hill." The warriors—Air Combat Command representatives—discussed how training and close coordination of operations between the shooters and E-8 Joint STARS and E-3 AWACS aircraft enhanced time-sensitive targeting during Iraqi Freedom. ACC personnel described the dramatic improvements in target acquisition the F-15E weapons systems upgrades provide over the older systems. **Brig. Gen. Eric J. Rosborg,** commander of the 379th Air Expeditionary Wing during OIF, moderated the discussion. Members of Congress attending included **Sen. Don Nickles** (R-Okla.), **Rep. Cliff Stearns** (R-Fla.), **Rep. Ed Schrock** (R-Va.), and senior staffers. AFA National President Pat Condon represented the association. The Congressional Air Force Caucus, now with 68 members, was formed in 1998. It provides members of Congress with an opportunity to discuss Air Force issues, receive briefings on new technologies and programs, and provide USAF leaders with counsel. **Sen. Michael Enzi** (R-Wyo.) co-chairs the caucus with Stearns.

Chapter President John K. Barbour said the idea for this chapter meeting took root at the 2002 AFA National Convention. The Air Force Weather Agency, based at Offutt AFB, Neb., was an exhibitor at the aerospace technology exhibition, and Barbour learned that the agency had an operating location at Travis. "That started the ball rolling," he said.

California Convention

AFA National President Condon was keynote speaker for the California State Convention, hosted by the **Bob Hope Chapter** at March ARB, Calif., in June.

He spoke at the first of two awards banquets at the convention. The first honored the state AFA award recipients. The second, held the next night, recognized military award recipients. The featured speaker was Maj. Gen. Thomas D. Taverney, who is the military assistant to the commander, Air Force Space Command. He spoke about the role of space assets in Iraqi Freedom.

During the business session, convention-goers elected Maj. Dennis R. Davoren, an AFA national director and president of the **David J. Price/ Beale Chapter,** as state president. The three state vice presidents elected were John K. Barbour from the **Tennessee Ernie Ford Chapter;** Dennis Laws of the **Robert H. Goddard Chapter;** and Rick L. Randall of the **Gen. B.A. Schriever Los Angeles Chapter.** Robert K. Marohn, also from the Schriever Chapter, was elected state secretary, and Martin Ledwitz, **Pasadena Area Chapter,** will serve as state treasurer.

Other Services

Robert F. Cutler, president of the **Gen. Nathan F. Twining Chapter (Fla.),** notes that since there are no Air Force JROTC units in Pinellas County, Fla., the chapter honors cadets in JROTC programs of other military services.

Two of the cadets announced at the chapter's May banquet that they had enlisted in the Air Force. At the banquet, the chapter presented awards to the two prospective airmen: Navy JROTC cadet Stacy Kearin, from Dunedin High School, and Army JROTC cadet Tamara Stainton of Dixie Hollins High School in St. Petersburg.

Also receiving awards were Tania Vasquez, from the Marine JROTC unit at Clearwater High School, and Civil Air Patrol cadet Christopher Karbowiak. With help from the chap-

ter, Karbowiak was preparing to apply to the US Air Force Academy. The chapter planned to introduce him to US Rep. Michael Bilirakis (R-Fla.), who can nominate him for an academy appointment, and retired Maj. Gen. Earl G. Peck, who has offered to write a letter of recommendation.

Peck was guest speaker for the awards banquet.

Other awards that evening went to Leslie Pohley, selected as the chapter's Science Teacher of the Year, and students Eryn Berg and Shana Geary—all from Largo Middle School. The students produced the top aerospace–aviation project in the Pinellas County science and engineering fair. (Henry L. Marois Jr., former chapter president, has been a judge at this fair for many years, at the invitation of the county.)

The chapter planned to submit Pohley's name for an AEF Educator Grant, a $250 award that teachers may use to pay for extra resources such as books, software, or field trips.

Rewards for Scholarship

Lt. Gen. Leslie F. Kenne, USAF deputy chief of staff for warfighting integration, was keynote speaker for the Chief of Staff Scholarship dinner of the **Paul Revere Chapter (Mass.)** in Bolton, Mass., in May.

The audience of more than 200 guests included Lt. Gen. William R. Looney III, commander of Electronic Systems Center at Hanscom AFB, Mass.

Corey Baggett, son of chapter member Lt. Col. Mark Baggett, received the chapter's top honor, a $3,000 Chief of Staff Scholarship.

David Gagnon, son of chapter member Maj. Garry Gagnon, received the $2,000 Col. Charles E. Jones Scholarship.

The $2,000 Brian D. Sweeney Scholarship went to Michael Sasseville, son of Richard R. Sasseville of the **Worcester Chapter (Mass.).** The scholarships Gagnon and Sasseville received are named for chapter members who died on airliners hijacked by 9/11 terrorists and flown into the World Trade Center.

Others recognized at the scholarship dinner were Ann Phillips and TSgt. Eric Soluri.

Phillips, the wife of Lt. Col. Dean Phillips, received a $1,000 AEF Spouse Scholarship to aid in her master's degree studies in nursing at Regis College in Weston, Mass. Soluri received a $400 scholarship from the chapter as Hanscom's outstanding CCAF graduate. He is a security forces trainer with the 66th Security Forces Squadron.

Former Bronco Aids AEF

A former Denver Broncos football player lent his name to the Colorado state AEF's golf tournament in May, to help the fund-raising effort.

The Steve Foley Golf Tournament and a silent auction together raised $6,000 for the aerospace education scholarship funds of the state's five chapters: the **Gen. Robert E. Huyser Chapter, Lance P. Sijan Chapter, Long's Peak Chapter, Mel Harmon Chapter,** and **Mile High Chapter.**

Foley was a defensive back with the Broncos from 1976 to 1986. He is now a real estate developer in Colorado. He became involved in Colorado AEF fund-raising efforts after attending the organization's reception for golfers last year at the Air Force Academy.

For this year's tournament, players teed up at the Ft. Carson Golf Club, a military course open to the public. The golf outing and silent action were held in conjunction with AFA's annual Outstanding Squadron Banquet, honoring cadets at the Air

Force Academy, and a space operations symposium, sponsored by the Sijan Chapter.

Sijan Remembered

A memorial to Medal of Honor recipient Capt. Lance P. Sijan—for whom the Colorado chapter is named—was dedicated in his hometown of Milwaukee in June.

The Wisconsin AFA organization, the **Billy Mitchell Chapter,** and **Capt. William J. Henderson Chapter** were among the donors for the memorial, which includes a landscaped area in Milwaukee's Arlington Park Cemetery, plaques, and stone benches.

Sijan, a 1965 USAF Academy graduate, was an F-4 pilot during the Vietnam War. He was shot down Nov. 9, 1967, over North Vietnam and, despite extreme injuries and starvation, evaded capture for more than six weeks. He endured severe torture before dying in January 1968 at what the American POWs called the Hanoi Hilton.

The memorial in the Milwaukee cemetery echoes the shape of an F-4 Phantom. A small headstone sits at its foot, inscribed in Vietnamese and with Sijan's initials—in English—and the date of his death. A bronze plaque nearby explains that the headstone is a replica of one used by the North Vietnamese to mark Sijan's grave and that, in an unusual gesture of respect, the original headstone was returned with Sijan's remains in 1974.

The second plaque bears the wording of Sijan's Medal of Honor citation.

Speakers at the ceremony included former Presidential candidate H. Ross Perot and AFRC Col. Michael L. Smith, who is a Henderson Chapter member and commander of the 440th Airlift Wing at Gen. Mitchell Arpt./ARS, Wis.

Among the Sijan family members at the ceremony was his father, Sylvester, a Sijan Chapter member, and his mother Jane. Victor L. Johnson Jr., president of the Mitchell Chapter; Robert E. Meinecke, chapter treasurer; and Charles W. Marotske, chapter member, also attended.

Focus on Aviation

The **Diamond State Chapter (Del.)** held its annual Focus on Aviation program at Wilmington College in New Castle, Del., in May.

It featured a presentation by Nettye H. Evans on the history of the World War II Tuskegee Airmen. Evans is an adjunct professor of education and human performance at Delaware State University (Dover, Del.). Her husband, the late Walter C. Evans Sr., was president of a local chapter of the Tuskegee Airmen Association.

Richard Bundy, state president and member of the **Delaware Galaxy Chapter,** and Harry E. Van Den Heuvel, president of the Diamond State Chapter, presented nine awards at the event.

Four awards for ANG personnel went to members of the 166th Airlift Wing (ANG), New Castle County Arpt.: MSgt. Kenneth H. Brown, CMSgt. Lynn M. Davis, TSgt. Piers Heriz-Smith, and SrA. Summer Brown.

Other award recipients were Shannon Cathcart, Teacher of the Year; Larry Alfree, outstanding Civil Air Patrol achievements; Greg Wilson, excellence in flight training; and Jan Churchill and Bill Hall, community service.

More AFA/AEF News

■ Lt. Gen. Norton A. Schwartz, director of operations on the Joint Staff, addressed the evening banquet of the Virginia state quarterly meeting in May. He spoke about the war on terror and lessons learned from Enduring Freedom and Iraqi Freedom. The **Gen. Charles A. Gabriel Chapter (Va.),** headed by President Jeffery Barnett, hosted the event in Reston, Va. A second speaker was chapter member William H. Wheeler, who spoke about his book *Shootdown.* Wheeler was a B-17 pilot stationed at Bassingborn, UK, when he was shot down over Schweinfurt, Germany, on his 24th mission. He spent 21 months in Stalag Luft III.

■ Lt. Gen. Daniel James III, ANG director, addressed the **Donald W. Steele Sr. Memorial Chapter (Va.)** at a luncheon held at the Army Navy Country Club in Arlington, Va., in June. James talked about the ANG's importance to the Total Force, its missions in Iraqi Freedom, and its modernization plans and programs. The ANG leader took questions from the audience about the challenges Guard members face when they are deployed and gone from their civilian jobs and their families for extended periods. Chapter President James R. Lauducci later presented $1,000 chapter scholarships to SSgt. Kenneth Henkle, from the 89th Airlift Wing, Andrews AFB, Md., and Megan Harencak and William Place. Harencak and Place plan

to enroll in AFROTC programs at, respectively, Florida State University and Virginia Polytechnic Institute and State University in Blacksburg, Va.

■ Wisconsin State President Henry Syring presented a ceremonial sword to a Marquette University AFROTC cadet in Milwaukee in April. Heather M. Wooten received the award from the state AFA and the **Billy Mitchell Chapter (Wis.)** in recognition of her leadership.

■ Robert Radford received the Washington state Teacher of the Year award from O. Thomas Hansen, state president, and Col. David A. Reinholz, **Greater Seattle Chapter** member and state aerospace education VP. Radford organized an aviation program at Seattle's Greenwood Elementary School, where he is the principal. Fifth-graders in the aviation program train on flight simulators and at the end of the year fly Cessna 172s with instructors at Boeing Field, Wash.

■ ANG Lt. Col. Carl F. Bess Jr., in dress uniform, attended a change of command and awards ceremony at Atlee High School in Hanover, Va., in May to present an AFA Medal and certificate to AFJROTC cadet Kyle West. Bess is president of the **Richmond Chapter (Va.).** ■

Unit Reunions

reunions@afa.org

40th BG Assn. Sept 3-7 at the Providence Biltmore Hotel in Providence, R.I. **Contact:** Jean Suitt, 10336 Brangus Dr., Crowley, TX 76036 (800-959-2583) (jsuitt@crescent.com).

302nd Air Rescue Sq, Williams AFB, AZ (1956-60), and Luke AFB, AZ (1960-74). Nov. 1 in Phoenix. **Contact:** Pete Long (480-963-8459) (pjlong17@hotmail.com).

366th FG, FBW, TFW, and AEW. Mini reunion Sept. 13-14 at Mountain Home AFB, ID. Regular reunion Oct. 22-26 in Tennessee. **Contact:** (425-774-7504) (mkjeanpennington@juno.com).

178th FW/FG pilots. Oct. 25 at Springfield ANGB in Springfield, OH. **Contact:** Maj. John DeNezza, 162FS/ADO, 801 A-Ave., Springfield ANGB, Springfield, OH 45502 (937-327-2201) (john.denezza@ohspri.ang.af.mil).

380th BG. Sept. 10-13 at the Patrick Henry Inn in Williamsburg, VA. **Contact:** Pat Carnevale, PO Box 1230, Sonoita, AZ 85637-1230 (phone: 800-659-8808 or fax: 520-455-5866) (carne@dakotacom.net).

416th NFS/TFS (WWII-1993). Nov. 14-16 at Sam's Town in Las Vegas. **Contact:** Ron Green, 6303 E. Mesquite Rd., Cave Creek, AZ 85331 (480-595-8693) (bargranch@aol.com).

493rd FS. Sept. 25-27 at the Lodge of the Ozarks in Branson, MO. **Contact:** Pat Carnevale, PO Box 1230, Sonoita, AZ 85637-1230 (phone: 800-659-8808 or fax: 520-455-5866) (carne@dakotacom.net).

6511th Test Group (Parachute). Oct. 30-Nov. 2 in El Centro, CA. **Contact:** Ken Cunningham, PO Box 2774, Lancaster, CA 93539 (661-942-7712) (cunninghamk@iopener.net).

Air Force Intel Training, Goodfellow AFB, TX (1958-present). Oct. 3-4 in San Angelo, TX. **Contact:** MSgt. Dave Thompson (DSN: 477-5400 or 325-654-5400) (david.thompson@goodfellow.af.mil).

Air Force Navigators and Observers Assn. Oct. 8-12 in Daytona Beach, FL. **Contact:** Jim Bannerman, 761 Marina Point Dr., Daytona Beach, FL 32114 (386-257-3853) (afnoasecretary@aol.com).

Air Force Postal and Courier Assn. Oct. 15-18 at the St. Augsutine Beach Front Resort in St. Augustine, FL. **Contacts:** Dan Neff, 413 Hartzell Ave., Redlands, CA 92374 (909-792-5424) (afpcadneff@cyberhotline.com) or Ernie Smith (904-824-6097) (ernies@aug.com).

Aviation Cadet Class 53-B. Oct. 2-5 at the Doubletree Downtown in Dayton, OH. **Contact:** Pat Carnevale, PO Box 1230, Sonoita, AZ 85637-1230 (phone: 800-659-8808 or fax: 520-455-5866) (carne@dakotacom.net).

Itazuke AB, Brady AB, and Camp Hakata, Japan, dependents schools, all years. July 31-Aug. 2, 2004, at the Hilton Garden Inn in Kansas City, KS. **Contact**: John O'Brien (816-229-7648) (obrien.john60@itazuke.org).

SAC Airborne Command Control (PACCS) personnel. Sept. 22-26, 2004, in Omaha, NE. **Contacts:** Fred Kemp, 2356 S. Orchard View Dr., Green Valley, AZ 85614 (520-393-1054) (fkemp8367@aol.com) or Jack Suggs, 855 Crenshaw Loop N., Keizer, OR 97303 (503-390-2435) (jwsuggs@comcast.net).

Stray Goose International, all involved with the Combat Talons in the Pacific AOR. Oct. 10-12 at Hurlburt Field, FL. **Contacts:** SGI, PO Box 9355, Hurlburt Field, FL 32544 or Lee Hess (850-651-0353) (sgi@straygoose.org).

Seeking members of the **343rd Supply Sq,** Eielson AFB, Alaska (1985-98), for a reunion in Las Vegas in 2005. **Contact:** Alok Pandeya, 2208 Tam Dr., Apt. 04, Las Vegas, NV 89102. ■

Mail unit reunion notices four months ahead 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. We reserve the right to condense notices.

AFA Conventions

Sept. 15-17
AFA National Convention, Washington, D.C.

Sept. 28
New Hampshire State Convention, Manchester, N.H.

Pieces of History

Photography by Paul Kennedy

Fortress

The B-17 Flying Fortress of World War II was one of the most famous airplanes ever built. With 13 machine guns and a bomb load of 6,000 pounds, the four-engine, 300 mph B-17 was a fearsome weapon everywhere, but especially against Germany, where it was key to daylight strategic bombing operations. The B-17 first flew in 1935, but production did not surge until after Pearl Harbor. Altogether, Boeing churned out a staggering 12,726 aircraft. One of the few remaining B-17 combat veterans, seen here, is on display at the US Air Force Museum at Wright-Patterson AFB, Ohio. Shoo Shoo Shoo Baby—model B-17G-35-BO S/N 42-32076—flew 24 missions with the 91st Bomb Group before landing in Sweden with engine trouble in 1944. It was recovered, restored, and presented to the museum in 1988.

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- ✯ In Production for United States Air Force

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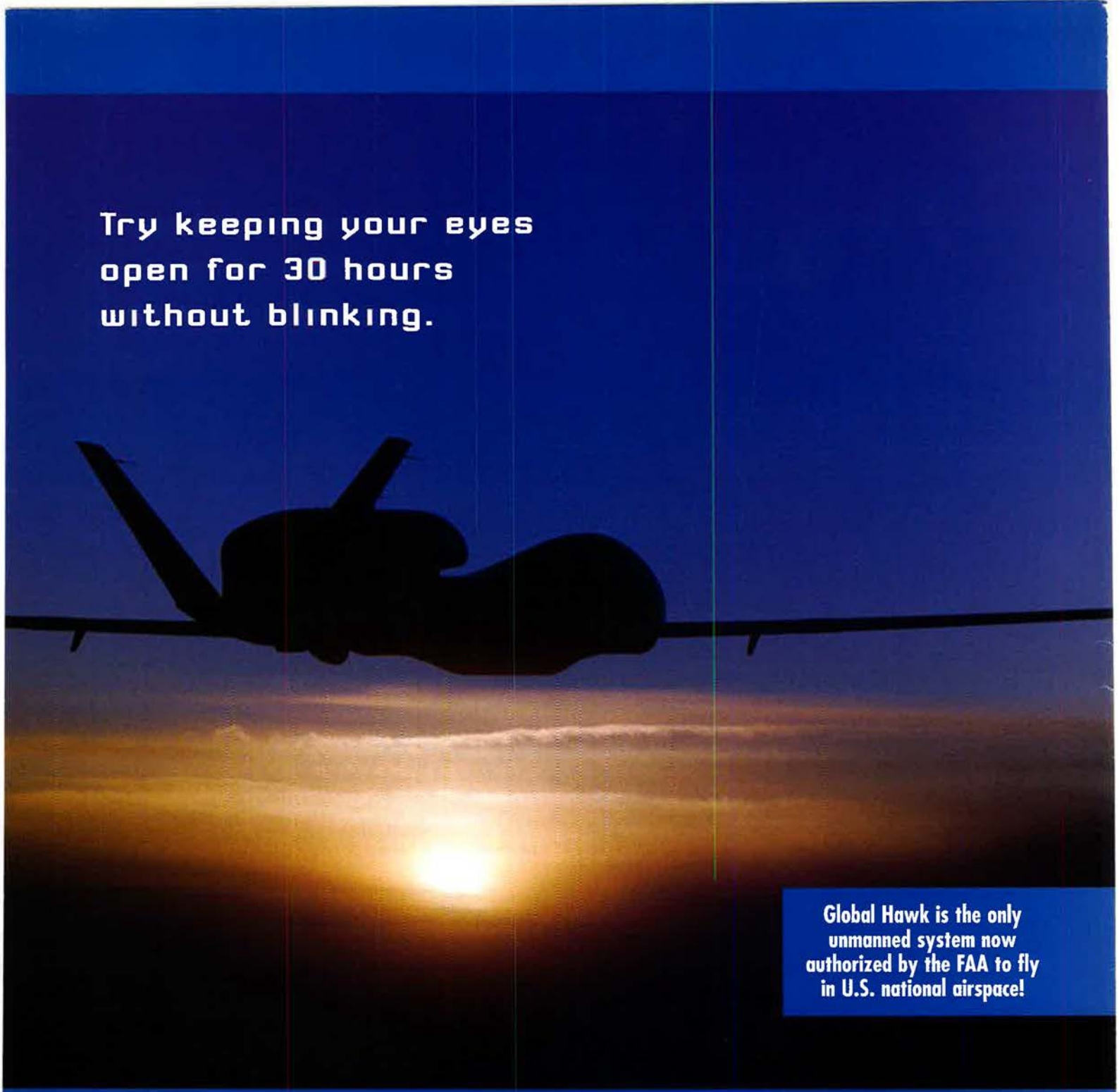

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