February 2004/$4

AIR FORCE

JOURNAL OF THE AIR FORCE ASSOCIATION MAGAZINE

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The "War" Before the War

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February 2004, Vol. 87, No. 2

AIR FORCE MAGAZINE

JOURNAL OF THE AIR FORCE ASSOCIATION

About the cover: An artist's conception of a next generation surveillance satellite. By Erik Simonsen. See "New Orbit for American Space Power," p. 38.

52

64

AIR FORCE Magazine (ISSN 0730-6784) February 2004 (Vol. 87, No. 2) is published monthly by the Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Phone (703) 247-5800. Second-class postage paid at Arlington, Va., and additional mailing offices. **Membership Rate:** $36 per year; $90 for three-year membership. **Life Membership (nonrefundable):** $500 single payment, $525 extended payments. **Subscription Rate:** $36 per year; $29 per year additional for postage to foreign addresses (except Canada and Mexico, which are $10 per year additional). Regular issues $4 each. USAF Almanac issue $6 each. **Change of address** requires four weeks' notice. Please include mailing label. **POSTMASTER:** Send changes of address to Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Publisher assumes no responsibility for unsolicited material. Trademark registered by Air Force Association.

Editorial

By Robert S. Dudney, Editor in Chief

The Dragon and the Snakes

As THE Pentagon prepared to unveil its 2005 budget, the big buzz in Washington was that spending was back at "Cold War levels."

There was some truth to this claim. Though DOD's budget dropped for 13 years in a row (1986-98), it now has gone up for six straight years (1999-2004). The 2005 plan, out this month, would push expenditures above $400 billion. While that doesn't approach the mammoth Reagan outlays of the 1980s, it matches or exceeds some earlier Cold War budgets.

Predictably, critics deemed this excessive. "These are parlous times," said one skeptic, "but are they *that* parlous?" Another had evidently forgotten the underfunding of the 1990s, recalling them now as years of "high" military readiness and "prescient modernization."

If the public as a whole ever develops doubts about the need for expanded defense budgets, it will be a serious problem.

The nation faces an enormous task in preparing its forces to confront new and different—very different—enemies operating on a global front. This is an expensive proposition. It can't be done without broad support from Congress and the public.

While such support exists today, it can fade quickly. Even the Reagan "buildup," strictly defined, lasted for just four budget years—1982, 1983, 1984, and 1985. After that, huge deficits and Soviet retrenchment pulled Pentagon spending downward.

Today, that kind of stall-out would be truly dangerous. President Bush's defense program is a modest one, yet his budgets, far from being lavish, may be insufficient even for the program at hand. Spending must increase for some years to come.

The Pentagon knows this. It plans to raise spending each year for six years, to $484 billion in 2009.

In a recent study, Steven M. Kosiak of the Center for Strategic and Budgetary Assessments (CSBA) found that modernizing the armed forces and maintaining it at high readiness was likely to require $360 billion more than Bush has planned over the next 10 years. (Costs of new wars and occupations are not included.)

The Congressional Budget Office reached a similar conclusion. In October, CBO warned that DOD budgets have to grow by 20 percent just to keep today's 1.4 million member force from shrinking even further. CBO Director Douglas Holtz–Eaken said, in effect, that Bush budgets need to be 10 percent bigger than Reagan's.

The Cold War was long and expensive. The Global War on Terror will be no different.

Half of the hike is needed to cover recent increases in pay and benefits for the volunteer force and half to replace outmoded equipment, he said.

Congress this year appropriated about $74 billion for weapons. The services have said it should be more like $100 billion a year.

For the Air Force, the equipment problem is acute, especially in the aged fighter force. CBO warned that maintaining today's 20-wing fleet at its current steady-state age requires procurement of 150 fighters per year.

USAF hasn't bought fighters at that rate for years, and it won't happen for another decade—if then.

Gen. William J. Begert, commander of Pacific Air Forces, recently told reporters PACAF's F-15s have not achieved their desired mission capable rate in four years, mostly because of age-related difficulties. Elsewhere, the story is much the same.

USAF's fleet of KC-135 tankers were designed and built in the Eisenhower years. It should be remembered that the Air Force came up with its doomed plan to lease 100 Boeing KC-767 replacements precisely because it could not, with its current budget, afford the up-front cost of an outright purchase.

The military health care program, though justified, poses big budget problems. The cost, about $14 billion a decade ago, is now running to $28 billion a year and could hit $50 billion in two decades.

Because of high cost, the Bush defense budget does not try to increase the end strength of the hard-pressed armed services. DOD believes it can free up more "trigger pullers" by shifting some military jobs to civilians or contractors, but that, in itself, will be expensive.

In Washington, one often hears that the problem is not that the budget is too small but that the program is too large and thus "unaffordable." CSBA's Kosiak, for example, argues DOD could pursue a "more affordable" program, requiring fewer dollars.

The "affordability" argument is hard to make, however. The Bush Administration allocates 3.4 percent of US gross domestic product to defense. That is not an onerous burden.

It is not anywhere close to the Cold War standard. President Reagan in the 1980s devoted six percent of GDP to defense. In the Kennedy years, the figure was nine percent.

War and national security do not come cheap. The Cold War was long and expensive. The Global War on Terror will be no different. The nation has no alternative but to fund the forces that are needed.

Rep. Duncan Hunter (R-Calif.), chairman of the House Armed Services Committee, has argued for adding $100 billion to annual defense spending. This, he said, would put today's budgets on a par with those of the Reagan years.

Hunter paraphrased former CIA Director R. James Woolsey's famous assessment of the strategic situation: "We have killed the big dragon—that is, we have disassembled the Soviet Union—but there are lots of poisonous snakes out there."

For some years after the collapse of Soviet power, it was fashionable in certain political circles to say that hawks—defined as anyone who saw a need to maintain a strong military—just didn't get it. They didn't realize the Cold War was over.

Somebody needs to tell the critics that the post-Cold War is over, too. ■

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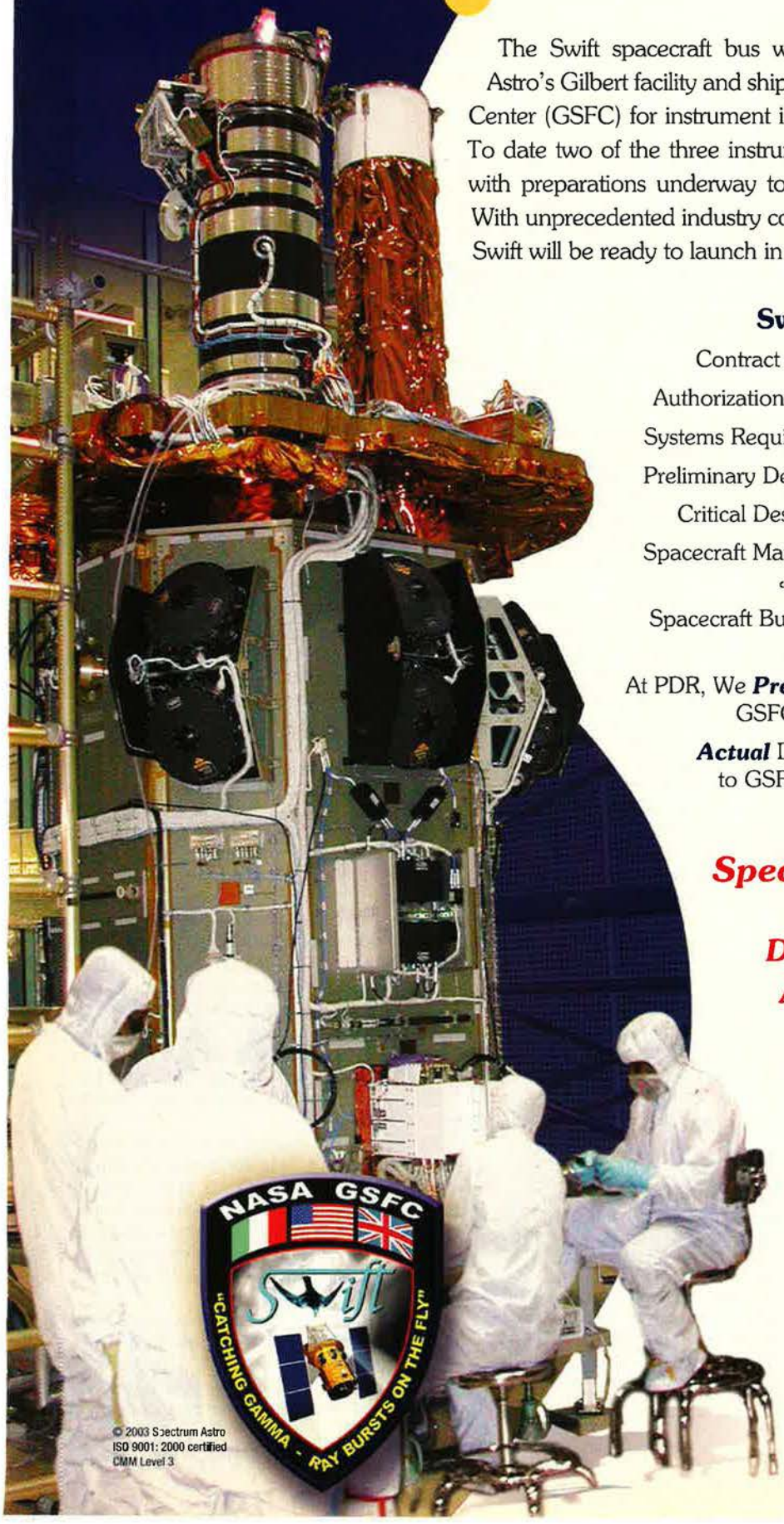

The Swift spacecraft bus was designed and built at Spectrum Astro's Gilbert facility and shipped to NASA's Goddard Space Flight Center (GSFC) for instrument integration and environmental testing. To date two of the three instruments are fully integrated and tested, with preparations underway to integrate the Burst Alert Telescope. With unprecedented industry cooperation and teamwork with GSFC, Swift will be ready to launch in early 2004.

Swift Key Events:

Contract Awarded - *June 18, 1999*

Authorization to Proceed - *August 24, 1999*

Systems Requirements Review - *May 9, 2000*

Preliminary Design Review - *August 29, 2000*

Critical Design Review - *May 17, 2001*

Spacecraft Manufacturing Readiness Review - *January 16, 2002*

Spacecraft Bus Pre-Ship Readiness Review - *August 7, 2002*

At PDR, We ***Predicted*** Delivery of Spacecraft to GSFC for *August 28, 2002*

Actual Delivery Date of Spacecraft to GSFC - *September 8, 2002*

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Letters

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More on *Enola Gay* II

The December issue of *Air Force* Magazine is a particularly good one, with its date-by-date chronology of the development of aviation, but the star of the show is your editorial, "*Enola Gay* II" *[p. 3].*

I am well aware of the cabal of Noam Chomsky et al, having crossed swords with them before now, during my 30-year career as a professor of physics at Boston University. Indeed, I am ashamed that the word "scholar" appears in your activist list. After all, I'm supposed to be a scholar, but my beliefs are far removed from those of the people you list.

I first became aware of the *Enola Gay* exhibit proposed by then-National Air and Space Museum Director Martin Harwit when an organization called Citizens Against Government Waste asked me to protest the waste of our tax money on this exhibit, saying that many Americans wouldn't like their money spent on pro-Japanese propaganda and providing a reply card to that effect. I was incensed by the information CAGW provided, considered that the waste of tax money was the least of the faults in this exhibit, and not only returned the card but wrote my own letter of protest to then-Smithsonian Secretary Ira Heyman that [detailed] my full support of your position.

I have just returned from a most impressive preview of the new Udvar–Hazy Center and saw the complete *Enola Gay* sitting there in that enormous building (it's too big to be just called a hangar) in all its glory and put my hand up to touch the bomb bay from which issued the bomb that in all probability saved my life along with thousands of others.

Dean S. Edmonds Jr.
Naples, Fla.

At what point do we just burn everything that's suggested to be inappropriate? Ray Bradbury invented his own fire department for this purpose in *Fahrenheit 451.* And are we not leaning in this direction, by suggesting that it is inappropriate to display [the *Enola Gay*] by virtue of its very nature? The National Air and Space Museum has presented an artifact in a context that correctly depicts its place in history. I have pride in the display. It is up to the individual viewer to resolve the moral issue the display presents. This is as it should be. To those who wish to rewrite history—Get over it!

Scott F. Donnell
Riverside, Calif.

While I agree with Robert Dudney's editorial comments, I disagree with him that the motivation for this dispute is over how the *Enola Gay* shall be displayed and in what historical context. It isn't about defense posture; this is about politics, pure and simple.

The [political critique] of the *Enola Gay* is Orwellian in nature. [The critics] are members of the so-called intellectual elite, and they firmly believe that they know what is best for everyone. Since they are sufficiently egotistical to believe in the superiority of their preferences, their politics transcends the normal political discourse. These people are essentially practicing a religion, and you cannot debate firmly held beliefs with someone who believes without any supporting evidence.

Lt. Col. Gerald P. Hanner,
USAF (Ret.)
Papillion, Neb.

At the time the *Enola Gay* dropped its bomb, I was one day out of Italy in the Atlantic Ocean, on a Norwegian ship loaded with troops being repositioned from the Mediterranean theater to the Pacific theater via the Panama Canal. Two days later, we received word that the second bomb had been dropped.

Then, on the night of Aug. 14, a chaplain got on the PA system and made the announcement that the shooting in the Pacific had stopped. [By] the morning, we had changed course.

It is difficult to estimate how many thousands of troops were in that pipeline to the Pacific theater, and, needless to say, had not the bombs been dropped, many would not have returned.

MSgt. Frederick W. McFadden
USAF (Ret.)
Melbourne, Fla.

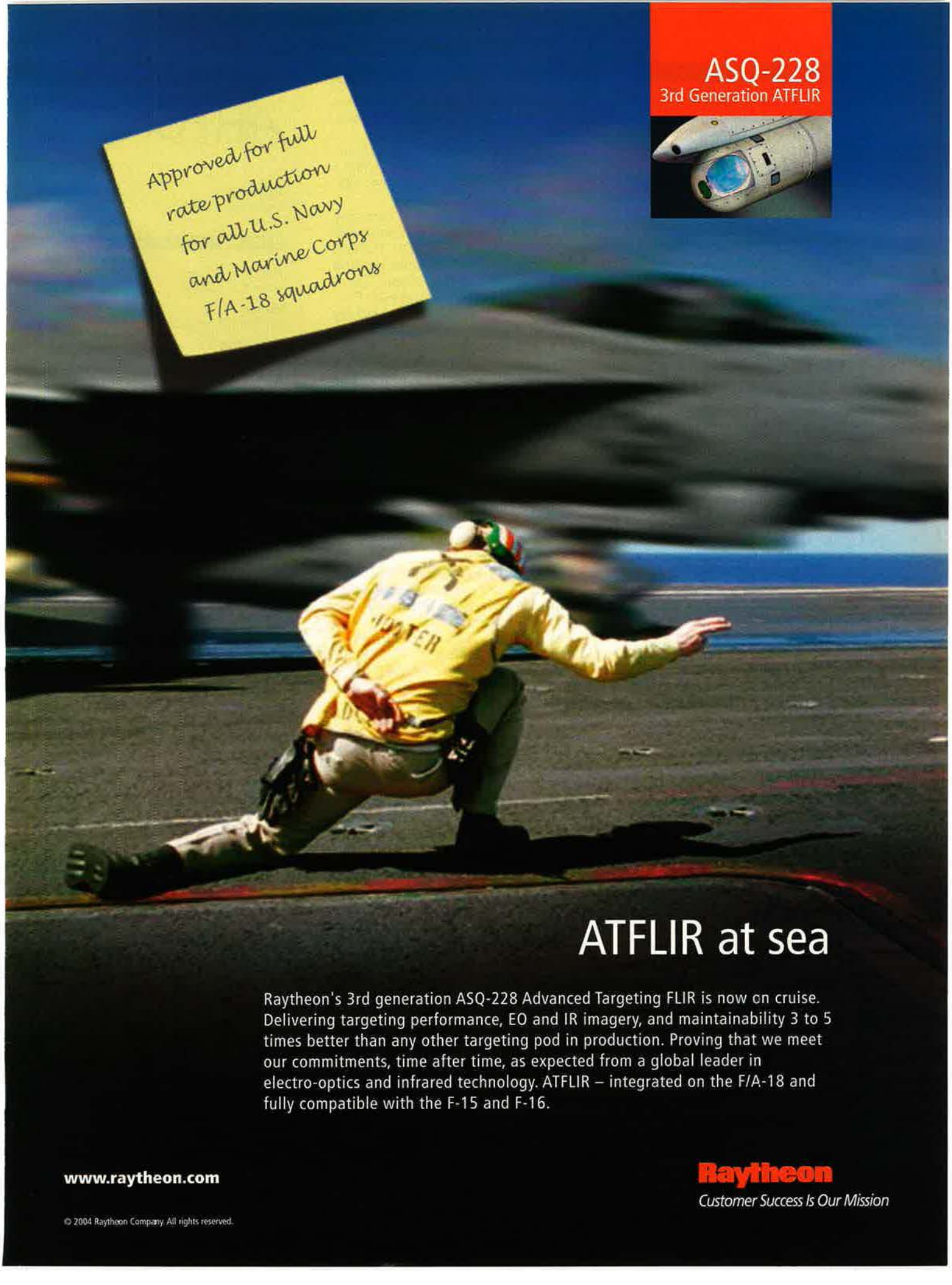
I am totally amazed that not one responsible journalist has ever picked up the gauntlet that is thrown down every year by a bunch of evidently uninformed antinuke types protesting Hiroshima, the *Enola Gay,* and Nagasaki and enlightened them on the Japanese genzai bakudan (atomic bomb) project.

My research convinces me that the Japanese were hard at work developing their atomic bomb and had been at it since almost the beginning of World War II. There is reasonable, in fact more than reasonable, proof that the Japanese detonated their "Trinity" test shot about two days after we dropped on Nagasaki. And more reasonable proof that two days after this test shot about 25 miles off the North Korean coast, the Russian Army descended on the area and took all the equipment, documentation, and scientists involved in the project back to Vladivostok.

Edwin O. Reischauer, Harvard professor and former ambassador to Japan, has stated: "I have always assumed that the Japanese would have done whatever they could to develop the atomic bomb during the war, and if they had had it, they would have used it."

Reports of the Japanese program were published by the *New York Times* and the *Atlanta Journal–Constitution* in the 1940s but never a comment when the antinuke troops come out

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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every year to damn the United States for using the bombs against Japan and most likely saving a few million lives—ours and Japanese.

Col. Wendell E. Cosner,
USAF (Ret.)
Albuquerque, N.M.

Up From Kitty Hawk

■ *Below is a sampling of letters, with comments and corrections for the aerospace chronology "Up From Kitty Hawk" (December 2003, p. 30). We continue to receive letters, telephone calls, and e-mails almost daily, with information about corrections or possible additions. Rather than running additional letters in this column in succeeding issues, we plan to confirm the new information and post changes or additions, as needed, to the online version of the chronology. The online chronology, which can be found on the AFA Web site (www.afa.org), is at least three times as long as the one that ran in the December issue and will be regularly updated.*—THE EDITORS

Congratulations on your excellent chronology of air and space power since 1903. I am sure others will write in about significant events they feel were left out. In my opinion, there is one event in particular which will be significant to the space force chronology someday, and that is the first operational repositioning of an orbital space asset in support of wartime activity.

If Desert Storm was the "first space war," then the movement of a reserve DSCS II (D14) comsat from above the east coast of Australia (175 E) to the Indian Ocean below Iraq (65 E) should be added to any updated chronology. This deliberate 110-degree repositioning maneuver to the west was accomplished by the skilled satellite operators of the 3rd Satellite Control Squadron at Falcon AFB, Colo., from August through September 1990. Of note, the DSCS constellation carried much of the communications traffic out of the theater during Desert Shield/Storm.

The buildup time from Sept. 3, 1990, until Jan. 16, 1991, was not sufficient to add any more military satellites on orbit than may have already been scheduled. With this maneuver, only three US milsatcom satellites were available to handle the almost 20 times increase in throughput for Central Command. During this war, DSCS supported over 80 percent of all long-haul communications and 85 percent of all multichannel ground terminals used in the conflict.

Col. Victor P. Budura Jr.,
USAF (Ret.)
Huntsville, Ala.

Your chronology says, "January 1941. War Department announces establishment of the 99th Pursuit Squadron and the Tuskegee training for black pilots at Tuskegee, Ala.," [but] omits the fact that the 99th Pursuit Squadron was [constituted] by the War Department on March 19, 1941, at Chanute Field, Ill. Eight months later, in November 1941, five aviation cadets and approximately 250 enlisted men trained at Chanute Field were then transferred to Tuskegee, Ala. This fact is documented in the 99th Pursuit Squadron "It Started Here" exhibit room in the Chanute Air Museum at Rantoul, Ill.

CMSgt. Donald O. Weckhorst,
USAF (Ret.)
Chanute Air Museum Historian
Rantoul, Ill.

I enjoyed the 100-year historical chronology in your December 2003 issue. However, there are two corrections I'd like to offer.

[You wrote:] "Dec. 1, 1965. Four crews flying modified F-100F Super Sabres carry out the first Wild Weasel radar suppression mission near the North Vietnam border."

Although this was the first Wild Weasel mission, it didn't succeed in finding and destroying a SAM site. A better entry for the chronology would have been Dec. 22, 1965, the date of the first successful mission, when an F-100F Wild Weasel crew detected a SAM site in North Vietnam and led a flight of four F-105Ds in its destruction.

[You wrote:] "May 13, 1967. Pilots of the 8th Tactical Fighter Wing, Ubon RTAB, Thailand, shoot down seven MiGs in a single day's action over North Vietnam."

The 8th TFW got only two of the seven MiG-17s on May 13. F-105D pilots from the 355th TFW at Takhli were credited with four of the MiGs, and the fifth was by an F-105D pilot from the 388th TFW at Korat.

The significance of this event is that, unlike Operation Bolo on Jan. 2, which was a deliberate MiG hunt when 8th TFW F-4Cs did bag seven MiGs, shooting down the MiGs on May 13 was a task added to the F-105's primary mission, bombing two JCS-designated targets, the Yen Vien railroad yard and the Vinh Yen army

AIR FORCE MAGAZINE
JOURNAL OF THE AIR FORCE ASSOCIATION

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barracks. The MiGs made the mistake of getting in the way of some very skilled Thud pilots.

Lt. Col. W. Howard Plunkett, USAF (Ret.)
Albuquerque, N.M.

I thought "Up From Kitty Hawk" was excellent. However, I'm sure you will receive many suggestions for feats you neglected that should have been included, and the following two are mine.

On July 1, 1935, Al and Fred Key landed their Curtiss Robin, *Ole Miss,* after setting a remarkable record of over 27 days in the air. They took off from the Meridian, Miss., municipal airport, which was renamed Key Field while they were airborne. Their flight featured air refueling from a second Curtiss Robin and engine maintenance and oil changes performed by Fred on a catwalk attached to the fuselage.

On Feb. 7, 1959, Bob Timm and John Cook set their Cessna 172, *Hacienda,* down on the runway at McCarran Field in Las Vegas, almost 65 days after take off from the same runway. Their amazing feat of endurance shattered the old record by 38 days and was accomplished with ground-to-air refueling and resupply formatting with a truck on another idle runway.

I'm sure almost everyone would agree that these two marvelous flights should be included on any list of aviation milestones.

John E. Appel
Largo, Fla.

After thoroughly enjoying "Up From Kitty Hawk" in the December 2003 issue, I couldn't help but wonder what the United States' aviation program would have been like if we had OSHA in 1903. We probably would not have had a program because it was too dangerous.

Maj. James P. McCormack, USAF (Ret.)
Eagle Lake, Calif.

I was completely puzzled by the entry for Dec. 10, 1941. There was no mention of the mission of Capt. Colin Kelly (a lone plane mission), where three bombs recorded two indirect and one direct hit on a naval warship (identified, eventually, by the Japanese as the heavy cruiser *Ashigawa.* The ship was left burning and apparently run aground on the northwest side of the Philippines' Luzon Island.

Instead, the entry for Dec. 10, 1941, shows a five-plane formation of the 93rd Squadron attacking a Japanese convoy and sinking the first enemy vessel by aerial combat bombing. Nowhere in history is there a version of a five plane B-17 bombing mission in the Philippines at the beginning of World War II. We were lucky to get off one plane at a time, due to the monumental bungling of MacArthur's headquarters in regard to Army Air Forces operations.

Robert E. Altman
Gainesville, Fla.

■ *The accounts of that mission on Dec. 10, 1941, vary greatly, and we may have erred. We will correct the online version of the chronology to conform with the official account by Air Force historian Bernard C. Nalty, who wrote in* Winged Shield, Winged Sword: A History of the USAF: *"Until Clark Field became untenable, the B-17s staged through it, as three*

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bombers did on Dec. 10 to attack the Japanese invading northern Luzon. The pilot of one, Capt. Colin Kelly, became one of the first heros of the war against Japan." (For further information on Captain Kelly's heroic mission, please see "Valor: Colin Kelly," Air Force *Magazine, June 1994 (www.afa.org).) We will correct our online chronology.*—THE EDITORS

About Those Medals

["A Short History of Medals," December, p. 78] struck me as not only good but also a little different from the normal topics covered in *Air Force* Magazine.

It made me think about Napoleon's remark that if he were given enough ribbon (for medals) he could conquer the world. The motivation inspired by a bit of ribbon in the wearer and those who see it is unquestioned.

Given that, it is hard to believe that mistakes (other words might also fit here—injustices, wrongheadedness, depending on the case in hand) are not only made, but can go uncorrected for years or forever. It used to be a trite phrase: "It takes an act of Congress to get anything done around here." Yet, it seems that *is* often what it takes, as in the case of the Korea Defense Service Medal.

Mr. Callander makes mention of the new unit awards and how they are designed to bridge the gap between the Presidential Unit Citation and the Outstanding Unit Award. Hopefully this will help prevent odd-looking situations, like the bomber and tanker wings at U Tapao getting the Outstanding Unit Award for the period when their efforts during Linebacker II ended the Vietnam War and 7th Air Force, when headquartered at Osan AB, South Korea, in the later 1990s, getting the Presidential Unit Citation. Not that the Air Force units in Korea don't deserve recognition each and every day, but why this period and no other?

I am not advocating that some large-scale nut roll be initiated to revise past awards but that those who submit, review, and approve them continue to realize the importance of getting it right the first time.

In any event, I fully expect us to see in the years to come campaigns waged on behalf of decorations not received in Korea, Vietnam, and later wars (while World War II personnel continue to receive theirs today), a Cold War Victory Medal, a UN medal for armistice service in Korea, and—who knows?—a joint tour service ribbon (which somehow needs to be purple but not resemble the Purple Heart), and that's as it should be!

Lt. Col. John Gavel,
USAF (Ret.)
Melbourne, Fla.

Mr. Callander states the practice of awarding enlisted promotion points for medals is criticized for giving an edge to airmen in specialties where awards are more likely to be given. I ask, who is doing the criticizing? Enlisted members compete for promotions only within their own specialty career fields. Therefore, specialties more likely to be awarded medals do not conflict with other career fields' promotion opportunities.

CMSgt. Robert A. Urie,
USAF (Ret.)
Lexington, Ky.

Spaceplanes

The hypersonic, transatmospheric spaceplanes described in the December issue *["In Search of Spaceplanes," p. 66]* interested me immensely.

Why do we need these hypersonic

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planes? The answer is simple: Even though the F/A-22 is going to be the air dominance fighter for a while, other world powers are soon going to construct newfangled fighters that are going to surpass the current one we have. The need to stay ahead in the world of technology is quite evident. If and when the countries develop their fighters, we will need to have a secure and foolproof way to defend our country.

These hypersonic vehicles are the answer. They will be fast, stealthy, and, above all, they will be able to carry out their mission with devastating effects. They will also have range like no other. For these things to happen, the Air Force has to plan decades ahead.

Tim Moss
Yorktown, Va.

Long Slog

I conclude that the reprint of Rumsfeld's "Long, Hard Slog" internal DOD memo in the December issue *["The Keeper File," p. 65]* is printed in its original entirety, and, if so, I fail to see what all the fuss is about, with the exception of who leaked the memo to unauthorized persons.

First of all, Secretary Rumsfeld must take a military that was unconscionably neglected by our previous Administration and whip it into shape to face the threats of the 21st century, all the while having to contend with the entrenched military mind-set and many of the so-called servants of the people—our elected officials—who complain, try to find fault, and whine at every opportunity.

Second, a true leader must constantly challenge his subordinates to higher levels of efficiency and productivity, ignoring the status quo and complacency. This can only happen by forcing them to think as individuals and, collectively, as members of a team. Additionally, he must allow them to openly disagree and state their reasons without having to worry about repercussions.

This is exactly what this memo does. It openly states success, but admits areas in which less than desired results have occurred. Questions are asked of the recipients, requesting their opinions on if we are doing enough and how we can do better, while giving them possible solutions for them to consider and to come up with what they feel are plausible alternatives.

This memo is pertinent and crucial for the development of policies not only for the short term but the long term as well. Many people fail to realize that some decisions made today will not become effective until two, three, five, or even 10 years from now. Therefore, it is imperative that all possible avenues be explored and that those responsible constantly evaluate and re-evaluate.

Secretary Rumsfeld's memo was right on target, and anyone who says otherwise needs to get his head out of the sand.

Philip E. Giammarco
Glendale, N.Y.

Concurrent Receipt

It seems to me that equal protection under the law was ignored in the concurrent receipt legislation. *[See "Action in Congress," December, p. 20.]* The Supreme Court declared that it was unconstitutional to tax federal pensions but not state ones. I expect the same treatment should be given to concurrent receipt. If any one person qualifies for concurrent receipt, then all retirees with a disability should be included. Must we go through the courts and wait for the Supreme Court to correct this situation?

Maj. Edward J. Gagznos,
USAF (Ret.)
Dallas, Ore.

As a retired Air Force veteran of 20 years, at 40 percent disability, noncombat related: It is unfair to give full retirement and disability pay to those members who have combat-related disability. As you should know, the military is the only branch of the government that doesn't receive both full retirement and disability. This is very unfair to the rest of the military members who served and have noncombat-related disabilities of 10 percent or more.

As in the past, the government is going to [anger] a lot of people who are retired with disabilities who have to have their disability pay taken off the top of their retirement pay.

SSgt. Stephen L. Farris,
USAF (Ret.)
Lockport, Ill.

Protoplasm Limits

I read the article on combat UAVs with some interest and cannot believe that General Jumper's audience was silent. *[See "New Horizons for Combat UAVs, December, p. 70.]* Aside from the obvious applicability of better stealth, lower personal risk with a UAV, the ability to carry hundreds of pounds of more weapons or fuel (think about eliminating seats, life support systems, the need for a pressure-tight cockpit, and the overdesign needed for a man rated system, plus 200 pounds of pilot)—any of which will give you a significantly enhanced weapon system—you need to key on the one major advantage of a UAV which we have yet to exploit: Namely, the current generation fighters are G-limited by the onboard protoplasm.

Remove that limit and you have an aircraft which can pull significantly more Gs. Significantly more Gs means better manueverability. You get inside the manned aircraft and you stay there—the manned aircraft is part of your target-rich environment. The early MiG fighters in Korea stand out as an example of what happens when you are consistently outmanuevered. We need to learn from that history and look for a high-performance UAV, not a better Predator or a Global Hawk with refueling capability.

Lt. Col. Thomas M. Hargrove,
USAF (Ret.)
Dallas, Ore.

Enlisted EWOs

Jack Kovacs's letter to the editor says, "In place of a bomb bay was a compartment where three electronic warfare officer crew members operated the collection equipment." *[See "Letters: The Heritage of the Force," December, p. 6.]* Please be advised that not all those individuals were officers.

I completed about three years' research documenting the fact that 132 enlisted personnel served as electronic warfare operators on B-52 and RB-47 aircraft during the Cold War. All items collected were submitted to the archives of the NCO Heritage Hall, Gunter Annex, Ala., and are now being used as research material for the NCO Academy.

James E. Maxson
Smithville, Mo.

Is it Me?

In "Dawn at Kill Devil Hill" *(December 2003, p. 22),* the Flyer weighs 630 pounds without pilot, 700 pounds with pilot. In pictures, the Wrights do look tall, slender, and a bit undernourished by today's standards, but 70 pounds? Is there something wrong with my math? Great article, though.

G. Laguens
Sacramento, Calif.

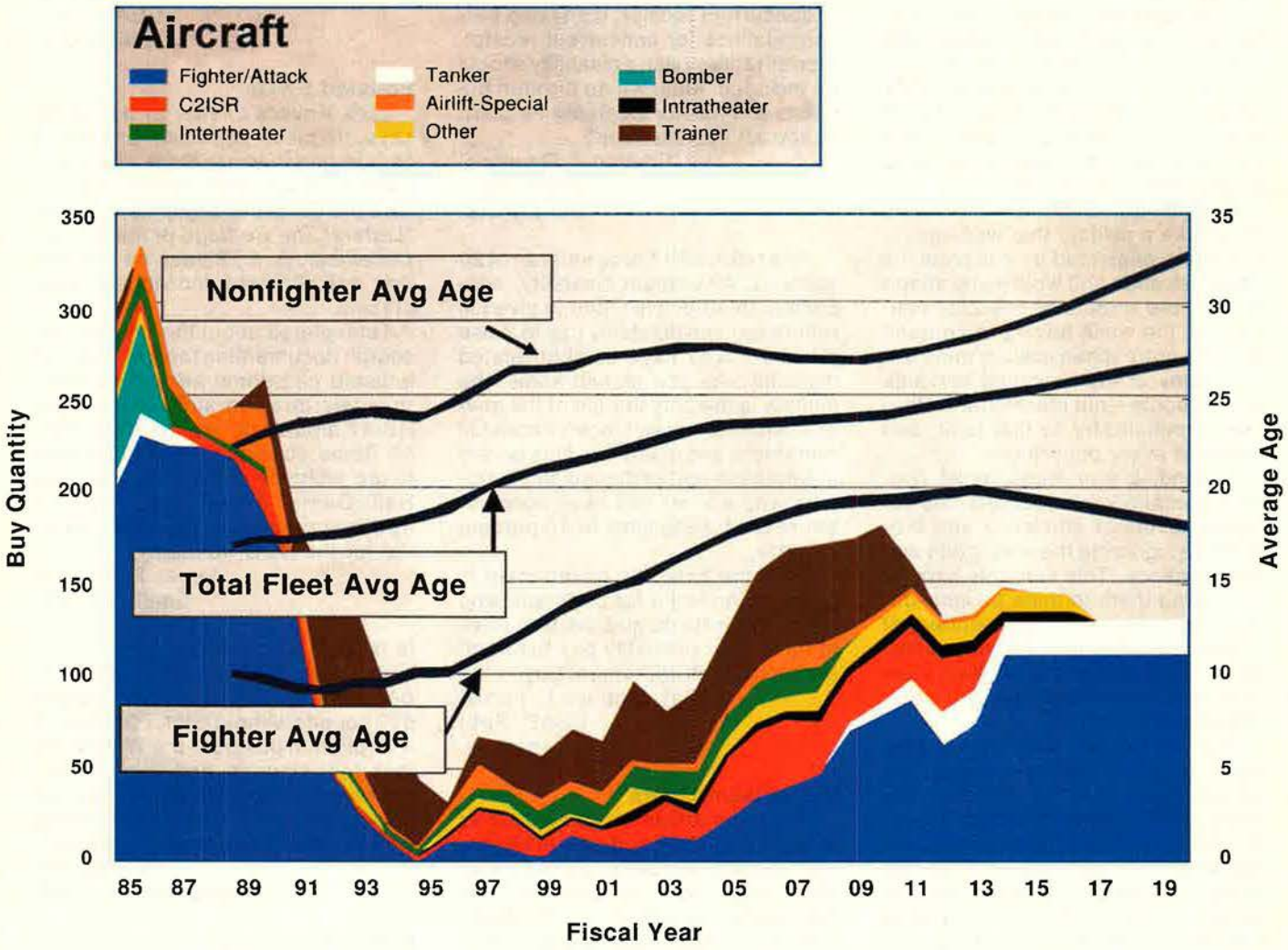
■ *Nothing is wrong with your math—we goofed. According to various sources, the Flyer, without pilot, weighed 605 pounds and, with pilot, 750 pounds—which may still beg the question.*—THE EDITORS

The Chart Page

By Tamar A. Mehuron, Associate Editor

The Graybeard Fleet

The average age of all aircraft in the Air Force fleet will exceed 25 years by 2013. The service's tankers—average age of 40 years—and fighters—average age of 20 years by 2013 or earlier—are key factors in the problem. Over the years, new aircraft purchases have not been sufficient to keep fleet age at a steady state. Planned acquisition of new 767 tankers (see "Tanker Twilight Zone," p. 46) and new fighters—F/A-22 Raptors and F-35 Joint Strike Fighters—won't be enough to bring down total fleet age, according to USAF projections.



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Washington Watch

By John A. Tirpak, Executive Editor

Plan B for F/A-22; Mother of all Concepts; Britain Overhauls Defense; Aerospace Prescription ....

For F/A-22, On to Plan B

The Air Force and DOD are again trying to decide how USAF can obtain a sufficient number of F/A-22 Raptors, the service's top procurement priority. Recent Congressional action has thwarted a plan to increase the size of the Raptor purchase and sent the Air Force and the Pentagon back to the budgetary drawing board.

Congress cut $161 million from the program as a result of "cost savings," according to a Senate Armed Services Committee summary of the final 2004 Defense Authorization Bill. In other words, the service didn't need all the money it asked for to buy 20 F/A-22s.

In practical terms, however, this meant USAF would be able to buy two fewer Raptors.

Last year, the Pentagon and the Air Force agreed that, given the costs projected at that time, the service would be able to buy 277 Raptors and still remain within a $43 billion cost cap imposed by Congress. However, since 277 is far short of the number of F/A-22s that the Air Force maintains it needs, service leaders exacted an important concession from DOD. If USAF could get the price down through more efficient production, it could use the savings to buy more of the airplanes.

The idea, which was christened "buy-to-budget" by Air Force Secretary James G. Roche, was endorsed by the Defense Department and seemed to have backing on Capitol Hill. The Air Force believed that, with production efficiencies, it could build a fleet of 339 Raptors without breaking the cost cap.

Taking the savings away from the program in the authorization bill, however, "effectively means that buy-to-budget is DOA [dead on arrival] on the Hill," a senior Air Force official said. "We will have to come up with something new, because ... if we're held to 277 airplanes ... that is clearly not even close to what we need."

The Pentagon agrees. Defense Department comptroller Dov S. Zakheim told reporters in December that buy-to-budget was an innovative approach to a thorny problem but that Congress might come around if the idea is presented differently.

"I don't think it was wishful thinking" to assume that Congress would go along with the scheme, Zakheim said. "From a managerial point of view, Roche made a lot of sense. ... Certainly, there was a lot of merit to what he proposed and what we supported." However, he admitted, "it is not the way Congress tends to look at programs, there's no question about it."

Zakheim suggested, though, that the idea might be tried again.

"There have been a lot of ideas that have been DOA on the Hill, and then, every once in a while, they turn up again," said Zakheim. As to whether buy to budget will be resubmitted, Zakheim hedged, "We're looking at a host of different things," but he suggested the answer would be found in the Fiscal 2005 budget, due out this month.

USAF photo by TSgt. Michael Ammons

Lawmakers to USAF: Deal? What deal?

Mother of All Concepts

Defense Secretary Donald H. Rumsfeld in December signed new guidance laying the groundwork for all transformation projects in the US military. Called simply "Joint Operations Concepts," it now stands as the overarching document that will guide everything from development of exercises to the purchase of equipment among all the services.

The guidance provides the framework for shifting from a scenario-based planning approach to the capabilities-based approach set forth in the 2001 Quadrennial Defense Review, stated Rumsfeld in the foreword of the new document.

"This approach focuses more on how the United States can defeat a broad array of capabilities that any adversary may employ rather than who the adversaries are and where they may threaten joint forces or US interest," Rumsfeld said. "The joint force will have attributes to make it fully integrated, expeditionary in nature, networked, decentralized, adaptable, able to achieve decision superiority, and lethal."

The Joint Operations Concept "will act as the genesis for new ideas and concepts," Rumsfeld said. It lays down guidance on "how the joint force will operate in a complex environment within the next 15 to 20 years." The concept document will be updated every two years.

The US will act pre-emptively "in self-defense against emerging threats before they can be applied against vital national interests," according to the concept document. The document restates the previously announced defense policy goals of assuring allies and dissuading, deterring, and defeating adversaries.

The concept paper reiterated that the US must achieve "full spectrum dominance"—the ability to control any situation or win any fight "across the full range of military operations." To do it, the US military must have "fused" intelligence at all levels to achieve "decision superiority"—the ability to make decisions and act faster than the adversary.

The military must embrace "a joint and expeditionary 'mind-set,' which reflects a greater level of deployability and versatility," according to the document. However, it must also be able to sustain operations "for a specified time without requiring an operational pause." To do that, integrated logistics systems will be pursued.

The military is to have standing or rotation-based forces on hand that can immediately deploy to any hot spot. These as well as fast-reaction forces launched from the continental United States, plus space-based assets, "provide the initial engagement capabilities and facilitate introduction of follow-on forces."

USAF photo by SSgt. Jeffrey A.Wolfe

Rumsfeld wants a more joint and expeditionary approach.

The Joint Operations Concept seeks to do away with set-piece military operations and emphasizes adaptability "in scope, scale, and method" to keep up with fluid situations.

The new military will apply "effects-based" thinking to its operations and will create new tools that will allow commanders to anticipate what effects—intended and unintended—may result from applying certain types of force. This "systems visualization" will provide a "shared understanding of causal relationships" and "essential political, military, economic, social, infrastructure, and information systems within an area of interest."

The new concept document went into effect with Rumsfeld's signature. It will be used to guide defense budgets from Fiscal 2005 onward.

Britain Overhauls Defense

"Effects-Based Operations," the conceptual framework pioneered by USAF to achieve combat goals more rapidly and logically has now also been adopted by British defense forces. In addition, interoperability with the US will be of prime importance in an overhauled British military.

EBO is "a new phrase, but it describes an approach to the use of force that is well-established—that military force exists to serve political or strategic ends," said Geoffrey W. Hoon, Britain's minister of defense, in the latest ministry white paper, released in December.

The white paper sets out the conceptual underpinnings of defense strategy and budgets for the UK. In many ways, it mirrors the realignment and transformation of the US military since the end of the Cold War.

"We have begun to develop our military capabilities so that we can provide as wide as possible a range of options to fulfill operational objectives without necessarily resorting to traditional attritional warfare," Hoon wrote.

The white paper outlines a planned large-scale shift in the shape, size, and focus of British forces, to adapt to a changed world in which there no longer is a "large-scale conventional threat" to the United Kingdom or NATO, calling it a "rebalancing" of British military capabilities.

The UK military will size itself to be able to handle three medium-size operations, one of which will be a peacekeeping mission, Hoon said. He added that the UK will have to focus more on special operations forces to combat terrorism and counter the spread of weapons of mass destruction.

Britain will no longer try to maintain a capability to fight large, nation-on-nation wars by itself. It will fight such a war only in partnership with the US, according to the white paper.

"The most demanding expeditionary operations, including intervention against state adversaries, can only be plausibly conducted if US forces are engaged, either leading a coalition or in NATO," it said. However, Hoon said the UK must provide enough value in these joint operations to enable Britain "to influence political and military decision-making." In other words, London wants to have military credibility and a say in the war and in its aftermath.

To meet new threats, Britain will reduce its numbers of heavy fighting forces, such as armored divisions, and increase its light divisions to emphasize speed, lethality, and mobility. Hoon said it would be "quite wrong to retain systems, within a finite budget, which we know are no longer effective."

The strategy echoes USAF's emphasis on gaining access where an adversary may try to deny it.

New threats "require a clear focus on projecting force, further afield and even more quickly than has previously been the case," Hoon wrote. "This places a premium on deployability and sustainability of our forces, sometimes in circumstances where access, basing, and overflight cannot be guaranteed."

There will be a new emphasis on "jointery"—joint forces and joint task forces drawn from all the UK military branches.

In aviation, Hoon reported that the Typhoon and Joint Strike Fighter will be so much more advanced than previous aircraft that Britain will be able to field fewer fighters without sacrificing any combat capability. Although the white paper continues to list a requirement for 232 Typhoons, the Royal Air Force announced last fall its intention to only buy 143 airplanes. The white paper maintains a requirement for 150 Joint Strike Fighters, which are being developed in conjunction with the US.

RAF Typhoon figures heavily in Britain's new concept.

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In deciding where it will commit its forces, Hoon said, "We will, as a force, focus on those areas where we have strong historical ties and responsibilities."

The Prescription for Aerospace

President Bush and Congress have the prescription in hand for reinvigorating the American aerospace industry, but, according to a blue-ribbon panel, they aren't following doctor's orders closely enough.

Reflecting, in December, on the progress made since the Commission on the Future of the United States Aerospace Industry released its final report one year before, commission members said some of their recommendations have been taken to heart and are helping, but others are being ignored at the nation's peril.

In its 2002 report, the commission recommended:

- Creating a national aerospace policy.
- Making a government commitment to ensure US primacy in aerospace technology and industrial capacity.
- Transforming the US air transport system.
- Setting new goals for space exploration.
- Creating executive and legislative coordination offices for aerospace.
- Overhauling US export control laws.
- Reforming tax laws regarding investment in aerospace.
- Boosting, substantially, federal investment in basic aerospace technology research.
- Making a government commitment to combat the aging of the industry workforce by creating incentives for young people to seek aerospace careers at all levels.

Export controls have not been relaxed and continue to be a major drag on the industry, commissioners said. Items with potential dual use for civilian and military purposes are subject to an onerous and lengthy process of export approvals, whereas comparable items can be readily obtained from other countries with no delay. This puts American products at a disadvantage.

The commissioners reiterated their plea for an overhaul of the export control system—a step that requires coordinated effort by the executive and legislative branches.

John W. Douglass, commission member and president of the Aerospace Industries Association, described the export process as not only "byzantine" but way out of date with regard to the globalization of the industry.

The commissioners also repeated their call for the government to create a new aerospace agenda, setting goals in space exploration, air transport efficiency, air traffic management, and military aircraft performance and cost—and providing the funds to accomplish those goals.

In addition, the panelists said there's still no comprehensive plan to confront the "graying" of the aerospace industry, in which most of the workers are over 40. They want government to create educational incentives to pursue a career in aerospace. Besides grants and scholarships, they said, a focused government initiative in air and space will inspire a new generation of fliers, engineers, scientists, and aerospace workers.

On the upside, the panelists were heartened by the bill reauthorizing the Federal Aviation Administration. It includes language creating a joint planning office for the national air transport system. This office will bring together NASA, the FAA, and Defense Department officials to plan ways to keep the US aerospace industry competitive with that of other countries.

Panel chairman Robert S. Walker also praised NASA's effort to develop an Orbital Spaceplane to ferry space station crews back and forth from orbit and the Pentagon's effort to streamline the DOD acquisition system.

The Cost of Access to Space

The Defense Department wants to keep two launch vehicle contractors in business to compete for its medium and heavy space launch program, even though it will cost considerably more money than it would to sustain just one. Cost, according to DOD, is not the only or primary consideration. Top priority is ensured access to space.

In a program decision memorandum signed in early December, Deputy Defense Secretary Paul D. Wolfowitz, said the Air Force will try to keep both Boeing and Lockheed Martin as suppliers for the Evolved Expendable Launch Vehicle program.

DOD to maintain two EELV lines—Delta and Atlas.

Wolfowitz made the decision over the objection of the Pentagon's Program Analysis and Evaluation office. PA&E analysts said the limited number of launches anticipated for the next decade or so made it cheaper to downsize to just one launch provider. However, Pentagon officials said that Wolfowitz decided it was prudent to keep two suppliers in business to avoid being stuck with no access to space if the selected provider's family of rockets was grounded.

Peter B. Teets, Air Force undersecretary and DOD executive agent for space, told Congress in November that keeping two rocket builders in business would cost 20 to 50 percent more than keeping just one. He qualified that, though, by saying that space access is too important for the Pentagon to rely on a single contractor.

The cost of keeping two companies in the business is estimated at about $50 million a year.

The decision means that USAF must continue working with Boeing, which was censured by the Air Force last summer for ethics problems surrounding launch vehicle contract negotiations in 1998. At the start of this year, Boeing remained barred from competing for more space launch work. USAF penalized the company about $1 billion in launch services work and required it to show progress in improving the ethical behavior of its personnel. (See "Washington Watch: The Boeing Case," September 2003, p. 12.) ■


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Aerospace World

By Adam J. Hebert, Senior Editor

Lawmakers: Boost End Strength

Despite Pentagon resistance, lawmakers are beginning to clamor for the first true increase in military force structure since the Cold War drawdown of the early 1990s.

One bill, introduced Dec. 8 by Rep. Ellen O. Tauscher (D-Calif.), called for temporarily boosting the end strength of each of the armed services by about eight percent. This would result in nearly 30,000 additional personnel for the Air Force.

The bill, cosponsored by 25 other Democrats, would carry out the boosts through 2008. According to the bill's sponsors, the estimated five-year cost would be $1 billion.

Meanwhile, Sen. John F. Kerry (D-Mass.) called for adding 40,000 troops overall to help carry out expanded US missions worldwide. Kerry, who is seeking the Democratic nomination for President, said that a Kerry Administration would work to enlarge the military during its first 100 days in office.

USAF photo by SSgt. Suzanne M. Jenkins

Airmen in Southwest Asia remove the No. 4 engine of the C-5 Galaxy that on Jan. 8 was struck by a missile upon takeoff from Baghdad Airport. See "SAMs Hit Aircraft in Iraq," below.

Chiefs: No More End Strength

In contrast to the lawmakers noted above, the military service Chiefs are not pushing for end strength increases—at this time.

Three of the four service Chiefs of Staff stated at a December forum, sponsored by the Institute for Foreign Policy Analysis, that they did not need additional end strength to support ongoing operations.

Gen. John P. Jumper, Air Force Chief of Staff, although not present at that event, previously had said that he supports Defense Secretary Donald H. Rumsfeld's effort to find efficiencies in-house before seeking additional uniformed personnel.

At the forum, Chief of Naval Operations Adm. Vern Clark said that he is "working hard" to make the Navy less manpower-intensive and that technological advances will allow future ships to have smaller crews. "I am actively pursuing less end strength," the CNO asserted.

Army Gen. Peter J. Schoomaker said, "There is no commander in Iraq or Afghanistan who is asking for more people." He added that he would not rule out seeking more soldiers in the future, but, for the time being, the Army is "making quite a bit of headway" in recasting its force to meet future demands.

The problem with increased force structure is that the services become stuck with it for better or worse, Schoomaker said, adding, "The big challenge, resource wise, is paying for more people."

Marine Corps Gen. Michael W. Hagee said that if current requirements are a "spike" and not a permanent change in worldwide demands, then "no, we do not need an increase in end strength."

SAMs Hit Aircraft in Iraq

In the past two months, surface-to-air missiles apparently hit two USAF aircraft—a C-17 on Dec. 10 and a C-5 on Jan. 8—as they took off from Baghdad Airport in Iraq. Both aircraft made emergency landings and no one on board was injured.

Sixteen persons, including five crew members, were aboard the C-17, and 63 persons, including 11 aircrew, were on the C-5.

The C-17's No. 2 engine was hit and exploded shortly after takeoff. An Air Mobility Command investigation team has not concluded its probe, but it's possible that the transport was hit by a SAM. The aircraft commander, Capt. Paul Sonstein, with the 62nd Airlift Wing, McChord AFB, Wash., said he knew they were hit by something big.

"The impact just shuddered the plane," he said. "I thought we were hit by something; I didn't know what, but I knew something got us."

The experience was much the same for the C-5 crew. The huge airlifter had barely left the runway when its No. 4 engine exploded. The C-5 belongs to the 60th Air Mobility Wing, Travis AFB, Calif.

Air Force officials said that initial reports on the C-5 emergency definitely pointed to "hostile action from the ground."

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USAF photo by A1C Vanessa LaBoy

USAF repainted this F-117 stealth fighter, changing it from its usual all-black to the light gray scheme used for other fighters. USAF wanted to test its ability to perform missions around the clock. (See "F-117s To Get a Day Job?" below.)

prehensive study of airlift and mobility needs—Mobility Requirements Study 2005, which was completed in January 2001—has long been obsolete, according to Gen. John W. Handy, commander of US Transportation Command and Air Mobility Command.

Handy told reporters at the Defense Logistics Conference in December that MRS-05 "was a good study for its time" but that it predated the 9/11 terrorist attacks and subsequent operations in Afghanistan and Iraq. The Defense Department's next mobility study, Handy said, should be more "scenario driven," and it is almost a given that the next study will call for more airlift capability.

MRS-05 called for a force of at least 222 C-17s, and, since then, "the world has changed, and [the real requirement] is probably something well above that, but I don't know what it is," Handy said. At present, the Air Force has approval to buy only 180 C-17s.

F-117s To Get a Day Job?

The Air Force is studying whether the F-117 stealth fighter is suitable for daylight operations. The service has repainted one of its all-black F-117 Nighthawks in the flat gray paint scheme, common to other fighters, to conduct tests that will determine whether the F-117 can be part of a "24-hour stealth presence over future battlefields," said Lt. Col. Buck Rogers.

Rogers said the project is an initiative of Gen. John P. Jumper, the Air Force Chief of Staff. Rogers is the operations officer of the Holloman AFB, N.M., detachment conducting the test—Det. 1 of the 53rd Test and Evaluation Group.

The gray F-117 will fly with the service's new stealthy fighter—the F/A-22—in several tests at Holloman and other locations, officials said.

USAF Forms Active C-130J Unit

The Air Force on Dec. 5 reactivated the 48th Airlift Squadron at Little Rock AFB, Ark., as the service's first active duty C-130J squadron. The unit's first C-130J is in final production and will be delivered in early 2004.

An initial cadre of 14 pilots and 10 loadmasters worked with the Air Force Reserve Command C-130J team at Keesler AFB, Miss., to prepare for the new squadron's establishment.

The entire initial group of 24 C-

USAF Identifies Operational Capability Shortfalls

A two-year review of Air Force capabilities and requirements has led to a prioritized list of 50 "critical operational shortfalls," USAF announced Dec. 17.

The list is the result of one of the service's capability review and risk assessments, which are designed to weigh warfighting requirements based on desired effects. Service officials said the list will help guide Air Force spending and modernization plans.

The corporate list of 50 "prioritized capability areas" represents the "most significant and immediate Air Force-wide capability objectives," said Brig. Gen. Stephen M. Goldfein, USAF director of operational capability requirements.

The Air Force released a list of six of the CRRA-identified shortfalls. They are:

- Global information grid—need an "interconnected capability that collects, processes, stores, disseminates, and manages information on demand."
- Battlespace management—must "implement effects-based planning and provide a common operational picture."
- Fleeting and mobile targets—must "reduce the time needed to find, track, and target hostile forces."
- Battle damage assessment—need a "toolkit and clarified definitions for commanders to determine effects-based decisions across the battlespace."
- Base defense—must "clarify roles and responsibilities between the Air Force and sister services."
- Cargo airlift—need a "study to review requirements and prepare for possible force-structure changes."

In implementing the CRRA process, USAF leaders departed from the previous system of quarterly acquisition program reviews. Those quarterly reviews frequently looked at weapons systems in isolation, while the new process, said Goldfein, is a "change from a threat-based, system-by-system requirements process toward an analysis methodology focusing on capability."

130J personnel became qualified on Dec. 4.

Gunship Crew Wins Mackay

A 16th Special Operations Squadron AC-130H Spectre crew, Hurlburt Field, Fla., has been awarded the Mackay Trophy for the Air Force's most meritorious flight of the year for 2002.

The gunship's 14 airmen helped save the lives of 82 soldiers and the crews of two HH-60 Pave Hawk helicopters on March 2, 2002, during the second day of Operation Anaconda in Afghanistan.

During Anaconda, enemy forces surrounded US Army soldiers and opened a fierce battle. The "Grim 31" AC-130H crew was tapped to provide close air support as two USAF helicopters began medical evacuations. Working with an Air Force enlisted tactical air controller on the ground, the gunship blasted enemy forces to clear the way for the helicopters.

The Spectre's 40 mm gun malfunctioned three times, but the lead gunner said that the crew switched over to the 105 mm "like clockwork." He added, "We just bounced back and forth between the two guns as our [controller] needed them."

US Seeks New Incirlik Agreement

The Administration would like to see long-standing arrangements for US military use of Incirlik AB, Turkey, continue, now that Operation Northern Watch has ended, a senior State Department official said in December.

"What we'd like to see, in the future, is for those arrangements to continue," said Marc Grossman, undersecretary of state for political affairs. "We think those arrangements are good for Turkey and are good for the United States." Grossman was in Ankara to discuss proposed changes in the US global force posture.

Incirlik was critical for Northern Watch operations patrolling the northern no-fly zone over Iraq, but Ankara refused to permit the US to use the base for combat operations during Operation Iraqi Freedom.

According to news reports in mid-January, Turkey approved use of Incirlik for the rotation of US troops in and out of Iraq.

Langley Stands Up Intel Wing

The Air Force officially established on Dec. 1, 2003, the newest wing for 8th Air Force when it activated the 480th Intelligence Wing at Langley AFB, Va.

F/A-22 Steering Group Tackling Long-Range Issues

The panel of Air Force lieutenant generals charged with overseeing the F/A-22's transition to an operational system is working in virtually new territory. It has been more than 20 years since the service introduced a new fighter—the F-117 in 1983. USAF expects to achieve initial operational capability with the Raptor by the end of 2005.

"We haven't done this in a while," said Lt. Gen. Bruce A. Wright, the head of the steering group, in an interview. Wright is also vice commander of Air Combat Command.

Wright said that a primary objective of the General Officer Steering Group is to ensure the F/A-22 remains on its current path—to deliver operationally credible and relevant combat capability. "There are lots of opinions on how this airplane will be used," he said.

The group will refine schedules and milestones to "meet the Chief's expectations" about IOC, Wright said. To ensure the fighter meets its IOC date, the commands involved must coordinate training, maintenance, and the availability of the aircraft—all elements must work to the schedule. Consequently, one of the group's first tasks was to bring together the development, maintenance, and operational communities.

According to the panel's charter, multicommand issues "become even more important" as the Raptor fleet expands in size and begins operations at more locations. Test and training F/A-22s are currently flying at Edwards AFB, Calif., Nellis AFB, Nev., and Tyndall AFB, Fla.

Another key priority is to ensure the long-term viability of the fighter by predicting what the system will need in terms of maintenance planning, support personnel, and future upgrades.

One such long-term sustainment issue is the development of technical orders. "This is the kind of thing that people forget," explained Wright, "but it takes a staff [across] major commands to get the tech orders right—so that we have the right guidance out there on the flight line."

Besides Wright, the steering group comprises the vice commanders of Air Education and Training Command, Air Force Materiel Command, Pacific Air Forces, and US Air Forces in Europe. It also includes the vice commander of AFMC's Aeronautical Systems Center. (See "Aerospace World: F/A-22 Gets Three-Star Oversight," January, p. 15.)

Recent GOSG discussions also have led to "a better picture about the threat environment that the F/A-22 is going to operate in, the double-digit SAM environment," said Wright.

Findings such as the updated threats are passed to a second group that, according to the GOSG's charter, is to focus on "the short-term success and day-to-day operations of the F/A-22 program." This second group includes the program executive officer for the F/A-22 and members of USAF's test community that are responsible for the Raptor's nascent operational testing program.

Saddam Capture Unfolded Swiftly

When an Iraqi tipster came into US custody Dec. 12, he set off a chain of events that led to the capture of Saddam Hussein the next day and three other former generals just a few days later.

On Dec. 13, Saddam was found hiding on a farm near Tikrit. The tipster had long been sought because of his close ties to the deposed dictator, officials said in December.

Documents found with Saddam enabled US forces to identify insurgent cells carrying out attacks on coalition forces and the financial network that supported them.

"What the capture of Saddam Hussein revealed is the structure that existed above the local cellular structure," said Army Brig. Gen. Martin E. Dempsey, commander of 1st Armored Division and leader of all US forces in Baghdad. He called it a "network."

Coalition troops moved quickly against six of the 14 cells believed to be operating within Baghdad, Dempsey told reporters at a mid-December press conference. By Dec. 16, three days after Saddam's capture, he said a series of raids had "chipped away at that network above [the cells] to the 60th percentile."

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The 480th's mission incorporates many different intelligence missions, according to its commander, Col. Larry Grundhauser. The units now subordinate to the wing played a major role during Operations Enduring Freedom and Iraqi Freedom.

Among other functions, the new wing oversees a DOD Intelligence Information System Center and maintains an intelligence imagery library and an image base production entity that collects commercial satellite or airborne imagery. Additionally, the wing produces target materials for mission planning for some USAF weapons systems and produces threat recognition products.

"Whether it's creating target materials and geospatial information for global strike missions ... or critical exploitation and dissemination architecture, the 480th Intelligence Wing wields a potent mix for warfighters," said Grundhauser.

The new intel wing comprises some 2,000 airmen in three groups, which oversee eight active duty squadrons and four Air National Guard squadrons. These subordinate units are based at various locations around the country. The 480th also has one squadron—the 27th Intelligence Support Squadron—that reports directly to the wing.

F-16 Mx Requirements Reduced

The Air Force recently extended from 300 to 400 flight hours the interval

News Notes

By Tamar A. Mehuron, Associate Editor

■ Space operators at Vandenberg AFB, Calif., on Dec. 2 launched the final Atlas IIAS rocket, boosting a National Reconnaissance Office payload into orbit.

■ The headquarters for 8th Air Force, located at Barksdale AFB, La., reopened in December, nearly two years after the building was gutted by a lightning-based fire. Officials began moving back into offices in the renovated building Dec. 8. An official opening for the new accommodations is scheduled for this spring.

■ The Air Force in late November received the 100th F119 engine manufactured by Pratt & Whitney at its Middletown, Conn., facility for the service's new F/A-22 fighter. A company news release noted that the new engines "containing features never before seen in a fighter engine, are demonstrating unmatched reliability and durability—more in keeping with an engine that has been in production for decades."

■ The National Imagery and Mapping Agency on Nov. 24 officially became the National Geospatial-Intelligence Agency (NGA). Officials said that the new name emphasizes the agency's primary purpose of providing both imagery and geospatial intelligence for combat support and policy-makers.

■ US Joint Forces Command in mid-January conducted its first large-scale "horizontal" joint training exercise under its new Joint National Training Capability initiative. Called Western Range Complex JNTC Horizontal Training Event 04-1, the exercise was slated to aid joint operations by helping US forces of all services "train as they fight," said officials. It's the first in a series of four exercises that will lead to the initial operational capability of the JNTC by October.

■ NATO's chemical, biological, radiological, and nuclear defense battalion became operational Dec. 1, according to NATO officials. The unit, with up to 700 personnel, will conduct CBRN reconnaissance operations, identify CBRN substances, detect and monitor biological operations, provide assessments and advice to NATO commanders, and conduct decontamination procedures.

■ Australia will participate in the US missile defense system, the Australian foreign minister announced Dec. 4. Such involvement might involve cooperation on missile detection, acquisition of ground and sea-based sensors, and assistance on research and development.

■ Japan's Defense Ministry wants to produce jointly with the US crucial elements of next generation interceptor missiles that would form part of an eventual US missile defense system. Such production would require a review and possible revision of Japan's law prohibiting export of weapons or parts. Following the North Korean ballistic missile launch over

DOD photo

USAF's Massive Ordnance Air Blast bomb was successfully tested at Eglin AFB, Fla., Nov. 21. The GBU-43B, which was dropped from an MC-130E Combat Talon I for the test, weighs 21,700 pounds and is 30 feet long with a diameter of 40.5 inches. It carries 18,700 pounds of high explosives. The plume from its detonation on the Eglin test range rose "more than 10,000 feet over the Florida panhandle," said officials.

between routine "phase" maintenance periods for newer F-16 fighters, contractor Lockheed Martin announced in December. The change affects about 600 of USAF's F-16s.

According to the company, the change is expected "to cut the inspection workload nearly 20 percent [and] increases the number of aircraft available on the flight line for operational training or combat missions."

A company news release further noted that the change could result in a five percent drop in total base-level F-16 maintenance hours.

Japan in 1998, Japan has engaged in joint research with the US on a missile defense system.

- The Air Force's new metallic name tag on Jan. 1 began appearing on service dress uniforms and pullover sweaters around the world, as the service implemented its mandatory wear date for the new accoutrement.
- An Air Force investigation report, released on Dec. 4, concluded that equipment malfunction, combined with pilot error, led to the June 12, 2003, crash of an F-16 in Iraq. The pilot had been flying a close air support mission for five hours when the fighter's single engine failed from fuel starvation because the pilot did not follow checklist procedures. The pilot, assigned to the 421st Fighter Squadron, Hill AFB, Utah, failed to notice that the fuel was not flowing from the external tanks—the product of one of three possible mechanical failures. He ejected safely, but the aircraft was a total loss.
- The Air Force and Navy agreed late last year to merge two separate programs to acquire radio systems. They will now work on development of the Joint Tactical Radio System, a single family of radios designed to improve compatibility across all the services.
- In a reorganization in December, the Air Mobility Warfare Center at Ft. Dix, N.J., created two new centers of excellence and two new Air Force schools. The two new centers of excellence are Agile-Combat Support and Air Mobility. The two schools are the USAF Mobility Operations School and USAF Expeditionary Operations School. Officials said that growth in the center's mission drove the expansion.

ACC Seeks To Close the Requirements/Funding Gap

Air Combat Command officials want to reconcile a proposed "objective" Air Force for 20 years hence with likely budgets.

ACC is developing a Future Force Structure Flight Plan that will help it determine how best to bring in new forces—for example, the F/A-22 Raptor and F-35 Joint Strike Fighter—while it continues to use so-called legacy systems.

"How do we fight, win, and pay for the next war?" asked Col. Gary L. Crowder, in an interview. He is chief of strategy, concepts, and doctrine for ACC's planning directorate.

ACC has developed a "vision force" to show what a fully capable Air and Space Expeditionary Force might look like in 2025. It is now trying to find the ways to get the Air Force as close as possible to that "marker on the wall," Crowder said.

Crowder noted that USAF could conceivably trade force structure for new systems. However, force structure studies frequently become political lighting rods.

Crowder saw this dynamic in action twice in the last year. First, a study of A-10 upgrade programs was misint[illegible] a call for retiring the Warthog. (See "Washington W[illegible] Air Support Criticisms," August 2003, p. 7.) Second, a look at whether Total Force units could wring greater efficiency out of the F/A-22 and F-35 was mistakenly portrayed as an Air Force move to buy fewer of the aircraft. (See "Aerospace World: USAF Studies F/A-22, JSF Associate Units," December 2003, p. 19.)

Crowder said that the studies are designed to produce efficient planning, not force structure cuts; therefore it is important "not to take the takes" before the benefits of doing so are actually realized. He said that capability improvements can come from two directions—either by maximizing the benefits of new systems or cutting less efficient old ones. The latter move, of course, presupposes that any funds saved are actually reinvested in higher-payoff programs. That is not always the case.

He said that the first major results will probably be seen in the Air Force's 2006 budget request due out in about one year.

Eglin Embraces Greenway

Lawmakers have given the Pentagon slightly more leeway to protect precious military training ranges from encroachment, and Eglin AFB, Fla., is one of the first installations to benefit.

In an unusual partnership, Eglin, the state of Florida, and the Nature Conservancy produced the Northwest Florida Greenway agreement. It reserves the first 7,600 acres of a planned 750,000-acre corridor that would maintain existing open space in the state's panhandle. The corridor, which will stretch from Eglin's eastern border to the Apalachicola National Forest, is considered an environmental hot spot because of its large number of rare species.

Brig. Gen. Chris T. Anzalone, Eglin's Air Armament Center vice commander, called it a "win-win strategy," in that urbanization had threatened both the military training mission and the environment.

The Air Force said the greenway corridor is strategically important to five USAF and Navy installations and is one of the larger open-air military training areas in the country.

Sea-Based BMDS Test Successful

The Missile Defense Agency successfully tested its Aegis cruiser-based ballistic missile defense system (BMDS) over the Pacific Ocean in mid-December.

The test team launched an Aries short-range missile from Hawaii, and, about four minutes later, a Standard Missile-3, launched from USS *Lake Erie,* struck the Aries, destroying it with only the force of the collision.

Flight mission-6 (FM-6) produced the fourth successful intercept for the Aegis BMD and SM-3 system. FM-6 was part of a test series, dubbed Block 2004, that includes increasingly complex and operationally realistic tests, said officials. Last June, the FM-5 test failed to intercept its Aries target missile. There are three more tests slated for Block 2004.

President Bush ordered the Pentagon to field an initial missile defense capability by Oct. 1. (See "Year of the Missile Shield," January, p. 24.) Up to 20 sea-based interceptors—based on board three Aegis cruisers—will be part of the system beginning in 2005.

V-22 Reaches Milestone

The V-22 Osprey program late last

Senior Staff Changes

PROMOTION: To **Lieutenant General:** Charles L. **Johnson II.**

NOMINATION: To be **Lieutenant General:** Donald J. **Wetekam.**

CHANGES: Lt. Gen. (sel.) Thomas L. **Baptiste,** from Asst. C/S, Ops., SHAPE, NATO, Casteau, Belgium, to Dep. Chairman, NATO Mil. Committee, Brussels, Belgium ... Brig. Gen. (sel.) William A. **Chambers,** from Cmdr., 11th Wg., Bolling AFB, D.C., to Dep. Dir., Learning and Force Dev., DCS, Personnel, USAF, Pentagon ...Maj. Gen. Craig R. **Cooning,** from Vice Cmdr., SMC, AFSPC, Los Angeles AFB, Calif., to Dir., Space Acq., Under SECAF, Pentagon ... Brig. Gen. Jan D. **Eakle,** from Vice Cmdr., Ogden ALC, AFMC, Hill AFB, Utah, to Dep. Dir., Defense Finance and Accounting Service, USD (Comptroller), Arlington, Va. ... Maj. Gen. James A. **Hawkins,** from Vice Dir., Jt. Staff, Pentagon, to Vice Cmdr., 18th AF, AMC, Scott AFB, Ill. ... Brig. Gen. William L. **Holland,** from Cmdr., 51st FW, PACAF, Osan AB, South Korea, to Dir., Air & Space Expeditionary Force Matters, DCS, Air & Space Ops., Pentagon ... Brig. Gen. (sel.) Larry D. **James,** from Dep Dir., Ops., AFSPC, Peterson AFB, Colo., to Vice Cmdr., SMC, AFSPC, Los Angeles AFB, Calif. ... Brig. Gen. Richard E. **Perraut Jr.,** from Vice Cmdr., 15th AF, AMC, Travis AFB, Calif., to Cmdr., 15th Expeditionary Mobility Task Force, AMC, Travis AFB, Calif. ... Lt. Gen. Steven R. **Polk,** from Vice Cmdr., PACAF, Hickam AFB, Hawaii, to IG, OSAF, Pentagon ... Brig. Gen. Robertus C.N. **Remkes,** from Cmdr., 3rd Wg., PACAF, Elmendorf AFB, Alaska, to Cmdr., Air Force Recruiting Service, AETC, Randolph AFB, Tex. ... Lt. Gen. Victor E. **Renuart Jr.,** from Dir., Ops., CENTCOM, MacDill AFB, Fla., to Vice Cmdr., PACAF, Hickam AFB, Hawaii ... Brig. Gen. Frederick F. **Roggero,** from Dir., Marketing, OSAF (Public Affairs), Pentagon, to Dir., Public Affairs, OSAF, Pentagon ... Brig. Gen. (sel.) Michael A. **Snodgrass,** from Dep. Dir., Operational Rqmts., DCS, Air & Space Ops., USAF, Pentagon, to Cmdr., 3rd Wg., PACAF, Elmendorf AFB, Alaska ... Maj. Gen. Joseph B. **Sovey,** from Dir., Space Acq., Under SECAF, Pentagon, to Dir., Rqmts., AFMC, Wright–Patterson AFB, Ohio ... Brig. Gen. (sel.) Robert P. **Steel,** from Dir., Staff and Senior US Rep., Allied Air Forces North Europe, NATO, Ramstein AB, Germany, to Cmdr., USAFE, Theater Air & Space Ops. Ctr., Ramstein AB, Germany ... Maj. Gen. Joseph P. **Stein,** from Dir., Aerospace Ops., ACC, Langley AFB, Va., to DCS, Ops., SHAPE, NATO, Casteau, Belgium.

SENIOR EXECUTIVE SERVICE CHANGE: David J. **Carstairs,** to Dir., Defense Info. Infrastructure, ESC, AFMC, Hanscom AFB, Mass. ▪

year reached 1,000 mishap-free flying hours since the program returned to flight in May 2002. Before that, the program had been grounded for more than a year after two fatal crashes forced many V-22 specifications to be redesigned.

Osprey No. 24 hit the 1,000-hour mark during a flight over Nova Scotia, where icing tests are being conducted.

The Osprey is being developed primarily as a Marine Corps transport. The Air Force is pursuing the CV-22 configuration as an insertion vehicle for Air Force Special Operations Command commandos. The Air Force intends to buy 50 CV-22s.

MDA Lets Billion Dollar Contracts

The Missile Defense Agency on Dec. 3 awarded Northrop Grumman a major contract to develop and test a concept for the Kinetic Energy Interceptor. The goal of the KEI program is to produce a system to intercept and destroy ballistic missiles in their boost phase.

According to DOD, the contract is worth approximately $4.5 billion over eight years. It is MDA's "first capability-based development and test contract" featuring a design that is "no longer constrained by the Antiballistic Missile Treaty."

In a separate contract on Dec. 9, MDA selected Lockheed Martin to develop targets and countermeasures that represent the capabilities of ballistic missiles that might be used in an attack on the US. The initial contract is worth $210 million but could, over 10 years, go up to $4.6 billion. MDA will use the targets to test the performance of all elements of the ballistic missile defense system.

The Latest in Iraq

Massive Troop Rotation Planned

The Pentagon begins a large-scale swap out of the forces in Iraq early this year, a move that would send more than 100,000 fresh troops to relieve the 130,000 that are there now.

The rotation is expected to occur roughly through May. The scale of the effort worries some planners who are concerned that the transit of large numbers of soldiers through unfamiliar terrain may make them vulnerable to attack until they are settled in at more secure locations.

Pentagon officials have said they want to make this wholesale exchange of troops to keep units intact and not engage in piecemeal replacements of individuals, as happened in Vietnam. The rotation is designed to let the services bring home entire units that have spent a year deployed for Operation Iraqi Freedom.

Defense Secretary Donald H. Rumsfeld in December acknowledged that "turbulence is always undesirable." However, he said that the new units will be "better designed" for operations in Iraq, and it is "appropriate to be worried" about the changeover.

ETAC Coordinates Air Strike

An Air Force enlisted terminal attack controller (ETAC) working with Army ground forces on Dec. 27 directed USAF F-16s, as they dropped Joint Direct Attack Munitions on a house frequently used by Iraqi insurgents to launch strikes against coalition forces.

According to US Central Command, the house had been used at least six times to attack the coalition. There were "improvised explosive device-making materials in the house that were destroyed" in the air strike, said CENTCOM officials.

The F-16s and crews are deployed to Southwest Asia from the 510th Fighter Squadron, Aviano AB, Italy. The ETAC's name and unit were withheld.

Casualties

A total of 23 US service members were killed in Iraq during the first three weeks of December, according to Defense Department figures.

All told, 463 US troops died in Iraq between the beginning of Operation Iraqi Freedom on March 20, 2003, and Dec. 22. Among these fatalities, 317 Americans were killed in combat incidents, while 146 died in noncombat events, such as accidents.

Of the 463 deaths, 325 Americans died after May 1—the end of major combat operations. These included 202 combat deaths and 123 noncombat fatalities.

S. Korea To Search for Remains

South Korea plans to search for Korean War dead along the Demilitarized Zone border with North Korea, a move that could uncover the remains of US troops, *Pacific Stars and Stripes* reported in December. South Korean Lt. Col. Song Bong-jun, who works in that nation's remains recovery office, said it is possible that the bodies of deceased Americans will be found.

The remains of 89 Americans are believed to be located within the 2.5-mile wide DMZ that separates democratic South Korea from the communist North, according to the Defense Prisoner of War/Missing in Action Office. ■

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Action in Congress

By Tom Philpott, Contributing Editor

Gusher for Disabled Vets; Attacking the Housing Gap; New Fight Over Commissaries ....

Key Disabled-Vet Programs Begin

The tangible result of a recent legislative victory for seriously disabled military retirees this month begins to appear in hundreds of thousands of federal paychecks.

Two provisions of the 2004 Defense Authorization Act will add at least $2 billion a year to the combined incomes of 200,000 disabled retirees. They are limited Concurrent Receipt (CR), a program that defense officials call Concurrent Disability Pay (CDP), and expanded Combat-Related Special Compensation (CRSC).

Both took effect Jan. 1, but arranging payments, retroactive to that date, will take time.

CDP is now payable to retirees with disability ratings of 50 percent or higher. It will be phased in over 10 years, gradually ending the dollar-for-dollar offset in retired pay that occurs when retirees elect to draw tax-exempt VA disability compensation for service connected ailments.

Retirees need not apply for CDP payments. They will be automatic.

Expanded CRSC is a tax-exempt payment for retirees with 20 or more years of service who have disabilities from combat or from combat-related training.

When CRSC first took effect last June, it was limited to retirees with combat-related disabilities rated 60 percent or higher, or disabilities tied to the award of a Purple Heart. The new threshold will be any combat-related disabilities down to 10 percent. Roughly 100,000 additional retirees are expected to qualify and join with the 35,000 eligible under the first set of rules.

Retirees must apply for CRSC. Review and approval of new applications could take several months.

Shrinking BAH Gap

January brought a seven percent average increase in basic allowance for housing for 820,000 service members living off base in the United States, thanks to Congress following through on its promise to continue to narrow—and, by 2005, eliminate—a gap between BAH and local rental costs.

The 2004 BAH rate hikes continued a string of annual increases exceeding the rise in rental costs nationwide—2.9 percent this year—and therefore lower out-of-pocket costs for military renters. Military homeowners benefit identically from the BAH increases, but actual rates are based on local rents rather than, say, average home mortgages.

The new BAH levels cover, on average, all but 3.5 percent of off base rental costs. The next adjustment, in 2005, should close the gap entirely, a goal set by the Pentagon and Congress in the final years of the Clinton Administration.

In the late 1990s, service members were paying, out of pocket, an average of 22 percent of rental costs for housing deemed adequate for their pay grades.

In 2004, the service will spend $9.8 billion on Stateside housing allowances, an increase of $785 million over 2003. Once again, individual raises vary by pay grade, family status, and military housing area.

New BAH rates for all Stateside areas can be viewed online at: www.dtic.mil/perdiem/bahform.html.

Service Members Civil Relief Act

President Bush in late December signed legislation to ease financial and legal burdens on both active duty members and mobilized reservists serving away from home in the war on terrorism.

The Service Members Civil Relief Act, authored by Rep. Chris Smith (R-N.J.), the chairman of the House Veterans' Affairs Committee, modernizes the 1940 Soldiers and Sailors Civil Relief Act. It has dozens of new provisions to help meet or manage financial and legal obligations, from car lease agreements to civil law proceedings.

Smith noted that many Guard and Reserve members called to active duty for a year or more in Operation Iraqi Freedom face income losses and financial pressures that call for "special relief" from obligations and liabilities such as rents, mortgages, installment contracts, and leases. Here are some of the most important revisions:

- Eviction protection. Landlords previously could not evict a service member without a court order for nonpayment of monthly rent of $1,200 or less. Now, the figure is $2,400, and it will rise with inflation.
- Housing leases. Service members who receive permanent change of station orders, or who deploy to a new location for 90 days or more, may terminate a lease without penalty.
- Interest obligations. Creditors of a reservist must lower to six percent the interest rate charged on debts, including credit card debt, when the reservist is mobilized. The foregone amount can't be made payable when the reservist is deactivated.
- Life insurance. The law raises from $10,000 to $250,000 the maximum policy coverage that the government will provide to cover default for nonpayment while on active duty.
- Residence tax. While a member is on duty away from a permanent residence, a state cannot use income earned by that member to compute a spouse's tax rate.

Commissary Fight

Pentagon moves to cut spending on commissaries and to give a political appointee greater oversight of store policy drew a sharp rebuke from Congressional guardians of military grocery stores.

It appears that the Pentagon has begun "a process to fundamentally change, reduce, or eliminate the defense commissary system," charged Reps. John McHugh (R-N.Y.) and Vic Snyder (D-Ark.) in a late November protest letter to Secretary of Defense Donald H. Rumsfeld.

McHugh is chairman of the House armed services subcommittee on total force, and Snyder is the subcommittee's ranking Democrat.

The Congressmen said that DOD seems intent on cutting store operating costs without concern for the

impact those cuts may have on the quality of life of service members, retirees, and their families.

The lawmakers said they were angered by three recent internal DOD memos. In one, David S.C. Chu, undersecretary of defense for personnel and readiness, announced plans to install his principal deputy, Charles S. Abell, as chairman of the Commissary Operating Board, a position previously held only by a general officer. Another memo, signed by Abell last August, directed closure of 14 smaller commissaries, most of them overseas, and listed another 19 stores for possible closure. A third memo, signed in October by John M. Molino, Abell's deputy, announced that a defense contractor will conduct a study of "variable pricing" for commissaries, a study opposed by the Commissary Operating Board. All commissary items now sell at cost plus a five percent surcharge. Variable pricing is seen as a way to use pricing to make a profit and reduce the $1 billion-a-year commissary subsidy.

Congress doesn't want commissary funding cut, said McHugh and Snyder, warning Rumsfeld that DOD is "sending the wrong message" on its commitment to quality of life for service families "at the very moment when we can least afford to alienate the force."

Veterans Benefits Act ...

In December, Bush signed into law H.R. 2297, a catchall veterans bill that improves benefits for the disabled, surviving spouses, and their children. It has 39 substantive provisions that will cost taxpayers $1 billion over 10 years.

Among the bill's highlights is a provision that, some argue, takes a first step toward ending a "concurrent-receipt" prohibition for surviving spouses of military retirees. It restores dependency and indemnity compensation (DIC)—as well as home loan, education, and burial benefit eligibility—for widows of disabled veterans and military retirees who remarry after age 57.

When a veteran dies of a service-connected ailment, the survivor spouse can receive tax-free DIC. However, the spouse faces a dollar-for-dollar offset in benefits. Their Survivor Benefit Plan annuity is reduced by monthly DIC, even though SBP is not given away but bought with premiums paid by the retiree.

Under previous law, DIC always has been suspended if the surviving spouse remarries. SBP then can begin again. DIC can be restored, too, however, if the remarriage ends because of death, annulment, or divorce.

Effective Jan. 1, the law allows DIC to continue if a widow or widower remarries after age 57, and with no reduction in other federal benefits, including SBP.

... And More Key Provisions

H.R. 2297 also:

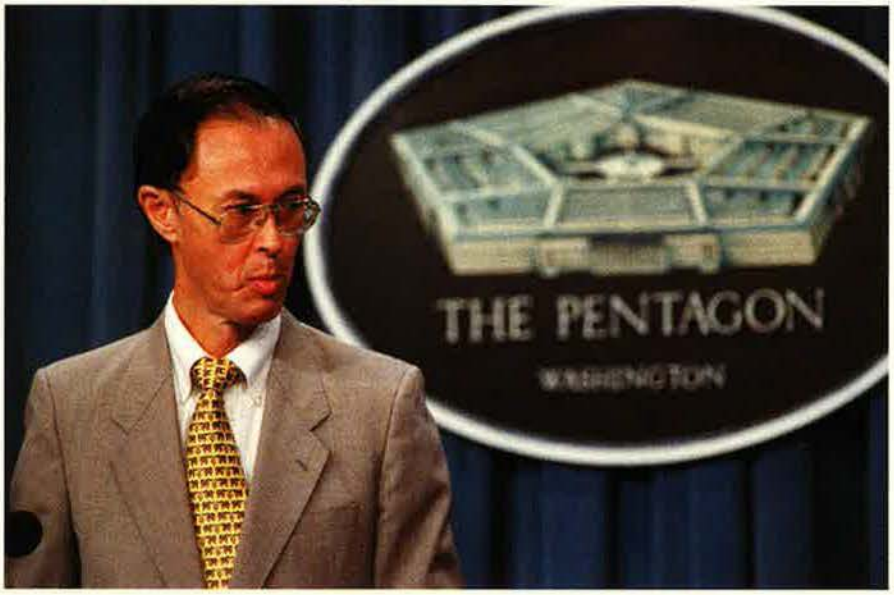
- Increases monthly educational benefits for spouses and dependent children of disabled veterans from $695 to $788 for full-time study, from $522 to $592 for three-quarter time study, and from $347 to $394 for half-time study.
- Allows a specially adapted housing grant for severely disabled service members who remain on active duty.
- Raises the specially adapted automobile grant from $9,000 to $11,000 and the specially adapted housing grants, for the most severely disabled veterans, from $48,000 to $50,000. For less severely disabled vets, the housing grant is raised by $750 to reach $10,000.
- Expands benefits eligibility to children with spina bifida who were born to certain Vietnam-era veterans who served in Korea near the demilitarized zone.
- Allows the surviving spouse or dependent children to receive the full amount of accrued benefits if the veteran dies while their claim is still pending.
- Expands the Montgomery GI Bill program to cover self-employment training programs of less than six months and entrepreneurship courses at approved institutions.

New Push for SBP Reform

Sen. Mary Landrieu (D-La.) and Rep. Jeff Miller (R-Fla.) are primary sponsors of Survivor Benefit Plan (SBP) reform legislation that The Military Coalition, an umbrella group of service organizations and veterans groups, will push in the new term of Congress.

S. 401 and H.R. 548 would phase out the sharp drop in SBP benefits that occurs when a survivor spouse turns 62 and becomes eligible for Social Security. Survivor annuities now drop to as low as 35 percent. The bills would raise the pre-62 annuity formula in phases so that, eventually, spouses receive 55 percent of the covered amount, from the time of the member's death through old age.

Proponents argue for the higher benefit because some retirees and their spouses were not briefed well on the drop in benefits at age 62 when they enrolled for SBP. Also, because retirees are living longer, the government's share of the cost of SBP has declined over the last 30 years, from 40 percent down to under 20 percent. Raising the subsidy again, proponents argue, would go a long way toward covering the cost of ending the drop in benefits at age 62. ■



DOD photo by R.D. Ward

David Chu and his staff raised lawmaker hackles over commissary issues.

Verbatim

By John T. Correll, Contributing Editor

Rumsfeld's Prediction

"I do see a day when this peninsula will be unified. I don't know when it will happen. I sure hope and pray it's in my lifetime."***—Secretary of Defense Donald H. Rumsfeld, "town hall" meeting with US troops, Osan AB, South Korea, Nov. 18.***

Minority Opinion

"This is a bad day for Iraq: He was a brave leader; he is a hero. Everything he did was good. He brought security and stability, while the Americans have done nothing for us. I don't even believe that he has been captured."***—Faraz Mahmoud, grocer in Saddam Hussein's power base of Tikrit, on news of Saddam's capture, London's* Times, *Dec. 15.***

Ask. Tell.

"A homosexual will be evaluated on his general suitability for armed service. If he is psychologically and physically healthy, he is suitable and will serve in the armed forces."***—General Major Valery Kulikov, a member of the Russian defense ministry health commission,* Moscow Times, *Nov. 28.***

No Moore Blessing ...

"Stop this God bless America stuff."***—Movie director Michael Moore, speaking in Berlin, NewsMax.com, Nov. 17.***

... Just More Moore

"Not only do I really like what Michael Moore is saying, but I can really imagine that Bush had something to do with the [Sept. 11] attacks."***—Wenzel Mielke, German teenager who has read four books by his "favorite author," Michael Moore,* Christian Science Monitor, *Dec. 10.***

War and Peace

"Despite the President's rhetoric, we are not a nation at war. There are no 'Rosie the Riveters' on production lines, replacing men sent off to war. There is no draft, no ration cards, or even victory gardens in our backyards. We remain a nation very much at peace."***—Harlan K. Ullman, leading advocate of "Shock and Awe,"* Washington Times, *Nov. 26.***

Weaseling Out

"We cannot afford to have a leader who weaseled out of going to Vietnam on a medical deferment for a bad back and wound up on the ski slopes of Aspen like Howard Dean."***—Former Sen. Max Cleland, who lost an arm and both legs in Vietnam, in anti-Dean statement released Nov. 23 by Sen. John F. Kerry's Presidential campaign.***

The War of Ideas

"Our inability to seize the initiative in the 'War of Ideas' with al Qaeda is perhaps our most significant shortcoming so far in the war against terrorism."***—Pentagon document, Sept. 17, awarding contract to SAIC to design an "effective strategic influence" campaign to combat global terror, quoted by the* New York Times, *Dec. 5.***

Two Hours to Strike

"The bottom line is, what we want to be able to do is have the capability to strike anywhere on the globe in less than two hours."***—Jan Walker, spokeswoman for the Defense Advanced Research Projects Agency, Associated Press, Dec. 8.***

Commerce Contradicts Rumsfeld

"There is no 'new' Europe or 'old' Europe; there is just Europe. ... There are lessons a lot of the rest of the world can learn in terms of what Europe is doing and what has been done over the past 50 years."***—Grant D. Aldonas, undersecretary of commerce for international trade, saying that Rumsfeld was "missing the point" with statements about "old Europe," United Press International, Nov. 25.***

Queen Bees

"In killing the terrorists, you will only kill the worker bees. The queen bees are the preachers, who teach a deviant form of Islam in schools and Islamic centers, who capture and twist the minds of the young."***—Lee Kuan Yew, senior minister and former prime minister of Singapore,* Newsweek, *Dec. 1.***

Airmen and Soldiers Together

"Long before we're soldiers or airmen, we were Americans. We tend to be able to come together and work things out in wartime. We just haven't done that on the front end."***—Maj. Gen. Ronald J. Bath, Air Force director of strategic planning, on the need to practice jointness in peacetime,* Air Force Times, *Dec. 8.***

Arriving Hungry

"I was just looking for a warm meal somewhere."***—President Bush, dropping in on the 1st Armored Division and the 82nd Airborne Division in Iraq on Thanksgiving Day,* New York Times, *Nov. 28.***

Taiwan Beware

"Taiwan independence means war. This is the word of 1.3 billion people, and we will keep our word."***—Maj. Gen. Peng Guangqian, Chinese Academy of Military Sciences strategist, interview by official New China News Agency, reported by the* New York Times, *Dec. 4.***

Victory Is Not Enough

"It's not enough to achieve victory—which we did; you've got to achieve a situation in which your adversary recognizes that he's been defeated and that violent resistance is futile—which we didn't."***—Ret. Army Gen. Barry R. McCaffrey,* Wall Street Journal, *Nov. 28.***

Jumper Stars on Stargate

"I can assure you, I'm not ready to give up my day job."***—Gen. John P. Jumper, Air Force Chief of Staff, on praise for his performance from producers of "Stargate SG-1," on which Jumper portrayed himself, defending Earth against aliens,* Colorado Springs Gazette, *Dec. 8.***

The Star Wars Speech

It was in this truly memorable speech that President Ronald Reagan declared, for the first time, his intent to build an anti-ballistic missile defense system—one he hoped would render nuclear weapons "impotent and obsolete." The televised announcement hit like 10,000 volts in Washington and Moscow, which had sworn off talk about missile defenses ever since the two superpowers signed the 1972 ABM Treaty.

It is interesting to note that 80 percent of the 4,500-word speech dealt not with missile defense but with the need to rearm against the Soviet threat. Reagan saved his blockbuster "vision" of a futuristic, high-tech missile defense for the very end.

Reagan's plan—officially, the "Strategic Defense Initiative"—was instantly dubbed the "Star Wars" program. Soviet President Yuri Andropov called it "insane." Critics warned it would upset deterrence. However, SDI survived, changing form, size, and name. On Oct. 1, the US will activate a limited missile defense system.

"Defense and National Security"

President Ronald Reagan
Address to the Nation
Washington, D.C.
March 23, 1983

Find the full text on the Air Force Association Web site
www.afa.org
Air Force Magazine
"The Keeper File"

I've become more and more deeply convinced that the human spirit must be capable of rising above dealing with other nations and human beings by threatening their existence. ...

If the Soviet Union will join with us in our effort to achieve major arms reduction, we will have succeeded in stabilizing the nuclear balance. Nevertheless, it will still be necessary to rely on the specter of retaliation—on mutual threat—and that's a sad commentary on the human condition. Wouldn't it be better to save lives than to avenge them? Are we not capable of demonstrating our peaceful intentions by applying all our abilities and our ingenuity to achieving a truly lasting stability? I think we are. Indeed, we must.

After careful consultation with my advisers, including the Joint Chiefs of Staff, I believe there is a way. Let me share with you a vision of the future which offers hope. It is that we embark on a program to counter the awesome Soviet missile threat with measures that are defensive. Let us turn to the very strengths in technology that spawned our great industrial base and that have given us the quality of life we enjoy today.

What if free people could live secure in the knowledge that their security did not rest upon the threat of instant US retaliation to deter a Soviet attack, that we could intercept and destroy strategic ballistic missiles before they reached our own soil or that of our allies?

I know this is a formidable technical task, one that may not be accomplished before the end of this century. Yet, current technology has attained a level of sophistication where it's reasonable for us to begin this effort. It will take years, probably decades of effort on many fronts. There will be failures and setbacks, just as there will be successes and breakthroughs. And as we proceed, we must remain constant in preserving the nuclear deterrent and maintaining a solid capability for flexible response. But isn't it worth every investment necessary to free the world from the threat of nuclear war? We know it is. ...

America does possess—now—the technologies to attain very significant improvements in the effectiveness of our conventional, nonnuclear forces. Proceeding boldly with these new technologies, we can significantly reduce any incentive that the Soviet Union may have to threaten attack against the United States or its allies. ...

I clearly recognize that defensive systems have limitations and raise certain problems and ambiguities. If paired with offensive systems, they can be viewed as fostering an aggressive policy, and no one wants that. But with these considerations firmly in mind, I call upon the scientific community in our country, those who gave us nuclear weapons, to turn their great talents now to the cause of mankind and world peace, to give us the means of rendering these nuclear weapons impotent and obsolete.

Tonight, consistent with our obligations of the ABM treaty and recognizing the need for closer consultation with our allies, I'm taking an important first step. I am directing a comprehensive and intensive effort to define a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles. This could pave the way for arms control measures to eliminate the weapons themselves. We seek neither military superiority nor political advantage. Our only purpose—one all people share—is to search for ways to reduce the danger of nuclear war.

My fellow Americans, tonight we're launching an effort which holds the promise of changing the course of human history. There will be risks, and results take time, but I believe we can do it. ■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At AFA's Los Angeles Symposium, senior Air Force leaders addressed the future course of military space.

New Orbit for Ame

Photo illustration by Erik Simonsen

rican Space Power

By **Robert S. Dudney** and **Peter Grier**

No one doubts that America's military space forces have awesome capabilities. They can spot a missile firing before the missile clears the launcher, beam an encyclopedia's worth of data around the world in an instant, and guide weapons through windows without hitting the sash. Air Force space forces have put together a streak, as of last November, of 32 straight successful launches of payload-carrying rockets.

Given these circumstances, it is easy to forget it took a defeat to propel the United States to superiority in space, notes Gen. John P. Jumper, the Air Force Chief of Staff.

On Oct. 4, 1957, the West heard the beeps and squeaks emanating from the Sputnik satellite, signifying the Soviet Union had won the race to space. "This nation was shocked," Jumper told an Air Force Association national symposium held Nov. 21 in Los Angeles. "We were behind"—and didn't like it.

The US, of course, was not behind for long. In the 1960s, the American space program caught up with and then surpassed its Soviet counterpart. The US military space program produced a dazzling

array of high-flying sensor, communication, and weather satellites, leaving its superpower rival in the dust. For most of the past 20 years, the US has stood virtually alone in space.

Now, however, the nation faces daunting new challenges, in the estimation of top military space officers and executives who spoke in Los Angeles.

They noted the growing need to deal with potential threats to US space assets; weaknesses that could undermine US space launch prowess; and organizational problems that thwart fullest exploitation of military space. Moreover, the Air Force has the need to develop new kinds of sensors as well as new kinds of space warriors.

In addition to Jumper, the speakers included Air Force Undersecretary Peter B. Teets, the Pentagon's executive agent for space; Gen. Lance W. Lord, commander of Air Force Space Command; Gen. Gregory S. Martin, commander of Air Force Materiel Command; and Lt. Gen. Brian A. Arnold, commander of Air Force Space Command's Space and Missile Systems Center.

Also taking part were George K. Muellner of Boeing, Carol A. Curry of Raytheon, Jeffrey D. Grant of Northrop Grumman, and G. Thomas Marsh of Lockheed Martin.

In Search of Space Control

There was universal agreement that space provides an asymmetric advantage for US forces, enabling them to perform combat feats that otherwise would be impossible. This has made space a US "center of gravity," too, raising concern that it could also become a focus of attack.

"Space ... is the center of gravity now," said Lord of Air Force Space Command. "We must not let it become a vulnerability. Our future adversaries understand that we have this advantage, and I think they are trying to develop capabilities right now to thwart that."

US officials have said over the years that such actions could include attacks on ground stations, use of "dazzling" lasers to blind US satellite sensors, computer network attacks, or even high-altitude bursts of nuclear weapons.

According to Lord, Space Command is working hard on space control—a euphemism for having the power to make unfettered use of space and, if necessary, deny use of it to others.

As a first step, the US is developing means for space surveillance and situational awareness in an effort to make sure that the US will understand what's going on in space and be ready should some future adversary try to attack or constrain American capabilities.

War in space is generally seen as something for the far future. As several speakers made clear, however, war in space, in a way, has already begun. They noted that, in Operation Iraqi Freedom, the forces of Saddam Hussein attempted—unsuccessfully—to jam signals from Global Positioning System satellites, upon which US forces depended for navigation and targeting.

In the view of Lord, it is not a matter of whether this struggle will escalate, only when. "We've got to have the ways to detect things like that and other attempts to attack our asymmetric advantage," said Lord.

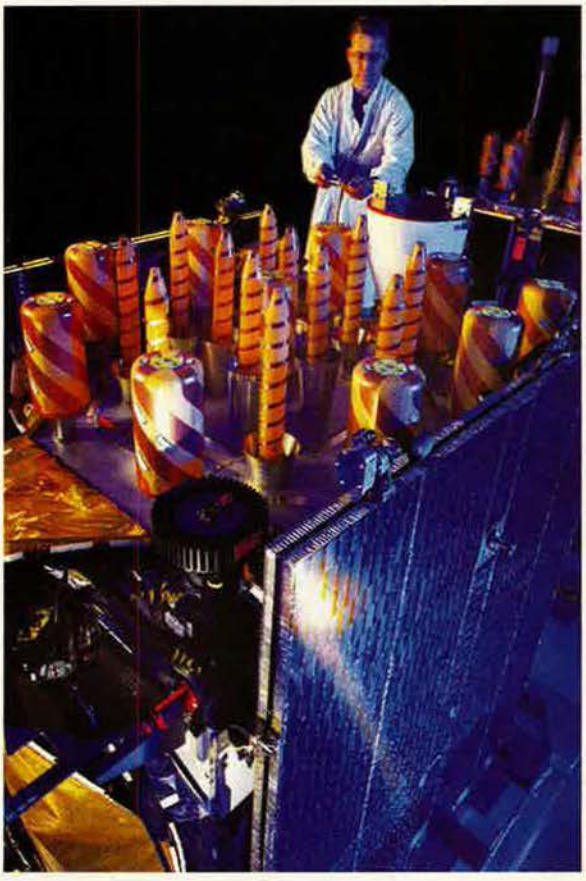
Teets also called attention to the problem. He noted that Air Force Space Command had organized a "Space Control Summit" and that "the time has come, no doubt, for us to move out in a very serious way" to deal with the danger.

Space Dominance

"[The challenge is] to field the world's greatest *space* force as well as *air* force," said Teets, "and make certain that we defend and protect it and maintain space dominance the way we've maintained air dominance now for so many years."

Lord pointed out that, since the collapse of the Soviet Union in the early 1990s, the US military has enjoyed a period of "unchallenged dominance" in military space. "Our jobs ... would be much easier if we could expect this trend to continue," said Lord, "but it won't. We must protect this [space] advantage."

US officials are casting a wary eye on China, which on Oct. 15 became only the third nation (after the United States and what was once the Soviet Union) to put a



Lockheed Martin photo by Russ Underwood

Even mature systems require constant attention and improvement. The GPS system, for example, continues to be upgraded and enhanced, as GPS location and timing information work their way into more and more military and civilian applications.

man in space. Moreover, recent government studies have reported evidence of an active Chinese space warfare effort.

According to Lord, the recent Chinese success "should give us cause to really be concerned" that China "will seek to work against or maybe thwart" America's asymmetric advantage.

"They are going to be a substantial competitor in there," said Lord. "So we had better get ready. They represent a potential threat for us, and we've got to get ahead of that."

Arnold, the head of Space and Missile Systems Center, summed up the new calculus: Space is an American center of gravity, and "enemies come after centers of gravity."

"We know what you can't do if you don't have air superiority," explained Lord. "Space is no different. Space superiority is also our mandate."

USAF photo by Carleton Baillie

The Titan IVB lifts a payload into orbit. This Sept. 9 launch put on station a classified National Reconnaissance Office satellite described as "probably the largest, heaviest, most energetic satellite our national program has ever launched."

Thin Launch Capabilities

As the symposium speakers told it, the task of assuring the nation's access to space shapes up as another major challenge.

The Air Force's space launch situation presents something of a paradox. The service's systems continue to succeed and expand the nation's overall military capabilities in space. At the same time, there are worries about systemic weaknesses that could undermine future space efforts.

As Teets put it, "I am sincerely concerned about the fragility of our ability to put these vitally important assets into space as we go downstream."

Space launch has come a long way over the past four decades. As Jumper pointed out, early launch operations suffered more than their share of failures and disasters. It was not until about 1968, he said, that the US reached an 85 percent launch reliability rate.

In the past two years, the Air Force has put 12 satellites into space, Teets told the AFA symposium. They include the final two Milstar satellites, which provide secure communications, and two more GPS IIR satellites. In September, a Titan IVB booster lifted a classified National Reconnaissance Office satellite into orbit. According to Teets, this spacecraft was "probably the largest, heaviest, most energetic satellite our national program has ever launched."

Moreover, the Air Force has recently demonstrated the new launch capabilities of the Delta and Atlas family of so-called Evolved Expendable Launch Vehicles, said Teets.

Despite this, Teets said he was worried about the nation's space launch future. Now, only three Titan IV boosters remain, and all are scheduled to lift extremely important payloads. Those last three Titan launchers will carry what Teets called "three of the most important satellites our nation has ever developed."

When those have left the pad, a family of launchers that has served the nation well for 40 years will be no more.

Arnold said, "We are in very delicate situations every time we launch. ... Every launch is a national treasure." He added that, while the Air Force has had 32 straight launch successes, "you are only as good as your last launch."

At times in the not-too-distant past, added Teets, problems cropped up because there has been too much emphasis on meeting cost and schedule demands and too little on ensuring quality. "A satellite that is launched on time on a rocket that ends up in the drink doesn't do any of us any favors," said Teets.

Moreover, according to Teets, the launch business has proved to be a difficult and volatile one for contractors. In the early 1990s, the commercial communications satellite market was strong and looked to stay that way for a long time. The bottom has fallen out of demand for commercial satellites, yet the EELVs were procured and the development program funded at a time when this private market was booming.

Beyond EELV

The confluence of economic factors makes it certain that the cost of launch will go up, said Teets.

Teets believes the military has no option but to make do with the interim fleets of EELVs until the Pentagon has the money and tech-

USAF photo by SSgt. Cherie A. Thurlby

The US space advantage plays out in many ways. Communications, surveillance, and information superiority—capabilities important to this mission support team in Baghdad—are all highly dependent upon the United States maintaining control of the "high ground" in space.

nology to produce something radically new and better.

"I am a strong believer that we need, as a country, to be investing in and finding a way to a next generation of launch capability," said Teets, "but I would simply say that it is going to be many years before that next generation ... comes along."

Teets added that, in pursuit of this goal, USAF must maintain close and active ties with NASA, which faces a crisis in access to space. The Air Force undersecretary said he'd had several meetings with Sean O'Keefe, NASA director, to explore ways to cooperate in meeting the common launch challenge.

Meanwhile, Jumper is anxious to see near-term improvements in other areas. One example: launch responsiveness.

"We talk about ... reliable space launch all the time," said Jumper. "Why don't we combine the terms of reliable space launch and rapid space launch? Why don't we aim that at the warfighter—integrate it with the national systems but have a capability to rapidly launch things into space, things like micro-sats, that can focus on an area for a short period of time, be a part of the network instantly, and be responsive" to troops on the ground?

Closing Gaps in Integration

In the early 1990s, USAF fought what was, by common agreement, the first true space war—Operation Desert Storm. On the day it was begun—Jan. 17, 1991—the US had 18 GPS satellites in space. It had enough communications bandwidth to deal with the data demands of the time. And national satellite capability was beginning to directly aid combat operators.

The big problem, according to Jumper, was the existence of "stovepipes" and "tribes." In Jumper's parlance, a stovepipe is an organizational structure in which information flows only vertically within an agency or unit. A tribe is a collection of individuals who show primary loyalty to their own organization, rather than to the larger mission of winning a war.

Jumper points out that GPS signals were available, but only five percent of the Air Force's aircraft were equipped to use it. There were no GPS-guided bombs. Moreover, different types of communications ground sets couldn't talk to each other. "We had four types of weather satellite receivers, again not compatible with one another," said Jumper. "We still had our intelligence process pretty much on strategic timelines, not often [helpful] to the tactical user."

Fast forward to the early 2000s. The entire Air Force, down to the lowest warfighter, had begun to learn that space is critical to everything the service does. The technologies used in Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom in Iraq took decades to emerge, but they are now all in service of the person on the front lines.

To help airmen make the necessary intellectual leap—bringing space into integration with other force elements—the Air Force is writing concepts of operations that describe how to fight, how to work with other services, and how to integrate manned and unmanned platforms and space capabilities.

These concepts of operations center on effects, not platforms. In Jumper's view, the fighter on the ground doesn't necessarily need help from any particular system. He needs there to be a particular explosion at a particular place at a particular time.

"We don't win wars in airplanes or in ships or in tanks by themselves or with a satellite by itself," said the Chief of Staff. "We win wars by our power to bring these things together. The magic and the miracle is in the integration—not in the platform. ... Why don't we put the emphasis on integration platforms, not by pedigree but by utility, so that satellites can talk seamlessly to other platforms on land, air, sea, manned or unmanned?"

New Tools

Horizontal integration is the key. According to Martin, commander of Air Force Materiel Command, data must flow into data banks on which many different users can draw. Intelligence analysts need to use and see the same data that warfighters are using, said Martin. It might also require new tools—

models based on knowledge of typical enemy activities.

All this would be designed to understand the nature of the enemy and the environment the enemy is operating in and likely movements. For example, a Scud missile on a road next to a cliff, with a lake on the other side, can only move in certain directions. The type of road will determine speed, as will current and recent weather conditions.

"You can find out whether you are going to find those guys in the mud or not, whether they are going to be able to move at 20 knots or five knots," said Martin.

The way information is displayed will also be important. Martin said AFMC is trying to produce battlespace awareness at a touch of a computer screen. Having to look at 21 screens won't do; warriors should be able to look in one place and get what they need.

The end result will be the ability to take action in time to get the job done.

"When it comes to that cursor on the target and taking action, if you think back to 1947, when we broke the sound barrier, what we are after in this business now is to break the time barrier," said Martin.

Teets believes that the Air Force is also making some progress in breaking down barriers the intelligence community has set up between itself and military operators. However, he added, "it is still more stovepiped than it should be. One of my real challenges ... is to build ways to get that intelligence information to warfighters in near real time."

New and Better Sensors

The Air Force is similarly engaged in a broad effort to make its space sensors more responsive and useful.

According to Martin, one of the most difficult tasks facing US aerospace scientists is finding a more effective method of locating concealed targets. "We are working on that with multi- and hyperspectral sensors," said Martin. "We're working on that with fusion devices. We are working on that with digital communications. But deep down inside, there are places people hide things and we can't find them."

Tracking mobile targets remains a tough task, as well. Such targets could potentially be of great significance—think of a Scud missile with a biological or chemical weapon warhead—and must be located quickly. Typically there is only a narrow window of opportunity between their appearance and use.

Sensor persistence is a concept that might help in both these cases, said Martin. The idea is to provide near-full-time coverage of an area of interest with a degree of precision and resolution that is of use to warfighters. However, he added, "sensor persistence" does not necessarily mean "stagnant system."

"You can have it with something that is there all the time, or you can have it with lots of things that are coming over the spot of the Earth you are interested in and communicating and coordinating with one another," said Martin.

The system will have to be responsive. It will have to get up on line quickly and provide enough information so decisions can be made. It will have to be predictive, in terms of identifying objects of interest, understanding what they are, and making a reasonable assumption about their future courses of action.

Integrated sensors will be one key to developing that capability. Ideally sensors could cue each other automatically—getting different looks from different angles, say.

"At that point, you get a triangulation and give yourself something of significance, and now you present a color on the screen of the object you are looking for that tells you something about it," said Martin.

Poster Child for Sensors

Martin added, "You have to have integrated sensors. ... Today, what we have is an amazing technical capability but stovepiped in systems that, if you get all 21 tubes in the room, and you can scan them fast, and you have a great brain, you can put together a coherent picture." Most of the time, that is not the case, though.

In the sensor world, the Air Force is putting emphasis on space-based radar. SBR, in fact, could become

USAF photo by Carleton Bailie

Space assets are in constant evolution. Here, a Delta IV booster lifts a new Defense Satellite Communications System III bird into orbit. The DSCS satellite is replacing an older one launched in 1995.

USAF photo by TSgt. Richard Froeland

Joint Direct Attack Munitions, such as these on a B-52, are perhaps the most blunt example of the advantage space power gives the warfighter. JDAMs use GPS signals to guide previously "dumb" bombs to their targets—with near-precision accuracy.

the poster child of horizontal integration development.

The Air Force is grinding away on a concept of operations for space radar, and officials say they will get it right, with major implications for combat operations. "The same radar wave front that is collected for intelligence information can be vitally important to the warfighter," said Teets.

In response to a questioner, Teets said the first launch of an SBR payload will come in 2012, with the full constellation going operational in 2016. The actual shape of the constellation is in some flux, however. Teets said it could comprise a mix of medium Earth orbit satellites with low Earth orbit satellites, or only LEO satellites.

"We are going to be evaluating that over the course of the next year, year-and-a-half," said Teets.

Developing Space Warriors

For all of the understandable emphasis on exotic hardware, America's space power also relies heavily on trained personnel. In recent months, the successes of Operation Iraqi Freedom were made possible by both satellites and forward-based space warriors, Lord told the AFA audience.

"We had 1,200 people from Air Force Space Command deployed," said Lord. "About 700 of them were deployed into Southwest Asia in support of operations, and many of them were working right there, shoulder to shoulder with their air colleagues, integrating air and space to achieve the combat effects."

Jumper told attendees that space warriors played a key role in the airdrop of the Army's 173rd Airborne Brigade into northern Iraq, one of the largest such operations in years.

"The mission was ... close to being scrapped because of weather," said Jumper. However, he said, an Air Force weather specialist, Capt. John Roberts, studied detailed data from weather satellites, saw that there was enough of a break in the weather to get this mission going, and argued that the mission should go on as planned. It did, with great success.

Jumper was asked whether Air Force space specialists could look forward some day to leadership positions in the Air Force.

"If you go around and you look at a combined air operations center in combat or any of the reachback centers around the world, what you see is a bunch of space warriors," said Jumper. "We've got space warriors integrated all over our Air Force now and we couldn't do without them."

Jumper went on, "The opportunities are here now. With our new program of force development, we are making sure that our space warriors get the opportunities they need to continue to progress in the warrior fields."

Lord said that Space Command has taken lessons from air and missile organizations and emphasized discipline and structured operations and sound technical data. Responsibility has been pushed deep down into the ranks.

"Military space today is an integrated team of officers, enlisted people, and professionals," said Lord.

Lord added that he feels the next big breakthrough in the space business will not be technical. It will be human.

"It is about how we unleash the rich human potential we have in this business, to do what the Chief asked us to do, which is to horizontally integrate air and space ... to build combat effects," said Lord.

In this respect, Lord added, "it is critical that we work ... [to] create a cadre of space warriors who are equally skilled in operational art and technical expertise.

Our military space operations must be powered by a team of professionals that understand the business. I think that is something our Chief has recognized, too, as he looks at building professionals from the ground up—across our Air Force, not only officers but enlisted and civilian professionals. It is an absolute imperative for us to develop our personnel." ■

Robert S. Dudney is editor in chief of Air Force *Magazine. Peter Grier, a Washington editor for the* Christian Science Monitor, *is a longtime defense correspondent and a contributing editor to* Air Force *Magazine. His most recent article, "The Viper Revolution," appeared in the January issue.*

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NORTHROP GRUMMAN

The USAF–Boeing tanker accord is a landmark deal, but it has now been thrust into uncharted territory.

Tanker Twilight

By John A. Tirpak, Executive Editor

THE Pentagon in December put the Air Force's tanker deal on hold in response to allegations that former Boeing and service officials had committed ethics violations. The agreement—a plan to lease 20 and buy 80 new Boeing KC-767 tankers to modernize USAF's aerial refueling fleet—marked the climax of more than two years of tough negotiations between the service and the contractor as well as scrutiny by the Administration and Congress.

Now, execution of the deal may be delayed until well into the spring, if not later. That could force both sides back to the bargaining table and conceivably result in a substantially higher price for the aircraft.

If current investigations support the allegations or uncover other breaches of law, the deal could be scrapped entirely.

Right now, only Boeing can provide an Air Force-compatible aerial refueling airplane. Were Boeing to be barred from any new arrangement, the Air Force would be compelled to explore a massive and costly service life extension program for its existing fleet of 126 aged KC-135Es, which suffer from serious corrosion and structural fatigue problems.

In the compromise tanker deal struck in November of last year, the Air Force would lease 20 KC-767 aircraft and purchase 80 more. The first four would be delivered in Fiscal 2006 and another 16 by the following year. All 100 would be in service by 2014, introduced at a rate of about a dozen a year. (See chart, "The 20/80 Deal," p. 49.)

"Our proposal strikes a necessary balance between the critical need for

Zone

The service wants 100 new KC-767 tankers such as this one being built for Italy. The Air Force's planned modernization of its tanker fleet was thrown into limbo, pending the outcome of various investigations.

AP photo / The Herald, Michael O'Leary

Staff photo by Guy Aceto

No one disputes that the KC-135E fleet is old. Sen. John Warner (R-Va.) has declared that tanker modernization must be carried out. He urged the Pentagon to work with Congress to resolve outstanding tanker issues.

new air refueling tankers and the constraints on our budget," Deputy Defense Secretary Paul D. Wolfowitz wrote to the chairmen of the House and Senate Armed Services Committees on Nov. 5, 2003.

The original plan, which called for a lease-to-own arrangement for all 100 aircraft, would have cost about $4 billion more than the 20/80 lease/buy plan. However, it will take three years longer to get the full complement of airplanes under the 20/80 plan.

The compromise was proposed by Sen. John Warner (R-Va.), chairman of the Senate Armed Services Committee. Warner was a key proponent who recognized the Air Force's need to acquire new tankers as quickly as possible, but he bowed to pressure to find a less costly route.

Under the original plan, the Pentagon pledged to go "beyond" 100 aircraft, but Wolfowitz said nothing in his letter about exceeding that figure.

The KC-767 tanker is a "quantum leap" beyond the KC-135E tanker, according to Boeing. Compared to the older aerial refueler, the new tanker will be able to:

- Off-load 20 percent more fuel.
- Lift off with a full load from four times as many runways.
- Provide greater capacities for cargo (19 pallets vs. six) and passengers (200 vs. 57).
- Refuel all US and allied aircraft types on one mission.
- Be air refueled itself.

Additionally, the KC-767 will have a state-of-the-art digital cockpit and enable the Air Force, in the future, to upgrade the aircraft to "smart" tanker capability. Even more importantly, the new tanker will spend 70 days in depot maintenance over a 10-year period, compared to 700 days for the KC-135E, according to Boeing.

The tanker deal went off the rails—at least temporarily—on Nov. 24, when Boeing fired two of its key leaders—Michael M. Sears, the company's chief financial officer, and Darleen A. Druyun, a vice president in the missile defense business. (See "Editorial: Tanker Turmoil," January, p. 2.) Druyun had been the Air Force's No. 2 acquisition official until she retired in late 2002.

In a statement, Boeing said the company sacked the two executives because Sears had approached Druyun about possible employment, though she was still working for the Air Force and before she had recused herself from official involvement with Boeing contracts. Boeing said that an internal investigation uncovered direct and indirect communications between Sears and Druyun and that the two had tried "to conceal their misconduct."

The company insisted that it received no special treatment from Druyun, who is described by some as an architect of the tanker deal. Druyun took the job with Boeing in January 2003.

Marvin R. Sambur, USAF's top acquisition official, said that Druyun left the Air Force long before the critical period of negotiations that produced the tanker deal. He added that the price of the aircraft continued to drop during negotiations in the year after her departure, which means she did not secure a windfall for Boeing, if that, indeed, was her goal.

Boeing also replaced its top executive, Philip M. Condit, on Dec. 1, 2003. Its new chief executive officer, Harry C. Stonecipher, said, "One of the first, foremost, and most immediate tasks I have" is "getting the tanker program going and reassuring the government that we are not only compliant but [also] an exemplary supplier to them."

The Boeing firings spawned separate investigations by Congress, the Justice Department, the Pentagon, and the Air Force. The Senate Armed Services Committe and Commerce, Science, and Transportation Committee plan to hold hearings on the issue this month.

At the heart of these probes lie the questions of whether Druyun improperly passed information to Boeing about a tanker offer from a rival manufacturer, European Aeronautic Defense and Space Co. (EADS), and whether Druyun somehow favored Boeing in the tanker deal in anticipation of working for the company.

Expanding Probes

Already, though, the problem has spread beyond the tanker deal.

At a Nov. 25 Pentagon press conference, Defense Secretary Donald H. Rumsfeld said that he had asked his aides whether the problem with the tanker deal might have broader implications for the Defense Department. "I said that I thought they ought to set about looking at it and asking those questions," said Rumsfeld, adding, "We're the custodian of the taxpayers' dollars. We have an obligation to see that things are done properly."

Air Force Secretary James G. Roche asked the Pentagon inspector general to look into other big-ticket contracts involving Druyun and Boeing, back to 2000. These programs include the F/A-22 fighter, the C-17 airlifter, an E-3C AWACS upgrade, and the Small Diameter Bomb. After it became known that Boeing was not the only company that consid-

ered hiring Druyun, the IG investigation widened further.

On Dec. 17, the Defense Criminal Investigative Service began an inquiry into all Druyun-related contracts valued $10 million or more in the two years before she left the Air Force. Such a list encompasses a wide variety of programs. A Pentagon official said that, even working diligently through the winter holidays, it could take "some months" for DCIS to sift through all those contracts.

Sen. John McCain (R-Ariz.), the chairman of the Commerce Committee and the tanker deal's chief Capitol Hill opponent, said he planned to investigate the large number of former senior Air Force and US government personnel who have found employment with Boeing.

At McCain's request, Boeing turned over thousands of internal e-mails pertaining to the tanker deal. McCain staffers released some of them, particularly those that seemed to suggest what McCain called an "incestuous relationship" between the company and USAF.

McCain last August turned over copies of those e-mails to the Pentagon inspector general. At that time, the IG launched an investigation focusing on the issue of whether Druyun had passed EADS proprietary information to Boeing.

Various news organizations picked up the e-mail trail. On Sept. 1, 2003, Boeing issued a response to one news report that claimed an e-mail revealed the company received proprietary data. Boeing said the information was taken out of context and simply referred to "a standard debriefing" following the Air Force decision to contract with Boeing, not EADS. According to Boeing, the e-mail shows that "an Air Force official was telling Boeing that, even though we had won the competition, our price would have to come down."

Still, lawmakers approved the tanker replacement plan in early November. They shied away from the Air Force's original request to lease all 100 tankers, but, on Nov. 5, they reached a compromise agreement with the Administration that produced the 20/80 lease/buy deal.

McCain, meanwhile, has held up the confirmation of Michael W. Wynne to be the Pentagon's new chief of acquisition, technology, and logistics. Wynne, in his Nov. 18 confirmation hearing, declined to promise that he would turn over all internal Defense Department documents relating to the tanker lease, as McCain demanded. Roche's nomination last July to be the new Secretary of the Army has been on hold, pending the outcome of a DOD IG investigation on the sexual assault problems at the Air Force Academy. (See "Upheaval at the Academy," January, p. 56.) The IG report was due in December. However, McCain is likely to block Roche's confirmation because of the tanker issue as well.

Pentagon officials later said they did not want to establish a precedent of giving a Senator access to internal communications, based simply on a request. "If he really wants them, he can subpoena them," a senior Pentagon official said.

While McCain continued his assault on the tanker deal, other lawmakers contended that the replacement plan must move forward. After the initial Boeing revelations, Senate Armed Services Committee Chairman Warner wrote to Rumsfeld, agreeing that the deal should get closer scrutiny but arguing that it shouldn't derail tanker modernization.

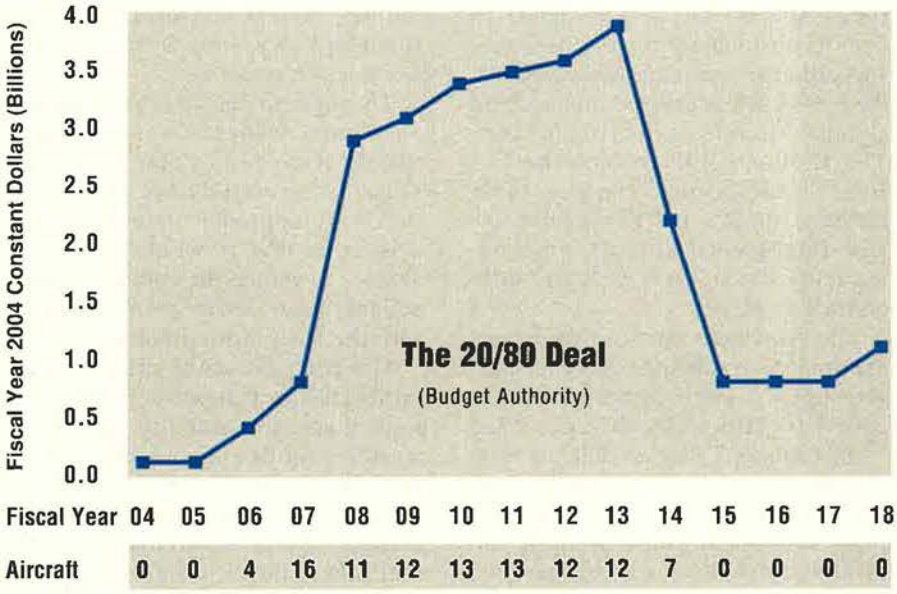
"Quite apart from the allegations surrounding the lease, additional tanker aircraft are needed for national security purposes," Warner wrote on Nov. 26. "For this reason, a full and cooperative effort between the legislative and executive branches is imperative to meet this requirement."

The "Pause"

Initially, Air Force officials wanted to press on with the tanker deal and award a contract early last December so that Boeing could start on the first 767 by midmonth. However, Air Force officials said, Pentagon leaders demanded some "breathing room" before the signing of a contract. Defense leadership advocated a Jan. 31 contract award, but even that date was dropped when Warner and McCain said that hearings on the tanker lease would start after Congress came back into session on Jan. 20.

Wolfowitz on Dec. 2 formally notified Congress that DOD had ordered a "pause" in the program.

Last fall, Boeing had announced that a lack of orders was forcing the company to shut down its 757 line and that the same fate awaited the 767 line if the Air Force tanker contract did not materialize before mid-December. Rather than close the 767 line, however, Boeing officials decided to fund the work internally. If the USAF deal evaporates, Boeing would try to sell the 767 tanker to another country. (Boeing already has a contract to provide four 767 tankers to the Italian Air Force. Under the July 2002 agree-



Under the 20/80 lease/buy plan, the Air Force would get 100 tankers by 2014. The new deal deepens a bow wave of procurement beginning late in this decade, when USAF is already buying F/A-22s, F-35s, the E-10A, and a major C-5 upgrade.

Boeing artist's concept

Shifting to the lease/buy tanker plan will force tough budget choices on the Air Force. No funds have yet been programmed for the tanker (shown here in an artist's rendering).

ment, the first one is due to be delivered in 2005.)

Boeing officials said that, should the tanker deal stay in limbo, they might still have to stop work and lay off more than 400 employees in the states of Washington and Kansas. Shutting down the 767 line would increase the cost of any subsequent order for tankers, since the line would have to be reopened and its workers retrained and recertified—an expensive process.

Line closure would be double trouble for the Air Force. In addition to counting on the 767 for tanker replacements, the service plans to base its next generation intelligence-surveillance-reconnaissance aircraft, the E-10A Multisensor Command and Control Aircraft, on the 767 airframe. The E-10A would replace the E-8 Joint STARS ground mapping radar airplane, the RC-135 Rivet Joint signals intelligence aircraft, and, potentially, the E-3 AWACS air battle control airplane.

The Air Force had already begun the process of retiring some of its 40-year-old KC-135E tankers in anticipation of getting new KC-767s. (See "100 Tankers," August 2003, p. 64.) By mid-December, the service had not decided whether it would alter those retirement plans, pending the results of the various investigations. Under terms of the 2004 defense authorization bill, the Air Force may withdraw no more than 12 KC-135Es from service over the next year.

Lawmakers also directed the Air Force to provide "an up-to-date, independent assessment of the material condition of the KC-135 aerial refueling fleet." They ordered the outside analysis because the corrosion problem was a major justification provided by the Air Force when it launched its tanker replacement proposal.

The Air Force's tanker plan has been controversial since its inception. Even so, the original lease-to-buy plan successfully ran a gauntlet of Capitol Hill committees, Office of Management and Budget, Pentagon program analysts, and other hurdles. Its last, and most important, roadblock was the Senate Armed Services Committee.

Throughout the two-year debate, Air Force leaders freely admitted that the lease-to-buy plan would cost more than an outright buy. What made the lease approach palatable, they said, was that it would allow the service to spread the cost more manageably and would get the tankers into the fleet more quickly.

McCain and other critics maintained that the lease deal would waste money and amounted to "corporate welfare" for Boeing, which had been hard hit by the downturn in airline business following the 9/11 terrorist attacks. McCain convinced Warner and others on the committee, notably ranking Democrat Carl Levin (D-Mich.), to modify the plan so that only 20 aircraft were to be leased and the remaining 80 purchased.

The original lease plan could be paid out of operation and maintenance funds over a longer period, but the 20/80 plan requires a substantial and unbudgeted up-front USAF investment—about $10 billion, according to the Air Force.

Robbing Peter

The Air Force will have to find about $2.4 billion from other programs to pay to lease the first 20 tankers and another $14.8 billion over the next decade to purchase the other 80.

"We are going to have to take it out of hide," said a senior Air Force official.

The tanker funding profile agreed to by the Defense Department and the Senate Armed Services Committee enlarges the "bow wave" of procurement bills the Air Force will have to pay in the years 2009-14. During that period, F/A-22 production will peak, and USAF will be buying early lots of the F-35 strike fighter. The service plans, in the period, to purchase E-10A aircraft and carry out a major upgrade to its C-5 airlifters. (See "Saving the Galaxy," January, p. 30.) In addition, Congress wants the Air Force to try to ready a new long-range strike capability for 2013.

While USAF would not state which programs might be reduced or sacrificed to pay for the tankers, some service officials did say, unofficially, that three programs—the C-5 upgrade, the E-10A, and the F-35—in particular were being scrutinized as potential sources of funds.

Scrapping the C-5 upgrade would provide about $8 billion—less than half the amount needed to pay for the 100 tankers. Not performing the upgrade could, in turn, require the Air Force to buy additional C-17 strategic transports. The E-10A is expected to reduce ISR operating costs by consolidating many missions onto a single platform and advance the state of the art in airborne battle management by improving coordination between various USAF sensor platforms. The F-35 is urgently needed to fill a shortage of fighters that already exists and that is expected to worsen in the next five years.

The up-front money needed to make the 20/80 deal work under the present law, said Sambur, is "money we simply do not have." ■

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Long before the actual land invasion, Iraqi forces were taking a ferocious beating from the air.

The "War" Before th

A YEAR ago, as Gulf War II was about to begin, another conflict in Iraq was already at its peak. US forces were engaged in a systematic but undeclared air campaign that set the stage for the coalition's rapid victory over Saddam Hussein's regime. And it, in turn, was aided by almost 12 years of combat air patrols in the Iraqi no-fly zones.

Unlike Operation Desert Storm in 1991, Operation Iraqi Freedom officially began (on March 20, 2003) with a ground campaign. Unofficially, a preparatory air campaign already had taken place. Since the end of the first Gulf War, the US and Britain had flown hundreds of thousands of combat and support sorties over Iraq in two no-fly zones that enforced UN resolutions. Air operations intensified greatly in the final months before the start of the ground war.

As Gen. T. Michael Moseley, the air boss for Iraqi Freedom and now the Air Force vice chief of staff, explained in a wartime press conference, "We've been involved in Operation Northern Watch for well over 4,000 days ... [and] Operation Southern Watch for well over 3,800 days. ... We've certainly had more preparation, pre-hostilities, than perhaps some people realize."

A few days later, Gen. John P. Jumper, USAF Chief of Staff, expanded on Moseley's comments. He said, "We started our work in the air

e War

By Suzann Chapman, Editor

component back in June of last year [2002], and, between June and March, we actually flew about 4,000 sorties against the integrated air defense system in Iraq and against surface-to-air missiles and their command and control."

Jumper added, "By the time we got to March, we think that they were pretty much out of business."

Ironically, this early preparation of the battlefield was aided immeasurably by the near constant Iraqi

Early Action. *Three operations—Northern Watch, Southern Watch, and the months-long, undeclared Southern Focus—helped produce a rapid coalition victory over Saddam Hussein's regime once the official war began. Here, an F-16CJ returns to Incirlik AB, Turkey, after an ONW mission.*

USAF photo by SSgt. Vincent A. Parker

USAF photo by SrA. James Harper

Tactical Change. *Under new rules of engagement, coalition aircraft such as this F-15E could respond to Iraqi attacks by striking command, control, and communications nodes as well as air defense radars and guns.*

attacks on US and British aircraft patrolling the no-fly zones. Since 1992, Iraqi military forces had fired anti-aircraft artillery or surface-to-air missiles during almost every coalition aircraft patrol. The aircrews returned fire—sometimes immediately, sometimes a few days later. Over the years, attacks outnumbered responses by a 10-to-one margin, according to Defense Secretary Donald H. Rumsfeld.

For most of the "pre-war" period, coalition aircrews routinely responded by targeting individual AAA or SAM sites. Occasionally, they would strike radar and communications facilities to weaken the Iraqi air defense capability overall. In summer 2002, however, air operations intensified dramatically.

The Tactics Change

Queried at a Sept. 16, 2002, press briefing about a perceived escalation in the number of coalition air strikes, Marine Gen. Peter Pace, the Joint Chiefs of Staff vice chairman, openly acknowledged that tactics had changed.

Pace explained that coalition forces had begun specifically targeting command and control and communications nodes. Pace said, "Instead of going at the specific radar that was involved, which can easily be moved between the time the missile was fired and the time we're able to counterstrike, they're picking on targets that are still part of that continuum of air defense but are not easily moved."

"I directed it [the change in tactics]," Rumsfeld said at the same briefing.

The new target set comprised all elements of the hostile Iraqi system, ranging from the AAA and SAMs themselves to support systems. The latter category included radars that helped gunners zero in on aircraft, communications links that connected those radars to the command and control nodes, and links between the command and control nodes.

Rumsfeld characterized earlier responses against the mobile gun batteries as "only marginally effective," given that Iraq continued to attack coalition aircraft. The benefit, he said, was not "worth putting pilots at risk," so flight operations were changed so that coalition aircraft would sortie in less risky areas.

However, said Rumsfeld, further consideration led Pentagon leaders and theater commanders to see that "there was a way to make the cost-benefit ratio make more sense." Coalition aircraft were sent back into the most risky areas but, explained Rumsfeld, with different orders. If attacked, they could strike more lucrative targets. Thus, said Rumsfeld, their responses "would give us a benefit that would merit the risks that were undertaken."

That was the thought process that led to a plan known as Operation Southern Focus. The air activity was designed to systematically degrade the Iraqi air defense system on a major scale.

Iraq had been attacking US and British aircraft since the coalition formed the two no-fly zones. Operation Southern Watch began on Aug. 26, 1992, and was designed to protect the Shiite population in southern Iraq from Saddam's repression. It was managed by US Central Command and covered territory from the 33rd parallel to the southern border of Iraq. (It had originally started at the 32nd parallel but was extended northward in 1996 in response to

USAF photo by SSgt. Jason Gamble

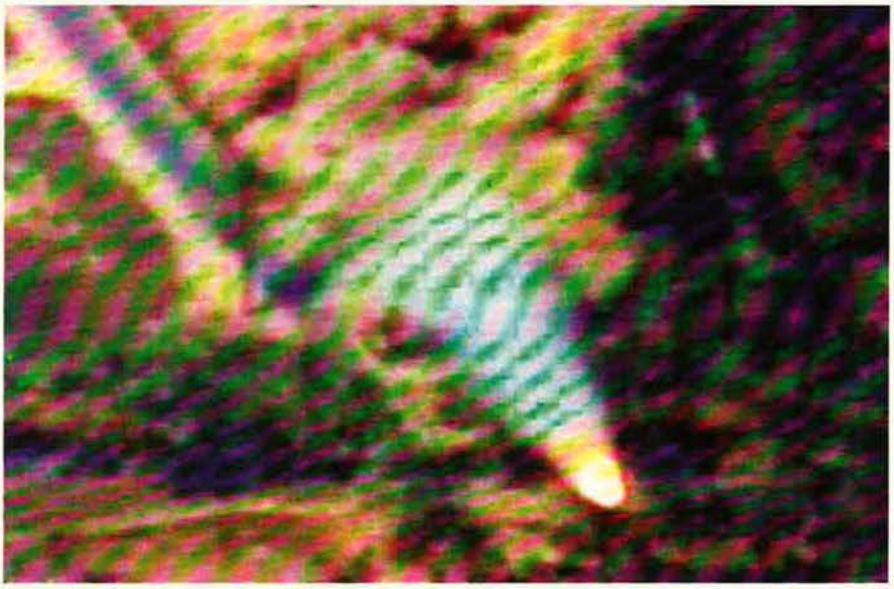
The Combat Watches. *Over nearly 12 years, coalition aircraft, such as this USAF F-16CJ, flew more than 300,000 sorties in the two no-fly zones. "Every mission was a combat sortie," said Maj. Gen. Robin Scott.*

continued Iraqi aggression). OSW covered 87,729 square miles and normally comprised more than 6,000 personnel and 150 aircraft, mostly in Saudi Arabia.

Operation Northern Watch, staged largely from Incirlik AB, Turkey, and run by US European Command, officially started on Jan. 1, 1997. However, it was actually much older. It was an outgrowth of the Operation Provide Comfort relief effort begun in 1991 when Saddam Hussein attacked Kurdish rebels in northern Iraq. ONW's normal complement was 1,400 personnel and 45 aircraft. It extended from the 36th parallel to the northern Iraq border and covered 16,871 square miles.

Together, the two no-fly zone operations sealed off the airspace over more than 62 percent of Iraqi territory. They were the focus of USAF's longest-ever steady state deployments.

DOD photos



***Bounty.** These two images show a truck-mounted SAM unit tracking a coalition aircraft and then launching its missile. Saddam Hussein offered a reward for bringing down a coalition aircraft. It never happened.*

Training a Generation

"Through the no-fly zones, we trained an entire generation of expeditionary warriors," remarked Maj. Gen. Robin E. Scott, who was co-commander for Northern Watch when the operation officially ended on May 1, 2003.

In 2002, an F-16 pilot was asked if he had ever flown an ONW patrol. "Are you kidding me?" he replied. "My whole career has been Operation Northern Watch and Southern Watch." According to EUCOM, the pilot had been deployed to ONW seven times and OSW three times. For many aircrews, maintainers, and support personnel, the story was much the same.

"Every mission was a combat sortie," said Scott. That "real combat flying," he explained, made the ONW and OSW operations "a step beyond Red Flag and the other Flag exercises." He added, "Squadrons deployed and joined a composite team, planned, patrolled, and responded when necessary to enemy threats."

US and British aircrews flew more than 300,000 sorties overall with no losses. The vast scale of the operations "was impressive" long before the start, in summer 2002, of the concerted effort to suppress the Iraqi air defense system, said Anthony H. Cordesman, a senior defense analyst with the Center for Strategic and International Studies, in his study, "The Lessons of the Iraq War."

For years, US aircrews had flown over Iraqi terrain. Seasoned maintenance and support troops became expert at expeditionary operations.

The operations also afforded coalition forces the opportunity to build a comprehensive portfolio of intelligence on threats, targets, terrain features, and enemy tactics. Central Command planners were able to identify and study the strengths and weaknesses of Saddam's regime. (See "The Iraqi File," July 2003, p. 51.) In mid-2002, CENTCOM opened a highly concentrated effort to compile imagery from satellites, U-2 spy aircraft, and other intelligence sources. The data permitted planners to produce a grid map covering every square foot of Iraq.

In November 2002, Rear Adm. David A. Gove, a JCS spokesman, noted that coalition pilots in the no-fly zones are "essentially flying combat missions. ... Any opportunity that they have to understand the capabilities and the layout of Iraqi air defense weapons systems is useful for their own experience base."

The Duels

In fact, the two no-fly zones were, from December 1998 onward, the

scenes of a long series of duels between US and British air forces and the Iraqi land-based air defenses, with occasional probes and challenges by Iraqi aircraft, said Cordesman. He continued: "The Iraqis lost all of these duels and suffered a steady attrition of their land-based defense capabilities. It must have also become apparent that the Iraqi Air Force could not successfully challenge US and British forces in air combat."

It must not have been apparent to Saddam Hussein, however. According to a January 1999 Iraqi news report, the dictator had offered a $14,000 bounty to any unit that succeeded in shooting down an allied airplane and an additional $2,800 reward to anyone who managed to capture a coalition pilot.

Saddam had ousted UN weapons inspectors in late 1998, and, in response, in mid-December 1998, President Clinton launched Operation Desert Fox, four days of air strikes that targeted suspected weapons of mass destruction sites, Republican Guard facilities, and air defense systems. After those strikes, the Iraqis became even more aggressive in their attacks on coalition aircraft.

Before Desert Fox, the coalition tended to confine its response to an Iraqi attack to the attack's immediate source. On Jan. 27, 1999, the Clinton Administration revised the rules of engagement (ROE), permitting US aircraft to target a wider range of Iraqi air defense systems and related installations. Pilots could not only defend themselves but also act to reduce the overall Iraqi air defense threat to coalition aircraft.

From 1999 onward, Iraq mounted more than 1,000 AAA attacks, launched 600 rockets, and fired some 60 SAMs. On Feb. 16, 2001, 24 US and British aircraft struck five Iraqi air defense command and control installations. The goal was to disrupt a fiber optic cable network that China was installing for the Iraqi military. On July 24, 2001, Iraqi forces fired a SAM at a U-2 spyplane, narrowly missing.

After the 9/11 terrorist attacks in the US, there was a brief lull in Iraq's provocations. It lasted just two months. Iraq subsequently resumed full-throttle attacks.

In 2001, Iraq showed "a considerably more aggressive stance in trying to bring down a coalition aircraft," said Rear Adm. Craig R. Quigley, a Pentagon spokesman. The motivation, said Quigley, was the reward that Saddam offered on several occasions. "He is trying his darnedest to bring down a coalition aircraft," said Quigley.

Quigley added that the volume of fire was up throughout Northern and Southern Watch, as compared to the same period in the preceding year.

USAF photo by SSgt. Pamela J. Farlin

Experience. *ONW and OSW provided experience for a generation of active and reserve air warriors, many of whom deployed numerous times. ANG MSgt. Walter Zaptin directs a KC-135 at Moron AB, Spain, for an ONW mission.*

USAF photo by TSgt. Jack Braden

Building a Portfolio. *In summer 2002, Air Force ISR assets, such as this U-2 flown by Maj. Jonathon Guertin, stepped up their efforts tc develop a comprehensive catalog of threats, targets, terrain features, and enemy tactics.*

In the first nine months of 2002, Iraq fired upon OSW aircraft 206 times and ONW aircraft 200 times. The coalition responses to those 406 attacks numbered about 60. As the Iraqi attacks continued—according to CENTCOM, they totaled nearly 500 for all of 2002—the number of coalition responses rose to about 90 for the year.

Air Force Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, reminded reporters at a Sept. 30, 2002, briefing that the Iraqi attacks were not limited to AAA and SAMs. Iraqi military aircraft, he said, were also "violating the no-fly zone airspace." Iraqi fighter aircraft flew into no-fly zone airspace about seven times between Jan. 1 and Sept. 20,

said Myers. On Sept. 24, three Iraqi MiG-25s violated Operation Southern Watch airspace, flying deep into the no-fly zone area.

The Iraqi attacks continued unabated even after Saddam sent a letter to the United Nations inviting the weapons inspectors to return. Gove noted in an Oct. 11, 2002, briefing that Iraqi firings on coalition aircraft has risen to 122 since Sept. 16, when Saddam sent the letter to the UN. Of those 122 firings, 33 were against aircraft flying in Operation Northern Watch and 89 were against aircraft carrying out Operation Southern Watch.

Given the Opportunity

Meanwhile, Operation Southern Focus had begun in earnest. The coalition took every opportunity to respond to an Iraqi attack with strikes that would degrade Iraq's air defenses. When Saddam moved some surface-to-surface missile batteries to the Kuwait border in early 2003, those were deemed to be covered by the Southern Focus ROE, as well.

Retired Air Force Col. John A. Warden III, a Gulf War I planner, told the *Washington Post* in January 2003, "Anything that would need to be knocked out that is knocked out now saves some sorties once the war starts." He added, "I suspect some of the attacks are really just an intensification of the tit for tat that has gone on for a long time—but with some obvious value in the event of a war."

Pentagon officials maintained that coalition actions, though focused on a new target set, were the direct result of Iraqi attacks on coalition aircraft. "To the extent they keep shooting at our airplanes, ... we keep engaging in response options," said Rumsfeld at a mid-September 2002 briefing. He added that, if those "response options are harmful to their air defense, which they are, then that's good."

Commenting about Southern Focus after the war, Moseley said, "If the Iraqi forces had stopped threatening or actually shooting at the aircraft, ... we would not have had to use force against any of the military targets."

According to the Air Force, coalition aircrews dropped 606 bombs on 391 targets during Southern Focus, which lasted from June 2002 to the March 20, 2003, start of Gulf War II.

USAF photo by MSgt. T. Collins

Beyond Supremacy. *Southern Focus led to air dominance. Iraq's air force did not come out during Iraqi Freedom and even buried some MiG-25s to try to save them. Coalition forces dug them up after the war.*

At the peak of Iraqi attacks, Saddam's forces were firing more than a dozen missiles and rockets per day at coalition forces. On one day, Iraq fired 15 SAMs.

The pace of coalition responses picked up between March 1 and the March 20 start of the war. During that time, coalition pilots in the no-fly zones flew 4,000 strike and support sorties. The flights not only cut down Iraqi radars, air defense guns, and fiber-optic links, but also enabled the coalition to map out the fiber-optic networks and wiring that provided the Iraqis centralized command and control. Surveillance aircraft, for example, carefully noted where there appeared to be any construction or repair of the air defense network.

The entire Southern Focus effort gave the coalition a clear advantage once ground troops crossed into Iraq and the air campaign "officially" began.

Just hours before the declared start of the war, Col. Gary L. Crowder, chief of Air Combat Command's strategy, concepts, and doctrine division, estimated that Saddam had, by that date, effectively ceded "about two-thirds of his airspace" to coalition forces. "We are starting off in a significantly better position as a consequence of the northern and southern no-fly zones, which will enable operations that might not otherwise have been able to commence."

After the fact, it was obvious that Day 1 air dominance made it possible for the coalition to escalate the timetable for the ground attack and seize Iraqi oil fields on short notice. By April 5, Moseley could declare: "The preponderance of the Republican Guard divisions that were outside of Baghdad are now dead." As Air Force Secretary James G. Roche pointed out at the conclusion of the war, "During the entire campaign, the Iraqi Air Force didn't fly a single sortie against coalition forces."

At first, many airpower critics called attention to what they saw as the lack of a long air campaign as prelude to the war. Retired Gen. Merrill A. McPeak, a former Air Force Chief of Staff, knew the true story.

In a June 5, 2003, *Washington Post* article McPeak wrote: "It's incorrect to say that, unlike Desert Storm 12 years before, there was no independent air campaign in advance of the jump off of our ground forces from Kuwait." He continued, "Because of this aerial preparation, Iraq's air defenses stayed mostly silent, and our aircraft were able to begin reducing opposing ground forces immediately. Army and Marine Corps formations, judged by 'experts' to be much too small for the job, captured Baghdad in just 22 days and with comparatively light casualties. Not only did coalition airpower systematically disorganize Iraq's ground forces, it did so at small cost." ■

Top leaders warn that USAF "cannot tolerate nor sustain" the recent level of loss.

A Plague of Accidents

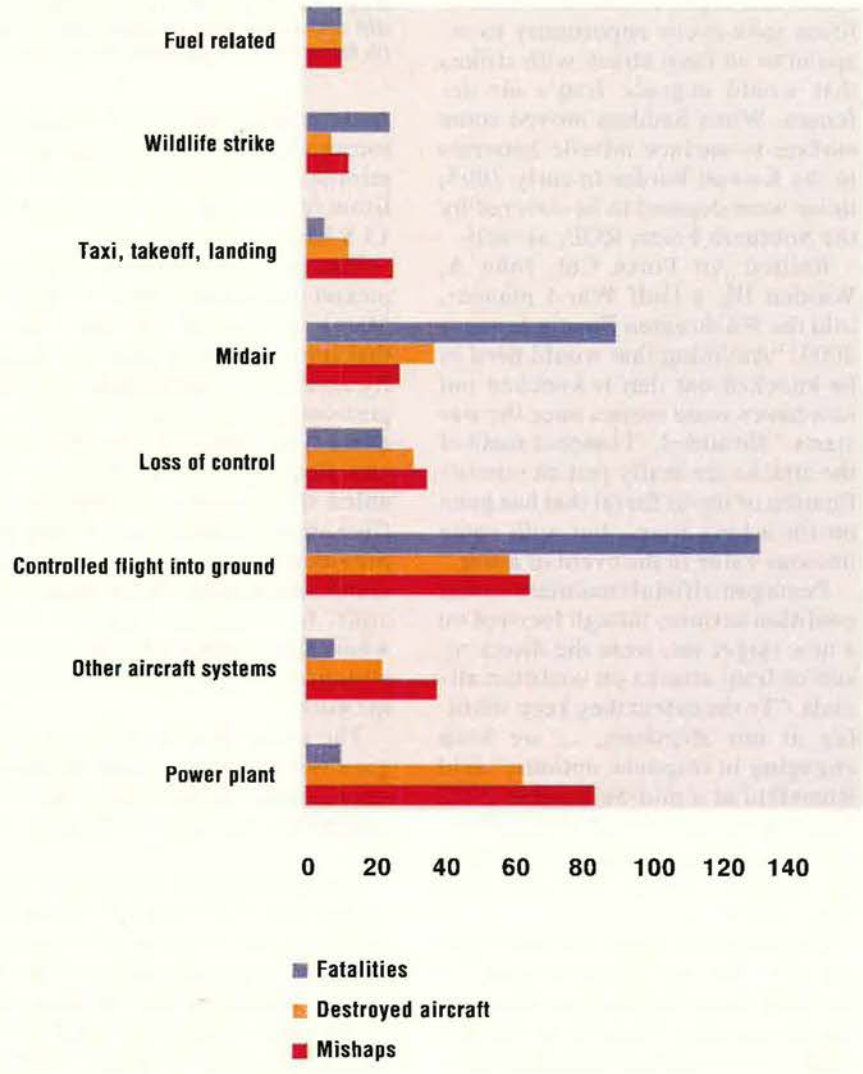
By Adam J. Hebert, Senior Editor

LAST March 17, two F-15Cs out of Nellis AFB, Nev., collided in midair during simulated air-to-air combat. The pilots suffered only minor injuries, but one fighter was destroyed when it crashed to the ground. The other sustained moderate damage.

The accident was the Air Force's fifth midair collision in less than five months—a sobering event for service officials, who have watched aviation accident rates climb in the past few years.

In 2000, USAF had its all-time-best flying safety year. The records in the past three years have been worse—in 2002, much worse. The major aircraft accident rate in 2002

Leading Causes of USAF Class A Mishaps and Fatalities
FY 1993-2002



was nearly 30 percent higher than in 2000. Last year proved only somewhat less troubling.

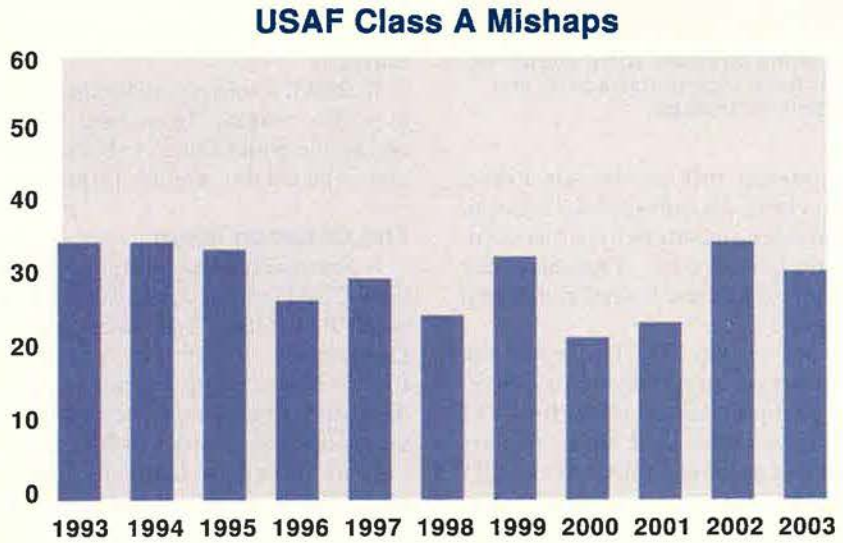
Gen. John P. Jumper, Chief of Staff, told Air Force personnel in December 2002 that the service "cannot tolerate, nor sustain, this level of loss."

The Air Force has made steady progress in aviation safety ever since it became a separate service in 1947. However, Jumper was concerned that USAF might have reached "a plateau" during the last decade. "While I would like to think that our [2002] mishap experience is an anomaly, I am concerned it may be a negative trend," Jumper wrote in a memo at the conclusion of that worrisome year.

The Air Force's Class A flight mishap rate dropped dramatically through the late 1940s and 1950s and continued a fairly steady decline until 1992. (The Class A flight mishap rate refers to the number of mishaps per 100,000 flying hours. The term "Class A" refers to mishaps that result in a death, permanent disability, loss of an aircraft, or damage of more than $1 million.)

USAF photo

USAF is now grappling with accident trends that lack "smoking gun" causes. This crash at Keesler AFB, Miss., resulted in $2.5 million in damage to the T-1.



Between 1993 and 2003, the Air Force lost 320 airmen and 274 aircraft to mishaps, at a cost of more than $6.2 billion.

In 1947, this benchmark rate was 44.22. Twelve years later, it fell below 10 for the first time. In 1983, the rate fell below two for the first time. Ever since, it has been in the "ones," but progress beyond that has been hard to achieve. All obvious, easy fixes have been made.

Air Force officials say the service goal is zero accidents. Is that target realistic? Maj. Gen. Kenneth W. Hess, USAF chief of safety, pointed out that, "what we [Air Force members] do is, by definition, dangerous."

The Air Force is not an airline and will always fly a large number of inherently risky combat missions, frequently in single-engine aircraft. Even training missions are dangerous. "We are in a high risk business," said Hess.

The Human Factor

Officials found human error to be a common thread in the accidents. The USAF analysis showed that two-thirds of the 2002 accidents resulted primarily from human-factor issues, which generally

means poor situational awareness during flight.

In the case of midair collisions, a pilot's loss of situational awareness is frequently cited as a determining factor. "You really have to hammer away at the fact that these mishaps are preventable," Hess maintained.

Hess said that he had never seen an unpreventable mishap. Lessons learned from previous accidents work their way into the system in the form of improvements to parts, procedures, and training.

The Air Force safety program, said officials, relies on commanders to ensure that their personnel are properly trained and that safety remains uppermost in the minds of airmen.

"We will get better," Hess asserted, adding that "nobody is naive" about the difficulty of the task. Some improvements will take time. Changes in training and procedures, for instance, can take two years or more to implement.

USAF photo by SMSgt. David H. Lipp

The goal is zero mishaps, but safety rates have stagnated in recent years. Bucking the trend, F-16s in 2002 had their safest year ever. Here, North Dakota ANG's 119th Fighter Wing celebrates 60,000 accident-free hours.

Photo via www.f-16.net

Accidents have a bewildering array of causes, some obvious, some subtle. In 2003 alone, wildlife strikes, bolt failures, blown tires, engine flameouts, and midair collisions were all cited as causes of Class A mishaps.

In the period 1993 to 2002, USAF lost 85 aircraft and suffered 18 fatalities in accidents stemming from power plant and other systems failures. In the same period, human error caused the loss of 127 aircraft and 244 personnel. Some human factor-type accidents are controlled-flight-into-terrain (CFIT), pilots losing control in flight, and midair collisions.

Officials said that CFIT errors take the greatest toll on the Air Force. They claim an average of 13 fatalities and six aircraft per year, according to USAF data. Typically, the problem is aircrew loss of situational awareness.

However, the Air Force has not found a systemic training or awareness problem that accounts for CFIT accidents. Hess said that the very nature of combat flight makes CFIT accidents an ever-present danger. Pilots flying and maneuvering at high speeds, frequently at low altitudes, are vulnerable to crashes. The safety chief said the Air Force must simply work to drive their frequency as low as possible.

"What's left for us is to concentrate on the humans, where the humans make errors and mistakes," Hess said.

Beyond human error, the service can find no "smoking gun" in the recent accidents. The mishaps did not have a single predominant cause, as was the case in the mid-1990s, when severe engine reliability problems caused many F-15 and F-16 crashes.

From 1993 through 1997, single-engine F-16 fighters each year had the most engine failures of USAF aircraft. An extensive engine improvement program brought down the number of power plant-related crashes.

In 2003, a variety of factors were at work, ranging from bird strikes and single-bolt failures to blown tires and catastrophic engine flameouts.

The Optempo Issue

A potential contributing factor has been USAF's high operational tempo since 9/11. One USAF safety analysis reported, "Flight crews pressing for mission accomplishment despite high operational risk factors drove an [operations] spike in FY02."

In an interview last fall, Jumper agreed that operational tempo can affect flight safety. "I've just seen this over a number of years—this general correlation between stress level and mishap rates," said the

Rumsfeld Weighs In

The rise in aviation mishaps across all services during 2002 prompted Defense Secretary Donald H. Rumsfeld to set a new goal. Each service was called on to cut mishaps and mishap rates in half by 2005.

"World-class organizations do not tolerate preventable accidents," Rumsfeld declared in a May 2003 memo.

In 2002, accidents claimed 82 personnel and 63 aircraft. Air Force accidents accounted for 22 fatalities and 19 destroyed aircraft.

The Defense Department must "turn this situation around," Rumsfeld wrote. He called the new goal "achievable" and said it "will directly increase our operational readiness."

Reducing mishaps by 50 percent in two years is ambitious. Each service already takes safety seriously. However, USAF's chief of safety, Maj. Gen. Kenneth W. Hess, said that it is good to "put a marker out there."

Whether the goal is attainable is irrelevant, Hess said, because the ultimate goal is zero mishaps.

In 2003, the Air Force had three fewer mishaps due to accidents and reduced its Class A mishap rate from 1.48 in 2002 to 1.39 in 2003. (For comparison with the other services, see the table below.)

Rumsfeld tasked DOD's personnel and readiness director, David S.C. Chu, to lead the mishap reduction effort. Chu later established the DOD Safety Oversight Council and established several service-led task forces to develop ideas and plans. Air Force general officers head two of the task forces.

DOD Class A Aircraft Flight Accidents

Service	Number		Rates		Fatalities	
	FY02	FY03	FY02	FY03	FY02	FY03
Army	26	29	2.51	2.91	17	33
Navy	21	26	1.76	2.25	20	10
USMC	15	11	3.89	2.79	13	16
Air Force	35	31	1.48	1.39	22	10

Chief of Staff. The pace of recent operations has resulted in "supervision stretched thin [and] maintenance stretched thin," Jumper added, though he noted that operational strains are "not an excuse" for safety lapses.

"When you get busy, and you're thinking about your next deployment, ... and it's rush, rush, rush, that's when the safety aspects start to drift away," Jumper explained. Steps to enhance safety "need to be brought back to center," he went on. "That's what our emphasis has been."

It is difficult to prove a direct correlation between mishaps and operational tempo. Though it seems logical that high optempo contributes to mishaps, stress on the force is almost never cited as a probable mishap cause, said retired Maj. Gen. Timothy A. Peppe, a former chief of Air Force safety.

"When you go digging in" to the root causes of a crash, Peppe said, "you cannot tie them directly to the optempo." Something else is almost always found to be the culprit.

An exception was the Feb. 13, 2003, crash of an Air Force Special Operations Command MH-53M while landing at the Udairi Range in Kuwait. The 16 troops aboard the helicopter had completed a realistic, nighttime training mission. None were seriously injured, but the helicopter sustained damage of more than $15 million.

A USAF accident investigation board laid blame for the mishap on "a combination of inadequate mission preparation and aircraft design deficiency." The aircrew had not sufficiently studied the planned landing site to determine its acceptable landing tolerances. Consequently, "the pilot landed on terrain that did not accommodate his touchdown profile," according to the accident report.

Bad Year for Helos

USAF helicopters, as a rule, have had low mishap rates over the years—until 2002, that is. In that year, the USAF helicopter community suffered more Class A mishaps than it had since 1969, a year of high Vietnam War activity.

In 2002, USAF sustained 25 operational aircraft mishaps, nine of which involved helicopters. Of those nine accidents, four occurred in Southwest Asia. In 2003, the number of helicopter mishaps dropped to four.

The helicopter Class A mishap rates in 2002 and 2003 were 15.74 and 5.96, respectively. The fighter/attack aircraft rates for those years were far lower, 2.16 and 2.54.

Hess cautioned that it is a mistake to become fixated on the mishap rates in any single year. Too many "curious things" can lead to an unrepresentative spike in the rates, he argued.

"Can we improve?" Hess asked. "Can we get better than a 1.4 [overall] mishap rate? I think the answer to that question is yes."

Hess noted that the next generation of airplanes will be far more reliable than the older generation of C-5, F-15, and F-16 aircraft, which are based on technology that is 25 to 30 years old.

"It's a generational thing," he said.

C-17s, F/A-22s, and F-35s—all designed with advanced computers and with years of data about airplane crashes—in a few years will dominate USAF's fleet.

Of course, new systems tend to produce more surprise mishaps. Such is the case with today's C-17. It is highly reliable, but, when it breaks, it breaks in unexpected ways.

Still, even with the surprises inherent in new systems, Hess emphasized, "I think we're going to be able to move to another level of safer operations." ■

Secretary of the Air Force James Roche says USAF is deep into its second "post-Cold War" transformation.

Revolution by Adaptation

James G. Roche, *Secretary of the Air Force, has been the service's top civilian leader since mid-2001. On Dec. 4, 2003, he addressed the United States of America Unmanned Aerial Vehicle Conference in Washington, D.C., where he presented a broad portrait of USAF transformation efforts. What follows are excerpts of his remarks.*

"Serious Error"

"There are some who mistakenly equate modernization with transformation. This is a serious error. New systems can just as easily serve obsolete strategies or operational concepts. If they do, they will be as irrelevant to the realities of the 21st century as the Curtiss JN-4 Jenny was to General Arnold in World War II or the P-51 Mustang was to General Horner in the Persian Gulf War. This is not to say that our legacy systems are condemned to irrelevance. ... The imperatives of this era demand that we modify our legacy systems, as well as the systems currently under development, and ensure that, when employed, we use them in ways that are suitable to the strategies we must support and the missions we must perform."

The Catalysts

"Advances in GPS-aided munitions, low observable technologies, space-based systems, manipulation of information, joint integration and communications, and smart weapons have revolutionized the way in which we conduct war. Many of these programs bridge the gap from the Cold War to the era of asymmetric war and still fit nicely into our concept of transformational systems."

Resurrection

"It is entirely appropriate for us to suggest that the B-1, as we employ it today, is transformational—certainly not because it is a new system but because we

are using it in ways never conceived of previously and gauging our success in terms of battlefield capability. With intercontinental range, duration over a target area measured in hours, and the new tactic of stacking aircraft for execution of time sensitive or emerging targets, the ability to carry 24 GPS-guided Joint Direct Attack Munitions or 24 Joint Air-to-Surface Standoff Missiles—and in the future, 24 JASSM-Extended Range weapons—we have made this aircraft much more than relevant to the new era."

Battlefield Air Operations

"In Operation Enduring Freedom, [USAF employed] a variety of systems that enabled us to convert 'Battlefield Air Operations' from a concept into a reality. A decade ago, we were concerned with the relevance of the B-52. Who would ever have predicted we'd employ B-52s from 39,000 feet in a close air support role? Combining technology such as the Global Positioning System and the Joint Direct Attack Munition with the expert skill of airmen on the ground using new technology, B-1s and B-52s successfully neutralized and destroyed Taliban forces in Afghanistan, even those in close proximity to friendly forces. We now have to deal with B-52 crews who think they are F-16CJ crews!"

Dawn of an Era

"While the Predator and Global Hawk often get the headlines, we know there were—and are—a broad range of UAV platforms and capabilities employed by other services in Operation Iraqi Freedom. We have shown that less expensive, limited-capability UAVs can [gain] leverage [from] the power of network operations to accomplish complex and demanding missions. They have shown promise in a variety of missions, from traditional ISR functions and battle damage assessment to interdiction under certain circumstances. They offer expanding opportunities for new and unique capabilities, for persistence and digital acuity, and they offer an invaluable advantage—the ability to perform needed missions without putting our warfighters into harm's way."

"New Form of Airpower"

"General Jumper and I believe that we should look at the development of unmanned vehicles and remotely piloted aircraft as a new form of airpower, not as a means of giving us capabilities we already possess but without the onboard pilots. We need to develop new capabilities that complement the advantages that manned systems bring to the fight, and we need to develop capabilities for UAVs without restricting our ideas to the limitations imposed by manned aircraft systems, such as G-force restrictions and environmental controls designed for humans."

Done That

"The Air Force has always adapted its strategies, organizations, and technology to the realities of the present and the future. The decade of the 1990s, often referred to as the 'post-Cold War era,' in retrospect, now looks more like an entire era of transformation. We restructured and reorganized our force to meet a variety of threats [rather than] a single threat, and we developed new ways of delivering capability. Our evolution from Cold War organizational models to the composite wing construct, followed by our introduction of the AEF concept, and our reorganization into the combat wing organization demonstrates how we've engaged in a continuous process of adjusting to a new era of new threats."

"Transition Force"

"Today's force—while capable and flexible and possessing unmatched speed, range, and precision—is a transition force. Our legacy aircraft and satellite systems were built with specialized roles and for a threat that has long since disappeared. Over the past decade, we've made marvelous advances in fielding a new generation of weapons that have enabled us to shift our focus from the number of airplanes it takes to destroy a single target, to the number of targets we can destroy with a single aircraft. Yet, our aircraft have limited networking, limited all-weather delivery, and limited standoff, and our sensors—whether airborne or spaceborne—are not yet fully integrated."

The Vision Force

"Our force of the future will be much different. We will employ multimission aircraft systems, with multispectral, fused sensors, and robust, all-weather weapons delivery with increased standoff capability. We'll deploy with reduced logistics tails, and we'll attack with vastly improved range, payload, speed, maneuverability, and precision. We'll launch new generations of satellites into orbit with more operationally responsive launch systems. Our vision is one of a fully integrated force of manned, unmanned, and space assets that communicate at the machine-to-machine level and deliver a capability to conduct near-instantaneous global attack against a range of threats and targets. We are developing a variety of systems that fulfill these objectives: the multimission command and control constellation, the smart tanker, an entire generation of unmanned vehicles, small diameter weapons, and the airborne laser—to name just a few."

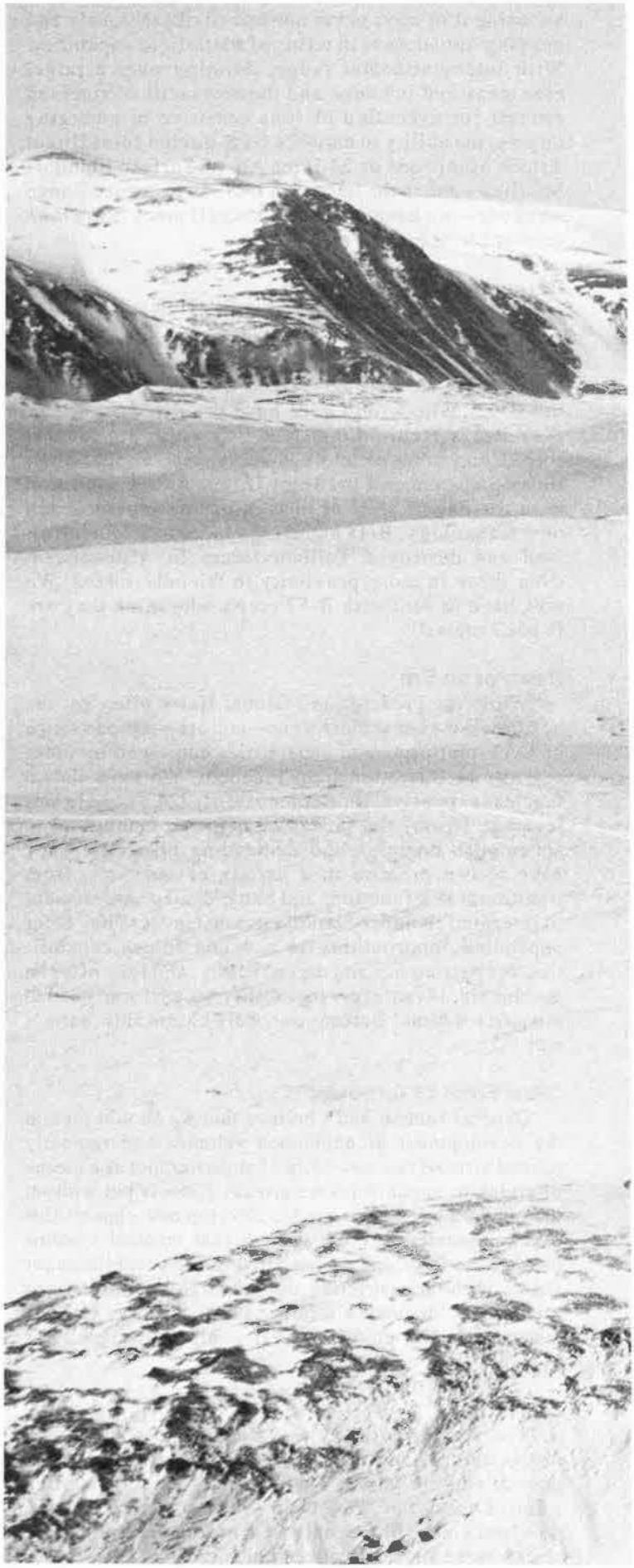
The Great Adaptation

"Technology is creating dynamic asymmetric advances in information systems, communications, and weapon systems, enabling us to identify targets, employ forces, and deliver more precise effects faster than ever before. Our airmen are more educated, more motivated, and better trained and equipped than at any time in our past, creating advantages for our service and delivering capability to our nation. ... We are in the midst of a truly revolutionary adaptation of our organizations, equipment, and operational concepts." ■

IT HAS BEEN A HALF-CENTURY SINCE THE "DEW LINE" FIRST STARTED RISING IN THE ARCTIC WASTE.

A LINE IN THE ICE

By Peter Grier



THEY'RE still up there in the frozen north, some of them. They rise abruptly from the icy wilderness, a jumble of buildings and platforms topped with giant white domes. They look like relics from another time, which, in a way, they are. When they were built, the United States' primary adversary was communism, not terrorism. The US military's greatest fear was of a sneak attack by Soviet bombers, flying undetected over the North Pole.

Five decades ago this year, the US and Canada launched one of the most ambitious construction projects ever—the Distant Early Warning, or DEW Line, a series of radar early warning stations from Greenland to Alaska. Over the next two-and-a-half years, thousands of people and some 460,000 tons of material would be shipped, hauled, and airlifted some 200 miles north of the Arctic Circle, up to a line

running roughly along the 69th parallel. When the crash project was over, North America had something that, for the era, was a technical marvel. It had also gained a crucial few hours' extra time to respond to any incursion by aircraft carrying nuclear bombs.

That strike never came, of course. Yet year after year, the radar technicians, radio operators, pilots, cooks, metal workers, and military commanders who constituted the isolated DEW Line population braved cold and boredom to keep watch for the West. Today, their mission may be largely forgotten. Any traveler happening upon the abandoned stations might wonder what on earth they were for.

Watching, Waiting

"To that, I must answer that, for a brief while, we stood on guard," writes former DEW worker Rick Ranson in his book *Working North*. "Like ancient guards in a lonely outpost on the Great Wall of China or Hadrian's Wall, we watched, we waited, and we slowly went nuts."

Some civilian technicians bought snowmobiles and went out hunting in their free time. Some hung around station bars, playing cards and swapping tall tales. Some immersed themselves in solitary hobbies like photography.

Some couldn't take it and fled when their contracts were up. Others loved it and today remember their time on the line with fondness.

"You had a lot of time to think," says Ranson, who still works as a boilermaker, in Winnipeg, Canada.

For centuries, the United States depended on broad oceans and peaceful neighbors to protect its people and home-based forces from military attack. From the beginning of the age of flight, however, visionaries realized this geographic isolation might no longer serve as an effective buffer. As early as 1916, Alexander Graham Bell worried that airships might be able to float over the waves and bomb US cities.

During World War II, the continental US remained virtually untouched, despite West Coast fears about Japanese aircraft. Japanese troops and aircraft did gain a foothold in the western Aleutian Islands early in the war, but withdrew by the middle of 1943. After the war, the threat to the US homeland seemed minimal, and air defense budgets crumbled accordingly.

In the late 1940s, however, Soviet acquisition of atomic weapons, plus Moscow's development of a long-range bomber force, quickly changed the situation. In 1947, the US Air Force proposed a $600 million radar fence composed of 411 radar stations and 18 control systems. The cost seemed high to Defense Department officials, who sent USAF back to the drawing board. By 1950, the Air Force erected an interim system named Lashup, which consisted of 44 World War II-vintage radars located near major US metropolitan areas. Lashup may have been better than nothing, but its old radars did not have much range, and it would have provided little advance warning of attack. Air Force officials wanted something more—distant warning of attack.

Canada was worried as well. Without its own nuclear deterrent, Ottawa saw air defense as its best protection against Soviet attack. In the early 1950s, the US and Canada began joint construction of the Pinetree Line, a series of some 30 radars that ran roughly along the line of the US–Canadian border. This system was fully operational in 1954, with the US paying two-thirds of its cost.

At around the same time, with its own funds, Canada began building another line farther north, near the 55th parallel. This Mid-Canada Line was a simpler microwave warning device, prone to false alarms set off by geese and other large birds. However, the fact that Canadians were even attempting to build this barrier, whatever its limitations, intrigued some US defense officials. If Canada could undertake a difficult construction task in the often-bitter weather of the 55th parallel, why couldn't the US do the same even farther north? A trip wire situated above the Arctic Circle would provide hours of extra warning of bomber attack.

Top Air Force officials were not initially enthusiastic. They thought that erecting and maintaining a string of high-tech radars in such weather was not feasible and that even trying would drain crucial funds from the main mission of SAC. They favored offensive nuclear deterrence, but nevertheless agreed to provide supplies and advisors for a February 1953 equipment test on Barter Island, off the northeast coast of Alaska.

***Out There.** At a DEW Line outpost, radar antennae probe the skies. "Like ancient guards," USAF radar technicians, radiomen, and support personnel stood lonely watch in the desolate Arctic.*

Breakthrough

It was at this experimental outpost, with nothing but the icy bleakness of the Arctic Ocean stretching away to the north, that personnel from MIT's Lincoln Laboratory and from Western Electric achieved the breakthroughs that made the DEW Line possible. Lincoln scientists developed automated alarms that sounded when radars picked up a target, so that operators did not have to stare at scopes for hours on end. They perfected communications via radio waves

bounced off the troposphere, overcoming the difficult radiation characteristics of the far north. They hardened, for Arctic use, two radars—the AN/FPS-19, which had a range of up to 65,000 feet and out 160 miles, and the AN/FPS-23, which handled low-level detection through its ability to pick up targets flying as low as 50 feet above water.

"So that neither would record flocks of migratory birds, both were set to disregard objects flying slower than 125 miles per hour—a feature the Mid-Canada Line lacked," notes *The Emerging Shield,* a 1991 publication of the Office of Air Force History about the evolution of US continental air defense.

In July 1953, the US began building an 18-site test line running across Alaska and northern Canada. Working from an old US Navy base in Barrow, Alaska, workers towed prefabricated modules across the tundra to selected sites, then set them up. Air Staff concerns about the difficulty of Arctic construction faded away. In December 1954, the Pentagon awarded Western Electric the project.

The DEW Line was on.

The DEW Line was the largest construction project ever undertaken in the Arctic and one of the most difficult construction projects of any kind, ever. Even today, the idea of constructing a string of habitable stations across trackless wilderness would raise major concerns. And these stations were not just erected. They were staffed with thousands of men who slept, ate, worked, played cards, did laundry, and generally carried on a normal life—as normal, that is, as one could be in such frozen isolation.

Lifeline. ***Isolated DEW Line sites were resupplied by aircraft such as the ski-equipped C-47 at left and the then-new C-124 at right. The flying was dangerous work; 25 people died in aircraft accidents in 1956 alone.***

Site selectors went in first. They came in overland by Caterpillar tractor "trains" in the Alaskan portion and by ski plane in much of the Canadian portion. With the help of parachute-dropped bulldozers, they cleared airstrips, often on frozen lakes, long enough to handle C-124 cargo aircraft. Except during two months in late summer, everything had to come in by air.

The basic unit of construction was a modular building 28 feet long, 16 feet wide and 10 feet high. Made of prefabricated panels, these modules were combined into "trains" like a string of blocks. Main stations had two 400-foot trains, connected by an overhead bridge, forming a giant H. The trains were laid on gravel pads or mounted on stilts to prevent thawing of the permafrost beneath and were oriented with the prevailing winds so as to minimize snow drifts.

On the Greenland ice cap at the line's eastern end, some three feet of snow and ice piled up every year. Some stations there were built on stilts and equipped with hydraulic equipment so they could jack themselves higher every year. This ingenious solution to the problem of ice buildup is still used today in polar research stations.

Steel towers were topped with the DEW Line's distinctive geodesic radomes. Classified electronic equipment was kept in separate offices, which were theoretically off-limits to all but cleared station staff. The other trains contained sleeping quarters, communications rooms, shops, and the all-important dining facilities, which often doubled as entertainment centers and bars. Inside, airlifted diesel fuel kept life comfortable. Outside, the temperature could fall to 65 degrees below zero. Every year the sun would disappear below the horizon for two months.

Paging Nanook. ***Construction workers drill foundation piers for a DEW Line building on Canada's Baffin Island, north of the Arctic Circle. Temperatures at such sites could hit 65 degrees below zero.***

Frozen in Time. *Inside a DEW Line site, personnel in an operations room plot aircraft movements on radar screens and plexiglass boards. They might not "see" all bombers, but getting just one was worth it, said Gen. Earle Partridge.*

The construction effort was like nothing so much as the marshaling of troops and supplies for the D-Day invasion, officials said at the time. In 1956 alone, air, sea, and water transport carried 167,183 short tons of supplies to DEW sites. It was dangerous work—25 people died that year in aircraft accidents. On July 31, 1957, responsibility for the DEW Line passed to the Air Force, and, by the end of that year, the first phase of stations was virtually complete.

The military role of the DEW Line was to detect the approach of Soviet bombers from the north in an actual attack. While its radars and communications could be jammed, that in itself would be a signal that something major was afoot, officials noted at the time. Theoretically Soviet aircraft could swing wide and come in toward the North American mainland from the Atlantic or Pacific Oceans, but this was unlikely, given the range of the USSR's bombers at the time. Navy ships, early warning aircraft, and Texas Tower radar platforms provided some protection outside the DEW Line's flanks.

If DEW radar blips turned out to be enemies, US and Canadian interceptor squadrons could be scrambled to meet them. Meanwhile, forces in the United States would have gained valuable warning of four to six hours to prepare for the attack. The Air Force especially liked the fact that the DEW Line would aid in the defense of US nuclear forces.

"We believe that our primary mission in the Air Defense Command is to defend the bases from which the Strategic Air Command is going to operate," said Gen. Earle E. Partridge, commander of Air Defense Command, at the time. "We believe also that we have to provide a reasonable, an equitable, protection for the key facilities, the population centers, and our industry."

Duck Hunting

Even with the DEW Line standing guard, some Soviet bombers would likely get through, noted Partridge. He compared the situation to duck hunting. Some days, the hunter would be good and the conditions right, and most of the ducks would be shot. Other days, the ducks would be more adept, the conditions worse, and many would get through, but getting even one duck might make a tremendous difference.

"If you shoot down a bomber coming in—one that was going to a big city like Washington—you save billions of dollars and maybe a million lives, by just shooting down one bomber," Partridge said in a lengthy 1957 interview with *US News and World Report*.

Aircraft did not have to be the size of a Soviet bomber for the DEW Line to pick it up, of course. "Unknowns" were a problem for radar operators from the beginning. Partridge said that the early warning system as a whole, including the lower Mid-Canada and Pinetree Lines, picked up an average of 35 unknowns a day in 1957. Generally these turned out to be small aircraft that had neglected to file flight plans.

"We have a lot of unknowns in the system when the fishing season starts up ... because those small planes come up and appear on the radar," said Partridge.

DEW Line work was carried out mostly by civilians. A scattering of Canadian and American military officers provided supervision. The civilians were at least volunteers, in a sense. For those in uniform, on the

Just Like Home. *This is "Northside America," one of the main radar stations. Amenities were few. Keeping such places running entailed battles with snow, ice, and the occasional polar bear.*

other hand, a posting to the Arctic Circle was not necessarily good news.

The work could be tedious. For radar and radio operators, there was little traffic to handle, save for B-52s sent north on alert and the occasional jetliner taking a polar route. Pay was good—superior to that most could earn Stateside. Most sites got three first-run movies a month and quantities of good food. Mealtimes were the most important times of the day, and dishes such as baked oysters or steak were not uncommon.

Fresh out of college in 1976, Fred K. Teeter Jr. was offered a DEW job because his uncle was president of Felec Services Inc., the company that then had the contract for line maintenance and operations. He took it because he had no other prospects. He had a rude introduction to DEW life when the C-141 carrying him north from McGuire AFB, N.J., suffered a collapsed cockpit windshield and made an emergency landing in Labrador, Canada.

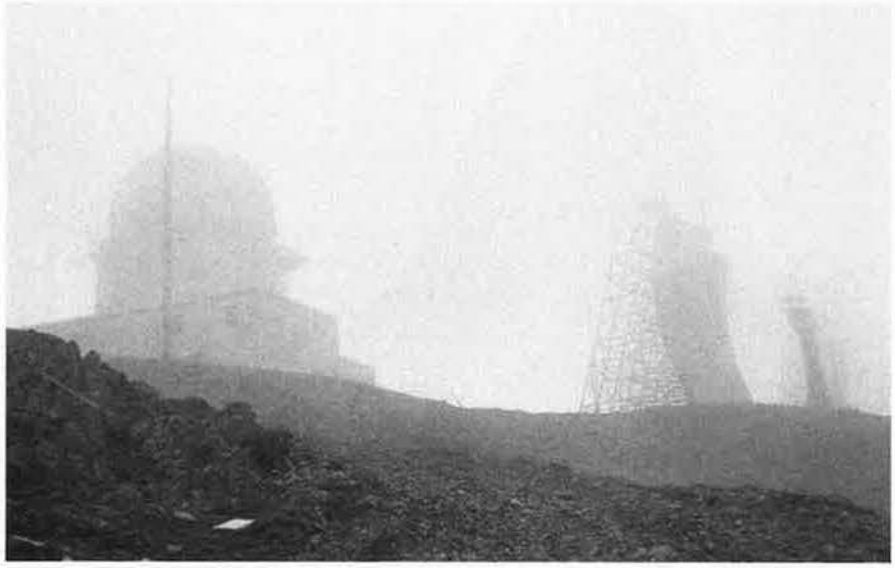
Hours were long—12 hours on, seven days a week for three months. With only 13 to 15 men at each station, everyone quickly learned everyone else's stories. But Teeter explored the Arctic landscape, took photos, and grew to love the experience.

"I just remember having this wonderful freedom," says Teeter, today a chamber of commerce president in Washington County, Md. "That seems odd because you were stuck on the station, but I had this time to think and do things on my own. It fit me perfectly."

Rick Ranson took up writing to while away long off-work hours. His series of letters home, detailing DEW life, eventually grew into a section of a book about the travails of Arctic Circle life. He's got a story about a seal that a worker sneaked inside so it could luxuriate in a shower and an orphan peregrine falcon chick, fattened by months of table scraps, that a friend freed from the top of the station radio tower.

Says Ranson: "Two hundred and four feet, straight down. Never opened a wing."

A self-described city boy, Ranson once got the job of guarding a camp on Cape Dyer, Baffin Island, Canada, from a polar bear. Everyone else nonessential was off clearing the airstrip. The bear was an aggressive one, looking for food. He had already ripped open the airstrip weather office and cornered the weatherman in a locked storage area.



Fog of Cold War. *In the Aleutians, heavy fog envelops a DEW Line station (left) and two antennae of a later communications system, dubbed White Alice. The Soviet bomber threat faded, and so did the DEW Line.*

Bear crackers—a cross between a firecracker and a percussion grenade—were not driving the bear off. So Ranson kneeled and shot, aiming just behind the bear's foreleg. The bear charged.

"When I shot him, he was a hundred paces away, and when he died he was 10 paces from me, and I had been running away," says Ranson.

A Short Life

The DEW Line was a marvel for its time. It pioneered construction and air control technology still in use today. But its heyday was not lengthy. Even as it went into operation, the Soviet Union was perfecting intercontinental ballistic missiles that it could not detect and which put the meaning of "strategic warning time" in a whole different perspective.

The US perception of the nuclear threat began to change drastically. By the middle of the 1960s, most defense officials felt that vulnerability to Soviet bombers had little relevance, given the capabilities of Soviet ICBMs. Defense Secretary Robert S. McNamara's embrace of mutual assured destruction further eroded air defense's position.

The Soviets, for their part, never lost interest in their own network of radars and early warning communications.

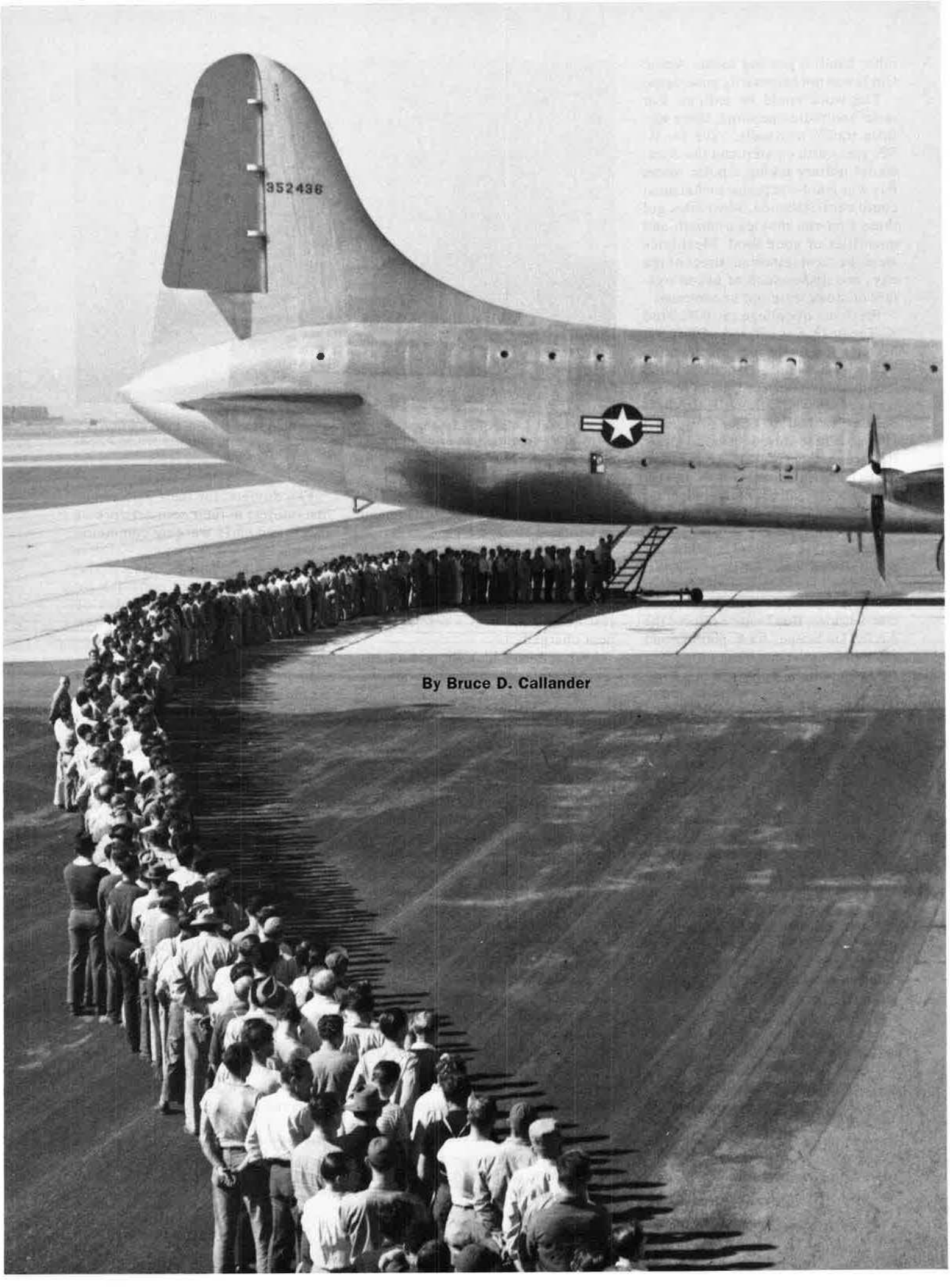
"Unlike the United States, the Soviet Union did not consider air and missile defense two sides of the same issue," states the Office of Air Force History in *The Emerging Shield*.

In 1980, Air Defense Command was inactivated. In 1985, the DEW Line became the North Warning System, with many sites scrapped, more automatic equipment, and many fewer personnel.

Today a few of the remaining DEW stations are rusting hulks, filled with old office equipment, cases of Danish beer, and other supplies too expensive to ship out when habitation was abandoned. The existence of PCBs and other toxins at the sites is a large environmental issue in Canada, whose officials have long pushed for the US to pay more for cleanup work.

Yet in the US, the DEW Line may be largely forgotten, despite its lifetime cost of some $7 billion in today's dollars. Congress has considered legislation that would establish Cold War commemorative sites; perhaps one day a DEW station and its dome will be preserved for future generations. ■

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



By Bruce D. Callander

USAF built only one XC-99, in 1947. Soon, this enormous aircraft will have a new home at the US Air Force Museum.

Big Fella

IN THE 1940s and 1950s, the Air Force explored the potential of a super cargo carrier by flying its one-of-a-kind XC-99 on regular, often record, transport runs. It also was touted as a possible prototype for a new generation of commercial air carriers. The experiment lasted 10 years. Then, for almost 50 years, the airplane was left open to wind and weather in a Texas field.

Now the big bird—one of history's largest airplanes—will soon have a fitting place in Air Force history. It is to be reassembled, restored, and enshrined at the US Air Force Museum in Dayton, Ohio.

"The XC-99 may have to go on display outside for a short time initially," said

The XC-99 comes in for a landing during its November 1947 maiden flight out of Lindbergh Field, Calif. It was, at the time, the world's largest land aircraft. The transport required a 3,000-foot runway to take off and a 5,000-foot runway to land.

museum spokesman Chris McGee, but the museum's long-term plan for construction will open "lots of space," much of which will be used to display experimental aircraft. "The XC-99 will go into that [experimental aircraft] building eventually," said McGee.

Everything about the XC-99 was huge. Its tail fin stood the height of a five-story building, some 57.5 feet. Its double-decker interior had 16,000 cubic feet of useable payload space, enough to carry 400 fully equipped troops or 50 tons of cargo. (The largest transport aircraft of the day—the C-97, which was based on the B-29 bomber—could only carry about 100 troops and less than half of the tonnage.) The XC-99 carried 21,000 gallons of fuel. Its gross weight was 322,000 pounds, which was distributed over 10 tires, making it possible for the huge aircraft to land on any 5,000-foot runway that could support the weight of the much smaller C-54. (A C-54 had a gross weight of only 73,000 pounds.)

A company news release noted that the six engines of the XC-99 developed as much horsepower as five locomotives. The engines weighed more than 10 tons. The release also noted that the aircraft had more than 60,000 square feet of sheet metal, more than one million rivets, and more than 25 miles of wiring.

The XC-99 had various nicknames, among them "Aerial Goliath" and "Queen of the Skies."

Photo via Robert F. Dorr

The XC-99, shown on a flight line alongside B-50s—the Air Force's workhorse bomber of the time—was derived from the B-36, but it was 20 feet longer, with a tail 10 feet taller. XC-99 dwarfed its contemporary aircraft.

The XC-99 grew out of the B-36 bomber, which was conceived and developed in the midst of World War II, when America feared that England might fall to Germany and the US would need to fly direct combat missions from its own shores. The B-36 was to be a truly intercontinental bomber that could carry 10,000 pounds of bombs more than 5,000 miles and return. Until then, no aircraft had even approached the proposed range of 10,000 miles.

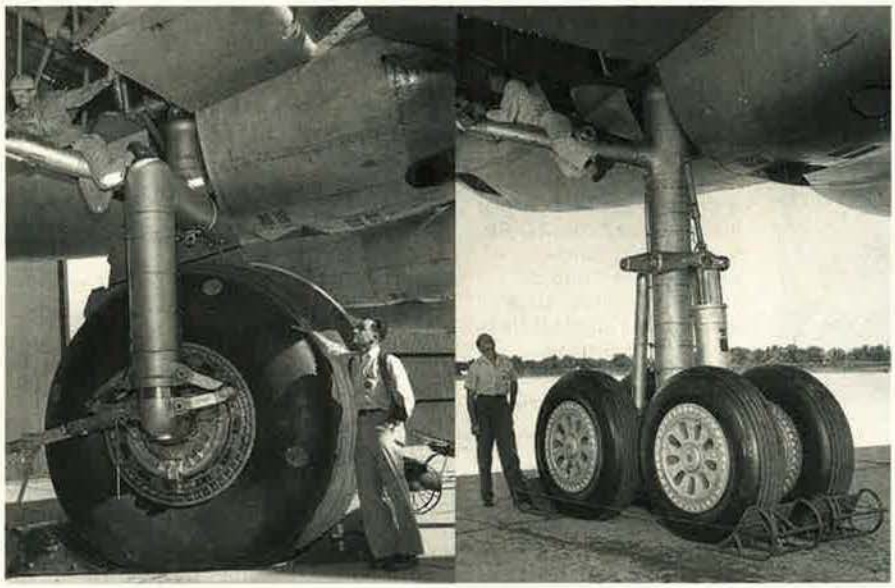
In October 1941, the Army Air Forces selected a Consolidated Aircraft Corp. (later Convair) proposal, designated Model 35, as the most promising candidate. In November 1941, Consolidated received a contract for two experimental aircraft to be designated XB-36.

The first XB-36 was to be delivered by May 1944, but when the war situation in Europe improved, the program lost some momentum. The XB-36 did not make its first flight until August 1946.

The bomber had a wingspan of 230 feet. It was 163 feet long and stood more than 46 feet high. Its gross weight was 265,000 pounds. It was powered by six Pratt & Whitney R-4360-25 radials; each pusher-type engine generated 3,000 horsepower as they turned 19-foot propellers. The wings were large enough for the crew to walk upright down a catwalk to reach the engines for in-flight maintenance. It had a maximum speed of 346 mph at 35,000 feet and a cruising speed of 216 mph.

It was the heaviest and largest land airplane to fly up to that time. It was also the first very large aircraft to be produced in any quantity. The initial production contract called for 100 bombers. The full production run would be 385 aircraft.

The first production B-36A aircraft flew in August 1947. Strategic Air Command's 7th Bomb Group received its first B-36A in June 1948 for crew training. The first combat-



The image at left shows one of the two huge tires initially used for XC-99 landing gear. The image at right shows one set of the four-wheel system—used on production B-36s—that was retrofitted to the XC-99.

ready production version—the B-36B—flew in July 1948, almost a year after the Air Force became a separate service.

From B-36 to XC-99

In 1942, as it was developing the huge bomber, Consolidated began preliminary studies for turning out a transport version. The Army Air Forces wanted to explore whether a supersize aircraft would be practical for rapid transport of large numbers of troops and much more cargo than was possible with contemporary airlifters.

AAF in December 1942 gave the company a formal contract to produce a test aircraft, dubbed XC-99. Because its development took a backseat to the B-36 bomber, however, the XC-99 was not completed until 1947.

Early that year, the company announced that the huge aircraft had been moved outdoors for completion. "No building at Consolidated Vultee ... is high enough to house the giant plane with its main landing wheels installed, or wide enough to house it with outer wing panels in place," stated the release. The XC-99 had the same wingspan as the bomber, but it was 20 feet longer and its tail was 10 feet higher.

Despite its huge size, aircrews that flew it said that, once airborne, the XC-99 handled with ease. On land, its reversing propellers and tricycle landing gear made it possible to back easily into parking areas. It had a top speed of 300 mph and a maximum range, with minimum load, of 8,100 miles.

The Air Force took formal delivery of the XC-99 in May 1949. It first went to the 7th Bomb Wing at Carswell AFB, Tex., because the unit had experience with the B-36 bomber. On June 9, 1949, Capt. Deane G. Curry piloted the first Air Force flight of the huge transport, making six landings during the mission. Curry subsequently made five more flights, including a night mission and an emergency landing at Kelly AFB, Tex., where it underwent repair and engine modifications.

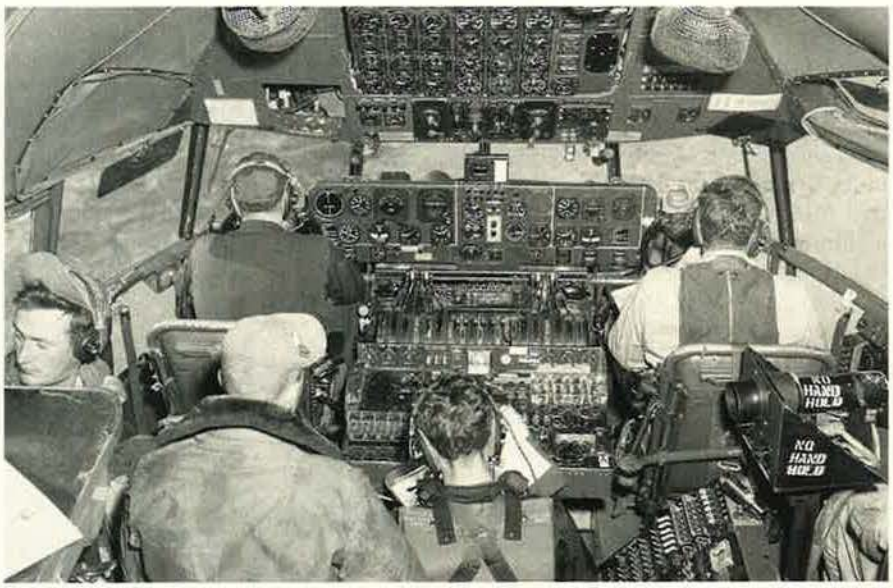
In September 1950, the XC-99 was transferred from Carswell to Kelly to begin its formal operational test program. According to an Air Force news release, it was one of the few experimental aircraft to clear its initial development costs. Yet, its days were numbered as the jet age approached.

Breaking Records

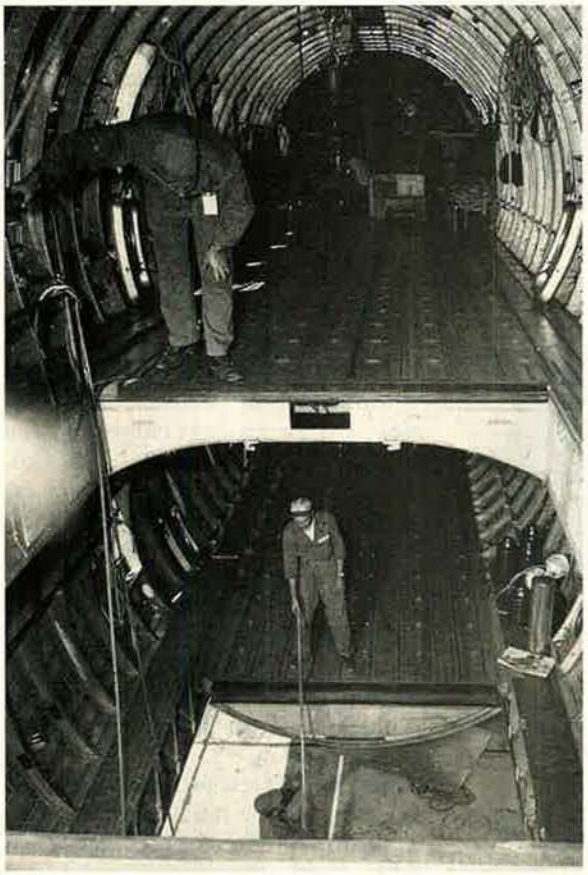
During its relatively short life, the XC-99 flew numerous missions, setting several records along the way. It flew its first cargo mission to Kelly in July 1950, with Col. Frederick Bell as pilot. That mission, known as Operation Elephant, delivered 101,266 pounds of cargo, including engines and propellers for B-36s, from San Diego to Kelly and was the first record-shattering flight of the XC-99. In another record flight, the XC-99 would lift 104,000 pounds from an airfield at 5,000-foot elevation.

The XC-99 test program routinely involved twice weekly runs from Kelly to the aircraft depot at McClellan AFB, Calif. The aircraft would return by way of other bases or depots, making pickups and deliveries.

In addition, the Air Force tasked the huge transport with special missions, such as the emergency transport of 42 C-54 aircraft engines to McChord AFB, Wash., during the Korean War. The C-54s were flying round-the-clock missions to resupply forces in Korea, so time was



The XC-99's ample cockpit accommodated a sizeable crew. When the airplane was in service, USAF noted that the pilot and flight engineer were responsible for overseeing more than 250 gauges, switches, and levers.



A double-decked cargo hold allowed the XC-99 to carry a record-breaking payload of 104,190 pounds. One month, the aircraft flew seven round-trips between Texas and California, delivering an average of 75,531 pounds of cargo per trip—for a total of more than one million pounds.

critical. Col. T.W. Tucker, the first XC-99 chief pilot and project officer, delivered the engines—27 on the lower deck and 15 on the upper—on a single flight and landed at McChord where he taxied the monster aircraft down a 48-foot-wide strip with only one foot of clearance on either side of the aircraft.

From July 1951 to May 1952, an Air Force record shows, the behemoth flew 600 hours and airlifted seven million pounds of equipment and supplies. About half of that went to support forces in Korea. One of its primary missions was to resupply SAC units that flew the B-36 bomber. In that role, the XC-99 flew thousands of hours around the US and to SAC locations in the Caribbean.

In August 1953, the XC-99 made its longest flight—12,000 miles—to Rhein–Main AB, Germany, by way of Bermuda and the Azores. It carried more than 60,000 pounds each way. At every stop, it attracted much attention from the public and the press. During 1953, the aircraft flew 200 missions at an average cost of 13 cents per ton-mile, less than half the ton-mile cost of its contemporaries.

In May 1955, the transport ferried cargo from Dover AFB, Del., to Keflavik, Iceland, destined for the Distant Early Warning Line project. (See "A Line in the Ice," p.64.) It flew six round-trips, delivering 380,000 pounds of cargo. The aircraft carried alternating crews and 31 maintenance technicians from Kelly. The technicians were able to make the few repairs needed during the 30,000 miles of flying under extreme weather conditions.

The big bird was also seen at various air shows and open houses around the country. One anecdote sums up the wonder the aircraft evoked at every stop. During an exhibit at Wright–Patterson AFB, Ohio, a woman asked Capt. Jim C. Douglas, the XC-99 pilot, how he got the aircraft off the ground. He replied: "We fly it, lady." To which, the woman retorted, "Young man, what kind of a fool do you take me for?"

The Death Knell

The XC-99 had proved it could operate economically if given long-distance routes that would have 60,000 to 80,000 pounds of cargo for transport at each end of the run. However, while that was possible during the Korean War, such loads were infrequent after combat operations ceased.

By 1955, the Air Force was focused on producing jet aircraft, so it dropped plans to start serial-production C-99s. With the phaseout of the B-36—rapidly being replaced by the B-52—parts common to both aircraft became scarce, and XC-99 maintenance became more expensive. In March 1957, the Air Force canceled XC-99 operations and declared the aircraft to be surplus.

Only 11 years later, the Air Force's current supersize transport, the turbojet C-5 Galaxy, made its first flight. The C-5 has a 223-foot wingspan, seven feet less than that of the XC-99, but the C-5 is longer, taller, and has twice

Photo via Robert F. Dorr

USAF took formal delivery of the XC-99 in 1949 and flew the aircraft until 1957. Early in its brief tenure, the XC-99 received its upgraded landing configuration and a nose radar unit.

the gross weight and cargo space. And, in the 1980s, the XC-99 lost the title to the largest land airplane when the Soviet Union introduced the Antonov An-225 with a wingspan of 290 feet—60 feet longer than that of the XC-99. Overall, the An-225 is 48 feet longer, about three feet higher, and can carry five times the payload.

During its brief life, though, the XC-99 added to USAF's knowledge of airlifters and helped the service develop improved loading and cargo-handling techniques. It had flown 60 million pounds of cargo a total of 1.5 million miles—the equivalent of 59 trips around the world. It amassed more than 7,400 flying hours.

After retiring the big aircraft, the service briefly considered flying the XC-99 to the Air Force Museum, but officials decided it would cost too much to make it flyable again. It was turned over to the Kelly disposal officer for sale, but a sale date was never set because public reaction in San Antonio was so negative. Instead, the Air Force donated the aircraft to the Texas Disabled American Veterans to be used only for "display, ceremonial, and historical purposes," according to a history of Kelly.

The DAV had 45 days to move the XC-99 from Kelly, where it stood on the base's north runway. After one extension, the huge aircraft finally was moved to an off-base location, northwest of the main Kelly runway.

For some 18 years, it was the property of the DAV and served as a historic tourist attraction. One-time commander of the Texas DAV Clem Searles was one of the key players in the effort and often led tours himself.

However, in 1976, the DAV passed the aircraft to the San Antonio Memorial Air Museum, a nonprofit group that planned to raise money to build a shelter to house it and to refurbish it. The amount needed was $6 million. Just moving the aircraft—at one point the group thought it would place it on the Lackland AFB, Tex., parade ground—was estimated to cost $135,000. The plan fizzled and so did an effort by the group to get the Air Force Museum interested. At that time, the Air Force Museum considered the project too expensive.

In the interim, ownership of the XC-99 became confusing. At one point, a Tennessee businessman claimed ownership and proposed turning it into a restaurant. The San Antonio museum group maintained it still "owned" the big airplane, though.

Nothing developed, so, for years, it remained on or near Kelly, visible to passersby and exposed to effects of the weather. Remarkably, the giant aircraft is in relatively good condition, according to the Air Force Museum's McGee.

"Although the exterior appears to be in poor shape," said McGee, "the aircraft remains in good overall condition, considering it's been exposed to the elements for 46 years. The interior structure remains sound."

Plans call for the museum, once it completes its current construction efforts, to house the XC-99 among other experimental aircraft in the museum's R&D hangar, located on the main portion of Wright–Patterson. ■

Photos by Robert F. Dorr

These photos show the XC-99 weathered by the decades the aircraft was left exposed to the elements in Texas. The Air Force Museum plans to refurbish the giant aircraft before it goes on display.

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, "Jumper to Airmen: 'Get in Shape,' " appeared in the January issue.*

The father of the RAF was one of the first to grasp that aviation would radically change warfare.

Trenchard at the Creation

By Rebecca Grant

BEFORE Hap Arnold, before Tooey Spaatz, before Douhet and de Seversky, even before Billy Mitchell, there was Britain's Hugh M. Trenchard. Yet, Trenchard today rates barely a footnote in most histories of airpower. When mentioned at all, he is remembered mainly as an advocate of an independent air force and as the first true practitioner of strategic bombing.

In his day, Trenchard was known as the father of the Royal Air Force—a gruff and forceful patron saint of airpower. He trained and organized the RAF for World War I, then led it into battle, pioneering many of the concepts central to air warfare today.

Trenchard the aviator was a dominating presence. He was described by American airpower legend Billy Mitchell as "decided in manner and very direct in speech." The stern and uncompromising officer who eventually found his niche in the Royal Flying Corps started off slouching through his military career. (The RFC, which was formed in April 1912, joined with the Royal Naval Air Service on April 1, 1918, to become the Royal Air Force.)

He twice failed the British Army entrance exams. However, by age 20, he slid through, became a lieutenant, and was posted to India, where he met a fellow officer, the young Winston Churchill, in a polo match in 1896.

Early on, he gained a reputation for flouting military authority and keeping his distance from Army bureaucracy. His passions were polo and military tactics, and he cared little for social graces.

Trenchard first saw combat in September 1900 in South Africa during the Boer War. His time in Africa ended after he and the Australian horsemen under his command pursued Boer riders into a valley. Trenchard, charging in ahead of most of his men, led a small party assaulting the farmhouse where the Boers were holed up. He was hit by a Boer bullet that pierced a lung and grazed his spine, knocking him out of the war.

Sent home to England as an in-

A rough landing while tobogganing apparently fixed a spine injury that Trenchard suffered in the Boer War. Never very impressive as a junior officer, he found his calling late in his career, as an air tactician and strategist.

valid, he could not walk without a cane. A benefactor paid for him to go for the air to the Alpine resort of St. Moritz, where Trenchard took up the toboggan. Miraculously, it restored him. One morning, he took a downhill curve too fast and flew off the toboggan, landing hard 30 feet down the hill. Rather than causing more damage, the jolt jarred his spine in such a way that the half-paralysis dissipated. He got up out of the snow, able to walk with no impediment.

His biographer Andrew Boyle wrote, "He had cured himself by violence."

Unfortunately there was no tonic for his career in the Army. After another 10 years of postings in places like Nigeria and Ireland, Trenchard, as a major at age 39, had an undistinguished record and few prospects.

It was at that point that Trenchard determined he would learn to fly.

The Airman

His commanding officer told Trenchard that he was too tall and too old. The infant Royal Flying Corps of 1912 accepted no one over 40. Undeterred, Trenchard got two weeks' leave and paid for his own instruction.

Thirteen days later, he soloed, after a grand total of one hour and four minutes of flying time. In truth, Trenchard was never a good pilot. According to Boyle in *Trenchard, Man of Vision,* he was described as "indifferent" by Royal Navy Lt. Arthur Longmore, who had two years' flying experience.

Fortunately, Trenchard found his niche at the new Central Flying School, which needed an adjutant to put it in order. Despite his tendency to be abrupt and gruff, Trenchard, during his Army years, had developed not only the knack of listening but a keen sense of human nature.

He set the curriculum for trainees and emphasized discipline and skills, such as map reading, signals, and engine mechanics. In the two years remaining before World War I broke out, Trenchard's courses turned out most of the officers for the land-based branch of the Royal Flying Corps.

He also earned the nickname "Boom" for his bluntness and loud voice. (British Prime Minister Churchill would later jokingly say Boom should be changed to "Bomb.")

Trenchard was one of the first to grasp the radical impact aviation would have upon land warfare. The revelation came in September1912, when he flew as an observer with Longmore during Army maneuvers. In less than an hour, Trenchard was able to locate the opposing force. He and Longmore reported back to headquarters, then set out again to find their side's cavalry and redirect them.

Trenchard realized that no army could maneuver in secret, with airplanes to spot them. From 1912 on, he was convinced that aviation would change the conduct of war.

Horatio H. Kitchener, the war minister, and Churchill, running the admiralty, were both believers in aviation—Churchill the more so. But the real man to impress was Gen. Douglas Haig, commander of Britain's First Army, in the World War I trenches in France.

Trenchard soon got his chance. He went to France in November 1914 as commander of one of the Royal Flying Corps' three operational wings. His observation of the war to date convinced him the corps was too cautious. Trenchard believed it was vital to fight for air ascendancy, not just undertake routine patrols and reconnaissance. Summoned to a meeting

Hulton Picture Library

Winston Churchill (in flying helmet) returns from a flight in 1915, greeted by a crowd of well-wishers. Churchill's enthusiasm for aviation aided Trenchard in his push to expand resources and responsibility for Britain's fledgling air arm.

with Haig in early January 1915, Trenchard learned of secret plans for a March offensive at Neuve Chappelle and offered his view on what air units could do.

Abandoning Caution

"I explained rather badly about artillery observation (then in its infancy), reporting to gun batteries by Morse and signal lamps, and of our early efforts to get wireless going," Boyle quotes Trenchard as saying. Scouring maps of the front with Haig, Trenchard explained where his squadrons would be. He convinced Haig. According to Boyle, Haig told him: "Well, Trenchard, I shall expect you to tell me before the attack whether you can fly, because on your being able to observe for the artillery and carry out reconnaissance, the battle will partly depend. If you can't fly because of the weather, I shall probably put off the attack."

In February, Trenchard's airmen scored a coup that justified such confidence. Trenchard had encouraged them to replace sketch pads with cameras for reconnaissance of German trench lines. One set of photographs uncovered German lines around a brick factory. Trenchard briefed Haig's ground commanders, who, using the aerial photos, took the brickworks in daylight. Now Haig wanted the aviators to not only map the whole trench line but also stage an aerial bombardment, in conjunction with the artillery barrages that were to precede the offensive. He approved an elaborate scheme linking aerial observers and artillery.

Haig summoned Trenchard to his headquarters at midnight on March 8 and asked him to send up a pilot at dawn for a weather report. Despite lingering low clouds, the fliers took to the air in perhaps the first instance in which air support was directly linked to a major ground assault.

Unfortunately, the Neuve Chappelle assault was not a success. The Germans regrouped and repulsed the attack. Haig did not fault his air support. Instead, he reprimanded his artillery commanders for ignoring aerial signals.

Trenchard realized, however, that the aerial bombing raids were too piecemeal and, in some cases, had failed altogether. Haig continued to look to Trenchard for support, though, and, for the spring offensives, Haig again asked Trenchard to provide aerial reconnaissance and bombing of targets behind enemy lines.

Imperial War Museum

Gen. Douglas Haig was receptive to Trenchard's ideas for the use of air in World War I. Here, Haig confers wih British war minister David Lloyd George (right), as French minister Albert Thomas and French Gen. Joseph Joffre look on.

In August 1915, Trenchard became commander of all British air forces in France. One month later, at the Battle of Loos, Trenchard's fliers sketched out for the first time a campaign recognizable as full-scale support to a land commander. It began again with meticulous mapping of enemy strong points, giving British heavy artillery targets in advance.

Haig hoped to break German lines at Loos at a narrow point then pour infantry reserves through the gap. To aid the plan, Trenchard's squadrons carried out three days of bombing of rail junctions and other targets to hinder movement of German reserves into the gap. The ground attack began Sept. 25, 1915. Airmen once again spotted for artillery, but Trenchard, for the first time, held some squadrons in reserve, dispatching them where needed, as the heavy fighting shifted. They were to survey the lines at low level and to update positions of enemy and friendly forces for the artillery. Communications were inadequate, so he pulled some pilots out of their cockpits and assigned them to the ground troops to signal patrolling aircraft during the battle.

Reconnaissance, interdiction, close air support, air liaison: the Battle of Loos featured them all, and it was Trenchard's handiwork.

The operation as a whole was no more successful than any of the other British assaults of 1915, yet senior military leaders recognized the value of the aerial support. The Battle of Loos brought Trenchard a promotion to general and, far more important, a citation from the British Expeditionary Force commander in chief, Field Marshall John D.P. French, praising the Royal Flying Corps for its work, especially the railway bomb attacks, which disrupted enemy communications.

Trenchard's practical insights had made airpower a partner—albeit a junior partner—among the combined arms. Next, Trenchard sought air superiority.

The technically superior German Fokker, with its synchronized machine guns, dominated the western front in late 1915. Following soaring Royal Flying Corps losses in November and December, Trenchard imposed a new rule on his pilots: Any aircraft flying reconnaissance must be escorted by at least three other aircraft, and all the aircraft must fly in close formation. Formation flying thus became a fundamental tactic, along with taking the offensive to establish air superiority.

Trenchard's tactics worked so well that the French, under pressure at Verdun in February 1916, began to borrow his style of concentrating airpower and fighting for air superiority. Trenchard coached the French air forces—through his French-speaking aide-de-camp, Capt. Maurice Baring—over Verdun as they battled back

and forth with the German airmen for air superiority.

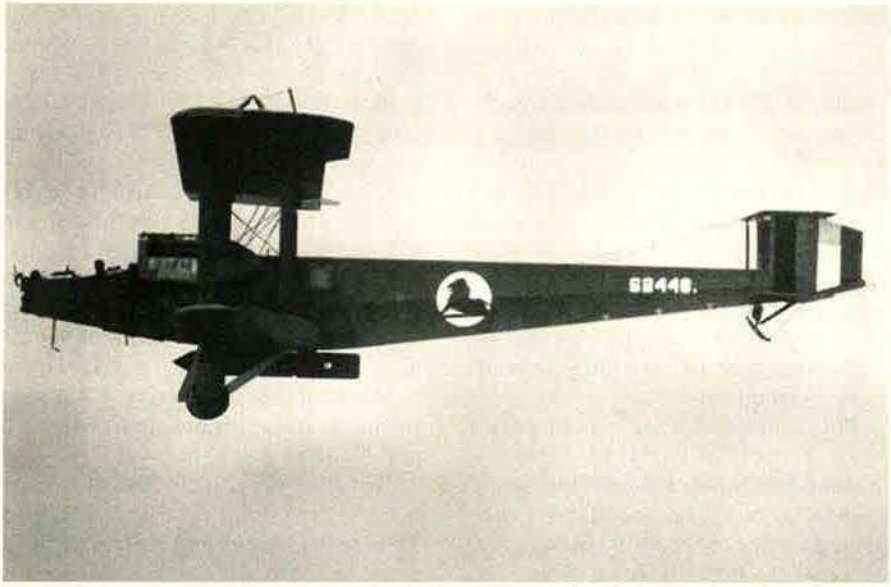
The lessons of 1916 showed that the air arm had to protect its own ability to operate—establish air superiority—before it could assist ground forces. Trenchard managed it smoothly. Haig, who was now in overall command of British forces in France, continued to call on him for air support plans and favored Trenchard by sending him choice staff officers to relieve some administrative burdens.

Imperial War Museum

By the end of World War I, Trenchard had made the RAF a critical part of an integrated land-air team. Here, Queen Mary, escorted by Trenchard (on her left), inspects aircraft in France in 1917.

Birds of a Feather

Word of Trenchard's expertise reached the ears of a US Army officer, one Lt. Col. William Mitchell, when he arrived in France in the spring of 1917, a peak time for offensives. Mitchell drove to Trenchard's country-house headquarters and asked to see him as Trenchard was about to leave on an inspection trip. Trenchard was brusque when Mitchell said he wanted to see all the Royal Flying Corps squadrons, equipment, and supplies and, of course, to hear all Trenchard could tell him about air operations. Trenchard, per an account in his biography, was true to form, barking out: "Do you suppose I've got nothing better to do than chaperone you and answer questions?"



Massive in those days, the Handley Page played a pivotal role in demonstrating some of Trenchard's theories of bombing. The aircraft was built in the US for Britain. Note the large bomb slung beneath the fuselage.

Mitchell, according to Boyle, replied: "I don't suppose anything, General. I just know you've got a good organization here. It won't miss you if you take a day or two off, no matter how bad you say things are."

Trenchard admired well-placed brashness. Three days of inspection tours and discussions followed. Mitchell left with a crash course in the principles of airpower and a fatherly invitation from Trenchard to seek him out any time. Mitchell later wrote that never had he spent a more instructive time.

Trenchard called Mitchell "a man after my own heart," wrote Boyle.

A year later, Mitchell sought out Trenchard's advice as the American planned his nation's first major air campaign—the Battle of St. Mihiel in September 1918. No doubt Trenchard's clout and backing helped Mitchell secure cooperation from the British, French, and Italian Air Forces. It also may have helped boost Mitchell's handful of American squadrons into a 1,400-airplane force.

Allied aircraft patrols gained air superiority over the lines, observation aircraft supported the half-million men on the ground, pursuit airplanes bombed behind German lines, and Trenchard's bombers hit rail junctions and other deep targets. Mitchell had played it in the style pioneered by Trenchard.

Despite these successes for airpower and Trenchard's ease with Allied airmen, he often faced trouble with his superiors in London. The discord reached a peak in April 1918 when Trenchard abruptly quit his post as the first chief of the Air Staff after only four months in the job and just two weeks after formation of the Royal Air Force. He blamed headquarters politics. However, within a few weeks, he expressed shame at his behavior at a time when the Germans were poised to invade Paris. Returning to France, Trenchard took command of an inter-allied independent bomber force.

Strategic Bombing

Trenchard's aim was to use long-range bombing to take more of the offensive to Germany itself, but the French commanders, who were leery of the independent air force, needed convincing. The father of the RAF

Trenchard was not a major airpower player in World War II, but he continued his development of bombing theory. Here, he talks with a protégé, Air Chief Marshal Arthur Tedder, who later served as deputy supreme allied commander.

faced an issue that would hound air commanders until the end of the 20th century: the allocation of airpower. Even the head of the French air service, Gen. Maurice Duvall, believed that allocating bombers to Trenchard for independent bombing equated to making the bombing of Germany the primary objective and relegated defeat of the enemy in the field to a secondary role.

The debate laid bare the essential point: Armies had grown attached to airplanes, and the trade-offs necessary to apply airpower to theaterwide objectives raised huge concerns for ground commanders. They were not soothed by Trenchard's assurances that he could easily divert bombers to support missions when ground forces got in trouble.

The 1918 campaign did not resolve this issue; indeed, it reappeared in every major combined campaign until the end of the 20th century.

In the summer of 1918, with all eyes on his bomber force, Trenchard had to produce results. His strategy was to distribute attacks across different points in Germany to keep the German Air Force off balance and unable to concentrate against the Allies. Trenchard's favorite targets were railways, since the Germans were short of rolling stock, and blast furnaces, because they were easy to find at night. His pilots also specialized in bombing German airfields.

His new challenge was motivating aircrews to carry out the campaign in spite of nearly overwhelming hazards. They not only had to make deep night bombing raids, flying underpowered machines loaded with bombs weighing up to 1,650 pounds, but also had do it in bad weather. Trenchard, as quoted by Boyle, later said, "My job was to prod, cajole, help, comfort, and will the pilots on, sometimes to their death." His customary technique was to make frequent unannounced visits and talk straight. Often he watched the squadrons take off, waiting up until they returned.

The Handley Page bomber crews were Trenchard's prized veterans, assigned the most difficult long-range night missions. The aircraft were also prized for the loads they could carry. Metz, Cologne, Coblenz, Stuttgart, and many tactical targets in Germany felt the weight of Trenchard's bombers. They routinely raided cities up to 200 miles from their bases in France. Steadily, their bomb tonnage increased, from 70 tons dropped in June to 1,000 tons in August.

Maintaining the RAF

After World War I, Trenchard battled for the continued existence of the Royal Air Force. In 1919, Churchill, who became secretary of war and air, recalled Trenchard to be chief of the Air Staff, a position he kept until his retirement in 1929.

During his tenure as Air Staff chief, he dealt with the impact of depleted budgets and fended off Army and Navy efforts to eliminate the RAF. Trenchard also established the RAF College at Cranwell and continued to promote training, organization, and technological advances as the solid foundations of the force.

When World War II broke out, Trenchard was in his early 60s and played no major role in it. Churchill did ask him to visit the squadrons during the Battle of Britain.

Many of the pilots Trenchard had helped to train now led the RAF. Not least among them was Charles F.A. "Peter" Portal, who soon became chief of the Air Staff, and Arthur W. Tedder, one of his young squadron commanders of 1918, who became deputy supreme allied commander to Gen. Dwight D. Eisenhower and a force behind the unified application of airpower in the Normandy invasion and beyond.

Trenchard pushed hard for unrelenting air attacks on Germany. He believed the airpower rout of German Gen. Erwin Rommel in North Africa reconfirmed the role of air superiority and the application of airpower in land warfare. According to Boyle, Trenchard wrote, "We won the battle of the air before El Alamein and Tunisia could be won."

British, French, and American airmen in two wars all owed much to Trenchard's practical ability to mold airpower into a respected weapon of warfare. That he did so in an age when airpower's technologies were still sorely lacking made the feat even more remarkable.

During and after the war, Trenchard was instrumental in raising money for the Battle of Britain Chapel in Westminster Abbey and, on his death in 1956, he was buried there. The formidable marshal of the RAF left a profound airpower legacy that showed itself best in those he influenced. ■

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AFA / AEF National Report

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By Frances McKenney, Assistant Managing Editor

Space Award at LA Ball

Maj. Robert K. Sheehan received the Gen. Thomas D. White Space Award at the 32nd annual Air Force Ball held in November at the Century Plaza Hotel in Los Angeles. The award—named for USAF's fourth Chief of Staff—honored Sheehan as an outstanding contributor to the nation's aerospace progress.

He is an instructor at the USAF Weapons School at Nellis AFB, Nev., and received the award for integrating space capabilities into combat operations in Afghanistan. According to his citation, Sheehan's efforts "directly contributed to the rapid collapse of the Taliban regime and resulted in the rescues of American soldiers and airmen."

AFA National President Stephen P. "Pat" Condon and Sebastian F. Coglitore, board chairman of the **Gen. B.A. Schriever Los Angeles Chapter,** made the presentation.

The Los Angeles Ball is sponsored by AFA and the Schriever Chapter, with assistance from the **General Doolittle Los Angeles Area Chapter** and the **Orange County/Gen. Curtis E. LeMay Chapter.**

USAF photo by Ron Hall

AFA National President Pat Condon (right) presents the Gen. Thomas D. White Space Award to Maj. Robert Sheehan at the Air Force Ball in Los Angeles in November. Sebastian Coglitore (left), board chairman of the Gen. B.A. Schriever Los Angeles Chapter, assisted.

More From LA

In another award presentation during the gala, retired Gen. Lester L. Lyles was named an Aerospace Education Foundation General Schriever Fellow. The award recognized Lyles's Air Force career, including command of Space and Missile Systems Center at Los Angeles AFB, Calif. A former USAF vice chief of staff (1999-2000), Lyles retired in October as head of Air Force Materiel Command.

Schriever Chapter President Wayne R. Kauffman served as master of ceremonies for the ball and introduced special guests, among them Peter B. Teets, the undersecretary of the Air Force and DOD executive agent for space, Gen. John P. Jumper, the USAF Chief of Staff, and four Medal of Honor recipients: retired Army Maj. Gen. Patrick Brady, retired USAF Col. Joe M. Jackson (a **Greater Seattle Chapter** member), retired USAF Col. Bernard F. Fisher (**Salt Lake City Chapter** member), and retired Army Chief Warrant Officer Michael J. Novosel (**Montgomery Chapter,** Ala.).

Ronald D. Sugar, chairman, chief executive officer, and president of Northrop Grumman, served as general chairman for the event. He told the audience that the Air Force Ball in Los Angeles supports AEF and the Schriever Chapter's Education Foundation and has, over the last 32 years, raised $3.3 million. In one of the evening's highlights, he presented a check for $115,000 to L. Boyd Anderson, the AEF Chairman of the Board, and Coglitore.

A list of past recipients of the Gen. Thomas D. White USAF Space Award appears in the May 2003 USAF Almanac issue, p. 159.

Roses for Pearl Harbor

AFA Chairman of the Board John J. Politi was a keynote speaker for a ceremony commemorating the 62nd anniversary of Pearl Harbor. The event, called Dropping of the Roses, took place on Long Island, N.Y., and was sponsored by the **Long Island Chapter** and *USA Today* newspaper.

Other dignitaries joining Politi at the ceremony were Rep. Steve J. Israel (R-N.Y.), who is a member of the House Armed Services Committee, Rep. Tim Bishop (D-N.Y.), and several members of the local Pearl Harbor Survivors Association.

During the gathering, one American Beauty rose for each year since Dec. 7, 1941, was blessed, along with a wreath to honor those killed in the 9/11 terrorist attacks. Usually, vintage aircraft then fly the roses to the Statue of Liberty in New York Harbor and drop them at 12:55 p.m., the East Coast time of the Japanese attack on Pearl Harbor. Because of snowy weather this year, a NYC police helicopter made the drop instead.

Joseph S. Hydrusko of Massapequa, N.Y., started Dropping of the Roses in 1970 as a way to honor fallen comrades. He had been serving on a hospital ship when Pearl Harbor was bombed and saved many sailors afterward. He flew the first rose drop in his own World War II-era Stinson airplane.

New York State President Fred Di Fabio directed the event. It was planned by Long Island Chapter President William G. Stratemeier Jr., with help from chapter officers David E. Boone, Irwin Hansen, Alphonse Parise, Cathy Ward, and Clifford R. Way. Chapter Vice President Christopher Patti hosted the ceremony.

ManTech Moderator

AFA National President Stephen P. "Pat" Condon was moderator for a panel at the 2003 Defense Manufacturing Conference in Washington, D.C., in December.

The conference was hosted by the Joint Defense Manufacturing Technology (ManTech) Panel. The four-day event attracted 700 attendees. It offered technical presentations and forums on the defense industrial base and DOD's transformational initiatives, bringing together senior level leaders from all services, government, and the defense industry. Air Force Secretary James G. Roche was a featured speaker.

Condon delivered opening remarks on the conference's third day, when the focus turned to industry leadership perspectives on government policy, programs, initiatives, and workforce issues. He then led a panel discussion and, on the final day of the conference, delivered a summary to a select group of government and industry leaders.

Conference organizers tapped Condon for these high-profile roles because of his AFA office, his Air Force background in science and technology, research and development, and test and logistics, and his experience as consultant for Dayton Aerospace of Dayton, Ohio.

Condon said that, as panel moderator, he highlighted aspects of AFA's Statement of Policy that address the defense industrial base.

In Washington State

AFA National President Condon and AEF Board Chairman Anderson traveled to Seattle in November to learn about operations at Boeing's Developmental Center. They received briefings on the 767 tanker and unmanned combat attack vehicle programs and visited the F/A-22 production line.

O. Thomas Hansen, Northwest Region president, Kenneth J. St. John, Washington state president, and I. Fred Rosenfelder, **Seattle Chapter** president, joined them for the orientation.

The AFA leaders, and Helen F. McGregor, **McChord Chapter (Wash.)** president, went on to spend an afternoon at McChord Air Force Base.

Col. Frederick H. Martin, 62nd Airlift Wing vice commander and a McChord Chapter member, presented them with information on the base's mission and programs. More than 5,000 military and civilian personnel operate and support C-17 transports at McChord.

In the C-17 Simulator Section, the visitors "flew" a local C-17 mission profile and later went through the base's newest airlifter parked on the flight line. At the base's AETC Field Training Flight, they looked at innovative devices used to train maintenance and aircrew members. The McChord orientation finished up at the 22nd Special Tactics Squadron, where they received a briefing on the unit's mission, equipment, and recent work in Afghanistan and Iraq.

The next day, Condon and Anderson participated in the AFA Northwest Region Workshop. Hansen said that Condon discussed three key topics: AFA's strategic planning process, the need for leadership development, and development of an active membership program. Anderson's presentation covered new AEF initiatives and suggestions on renewing contacts with local Civil Air Patrol and ROTC units.

New AFA Chapter

Rep. Tom Latham (R-Iowa) launched AFA's newest chapter Nov. 1 by formally presenting the charter for the **Fort Dodge Chapter (Iowa)** to Justin M. Faiferlick, chapter vice president.

Marvin L. Tooman, Iowa state president, participated in the ceremony, which took place at the 133rd Test Squadron (ANG) in Fort Dodge. The chapter's inaugural meeting included a POW/MIA remembrance ceremony and an informal talk by Latham, a five-term Congressman and member of the House Appropriations Committee.

In particular, Latham noted the 133rd's innovative work. The squadron has helped develop a command and control hub called the Battle Control Center-Experimental. In a recent demonstration of BCC-X capabilities, the system linked six radars—three in the Midwest and one each in Baghdad, Afghanistan, and Puerto Rico—and two data link pictures. This allowed the unit to simultaneously direct live control missions over Iowa and communicate with KC-135s over Iraq.

Two dozen of the chapter's 31 initial members turned out for this chapter meeting, reported Faiferlick, an ANG captain. The full-time Guardsman is an air battle manager by training and serves as the 133rd's director of operations. He said he used to face the choice of traveling 90 miles from Fort Dodge for an AFA meeting of the **Gen. Charles A. Horner Chap-**

AFA Chairman of the Board John Politi speaks at a Dec. 7 remembrance ceremony held at Republic Airport, Farmingdale, N.Y. We must never become complacent about what is needed to preserve our national security and freedom, he told the audience. See "Roses for Pearl Harbor," p. 82.

ter in Des Moines or traveling 100 miles for a **Richard D. Kisling Chapter** meeting in Sioux City.

Instead, he and Richard Breitbach, the 133rd's commander, organized the Fort Dodge Chapter. The chapter will host AFA's Iowa State Convention this spring.

Firsthand Info on Iraq

In August, **Denton Chapter (Tex.)** members heard a Congressman's perspective on the war in Iraq when guest speaker Rep. Michael C. Burgess (R-Tex.) addressed an audience at Texas Woman's University in Denton.

Chapter President J. Brandon Barnes said the gathering was part of the annual joint meeting the chapter holds with the Texas Pilots Association.

Burgess had just returned from a three-day visit to Iraq in late August. He had been part of an 11-member Congressional delegation, headed by Rep. Tom Davis (R-Va.). The group visited military members to gauge morale there, to learn details of the attacks on troops, and to examine reconstruction efforts. They also met with officials of the Coalition Provisional Authority. The delegation stayed in Kuwait and traveled each day into Iraq, visiting Baghdad, Mosul, Tikrit, Babylon, and Al Hillah, a city revealed during Operation Iraqi Freedom as the site of several mass graves.

Burgess, a first-termer, also talked to the Denton audience about his first year in Congress.

Joint Effort

Three California chapters joined forces to help run AFA booths at an air show in October at Edwards AFB, Calif.

The **Antelope Valley Chapter,** headed by Randolph H. Kelly, took the lead in manning an AFA booth in the Air Force Flight Test Center's VIP tent. A second booth was set up on the flight line. Volunteers from the **Charles Hudson Chapter** were led by Fred B. Phillips and Ken Nishiyama, current and past presidents. From the **Gen. B.A. Schriever Chapter** came Melissa K. Ayala, Bob Peterson, Robert I. Recker Jr., and Don K. Tomajan, who were among the AFAers handling a variety of air show tasks, from coordinating workers to setting up beforehand and cleaning up afterward.

Some of the VIPs who stopped by the AFFTC tent: three legendary Edwards test pilots, retired Brig. Gen. Charles E. Yeager, who in 1947 flew the X-1 faster than the speed of sound; retired Col. William J. "Pete" Knight, who flew X-15s; and retired Maj. Gen. Joe H. Engle, the only astronaut to have flown two entirely different winged vehicles—an X-15 and the space shuttle—into space.

The air show and open house made headlines when the F/A-22 Raptor carried out its first public flight—with several low passes over the crowd on both days—and when a B-1B Lancer unofficially set nearly 50 world records during two flights. The bomber's record-breaking courses included three 15-, 25-, 100-, 500-, and 1,000-kilometer speed dashes.

Kelly said more than 30 Antelope Valley Chapter Community Partners contributed resources to the air show. One of them donated food and catering for the more than 100 volunteers behind the scenes who helped the B-1B establish its records.

More X-15 Legends

Another X-15 pilot, William H. Dana, spoke at the November meeting of the **Charles Hudson Chapter (Calif.)** in Bakersfield, Calif.

The occasion served to honor Dana's 40-year career with NASA, from which he retired in 1998 as chief engineer at the Dryden Flight Research Center at Edwards AFB, Calif. He received a Congressional Certificate from Rep. William M. Thomas (R-Calif.) and a Hudson Chapter Outstanding Service award, presented by Chapter President Fred B. Phillips.

Dana spent four years as an Air Force fighter pilot after graduating from the US Military Academy. He began at Dryden as a simulator pilot for the X-15 and went on to complete 16 X-15 research missions, including the aircraft's 199th and last flight Oct. 24, 1968. During those flights, he reached Mach 5.53 (3,856 mph) and, like Engle (above), qualified for astronaut wings by piloting the aircraft to more than 50 miles.

Dana became a pilot for the Lifting Body Program, flying experimental wingless vehicles to determine if energy management techniques could be used to make precision landings after gliding from high altitudes. In his talk to the chapter, Dana showed video and slides from these flights. Data from this program helped in development of the space shuttle, pointed out John J. Rosso, chapter secretary.

James F. Shambo, 1950-2003

Retired USAF Col. James F. Shambo, an AFA national director, died Dec. 7 of cancer in Niceville, Fla. He was 53 years old.

A native of St. Louis, Colonel Shambo graduated from Bowling Green State University (Ohio) with a business degree and later earned a master's degree in logistics management. He entered military service in 1974 and served for 26 years on active duty, primarily as an RF-4 and U-2 pilot. He retired as commander of the 96th Air Base Wing at Eglin AFB, Fla.

In his civilian career, Colonel Shambo was chief operating officer of CHELCO Services, a subsidiary of the Choctawhatchee Electric Cooperative of DeFuniak Springs, Fla.

He joined AFA in 1974 and had served as **Eglin Chapter** president and as a chapter board member. He became an AFA national director, in a leadership development position, last fall.

James A. McDonnell, 1930-2003

Retired USAF Maj. James A. McDonnell Jr., who retired from AFA in June 2001 as director of special events, died Dec. 21 in Reston, Va., of cardiac arrest. He was 73 years old.

Born in Maple Shade, N.J., he held a bachelor's degree in government from Florida State University and a master's degree from Boston University.

He began working for AFA in 1968, principally on the association's national conventions and symposia and national aerospace awards programs. Even after retiring, he volunteered at the association's National Convention.

More AFA/AEF News

■ At a November dining-out, **Central Florida Chapter** President John T. Brock presented $8,000 in scholarships to a dozen AFROTC cadets from the University of Central Florida's Det. 159 in Orlando, Fla. Receiving scholarships ranging from $525 to $1,000 were: Yalunda Akinloba, Priscilla Carrera, Skyler K. Dobbin, Carson Dobbs, David Gordon, Brad Haynes, Derrick Langley, Jeremy Regans, Christopher Reveiz, Christina D. Simpson, Joseph Vargas, and Samuel Williams. USAF Brig. Gen. Henry L. Taylor, vice director for logistics on the joint staff, and Lt. Col. Timothy D. Wieck, commander of the detachment as well as a chapter member, helped present the scholarships. ■

Correction

In the January "AFA/AEF National Report," p. 86, SSgt. Amy McNeal's unit should have been listed as the 19th Maintenance Squadron.

Unit Reunions

reunions@afa.org

12th Missile Sq, Malmstrom AFB, MT. March 4-6 in Great Falls, MT. **Contacts:** Capt. Amy Sitze (amy.sitzea@malmstrom.af.mil) or Lt. Tim Ryan (timothy.ryan@malmstrom.af.mil).

18th FW/FG. April 28-May 1 in Dayton, OH. **Contact:** Tom Ryder (806-352-0345) (redryder4@cox.net).

56th FG. June 17-19 at the Holiday Inn in Fairfax, VA. **Contact:** Ron Brubaker, PO Box 57, Red Creek, WV 26289 (304-866-4415) (rclif@frontiernet.net).

67th TFS (1962-67). March 19-21 in San Antonio. **Contact:** Wes Schierman (425-228-5534) (wess@premier1.net).

80th FG (WWII). May 11-15 in Indianapolis, IN. **Contact:** Tom Wheeler, 4487 E. 250 S., Shelbyville, IN 46176 (317-392-1031) (tawheeler@lightbound.com).

100th BW, Pease AFB, NH. Sept. 30-Oct. 3 in San Diego. **Contacts:** Bill Francke, 1 Redwood Tree Ln., Irvine, CA 92612-2226 (949-786-9575) (bjfrancke@aol.com) or Dave Lambert, 6 Portside, Irvine, CA 92614-7061 (949-786-1914) (tlamb529@aol.com).

303rd BG, Eighth AF, Molesworth, UK (WWII). Aug. 26-30 in Savannah, GA. **Contact:** Eddie Deerfield, 3552 Landmark Trl., Palm Harbor, FL 34684 (ed303fsra@aol.com).

303rd BW, Davis–Monthan AFB, AZ (1953-64). April 22-25 at the Viscount Suite Hotel in Tucson, AZ. **Contact:** D.H. Bott (520-825-2056) (dhbott@juno.com).

320th ARS, March AFB, CA (1952-62). Sept. 20-24 in Colorado Springs, CO. **Contacts:** John and Winnie Burdan, 10118 W. Roxbury Ave., Littleton, CO 80127-3423 (303-972-9296) (wburdan119@aol.com).

349th TCG (WWII), including the TCW, FBW, MAW, and AMW. May 29 at the Travis AFB, CA, Conference Center. **Contact:** S.A. Owens, 125 Bayview Dr., San Carlos, CA 94070 (phone/fax: 650-595-4344) (saocol@aol.com).

353rd/614th TFS, Torrejon AB, Spain (1970-75). April 9-11 in Las Vegas. **Contact:** Ron Offley (505-682-6027) (offley@nmsua.nmsu.edu).

364th FG and support units, Eighth AF, Honington, UK (WWII). Sept. 27-Oct. 4 at the Holiday Inn National Airport/Crystal City in Arlington, VA. **Contact:** Dan Leftwich, 6630 Caldero Ct., Dayton, OH 45415 (937-890-3641).

394th BS and **4th Recon Sq.** May 27-31 at the Sheraton Crystal City Hotel in Arlington, VA. **Contact:** Dag Larsen (949-725-6460) (daglynn@aol.com).

494th BG (H) WWII. May 12-16 at the Drawbridge Inn in Fort Mitchell, KY. **Contacts:** Marshall Keller, 7412 A Vassar Dr. East, W. Bloomfield, MI 48322 (248-626-3684) or Eunice Goodrich, 340 Country Club Dr., Mt. Vernon, IA 52314 (319-895-8162).

735th AC&W Sq, Morocco (1952-60). April 16-20 at the Holiday Inn Palo Verde in Tucson, AZ. **Contact:** Steve Greef, 434 W. Jackson St., Belvidere, IL 61008-2506 (815-544-3682) (segreef735@juno.com).

815th TCS. April 16-18 in Biloxi, MS. **Contact:** Jim Elmer, 2512 Fairway Ave., North Little Rock, AR 72116 (501-771-4106) (jimelmer@swbell.net) (http://www.c130.up.to).

Air Commando Assn. Oct. 8-10 in Fort Walton Beach, FL. **Contact:** (phone: 850-581-0099 or fax: 850-581-8988) (aircomando@aol.com).

Air Force Missileers. May 19-23 at the Marriott Hotel in Omaha, NE. **Contact:** Charles Simpson, AAFM, Box 5693, Breckenridge, CO 80424 (phone/fax: 970-453-0500) (AAFM@afmissileers.org).

Air Forces Escape and Evasion Society. April 29-May 3 in King of Prussia, PA. **Contact:** Clayton David, 19 Oak Ridge Pond, Hannibal, MO 63401 (573-221-0441) (davidafe@packetx.net).

Air Force Public Affairs Alumni Assn. April 29-May 1 in Sandestin, FL. **Contact:** Linda Arnold, Attn: AFPAAA, 1831 Parhaven Dr., San Antonio, TX 78232.

Air Transport Command Assn (WWII). May 13-15 in Tucson, AZ. **Contacts:** Rick and Gail Ravitts (815-229-1122) (devonshir@att.net).

Aviano AB, Italy (1955-present). Nov. 3-7 at the Riverwalk Drury Inn & Suites in San Antonio. **Contacts:** Ben or Lynn Catalina, 8510 Aesop Ln., Universal City, TX 78148 (210-658-8388) (bcatalina@satx.rr.com) (http://www.avianoreunion.com).

Aviation Cadet Pilot Training Class 54-G. April 14-18 in Phoenix. **Contact:** John Schaefer, 18894 N. 69 Ave., Glendale, AZ 85308 (623-561-5000) (johntomoko3@cox.net).

B-24H (serial # 45-52569, which crash-landed April 9, 1944, near Saksfjed, Denmark) aircrew and families. April in Denmark. **Contact:** Jette Smith (phone: 210-558-5865 or fax: 210-558-9657) (dkdane@juno.com).

Defense Communications Agency. April 30-May 2 in Gettysburg, PA. **Contact:** C.R. Timms, PO Box 1531, Taylors, SC 29687 (864-292-1953) (dcacrtimms@mindspring.com).

Forward Air Controllers. May 5-8 in San Antonio. **Contact:** EEM Tours (800-tours-12 or 214-366-9777) (fac2004@onlinemeetingservices.com).

RF-101 pilots. May 20-22 in Nashville, TN. **Contact:** Chuck Lustig, 2353 Mt. Vernon Dr., Sumter, SC 29154 (803-499-4098) (vulturebait@earthlink.net).

Stategic Air Command. May 12-15 at the Isle of Capri Hotel & Casino in Shreveport, LA. **Contacts:** Peyton Cole (318-742-8071) (peyt1@earthlink.net) or Steve dePyssler (866-544-2412) (rao@barksdale.af.mil).

Seeking all who served in the **667th, 932nd, 933rd, and 934th AC&W Radar Sqs,** Iceland (1952-present) for a reunion. **Contact:** William Chick, 104 Summit Point Ct., Chapin, SC 29036 (803-932-9596) (littlechick@msn.com). ■

Books

Compiled by Chequita Wood, Editorial Associate

American Women and Flight Since 1940. Deborah G. Douglas. University of Kentucky Press, Lexington, KY (800-839-6855). 359 pages. $29.95.

FJ Fury in Detail and Scale. Bert Kinzey. Squadron/Signal Publications, Carrollton, TX (800-527-7427). 79 pages. $14.95.

I Remember Korea: Veterans Tell Their Stories of the Korean War, 1950-53. Linda Granfield. Clarion Books, New York (800-225-3362). 136 pages. $16.00.

The Blitzkrieg Myth: How Hitler and the Allies Misread the Strategic Realities of World War II. John Mosier. HarperCollins Publishers, New York (212-207-7000). 338 pages. $27.50.

Marauder: Memoir of a B-26 Pilot in Europe in World War II. Louis S. Rehr with Carleton R. Rehr. McFarland & Co., Jefferson, NC (800-253-2187). 220 pages. $35.00.

SR-71 Blackbird: Walk Around No. 32. James Goodall. Squadron/Signal Publications, Carrollton, TX (800-527-7427). 79 pages. $14.95.

Combat in the Sky: The Art of Warfare. Philip Handleman. MBI Publishing, St. Paul, MN (800-826-6600). 203 pages. $40.00.

Messerschmitt Bf-110/Me-210/Me-410: An Illustrated History. Heinz Mankau and Peter Petrik. Schiffer Publishing, Ltd., Atglen, PA (610) 593-1777. 360 pages. $69.95.

"Tex" Hill: Flying Tiger. David Lee "Tex" Hill with Maj. Reagan Schaupp, USAF. Order from: Tex Hill, c/o Nathan Schaupp, 129 James Cir., Central, SC 29630 (864-639-1545). 318 pages. $31.10.

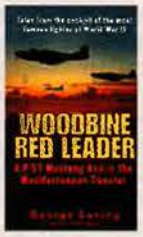
Combat Legend: F-4 Phantom. Martin W. Bowman. Stackpole Books, Mechanicsburg, PA (800-732-3669). 96 pages. $14.95.

The Muslim–Croat Civil War in Central Bosnia: A Military History, 1992-1994. Charles R. Shrader. Texas A&M University Press, College Station, TX (800-826-8911). 223 pages. $42.95.

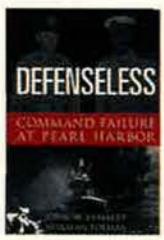
Warrior Soul: The Memoir of a Navy SEAL. Chuck Pfarrer. Random House, New York (800-726-0600). 332 pages. $25.95.

Countering Terrorism: Dimensions of Preparedness. Arnold M. Howitt and Robyn L. Pangi, eds. MIT Press, Cambridge, MA (800-405-1619). 477 pages. $25.00.

One Hundred Years of World Military Aircraft. Norman Polmar and Dana Bell. Naval Institute Press, Annapolis, MD (800-233-8764). 432 pages. $32.95.

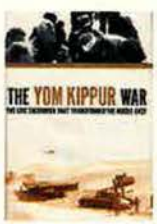


Woodbine Red Leader: A P-51 Mustang Ace in the Mediterranean Theater. Lt. Gen. George Loving, USAF (Ret.). Ballantine Books, New York (800-733-3000). 292 pages. $6.99.



Defenseless: Command Failure at Pearl Harbor. John W. Lambert and Norman Polmar. MBI Publishing, St. Paul, MN (800-826-6600). 256 pages. $27.95.

Operation Overflight: A Memoir of the U-2 Incident. Francis Gary Powers with Curt Gentry. Brassey's, Herndon, VA (800-775-2518). 327 pages. $24.95.



The Yom Kippur War: The Epic Encounter That Transformed the Middle East. Abraham Rabinovich. Schocken Books, New York (800-726-0600). 543 pages. $27.50.

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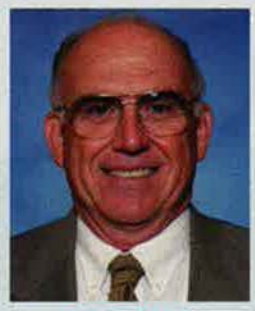

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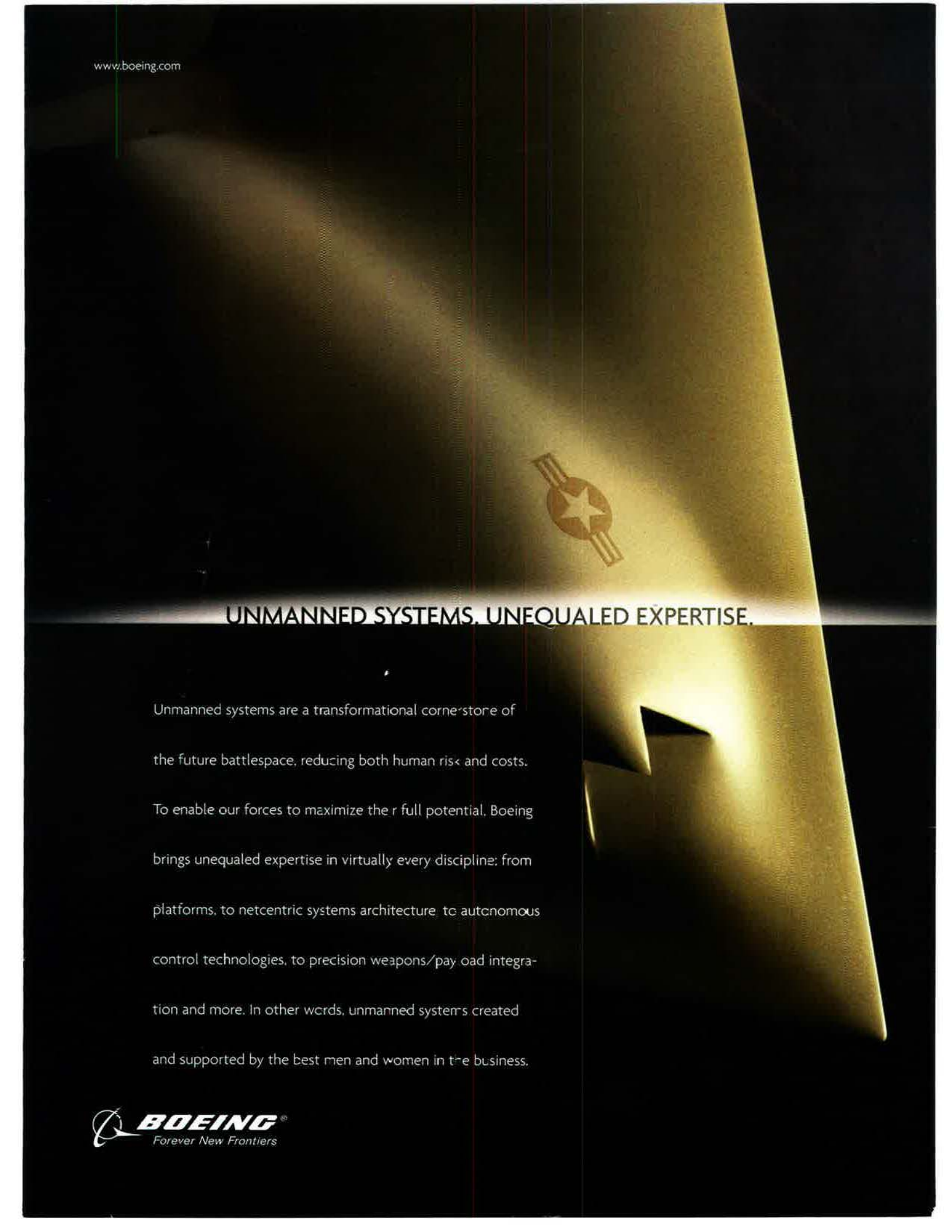
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