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AIR FORCE MAGAZINE

JOURNAL OF THE AIR FORCE ASSOCIATION

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December 2003, Vol. 86, No. 12

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About the cover: Wilbur (left) and Orville Wright sit on the porch steps of their home in Dayton, Ohio. NASM photo. See "Dawn at Kill Devil Hill," p. 22.

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Editorial

By Robert S. Dudney, Editor in Chief

Enola Gay II

THE National Air and Space Museum recently unveiled its plan to exhibit, fully assembled, the *Enola Gay*—the B-29 which, in August 1945, dropped an atomic weapon on Japan. The announcement sparked a nasty outburst of antinuclear demagoguery. Protestors assailed the museum for "whitewashing" history, and more.

The focus was the Dec. 15 opening of NASM's Udvar–Hazy Center near Washington, D.C. This gleaming facility will house some 300 large aviation artifacts, of which the *Enola Gay* is one. While the opening of the museum should be—and is—cause for celebration, the critics had other plans.

Some 177 scholars, clergy, and activists fired off a petition. Leading the charge was Peter Kuznick, a professor at American University, backed by Daniel Ellsberg, Noam Chomsky, and Oliver Stone, to name a few. They were unhappy that the bomber would be unadorned by antinuclear homilies and presented, to quote NASM head John R. Dailey, "as a magnificent technological achievement."

"You wouldn't display a slave ship solely as a model of technological advancement," retorted David Nasaw (City University of New York). Critics demanded a role in planning a new exhibit, one whose "context" would "stimulate" a "national discussion" about "US nuclear history and current policy."

It was never likely that Dailey, a retired Marine Corps general, would capitulate. On Nov. 7, NASM turned down the petition, saying that the planned exhibit would not "glorify or vilify" the atomic bombing of Hiroshima.

It would be unwise to assume the struggle ends here, however. The protesters are likely to regroup, return, and re-engage. They've done it before.

If you think you've already seen this movie, you're right. NASM was shaken by the same controversy in 1994-95. At its center was the plan of Dr. Martin O. Harwit, NASM's director, and his curators to display a section of the *Enola Gay* fuselage in an exhibit titled, "The Last Act: The Atomic Bomb and the End of World War II." At that time, the antinuclear activists were mostly inside the NASM tent spitting out. Today, they are outside, spitting in. What has not changed is their goal, which is to use the *Enola Gay* as a prop in a politically loaded antinuclear horror show.

Full disclosure: *Air Force* Magazine is not neutral. Former Editor in Chief John T. Correll was the key

If you think you've seen this movie before, you are right.

figure in exposing the earlier problem at NASM. The controversy became a major public issue with publication, in our April 1994 issue, of his article, "War Stories at Air and Space."

At that time, Americans believed the use of atomic weapons in 1945 was a legitimate military action against a dangerous foe to save US lives. They were shocked at hearing details of "The Last Act." It was filled with anti-American speculation. Victim photos emphasized Japanese suffering. President Harry Truman, who ordered the bombings, was very much in the dock.

The article sparked a huge public struggle, well described in Correll's December 1994 editorial, "Airplanes in the Mist."

"In the beginning," he wrote, "the museum was all set to use the *Enola Gay* as a prop in a politically rigged program that made the Japanese in World War II look like victims instead of aggressors. ... It portrayed the Japanese as desperate defenders of homeland and culture, the Americans as ruthless invaders, driven by racism and revenge. Use of the atomic bomb was depicted as a questionable act, if not an immoral one."

Harwit and company soon were swamped by negative public opinion and Congressional anger. Under pressure, Harwit shifted course a bit, but, as Correll noted, the exhibit creators "managed to preserve the gist of their biases."

Next, 48 "historians and scholars" (Kuznick was one) counterattacked, demanding that Smithsonian Secretary I. Michael Heyman stop the "historical cleansing," reject complaints by veterans, and restore Harwit's original, biased morality pageant.

However, nothing could save that exhibit, which the *Washington Post* described as "incredibly propagandistic and intellectually shabby." Heyman eventually pulled the plug and ordered a new exhibit, devoid of antinuclear trappings.

This new exhibit opened in June 1995 and ran for three years to widespread acclaim. Harwit resigned and new management took over at the museum.

What does this record tell us about a possible *Enola Gay* II?

First, this dispute isn't about history. It's about today's defense posture. The protesters' petition states, "We fear that such a celebratory exhibit ... helps build support for the Bush Administration's dangerous new nuclear policies." It reflects the desire of some for drastic cuts in, or even the total abolition of, nuclear arms.

Second, it *is* about a negative vision of America. Kuznick has worried publicly that the exhibit "only helps to legitimize the past use of nuclear weapons" against Japan, as if its legitimacy were seriously in question. To critics, Hiroshima and Nagasaki were unjustified, Japan would have surrendered anyway, and Washington acted only to establish postwar dominance, impress the Soviet Union, or ... something. In short, we have blood on our hands.

The truth was stated by Correll in his May 1995 editorial. "Imperial Japan," he wrote, "started the war, waged it savagely, and refused to surrender until the bombs fell."

To declare this fundamental truth is to court the wrath of the protesters, as veterans' groups and this magazine can testify. Yet it must be done—repeatedly, apparently.

The situation brings to mind the words of "Give 'Em Hell Harry" Truman himself, when asked why he was harsh with his critics. "I never give 'em hell," said Truman. "I just tell the truth, and they think it's hell." ■

Letters

letters@afa.org

Bottom-Up Review Legacy

Yours is one of the magazines I read from cover to cover each month. I especially enjoy the historical articles about our past, even when they are not directly about aviation.

Your recent article *["The Legacy of the Bottom-Up Review," October, p. 54]* was an interesting summary of the events of those difficult times. It is a tribute to our armed forces that most of us survived in spite of the poor civilian leadership of that era.

Lt. Col. Richard W. Gungel,
USAF (Ret.)
Roscoe, Ill.

John Correll presents a compelling warning to politicians and, more to the point, their appointees in his article entitled "The Legacy of the Bottom-Up Review." Unfortunately, I see a very real parallel with the current Administration, especially some of their appointees. General Vail painted that picture very well in his letter, "Rumsfeld and the Army" *["Letters," October, p. 5]*.

It's important those of us who know the folly of the politicians and their appointees get this message out to the American people. Too often the decisions made by these amateur strategists have directly impacted the lives of American servicemen, most notably the action of Les Aspin chronicled in Correll's article. Those servicemen and -women who are serving and dying daily in Afghanistan and Iraq are no less deserving of a sound strategy, adequate resources, and the hope the very politicians who placed them in harm's way won't forget them.

I believe one of the greatest things organizations like AFA can do is to use the power of our membership to take an active part in the political process and try to limit the damage that amateur, incompetent, or even malicious politicians and appointees can do to our country and specifically its military. Every member should be an active voter.

By law, we serve our elected officials; we don't have to vote for them.

Lt. Col. David J. Wallace,
USAF (Ret.)
Kokomo, Ind.

Remain in Germany

Removing most US troops from Germany would be a huge mistake, as noted by [retired] General Meigs, because it would shift military force in Europe to the European Union. *[See "Lighter Footprint, Longer Reach," October, p. 48.]* What a disaster.

Who dominates the European Union? France and Germany. Who is really the dominant force? Germany has the largest population, largest gross domestic product, and largest military. Sure, Germany doesn't have nuclear weapons now, but how long after the last US troop leaves would it take? About three months is a good guess.

If we need to worry about Saddam, Iran, and North Korea getting a nuclear bomb, how much should we worry about Germany? One could argue that Germany hasn't developed nuclear weapons in 58 years since the end of World War II; however, the presence of US and Soviet troops might have had something to do with that.

It has been just over 10 years since East and West Germany were reunited. Have you noticed any difference? How about how our "loyal" German ally fought against us over Iraq? If we remove our troops from Germany, do you think Germany might change some more? I do.

Bill Thayer
San Diego

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

It's About Airplanes

The October piece on the *Enola Gay* exhibit at the Smithsonian's National Air and Space Museum *["Aerospace World: A Preview of the* Enola Gay," *p. 16]* referred to a comment one Hideki Yui of NHK (Japanese media conglomerate) made to the AP. It noted that "Japanese survivors want to focus attention more on the damage of the atomic bomb."

First, it isn't a Japanese exhibit, it's an American one, and it's about airplanes.

Second, are there any sites in Japan where visitors can see displays of the Japanese military's barbaric episodes of butchery in World War II (Nanking, Manila, Bataan, etc.) so that survivors of these atrocities can focus on the "damage" caused by those shameful government-sanctioned policies?

Unlike Germany, Japan has yet to face up to its crimes in World War II (the recent "apology" by the Prime Minister notwithstanding).

Timothy Sweeney
New Carlisle, Ohio

What They Deserve

As Mr. Philip E. Giammarco stated so well in his letter "This Is Support?" in the October issue *[p. 5]*: I, also, am bewildered, dismayed, and fighting mad.

How can anyone living in the USA, with all that is given them (their very existence) by our armed forces, think twice about giving to our soldiers, sailors, and airmen anything less than total medical coverage (100 percent) from the time they sign on the dotted line until they are given their last rites, no matter the cost? *[See: "Action in Congress," October, p. 22.]*

I am amazed that medical coverage and now driver's licenses are

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issued to people who are blatantly breaking the US laws of immigration (cost not a problem), and yet the guys and gals who fought for our country have to struggle to get proper medical coverage.

The United States Army Air Forces gave to me, after serving as a fighter pilot in World War II, backup coverage on medical problems, life insurance, educational costs that literally gave me my career as a civilian pilot, and I didn't have to fight for it. What's happened?

Folks, give them what they deserve—they laid their lives on the line for each and every one of us. I'll gladly pay whatever the costs.

H. Dixon
Irvine, Calif.

Truth About the Anthrax Shot

Your October issue stated that I relented to take the anthrax shot because I did not think I could win the case. *[See "Aerospace World: Pilot Yields on Anthrax Shots," p.19.]* This is untrue. I relented because the Air Force was likely to forbid me from presenting my case at the court-martial. I would be defenseless despite having an excellent defense.

The Air Force had previously disallowed any challenge to the order by those who refused the shot. However, my intent was not to challenge the order, only its implementation. I have no problem with the order or the anthrax vaccine. I object to the presence of the experimental and illegal vaccine adjuvant (booster) squalene.

In May 1999, Air Force Surgeon General Lt. Gen. Charles Roadman, spoke to Dover Air Force Base aircrews, in person and while being filmed, about the anthrax vaccination program. He guaranteed us that there was no squalene in any military shot, including the anthrax shot. Yet FDA testing later revealed the presence of squalene in the vaccine. He probably meant there should not be any squalene, and that would be correct. DOD is issuing superficially plausible, but scientifically ludicrous, explanations for the presence of squalene in the shots.

Injected squalene is entirely different than squalene in the blood, just as injected fecal material would be entirely different than that substance in the bowel. When injected, the body's immune system sees the squalene as an invader and contests it. In animal experiments, interaction with injected squalene corrupted the immune system and resulted in severe autoimmune disorders (the immune system attacking its own body). The medical community, therefore, disapproved squalene's use as an adjuvant.

The current "mystery pneumonia" reportedly infecting troops in Southwest Asia and in the US is likely Churg–Strauss syndrome, or associated pulmonary vasculitis, autoimmune disorders that can cause nonbacterial, nonviral pneumonia, sudden heart attacks, rashes, and other ailments, all inflammatory autoimmune reactions. These diseases are well-described in medical texts, yet the entire military medical corps claims to be mystified by the ailments.

DOD medical rationales on the presence of squalene would be shredded in court, thus the necessity to disallow my evidence. Western civilization is based on the premise that no one, not even the king, is above the law. Yet, apparently the Air Force can declare its

orders, and their implementation, exempt from due process in its own courts.

Lt. Col. Jay F. Lacklen, USAFR
Dover AFB, Del.

Gooney Bird

On p. 80 of the October issue *["Pieces of History: Gooney Bird"],* the C-47's use as a gunship was omitted. This gunship was the forerunner of the AC-119 and the AC-130 and was one of the most effective weapon systems of the Vietnam War. Ask any soldier who had Spooky overhead at night! Its omission must have been an oversight.

Col. John M. Patton, USAF (Ret.)
Colorado Springs, Colo.

You state: "C-47s have hauled supplies, carried paratroopers, evacuated wounded, and dropped flares to guide bomb runs."

In the European theater, not only did we carry paratroopers and other personnel (and perform the other missions you mentioned), we dropped paratroopers into combat in North Africa, Sicily, France, Holland, and Germany. We also towed gliders into all of these combat areas save North Africa. All these missions were performed at low altitude, at minimal speeds, and in aircraft without armor.

Michael N. Ingrisano Jr.
McLean, Va.

Chinese Military

Enjoyed your article on advancements in the Chinese military. *[See "Washington Watch: China Focuses Power on Taiwan," October, p. 8.]*

I do want to point out one error: The Chinese are up gunning their tanks to 105 mm, but it is not the same as the Army's M1A1 main battle tank. The M1A1 or M1A2 was up gunned to a 120 mm smooth bore some years ago. We still have them outgunned. I say this as having worked with the M1A1 for 11 years as an ordnance engineer.

Lt. Col. Raymond T. Cwikowski, USAF (Ret.)
Foley, Ala.

The Heritage of the Force

When I read your article in September *["The Heritage of the Force," p. 62]* on the loss of interest of kids in the older aircraft, I became upset. I am 10 years old and my top four favorite airplanes were used in the '30s and '40s. You said that kids only like the new stuff because of video games. I tend to agree with you. Keep on saving World War II aircraft so they are not lost. I enjoy reading about these classic aircraft and hope to one day go to Wright–Patterson to see the collection.

My philosophy is, from the Langley Aerodrome to the P-51 Mustang to the F-4 Phantom II, they all have their place in history. As an example of my knowledge, in the September magazine there is a DH-98 with no tail, an A-17 without an engine, and a dusty red and gray Aeronca Champ with the wings removed in the corner.

Christopher Hoage
Norco, Calif.

The aircraft in the photo is an RB-47H, tail #53-4299, being moved into the newly constructed building of the USAF Museum. 4299 was one of only 35 H models of the RB-47 built by Boeing and assigned to the 55th Strategic Reconnaissance Wing during the Cold War era. The H model flew electronic reconnaissance missions around the Soviet Union and other countries. In place of a bomb bay was a compartment where three electronic warfare officer crew members operated the collection equipment. We had a crew of six.

This H model was loaned for display to the airport in Salina, Kan., in 1968. Restoration dismantling for shipping started in about 1997, and in August 1999 it arrived at the restoration area of the USAF Museum at Wright–Patterson Air Force Base. Restoration was completed in early 2003, and, as stated above, it was moved into the newly constructed building of the USAF Museum in March 2003.

Jack Kovacs
Fairborn, Ohio

Joint Pants

The Department of Defense hasn't finished congratulating itself on the development of teamwork that resulted in the Joint Strike Fighter, but the lessons are already being lost. After decades of common fatigues, first the Marine Corps and now the Air Force have announced they will be fielding service unique uniforms. *[See "Aerospace World: USAF To Test New BDUs," October, p. 15.]*

Don't all soldiers, sailors, airmen, and Marines have two legs? If the challenges of the JSF program can be overcome, surely the services can settle on Joint Work Trousers!

Andrew Wagner
Somerville, Mass.

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Washington Watch

By John A. Tirpak, Executive Editor

The Defense Budget Gap; "Discriminate Use of Force"; Europe's Forces; The Army in Smaller Pieces ....

A 20 Percent Solution?

Defense budgets are going to have to get about 20 percent bigger just to keep the US military from shrinking, according to the Congressional Budget Office. Half of that increase is needed to cover recently enacted hikes in pay and benefits, while the other half is needed to replace equipment which is getting too old.

The level of spending that is required just to maintain the status quo is "20 percent higher than current funding"—excluding the costs of contingencies such as Afghanistan and Iraq—and 10 percent higher than the peak of military spending during the so-called Reagan buildup of the 1980s, according to CBO director Douglas Holtz-Eakin.

In October testimony before the House Budget Committee, Holtz-Eakin said the Pentagon needs some $44 billion more budget authority each year to cover "substantial increases in future purchases of equipment and weapons to fill the gap created by the 'procurement holiday' of the 1990s," as well as to invest in new systems and technologies.

If the money is provided, the Pentagon "will eventually be able to halt or reverse adverse aging trends associated with much of its current equipment."

If not, warned CBO, the Defense Department will either have to cut troop levels and inventories or keep equipment until it is older—perhaps significantly so—than current plans envision.

Because of the high cost of technology-intensive aircraft, the Air Force "typically has the largest investment budget of any of the services," Holtz-Eakin said, averaging a 38 percent share of the annual procurement budget vs. 17 percent for the Army and 35 percent for the Navy-Marine Corps.

Under the Pentagon's own plans, the Air Force would have to see an increase from $50 billion in 2004 to $58 billion by 2009 just to fund the aircraft now in the development or production pipeline. In inflation-adjusted terms, the Air Force's need for investment dollars will peak at $72 billion by 2021, CBO determined. However, CBO said the cost growth historically seen in USAF's major programs would likely mean an actual annual average of $74 billion over the period 2010-22, with a peak of $84 billion.

CBO assumed that the F/A-22 and F-35 both go forward as planned and that some replacement or augmentation of today's Air Force nuclear systems (bombers and ICBMs) is developed. Since those plans are still being formulated, CBO based its projections on "experience with the costs and schedules of previous bombers and ICBMs," but its charts indicate that it expects the Air Force will buy the FB-22, a dedicated long-range attack version of the F/A-22.

According to CBO, USAF needs to buy about 150 fighters a year to maintain today's fleet size at a "steady state," but Pentagon plans—the future years defense program and projected out-years—don't get up to that level until 2011-15. Funding for fighters is about $4 billion in Fiscal 2004, but would have to be double that to preserve the steady state. The Pentagon doesn't forecast such a spending level until 2012.

Using USAF numbers, CBO determined that the Air Force's fighters and tankers are the most aged parts of the fleet and will average 20 and 40 years, respectively, by 2010. CBO compared those figures with the "half-life" of systems—half the planned or expected full service life—to see if most of the fleet was young or old. Fighters have a half-life of 10-15 years, while tankers have one of 28-33 years.

USAF photo by Lisa Carroll

Fighters: USAF needs to buy 150 a year.

Even if the F/A-22 and F-35 fighters and KC-767 tanker all go forward, CBO found, the fighter and tanker fleets overall will still average more than the suggested half-life in 2010. By 2020, fighters finally get down to 15 years average age, while tankers get down to 34 years.

Using the same method, CBO determined that the bomber fleet is practically spry, averaging only 35 years of age in 2010, vs. a half-life of 35-40 years. Airlifters will continue to average a youthful 23-27 years old by 2020, vs. a half-life of 18-23 years.

All this means that, to combat the aging aircraft problem, USAF will have to concentrate on fighters and tankers in the near term.

Go for Effects-Based Operations

Just as it's becoming imperative to use force discriminately—avoiding civilian casualties and the destruction of nonmilitary targets—the enabling technology has arrived, declared the Defense Science Board.

This, said a recent DSB report, means effects-based operations are "coming of age." EBO is now the stock in trade of the United States Air Force.

In its recent report, "Discriminate Use of Force," a DSB task force said the US military campaigns in Iraq and Afghanistan showed that instantaneous media coverage of war, the need to hold public support, the requirement to keep coalitions together, and the need to demonstrate restraint have made it essential to use minimum force necessary wherever possible in combat.

At the same time, the DSB said such discriminate force is made possible by "new weapons, improved intelligence, surveillance, and reconnaissance, shared situation understanding, improved individual and collaborative training, greater agility, smaller footprints, and other emerging capabilities of the US military that allow more timely and precise use of force than heretofore possible."

The DSB suggested that the Pentagon work toward performing strategic and operational level planning with the same level of "detail, coherence, and comprehensiveness" that it can now do at the tactical level. Specifically, it suggested creating a Strategic Campaign Support Center to plan for regional conflicts, apply effects-based methods, and "invent concepts of operations involving all the instruments of US power and game alternative courses of action."

This organization would be set aside from other organizations but reflect parts of them all. The task force wrote that this supra-agency organization "should be perceived as too diplomatic for DOD, too military for State, too oriented to open-source information for the intelligence community, and too transnational for anyone." It would work to create behavioral and predictive "models" of possible adversaries.

Still, the suggested center would "complement, not replace, responsibilities and authorities of regional combatant commanders." It would be broad in scope in bringing in expertise from virtually every Cabinet department and help coordinate diplomatic, intelligence, and economic actions "prior to the need for military force." Initially, this center should work with US Strategic Command and US Special Operations Command.

The planners who pulled together the recent campaigns in Southwest Asia, using precision to substitute for mass and keeping an eye on infrastructure that would be needed in the postwar period, are "a precious resource," and the Defense Department should cultivate more like them, the task force said.

"From our perspective," task force co-chairs Ted Gold and Joshua Lederberg wrote, "their groundbreaking experience in effects-based campaigning would be invaluable in helping restructure military professional development to prepare future commanders and their staffs to conduct effects-based operations."

Discriminate use of force and effects-based operations should be central to US military transformation, and the Pentagon should launch a study on how it will incorporate them at every level, the DSB panel recommended.

From some quarters in the military, the task force heard only criticism of discriminate use of force and effects-based operations. Critics—many of whom are in the Army—charged that the "restraint in the use of force will be seen as weakness" or that such a philosophy would raise false hopes for a bloodless war. To the former, the DSB panel said that the philosophy is "not about restraint; it is about the clarity of objectives and attention to achieving multiple and often competing objectives." To the latter charge, the panel said, "We have no such expectations" that war will be bloodless in the future.

Key enablers of this new style of war are persistent ISR, targeting, collaboration with other participants, preparation during peacetime, predictive intelligence, and fast, accurate bomb damage assessment. This last item is something that Gen. John P. Jumper, Air Force Chief of Staff, has said was one of the main sore spots of Gulf War II.

Old Europe's "Paper Armies"

NATO forces must become more efficient and battle worthy if the 19-nation alliance is to remain relevant against new threats, warned NATO Secretary–General George Robertson.

The alliance has to increase "the deployability and usability" of its forces, Robertson said at an October meeting of NATO defense ministers in Colorado Springs, Colo.

"Out of 1.4 million non-US soldiers under arms, the 18 non-American allies have around 55,000 deployed on multinational operations in the Balkans, Afghanistan, and elsewhere, and yet they feel overstretched," Robertson said. "That is a situation that is unacceptable." Far too many of NATO's troops, he said, are involved in administration or are in static, garrison basing rather than in mobile, quick-response fighting specialties.

NATO photo

They must be usable, deployable.

If NATO operations are to succeed in Afghanistan and elsewhere, "we have got to generate more usable soldiers and have the political will to deploy more of them on multinational operations," especially to deal with "asymmetric threats," Robertson added.

"The blunt message from Colorado is going to be this: We need real, deployable soldiers, not paper armies," Robertson insisted.

Taxpayers in member countries are being "ripped off," he continued.

"They expect usable, deployable, survivable, well-equipped troops to be available to deal with each and every crisis that they are called upon to deal with, and yet we don't have them." Instead, NATO's European troops are configured for the wrong threat, he said.

Robertson concludes his term this month; he will be succeeded by the foreign minister of the Netherlands, Jaap de Hoop Scheffer.

The NATO ministers, along with their military chiefs,

participated in the first-ever tabletop exercise of the new NATO Response Force, a 20,000-strong multinational unit set to be fully operational in 2006. The initial version, which will "stand up" in June, calls for 6,000 troops to train together, then serve in their home countries on standby status until called for joint duty. Conceptually, the NRF ultimately is to be able to deploy 5,000 troops in five to 30 days, with the remainder able to provide backup and sustainment for longer periods.

The exercise called the NRF into action on a fictional Mediterranean island, where it encountered terrorists, hostage-takers, and use of chemical weapons. Robertson reported it to be a success in educating the assembled ministers as to the new kinds of threats that face NATO and in developing working relationships between the alliance's political and military leaders, who normally engage in separate exercises and wargames.

The seminar was intended to "inform and provoke but not to reach decisions or conclusions," he said.

US Defense Secretary Donald H. Rumsfeld also declared the seminar a success, saying that "progress has been swift" since the US recommended that NATO ministers create the NRF.

The seminar "highlighted the need for that response force to have capabilities that are agile, swift, and lethal," said Rumsfeld. And it emphasized the need to "transform not only our forces and capabilities but also to bring NATO's decision-making structures up to date, so that NATO commanders can take decisive action against fast-moving threats in the 21st century," he added.

Pentagon officials said the US delegation took the opportunity to press their NATO allies to invest more funds in mobility, secure communications, and precision weapons.

The Schoomaker Doctrine

The Army's new Chief of Staff, Gen. Peter J. Schoomaker, wants to reorganize the service into smaller, modular chunks that will be easier to mobilize and deploy yet retain considerable combat punch.

Speaking with reporters at an Association of the US Army convention in Washington in October, Schoomaker said he believes the service "can get more power out of smaller organizations." He also wants to shift emphasis from the Army of the future to the Army of right now.

Schoomaker ordered the 3rd Infantry Division and 101st Airborne Division, each now with three brigades, to look at ways they could reorganize into five brigades each. A division is nominally about 15,000 to 20,000 troops, and a brigade usually has around 3,000 to 5,000 troops. There would be fewer troops in each brigade, but they would be beefed up with other forms of firepower, such as aviation units and artillery, that normally deploy as entire divisions.

The new brigades would be completely integrated with joint organizations, so that regional commanders could request building blocks of combat capability in finer increments than is possible under the Army's current structure.

Today, the Army must split off helicopter units, armored units, and infantry to fill task forces, but they take key personnel and gear with them, and the left-behind portions are less able to be used elsewhere if needed.

Schoomaker said he's going to try the new arrangement for six to 12 months. After that, he said, he'll make a recommendation to Defense Secretary Rumsfeld about how large he thinks the Army needs to be.

Rumsfeld has been skeptical of calls for increased end strength of the services, but Schoomaker went out on a limb during confirmation hearings last summer, saying his instinct told him the Army needs more troops. (See "Washington Watch: Rumsfeld's 'Open Mind' on Troops," October, p. 8.) At the AUSA meeting, Schoomaker conceded it would take two years from a standing start to bring on more troops and get them trained and into the field.

Schoomaker is also shifting the service's focus to supporting today's troops, in contrast with the future-force emphasis of his predecessor, Gen. Eric K. Shinseki, now retired. Under Shinseki's leadership, the Army accepted some "near-term risks" to fund technologies for a future, or "objective," force.

US Army photo by Capt. Timothy Beninato

Moving the Army faster takes airlift.

However, Shinseki started his course before Sept. 11, 2001, Schoomaker said, and couldn't have known the demands that would soon be put upon the Army.

"We have to fight [using] the current force," Schoomaker said. The new Army Chief considers the Stryker to be part of the "current force."

"The future force can't be [used]—it doesn't exist," explained Schoomaker at the AUSA convention, as he outlined the focus areas recently identified by senior Army leadership.

To move the mind-set back to the here and now, Schoomaker has decreed that the Army will stop using terms such as "legacy" to describe current systems or forces, since they will be with the service for many years to come.

While he won't abandon Shinseki's Stryker brigade concept—a concept that calls for lighter vehicles and a smaller footprint designed for the fast-moving, urban-warfare scenarios Shinseki expected to be the future norm—Schoomaker is not pushing it further, either. He said he has no plans at present to shift heavy elements to light or vice versa.

Rather, he wants to make existing units smaller but with nearly twice the lethality as they currently possess.

Nevertheless, getting the troops to the front faster will require a means to get them there, and Schoomaker's recommendations to Rumsfeld will no doubt play into the Air Force's desire to conduct yet another Mobility Requirements Study. Air Mobility Command chief Gen. John W. Handy said the service is facing a severe shortage in airlift, and Shinseki's plans to speed up Army mobility by air were "not addressed" in the last MRS. ■


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Aerospace World

By Adam J. Hebert, Senior Editor

Tanker Compromise Reached

The Air Force announced Nov. 6 that the Administration had reached an agreement with Congress over the service's plan to acquire new KC-767 refueling tankers. The deal would enable USAF to lease 20 and buy 80 of the Boeing aircraft, ending an extended controversy over USAF's plan to lease all 100 tankers.

Under the terms of the agreement, the Air Force will lease 20 KC-767A aircraft, beginning in 2006. This will allow the service to begin to replace its fleet of aging KC-135s sooner than would have been possible through a traditional acquisition program. USAF will begin its purchase of 80 additional tankers in 2008, with final delivery in 2014.

The service's acquisition executive, Marvin R. Sambur, said that "details remain to be finalized." However, he added that the compromise agreement "achieves an appropriate balance between the need to begin tanker recapitalization and the hard fiscal realities of the budgeting process."

USAF photo by SrA. James Seymore

A KC-135 tanker on Nov. 6 takes off from Incirlik AB, Turkey. Tankers and crews from Grand Forks AFB, N.D., McConnell AFB, Kan., and Robins AFB, Ga., deployed to Incirlik in early November to support missions over Afghanistan and Iraq. Congress finally approved a plan that will let USAF quickly replace its elderly tankers. (See "Tanker Compromise Reached," at left.)

F/A-22 Sails Through Review

The F/A-22 Raptor, the Air Force's highest procurement priority, passed its most recent Defense Acquisition Board review, paving the way for the award of new contracts.

The review panel in late September concluded that the stealthy fighter's contractor team "continues to make progress to improve avionics stability," one of the key developmental stumbling blocks in recent months.

Next up for award are the program's Lot 4 (production) and Lot 5 (advance procurement) contracts. However, the panel ordered USAF to wait until the program meets designated exit criteria.

Plans call for the panel in February to meet again to further review the F/A-22's progress, according to a Defense Department information paper.

The panel will then evaluate readiness to enter initial operational test and evaluation, reliability growth plans, exit criteria for the next batch of contract awards, and "survivability against revised estimates of the [future] threat environment."

27th FS To Get F/A-22s First

The 27th Fighter Squadron, part of the 1st Fighter Wing located at Langley AFB, Va., will be the first Air Force unit to fly operational F/A-22s.

The service announced the decision in October.

The squadron flies F-15C fighters and will begin next year to transition from Eagles to Raptors. The F/A-22 is scheduled to reach initial operational capability in 2005.

Evidently, the squadron's history played a major role in USAF's decision to make it the vanguard of F/A-22 deployment.

The 27th in 1941 became the first unit to fly the P-38 Lightning and in 1975 became the first to fly operational F-15s, said Col. Frank Gorenc, wing commander.

If all goes as planned, the three 1st FW squadrons will have made the transition to F/A-22 operations by the end of 2007.

In October, the first operational Raptor, No. 18, arrived at the pilot training schoolhouse at Tyndall AFB, Fla. Raptor pilots will train at Tyndall before returning to Langley.

Moseley: USAF Must Fill the Bins

USAF reconstitution requires a huge infusion of basic items consumed during Gulf War II, said Gen. T. Michael Moseley.

The Air Force vice chief of staff, testifying before the House Armed Services Committee on Oct. 21, said the service must restock depleted supplies of precision weapons—both laser guided and satellite guided types.

Also in the pipeline are new electro-optical Maverick missiles to replace older versions and Wind-Corrected Munitions Dispenser-equipped cluster bombs to restock older cluster bomb units used in the conflict. Other needs include rockets, various small arms, and fuzes.

Moseley said most of these items would be procured through supplemental funding.

Troops Need Reconstitution, Too

As Moseley sees it, the Air Force also needs to reconstitute its personnel to go along with its hardware.

He told the House panel that the equivalent of 7.3 of the Air Force's 10 Air Expeditionary Forces are, even now, "globally engaged." Fully eight of the 10 were engaged during Gulf War II.

The force has been so busy for so long that it has fallen well off its training, education, and rotation schedules. USAF needs to get back on track, said Moseley.

The Air Force "must focus on reconstituting capabilities, not just commodities," he explained.

Air Force leaders are struggling to get back to troop rotations lasting 90 days. The 90-day rotations were suspended at the start of the war and have not been reinstated. Air Force plans call for resumption of the 90-day AEF standard in March.

At that time, said Moseley, Air Force fighter and bomber forces "will be ready to resume normal rotations." Moreover, added Moseley, "we will have completed the repositioning of our war reserve stocks."

However, said the vice chief, the Air Force "will not meet the March goal" in certain high-demand career fields because they are engaged in sustained combat operations and are not able to work off their training backlogs in time.

Dyess B-1Bs in Record Surge

A group of 18 B-1B bombers based at Dyess AFB, Tex., surged in October, generating 114 sorties in 68 hours. This was a record rate, Air Force officials said.

Operation Iron Thunder, as the surge exercise was called, ran from Oct. 7 through Oct. 9 and produced 321 simulated bombing runs, according to a service news release.

USAF has "known for a long time" that B-1Bs could strike targets from long range with large payloads, noted Col. Jonathan George, commander of the 7th Bomb Wing at Dyess.

He went on to say that this surge operation "demonstrated the impressive amount of firepower ... that we could potentially unleash on the enemy" in a relatively short period.

If those 114 flights had been actual combat sorties, said George, the B-1Bs could have delivered more than 2,500 Joint Direct Attack Munitions. To deliver that same weapons load, a force of F-16 fighters would need 1,400 sorties.

Jones Says US May Quit Bosnia

US peacekeeping forces may be withdrawn from Bosnia in 2004, re-

USAF photo by SSgt. Alex Koenig

An Air Force C-130 drops fire retardant on a wildfire in Southern California. Four USAF wings helped fight the fires: Air National Guard's 146th Airlift Wing, Channel Islands AGS, Calif.; Air Force Reserve Command's 302nd AW, Peterson AFB, Colo.; ANG's 153rd AW, Cheyenne, Wyo.; and ANG's 145th AW, Charlotte, N.C..

The Latest In Iraq

OIF Casualties Slowly Climb

By Oct. 23, deaths during Operation Iraqi Freedom reached a total of 548 since combat operations began. These include 219 deaths due to hostile actions and 124 noncombat fatalities. Since the end of major combat operations May 1, deaths totaled 205. Of those fatalities, 104 were due to hostile fire, and 101 were from noncombat causes.

Gulf War II fatalities passed the total from the 1991 Gulf War on Sept. 13, when they reached 294. In the 40 days from Sept. 13 to Oct. 23, 49 additional Americans died in Iraq, slightly more than one per day.

Ansar al-Islam Terror Leader Apprehended

US officials captured Aso Hawleri, a top member of the Ansar al-Islam terror organization that has ties to Osama bin Laden's al Qaeda terror network, in Iraq. Hawleri, also known as Asad Muhammad Hasan, was taken into custody in the northern Iraqi city of Mosul, according to the Associated Press.

Thought to be the third-ranking member of his terror organization, Hawleri was reportedly taken into custody by members of the 101st Airborne without shots being fired.

Saddam Hussein Holed Up Near Tikrit?

US officials said in October that they believe deposed Iraqi dictator Saddam Hussein may be hiding out near his hometown of Tikrit, in north-central Iraq. "We have clear indication he has been here recently," said Army Maj. Troy Smith, a deputy brigade commander in Tikrit. "He could be here right now," Smith said Oct. 13.

Hussein's exact whereabouts—or even if he is still alive—has been unknown since the attacks March 20 that marked the beginning of Operation Iraqi Freedom. Overall, of the 55 former regime leaders on the coalition's "most wanted" list, 38 are reportedly in custody, three are thought dead, and 14 remained at large by mid-October.

ported Marine Corps Gen. James L. Jones.

Jones, the Supreme Allied Commander, Europe and commander of US European Command, made the announcement Oct. 10.

The first US peacekeepers entered Bosnia in December 1995, after the signing of the Dayton peace accords. President Clinton pledged at that time to have all troops out within one year.

Eight years later, about 500 airmen remain in that Balkan nation. The Army has a larger presence in the region—about 1,500 soldiers in Bosnia and 2,200 more in Kosovo.

The exit from Bosnia, if it happens, won't be duplicated elsewhere in the Balkans. Jones said the Kosovo mission lacks the "maturity" needed to send military peacekeepers home.

US troops have been helping to keep the peace in Kosovo ever since Operation Allied Force in 1999 prompted Serbia to withdraw its forces from the breakaway province.

Perle: USAF Deserves More

Modern trends in warfare mean that the traditional even-thirds allocation of the defense budget may need retooling, with the Air Force getting a larger share, stated Richard Perle, a member of the Defense Policy Board.

Perle argued the case for the Air Force during an Oct. 10 American Enterprise Institute briefing in Washington, D.C.

In recent years, the Departments of the Army, Navy, and Air Force have received roughly even shares of defense funds, though this was not always the case. (See "Footing the Bill for Military Space," August, p. 54.)

Perle noted that recent operations show that the nation's military puts "an incredible premium" on speed, flexibility, and precision in weapons systems.

With the United States now building cost-effective weapons that actually "hit the targets," the Air Force should benefit, he said. That is because airpower forces offer advantages not conferred by ground and naval forces.

Perle noted that USAF can reliably

USAF photo by A1C Alicia M. Sarkkinen

The mission gets done despite the challenges facing US forces in Iraq. Here, USAF SSgt. Lonny Ellison (left) and Latvian 1st Sgt. Renars Vandinskis tape down C-4 plastic explosives to detonate unexploded ordnance found in downtown Kirkuk.

DOD To Closely Watch Morale in Iraq

Pentagon leaders have not yet seen convincing indications that morale among troops is suffering in Iraq. Even so, officials pledged to closely monitor the situation in the wake of a *Stars and Stripes* poll that reported widespread dissatisfaction among the rank and file.

Morale is "something we take very, very seriously," said Air Force Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff.

In a survey of nearly 2,000 troops throughout Iraq, the newspaper found 34 percent of respondents described their morale as low, and 49 percent said their unit's morale was low. These totals were in stark contrast to official reports of high morale. According to the survey, 27 percent described their morale as high, but only 16 percent felt their unit was in good spirits.

The newspaper conceded it had not conducted a scientific poll, with specific controls.

Among those surveyed, 49 percent said it was not likely that they would remain in the military once their current tour of duty was up.

Furthermore, the paper said, many troops felt that visiting dignitaries, such as generals and members of Congress, were given a "dog and pony show" when they came to Iraq. Many respondents believed the VIPs only had access to preselected troops.

Asked about this at a Pentagon briefing, Myers echoed the concern. "As a four-star [general], somebody's always ... bringing us all the happy folks," he said. "I want to see the folks that have complaints," Myers said, jokingly adding, "They won't let them near me."

Defense Secretary Donald H. Rumsfeld noted at the same briefing that only the Army Reserve was having "soft" recruiting and retention, but added that "the effects of a stress on the force are unlikely to be felt immediately."

strike targets with systems such as relatively inexpensive Joint Direct Attack Munitions. However, he went on, the service continues to live with a static budget.

Perhaps a better metric for determining defense budget shares would be to emphasize innovative measurements such as "cost per target destroyed," Perle suggested.

Changing the relative shares of the budget would require overcoming both parochialism and bureaucratic inertia, but would create a more capable military force, Perle concluded.

US Buying Up MANPADS

Trying to get the anti-aircraft weapons off the streets in Iraq, American officials are buying up Stinger-type, man-portable missiles. The US is paying $500 to take a single missile out of circulation.

Various wire service news reports said the US had succeeded in acquiring more than 300 of the missiles by Oct. 8.

Several man-portable air defense system missiles have been fired at US aircraft in Iraq, though no aircraft have been hit. (See "Aerospace World: Missiles Fired at C-141 Departing Baghdad," November, p. 17.) Gen. John W. Handy, commander of US Transportation Command and Air Mobility Command, has said he views the MANPADS threat as a serious problem.

An Army official noted that the total number of weapons acquired does not include "many hundreds" of anti-aircraft missiles that coalition forces located and destroyed on their own.

According to Army Lt. Col. George Krivo, the going bounty is $500 for a full system and $250 for grip stock or an "a la carte" missile.

China Enters Space Club

The exclusive, two-member manned spaceflight club, formed in 1961, is no more.

China in October joined the United States and Soviet Union (now Russia) as the only nations to have successfully launched a human being into space. Chinese astronaut Lt. Col. Yang Liwei orbited the Earth 14 times during a 21-hour flight that stretched from Oct. 15 through Oct. 16.

In early 1961, Soviet cosmonaut Yuri Gagarin and American astronaut Alan B. Shepard Jr. made the trip into space within weeks of each other. No other nation has matched those feats—until now.

The spacecraft Shenzhou V blasted

USAF photo by MSgt. John E. Lasky

Capt. Tiamo Strother watches SrA. Chhay Uy as he uses Raindrop 3-D goggles to select targeting coordinates for strike aircraft during a Red Flag war training scenario. Both airmen are from the 32nd Operations Group, Ramstein AB, Germany.

JFCOM Itemizes Iraq's Lessons Learned

A US Joint Forces Command evaluation of Operation Iraqi Freedom has determined that the prevention of fratricide is the Defense Department's area of greatest need.

"We have to do things," about fratricide, said Army Brig. Gen. Robert W. Cone, director of JFCOM's lessons learned center.

The Defense Department sees fratricide prevention as having "two critical ingredients," Cone said at an October Pentagon briefing. Combat identification (positively classifying a target before shooting) and situational awareness (knowing who is supposed to be where at a given time) are both areas requiring improvement.

"In terms of combat ID, I don't think we've made a lot of progress in the last 10 years," Cone said.

Thermal panels and infrared "bug lights" for ground forces can help, he said, but "I could show you ... what that looks like from an F-14 LANTIRN pod at 15,000 feet." It is "not comforting in terms of the ability to discern" between friend and foe, Cone said.

Blue force tracking capabilities are good at the operations center level, Cone said, but DOD needs to ensure the information gets to the "lowest level," where the shooters are.

Cone said part of the challenge in preventing fratricide recently has been that the battlefields have not been distinct—they lack clearly separated forces. In both Afghanistan and Iraq, there was considerable mixing of combatants, and as forces converge "it's a greater challenge," he said.

Overall, however, Cone described OIF as a triumph of integrated combat power. Joint force integration and adaptive planning, joint force synergy, and special operations on the battlefield were the "big winners," according to JFCOM. These efforts gave the coalition "overmatching power, overmatching at a time and place of our choosing, on the battlefield against a specific opponent," Cone said.

off from a launch site located in the Gobi Desert, northwest of Beijing.

The system used to launch Yang is primitive compared to those based on modern US technology. Even so, the event provided a source of tremendous national pride and political support for China's Communist rulers.

The launch system has been described as comparable to what the superpowers used in the 1950s, during the early days of the "Space Race."

Chinese officials said they expect their next spaceflight to occur within two years.

Civil Service Changes Slammed

Opponents of proposed Civil Service reforms for DOD employees have launched a grassroots campaign to protect union workers, the *Washington Post* reported.

Pentagon leaders would like to streamline the way the Defense Department manages its civilian employees. Secretary of Defense Donald H. Rumsfeld seeks legislation that would allow pay-for-performance procedures, faster and easier hirings and firings, and a shorter disciplinary process.

The American Federation of Government Employees, one of the largest unions representing DOD civil service employees, opposes some of the proposals that could affect AFGE's members.

The union bought radio ads supporting legislation that would limit the changes. The legislation, sponsored by Sen. Susan M. Collins (R-Maine), would, for example, guarantee that DOD civilians, if disciplined, would have access to an external appeals process.

AFGE is also opposed to proposed outsourcing measures that could turn over large numbers of DOD jobs to contractors. According to the *Post,* the Administration has determined that about 850,000 federal jobs are commercial in nature, meaning they could be candidates for outsourcing.

DOD has about 746,000 civilian employees and for years has led the way in performing competitive outsourcing competitions.

News Notes

By Tamar A. Mehuron, Associate Editor

■ USAF's Class A aviation mishap rate for Fiscal 2003 showed a drop from 2002, while Army and Navy rates increased. USAF had a rate of 1.39 accidents for every 100,000 hours of flying time, down from the 1.48 rate in 2002. The Army had a rate of 2.91 accidents in 2003, vs. 2.51 in Fiscal 2002. The Navy had a rate of 2.25 accidents in 2003, vs. 1.76 in 2002. The Marines had an aviation mishap rate of 2.79 for 2003, down from 3.89 in 2002.

■ Pakistan on Oct. 14 launched a nuclear-capable Hatf 4 missile—the second recent test of the 435-mile-range missile that is capable of hitting New Delhi and other targets inside India. Pakistan informed India of the test beforehand.

■ USAF reactivated the 64th Aggressor Squadron Oct. 3 at Nellis AFB, Nev. Since 1990, aggressor pilots had been serving in the 414th Combat Training Squadron, which runs Red Flag.

■ In October USAF awarded Lockheed Martin $560 million in contracts to launch seven US military satellites into space. The contracts were originally awarded to Boeing, but USAF stripped them from Boeing in July as a penalty for ethics violations during the 1998 evolved expendable launch vehicle competition.

■ USAF search and rescue missions and assets formally transferred to Air Force Special Operations Command from Air Combat Command Oct. 1 at Moody AFB, Ga. AFSOC gains 7,000 people and more than 100 fixed- and rotor-wing aircraft from ACC.

■ Airmen can now complete personnel record reviews online through the virtual military personnel flight. They may correct errors through the links provided. For more information, contact the local military personnel flight or commander's support staff.

■ USAF plans to use private contractors to handle routine information technology operations at its Stateside bases, according to *Federal Computer Week.* The outsourcing move is intended to help free up airmen for the warfighting mission. The service expects to complete a study next year that will identify what IT equipment and operations it can outsource.

■ India signed an agreement Oct. 10 to buy Israeli airborne early warning radars, reported the *Washington Post.* The contract is estimated to be worth $1 billion, perhaps the largest arms contract between the two nations. Pakistan views the deal as a step toward a regional arms race.

■ The remains of three airmen and a Coast Guard pilot on an Air Force exchange program who were missing in action from the Vietnam War have been identified and will be sent to their families for burial, DOD officials said Sept. 29. The airmen are: SSgt. Elmer L. Holden, Oklahoma City; Sgt. James D. Locker, Sidney, Ohio; and Capt. Richard C. Yeend Jr., Mobile, Ala. Lt. Jack Rittichier of Barberton, Ohio, had been the only Coast Guardsman MIA in the Vietnam War.

■ Congress has funded creation of a dozen new Civil Support Teams in Fiscal 2004, bringing the total number of currently authorized teams to 44. Each team includes 22 Air and Army National Guard members trained to identify and respond to nuclear, biological, chemical or radiological incidents. No information on location of the additional teams was available. There is a push by some lawmakers to authorize enough teams to have one in each state.

■ The new Air Force Expeditionary Service Ribbon recognizes active duty, Guard, and Reserve who served in support of an air expeditionary deployment after Oct. 1, 1999, and deployed for either 45 consecutive days or 90 nonconsecutive days.

■ The National Imagery and Mapping Agency awarded a five-year, $500 million contract to DigitalGlobe Inc., Longmont, Colo., for next generation commercial satellite imagery. The NextView contract, which runs through 2008, provides for greater access plus more advanced capability and capacity than previous contracts, according to a DOD release.

■ Pilot failure to follow emergency checklist procedures for a failed hydraulic pump caused a collision of an F-16CG with a parked F-16 at a forward operating location June 15, according to an Air Combat Command report. Returning from a six-hour mission, the pilot continued taxiing after landing, depleting the hydraulic accumulators. Complete loss of brakes

$87 Billion Iraq Bill Passes

Lawmakers in both houses on Nov. 3 agreed to President Bush's $87 billion request for security and reconstruction requirements in Afghanistan and Iraq. The vast majority of the money—$67 billion—goes to finance American military efforts in the region.

The other $20 billion actually turned out to be the most controversial. It is earmarked for reconstruction in Afghanistan and Iraq, with the greater portion—more than $18 billion—going to rebuilding efforts in Iraq. Lawmakers were bitterly divided over whether this money should be provided in the form of a grant or a loan.

The House had followed Bush's request that the money be provided as a grant, but the Senate wanted roughly half the funds to be provided

AEF Blue Needs Some Airmen for Longer Period

The Air Force said in September that about 10 percent of airmen in AEF Blue, the first of two provisional Air Expeditionary Forces, will be deployed beyond the expected 120-day rotation.

AEF Blue and AEF Silver were formed of units and personnel not deployed for Operation Iraqi Freedom. They were to cover USAF deployment responsibilities until March 2004 and thus give the wartime units a chance to reconstitute.

AEF Blue deployed in July. Plans called for it to be relieved in November by AEF Silver. However, about 2,300 of the 22,000 airmen assigned to AEF Blue had to stay on longer, the service announced.

Not all airmen assigned to an AEF actually deploy—the Air Force currently has about 20,440 personnel deployed worldwide. Of those, 16,700 are in US Central Command's area of responsibility, which includes both Iraq and Afghanistan.

The extended-tour personnel are in the high-demand, low-density career fields that have seen frequent strain since 2001. They are primarily security forces but "may include air traffic control, civil engineering, services, medical, and intelligence personnel," said Maj. Gen. Timothy A. Peppe, the Air Force's chief AEF planner.

and steering capability resulted. One maintenance person was injured. Damage to both aircraft and ground equipment was estimated at $3.2 million.

■ An AETC accident investigation report concluded that a bird strike caused the crash of an F-16 June 13 at Luke AFB, Ariz. Shortly after takeoff, the fighter's single engine ingested a turkey vulture and lost thrust. The pilot was unable to regain thrust and realized he couldn't land the aircraft safely, so he headed it away from airfield buildings. The pilot, who was assigned to the 61st Fighter Squadron at Luke, ejected safely, and the airplane crashed in the desert.

■ The Department of Homeland Security was to begin test flights of unmanned aerial vehicles late this fall at Ft. Huachuca and Gila Bend, Ariz., for possible use in security patrols along the US-Mexican border, reported the *Arizona Daily Star.*

■ Test teams at Edwards AFB, Calif., recently installed, for the first time, three integrated defensive systems on a C-130J. The systems were a radar warning receiver, a countermeasures dispensing system, and a missile warning system. The added capabilities will enhance the situational awareness in a threat environment.

■ A T-38A Talon aircraft crashed on takeoff at Sheppard AFB, Tex., on Oct. 14. The aircraft was assigned to the 80th Flying Training Wing. Both crewmembers ejected. They were taken to the base hospital and later released. An accident board is investigating.

■ Air Mobility Command officially reactivated 18th Air Force Oct. 1, at Scott AFB, Ill. The 15th Air Force, Travis AFB, Calif., and 21st Air Force, McGuire AFB, N.J., were redesignated as expeditionary mobility task forces. (See "Aerospace World: AMC To Reorganize," October, p. 14.)

USAF's last Titan II was launched Oct. 18 from Vandenberg AFB, Calif. It placed a Defense Meteorological Satellite Program weather satellite into low Earth orbit.

■ Housing upgrades at Bagram and Kandahar Air Bases in Afghanistan mean troops will soon live in B huts and modular housing instead of plywood-buttressed tents. The new units, which will offer more personal living space, refrigerators, heating, air-conditioning, and electrical outlets, are part of five- to eight-year plans to improve facilities in Afghanistan and could portend a lengthy stay, according to the *European Stars and Stripes.* The modular units being built at Kandahar resemble trailers and will have indoor plumbing with showers and toilets. Other improvements at Bagram include a new laundry facility and athletic field.

■ The last C-141 airlifter to undergo programmed depot maintenance left Robins AFB, Ga., Oct. 16, with a special ceremony, on its way to March ARB, Calif. Only three units still have C-141s: the 305th Air Mobility Wing at McGuire AFB, N.J., 452nd AMW at March, and 445th Airlift Wing at Wright–Patterson AFB, Ohio. The units are slated to convert to other airlift missions before USAF retires the last C-141s in 2006, after some 40 years of service.

as loans that would be repaid out of future Iraqi oil revenues. After the White House threatened to veto the bill if the Senate amendment was included, lawmakers dropped the provision.

Weapons Dumps Pose Threat

Coalition forces in Iraq face a daunting task: securing and cleaning up more than 100 large weapons dumps holding perhaps as much as a million tons of ammunition.

Officials are attempting to clean up and secure the locations quickly to prevent terrorists and others hostile to the United States from laying hands on the weapons.

According to Army Brig. Gen. Robert L. Davis, the chief US military engineer in Iraq, more than 105 large dumps have been identified across the nation, and "we find new caches every day."

"I have no idea how many there are," in all, Davis said, according to Knight Ridder News Service.

A large dump is defined as one containing more than 100 weapons bunkers. Some of those in Iraq have up to 700 open pits containing artillery shells and other munitions. And smaller weapons loads abound.

The cleanup process continues and is massive. Davis said that contractors had destroyed more than 2.5 million pounds of ammunition between mid-September and mid-October.

Overseas Base Closures Eyed

The Pentagon plans further cuts and shifts in US overseas bases before it proceeds with the 2005 base closure round, said a senior Defense Department official on Oct. 6.

The Pentagon is reworking budgets to shift money away from "non-enduring" overseas bases, noted Raymond F. DuBois, deputy undersecretary of defense for installations and environment.

In a speech at the Association of the US Army's annual convention, DuBois reported that millions of dollars in military construction funds are being diverted to bases with critical missions in the "global basing" structure.

For example, he said, 26 projects in Germany worth $280 million were canceled in Fiscal 2003 and 2004. Funding was then directed to 18 new projects in the United States.

BRAC Is Looming

Two years before the next scheduled round of base realignment and closure, BRAC-mania has reached a

USAF photo by SSgt. Jerry Morrison Jr.

Airmen from the 27th Fighter Wing, Cannon AFB, N.M., prepare their sleeping quarters inside a hangar during Exercise Eagle Flag.

USAF Conducts Bare-Base Op—in New Jersey

With Exercise Eagle Flag, the Air Force for the first time practiced the setup and operation of a bare base in an official flag-level exercise. Held in Lakehurst, N.J., Eagle Flag tested the Air Force's ability to quickly set up a bare base—a mission USAF has had to perform numerous times since 2001.

For support troops, Eagle Flag is the equivalent of the Red Flag exercises that fighter pilots use to hone their skills in realistic combat environments. It is an opportunity to rehearse the use of "force modules" that will be used in the future to initiate airfield operations. According to USAF, a force module is "a grouping of combat support forces and ... equipment and supplies" needed to sustain an initial force for at least 30 days.

For Eagle Flag, USAF forces deployed to Naval Air Engineering Station Lakehurst. They were led by an assessment team that determined what repairs and upgrades were needed to make the site operational. Three force modules followed.

The first module consisted of fuels, security, supply, and other personnel required to open the base. The second comprised civil engineers, logisticians, public affairs personnel, and other experts needed to give leadership on-site command and control capabilities. The third module deployed airmen to expand base infrastructure, such as chaplain, safety, and weather personnel.

According to the Air Force, in a real deployment, two more modules would follow. They would consist of experts needed to generate additional sorties and operate the air base.

The Air Force has eight Eagle Flag exercises scheduled in 2004.

Index to Advertisers

USAF Studies F/A-22, JSF Associate Units

As it seeks the best ways to deploy new F/A-22 and F-35 fighters, USAF is pondering integration of active, Air National Guard, and Air Force Reserve Command airmen into single units.

Such an organizational structure might yield the most efficient use of the two new fighters, bringing more combat power per unit, said Gen. John P. Jumper, the USAF Chief of Staff.

Greater efficiency, however, emphatically does *not* mean there is a reduced requirement, Jumper argued. He dismissed press reports that the Air Force is wavering on the number of fighters it seeks. Jumper said such reports are flat wrong.

"There is no decrease in commitment to either [fighter] right now," said the Chief, speaking at a Capitol Hill breakfast sponsored by the consulting firm DFI International.

The Air Force has seen success with its most prominent associate unit. The 116th Air Control Wing, Robins AFB, Ga., has brought active, Guard, and Reserve personnel together to operate E-8 Joint STARS aircraft.

The service feels similar arrangements may be possible when combat units acquire the F/A-22 and F-35.

The Air Force's stated goal is 381 F/A-22s. In an interview, Jumper noted the service's long-range budget currently supports a fleet of 276 F/A-22s, but these are expected to replace roughly 700 F-15s.

"The objective is to get more efficiency out of the airplanes you have," he said.

One concept calls for basing the next generation fighters at locations where multiple crews could have access to the aircraft, allowing fewer aircraft to be flown more frequently.

Yet fighters pushed to maximum-use conditions create their own set of challenges. "The problem in the fighter business is a little different," Jumper told DFI attendees. "When you do this integration in the fighter business, you've got to make sure that you have the resources and you're buying the parts and the pieces to keep those airplanes flying at a high rate."

USAF can experiment with existing F-15s and F-16s, Jumper told *Air Force* Magazine, but "you have to be able to generate a lot more sorties per aircraft than we are able to right now, on the aircraft we have, before it appears that [creative basing arrangements] will pay big dividends. That's why we are aiming this at the next generation of airplanes."

Plans call for the F-35, which will become operational in about a decade, to replace aging F-16 and A-10 aircraft. The Air Force requirement remains 1,763 F-35s.

fever pitch, with numerous communities taking actions they hope will protect their local bases and their associated jobs and benefits.

In October, Pentagon officials scrambled to knock down an inflammatory *Los Angeles Times* report that DOD planned to close at least 100 of the nation's 425 military installations.

A spokesman noted that DOD intends to cut basing capacity by 25 percent, which is not the same as cutting bases by 25 percent, because of the huge disparity in the size and efficiency of various installations.

However, DOD does not deny the closures must come, given that billions of dollars are wasted on a base infrastructure that has not been reduced nearly in proportion to cuts in active duty force structure.

USAF Battening Down for BRAC

With an eye to the upcoming base closure round, USAF is cautioning commanders to be careful about accepting new missions on Air Force bases.

In August, the service's top uniformed official for installations and logistics, as well as the assistant Air Force secretary for installations, environment, and logistics, penned a cautionary memo on beddown actions.

Lt. Gen. Michael E. Zettler and Nelson F. Gibbs noted that "an increasing number of organizations both in and out of the Department of Defense have sought to place new units or missions on Air Force installations." Because of the pending BRAC efforts, they wrote, "it is particularly important to be sensitive to actions that may create an improper impression of Air Force intentions."

The memo went on to point out that force structure changes, new missions, and construction projects do not "insulate" a facility from realignment or closure under BRAC. ■

Senior Staff Changes

CHANGE: Brig. Gen. Maurice H. **Forsyth,** from Cmdr., USAFE Theater Air & Space Ops. Ctr., Ramstein AB, Germany, to Cmdr., 51st FW, PACAF, Osan AB, South Korea. ■

Would US Airmen Be "Trigger Hesitant"?

North American Aerospace Defense Command, charged with defending US and Canadian airspace, routinely practices the task of shooting down a hijacked civilian airliner.

That is the word from Air Force Gen. Ralph E. Eberhart, commander of not only NORAD but also US Northern Command. Both are located in the Colorado Springs, Colo., area.

In October, Eberhart told the Defense Writers Group in Washington, D.C., "We exercise this several times every week, ... whether it is an airplane shooting down an airplane or whether it is the air defense system here in the National Capital Region shooting down an airplane."

Such exercises are an outgrowth of the 9/11 terrorist attacks, when the Defense Department was caught off guard by an unexpected type of attack against the United States. "God forbid we'd ever have to do this," Eberhart noted, but interdicting a hijacked aircraft is now a scenario the military trains for and is "well-prepared to do," he said.

Eberhart made it plain that this is not a mission that defense officials take lightly. Some pilots may have no qualms about attacking enemies in Iraq or Afghanistan, but pilots faced with "a lot of innocent people" on board—and perhaps only a handful of terrorists—may become queasy.

The problem is not that a pilot would be trigger happy but rather that he would be "trigger hesitant," Eberhart said. Therefore, training is critical to ensure the mission could be accomplished.

Action in Congress

By Tom Philpott, Contributing Editor

Concurrent Receipt Winners and Losers; Divvying up $22.1 Billion; Tax Bill Moves ....

Prize for 225,000 Retirees

The "concurrent receipt" compromise that was struck in October will boost incomes of 225,000 military retirees, according to Congressional Budget Office estimates.

CBO reports that about half will qualify for tax-exempt Combat-Related Special Compensation on top of their VA disability compensation.

Others may not qualify for CRSC but have disabilities rated 50 percent or higher, which means Washington will restore, over a 10-year period, whatever retired pay they now forfeit to receive disability compensation.

The Bush Administration and Congress agreed to ease the century-old ban on simultaneous receipt of both retired pay and disability compensation. A disabled veteran had to reduce his retired pay, dollar for dollar, if receiving VA payments.

The deal pleased those who stand to gain but left others angry. More than 300,000 retirees who forfeit some retired pay do not benefit because their disabilities are rated below 50 percent and are deemed to be unrelated to combat.

The Deal's Fine Print

Language in the 2004 defense authorization bill not only shapes the 10-year, $22.1 billion deal but also clarifies what levels of retired pay will be restored—and when.

Here are key details of the compromise.

- *Combat-Related Special Compensation.* Some 107,000 retirees could be eligible for payments for combat-related disabilities as low as 10 percent. This is in addition to 35,000 expected to qualify for CRSC under more restrictive criteria passed last year. Applicants must have a Purple Heart for war wounds or combat-related disabilities rated 60 percent or higher. Payments are retroactive to June 1. In January, CRSC will expand to include all retirees with 20 or more years of service and any combat-related disability.
- *Limited Concurrent Receipt.* Another 115,000 retirees receiving VA checks will see a 10-year phase in of payments that will take them back to full retired pay. They must have disability ratings of 50 percent or higher. Included in this eligibility pool are service members who retired with 15 to 19 years of service under Temporary Early Retirement Authority (TERA) used during the post-Cold War drawdown. Retired pay will be restored automatically.
- *Reserve Eligibility.* CBO projects that an estimated 3,000 National Guard and Reserve retirees would qualify for CRSC or limited CR.
- *Other Payments.* Military retired pay is offset not only by VA disability compensation but also by other VA payments—for dependents, for individuals deemed unemployable, and for veterans receiving Special Monthly Compensation for the most severe injuries. The legislation restores all retired pay lost as a result of any kind of VA payment.

Commission To Study Benefits

The same law that eases the ban on concurrent receipt also establishes a Veterans' Disability Benefits Commission. This 13-member panel will feature eight commissioners appointed by leaders of Congress and five appointed by President Bush. Seven of the 13 must be veterans awarded at least a Silver Star.

After its first meeting, the commission will have 15 months to conduct a comprehensive study on revising disability and death benefits for veterans and their survivors before delivering its finding to the President and Congress.

Action on Tax Breaks, Finally

Military associations and a Texas Congressman urged tax-writing lawmakers to resist the temptation to play politics this year with much-needed tax reform for military members. Their pleas apparently were heard.

In late October, Rep. Chet Edwards (D-Tex.) joined the Air Force Association and other service organizations in urging House Speaker Dennis Hastert to take the original Armed Forces Tax Fairness Act (H.R. 1307) "off the shelf and send it to the President for his signature." (See "AFA in Action," p. 84.)

Both the House and Senate earlier this year had passed different versions of the tax fairness bill, which would have put an end to tax inequities that for years have burdened military homeowners. Yet, the measure faced unreconciled differences and seemed set on a course for stalemate.

However, in early November, action in both houses led to passage of a follow-on bill, the Military Family Tax Relief Act (H.R. 3365) that included key provisions of the tax fairness act. The new tax relief bill will:

- Extend to military members—retroactively—the same tax breaks on capital gains from home sales that other taxpayers have enjoyed since 1997.
- Provide tax deductions for reservists who incur travel and lodging expenses when drilling 100 miles or more from home.
- Raise the military death gratuity from $6,000 to $12,000 and restore full tax-exempt status to the gratuity. (The increase is retroactive to Sept. 11, 2001, and future increases are also to be tax free.)

President Bush signed the legislation on Veterans Day, Nov. 11.

No Drug Plan Impact

As a House–Senate conference committee negotiated final details of the Prescription Drug and Medicare Improvement Act of 2003 (S. 1, H.R. 1), defense health officials reviewed what impact the bill's $400 million prescription drug program might have on military pharmacy benefits.

The answer is none, they concluded.

William Winkenwerder Jr., assistant secretary of defense for health affairs, told the Military Coalition, an umbrella group for a few dozen service associations, that the proposed Medicare drug benefit "would be in addition to current Tricare pharmacy benefits, not in place of them." ■


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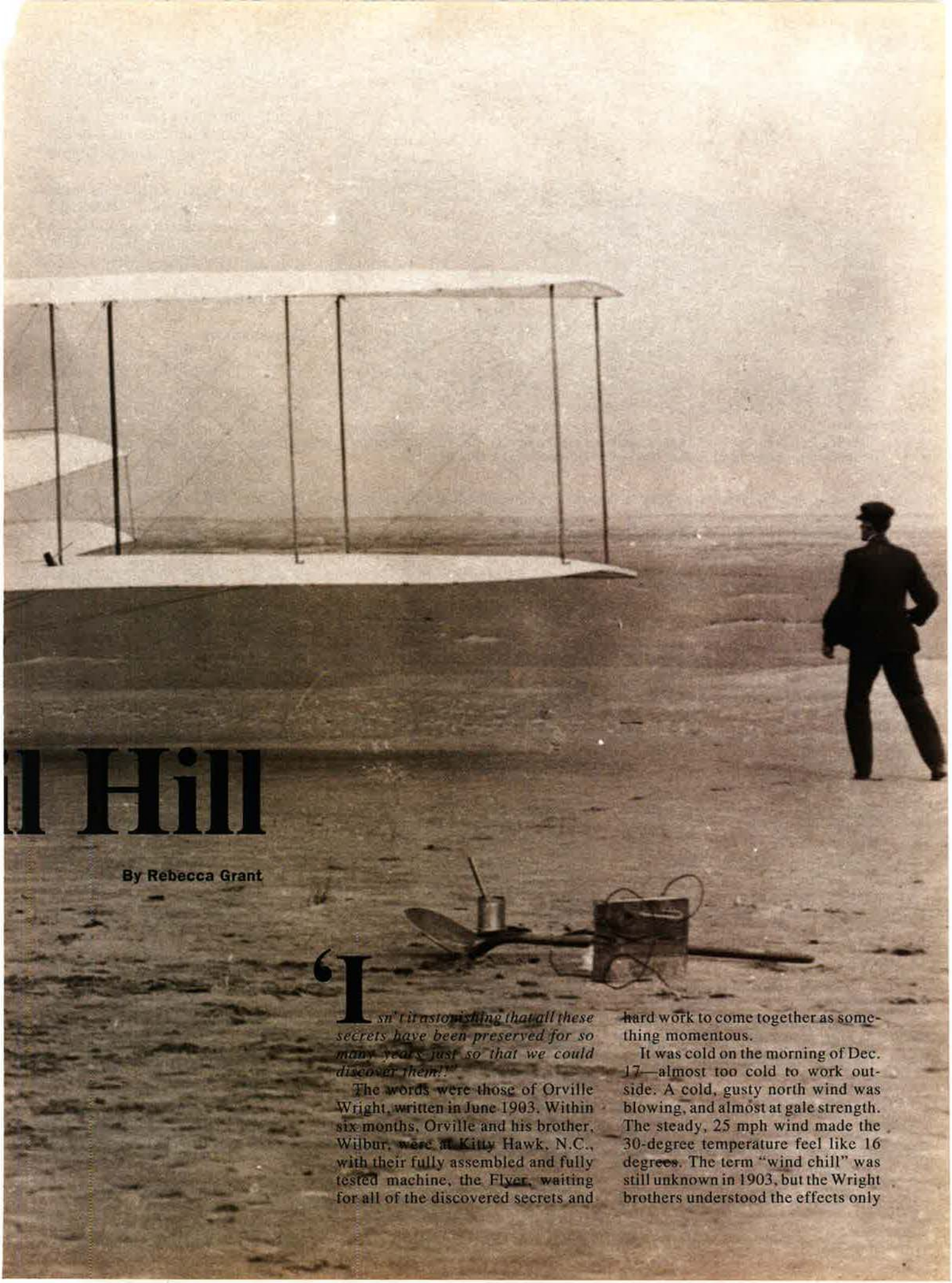
With four powered flights totaling 98 seconds 100 years ago, the Wright brothers changed the world.

Dawn at Kill Dev

The Moment. *On the sand flats stretching north from Kill Devil Hill, mankind begins a new day and the Wright brothers make history. The camera snapped the first flight at 10:35 a.m., Dec. 17, 1903. Orville is at the controls. Wilbur watches from the side.*



l Hill

By Rebecca Grant

"Isn't it astonishing that all these secrets have been preserved for so many years just so that we could discover them!"

The words were those of Orville Wright, written in June 1903. Within six months, Orville and his brother, Wilbur, were at Kitty Hawk, N.C., with their fully assembled and fully tested machine, the Flyer, waiting for all of the discovered secrets and hard work to come together as something momentous.

It was cold on the morning of Dec. 17—almost too cold to work outside. A cold, gusty north wind was blowing, and almost at gale strength. The steady, 25 mph wind made the 30-degree temperature feel like 16 degrees. The term "wind chill" was still unknown in 1903, but the Wright brothers understood the effects only

Big Hill. *In 1901, the Wrights camped near Kill Devil Hill, a prime gliding spot. This photo, taken Dec. 14, 1903, shows the track used in the Wrights' first, unsuccessful attempt at flight. The Dec. 17 flights took place nearby.*

too well. The body loses heat at an accelerated pace. Hands become stiff. Eyes water. The throat feels cold, the ears tingle. Hauling, lifting—indeed, any heavy work outdoors—makes the wind feel like an adversary.

The brothers had been to North Carolina before, but never had they stayed so late in the year. Through the fall, the weather had taunted them, bringing high winds and rain on some days and dead calm on others. On the worst nights, water puddles would freeze. They woke to wash basins filled with solid ice.

True, they had a good stove inside, built by Orv. They also had his French drip coffee pot, complete with a custom filter of wire mesh imported from Dayton, Ohio. Still, the brothers on several occasions that fall had given in to the cold wind and suspended their outdoor work. One day they noted they were "too sore" from gliding to do much work at all.

It is ironic, then, that, on the morning of Dec. 17, 1903, the fierce wind howling across the dunes would become the Wrights' partner in one of mankind's greatest achievements.

To Kitty Hawk

"They think that life at Kitty Hawk cures all ills, you know," wrote Katherine Wright, speaking of her two brothers. Will and Orv had discovered Kitty Hawk in the late summer of 1900. "I never did hear of such an out-of-the-way place," Katherine groused to their father, Bishop Milton Wright. "Probably the mail goes out but once a week." She was right. It left each week in a small sailboat.

Kitty Hawk was a fishing village where no one ever sold a fish. The commercial catches all went to Baltimore, where they fetched a higher price. The Kitty Hawkers ate wild game—in or out of season—and fish if they caught it. Milk came only in cans. Orv thought the horses, cows, and hogs were the most pitiful-looking livestock he had ever seen.

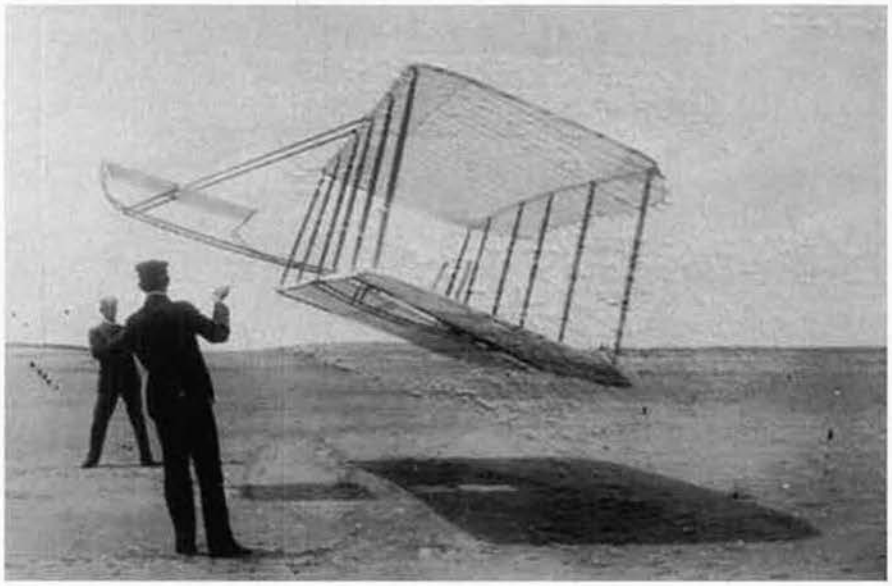
The brothers loved the place. "The sunsets here are the prettiest I have ever seen," Orville reported. "The clouds light up in all colors in the background, with deep blue clouds of various shapes fringed with gold before."

They liked Kitty Hawkers, who returned the sentiment. "Our fame has spread far and wide up and down the beach," Orv joked on one occasion. And it was the beach that hooked them. "The sand is the greatest thing in Kitty Hawk," said Orville.

The Passion

In late 1903, Will was 36 and Orv was 32—middle-aged men for that era. Although unmarried, they were domestically settled, the youngest sons of the bishop, living contentedly in the family's foursquare Dayton home with their father and sister. Orv liked camping and made caramels and fudge for his niece and nephews. At age 18, Will suffered an injury playing ice hockey and gave up the idea of going to Yale. Instead, he spent three years caring for his mother, a tuberculosis case, who finally succumbed.

Before long, the brothers set out to become newspapermen. They wrote and published a little local broadsheet, but they soon found that the money was in printing. Orv at age 17 built a high-speed printing press so peculiar it led a visiting pressman to declare, "It works, but I certainly don't see how it does the work."



Origins. *Before building airplanes, the Wrights built gliders; before gliders, they built kites. Here, they fly the 1901 glider as a kite.*

April 16, 1949. First flight of the YF-94 Starfire prototype takes place at Van Nuys, Calif. The Starfire is designed to serve as an interim all-weather interceptor.
May 7, 1949. Retired Gen. H. H. "Hap" Arnold is given the permanent rank of General of the Air Force by a special act of Congress.
May 11, 1949. President Truman signs a bill providing for a 3,000-mile-long guided-missile test range for the Air Force. The range is subsequently established at Cape Canaveral, Fla.
May 12, 1949. The Soviets reopen routes into Berlin.
July 27, 1949. The deHavilland DH-106 Comet airliner prototype makes its first flight at Hatfield, England. The Comet is the world's first jet airliner.
Aug. 9, 1949. Navy Lt. J.L. Fruin makes the first emergency escape with an ejection seat in the US near Walterboro, S.C. His McDonnell F2H-1 Banshee is traveling at more than 500 knots at the time.
Sept. 30, 1949. The Berlin Airlift, gradually reduced since May 12, 1949, officially ends. Results show 2,343,301.5 tons of supplies carried on 277,264 flights. US airplanes carried 1,783,826 tons.

1950

Jan. 14, 1950. General of the Air Force H.H. "Hap" Arnold dies of a heart ailment at Sonoma, Calif.
Jan. 23, 1950. USAF establishes Research and Development Command. Eight months later it is redesignated Air Research and Development Command. In 1961, ARDC will be redesignated Air Force Systems Command.
Jan. 31, 1950. President Truman announces that he has directed the Atomic Energy Commission "to continue its work on all forms of atomic energy weapons, including the so-called hydrogen or super bomb." This is the first confirmation of US H-bomb work.
Feb. 1, 1950. The prototype of the MiG-17 (NATO reporting name "Fresco") fighter makes its first flight at the Soviet flight test center at Zhukovsky.
March 15, 1950. The Joint Chiefs of Staff, in a statement of basic roles and missions, give the Air Force formal and exclusive responsibility for strategic guided missiles.
June 25, 1950. North Korea attacks South Korea to begin Korean War.
June 27, 1950. Flying a North American F-82 Twin Mustang, Lt. William G. Hudson, with radar operator Lt. Carl Fraser, destroys a Yak-11 near Seoul.
June 28, 1950. USAF aircraft fly first strikes of the war, attacking tanks, trucks, and supply columns along the North Korean invasion route.
June 30, 1950. President Truman authorizes Army Gen. Douglas MacArthur to dispatch air forces against targets in North Korea.
July 10, 1950. Flying a North American T-6 Texan trainer armed with smoke rockets, Lts. James Bryant and Frank Mitchell, on the first day of "mosquito missions" (forward air control sorties) in Korea, call in a strike by F-80 pilots.
Sept. 14, 1950. North Koreans push retreating UN forces into the "Pusan Perimeter" in southeast Korea, marking the line of maximum advancement for the invaders. Airpower pounds North Korean supply lines, limiting the enemy force that can be brought to bear on Pusan.
Sept. 22, 1950. Air Force Col. David C. Schilling makes the first nonstop trans-Atlantic flight in a jet aircraft, flying a Republic F-84E from Manston, England, to Limestone (later Loring) AFB, Maine, in 10 hours, one minute. The trip requires three in-flight refuelings.
Oct. 25, 1950. Communist China enters the Korean War.
Nov. 8, 1950. 1st Lt. Russell J. Brown, flying a Lockheed F-80 Shooting Star, downs a North Korean MiG-15 in history's first all-jet aerial combat.
Dec. 17, 1950. Lt. Col. Bruce Hinton, flying a North American F-86 Sabre, wins the first ever air-to-air combat between swept-wing fighters when he shoots down a MiG-15 over Korea.

An F-80 in the Korean War.

1951

May 20, 1951. Maj. James Jabara becomes the Air Force's first Korean War ace. He eventually downs 15 enemy airplanes in Korea.
June 20, 1951. First flight of the Bell X-5 takes place at Edwards AFB, Calif.
July 6, 1951. A Stategic Air Command crew, flying a KB-29M tanker, conducts the first air refueling operation over enemy territory under combat conditions. The tanker refuels three RF-80s flying reconnaissance over North Korea.
Oct. 2, 1951. Col. Francis S. Gabreski of the 51st Fighter Wing downs a MiG-15, which gives him 6.5 victories in Korea. Combined with his 28 victories in World War II, he is the highest scoring Air Force ace with victories in two wars.

1952

April 1, 1952. In a further change from practices carried over from when it was part of the Army, the Air Force redesignates the grades of private first class, corporal, and buck sergeant as airman third class, airman second class, and airman first class.
April 15, 1952. The Boeing YB-52 Stratofortress bomber prototype makes its maiden flight from Seattle.
April 27, 1952. The Tupolev Model 88, the prototype of the Tu-16 jet bomber, makes its first flight. The Tu-16

(later given the NATO reporting name "Badger") is the Soviet Union's first strategic jet-powered bomber and is also the first with swept wings.

May 3, 1952. Air Force Lt. Cols. William Benedict and Joseph Fletcher land an LC-47 on the North Pole.

June 23-24, 1952. Combined air elements of the Air Force, Navy, and Marines virtually destroy the electrical power potential of North Korea. The two-day attack involves more than 1,200 sorties and is the largest single air effort since World War II and first to employ aircraft in Korea from all three services.

July 13-31, 1952. Two Air Force crews make the first crossing of the Atlantic by helicopter.

July 29, 1952. A North American RB-45C Tornado crew makes the first nonstop trans-Pacific flight by a multiengine jet bomber, flying the 3,640 miles from Alaska to Japan in nine hours and 50 minutes with the help of a KB-29 tanker.

Oct. 31, 1952. The United States tests its first thermonuclear device at Eniwetok in the Marshall Islands.

1953

Jan. 26, 1953. Chance Vought Aircraft completes the last F4U Corsair. In production for 13 years (and built by two other manufacturers during World War II), almost 12,700 Corsairs will be built in a number of versions, making for one of the longest and largest production runs in history.

Jan. 30, 1953. Capt. B.L. Fithian (pilot) and Lt. S.R. Lyons (radar operator) shoot down an unseen North Korean aircraft using only the radar in their Lockheed F-94 Starfire to guide them to the intercept.

May 13 and 16, 1953. Air Force crews flying Republic F-84 Thunderjets conduct two raids on dams, causing the loss of all electrical power to North Korea.

May 18, 1953. Capt. Joseph C. McConnell Jr., flying an F-86, downs three MiG-15 fighters in two separate engagements. These victories give McConnell a total of 16 victories in just five months of action and make him the leading American ace of the Korean War.

May 25, 1953. First flight of the North American YF-100 Super Sabre prototype takes place at the Air Force Flight Test Center at Edwards AFB, Calif.

June 8, 1953. Officially activated June 1, 1953, USAF's 3600th Air Demonstration Team, the Thunderbirds, perform their first aerial demonstration.

July 16, 1953. Lt. Col. William Barnes pushes the recognized absolute speed record past 700 mph, as he hits 715.697 mph in a North American F-86D.

July 27, 1953. UN and North Korea sign armistice agreement, producing a cease-fire in Korea.

Aug. 20, 1953. Seventeen Republic F-84G Thunderjets, refueling from Boeing KC-97s, are flown nonstop 4,485 miles from Turner AFB, Ga., to RAF Lakenheath, UK, in what is, up to this point, the longest mass movement of fighter-bombers in history.

Sept. 1, 1953. The first jet-to-jet air refueling takes place between a Boeing KB-47 and a "standard" B-47.

Sept. 11, 1953. A Grumman F6F drone is destroyed in the first successful interception test of the Sidewinder air-to-air missile at China Lake, Calif.

Nov. 20, 1953. NACA test pilot Scott Crossfield becomes the first pilot to exceed Mach 2. His Douglas D-588-II Skyrocket research airplane is dropped from a Navy P2B-1S (B-29) at an altitude of 32,000 feet over Edwards AFB, Calif.

1954

Feb. 28, 1954. First flight of the Lockheed XF-104 Starfighter takes place at Edwards AFB, Calif. A landing gear retraction problem cuts the flight short, however.

March 1, 1954. In the Marshall Islands, the US successfully explodes its first deliverable hydrogen bomb.

March 4, 1954. First full flight of the XF-104.

March 18, 1954. Boeing rolls out the first production B-52A Stratofortress at its plant in Seattle. Production will continue until 1962.

April 1, 1954. President Eisenhower signs into law a bill creating the US Air Force Academy.

June 28, 1954. First flight of the Douglas RB-66A Destroyer takes place at Long Beach, Calif. Developed from the Navy's A3D Skywarrior, the RB/B-66 variant is intended to provide the Air Force with a tactical light bomber and reconnaissance aircraft.

July 15, 1954. The Boeing Model 367-80 makes its first flight. The aircraft is the prototype for the Air Force's C/KC-135 series and the progenitor of the 707, which will become the first civilian jetliner to see wide use.

Aug. 23, 1954. First flight of the YC-130 Hercules takes place at Burbank, Calif.

Sept. 1, 1954. Continental Air Defense Command—a joint command composed of Air Force, Army, Navy, and Marine forces—is established at Colorado Springs, Colo.

Sept. 29, 1954. First flight of the McDonnell F-101A Voodoo takes place at Edwards AFB, Calif.

Oct. 12, 1954. The Cessna XT-37 Tweet trainer prototype is flown for the first time at Wichita, Kan.

Oct. 27, 1954. Benjamin O. Davis Jr., son of the first black general officer in the US Army, becomes the first black general officer in the US Air Force.

Dec. 10, 1954. To determine if a pilot could eject from an airplane at supersonic speed and live, Lt. Col. John Paul Stapp, a flight surgeon, rides a rocket sled to 632 mph,

A Boeing 707 testing a new refueling boom for the KC-135.

decelerates to zero in 1.4 seconds, and survives 40 times the force of gravity.

1955

Feb. 23, 1955. The Army picks Bell Helicopter from a list of 20 competing companies to build its first turbine-powered helicopter. The winning design, designated XH-40, will become the HU-1 (and later still, UH-1) Iroquois, the renowned Huey.

Feb. 26, 1955. North American Aviation test pilot George Smith becomes the first person to survive ejection from an aircraft flying at supersonic speed. His F-100 Super Sabre is traveling at Mach 1.05 when the controls jam and he is forced to punch out.

July 11, 1955. The first class (306 cadets) is sworn in at the Air Force Academy's temporary location at Lowry AFB, Colo.

Aug. 4, 1955. First official flight of the Lockheed U-2 spyplane takes place at Groom Lake, Nev. An inadvertent hop had been made on July 29.

Oct. 22, 1955. First flight of the Republic YF-105 Thunderchief takes place at Edwards AFB, Calif. The aircraft, commonly known as the "Thud," is the largest single-engine, single-seat fighter ever built.

Nov. 26, 1955. Defense Secretary Charles E. Wilson assigns responsibility for development and operations of land-based ICBMs to the Air Force.

1956

Jan. 9, 1956. The Ye-5, the first true prototype of the MiG-21 supersonic point defense fighter, makes its first flight. Later given the NATO reporting name "Fishbed," more than 8,000 MiG-21s will be built.

March 10, 1956. The recognized absolute speed record passes the 1,000 mph barrier, as company pilot Peter Twiss hits 1,132.13 mph in the Fairey Delta 2 research aircraft at Sussex, England.

May 21, 1956. An Air Force crew flying a Boeing B-52B Stratofortress at 40,000 feet air-drops a live hydrogen bomb over Bikini Atoll in the Pacific. The bomb has a measured blast of 3.75 megatons.

May 28, 1956. First flight of the Ryan X-13 Vertijet Vertical Takeoff and Landing (VTOL) research aircraft in hover mode takes place at Edwards AFB, Calif.

Aug. 31, 1956. The KC-135, the first jet-powered tanker, makes its first flight.

Sept. 27, 1956. Capt. Milburn Apt, USAF, reaches Mach 3.196 in the Bell X-2, becoming the first pilot to fly three times the speed of sound. Apt is killed, however, when the aircraft tumbles out of control.

Oct. 26, 1956. First flight of the Bell XH-40 at Fort Worth, Tex. Later redesignated UH-1, the Iroquois, or Huey.

Oct. 31, 1956. A ski-equipped Douglas R4D (Navy C-47) Skytrain lands at the South Pole, becoming the first aircraft to land at the bottom of the world.

Nov. 11, 1956. First flight of the Convair XB-58A Hustler takes place at Fort Worth, Tex. The delta-winged B-58 is the Air Force's first supersonic bomber.

Dec. 26, 1956. First flight of the Convair F-106 Delta Dart takes place at Edwards AFB, Calif.

1957

Jan. 18, 1957. Commanded by Maj. Gen. Archie J. Old Jr., three B-52 Stratofortresses complete a 24,325-mile round-the-world nonstop flight in 45 hours, 19 minutes, with an average speed of 534 mph. It is the first globe-circling nonstop flight by a jet aircraft.

April 11, 1957. The jet-powered Ryan X-13 Vertijet makes its first full-cycle flight, taking off vertically, transitioning to horizontal flight, and landing vertically.

June 11, 1957. The first Convair XSM-65A (later redesignated CGM-16A) Atlas ICBM launches from Cape Canaveral, Fla., but is destroyed within a few seconds.

Aug. 1, 1957. NORAD, the bilateral US-Canadian North American Air Defense Command, is informally established.

Aug. 15, 1957. Gen. Nathan F. Twining becomes Chairman of the Joint Chiefs of Staff, the first USAF officer to serve in this position.

Oct. 4, 1957. The space age begins when the Soviet Union launches Sputnik 1, the world's first artificial satellite, into Earth orbit.

Dec. 6, 1957. The first US attempt to orbit a satellite fails when a Vanguard rocket loses thrust and explodes.

Dec. 17, 1957. The Convair HGM-16 Atlas ICBM makes its first successful launch and flight.

1958

Jan. 31, 1958. Explorer I, the first US satellite, is launched by the Army at Cape Canaveral, Fla.

Feb. 4, 1958. The keel of the world's first nuclear-powered aircraft carrier, USS *Enterprise*, is laid at the Newport News Shipbuilding and Drydock Co. yards in Virginia.

Feb. 27, 1958. Approval is given to USAF to start research and development on an ICBM that will later be called Minuteman.

May 27, 1958. First flight of the McDonnell XF4H-1 (F-4) Phantom II takes place at St. Louis.

June 17, 1958. Boeing and Martin are named prime contractors to develop competitive designs for the Air Force's X-20 Dyna-Soar boost-glide space vehicle. This project, although later canceled, is the first step toward the space shuttle.

Explorer I launch in 1958.

July 15, 1958. The first Boeing Vertol VZ-2A tilt-wing research aircraft makes its first successful transition from vertical to horizontal flight and vice versa.
August 1958. The term "aerospace" is used publicly for the first time by Gen. Thomas D. White, USAF Chief of Staff, in an *Air Force* Magazine article. The term was coined by Frank W. Jennings, a civilian writer and editor for the Air Force News Service.
Oct. 1, 1958. The National Aeronautics and Space Administration (NASA) is officially established, replacing NACA.
Dec. 18, 1958. Project Score, an Atlas booster with a communications repeater satellite, is launched into Earth orbit. The satellite carries a Christmas message from President Eisenhower that is broadcast to Earth, the first time a human voice has been heard from space.

1959

Jan. 8, 1959. NASA requests eight Redstone-type launch vehicles from the Army for Project Mercury development flights. Four days later, McDonnell Aircraft Co. is selected to build the Mercury capsules.
Feb. 6, 1959. An Air Force Systems Command crew launches the first Martin XSM-68A (later redesignated HGM-25A) Titan ICBM from Patrick AFB, Fla.
Feb. 12, 1959. The last Convair B-36 Peacemaker is retired from USAF service.
Feb. 28, 1959. USAF successfully launches the Discoverer I satellite into polar orbit from Vandenberg AFB, Calif.
April 2, 1959. Seven test pilots—Air Force Capts. L. Gordon Cooper Jr., Virgil I. "Gus" Grissom, and Donald K. "Deke" Slayton; Navy Lt. Cmdrs. Walter M. Schirra Jr. and Alan B. Shepard Jr.; Lt. M. Scott Carpenter; and Marine Lt. Col. John H. Glenn Jr.—are announced as the Project Mercury astronauts.
April 20, 1959. The prototype Lockheed UGM-27A Polaris sea-launched ballistic missile successfully flies a 500-mile trajectory in a Navy test.
April 30, 1959. A Convair B-36J Peacemaker is flown to the Air Force Museum at Wright–Patterson AFB, Ohio. This is the last flight of the mammoth B-36.
May 28, 1959. Astrochimps Able and Baker are recovered alive in the Atlantic after their flight to an altitude of 300 miles in the nosecone of a PGM-19 Jupiter missile launched from Cape Canaveral Missile Test Annex, Fla.

Test pilot Scott Crossfield with the X-15.

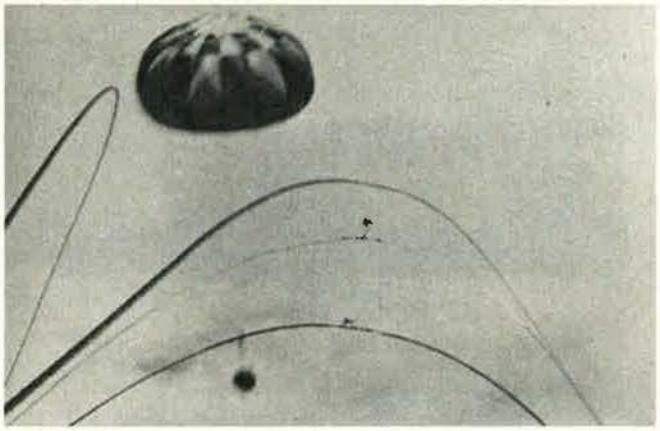
June 3, 1959. The first class is graduated from the Air Force Academy.
June 8, 1959. After several attempts, North American pilot Scott Crossfield makes the first nonpowered X-15 flight.
Aug. 7, 1959. First intercontinental relay of a voice message by satellite takes place. The voice is that of Maj. Robert C. Mathis, later USAF vice chief of staff.
Sept. 9, 1959. The Atlas missile is fired for the first time by a SAC crew from Vandenberg AFB, Calif., and the missile type is declared operational by the SAC commander in chief.
Sept. 12, 1959. The Soviet Union launches Luna 2, the first man-made object to reach the moon.
Sept. 17, 1959. First powered flight of the North American X-15 rocket powered research aircraft takes place at Edwards AFB, Calif. Company pilot Scott Crossfield reaches a speed of Mach 2.11 and an altitude of 52,341 feet.

1960

Jan. 25, 1960. In the first known shootdown of a ballistic missile, an Army MIM-23 HAWK anti-aircraft missile downs an unarmed MGR-1 Honest John surface-to-surface unguided rocket.
April 1, 1960. The RCA-built TIROS 1 (Television Infrared Observation Satellite), the world's first meteorological satellite, is successfully launched from Cape Canaveral Missile Test Annex, Fla., atop a Thor launch vehicle.
April 19, 1960. The Grumman A2F-1 attack aircraft prototype makes its first flight at the company's Calverton, N.Y., facility. Later designated the A-6 Intruder, more than 680 Intruders are built.
May 1, 1960. Central Intelligence Agency pilot Francis Gary Powers, flying a U-2 reconnaissance aircraft, is shot down over the Soviet Union near Sverdlovsk. He is captured and later put on trial for espionage.
July 20, 1960. The first underwater launch of a Lockheed UGM-27 Polaris ballistic missile is successfully carried out from USS *George Washington* off Cape Canaveral Missile Test Annex, Fla.
Aug. 16, 1960. At an altitude of 102,800 feet over Tularosa, N.M., Air Force Capt. Joseph W. Kittinger Jr. steps out of his balloon's open gondola and freefalls 84,700 feet, reaching a speed of 614 mph. Kittinger lands unharmed 13 minutes, 45 seconds after jumping. This the highest jump and longest free fall ever recorded.
Aug. 18, 1960. A USAF crew flying a specially modified Fairchild C-119J Flying Boxcar makes the first successful midair retrieval of a then-classified Corona program satellite imagery capsule re-entering the atmosphere. The crew uses two wire hooks trailing from the aircraft's cargo hold to snag the parachute of the Discoverer XIV imagery capsule over the Pacific.
Sept. 21, 1960. Tactical Air Command formally accepts the first Republic F-105D Thunderchief all-weather fighter in ceremonies at Nellis AFB, Nev.

1961

Feb. 1, 1961. The first Boeing LGM-30A Minuteman ICBM is launched from Cape Canaveral Missile Test



A C-119J attempt to retrieve a satellite in midair in 1960.

Annex, Fla. It travels 4,600 miles and hits the target area.
Feb. 3, 1961. SAC's Boeing EC-135 Airborne Command Post begins operations. Dubbed "Looking Glass," the airplanes and their equipment provide a backup means of controlling manned bombers and launching land-based ICBMs in case a nuclear attack wipes out conventional command and control systems.
March 10, 1961. The Ye-155—the prototype of the MiG-25, a Mach 3 capable interceptor and reconnaissance platform—makes its first flight.
April 12, 1961. The Soviet Union stuns the world with the first successful manned spaceflight. Cosmonaut Yuri Gagarin is not only history's first spaceman, he is also the first person to orbit the Earth.
April 15, 1961. The Lockheed P3V-1 Orion makes its first flight at Burbank, Calif.
May 5, 1961. Cmdr. Alan B. Shepard Jr. becomes the first Project Mercury astronaut to cross the space frontier. His flight in Freedom 7 lasts 15 minutes, 28 seconds, reaches an altitude of 116.5 miles, and ends 303.8 miles downrange.
May 25, 1961. President Kennedy, at a joint session of Congress, declares a national space objective: "I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to Earth."
July 21, 1961. Capt. Virgil I. "Gus" Grissom becomes the first Air Force astronaut in space. He attains an altitude of 118.3 miles on the second Mercury mission.
Aug. 6-7, 1961. Flying in the Vostok 2 spacecraft, Soviet Air Force Capt. Gherman Titov becomes the first person to orbit the Earth for more than a day. He also becomes the first person to get spacesick.

1962

Jan. 17, 1962. Defense Secretary Robert S. McNamara announces the Air Force will adopt the Navy's McDonnell F4H-1 Phantom II as an interim replacement for the F-105.
Feb. 2, 1962. A Fairchild C-12 crashes while spraying defoliant on a Viet Cong ambush site. It is the first Air Force crew and aircraft lost in South Vietnam.
Feb. 20, 1962. Marine Lt. Col. John H. Glenn Jr. becomes the first US astronaut to orbit the Earth. His Friendship 7 flight lasts nearly five hours.
April 30, 1962. First official flight of the Lockheed A-12, the forerunner of the SR-71 high-speed reconnaissance aircraft, takes place at Groom Lake, Nev.
June 30, 1962. The Department of Defense adopts a common designation system for all military aircraft based on existing (and much simpler) Air Force designation methods.
July 17, 1962. Maj. Robert M. White pilots the X-15 research aircraft to an altitude of 314,750 feet, thus making the first spaceflight in a manned aircraft.
Oct. 3, 1962. Navy Cmdr. Walter M. "Wally" Schirra Jr. completes nearly six orbits. He is also the first astronaut to splash down in the Pacific Ocean.
Oct. 14, 1962. Maj. Richard S. Heyser, flying a Lockheed U-2E, returns to the United States with photographic evidence that Soviet SS-4 intermediate range nuclear missiles are being erected near San Christobal, Cuba.
Oct. 22, 1962. Strategic Air Command goes on actual airborne alert.
Oct. 23, 1962. Air Force pilots from Shaw AFB, S.C., make the first low-level photoreconnaissance flights during the Cuban Missile Crisis.
Oct. 26, 1962. The 744th and last Boeing B-52 Stratofortress is delivered to SAC.
Oct. 27, 1962. Maj. Rudolph Anderson Jr., flying a Lockheed U-2, is shot down by a Soviet built SA-2 Guideline surface-to-air missile while performing an overflight mission over Cuba. He is the only combat casualty of the Cuban Missile Crisis.
Dec. 14, 1962. NASA's Mariner II satellite scans the surface of Venus for 35 minutes as it flies past the planet at a distance of 21,642 miles.

1963

Feb. 9, 1963. The Boeing 727 tri-jet airliner makes its first flight, from Seattle to Everett, Wash.
Feb. 28, 1963. The first Minuteman ICBM squadron, the 10th Strategic Missile Squadron (SMS) at Malmstrom AFB, Mont., is declared operational.
May 15, 1963. Air Force Maj. L. Gordon Cooper Jr. is the first to spend a complete day in orbit.
June 16-19, 1963. Cosmonaut Jr. Lt. Valentina Tereshkova, a former cotton mill worker, becomes the first woman in space. Her Vostok 6 flight lasts nearly three days.
Aug. 22, 1963. NASA pilot Joe Walker achieves an unofficial world altitude record of 354,200 feet in the X-15.
Oct. 17, 1963. The first LGM-30A Minuteman I operational test launch is carried out at Vandenberg AFB, Calif., by a crew from Malmstrom AFB, Mont.
Oct. 22, 1963. In Exercise Big Lift, the Air Force airlifts more than 15,000 men of the 2nd Armored Division and its supporting units from Ft. Hood, Tex., to bases near Frankfurt, West Germany.
Dec. 17, 1963. Lockheed C-141A Starlifter, USAF's first jet-powered transport, makes its first flight at Marietta, Ga.

1964

Jan. 8, 1964. The newest Air Force decoration, the Air Force Cross, is posthumously awarded to reconnaissance pilot Maj. Rudolf Anderson Jr., the only combat casualty of the 1962 Cuban Missile Crisis.

Feb. 29, 1964. President Lyndon B. Johnson announces the existence of the Lockheed A-11 with a cruising speed of more than Mach 3 above 70,000 feet.
May 11, 1964. The North American XB-70 Valkyrie is rolled out at Palmdale, Calif.
Aug. 2, 1964. The destroyer USS *Maddox* is attacked by North Vietnamese patrol boats in the Gulf of Tonkin.
Aug. 5, 1964. USAF moves into Southeast Asia in force. B-57s from Clark AB, Philippines, deploy to Bien Hoa, South Vietnam, and additional F-100s move to Da Nang, South Vietnam. Eighteen F-105s deploy from Japan to Korat AB, Thailand, beginning Aug. 6.
Aug. 7, 1964. Congress passes the Gulf of Tonkin Resolution.
Aug. 19, 1964. The Hughes Syncom III satellite is launched by a Thor-Delta launch vehicle. It becomes the world's first geosynchronous satellite.
Sept. 21, 1964. First flight of the North American XB-70A Valkyrie takes place at Palmdale, Calif.
Dec. 14, 1964. US Air Force flies the first Barrel Roll armed reconnaissance mission in Laos.
Dec. 15, 1964. Taking off from Bien Hoa AB, South Vietnam, the Douglas FC-47 (later redesignated AC-47) gunship, attacks enemy sampans, buildings, trails, and suspected jungle staging areas.
Dec. 21, 1964. First flight of the variable-geometry General Dynamics F-111A takes place at Fort Worth, Tex. The flight lasts 22 minutes.
Dec. 22, 1964. Lockheed gets approval to start development for the Air Force of the CX-HLS transport, which will become the C-5A.
Dec. 22, 1964. First flight of the Lockheed SR-71A "Blackbird" strategic reconnaissance aircraft takes place at Palmdale, Calif.

1965

Feb. 8, 1965. The Air Force performs its first retaliatory air strike in North Vietnam. A North American F-100 Super Sabre flies cover for attacking South Vietnamese fighter aircraft, suppressing ground fire.
Feb. 18, 1965. First Air Force jet raids are flown against an enemy concentration in South Vietnam.
March 2, 1965. Capt. Hayden J. Lockhart, flying an F-100 in a raid against an ammunition dump north of the Vietnamese demilitarized zone, is shot down and becomes the first Air Force pilot to be taken prisoner by the North Vietnamese. He will not be released until Feb. 12, 1973.
June 3-7, 1965. Air Force Maj. Edward H. White makes the first US spacewalk.
June 18, 1965. SAC B-52s are used for the first time in Vietnam, when 28 aircraft strike Viet Cong targets near Saigon.
July 10, 1965. Capt. Thomas S. Roberts, with his backseater Capt. Ronald C. Anderson, and Capt. Kenneth E. Holcombe, and his backseater Capt. Arthur C. Clark, both flying F-4C Phantom IIs, shoot down two MiG-17s, the first Air Force air-to-air victories of the Vietnam War.
Aug. 18, 1965. In an effort to combat mounting aircraft losses to North Vietnamese surface-to-air missiles, an Air Force committee headed by Brig. Gen. Kenneth C. Dempster recommends the installation of radar homing and warning (RHAW) electronic equipment in North American F-100Fs.
Sept. 27, 1965. First flight of the YA-7A Corsair II attack aircraft takes place at NAS Dallas, Tex.
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.
Dec. 15, 1965. In a first for the US space program, the crews of Gemini 6 and Gemini 7 rendezvous in space.

A Strategic Air Command B-52D.

1966

Jan. 1, 1966. Military Air Transport Service is redesignated Military Airlift Command (MAC).
Jan. 17, 1966. A B-52 loaded with four hydrogen bombs collides with a KC-135 while refueling near Palomares, Spain. Seven of the 11 crew members involved are killed. Three of the four weapons are quickly recovered. The fourth, which falls into the Mediterranean Sea, is not recovered until early spring.
Jan. 23, 1966. Military Airlift Command completes Operation Blue Light, the airlift of the Army's 3rd Brigade, 25th Infantry Division, from Hawaii to Pleiku, South Vietnam, to offset the buildup of Communist forces there.
Feb. 28, 1966. The US space program suffers its first fatalities, as the Gemini 9 prime crew of Elliot M. See Jr. and Charles A. Bassett II are killed as their Northrop T-38 crashes in St. Louis in bad weather.
March 4, 1966. A flight of Air Force F-4C Phantoms is attacked by three MiG-17s in the first air-to-air combat of the war over North Vietnam. The MiGs make unsuccessful passes before fleeing to the sanctuary of the Communist capital area.
March 16, 1966. The Gemini 8 crew, Neil A. Armstrong and USAF Maj. David R. Scott, successfully carry out the first docking with another vehicle in space.
April 12, 1966. Strategic Air Command B-52 bombers strike targets in North Vietnam for the first time. They hit a supply route in the Mu Gia Pass, about 85 miles north of the border.

1967

Jan. 2, 1967. USAF 8th Tactical Fighter Wing pilots, led by Col. Robin Olds in the famous MiG sweep Operation

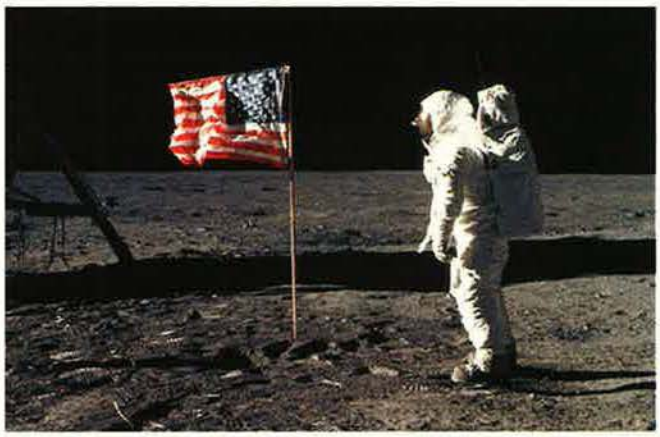
Bolo mission, down seven North Vietnamese MiG-21s over the Red River Valley in North Vietnam.
Jan. 2, 1967. By shooting down a MiG-21, Col. Robin Olds becomes the first and only USAF ace with victories in both World War II and Vietnam.
Jan. 27, 1967. Astronauts USAF Lt. Col. Virgil I. "Gus" Grissom, Navy Lt. Cmdr. Roger B. Chaffee, and USAF Lt. Col. Edward H. White II are killed in a flash fire aboard their Apollo 1 command module during a ground test.
March 10, 1967. Air Force F-105 Thunderchief and F-4C Phantom II crews bomb the Thai Nguyen steel plant in North Vietnam for the first time.
April 3, 1967. CMSgt. Paul W. Airey becomes the first Chief Master Sergeant of the Air Force.
April 9, 1967. First flight of the Boeing 737 airliner takes place at Seattle. The 737 becomes the world's best-selling passenger aircraft.
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.
May 31-June 1, 1967. Two Air Force crews flying Sikorsky HH-3E Jolly Green Giants make the first nonstop flight across the Atlantic by helicopter.
Nov. 17-Dec. 29, 1967. Operation Eagle Thrust, the largest and longest airlift of troops and cargo from the US to Southeast Asia, begins by C-141 and C-133 aircraft.
Dec. 11, 1967. The Aerospatiale-built Concorde supersonic jetliner prototype rolls out at the company's plant in Toulouse, France.

1968

Jan. 1, 1968. Battle of Khe Sanh in South Vietnam begins. Air Force airlifters bring in an average of 165 tons of materiel daily during the 77-day siege.
Feb. 29, 1968. Jeanne M. Holm, director of Women in the Air Force, and Helen O'Day, assigned to the Office of the Air Force Chief of Staff, become the first women promoted to permanent colonel.
March 2, 1968. The first of 80 C-5A Galaxy transports rolls out at Lockheed's Marietta, Ga., facility.
March 25, 1968. F-111s fly their first combat mission against military targets in North Vietnam.
March 31, 1968. President Johnson announces a partial halt of bombing missions over North Vietnam and proposes peace talks.
May 25, 1968. The Grumman EA-6B electronic warfare/airborne jammer prototype makes its first flight at Long Island, N.Y.
June 30, 1968. The world's largest aircraft, the Lockheed C-5A Galaxy, makes its first flight, at Dobbins AFB, Ga.
Aug. 16, 1968. The first test launch of a Boeing LGM-30G Minuteman III ICBM is carried out from Cape Kennedy AFS, Fla.
Oct. 11-22, 1968. Apollo 7, the first test mission following the disastrous Apollo 1 fire, is carried out.
Nov. 1, 1968. President Johnson halts all bombing of North Vietnam.
Dec. 21-27, 1968. Three Apollo 8 Astronauts, USAF Col. Frank Borman, Navy Cmdr. James A. Lovell Jr., and USAF Maj. William A. Anders, become the first humans to orbit the moon.
Dec. 31, 1968. The Soviet Union conducts the first flight of the Tu-144, the world's first supersonic transport.

1969

Feb. 9, 1969. Boeing conducts the first flight of the 747. The jumbo jet, with standard seating for 347 passengers, introduces high passenger volume to the world's airways.
May 18-26, 1969. In a dress rehearsal for the moon landing, Apollo 10 astronauts USAF Col. Thomas P. Stafford and Cmdr. Eugene A. Cernan fly the lunar module *Snoopy* to within nine miles of the lunar surface.
July 20, 1969. Man sets foot on the moon for the first time. At 10:56 p.m. EDT, Apollo 11 astronaut Neil A. Armstrong puts his left foot on the lunar surface. He and lunar module pilot Col. Edwin E. "Buzz" Aldrin Jr., USAF, spend just under three hours walking on the moon. Command module pilot Lt. Col. Michael Collins, USAF, remains in orbit.



Astronaut Buzz Aldrin during an Apollo 11 moon walk.

Oct. 31, 1969. The last Boeing B-47 Stratojet jet bomber is retired from USAF service.
Nov. 3, 1969. The Air Force issues a request for proposal for a new bomber to meet its advanced manned strategic aircraft requirement. Its designation will be B-1.
Nov. 14-24, 1969. Apollo 12 is hit by lightning on liftoff, but Cmdrs. Charles Conrad Jr. and Alan L. Bean make the second manned lunar landing with pinpoint accuracy.

1970

Feb. 17, 1970. Crews flying Boeing B-52s bomb targets in northern Laos for the first time.
April 11-17, 1970. An explosion in the Apollo 13 service module cripples the spaceship and forces the crew to use the lunar module as a lifeboat to get back to Earth. After a tense four days, the Apollo 13 crew safely splashes down in the Pacific.
June 6, 1970. The first operational C-5A Galaxy transport is delivered at Charleston AFB, S.C.
Aug. 24, 1970. Two Air Force crews complete the first nonstop trans-Pacific helicopter flight as they land their Sikorsky HH-53Cs at Da Nang AB, South Vietnam, after a 9,000-mile flight from Eglin AFB, Fla. The helicopters were refueled in flight.

Dec. 21, 1970. The Grumman F-14A Tomcat fleet air defense fighter makes its first flight at Long Island, N.Y.

1971

April 17, 1971. Federal Express begins air freight operations from Memphis, Tenn., guaranteeing overnight delivery anywhere in the United States.
July 16, 1971. Jeanne M. Holm becomes the first female general officer in the Air Force.
July 26, 1971. Apollo 15 blasts off with an all-Air Force crew: Col. David R. Scott, Lt. Col. James B. Irwin, and Maj. Alfred M. Worden. Millions of viewers throughout the world watch as color-TV cameras cover Scott and Irwin exploring the lunar surface using a moon rover vehicle for the first time.
Sept. 3, 1971. President Richard M. Nixon dedicates the new US Air Force Museum building at Wright-Patterson AFB, in Dayton, Ohio.

1972

March 1972. The North Vietnamese spring invasion is stopped and then turned back by US airpower.
April 6, 1972. American aircraft and warships begin heavy, sustained attacks on North Vietnam for the first time since the cessation of bombing in October 1968.
April 27, 1972. Four Air Force fighter crews, releasing Paveway 1 "smart" bombs, knock down the Thanh Hoa Bridge in North Vietnam. Previously, 871 conventional sorties resulted in only superficial damage to the bridge.
May 10-11, 1972. F-4 Phantoms from the 8th Tactical Fighter Wing drop smart bombs on the Paul Doumer Bridge, causing enough damage to keep this mile-long highway and rail crossing at Hanoi out of use. It will not be rebuilt until air attacks on North Vietnam cease in 1973.
July 27, 1972. First flight of the McDonnell Douglas F-15A Eagle air superiority fighter at Edwards AFB, Calif.
Aug. 28, 1972. Capt. Richard S. Ritchie shoots down his fifth MiG-21 near Hanoi, becoming the Air Force's first ace since the Korean War.
Sept. 9, 1972. Capt. Charles B. DeBellevue (WSO), in a McDonnell Douglas F-4D, shoots down two MiG-19s near Hanoi. These were the fifth and sixth victories for DeBellevue, which made him the leading American ace of the war.
Dec. 7-19, 1972. The Apollo 17 mission is the last of the moon landings.
Dec. 18, 1972. The US begins Operation Linebacker II, the 11-day bombing of Hanoi and Haiphong. Massive air strikes help persuade North Vietnam to conclude Paris peace negotiations, which will be finalized Jan. 27, 1973.

1973

April 17, 1973. Taking off from Guam, Air Force crews flying B-52 Stratofortresses make the last bombing missions over Laos, attacking targets south of the Plain of Jars because of Communist cease-fire violations.
Aug. 15, 1973. Maj. John J. Hoskins and Capt. Lonnie O. Ratley, flying LTV A-7D Corsair IIs, make the last raids of the war in Southeast Asia when they attack targets near Phnom Penh, Cambodia, late in the afternoon.
Nov. 14, 1973. The US ends its major airlift to Israel. In a 32-day operation during the Yom Kippur War, Military Airlift Command airlifts 22,318 tons of supplies.
Nov. 14, 1973. The first production F-15A Eagle is delivered to the Air Force at Luke AFB, Ariz.
Nov. 16, 1973-Feb. 8, 1974. Marine Lt. Col. Gerald Carr, Air Force Lt. Col. William Pogue, and Edward Gibson form the third and final Skylab crew.

1974

Jan. 21, 1974. The YF-16 prototype makes a first, unplanned flight at Edwards AFB, Calif. As company test pilot conducts high-speed taxi tests, the aircraft lifts off the runway, and rather than risk damage to the aircraft, the pilot elects to lift off and go around to come in for a normal landing.
June 9, 1974. First flight of the Northrop YF-17 at Edwards AFB, Calif. It would become the progenitor of the Navy's F/A-18 Hornet.
Oct. 24, 1974. The Air Force's Space and Missile Systems Organization carries out a midair launch of a Boeing LGM-30A Minuteman I from the hold of a Lockheed C-5A.
Dec. 23, 1974. First flight of the Rockwell B-1A variable-geometry bomber takes place at Palmdale, Calif.

YF-16—Lightweight Fighter Technology program.

1975

Jan. 13, 1975. The General Dynamics YF-16 is announced as the winner of the Air Force's Lightweight Fighter Technology evaluation program.
June 30, 1975. The last Douglas C-47A Skytrain in routine Air Force use is retired to the US Air Force Museum at Wright-Patterson AFB, Ohio.
July 15-24, 1975. US astronauts Brig. Gen. Thomas P. Stafford, USAF, Vance D. Brand, and Donald K. Slayton rendezvous, dock, and shake hands with Soviet cosmonauts Alexei A. Leonov and Valeri N. Kubasov in orbit during the Apollo-Soyuz Test Project.
Aug. 20, 1975. The Viking 1 mission to Mars is launched. The lander soft-lands on July 20, 1976.
Sept. 1, 1975. Gen. Daniel "Chappie" James Jr., USAF,

Daniel "Chappie" James receiving a fourth star.

becomes the first black officer to achieve four-star rank in the US military.

Oct. 21, 1975. Fairchild Republic's A-10A Thunderbolt II makes its first flight.

Nov. 29, 1975. The first Red Flag exercise at Nellis AFB, Nev., begins a new era of highly realistic training for combat aircrews.

1976

Jan. 9, 1976. Air Force's first operational F-15 Eagle arrives at the 1st Tactical Fighter Wing, Langley AFB, Va.

Sept. 6, 1976. Soviet pilot Lt. Victor Belenko, taking off from Sakharovka Air Base near Vladivostok, lands his MiG-25 (NATO reporting name "Foxbat") interceptor at the Hakodate Airport in northern Japan and asks for political asylum.

1977

March 10, 1977. The prototype Grumman EF-111A airborne tactical jamming platform for the Air Force is flown for the first time.

March 24, 1977. Boeing delivers the first basic production version of the E-3A Sentry (AWACS) to Tinker AFB, Okla.

May 20, 1977. The Sukoi T-10, the prototype of the Su-27 (NATO reporting name "Flanker") makes its first flight.

June 30, 1977. President Jimmy Carter announces he is canceling the B-1A variable-geometry bomber program.

Oct. 6, 1977. The MiG-29 prototype (NATO reporting name "Fulcrum") makes its first flight.

Dec. 1, 1977. First flight of the Lockheed XST Have Blue demonstrator takes place at Groom Lake, Nev. Developed in only 20 months, Have Blue is designed as a test bed for stealth technology.

1978

Feb. 22, 1978. The first test satellite in the Air Force's Navstar Global Positioning System is successfully launched into orbit.

March 23, 1978. Capt. Sandra M. Scott becomes the first female aircrew member to pull alert duty in SAC.

Nov. 30, 1978. The last Boeing LGM-30G Minuteman III ICBM is delivered to the Air Force at Hill AFB, Utah.

1979

Jan. 6, 1979. The 388th Tactical Fighter Wing at Hill AFB, Utah, receives the first operational General Dynamics F-16A fighters.

July 9, 1979. The Voyager 2 space probe, launched in 1977, flies within 399,560 miles of Jupiter's cloud tops. Voyager 2 will pass Neptune in 1989.

Oct. 1, 1979. All atmospheric defense assets and missions of Aerospace Defense Command are transferred to Tactical Air Command (TAC).

1980

April 24, 1980. In the middle of an attempt to rescue US citizens held hostage in Iran, mechanical difficulties force several Navy RH-53 helicopter crews to turn back. Later, one of the RH-53s collides with an Air Force HC-130 in a sandstorm at the Desert One refueling site. Eight US servicemen are killed.

May 28, 1980. The Air Force Academy graduates its first female cadets.

Aug. 22, 1980. Department of Defense reveals existence of stealth technology that "enables the United States to build manned and unmanned aircraft that cannot be successfully intercepted with existing air defense systems."

1981

April 12, 1981. The space shuttle *Columbia*, the world's first reusable manned space vehicle, makes its first flight.

April 14, 1981. The space shuttle *Columbia* lands at Edwards AFB, Calif., after its first orbital mission. This is the first time in history that an orbital vehicle leaves the Earth under rocket power and returns as an aircraft.

June 7, 1981. A surprise attack by the Israeli Air Force destroys the Osirak nuclear reactor near Baghdad, setting back Iraq's attempt to develop nuclear weapons.

June 18, 1981. In total secrecy, company pilot Hal Farley makes the first flight of the Lockheed F-117A stealth fighter at Tonopah Test Range, Nev.

June 26, 1981. The first production Grumman/General Dynamics EF-111A, a specially developed ECM tactical jamming aircraft, makes its first flight.

Sept. 26, 1981. The Boeing 767 twin-engine, twin-aisle jetliner makes its first flight at Everett, Wash.

Oct. 2, 1981. President Reagan reinstitutes the B-1 bomber program canceled by the Carter Administration in 1977.

1982

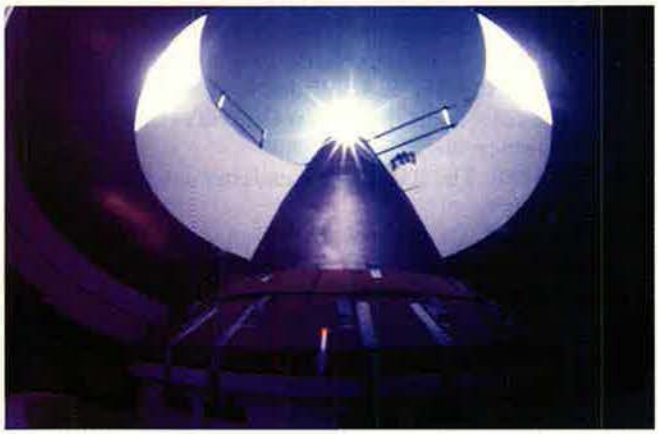
Feb. 4, 1982. First flight of Tacit Blue "Whale," which demonstrates that curvilinear surfaces are valuable in foiling radar. It leads to advances that live on in the B-2 and the F/A-22.

Feb. 19, 1982. The Boeing 757 twin-engine, single aisle jetliner makes its first flight at Renton, Wash.

Feb. 24, 1982. NATO receives the first of 18 E-3A Airborne Warning and Control System (AWACS) aircraft at Geilenkirchen AB, Germany.
June 6-11, 1982. In the Bekka Valley of Lebanon, the Israeli Air Force overcomes the long-standing combat advantage of surface-to-air missiles, destroying 19 SAMs with no losses. In the follow-up action, the Israelis shoot down 82 Syrian MiGs without losing any of their own fighters.
Sept. 1, 1982. Air Force Space Command is established, with headquarters at Colorado Springs, Colo.

1983

March 23, 1983. Flight testing of the Rockwell B-1A resumes at Edwards AFB, Calif. This aircraft is modified for the B-1B development effort.
June 17, 1983. The first LGM-118A Peacekeeper ICBM is test-launched from Vandenberg AFB, Calif.



The LGM-118 Peacekeeper ICBM.

June 18, 1983. The first American woman to go into space, Sally K. Ride, is aboard *Challenger* on the seventh space shuttle mission.
Aug. 30, 1983. The first black American astronaut, Lt. Col. Guion S. Bluford Jr., USAF, is sent aloft on the space shuttle *Challenger*.

1984

Aug. 27, 1984. The first Grumman X-29A forward-swept-wing research aircraft rolls out at the company's Long Island facility in New York.
Sept. 4, 1984. The first production Rockwell B-1B bomber is rolled out at Air Force Plant 42 in Palmdale, Calif.
Oct. 18, 1984. Company pilot M.L. Evenson and USAF Lt. Col. L.B. Schroeder make the first flight of the Rockwell B-1B variable-geometry bomber at Palmdale, Calif., and land at Edwards AFB, Calif.
Dec. 14, 1984. At Edwards AFB, Calif., Grumman pilot Chuck Sewell makes the first flight of the X-29A forward-swept-wing demonstrator.

1985

Jan. 24-27, 1985. The 15th space shuttle mission is the first dedicated DOD flight. The *Discovery* crew deploys a classified payload, believed to be a signals intelligence satellite.
Sept. 13, 1985. The first test of the LTV-Boeing ASM-135A air-launched antisatellite weapon against a target is successfully carried out over the Western Test Range at Vandenberg AFB, Calif. Launched from an F-15, the missile destroys a satellite orbiting at a speed of 17,500 mph approximately 290 miles above Earth.
Oct. 10, 1985. The LGM-118 Peacekeeper ICBM reaches initial operational capability. The 10-warhead missiles are based at F.E. Warren AFB, Wyo.
Dec. 16, 1985. After 20 years of operation, the Pioneer 6 satellite becomes the longest-running spacecraft in history. When launched in 1965, the solar-orbiting satellite had a life expectancy of six months.

1986

Jan. 28, 1986. The space shuttle *Challenger* explodes 73 seconds after liftoff, killing all seven astronauts, including schoolteacher Christa McAuliffe. Others on Mission 51-L were Francis R. Scobee, Navy Cmdr. Michael J. Smith, Judith A. Resnik, Ronald E. McNair, Air Force Lt. Col. Ellison S. Onizuka, and Gregory B. Jarvis.
April 15, 1986. In Operation El Dorado Canyon, US Air Force F-111s launch from RAF Lakenheath in England, are refueled in the air six times by KC-10 tankers, maintain complete radio silence, and are joined by Navy A-6s in a retaliatory raid against Libya in response to state-sponsored terrorism.
Dec. 23, 1986. Dick Rutan and Jeanna Yeager land at Edwards AFB, Calif., after nine-day flight in experimental aircraft *Voyager*, the first-ever nonstop, unrefueled flight around the world.

1987

May 5, 1987. The last Martin Marietta LGM-25C Titan II ICBM is taken off strategic alert at Little Rock AFB, Ark. The Titan II had stood nuclear alert since 1963.
Sept. 24, 1987. The Air Force's Thunderbirds fly for a crowd of 5,000 in Beijing. It has been nearly 40 years since a US combat aircraft flew over and landed on Chinese soil.

1988

Jan. 20, 1988. The 100th and final B-1B bomber rolls off the line at Rockwell's plant in Palmdale.
May 23, 1988. The Bell-Boeing V-22 Osprey, the world's first production tilt-rotor aircraft, is rolled out at Bell Helicopter Textron's plant in Arlington, Tex.
Sept. 29, 1988. Launch of the space shuttle *Discovery* ends the long stand-down of the US manned space program in the wake of the *Challenger* disaster.
Nov. 6, 1988. The Air Force launches its last Martin Marietta Titan 34D booster from Vandenberg AFB, Calif. It carries a classified payload.
Nov. 10, 1988. The Air Force reveals the existence of the Lockheed F-117A stealth fighter, operational since 1983.
Nov. 12, 1988. Soviet cosmonauts Vladimir G. Titov and Musa K. Manarov break the world space endurance

record as they remain on board the space station Mir for their 326th day in orbit.

Nov. 22, 1988. Northrop and the Air Force roll out the B-2 stealth bomber at Air Force Plant 42 in Palmdale, Calif.

Nov. 30, 1988. The Soviets roll out the An-225 transport, the world's largest airplane.

Dec. 29, 1988. The first operational dual-role (air superiority and deep interdiction) McDonnell Douglas F-15E fighter is delivered to the Air Force.

1989

March 19, 1989. First flight of the Bell-Boeing V-22 Osprey takes place at Arlington, Tex.

April 17, 1989. Lockheed delivers the 50th and last C-5B Galaxy transport to the Air Force in ceremonies at Marietta, Ga.

June 10, 1989. Capt. Jacquelyn S. Parker becomes the first female pilot to graduate from the Air Force Test Pilot School at Edwards AFB, Calif.

June 14, 1989. The first Martin Marietta Titan IV heavy-lift space booster is successfully launched from Launch Complex 40 at Cape Canaveral AFS, Fla.

July 6, 1989. The nation's highest civilian award, the Presidential Medal of Freedom, is presented to retired Air Force Gen. Jimmy Doolittle.

July 17, 1989. First flight of the Northrop B-2A advanced technology bomber, takes place from Palmdale, Calif., to Edwards AFB, Calif.

Aug. 24, 1989. The Voyager 2 space probe passes within 3,000 miles of Neptune. Voyager 2 was launched in Aug. 1977.

Oct. 3, 1989. The last of 37 Lockheed U-2R/TR-1A/B high-altitude reconnaissance aircraft is delivered to the Air Force.

Oct. 4, 1989. A crew from the 60th Military Airlift Wing, Travis AFB, Calif., lands a Lockheed C-5B transport at McMurdo Station in Antarctica.

Dec. 20, 1989. Operation Just Cause begins in Panama. The Lockheed F-117A stealth fighter is used operationally for the first time.

1990

Jan. 25, 1990. The Lockheed SR-71 Blackbird high-altitude, high-speed reconnaissance aircraft is retired from SAC service in ceremonies at Beale AFB, Calif.

March 1, 1990. The Rockwell/MBB X-31A Enhanced Fighter Maneuverability demonstrator rolls out in Palmdale, Calif.

March 26, 1990. Grumman rolls out the first production-standard F-14D Tomcat in Calverton, N.Y.

April 2, 1990. Air Force pilot Maj. Erwin "Bud" Jenschke demonstrates in-flight thrust reversing for the first time while flying the McDonnell Douglas NF-15B S/MTD (STOL/Maneuvering Technology Demonstrator) aircraft over Edwards AFB, Calif.

July 12, 1990. The last of 59 Lockheed F-117A stealth fighters is delivered at Palmdale, Calif.

July 24, 1990. SAC ends Looking Glass, more than 29 years of continuous airborne alert, as a Boeing EC-135C airborne command post aircraft lands at Offutt AFB, Neb.

Aug. 7, 1990. The US begins Operation Desert Shield, the large-scale movement of US forces to the Middle East in response to Iraq's Aug. 2 invasion of Kuwait and threat to Saudi Arabia.

Aug. 8, 1990. A C-141 carrying an airlift control element lands in Dhahran, Saudi Arabia, the first USAF aircraft into the crisis zone. F-15s from 1st Tactical Fighter Wing, Langley AFB, Va., and elements of the 82nd Airborne Division, Ft. Bragg, N.C., arrive in Saudi Arabia. US AWACS aircraft augment Saudi AWACS orbiting over Saudi Arabia.

Aug. 17, 1990. For the first time, the Civil Reserve Air Fleet is activated to increase the availability of airlift to the Middle East.

Aug. 29, 1990. The Lockheed/Boeing/General Dynamics YF-22A prototype is unveiled in ceremonies at Lockheed Plant 10 in Palmdale, Calif.

Oct. 11, 1990. First flight of the Rockwell/MBB X-31A EFM demonstrator takes place at Palmdale, Calif.

1991

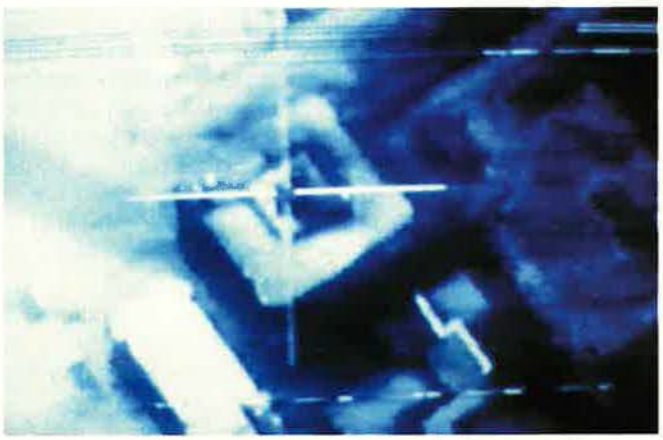
Jan. 7, 1991. Secretary of Defense Dick Cheney announces that he is canceling the A-12 Avenger attack aircraft program for default. The A-12 would have been the Navy's first stealth aircraft.

Jan. 16, 1991. At 6:35 a.m. local time, B-52G crews from the 2nd Bomb Wing, Barksdale AFB, La., take off to begin what will become the longest bombing mission in history. Carrying 39 AGM-86C Air Launched Cruise Missiles, the bomber crews fly to the Middle East and launch their missiles against high-priority targets in Iraq.

Jan. 17, 1991. War begins in the Persian Gulf. Operation Desert Shield becomes Operation Desert Storm.

Feb. 28, 1991. Iraq surrenders to the US-led coalition. In the 43-day, round-the-clock war, the Air Force flies more than 38,000 combat sorties, offloads more than 800 million pounds of fuel, and transports 96,465 passengers and 333 million pounds of cargo.

March 8, 1991. The first Martin Marietta Titan IV heavy-lift space booster to be launched from Vandenberg AFB, Calif., lifts off. The booster carries a classified payload.



In the crosshairs—precision weapons in Gulf War I.

April 18, 1991. The Air Force carries out the first successful flight test of the Martin Marietta/Boeing MGM-134A small ICBM. The missile flies 4,000 miles from Vandenberg AFB, Calif., to its assigned target area in the Army's Kwajalein Missile Range in the Pacific Ocean.
Sept. 15, 1991. The McDonnell Douglas C-17A transport makes its first flight.
Sept. 27, 1991. Strategic bomber crews stand down from their decades-long, round-the-clock readiness for nuclear war.

1992

Jan. 18, 1992. Air Training Command receives its first T-1A Jayhawk trainer aircraft at Reese AFB, Tex.
Jan. 31, 1992. The Navy takes delivery of the last production Grumman A-6 Intruder attack aircraft, closing out 31 years of Intruder production.
May 12, 1992. Lockheed delivers the 2,000th C-130 Hercules transport at Marietta, Ga.
June 1, 1992. SAC, TAC, and MAC are deactivated. Bomber, fighter, attack, reconnaissance, and electronic combat/electronic warfare aircraft and all ICBMs regroup under Air Combat Command. Airlifter and tanker aircraft regroup under Air Mobility Command.
July 1, 1992. Air Force begins Operation Provide Promise, flying humanitarian relief missions into Croatia and Bosnia. It is the longest-running air supply effort in history, officially ending Jan. 4, 1996.
Aug. 27, 1992. Operation Southern Watch begins as Persian Gulf coalition members (primarily the US Air Force and Navy) enforce the ban on Iraqi airplanes flying south of the 32nd parallel.
Dec. 27, 1992. Two F-16 pilots intercept a pair of Iraqi MiG-25s flying in the UN-imposed no-fly zone over southern Iraq. One of the pilots fires an AIM-120A AMRAAM and downs one of the MiGs, marking the first use of the AIM-120A in combat and the first USAF F-16 air-to-air victory.

1993

Jan. 13, 1993. USAF Maj. Susan Helms, aboard *Endeavour,* becomes the first US military woman in space.
April 12, 1993. NATO Operation Deny Fight begins, enforcing a ban ordered by the UN Security Council on aircraft operations in the no-fly zone of Bosnia.
April 28, 1993. Defense Secretary Les Aspin lifts the long-standing ban on female pilots flying US combat aircraft.
April 29, 1993. German test pilot Karl Lang makes the first demonstration of a high-angle-of-attack, post-stall, 180-degree turn known as a Herbst Maneuver while flying the Rockwell/MBB X-31A.
June 14, 1993. The first operational C-17A transport is delivered at Charleston AFB, S.C.
July 1, 1993. Day-to-day control of ICBMs passes to Air Force Space Command from Air Combat Command.
Aug. 6, 1993. Sheila E. Widnall becomes Secretary of the Air Force. Widnall is the first female Secretary for any of the armed services.
Sept. 15, 1993. The first B-52H bomber to be adapted for conventional warfare missions is completed.

Delivery of the first operational B-2 stealth bomber.

Dec. 17, 1993. On the 90th anniversary of the Wright brothers' first sustained flight, the first operational Northrop B-2 stealth bomber, *Spirit of Missouri,* is delivered to the 509th Bomb Wing at Whiteman AFB, Mo.

1994

Feb. 10, 1994. Lt. Jeannie M. Flynn, the first woman selected for USAF combat pilot training, completes her F-15E training.
Feb. 28, 1994. Air Force F-16s, operating under NATO command, shoot down four Bosnian Serb aircraft. It is NATO's first combat in its 45-year history.
March 15, 1994. Reports by *Air Force* Magazine reveal the politically slanted plans of the National Air and Space Museum to exhibit the *Enola Gay,* the B-29 that dropped the atomic bomb on Hiroshima. Under pressure from Congress, the news media, and public opinion, the exhibit is canceled and the museum director is fired.
April 10, 1994. In NATO's first air attacks on ground positions, two Air Force F-16C fighters destroy a Bosnian Serb Army command post with Mk 82 500-pound bombs.
June 12, 1994. The Boeing 777 makes its first flight. It is the first jetliner to be 100 percent digitally designed using three-dimensional computer graphics.
June 29, 1994. First visit of a US space shuttle to a space station, the Russian Mir.
July 1994. The 184th Bomb Group, Kansas Air National Guard, becomes the first Guard unit to be equipped with the B-1B.
Aug. 2, 1994. Two B-52s from the 2nd Bomb Wing, Barksdale AFB, La., set a world record while circumnavigating the Earth. Flying 47.2 hours, the bombers set a world record not only for the longest B-52 flight but also for the longest jet aircraft flight in history.
Aug. 4, 1994. Two B-1Bs complete a 19-hour nonstop global power mission.
October 1994. USAF responds to hostile movements in the Persian Gulf area by Iraq's Saddam Hussein by deploying 193 combat aircraft.
Nov. 21-23, 1994. In Project Sapphire, Air Mobility Command C-5s transport more than 1,300 pounds of highly enriched uranium from the former Soviet republic of Kazakhstan to Dover AFB, Del., to protect this large

supply of nuclear materials from terrorists, smugglers, and unfriendly governments.

1995

Feb. 7, 1995. First drop of live bombs from the B-2A stealth bomber. The two Mk 84 bombs were dropped as part of the B-2's first Red Flag exercise at Nellis AFB, Nev.
April 7, 1995. 2nd Lt. Kelly Flinn, the first woman to join a bomber crew, begins student pilot training with the 11th Bomb Squadron, 2nd Bomb Wing, Barksdale AFB, La.
April 27, 1995. The Global Positioning System (GPS) achieves full operational capability.
June 2-3, 1995. Two Dyess AFB, Tex.–based Rockwell B-1B crews land after completing a 36 hour, 13 minute, 36 second, 20,100-mile nonstop round-the-world flight.
June 28, 1995. The National Air and Space Museum of the Smithsonian Institution finally puts the *Enola Gay*, the B-29 that dropped the first atomic bomb on Japan, on display. Exhibition is straightforward.
July 29, 1995. Air Combat Command activates an unmanned aerial vehicle (UAV) unit and assigns it to the 57th Operations Group at Nellis AFB, Nev.
Aug. 30, 1995. US Air Force, Navy, and Marine aircraft lead Operation Deliberate Force, a NATO bombing campaign responding to Bosnian Serb mortar attacks that killed 38 civilians at an outdoor market in Sarajevo, Yugoslavia. The operation ends Sept. 14, 1995.
Nov. 29, 1995. First flight of the F/A-18E Super Hornet carrier-based fighter attack aircraft.
Dec. 6, 1995. A crew from the 37th Airlift Squadron at Ramstein AB, Germany, marks the beginning of Operation Joint Endeavor by flying their Lockheed C-130E to Tuzla, Bosnia.
Dec. 20, 1995. NATO air operation Decisive Endeavor begins to monitor and enforce peace in Bosnia.

1996

Jan. 4, 1996. First flight of the Army's YRAH-66 Comanche helicopter prototype.
March 15, 1996. After 77 years of aircraft manufacturing in the Netherlands, Fokker Aircraft declares bankruptcy.
June 25, 1996. Terrorist truck bomb explodes at Khobar Towers in Dhahran, Saudi Arabia, killing 19 airmen.
July 27, 1996. On the day it is retired from service, the Air Force officially bestows the nickname Aardvark on the General Dynamics F-111 in ceremonies at the (now Lockheed Martin) plant in Fort Worth, Tex.
October 1996. After the terrorist bombing at Khobar Towers in June, the Air Force moves to Prince Sultan Air Base in the Saudi Arabian desert.
Oct. 8, 1996. B-2A Spirit bombers hit 16 out of 16 targets with live Global Position System-Aided Targeting System/ GPS-Aided Munition (GATS/GAM) weapons during a test.
Nov. 26, 1996. The Air Force carries out the first successful test of a full-up GBU-31 Joint Direct Attack Munition (JDAM).
Dec. 4, 1996. The Mars Pathfinder, the first spacecraft designed to land on and explore Mars in nearly 21 years, is launched from Cape Canaveral AS, Fla.

1997

Jan. 1, 1997. Operation Northern Watch, the follow-on to Provide Comfort II, begins, as US aircrews patrol the no-fly zone over northern Iraq.
Feb. 20, 1997. The Global Hawk long-range reconnaissance UAV rolls out in San Diego.
April 1, 1997. The B-2A Spirit stealth bomber reaches initial operational capability with the 509th Bomb Wing at Whiteman AFB, Mo.

Roll out of the first production F-22 Raptor.

April 9, 1997. The first F-22 fighter, *Spirit of America*, rolls out at the Lockheed plant at Marietta, Ga.
July 4, 1997. NASA's Pathfinder spacecraft lands on Mars.
Sept. 7, 1997. First flight of the F-22 Raptor takes place at Dobbins ARB, Ga.
Sept. 12, 1997. Air University begins the Air and Space Basic Course School at Maxwell AFB, Ala.
Sept. 25, 1997. Russia's Sukhoi S-32 stealth fighter makes its maiden flight at an air base outside of Moscow.
Dec. 18, 1997. Joint STARS officially achieves IOC seven years after the aircraft, in its development phase, was employed in the Persian Gulf War.

1998

March 23-April 3, 1998. The B-2 bomber makes its first sustained overseas deployment, to Guam, demonstrating the capability to deploy and operate from locations around the world.
Aug. 4, 1998. The Air Force announces plans to reorganize its operational capabilities into an Expeditionary Aerospace Force, with 10 standing Air Expeditionary Forces.
Dec. 9, 1998. Benjamin O. Davis Jr., retired World War II Air Force hero and leader of the all-black Tuskegee Airmen, is promoted to four-star rank.
Dec. 16, 1998. In Operation Desert Fox, a limited four-day operation, American and British aircraft and US air- and sea-launched cruise missiles strike some 100 targets in Iraq.

1999

March 24, 1999. Combat begins in Operation Allied Force, the NATO air campaign against Serbia.
March 24, 1999. B-2 bomber makes its combat debut in Operation Allied Force. It will account for 11 percent of the bombing.
June 10, 1999. Operations against Serbia are suspended and end formally on June 20.
June 23-27, 1999. Air Force Lt. Col. Eileen M. Collins becomes the first woman to command a space shuttle.
Oct. 1, 1999. First regular Air Expeditionary Force rotational cycle begins. The full cycle is 15 months, divided into five three-month periods.
Oct. 6, 1999. Destruction of 150 Minuteman III silos, in accordance with the Strategic Arms Reduction Treaty, begins near Langdon, N.D.

2000

May 3, 2000. Gen. Joseph W. Ralston becomes Supreme Allied Commander, Europe, the first Air Force officer to lead NATO in almost 40 years.
July 25, 2000. The Air Force CV-22, a special operations-modified version of the V-22 Osprey tilt-rotor aircraft, rolls out at Fort Worth, Tex.
Sept. 27, 2000. Boeing unveils the first X-45A Unmanned Combat Air Vehicle at its facilities at St. Louis.
Oct. 24, 2000. Lockheed Martin's X-35A Joint Strike Fighter demonstrator makes its first flight at Palmdale, Calif.
Oct. 27, 2000. Gen. Charles R. Holland becomes commander of US Special Operations Command, the first Air Force officer ever to command all SOF.

2001

Jan. 11, 2001. Congressionally mandated Space Commission recommends significant organizational realignments and increased responsibilities for the Air Force.
Jan. 22-26, 2001. Air Force Space Command's Space Warfare Center conducts "Schriever 2001," the first war game to explore requirements for space control, counters to enemy space capabilities, and the ability of an enemy to deny the US and its allies the use of space assets.

USAF photo by Lt. Col. William Ramsay

An ANG F-15 on combat air patrol over New York City.

Feb. 21, 2001. A Predator UAV—up to then strictly a surveillance platform—hits a stationary Army tank with a live Hellfire-C missile.
April 22-23, 2001. Global Hawk UAV takes off from Edwards AFB, Calif., and flies 22-hour, 8,600-mile mission, nonstop and unrefueled, to a precision landing in Australia.
May 8, 2001. The Air Force is designated as Department of Defense executive agent for space.
Sept. 11, 2001. Airliners hijacked by terrorists crash into the World Trade Center, the Pentagon, and a field in Pennsylvania. Operation Noble Eagle—combat air patrols above American cities—begins.
Oct. 7, 2001. Operation Enduring Freedom begins with air strikes against terrorist targets in Afghanistan.
Oct. 8, 2001. NATO announces that five of its AWACS aircraft will patrol off the East Coast of the United States. Patrols begin Oct. 12.
Oct. 17, 2001. Pentagon announces that it is employing armed Predator drones, equipped with Hellfire missiles, in Afghanistan.
Oct. 26, 2001. The Air Force awards the Joint Strike Fighter contract to Lockheed Martin.
Nov. 13, 2001. Taliban forces, hammered hard by airpower, abandon the Afghan capital of Kabul.
Dec. 9, 2001. Taliban rule in Afghanistan officially ends as the final province slips from its control.

2002

May 22, 2002. On its first flight, Boeing's X-45A Unmanned Combat Air Vehicle prototype takes off, flies for 14 minutes, and lands at Edwards AFB, Calif., controlled by an onboard computer preprogrammed with flight instructions.
Sept. 17, 2002. The F-22 fighter is redesignated the F/A-22 to emphasize its multiple roles, including attack.
Oct. 7, 2002. Operation Noble Eagle, combat air patrols above American cities, marks end of first year, with 25,100 total sorties flown.

2003

Feb. 1, 2003. Seven astronauts perish as the shuttle *Columbia* breaks up on re-entry, 200,000 feet above east Texas, on its return from a 16-day mission in space.
March 17, 2003. Operation Northern Watch flies its last mission over the northern no-fly zone in Iraq. The operation is officially terminated May 2.
March 19, 2003. Operation Southern Watch flies its last mission over the southern no-fly zone in Iraq.
March 20, 2003. Air Force F-117 fighters and cruise missiles from six US warships strike "leadership targets of opportunity" in Iraq at 5:35 a.m., Baghdad time.
March 21, 2003. Coalition air forces launch nearly 1,000 strike sorties as A-Day, the air campaign, begins at 9 p.m. for Operation Iraqi Freedom.
April 9, 2003. Baghdad falls to coalition ground troops.
May 1, 2003. President George W. Bush, speaking from the deck of the aircraft carrier *Abraham Lincoln,* declares that major combat operations in Iraq are over. ■

Pitsenbarger Pulls One Out

Photos by Ray Schmid

This minefield was on the perimeter of Bien Hoa AB, South Vietnam. On March 7, 1966, a South Vietnamese soldier entered it on a fire-fighting mission. He tripped a mine, which blew off his foot. Minutes later, an HH-43 "Husky" helicopter appeared and lowered a pararescue jumper to the injured soldier. The PJ who lifted the man out of the minefield was A1C William H. Pitsenbarger—the same PJ whose heroic actions east of Saigon on April 11, 1966, saved many lives and led to his being awarded a posthumous Medal of Honor. (See: "Pitsenbarger, Medal of Honor," February 2001, p. 26.) These photographs were taken by Ray Schmid, an air policeman with the 3rd Air Police Squadron.

Staff photo by Guy Aceto

European Command Looks South and

The emphasis is shifting to places like Romania, Sao Tome, and Camp Bondsteel.

Old Europe. *In a classic scene, an F-16 flies over picturesque villages in Germany's Eifel region, but US attention is shifting to Europe's rimlands—and beyond.*

East

By John T. Correll

THINGS have changed drastically for US European Command. Personnel strength and base facilities are down about 70 percent since the peak of the Cold War.

The old mission, keeping the Soviet Union out of Western Europe, is long gone. In recent years, the focus has been on smaller regional conflicts, notably Operation Allied Force in Yugoslavia in 1999, and on building partnerships with nations that used to be part of the Warsaw Pact.

Now, more changes are on the way for EUCOM as the United States shifts its strategic attention to an "arc of instability" that cuts across Africa, the Middle East, and Southwest Asia.

"The Cold War is over and we're not expecting the Soviet Union, which doesn't exist anymore, to launch a major tank war across the north German plain," Secretary of Defense Donald H. Rumsfeld said on a visit to Iraq in September. "So we need to adjust our footprint. One of the places we're looking at adjusting it is in Europe."

"The current disposition of our forces reflects a positioning in keeping with the symmetrical threats of the last century," the EUCOM commander, Marine Gen. James L. Jones Jr., told the Senate Armed Services Committee in April.

"The missions have moved to the east and south," Air Force Gen. Charles F. Wald, Jones's deputy, said at a breakfast meeting with reporters in Washington in September.

Even though EUCOM's force structure has shrunk, its geographic boundaries have expanded. Its responsibilities now extend as far as the Caspian Sea and into Africa. "European Command is not the right word anymore," Wald said. "I don't know what it is, ... but it is something other than European Command."

Rumors have been circulating for the past year that the United States might pull out of bases in Western Europe and move its forces closer to the war on terrorism. That would have considerable impact on several European nations, particularly Germany, where some 70,000 US troops are currently based.

In February, *Deutsche Welle* reviewed the potential effect on the German state of Rhineland Palatinate if the US Air Force left Spangdahlem Air Base. The base, which employs 800 Germans, is the region's biggest employer, and 20,000 more jobs in the area depend on the US presence there.

One rumor said that the 1st Armored Division, deployed to Iraq, might not be returning to its posts in Germany.

"There is some talk about an Army division never coming back here [to Germany] and going directly back to some unspecified location in the States," Jones told *European Stars and Stripes* in September. "That's simply not going to happen."

Congress is interested in European bases, too. One reason is that the next base realignment and closure round is coming up in 2005, and the elimination of overseas bases and the possible relocation of units could take the pressure off the need to close bases at home.

Looking ahead to possible base closures, Raymond F. Dubois, deputy undersecretary of defense for installations and environment, said in October, "The Secretary of Defense promised the Congress of the United States that he would arrange his overseas footprint before he began to rearrange his domestic footprint."

Forward Bases and Operating Locations

The EUCOM infrastructure of the future will be a combination of main operating bases, forward operating bases, and forward operating locations.

"We won't be building any more little Americas," Wald told the *Boston Globe* in July, referring to the large overseas bases of the Cold War, complete with American schools, shopping areas, and McDonald's restaurants.

Some of the main operating bases will remain. Jones told German reporters in July, "We would like to operate Ramstein for as long as we're welcome in Germany," but added that "I don't want to talk about the others."

Ramstein, located in western Germany, about 85 miles from EUCOM headquarters at Stuttgart, is headquarters for US Air Forces in Europe.

Wald, interviewed by the Air Force's internal information news service in August, said, "Ramstein was critical to the success of the Operation Enduring Freedom and

AP photo

Into Africa. *Navy SEALs land in Liberia. Said Gen. Charles Wald, "European Command is not the right word anymore. I don't know what it is, ... but it is something other than European Command."*

Operation Iraqi Freedom missions. A lot of airlift aircraft landed at Ramstein" which "has significant infrastructure, and we have a great relationship with the Germans. It makes a lot of sense to keep places like Ramstein and Spangdahlem and Moron [AB], Spain, open because they have large ramps that can handle large numbers of aircraft."

Camp Bondsteel in Kosovo is an example of a forward operating base. It has some wooden buildings, medical facilities, and an airfield for helicopters. It has some basic amenities, such as a theater and a post exchange, but it is a semipermanent installation, built and run for a fraction of the cost of a main operating base.

When Bondsteel is no longer needed by the peacekeeping force now stationed there, EUCOM hopes to keep the facilities and access, which might be useful for some future operation, Wald said.

Another example of a forward operating base is Thumrait in Oman. The access agreement has been in place for more than 20 years. Air expeditionary forces have used the base periodically, and enough equipment and fuel were pre-positioned there to support several elements of deploying airpower.

During combat operations in Afghanistan and Iraq, the Air Force was fortunate to have forward operating bases like Thumrait and Diego Garcia in the Indian Ocean. It also made use of forward operating locations in such places as Bulgaria and Kyrgyzstan in central Asia.

EUCOM is constantly scouting for good forward operating locations. The command hopes to put small investments into such locations. That could include such assets as buildings, security fences, fuel storage, and even communications capability. "Some of the investment may be just the fact that there is a relationship with the United States," Wald said.

Bases farther south and east could open up training opportunities, which are presently a problem for EUCOM forces.

"The training ranges we have used historically, mostly in Western Europe, have diminished utility due to increasing restrictions on operating hours, costs, limitations on the weapons that are authorized to be employed, and the size of forces that can maneuver on these ranges," Jones said in his testimony to the Senate in April.

Several nations in Central and Eastern Europe and in Northern Africa have expressed interest in providing suitable training ranges, he said.

Last year, the Pentagon floated a proposal to eliminate service components and their four-star commanders within the unified command structure, replacing them with standing joint force headquarters headed by three-star commanders.

Jones and Wald do not believe that arrangement would work in Europe, where, for example, the commander of US Air Forces in Europe is one of seven four-star airmen from NATO and European countries. The United States is the clear leader in airpower, but to believe that the senior American airman could be a three-star general and that the six European four stars "would come to a meeting and defer to the senior US guy is a little bit naive," Wald said.

"In Europe, it is rank, position, and credibility," Wald added. "In the United States, it is position, credibility, and rank. Rank means a lot there. ... General Jones is a strong believer in the fact that we need to retain four-star components, at least in the Navy, Air Force, and Army."

Eyes on Africa and Asia

The places where EUCOM will try to establish forward operating bases and locations will be influenced by both strategic and economic interests.

There is "an emerging concern, not only for the alliance but for the United States, to our south," Jones said in a *Newsweek* interview in October. "Africa is replete with ungoverned spaces for attracting the merchants of terrorism, radical fundamentalism, weapons of mass destruction, and all kinds of criminality, and I think we're going to see more of that."

On behalf of EUCOM, Wald has recently visited such places as Sao Tome, a small nation off the coast of West Africa near Nigeria. The United States presently gets about 15 percent of its oil from Africa, with Nigeria a leading supplier.

"The estimate is in the next 10 years, we will get 25 percent of our oil from there. The Europeans will get a lot from there," Wald said. "I can see the United States potentially having a forward operating location in Sao Tome."

In some cases, the relative desirability of a forward location is attributable to the range of aircraft.

"One of the things we like about Ramstein, for example, is the footprint of one strategic flight without refueling for an airlifter," Wald said. "You can take off from the States, no refueling, [and] land at Ramstein."

The airlifter can refuel in flight, of course, but "we are not always

going to want to use refueling," he said. "We want to use refueling for other things, maybe."

"The same thing going south," he added. "You can only go so far unrefueled with a strategic lifter. It turns out it is about in the middle part of Africa. You want to take a look at places you can land." From Ramstein to Kinshasa (in the Congo) or to Entebbe (in Uganda) is about the same distance as from Washington, D.C., to Ramstein.

At Entebbe airport, Wald said, the US has two K-Span steel buildings—basic construction but clean and dry, with cement floors. "We built those quite a while ago, just in case we ever needed to use something there." UN peacekeeping forces, as well as the French, have been allowed to operate from the K-Spans at Entebbe.

In Asia, Wald said, "we have an initiative called Caspian Guard. ... It will be building surveillance capabilities for both air and sea in the Caspian Sea in conjunction with the Azerbaijanis."

In the near future, Azerbaijan will substantially increase its production of oil, and Southeast Europe will get a majority of its natural gas from the Caspian Sea.

"That becomes a significant strategic issue," Wald said, but noted that "the majority of that economic benefit is going into European capitals."

Thus, stability of the area around the Caspian Sea should be of keen interest to the Europeans. "I asked the Germans yesterday, 'Why should the United States ensure the oil flow out of the Caspian Sea if it is all going to go to Europe?' " Wald said. "To me that is a NATO mission. ... They agreed."

The same applies to the Persian Gulf.

"There isn't any reason why the United States should have been the guarantor of the Middle East for all those years, along with Britain," Wald said. "We should have had other participants helping us all along. ... Europe benefitted from the oil from the Middle East just as much as the United States."

European Challenge to NATO

Changes are also sweeping through NATO, of which US European Command is the leading in-place military component. (Jones, the EUCOM commander, is Supreme Allied Commander, Europe as well.)

NATO continues to expand. Membership, which stood at 15 nations for many years, is now headed for 26 as seven more countries—Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia—join in 2004.

For most of its 54-year history, NATO strictly avoided out-of-area operations and kept its attention within the borders of Europe. In August, however, NATO took formal control of the International Security Assistance Force in Kabul, Afghanistan, its first major mission ever outside of Europe.

At the Prague Summit in November 2002, NATO announced that it would deal with threats "from wherever they may come" and "field forces that can move quickly to wherever they are needed."

The alliance agreed to form a NATO Response Force, with full operational capability in 2006. This force would be tailored for specific operations, as required, based on a brigade-size land element, a joint naval task force, and an air element capable of 200 combat missions per day.

It would be able to deploy quickly and act either in a stand-alone role or as an initial entry force. Its elements would be drawn from the regular NATO force structure.

The latest imbroglio centers on whether the European Union, which pointedly does not include the United States, will field its own military force in competition with NATO.

At a mini-summit of the European Union—formerly the European Economic Community—on April 29, France, Germany, Belgium, and Luxembourg voted to push ahead with a European Union defense force with a command headquarters separate from NATO.

"We consider our commitments within the Atlantic alliance and the European Union as being complementary," the four nations said in a joint statement.

Belgian Prime Minister Guy Verhofstadt said the separate headquarters was needed so Europe could "plan and execute European operations autonomously," meaning without the United States.

An independent military command for the European Union "does cast a doubt about where those countries are headed and what their intentions are," said US Ambassador to NATO R. Nicholas Burns. "Europe does not need more headquarters."

Britain, worried about the potential damage to NATO cohesion, tried to head off the idea of a separate headquarters, proposing instead a European Union "planning cell" at NATO headquarters. In September, though, the British joined the French and Germans in a position paper that said (according to a copy obtained by the German magazine *Der Spiegel*), "We are together convinced that the

Staff photo by Guy Aceto

"A Keeper." ***For the US, Ramstein AB, Germany, has continuing value. "We would like to operate Ramstein for as long as we're welcome in Germany," said Marine Gen. James Jones, EUCOM commander.***

USAF photo by MSgt. Dave Ahlschwede

Balkan Bridge. *In recent wars, USAF operated from forward sites such as Burgas Airport in Bulgaria (shown here, as a C-17 awaits loading). The Balkan nation is close to Middle East hot spots.*

EU must be able to plan and conduct operations without the backing of NATO assets and NATO capability."

The director-general of the EU military staff, German Lt. Gen. Rainer Schuwirth said that member states would be expected to cede national sovereignty on issues of war and peace. "National governments would have to give away their authority over their army," he told the London *Financial Times*.

"I think the NATO Response Force will be, frankly, much more capable ... and probably more viable than, say, an EU standing force," Wald said at his breakfast meeting with reporters. "Between the European Union and the NATO Response Force, I think the NATO Response Force will be the force of choice."

His view was that "the EU is pushing too hard" and that "a total separate military capability is a mistake for Europe."

Earlier this year, 400 soldiers of a European Union force began peacekeeping patrols in Macedonia.

"The EU–NATO relationship is not a problem, but it is a developing relationship," Jones said in a *Defense News* interview in August. However, he said that "it is more efficient to have one military organization that can address the security concerns of both the alliance and the European community. I believe that's the most efficient way. The least efficient and most expensive way is to develop two parallel military structures, neither one of which would probably get the resources required."

Bernard Jenkin, writing in London's *Financial Times,* said a separate European Union military capability "is essentially a French ambition. Most EU countries—including the UK, Italy, Spain, and even Germany—are good NATO supporters. Either they fail to see the anti-NATO. anti-US consequences of ESDP [European Security and Defense Policy], or they believe security policy in Europe is second to European integration."

European Force Capabilities

The question of a separate command and headquarters does not change a problem of long standing in NATO: the gap between the capabilities of US and European forces and their lack of interoperability.

It has been proposed from time to time that the smaller nations specialize and fill specific niches in the alliance requirement rather than try to maintain modern military capabilities across the board.

Among those taking that approach is Norway, which concentrates on mine clearing and mountain reconnaissance. "Identify what you are good at and concentrate on it," Norwegian Defense Minister Kristin Krohn Devold told *New York Times Magazine* in August. "That way, you can play with the big boys even if you are small."

A "Capabilities Commitment," adopted at Prague, obliges the NATO nations to improve in areas critical to modern military operations, such as airlift and air-to-ground surveillance. At present, however, the amount of force they can project on their own is limited.

"The 18 countries of NATO's Integrated Military Structure in principle declare around 240 combat brigades to the alliance, each about 5,000 strong," the NATO Secretary–General, George Robertson, said in June. "A huge figure. But fewer than half of that number are declared as deployable and therefore usable for today's real-world operations. And when you subtract the US contribution and those forces which NATO assesses to be undeployable in practice, the number of usable brigades falls to fewer than 50. Factor in the need to train, rotate, and rest your troops, and the absolute maximum NATO's members, less the US and France, can sustain is around 16 brigades, or some 80,000 soldiers. Even this would require larger European countries such as Germany to be willing and able to keep two or three brigades deployed at any one time."

Wald said that to be a "real participant" in worldwide missions, Europe "is going to have to have more strategic lift. ... I think strategic airlift is going to be one of the keys to this whole NATO viability issue that has to be watched."

He noted the tendency of European nations to procure European systems. For example, The Airbus A400M airlifter, he said, "is almost a C-130J-class aircraft. That is not what you call strategic lift." However, he said, "You don't necessarily have to purchase US things."

"What you do need to do is make sure that whatever you buy works with our stuff," said Wald. "Because when we come to the fight, we bring a lot a capability that nobody else will ever have. I used to tell people in the Middle East, you're not going to buy a B-2, but if we're allies, you'll have a B-2 if a fight starts." ■

John T. Correll was editor in chief of Air Force *Magazine for 18 years and is now a contributing editor. His most recent article, "What Happened to Shock and Awe?" appeared in the November issue.*

The Keeper File

Rumsfeld's "Long, Hard Slog"

Donald H. Rumsfeld, Secretary of Defense under President George W. Bush, found himself in a major controversy after one of his sensitive war memos leaked to the press. The two-page note, dated Oct. 16, 2003, offered a mixed view of progress in the two-year war against terrorists. Rumsfeld, while confident of ultimate victory, warned that the nation faced a "long, hard slog" in Afghanistan and Iraq.

Rumsfeld sent the memo to four persons: USAF Gen. Richard B. Myers and Marine Gen. Peter Pace, chairman and vice chairman of the Joint Chiefs of Staff; Paul D. Wolfowitz, the deputy defense secretary; and Douglas J. Feith, undersecretary of defense for policy. The Pentagon chief wrote it at a time of mounting anxiety about continuing Baathist and Islamic violence that was claiming the lives of US service members in the Middle East.

Bush Administration critics pounced on the memo, contrasting its self-doubting tone with more upbeat public statements issued by Rumsfeld and other top Administration officials. Rumsfeld's aides, for their part, portrayed the memo as merely an attempt to provoke debate and goad the military to think and act creatively.

["USG" refers to the US government. "Omar" is Mullah Omar Muhammad, deposed Taliban leader. "Hekmatyar" refers to Gulbuddin Hekmatyar, an anti-US Afghan warlord. "Ansar al-Islam" is an Islamic terrorist group present in Iraq. A "madrassa" is a fundamentalist Islamic school. A CIA "finding" is a written Presidential authority to conduct a covert action.]

"Global War on Terrorism"

Donald H. Rumsfeld
Memo to Senior DOD Officials,
Washington, D.C.
October 16, 2003

October 16, 2003

TO: Gen. Dick Myers, Paul Wolfowitz, Gen. Pete Pace, Doug Feith

FROM: Donald Rumsfeld

SUBJECT: Global War on Terrorism

The questions I posed to combatant commanders this week were: Are we winning or losing the Global War on Terror? Is DOD changing fast enough to deal with the new 21st century security environment? Can a big institution change fast enough? Is the USG changing fast enough?

DOD has been organized, trained, and equipped to fight big armies, navies, and air forces. It is not possible to change DOD fast enough to successfully fight the Global War on Terror; an alternative might be to try to fashion a new institution, either within DOD or elsewhere—one that seamlessly focuses the capabilities of several departments and agencies on this key problem.

With respect to global terrorism, the record since September 11th seems to be:

- We are having mixed results with al Qaeda. Although we have put considerable pressure on them, nonetheless, a great many remain at large.
- USG has made reasonable progress in capturing or killing the top 55 Iraqis.
- USG has made somewhat slower progress tracking down the Taliban—Omar, Hekmatyar, etc.
- With respect to the Ansar al-Islam, we are just getting started.

Have we fashioned the right mix of rewards, amnesty, protection, and confidence in the US? Does DOD need to think through new ways to organize, train, equip, and focus to deal with the Global War on Terror? Are the changes we have [made] and are making too modest and incremental? My impression is that we have not yet made truly bold moves. ... [W]e have made many sensible, logical moves in the right direction, but are they enough?

Today, we lack metrics to know if we are winning or losing the Global War on Terror. Are we capturing, killing, or deterring and dissuading more terrorists every day than the madrassas and the radical clerics are recruiting, training, and deploying against us?

Does the US need to fashion a broad, integrated plan to stop the next generation of terrorists? The US is putting relatively little effort into a long-range plan, but we are putting a great deal of effort into trying to stop terrorists. The cost-benefit ratio is against us! Our cost is billions against the terrorists' costs of millions.

Do we need a new organization?

How do we stop those who are financing the radical madrassa schools?

Is our current situation such that "the harder we work, the behinder we get"?

It is pretty clear that the coalition can win in Afghanistan and Iraq in one way or another, but it will be a long, hard slog.

Does CIA need a new finding? Should we create a private foundation to entice radical madrassas to a more moderate course? What else should we be considering?

Please be prepared to discuss this at our meeting on Saturday or Monday. Thanks.

DHR

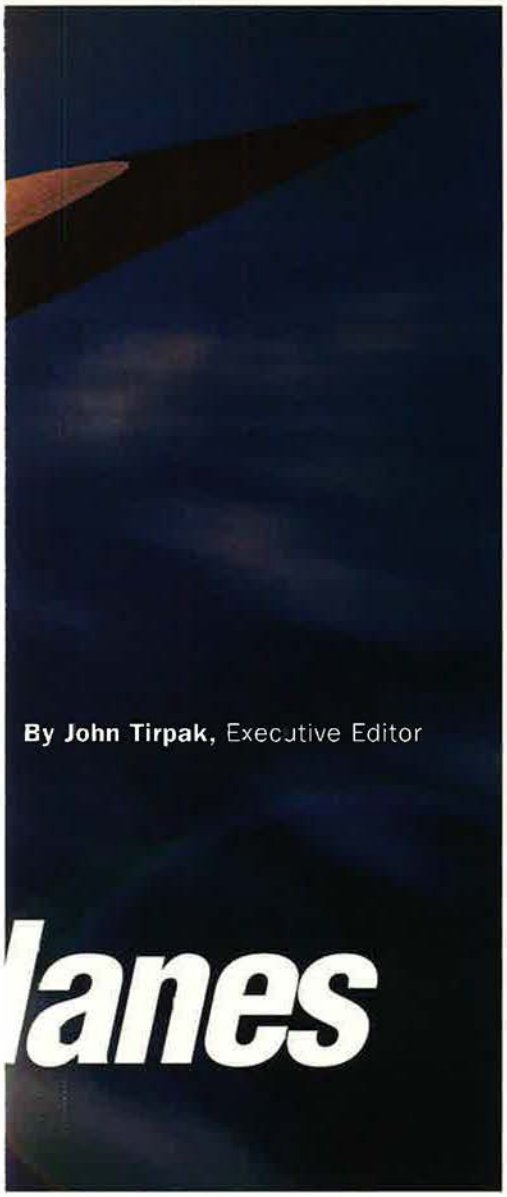
In Search of Spacep

For decades, the Air Force has wanted spaceplanes—craft that can take off from a runway, fly at hypersonic speeds through the upper atmosphere, reach low Earth orbit, and return in a conventional fashion. Yet, the practical application of the concept kept being pushed into the future because of high development costs, inadequate technology, and the lack of a truly pressing mission that would demand such an asset.

That is about to change. There now is an urgent mission for the capabilities of a spaceplane—or something like it.

USAF needs the ability to swiftly hit fleeting targets anywhere on Earth shortly after an order is given to do so. The target might be a terrorist camp, a ballistic missile launch site, a chemical weapons factory, or a leadership target. It also may be deeply buried. A spaceplane would offer the means to get to a target rapidly, soar high above defenses, and deliver munitions that would fall at high velocity and plunge far below the Earth's surface.

Fueling the new urgency to produce an operational spaceplane is the proliferation of theater ballistic missiles and weapons of mass destruction, plus the belief that these and other "anti-access" weapons will only become more widespread in the future. In the hands of terrorists or states that support them, such weapons could prevent the US from get-



By John Tirpak, Executive Editor

lanes

ting close enough to an enemy to conduct operations—a prospect that the national leadership no longer will accept.

Moreover, the last few armed conflicts have illustrated how the US has become highly dependent on space systems for its entire range of military operations. The need to obtain cheap, reliable, rapid access to space has never been greater.

"We have an important interest—and airmen have always had an important interest—in speed," said Gen. Gregory S. Martin, head of Air Force Materiel Command and former commander of US Air Forces in Europe. A spaceplane is "an activity that I think it is important for us to pursue."

US Strategic Command, the "owner" of military space operations and the global strike mission, has established the requirement for a spaceplane. This fall, the Air Force and the Defense Advanced Research Projects Agency began accepting industry proposals for a project that in 2025 would produce a spaceplane—one that may look much like the defunct National Aerospace Plane conceptualized in the 1980s.

To Mach 15

The new craft, which is described as a Hypersonic Cruise Vehicle (HCV), would be capable both of launching satellites and deploying weapons. Plans call for it to fly at speeds up to Mach 15 and carry a mix of weapons comparable to the load carried by one of today's fighter aircraft. It would probably be flown by a crew, but it could be flown remotely as well.

"The ability to reach out and touch somebody with great precision ... at very long range is ... a very attractive attribute," said Brig. Gen. Stephen M. Goldfein, the Air Force's director of operational capability requirements. "We are looking at what industry can tell us about the art of the possible ... with great interest," Goldfein said in an August interview.

Beyond offering the advantage of extreme speed from point to point, an orbital or suborbital spaceplane would also obviate the need to obtain overflight permission from other countries.

USAF wants a system before 2025, however. As an interim measure, the service is developing a hypersonic glide munitions delivery system, known as the Common Aerospace Vehicle. It could be fielded within eight years. The CAV is part of a program dubbed "Falcon" (Force Application and Launch from Continental United States), which also includes development of a Small Launch Vehicle to carry the CAV to an orbit altitude, from which it would coast to its "pierce point" location—that is, the point and velocity at which the vehicle enters the atmosphere. Additionally, the SLV would provide a quick-reaction launch capability for small satellites.

The Air Force and DARPA are collaborating on Falcon and expect substantial assistance from NASA, particularly on propulsion and vehicle control concepts. The service last summer asked US industry to turn in proposals and concepts this fall.

USAF wants to build the means to attack any target on the globe within 12 hours of an order to do so. That requirement stems from an April 2003 Air Staff study titled "Long-Range Global Precision Engagement." In it, the Air Force—working with the Joint Staff and Office of the Secretary of Defense—put strike capabilities into three categories: prompt global strike, prompt theater strike, and persistent area strike.

USAF believes the products of Falcon will fulfill—to a great degree—the prompt global strike element. The ability to conduct prompt global strike would dissuade or deter enemies because they would know that the US could "hold at risk or strike high-value targets anytime and anywhere on the globe," said the study. Such a technology would also eliminate the need for intratheater buildup before conducting a strike.

The study set the following parameters for the prompt global strike capability:

- Availability on short notice.
- Great standoff range with penetrating weapons.
- Capacity for 200 strike effects within 12 hours.
- Range of at least 3,400 miles.

The study authors, despite seeing some partial workarounds, urged rapid development of hypersonic vehicles—be they new missiles or aircraft.

"In particular," the study authors wrote, "the development of high supersonic/hypersonic weapons and delivery platforms significantly enables global strike from significant ranges and reduces the risks associated with forward basing." Additionally, they said, the reusability of these platforms increases their value in a variety of threat scenarios and makes them more cost effective.

The study concluded that, by 2015, even stealthy new systems such as the F/A-22 and F-35 fighters may lack the range to attack critical targets deep behind enemy lines in the early hours of a crisis. The ranges of the two fighters in the initial stages of a conflict would "not allow for penetration beyond approximately 400 nautical miles [460 miles] into

an adversary's battlespace without the use of external fuel tanks that may degrade some aircraft capabilities," according to the study. Tankers that could refuel the two fighters would not be able to get close, if modern surface-to-air missiles were in the area.

The authors projected that some capability independent of forward bases will have to be in hand by 2015, if not sooner.

The Falcon program encompasses concepts that are near term—the Common Aerospace Vehicle and Small Launch Vehicle—and far term—the Hypersonic Cruise Vehicle.

Armed with 1,000 pounds of ordnance, the CAV hypersonic glide munitions dispenser could strike anywhere on an adversary's territory. Descending from high altitude and at high speed, it would be extremely effective against hardened or deeply buried targets. Impact speeds "of approximately 4,000 feet per second" are expected, according to a USAF–DARPA summary.

CAV technology has been studied "since the mid-'90s," USAF said. In that time, some workable concepts offered a downrange glide capability of nearly 3,500 miles. More advanced conceptual versions now promise ranges of up to 10,350 miles, but these enhanced systems would require significant technology development, "particularly in the areas of thermal protection and guidance, navigation, and control," said the USAF–DARPA request for proposal.

Plans call for fitting the Common Aerospace Vehicle on the Small Launch Vehicle, which should be able to launch in less than 24 hours and, with the CAV as its payload, surge to 16 launches in 24 hours. It must lift a 200-to-2,200-pound payload for less than $7,500 per pound. Today's benchmark is about $10,000 a pound.

The Air Force expects to have workable CAV and SLV systems by 2010.

USAF photo

This working scramjet is one of a number of propulsion concepts being explored for spaceplanes. Advances in computing power and materials, coupled with a flight program, point to functional manned hypersonic vehicles by 2025.

The Falcon program is set up to use initial CAV and SLV work as well as NASA's work on hypersonic technology in order to develop the Hypersonic Cruise Vehicle. This program is expected to culminate around 2025.

The Hypersonic Cruise Vehicle would be based on US territory. It would be reusable, having aircraft-like properties that enable it to take off from a conventional military runway. The system would:

- Strike targets 10,350 miles away within two hours.
- Carry a 12,000-pound payload.
- Engage multiple, diverse, and widely dispersed targets.
- Be retargetable and recallable.

The Hyper-X

NASA is about to resume testing of a vehicle that likely will be one of the Falcon program's key technology pathfinders.

Under a program called Hyper-X, NASA will fly a miniature hypersonic vehicle up to Mach 10. The goal is to learn about the environment of very high speed and the performance of hypersonic engines. Such conditions can't be duplicated in ground-based wind tunnels. The craft itself is called the X-43A. It has a hydrogen-based propulsion system.

David Reublish, deputy manager of NASA's Next Generation Launch Technology Flight Vehicles and Systems Program Office, said NASA is

NASA photo

DARPA never gave up on the National Aerospace Plane "dream," according to Director Anthony Tether. Until now, the demands of a NASP—a 1980s concept is shown—exceeded both the state of the art and funding.

"almost to the end" of its Hyper-X program, which was intended to be a seven-year technology project.

The initial program called for building three X-43A one-time-use vehicles, each about 12 feet long and mounted on a Pegasus booster. NASA uses the vehicles to explore ramjet and scramjet engine technologies at high Mach numbers. A booster problem caused the first vehicle test flight to fail. NASA scheduled the test flight of the second vehicle for this month. Plans called for it to fly at Mach 7 and then return to Earth. A third vehicle is slated to fly in the spring and reach Mach 10. The actual hypersonic segments of the flights will last only a few seconds, but they will provide mountains of valuable data, said Reublish. Completion of the third flight will mark the end of the first phase of Hyper-X.

Already under construction is the follow-on X-43C, developed in conjunction with the Air Force. Reublish said there would again be three vehicles. Each X-43C will be about 16 feet long and, like the A model, will ride to altitude on the front of a Pegasus rocket. The Pegasus will accelerate the X-43C to Mach 5. Then the vehicle will accelerate on its own power to Mach 7, where it will cruise. The first flight of the X-43C is expected in about 2007.

Unlike the X-43A, the X-43C will be fueled by JP-7 aviation gas. "The Air Force doesn't want to build a new infrastructure to support hydrogen fuel," Reublish said. Should the X-43C work, its derivatives could be refueled in flight—at fairly low speeds—by standard tankers.

After completing the X-43C, NASA will develop a 40-foot-long hypersonic vehicle called, for now, the Reusable Combined Cycle Flight Demonstrator. It will be carried aloft by a B-52H bomber. "The B-52 will get it to seven-tenths of Mach, then release it," said Reublish. "The craft will accelerate to Mach 10, then land."

Reublish explained that such air launches are used to cut costs. An air-launched craft can have lighter landing gear and smaller fuel tanks, he said. Development will cost about $1 billion. Giving the vehicle the ability to launch under its own power would increase the weight and boost the price tag to about $4 billion, he said, noting, "For every pound of weight you add, the cost grows geometrically."

Artist's conception by Erik Simonsen

The Air Force's "Falcon" program will develop a vehicle, a weapon, and a booster to make it possible, before 2020, to reach anywhere on the globe in two hours. This is an artist's concept, but the program is real and has multiagency support.

The demonstrator will feature engines of two kinds—the turbine for the thick air of the lower atmosphere and a scramjet for the thin air of the high atmosphere. It will be tricky, said Reublish, to accurately coordinate the closing of the turbine inlets with the opening of the scramjet inlets.

The project is not yet funded, but NASA and the Pentagon will undertake it jointly and fully expect to pursue it.

"NASA has a goal to develop a shuttle replacement by 2025," Reublish explained. The pace of the program will make it possible to fabricate a test version of a full hypersonic craft around 2020 and an operational model in 2025. The vehicle would weigh about one million pounds, or one-fifth the weight of the space shuttle. It would have to be powered by hydrogen.

Because hypersonic vehicles can use the ambient oxygen in the atmosphere to burn fuel, they don't need to carry along their own oxygen. This factor translates into tremendous weight savings.

Like an Airplane

NASA is also pursuing another spaceplane that would be airplane-like, taking off under its own power from a runway. Called Responsive Access Small Cargo Affordable Launch spaceplane (known as Rascal) it will be an 80,000-pound, winged reusable vehicle that could carry a 16,000-pound payload. The payload would consist of an internally carried two-stage rocket that could lift a 110-pound satellite into orbit.

In about a year, the US will begin construction on Rascal, which would fly to about 63,000 feet using four engines and then execute a sharp pull-up at supersonic speed. It then would release its payload—a satellite with an expendable booster. The booster would propel the satellite the rest of the way to its desired orbit. Meanwhile, Rascal would return to a runway landing.

Rascal's four engines will probably be similar to the F100 power plants found on F-15 and F-16 fighters. At high temperatures, they would be cooled with water and liquid oxygen sprayed directly into the inlets. This technique improves thrust but keeps the engines at an acceptable temperature and provides oxygen for combustion. It is called mass injection precompressor cooling and was tried successfully in the 1950s. The technique would let the F100-type engines propel the craft to Mach 6.

Although both the Air Force and NASA see some urgency in developing hypersonic spaceplanes, there are valid cost and technology concerns, said Martin. The AFMC chief supports the concept of hypersonic vehicles, but he added, "We have to pursue it at the right pace." ■

New Horizons f

DARPA artist's conception

Air Force planners say the Hellfire-equipped Predator UAV is only the beginning.

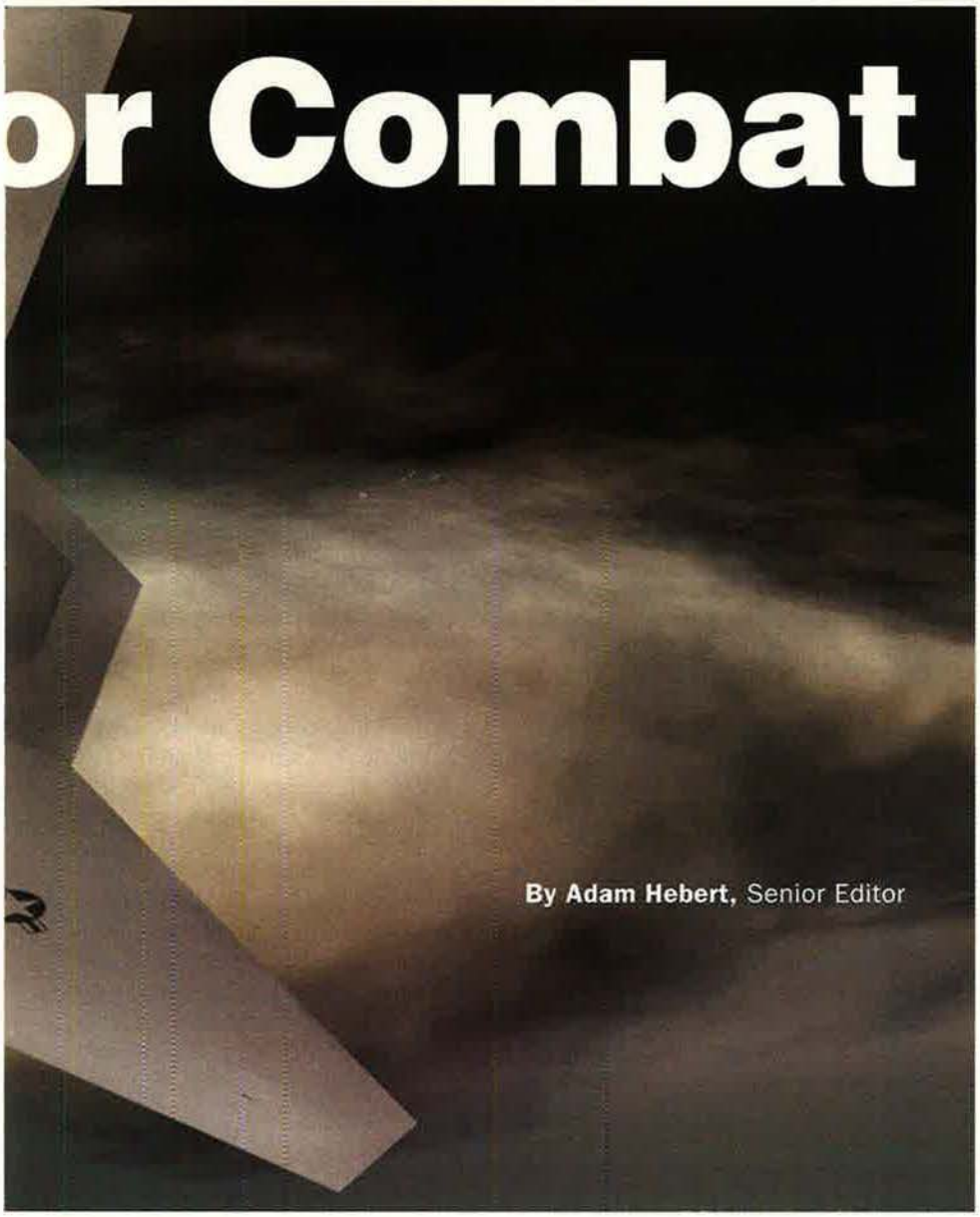
THE Air Force is rapidly increasing the effort and funding it devotes to the development of unmanned aerial combat systems, in the hope that, in about a decade, unmanned aircraft will be ready to take on some highly dangerous missions now performed by manned aircraft.

The success of unmanned aerial vehicles in recent conflicts has highlighted the potential of such systems. Predator UAVs, originally designed as reconnaissance drones, were armed with Hellfire missiles and successfully used to attack targets in Afghanistan, Yemen, and Iraq. Service officials say that initial cultural problems (pilots were reluctant to fly "drones" for fear of harming their careers) are being overcome.

UAV advocates contend the successful attacks on al Qaeda, Taliban, and Iraqi targets using weaponized Predators, now designated MQ-1s, provide just a glimpse of what unmanned systems can accomplish in the future.

According to its Unmanned Aerial Vehicles Roadmap, DOD projects it will invest $10 billion over the current decade for UAVs, compared to about $3 billion it spent during the 1990s. That investment largely will be overseen by a new joint systems management office the Pentagon created on Oct. 1 to guide development of the next generation of weaponized

or Combat UAVs



At left, an artist's "operational concept" of an X-45 unmanned combat aerial vehicle. USAF believes it can become an important strike platform.

By Adam Hebert, Senior Editor

UAVs, known as unmanned combat aerial vehicles.

Currently, there are two key programs: USAF's X-45 and the Navy's carrier-capable X-47. Both projects will continue but under the aegis of the Joint Unmanned Combat Air System (J-UCAS) program. The Defense Advanced Research Projects Agency, which had been working with both services on their individual systems, will lead the joint effort.

Pentagon leaders believe that merging the two projects will lead to greater efficiencies and, potentially, reduced acquisition costs, but DOD has no plan to shift from two systems to a single UCAV.

There is "much less emphasis" than in the past on moving to a common platform, Dyke Weatherington, deputy director of the UAV planning task force for the Office of the Secretary of Defense, told *Air Force* Magazine. He added that the Air Force and Navy will continue to determine their own requirements.

The services have pursued different goals in their respective programs. The Navy, of course, requires a vehicle suitable for use aboard a carrier and has placed more emphasis on surveillance than on strike. In contrast, the Air Force is interested in suppression of enemy air defenses and electronic attack capabilities.

Weatherington said that vehicle evaluation will continue until about 2007, at which time both systems will undergo a rigorous two-year operational assessment. Once that is complete, he said, decisions will be made on how to proceed to acquisition.

Questions Persist

Despite their promise, unmanned aircraft still have many problems, not the least of which is that the services still have poorly defined requirements.

Gen. John P. Jumper, Air Force Chief of Staff, has questioned blind devotion to unmanned systems *per se*. He said that, after the success of the armed Predator in Afghanistan, "everybody wanted to jump to the extreme conclusion."

The popular position was to "take everybody out of cockpits," said

Jumper. "Let's make them all go unmanned."

However, he cited the challenges the Air Force faces in making UAVs effective strike systems. "We have a debate going on about the UCAV today," Jumper said. "I asked a group one day, 'If it weren't for the novelty of not having a man in it, would we even be thinking about this vehicle?' The room was silent because the answer is no," the Chief said.

Jumper went on to say that he is not ruling out a vehicle "that absolutely advances the mission an order of magnitude [and] that happens not to have a person in it."

Gen. Hal M. Hornburg, commander of Air Combat Command, put it this way: "I want them to do more than just be unmanned."

The Air Force needs UAVs that can fly in tight formations, as do manned fighter aircraft. Without that capability, said Hornburg, the service cannot achieve the necessary "strike package density." Additionally, despite their long loiter times—typically more than 24 hours—UAVs should be able to refuel in the air. "That's a technical challenge," noted Hornburg.

Without such improvements, said the ACC boss, UAVs have little to offer as strike platforms, so "take the argument somewhere else."

Future systems should combine new capabilities with what is already desirable about UAVs, Jumper said. The future UAV "has to persist for long periods of time over the battlefield and be able to survive," he said. "It has to be able to defend itself ... [and] be able to air refuel in order to get that persistence."

General Atomics Aeronautical Systems photo

Combat UAVs began with the Predator MQ-1, armed with a pair of Hellfire missiles. USAF is now pursuing a larger Predator B, which would carry a larger and more potent weapons payload.

And, once it has an aerial refueling capability, Jumper emphasized, "it had better carry enough weapons to be useful to the people on the ground," because the UAV is "no longer a razor blade that we consider dispensable. It is now a Norelco, and it costs a lot of money."

That was Hornburg's point, as well. "I remember the days when Predators crashed and no one really cared," he said. "Now we care a lot. ... These things are valuable."

The unit cost for an MQ-1 Predator A air vehicle is roughly $4.5 million. When the Air Force starts building newer systems, such as the larger MQ-9 Predator B, with more expensive sensors, said Hornburg, "You'll find the price of the sensors exceed the price of the airplane." He added, "They're not going to be expendable." The more advanced UCAVs will see similar cost increases as new command, control, and weapons requirements drive up unit costs.

There is a balancing act. UCAVs must make unique contributions to the fight but do so without being overburdened by a requirements creep that threatens to make the systems too valuable to risk on high-threat missions. Hornburg said that Air Force leaders must think about what the UCAV mission is going to be before they start "spending the treasury" on them and conclude they should have "gotten more" for the money.

Weatherington agreed that UAVs should not simply replicate capabilities already present in manned fighters. "An unmanned system, without bringing any unique characteristics to the fight, is probably a novelty," he said. "But those [unique] characteristics can be things like endurance, signature, lower operational cost."

By taking "the man out of the system, you afford yourself design trade space" not otherwise present, he said.

For example, the Global Hawk intelligence-surveillance-reconnaissance UAV achieves much greater endurance than is possible with a pilot aboard. "Does Global Hawk inherently have much better capabilities than a U-2 does?" Weatherington asked. "Outside of endurance,

The X-45 UCAV

The Air Force's new unmanned combat aerial vehicle—the Boeing X-45—is expected to take over suppression of enemy air defenses and electronic attack missions.

Gen. Hal M. Hornburg, commander of Air Combat Command, said that ACC sees great future benefit in a squadron of UCAVs that can "go in and kill an entire [integrated air defense system] network."

Two X-45A prototypes, which were first flown successfully in 2002, bear little resemblance to the operational system USAF now expects to field around 2010.

The service scrapped plans for an X-45B, opting instead to go directly to work on an X-45C variant. The initial X-45C air vehicle will more closely approximate the objective UCAV system. It will have a new, larger airframe with dual internal weapons bays and demonstrate stealth characteristics. The X-45C will be able to deliver two 2,000-pound Joint Direct Attack Munitions. First flight for X-45C prototype is expected in 2005.

At about 35,000 pounds, the C model will weigh nearly three times as much as the X-45A. Its length will increase by 10 feet to 36 feet, and its wingspan will grow nearly 50 percent to 48 feet.

As a stealthy, flying wing design, the X-45C will look somewhat like a B-2 stealth bomber.

most people would say no," he said, and added, "In fact ... from a platform perspective, some people would make the argument that a Global Hawk is less capable than a U-2. It's got less payload, less power on the platform."

What Global Hawk does provide, though, is a level of endurance that the warfighter "has said is critical to the prosecution of the mission," added Weatherington.

An unmanned system provides "design flexibility that I don't have in a manned system," he explained.

As an example, he cited signature control. The cockpit of a manned fighter is a significant contributor to the radar cross section of a fighter. Using an unmanned system for a specific mission, such as SEAD, would offer the potential for much greater signature control. UAVs could fulfill this type of "crying need" for more capability, said Weatherington.

Predator's Larger Brother

The MQ-1 Predator A has become a known and trusted commodity to the warfighter through its successful use in Operations Enduring Freedom and Iraqi Freedom. Continuous upgrades and innovation have made the Predator A "something you wouldn't think of going to war without," Gen. Hal M. Hornburg, commander of Air Combat Command, told *Air Force* Magazine in September.

The Air Force determined it needed a multirole UAV "that would go faster, longer, [and] would process more," Hornburg noted. The service also wanted the UAV to have a greater weapons capability.

The service began working with General Atomics Aeronautical Systems to develop a larger Predator, dubbed the MQ-9 Predator B, which first flew in February 2001.

The MQ-9, powered by a more powerful turboprop engine, has demonstrated in contractor tests the ability to carry up to eight Hellfire missiles, two Joint Direct Attack Munitions, and two air-to-air missiles, among other configurations. (USAF has not set the exact Predator B loadout requirement.) The MQ-1, for comparison, is limited to a pair of Hellfires.

The B model is also significantly larger—at five tons, it is more than four times heavier than an A model. Its 64-foot wingspan is more than twice that of the Predator A.

The Predator B shows great potential, "but right now it's not proven," Hornburg said.

According to DOD's Unmanned Aerial Vehicles Roadmap, the Predator A and B variants will likely work together in future battle zones. "The MQ-9 could serve as the killer portion of an MQ-1–MQ-9 hunter-killer UAV team," the roadmap reads.

Keeping Cost Down

UAVs should ultimately help with the bottom line in the cost of flying operations and maintenance, although, as Weatherington pointed out, when the current batch of UAVs were being developed, "some people would say [cost and performance] weren't defined at all." The Pentagon needs to make up for lost time. Once requirements are better defined, cost should actually work to the advantage of unmanned systems.

About 90 percent of a manned combat aircraft's flying life is devoted to flights other than combat—primarily training missions. With UCAVs, that "ratio should change pretty significantly," said Weatherington.

Initially, UCAVs will fly a lot of training missions "because people generally will have some hesitancy that [UCAVs] can perform the mission," he said. "Once we overcome that inertia," the UCAVs will not have to be flown every day to prove they work. This means the total number of hours a tactical combat air system spends in the air "could be significantly reduced," compared to comparable manned systems, he said.

That would translate into real cost savings through lower maintenance, fuel, and parts requirements. The majority of an aircraft's life-cycle cost comes from long-term operating and maintenance expenses.

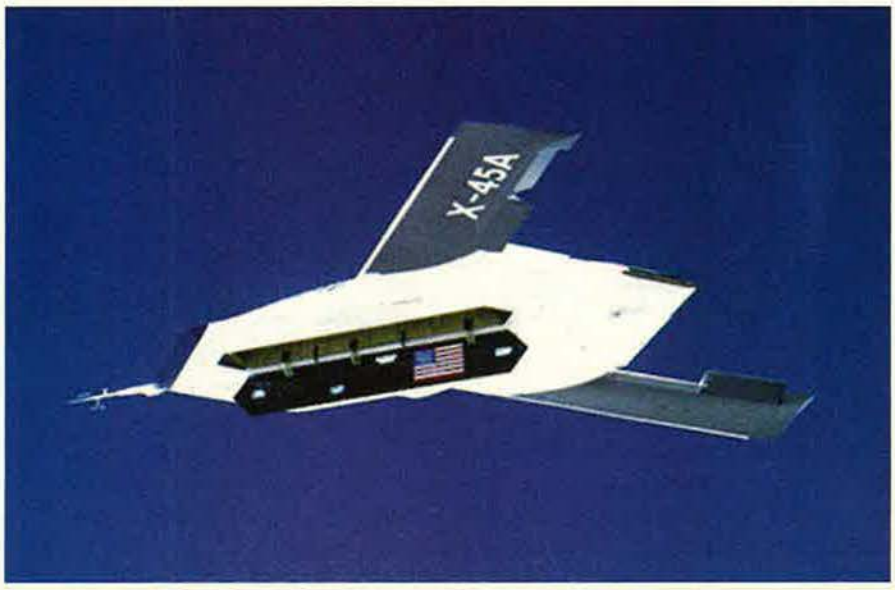
However, some analysts argue that UAVs have a reliability problem. An April 2003 Congressional Research Service report noted, "The current UAV accident rate ... is 100 times that of manned aircraft."

The Air Force stated that the 2002 accident rate for Predators was 32.8, which means that 32.8 Predators were damaged or destroyed per 100,000 flying hours. However, Weatherington pointed out that not a single UAV has actually amassed 100,000 flight hours. The accident rate was extrapolated from early developmental data.

In fact, Weatherington maintained that UAV reliability is not all that different from the levels shown by manned aircraft at comparable points in their development. He believes reliability will improve as the systems mature.

The Pentagon is counting on that. The UAV roadmap predicts that in 2012, "DOD will probably be operating F-16-size UAVs capable of supporting a variety of combat and combat support missions, including [SEAD], electronic attack, ... and possibly deep strike interdiction." ■

DARPA photo



The X-45A, with open weapons bay. Much like next generation manned fighters, operational X-45s will be stealthy, featuring internal weapons storage.

For Air Force technologists, "Eureka!" moments are few. Progress depends on small, steady gains.

Science Projects

By Peter Grier

The US Air Force and its organizational forebears have been the driving forces of aviation technology almost since the day the Wright Flyer changed the world at Kitty Hawk.

Early in the 20th century, Army units carried out extensive experiments with what was then the cutting edge of flight—early Wright aircraft models. Today, USAF organizations are hard at work on airborne lasers, unmanned aerial vehicles, and other potentially revolutionary 21st century systems.

Air Force research has contributed significantly to both military and civilian aerospace capabilities. A day-long symposium sponsored by the Air Force's chief scientist, Alexander H. Levis, and the Air Force Association at this fall's AFA National Convention in Washington, D.C., highlighted this impact by putting some of the service's most important developments in a historical perspective.

Among the general principles that a study of Air Force science and technology reveals is that it takes a long time for important ideas to develop, said Levis in his opening remarks to the symposium.

The projects that now occupy Air Force researchers will "benefit warfighters 20 years from now," he said.

As with other advances in modern science, important Air Force breakthroughs typically have not depended on a single "Eureka!" moment experienced by one person. They are more like a mosaic, comprising many small gains made by numerous individuals.

While the amount of funding for a project is important, that funding's consistency is even more important. Large up and down swings in support are destructive, said Levis.

Nor do the most useful capabilities spring pristine from researchers' imaginations. Many of today's key systems, such as the Airborne Warning and Control System, are now being used for missions that are beyond what was originally intended. In fact, the consensus of the symposium presenters was that the best results occur when warfighters are included in the development process.

The GPS Revolution

The Global Positioning System is a good example of the lengthy—and bumpy—road that many important Air Force technologies travel before deployment.

GPS was not in fact the first US military satellite-based navigation system, noted Michael I. Yarymovych, former Air Force chief scientist. It was preceded by a Navy system, Transit, which was developed in the early 1960s to provide positional information for the then-new nuclear submarine fleet.

Transit provided accuracy within 83 feet. But it could provide positions in only two dimensions and worked only if the Navy vessel attempting to use it was moving very slowly. "You had to be almost stationary" to use Transit, said Yarymovych.

By the late 1960s, the Pentagon was funding a number of development programs meant to address these problems, including an upgraded Transit and an Air Force research effort, dubbed USAF's System 621B.

The 621B program contained a number of visionary aspects, including a proposed use of satellites in "eggbeater" orbits to provide continuous coverage. Yet, in a clash of budgetary and programmatic priorities, 621B was canceled by Pentagon officials in August 1973. "I went down on bended knee and pleaded, 'Let's give this thing another chance,' " Yarymovych told symposium attendees.

A crash effort by a small group of Air Force officers yielded a refurbished proposal and Pentagon approval in December 1973. Yarymovych noted that, at the time, the term "satellite system" was considered a turnoff, so when the group cast about for a new name they decided to emphasize that the new

effort was aimed at a positioning system and a global one at that.

"GPS was the new name and that turned out to be a winner," said Yarymovych. However, it would be decades later, in 1994, before GPS was declared fully operational.

To say it was a hit with the military is an understatement. In 1991, before the system's complete deployment, only a very small percentage of munitions dropped in Desert Storm were GPS-guided. By 2003 in Operation Iraqi Freedom, 70 percent of the munitions dropped were guided—mainly by GPS. Positional information beamed from GPS "birds" guided everything from small groups of special operations forces on the ground to most air refuelings.

Yarymovych said that Iraq had some Russian-built jammers that might have posed a problem for GPS. "Fortunately they didn't have any Russians helping them," he added.

GPS designers were not surprised by the system's acceptance in the military, and Yarymovych predicted that, within the next five years, virtually all military systems will be dependent on GPS. What did amaze the system's architects was the rapid ascendancy of GPS in the civilian world. Today, the number of GPS sets in civilian hands is rising by 200,000 a month. Current predictions estimate there will be more than 50 million civilian users by 2010.

Creative ideas for use of GPS data are myriad. At Stanford, for instance, some students hooked a robot tractor up to a GPS receiver for autoplowing. The worst tracking error the tractor made? Three inches. Within a few years, every car, every ship, and half of all farm vehicles will have GPS capability, said Yarymovych. And scientists will use GPS to track shifts in crustal plates to help them predict earthquakes.

Today, GPS needs improvements in robustness. There is also a challenger—Europe's Galileo system—to its status as a world standard, but, to this point, the success of GPS is unquestioned.

"Here is a system that started in the '60s ... and, by 2000, revolutionized military operations and the world," said Yarymovych.

The Precision Hunt

Perhaps no area of military operations was revolutionized more than

delivery of munitions. The introduction of GPS, laser guidance, and associated targeting systems has given USAF a precision bombing capability undreamed of by service pioneers.

"In World War II, we put a quarter on the map and drew a circle around it and hoped to hit it," said Lt. Gen. William T. Hobbins, USAF deputy chief of staff for warfighting integration. "Today, we put a quarter on the ground and hope to hit it."

Initiatives to increase the effectiveness and accuracy of bombing date almost from the beginning of air warfare. By the end of World War I, the Navy was working with a "guided" system named the Sperry Aerial Torpedo. Army Air Services had the Kettering "Bug," an unmanned aircraft whose engine shut down after a set number of revolutions, causing the wings to collapse and the explosive-laden vehicle to plunge to earth in the vicinity of a preselected target.

During World War II, it still took delivery of thousands of bombs to achieve a hit probability of 90 percent. But, by then, the US was funding some 15 programs meant to result in some form of munition with terminal guidance.

"There was a lot going on in World War II with respect to guided weapons," said Robert P. White, historian for the Air Force Office of Scientific Research.

Some of this research culminated in the VB-13 Tarzon, a 12,000-pound, radio-guided bomb that was so big it could only be carried semirecessed on B-29 bombers. Technical and safety problems eventually led the Air Force to withdraw Tarzon from service but not before it was credited with destroying six targets during the Korean War.

By 1959, Bullpup, the first air-to-surface guided missile to be produced in quantity, had reached full deployment. It was less than ideal. Pilots deploying the radio-guided Bullpup essentially had to remain in sight of the weapon—exposed to enemy fire—as they steered it toward its target.

These relatively simple systems were followed by the Paveway series of laser guided bombs, which drew on basic research carried out decades previously. "You have to go back 20 to 30 years to see the pedigree in many of these weapons systems," said White.

While the LGBs were a vast improvement over the earlier precision systems, it was the advent of GPS that gave precision guidance a giant boost forward. Bad weather and smoke became irrelevant, and the Air Force gained true fire-and-forget capability.

"All this arrives ultimately at JDAM," said White. The Joint Direct Attack Munition is considered today's gold standard of guided weapons. (See "Precision: The Next Generation," November, p. 44.)

Basic research continues to add to existing systems—a new algorithm has improved JDAM accuracy, for instance. New technology is driving miniaturized systems that might not even have to explode to accomplish their mission. They could be corrosive, perhaps, or electronically debilitating.

The Sensor Path

The 1950s spawned innovations that led to remote sensing systems to improve detection, identification, and tracking of targets. For instance, electro-optical/infrared (EO/IR) imaging technology has been employed over the past 50 years on various platforms—each requiring different designs but all sharing basic technical parameters and components.

The most common application for EO/IR imaging systems is in air-to-air missile seekers, said Edward A. Watson, a technical advisor with the Air Force Research Laboratory. He said today's missiles are using third generation EO/IR technology.

That technology now has gained additional importance in its use on unmanned aerial vehicles. The ability of UAV sensors to provide streaming video literally has "changed the rules of the game," said Lt. Col. Steve Luxion, commander of the 17th Reconnaissance Squadron, Nellis AFB, Nev.

USAF's Predator UAV proved its worth in Operation Allied Force over Kosovo, where it was used to track everything from tanks to Serbian troops hidden in Red Cross vans. The President himself viewed Predator video as part of his intelligence briefings. At the time, the system was still under development.

Near the end of the Kosovo conflict, Gen. John P. Jumper, then commander, Allied Air Forces in Central Europe, and now USAF Chief of Staff, had Predator armed with Hellfire missiles—a move Luxion called a "natural evolution." Armed Predators were used in both Afghanistan and Iraq, destroying some high-value targets of opportunity.

During Operation Anaconda in Afghanistan, operators from Luxion's unit directed Predators to help protect US troops pinned down by enemy fire. Luxion said that one dubious forward air controller, communicating directly with a Predator pilot, asked him to fire a missile at a rock to prove the UAV's accuracy. After doing so to the FAC's satisfaction, Predators actively engaged in the fight.

Luxion believes the US currently is only in the World War I or World War II stage of UAV development. "We're just at the start of it," he said.

While the remote sensing systems have continued to revolutionize airpower over the past 50 years, there are new wonders in the making. Watson said that the future likely will see active remote sensing using lasers. "They'll use lasers as more than illumination," he said.

The Vertical Advantage

It has long been a cardinal principle of warfare that the advantage belongs to the one who can see farther and better. Development of radar and sensor technologies has enabled the Air Force to seize that "vertical" advantage in one of its most effective uses to date: airborne remote sensing for command and control.

Airborne C2—one of the service's

greatest strengths—grew out of early air radar systems, one of the first of which was the EC-121 Warning Star. A derivative of Lockheed's Constellation airliner, the Warning Star was originally used, beginning in 1953, as a radar picket line to buttress continental US strategic early warning systems.

Later, USAF employed it in ways its developers never envisioned—tracking material flowing down the Ho Chi Minh Trail in Vietnam. On Oct. 24, 1967, an EC-121 helped guide a US fighter into position over the Gulf of Tonkin to destroy a MiG-21. It was the first instance in which an airborne radar aircraft directed a successful air-to-air attack.

However, the EC-121 had two major flaws: radar clutter and reliability. "By and large, the Air Force remained unhappy with it," said Thomas W. Thompson, head of the Office of History, Air Force Research Laboratory. It would be 1967, though, before work started on the E-3 Airborne Warning and Control System, today's premier command, control, and communications platform.

Another present day system that grew out of operator frustrations during the Vietnam War is the E-8 Joint Surveillance Target Attack Radar System. During the war, the Air Force was stymied by its inability to destroy surface-to-air missile sites, so the service began work on the radar program that would later morph into Joint STARS.

"It's interesting how many times an operator or someone working with an operator envisioned the future," said Thompson.

Not that operators always see the future whole, according to retired Lt. Gen. Bruce K. Brown, former commander, Alaskan Air Command. Like the EC-121, AWACS was originally intended for strategic defense against incoming Soviet bombers. "[Tactical Air Command] wanted nothing to do with it," said Brown.

Then, a 1976 air defense exercise changed everything. AWACS intercepted 199 of 200 incoming targets ("I still don't know how that sumbitch got away," recalled Brown), and suddenly TAC generals embraced the AWACS concept. Today, virtually all US air operations rely on AWACS control.

Brown expressed concern that it takes "20 years to bring technology to bear." He advocates pushing technology ahead of defined operational need. In his words, "The notion that we need to tie technology to useful military applications is nonsense."

The Laser Revolution

Directed energy is a technology that has taken a long time to develop, but, after years of work, it may now be poised on the edge of success. "We expect some rather dramatic things to occur in the next decade or so," said retired Maj. Gen. Donald L. Lamberson, who worked on directed energy programs in the 1980s.

Lasers were discovered in May 1960 and were soon scaled up to high-power instruments. The potential of a beam of energy traveling at the speed of light immediately attracted the attention of Pentagon leaders, who envisioned a new class of weapons that would revolutionize warfare.

"Lasers were revolutionary," said Robert W. Duffner, historian at the Air Force Research Laboratory's Historical Information Office at Kirtland AFB, N.M. Lasers lent themselves to precision engagement with targets, and their effects could be tightly controlled.

Duffner noted that the name of one early laser research effort was Project Eight Card, a poker reference meant to symbolize the edge lasers might give the US over Soviet forces. Such early work eventually led to the Airborne Laser Laboratory (ALL), which served as a technological bridge between lab research and the current Airborne Laser (ABL) program.

"I look at the [ALL] as the Wright

Flyer of the laser world," said Duffner.

In a 1973 experiment, an Air Force laser shot down a drone. In 1983, another destroyed a missile in flight. Along the way, Air Force labs have produced a number of new and improved technologies, such as the chemical-oxygen iodine laser and sophisticated adaptive optics that are critical to the ABL system.

The ABL platform—a modified Boeing 747—is now at Edwards AFB, Calif., having control systems installed. Plans call for the entire ABL system to be integrated next summer. Lamberson credited uncooled laser optics developed for the Strategic Defense Initiative as being a "big, big help" in ABL development.

"Directed energy weapons will be the centerpiece of the 21st century Air Force," said Lamberson. "They are totally synergistic with precision guided weapons."

One of a Kind

The now retired SR-71 Blackbird reconnaissance aircraft is a prime example of the blending of human and weapons systems research and development. Without the early work of human systems researchers in life-support technologies, manned flight at Mach 3 and 80,000 feet would have been impossible.

"There are lots of [human systems research] challenges still out there today," retired Col. Joseph W. Kittinger Jr. told symposium attendees. Kittinger, as a young officer, did a series of experimental free jumps from altitudes of 76,000 to 103,000 feet. Among other things, these death-defying jumps helped researchers understand how to eject at supersonic speeds—since Kittinger himself went supersonic on the way down.

Retired Maj. Gen. Robert F. Behler, a former SR-71 pilot, said that the most dangerous part of flying the Blackbird was the training involved. In particular, he recalled being dropped in water in a full-pressure suit.

Behler also noted that the SR-71 ejection capsule contained only 15 minutes of oxygen, yet, from high altitude, the capsule took 12 minutes to come down. "In training, they always told us to try and not hyperventilate," he said.

The SR-71 remains one of the

physically most impressive airplanes ever designed. It flew so fast that the heat of atmospheric friction caused the aircraft to significantly expand in the air. This USAF technological marvel played an important role in US foreign policy. One example, said Behler, was the 1984 Nicaragua standoff.

In October 1984, US intelligence reported that Soviet MiG-21 fighters were being shipped in crates on a Bulgarian freighter bound for Managua, Nicaragua. US officials did not want such relatively modern fighters delivered into the hands of Nicaragua's Sandinista rulers. Behler said he made several reconnaissance trips, flying out of Beale AFB, Calif., to Nicaragua and back. The SR-71's sonic boom put the Sandinistas on notice. The crates remained on the freighter.

"The bottom line was, we were saying, 'We are watching and there is nothing you can do about it,' " said Behler, adding, "It was an honor to fly that aircraft."

Indispensable Satcom

Military satellite communications evolved from a paper concept in 1945 to the sophisticated systems that are the linchpin of modern US military operations.

"Everything we have done [in recent years] wouldn't be possible without satellite communications," said Harry L. Van Trees, a pioneer in the field and who is currently a professor of electrical engineering and director of the C3I center at George Mason University in Fairfax, Va.

Satcom developments in the commercial sector in the late 1950s and early 1960s aided initial military efforts. The first military capability came in the form of the Super High Frequency Defense Satellite Communications System, launched in 1966.

The Extremely High Frequency Milstar system, first launched in 1994, provided a transition from relays to networking in space. Networking "meant you could get guaranteed command and control for nukes," said Van Trees. "That's what Milstar was designed to do."

Military satcom capability continued to evolve, often still taking advantage of commercial developments. For instance, Van Trees noted that although the Iridium satellite communications system was a commercial flop for its developer Motorola, it became a crucial adjunct to military satcom. By the time Iridium's satellite constellation was in place, its satellite-based phone service—employing big 14-ounce handsets that needed to be near a window to work—had been supplanted in most of the developed world by cellular phone service.

Motorola's loss was the military's gain. As Van Trees pointed out, "There isn't ground-based cellular in many of the places the government wants to go."

The Pentagon also developed its Global Broadcast System initially using leased commercial satellites.

All this communications capability, and more, came together in Operation Iraqi Freedom. DSCS provided an enormous amount of bandwidth. Milstar enabled secure command communications. Ultra High Frequency satellites were used to direct the strike against a house where Saddam Hussein was reportedly located. GBS was used for Predator UAV control, and Iridium was crucial for special operations teams—in some cases, it was their only means of communication. ■

Peter Grier, a Washington, D.C., editor for the Christian Science Monitor, *is a longtime defense correspondent and a contributing editor to* Air Force Magazine. *His most recent article, "Lighter Footprint, Longer Reach," appeared in the October issue.*

In the beginning, they were few and rare. But that was in the beginning.

A SHORT HISTORY OF MEDALS

By Bruce D. Callander

THE tradition of awarding medals to America's military men and women dates to the American Revolution. On Aug. 7, 1782, Gen. George Washington established the first authorized US military decoration—the Badge of Military Merit. It was a piece of cloth in the shape of a heart. The nation used it to recognize unusual gallantry or extraordinary fidelity.

During the Revolutionary War, the Badge of Military Merit was awarded to only three soldiers, in recognition of their singular meritorious actions. The wearers were allowed to pass guards and sentinels without challenge.

No more awards of this type were made until 1932, when the practice was revived by Gen. Douglas MacArthur, then Army Chief of Staff, who proposed a new medal to mark the bicentennial of the birth of George Washington.

Washington's profile adorned the heart that formed the body of the medal. It became known as the Purple Heart.

The revised award still was given for meritorious acts. However, new Army regulations said that war wounds would qualify as evidence of such acts. Thereafter, the Purple Heart became associated with combat injuries and fatalities.

The second award specifically designed and authorized for American service members was the Medal of Honor. On Dec. 21, 1861, Congress passed a bill authorizing creation of the MOH for enlisted men of the Navy and Marine Corps. Within seven months, Congress had passed a similar bill for the Army.

On July 14, 1862, President Lincoln signed the legislation creating the Army Medal of Honor for enlisted Army troops. It would be the following year before Congress authorized the Medal of Honor for officers.

During the Civil War, more than 2,000 Medals of Honor were issued. Allegations of fraud and shady politics in the award of the medal led to a review of all those issued to Army members prior to 1917. A commission of five retired general officers determined that 911 of the medals had been improperly awarded. They were revoked.

Among the contested medals were those given to members of the 27th

From left, Air Force Cross, Silver Star, Distinguished Flying Cross, Air Medal, Air Force Commendation Medal, and Kosovo Campaign Medal.

Maine Regiment for re-enlisting during the Civil War and those given to members of the honor guard at President Lincoln's funeral. The commission also revoked medals of several civilian scouts, including Buffalo Bill Cody, and that of Mary Walker, a surgeon and the only female recipient. Later, the government restored these medals to Cody and Walker.

Especially for Fliers

The first medal developed exclusively for aviators was the Distinguished Flying Cross. It was authorized in 1926 by the same legislation that set up the Army Air Corps. The following year, President Coolidge presented DFCs to the fliers who completed a goodwill flight to South America and, a month later, to Charles Lindbergh for his trans-Atlantic flight.

Congress authorized the award to be retroactive so that it could be given for accomplishments in World War I. A special act of Congress also awarded the DFC to the Wright brothers.

Since the outbreak of World War II, the number of decorations available to airmen has grown. Congress, when it made the Air Force a separate service in September 1947, authorized USAF to develop its own version of various medals, including the Medal of Honor, Distinguished Service Cross (which became the Air Force Cross), and Soldier's Medal, now the Airman's Medal.

In World War II, Army Air Forces units gave out the Distinguished Flying Cross by the tens of thousands—Eighth Air Force alone issued some 46,000. And many air units awarded the newly created Air Medal automatically for a given number of missions.

Subsequent changes and additions have been made. In 1958, Air Force Secretary James H. Douglas Jr. created the Air Force Commendation Medal to replace the earlier Army version of the award. In 1980, Secretary Hans Mark established the Air Force Achievement Medal for service that doesn't quite warrant the commendation medal. In 1988, Secretary of the Air Force Edward C. Aldridge Jr. approved the Aerial Achievement Medal, which ranks just below the Air Medal.

The number of service ribbons grew as well. The Air Force developed awards for recruiting, overseas tours, longevity, marksmanship, and selection as an Outstanding Airman of the Year.

Ribbons now are available for completing initial training, for being an outstanding basic graduate, for taking NCO professional training, and for instructing in basic training. Airmen are also eligible for ribbons for serving in a growing number of operations or simply for being in one of a number of places at the right time.

Simplifying the Uniform

In some cases, medals and ribbons were created to replace the badges and insignia that had adorned the Army Air Forces uniform. Specialty and unit patches, insignia for marksmanship, and hash marks representing years of service and time overseas—all were carryovers from the Army.

When USAF first became a separate service, it allowed members to continue wearing many of these Army accoutrements. However, when the service developed its own distinctive uniform, officials decided it was time to rethink badges, patches, and ribbons. Shoulder patches were removed, corps insignia disappeared, and hash marks were eliminated.

However, the Air Force never quite achieved the "plain blue suit" look that the early leaders envisioned. As it eliminated some insignia, it continued to approve requests for new specialty badges and other adornments.

Today's service members have more "fruit salad" available than at any time in history, and more awards are in the works.

Maj. Jolisa Dudley, chief of the Air Force's Recognition Programs Branch, acknowledges that this bothers some old-timers. She said, "There is a perception, especially among people who have been in service longer, that people are racking up more awards than they used to."

The Air Force has ribbons for training, long tours, short tours, longevity, and good conduct. Officers who move every two or three years, as most do in the Air Force, said Dudley, "get some form of end-of-tour ribbon."

Dudley qualified her remarks, though, saying that many of the awards today are a direct result of the number of operations that have engaged airmen over the past few years. "It's probably one of the busiest times in recent history," she said. "We've added awards, and we have a lot of new ones in various stages of approval and implementation."

For instance, she said, the service has created an Air and Space Campaign Medal, and USAF recently approved the Air Force Expeditionary Service Ribbon to recognize people who deploy in various contingencies. Moreover, President Bush authorized two war-on-terrorism medals—the Global War on Terrorism Expeditionary Medal and the Global War on Terrorism Service Medal. The Defense Department and each of the services are ironing out specific criteria for those awards now, said Dudley.

Basically, the expeditionary medal will go to members who serve in

military expeditions to areas such as Afghanistan, Iraq, and the Philippines. The service medal will be for members who serve in military operations such as Operation Noble Eagle, the homeland defense effort.

The Air Force is also working on "some unit awards to bridge the gap between the Presidential Unit Citation and the Air Force Outstanding Unit and Excellence awards," said Dudley. Those will be the Gallant Unit Citation and the Meritorious Unit Award.

The Presidential Unit Citation is presented for heroism equivalent to that displayed by an individual who receives an Air Force Cross, explained Col. Joseph Marchino, deputy director of the Air Force Personnel Council. "The Gallant Unit Citation is designed to be somewhat less than that and you can think of it in terms of a Silver Star," he said, adding, "When you come down to the Meritorious Unit Award, you're talking about a Legion of Merit type of award."

Never Too Late

For veterans who earned medals but never received them, there is a legal way to claim them.

Although rules stipulate that recommendations for awards should be submitted within two years of the event and the awards made within three, said Marchino, there were always many requests for exceptions. Several years ago Congress authorized veterans to receive special consideration if they had been told they were going to get an award but never did. "Maybe it was processed but got lost in the paperwork, or maybe they just thought they were deserving of the award," explained Marchino.

Many such examples exist from World War II. Because of the rapid drawdown after victory was declared in Europe, "many units had other things to do, and there just wasn't a lot of time to process awards," said Marchino.

If a veteran wants to claim old awards, he must submit an application, and, "ideally," Marchino said, the veteran should have "some kind of an endorsement" from someone on an aircrew or from the unit commander. "It helps, too, if they have some documentation to go with that," he said, and added, "Perhaps they can show that other members of their crew got the award and they didn't."

The Air Force Decorations Board tries to apply the criteria that were current at the time of the event. "If it was something in World War II, we look at the things that were going on during that period and try to evaluate it without applying today's rules to the conditions of that time," he said.

Typical is the case of Wilbur C. West, a World War II pilot. In April 2001, the Air Force awarded West the Silver Star for a mission he flew as copilot 59 years earlier. It was the first low-level raid on Ploesti, Romania, on June 12, 1942. His airplane was one of 12 that reached the target, but it ran out of fuel and landed in Turkey, and West was interned for six months. At the time, other crews received medals for that mission. It was West's daughter who did much of the research that eventually led USAF to issue West a belated Silver Star.

While veterans of that 1942 raid received some recognition, the mission was overshadowed by another flown to Ploesti the following year. The 1943 mission, often erroneously identified as the first against the Ploesti oil fields, was widely publicized. The aircrews on that one received Silver Stars, and five were awarded Medals of Honor, all but two of them posthumously.

The award rules for World War II in general often seemed inconsistent from one theater to another.

In the Pacific, troops complained they received no medals until Lt. Gen. George C. Kenney, commander of Fifth Air Force, asked for and received authority to approve decorations up to the Distinguished Service Cross.

In Europe, aircrews in some Army Air Forces units received Air Medals for flying five missions and an oak leaf cluster for every 10 thereafter. Other units had different criteria. In one Fifteenth Air Force bomb group, no awards above the Air Medal were given out until statisticians at headquarters noted that the unit lagged behind others. Under pressure to make more awards, the group, within weeks, awarded several crews the DFC.

More Than Metal

For Air Force enlisted members, the more prestigious medals translate into points under the Weighted Airman Promotion System. The Medal of Honor, for example, counts 15 points, the DFC counts for seven, and the Air Medal, three. The maximum number of points an individual can count for medals is 25.

However, this practice has been criticized for giving an edge to airmen in specialties where awards are more likely to be given. Officials argue, though, that the WAPS medal-point system only does what human selection boards have done for years.

As chief of the Air Force's Recognition Programs Branch, Dudley said she is more concerned with presenting awards where earned. "Our primary goal is to ensure that the appropriate awards are given to deserving airmen," she said. "We have vested the decision-making authority in our commanders, and we rely heavily on their integrity."

Approval authority rests with various commands, depending on the award. "For all the operations [in] Southwest Asia, awards up to and including the DFC are approved by the US Central Command Air Forces commander," said Marchino.

The highest medals recently awarded to Air Force members have been for actions in Afghanistan. There were two Air Force Crosses approved for operations there, said Marchino. They were posthumously given to pararescuejumper SrA. Jason D. Cunningham and combat controller TSgt. John Chapman, for heroic actions in Operation Anaconda in Afghanistan. Those have been the only two given out for any of the operations in Southwest Asia.

Eighteen Silver Stars have been approved for operations in Afghanistan and three more were pending approval.

The highest Air Force awards for Operation Iraqi Freedom have been Distinguished Flying Crosses—"more than 100 of them," said Marchino. ■

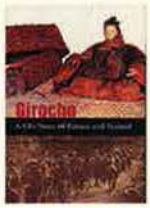
Bruce D. Callander is a contributing editor of Air Force *Magazine. He served tours of active duty during World War II and the Korean War and was editor of* Air Force Times *from 1972 to 1986. His most recent article for* Air Force *Magazine, "Controllers," appeared in the September issue.*

Books

Compiled by Chequita Wood, Editorial Associate

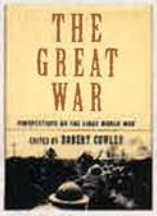
Air Force One: The Aircraft That Shaped the Modern Presidency. Von Hardesty. NorthWord Press, Chanhassen, MN (800-328-0590). 191 pages. $29.95.

Girocho: A GI's Story of Bataan and Beyond. John Henry Poncio and Marilyn Young. Louisiana State University Press, Baton Rouge, LA (800-861-3477). 327 pages. $34.95.



Reconsidering a Century of Flight. Roger D. Launius and Janet R. Daley Bednarek, eds. University of North Carolina Press, Chapel Hill, NC (800-848-6224). 300 pages. $49.95.

Air Power: Heroes and Heroism in American Flight Missions, 1916 to Today. Bill Gilbert. Citadel Press, New York (877-422-3665). 278 pages. $24.95.

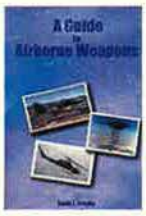


The Great War: Perspectives on the First World War. Robert Cowley, ed. Random House, New York (800-726-0600). 509 pages. $29.95.

Targeting the Reich: Allied Photographic Reconnaissance Over Europe, 1939-45. Alfred Price. Stackpole Books, Mechanicsburg, PA (800-732-3669). 144 pages. $34.95.

B-36 Photo Scrapbook. Dennis R. Jenkins, Mike Moore, and Don Pyeatt. Specialty Press Publishers and Wholesalers, North Branch, MN (800-895-4585). 108 pages. $16.95.

A Guide to Airborne Weapons. David F. Crosby. Nautical & Aviation Publishing Co. of America, Mount Pleasant, SC (843-856-0561). 139 pages. $26.95.



They Marched Into Sunlight: War and Peace, Vietnam and America, October 1967. David Maraniss. Simon & Schuster, New York (800-233-2348). 572 pages. $29.95.

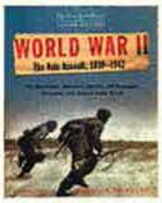
Extra Joker. Nicky U. Fox. Order from: Xlibris, Philadelphia (888-795-4274). 297 pages. $18.69.

The Media and the War on Terrorism. Stephen Hess and Marvin Kalb, eds. Brookings Institution Press, Washington, DC (800-275-1447). 307 pages. $22.95.

The Warthog and the Close Air Support Debate. Douglas N. Campbell. Naval Institute Press, Annapolis, MD (800-233-8764). 302 pages. $34.95.

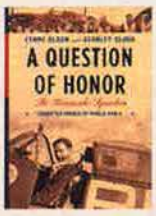
F-100 Super Sabre in Action: Aircraft No. 190. Larry Davis and David Menard. Squadron/Signal Publications, Carrollton, TX (800-527-7427). 49 pages. $9.95.

The New York Times Living History, World War II: The Axis Assault, 1939-1942. Douglas Brinkley, ed. Times Books, New York (888-330-8477). 349 pages. $30.00.

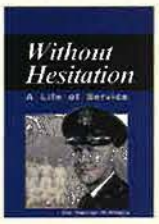


Wings: A History of Aviation From Kites To the Space Age. Tom D. Crouch. W.W. Norton & Co., New York (800-233-4830). 725 pages. $29.95.

First Light: The True Story of the Boy Who Became a Man in the War-Torn Skies Above Britain. Geoffrey Wellum. John Wiley & Sons, Hoboken, NJ (800-225-5945). 338 pages. $24.95.



A Question of Honor, The Kosciuszko Squadron: Forgotten Heroes of World War II. Lynne Olson and Stanley Cloud. Alfred A. Knopf, New York (800-726-0600). 495 pages. $27.95.



Without Hesitation: A Life of Service. Col. Sherman W. Wilkins, USAF (Ret.). Order from: Sherman Wilkins, 4506 Providence Point Pl. S.E., Issaquah, WA 98029 (425-391-4379). 231 pages. $20.00.

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AFA/AEF National Report

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By Frances McKenney, Assistant Managing Editor

The Japanese AFA

Representatives from the Air Force Association's counterpart in Japan—the Japan–America Air Force Goodwill Association—visited AFA headquarters in September, as part of their annual visit with US Air Force leaders.

AFA National President Stephen P. "Pat" Condon and AFA Executive Director Donald L. Peterson met with the group of visitors: retired Japanese Gen. Shigeru Sugiyama; retired Lt. Gens. Atsushi Itoh, Katsuhiko Iwasaki, and Masamutsu Shimizu; retired Maj. Gen. Toshikatsu Suzuki; retired Col. Kazuhide Sakai; and Lt. Col. Takayasu Yamashita from the Japanese Embassy.

Condon and Iwasaki, former commander of Air Defense Command in the Japan Air Self-Defense Force, first met this summer, when Condon visited Tokyo during an AFA outreach tour of Pacific Air Forces bases. Iwasaki had spent a Saturday escorting Condon to several historical sites in Tokyo.

According to its Web site, JAAGA was formed in 1996, and its nearly 300 members include retirees from the JASDF as well as individual and corporate associate members.

Photo by Susan Kennedy

AFA Board Chairman John Politi (center) and AFA National President Pat Condon (right) chat with Fred DiFabio, New York state president, at the Region and State Presidents' meeting in Arlington, Va., in October. The annual two-day orientation provided intensive training for AFA field leaders.

Celebrating Milestones

Air Force Birthday Balls held in many cities this September and October marked the service's 56th birthday this year, as well as the centennial of flight. Support from AFA chapters was one reason an unusually large number of guests turned out to celebrate these milestones.

In Nebraska, Rep. Lee Terry (R-Neb.) and his wife, Robyn, headed a long list of VIPs—and more than 600 guests—at AFA Nebraska's Air Force Birthday Ball on Oct. 4, held at the Strategic Air and Space Museum in Ashland, Neb.

This year's event was particularly well-attended because it honored local airmen who served in Operations Enduring Freedom and Iraqi Freedom: members of the 55th Wing at Offutt AFB, Neb., the base's tenant units, and the 155th Air Refueling Wing (ANG) from Lincoln Airport, Neb. Civic leaders from the Lincoln and Omaha communities showed their appreciation to these OEF and OIF veterans by sponsoring them as banquet guests.

Gen. John W. Handy, commander of US Transportation Command and Air Mobility Command at Scott AFB, Ill., was the evening's keynote speaker. According to SMSgt. Victoria Cerino, communications vice president from the **Lincoln Chapter (Neb.),** the general told the audience that in Iraq, more than 90 percent of communities have local governments in place, 6,000 reconstruction projects have been completed, and universities, schools, and hospitals have been reopened.

The evening program recognized two AFA national-level award recipients: an RC-135 crew from Offutt that had received the Gen. Jerome F. O'Malley Award and the Lincoln Chapter, which earned the Aerospace Education Foundation's Sam E. Keith Jr. Aerospace Education Award of Excellence. In addition, ANG awards were presented to SSgt. Melissa Berling and her employer, First Data Corp. of Omaha.

The 55th Communications Squadron from Offutt produced a video tribute to the OEF and OIF warriors. The Heartland of America Band, also from Offutt, provided music for the evening, along with a singing group from the University of Nebraska at Lincoln.

Paul Cohen, state vice president, served as master of ceremonies. The event was organized by Daniel Lake, president of the **Ak-Sar-Ben Chapter (Neb.);** Lt. Col. Robert J. Krist, chapter program director; Capt. Beth E. Kelley, communications VP; James M. McCoy, former AFA Board Chairman; and from the Lincoln Chapter, Mark Musick, president, and Cerino.

Four TV stations and two newspapers covered this birthday celebration. It was, Kelley said, "definitely a once-in-a-lifetime event for the Nebraska state AFA."

Honorary Iceman

In Alaska, "Team Iceman"—otherwise known as the 354th Fighter

Wing—began a new tradition at its annual Air Force Ball at Eielson Air Force Base when it named a civilian member of the Fairbanks community as an "Honorary Iceman." The wing's first choice for this honor was Karen Washburn, president of the **Fairbanks Midnight Sun Chapter.**

Brig. Gen. (sel.) Jan-Marc Jouas, the wing commander, announced the honoree at the ball not by name but by describing her accomplishments. The base newspaper reported that, as Jouas continued his description, "some people in the audience realized he was talking about Washburn."

The chapter is a major sponsor of this ball, which this year was held in an Eielson hangar called the Thunderdome and drew its largest crowd—800 people. The chapter helped generate this turnout, Washburn said later, because it worked with the Chamber of Commerce to round up local businesses to sponsor the event. Such sponsorship made it possible for more junior enlisted personnel to attend the ball.

James V. Drew, secretary, headed the chapter's table at the ball. Harry F. Cook, aerospace education VP, arranged for a C-46 to join an A-10 and F-16 on static display in the Thunderdome. Guests at the ball also enjoyed looking over a display of vintage uniforms and photos collected by William F. McDonald, chapter VP.

Washburn, who was part owner of a private aviation business in the 1980s and is now a realtor, received a framed photo montage of the Team Iceman and commemorative coins. She will also receive an incentive flight in an F-16.

Centennial Flight Ball

More than 500 guests celebrated the centennial of flight at an Air Force Birthday Ball in San Antonio on Sept. 20. The ball was co-sponsored by the 12th Flying Training Wing of Randolph AFB, Tex., and the **Alamo Chapter (Tex).**

The gala featured guest speaker Hans Mark, Secretary of the Air Force from 1979 to 1981. He spoke about the history of flight and his thoughts on USAF's future.

With so many celebrants on hand, the ball had to be held in Hangar 4 on base. It was one of the few sites big enough to hold the crowd, said Kaye Biggar, chapter secretary.

More than 100 basic military training troops, technical school graduates, junior airmen, and junior officers attended the ball as guests of the chapter's Community Partners, corporate sponsors, and other donors. The chapter provided half-price tickets to more than 60 junior enlisted personnel.

Proceeds from the ball went to the chapter's aerospace education and scholarship programs.

RED HORSE in Iraq

Maj. Steve Phillips of the Air National Guard's 203rd RED HORSE Flight spoke to the **Tidewater Chapter (Va.)** on the civil engineering unit's work in Iraq.

According to William M. Cuthriell, chapter president, Phillips had returned from Iraq only five days before. The 203rd is located in Virginia Beach, Va., and was mobilized by an executive order in January. The unit had been deployed many times before to carry out construction projects in Southwest Asia, but this marked its first activation for federal service since the unit stood up in 1985.

The 180-member unit began deploying to the Middle East in April. Phillips told the chapter that Qatar served as their base. They worked on quality of life projects there and traveled to Afghanistan for airfield engineering projects, to Oman to build taxiways, and to Baghdad for work on an 11,000-foot runway.

Along with guest speaker Phillips, the chapter's September meeting included recognition for David Lorenz, the chapter and state Teacher of the Year. Lorenz teaches physics at Great Bridge High School in Chesapeake, Va. The chapter presented him with a flag that had flown over the US Capitol, a letter of congratulations from Rep. Randy Forbes (R-Va.), and funds to attend a Civil Air Patrol aerospace conference.

The Blue Aces, a combo from the US Air Force Heritage of America Band, provided the evening's entertainment. They're based at Langley AFB, Va.

Lunch and Learn

With Lt. Gen. John D. Hopper Jr. as guest speaker, a lunchtime meeting of the **Gen. Charles L. Donnelly Jr. Chapter (Tex.)** attracted an audience of several hundred guests.

Chapter member Lt. Col. Jeffery S. Snell reported that Hopper, vice commander of Air Education and Training Command at Randolph AFB, Tex., spoke about the Air Force's recent successes and the importance of AFA's support for USAF. Hopper later helped present a donation from the

AFA In Action

The Air Force Association works closely with lawmakers on Capitol Hill, bringing to their attention issues of importance to the Air Force and its people.

■ AFA joined **Rep. Chet Edwards** (D-Tex.) for a press conference Oct. 22 to urge the House leadership to send the Armed Forces Tax Fairness Act to the President for his signature. The bill—H.R. 1307—provides a series of tax and quality of life benefits primarily for members of the armed forces and their dependents.

The House unanimously passed the bill in March and the Senate amended it and returned it to the House, but it had been sitting on the speaker's desk. (See "Action in Congress: Action on Tax Breaks, Finally," p. 20.)

"AFA has received an unprecedented volume of correspondence from our members on H.R. 1307 seeking fairness on these issues," said AFA Executive Director Donald L. Peterson at the press conference. "Now is the time to let our men and women in uniform know that we appreciate the sacrifices they and their families are making in defense of freedom." Joining Edwards and Peterson for the news conference were representatives from several other military associations.

Two weeks after the press conference, the House and Senate both passed a new version of the bill, The Military Family Tax Relief Act of 2003 (H.R. 3365). The President signed it on Veterans Day.

■ AFA National President Stephen P. "Pat" Condon met with **Steve Peterson,** chief counsel and policy advisor to **Rep. Rob Bishop** (R-Utah). Bishop serves on the House Armed Services Committee and its Readiness and Strategic Forces Subcommittees. The meeting is a follow-up to Condon's trip earlier this year to Pacific Air Forces bases, where he received command briefings, toured facilities, and met with airmen. Condon is building Congressional support for quality of life and quality of service needs for USAF airmen overseas. Since overseas bases are not located in Congressional districts, Condon believes, many of their needs are often overlooked and not understood.

USAF photo by SrA. Charles Haymond

At an Air Force Ball sponsored by AFA Nebraska, Gen. John Handy (left), commander of US TRANSCOM and AMC, presents an Air National Guard award to ANG SSgt. Melissa Berling and her civilian-job supervisor, Rick Burns (right). See "Celebrating Milestones," p. 83.

chapter to an outreach program run by the chapel on Sheppard Air Force Base.

The chapter's meeting, nicknamed "Lunch and Learn," took place at the base's officers' club. Snell said it brought out such a large crowd, some had to be turned away. The chapter promoted it through the base leadership channels, their Community Partners, the base newspaper, marquee-style signboards, e-mails, and word of mouth.

Hopper's speech was later broadcast several times the following month on the base's TV channel, Team Sheppard TV Channel 14.

Heritage Flight

The **Panhandle AFA Chapter (Tex.)** set up an AFA booth for the first time at the annual Tucumcari (N.M.) Rotary Club air show.

Held at the town's municipal airport in October, the air show featured the USAF Heritage Flight. This aerial demonstration program was established in 1997 to support the Air Force's 50th anniversary and showcases contemporary USAF fighters flying in close formation with vintage fighters. Heritage Flight consists of six Air Combat Command demonstration team pilots flying modern fighters—an A-10, F-15, and F-16—with a dozen civilians flying World War II and Korean War-era aircraft.

For the Tucumcari air show, former astronaut Frank Borman flew a P-51, reported George F. Moore, the chapter's communications and awards VP.

The Panhandle Chapter's booth offered popcorn, patriotic-theme t-shirts, AFA and AEF brochures, and back issues of *Air Force* Magazine (Nearly 300 of them were distributed.).

Bobby White, newly elected chapter vice president, supplied a commercial popcorn popper and supplies for the effort. Ray Clark, outgoing VP, constructed an easily transportable booth, and Moore and Allen Monroe, aerospace education VP, manned it.

The chapter also arranged for an AFJROTC color guard from Palo Duro High School in Amarillo, Tex., to present the colors at the air show's opening ceremony.

Moore said other "stars" of the midweek air show included an F/A-18 and several older aircraft—Grumman's TBM Avenger and Bearcat and a Lockheed Super Constellation.

The chapter's air show booth raised funds for its AFJROTC scholarships.

For Orville's Birthday

The **Kitty Hawk Chapter (N.C.)** arranged for a guest speaker for the National Park Service's National Aviation Day celebration, held in August at the Wright Brothers National Memorial in Kill Devil Hills, N.C.

Capt. Ryan Boyle, a pilot from the 3rd Airlift Squadron, 436th Airlift Wing, at Dover AFB, Del., spoke at one of the new visitors' pavilions erected for centennial of flight events.

National Aviation Day—established by Presidential proclamation in 1939—honors the anniversary of Orville Wright's birth on Aug. 19, 1871.

Chapter Secretary Joseph M. Hardman reported that Boyle, a C-5A pilot, talked about his flying experiences, including what has virtually become a "commute to Baghdad." Boyle gave his presentation on two different days to a full house and each time received a standing ovation, Hardman said.

Hardman added that National Aviation Day is always noted at the memorial—located at the site of the Wright brothers' historic Dec. 17, 1903, flight—but it has in the past featured the F-16, A-10, and other high-profile aircraft. Hardman rounded up a transport pilot, this time. He said it was a chance to highlight "another facet of the Air Force that frequently gets buried for the more glamourous" aspect. He was able to arrange for Boyle's appearance through the pilot's grandfather, Al Hibbs, a friend who lives in nearby Nags Head, N.C.

C-5A Future

The **Delaware Galaxy Chapter's** September meeting featured a presentation by Kenneth Goss, AFA's director of government relations.

In addition to describing the association's work on Capitol Hill, Goss spoke about USAF's Fleet Viability Board. The board was launched last spring and will make recommendations on the future of aging aircraft such as the C-5A airlifter. The FVB is of interest to the chapter members because the 436th Airlift Wing at Dover AFB, Del., flies three dozen C-5As.

Among those listening to Goss's presentation were Col. Bruce E. Davis, chapter member and commander of the 512th Airlift Wing (AFRC) at the base, and James L. Hutchison, mayor of the city.

Staff Appreciation

Sean Eagan, says the **Greater Seattle Chapter (Wash.),** keeps the information flowing between the chapter and his boss, Rep. Adam Smith (D-Wash.).

Smith is a member of the House Armed Services Committee, and his district includes McChord Air Force Base, as well as Ft. Lewis.

Eagan is Smith's deputy district director at the local office in Tacoma, Wash. To show the group's appreciation for his efforts in building a relationship between the chapter and the Congressman, I. Fred Rosenfelder, chapter president, presented Eagan with a plaque during an October chapter luncheon meeting.

The meeting also honored cadets of the quarter from AFROTC Det. 910 at the University of Washington. Rosenfelder and Eagan presented awards to 2nd Lt. Ryan J. Daugherty, a chapter member who was commissioned in June and is awaiting pilot training at Vance AFB, Okla., John D. Huntsman, Katherine J. Maddox, and William T. Carter III.

More AFA/AEF News

■ The **Tidewater Chapter (Va.)** sponsored a visit by Civil Air Patrol cadets to the Fighter Factory in Suffolk, Va., in July. Mechanics and craftsmen at the facility, located at Suffolk Municipal Airport, restore World War II warbirds. They are now working on an A-26 Invader, a B-25J Mitchell, and a Messerschmitt Bf-109. The Aviation Institute of Maintenance, in Norfolk, Va., operates the Fighter Factory. Seven Tidewater Chapter members, including William M. Cuthriell, president, and Robert Hudson, treasurer, joined the CAP cadets for this visit. The field trip was part of several chapter efforts to build ties with other organizations.

■ **Gainesville Chapter (Fla.)** member Col. Rodney S. Fitzpatrick was guest speaker for a meeting of the chapter's Ocala, Fla., section in September. Fitzpatrick heads AFROTC Det. 150 at the University of Florida in Gainesville. He spoke to the audience about his previous assignment as chief of staff, US Military Training Mission, Saudi Arabia, and described the Saudi–US relationship, covering government, military, and culture. In the audience listening to Fitzpatrick's presentation were AFJROTC cadets from Dunnellon High School and their aerospace science instructor, chapter member John E. Clark.

■ To raise funds for its AFROTC and AFJROTC scholarships, the **Gold Coast Chapter (Fla.)** held an old-fashioned garage sale in the parking lot of a Baptist church in Margate, Fla. More than 200 customers checked out the new-to-you items, including a stereo reported by Chapter President Robert C. Tash to be worth $2,000. Another item that garnered interest: a new wooden model of the B-29 *Enola Gay*. Tash said the five-hour garage sale raised more than $400 and helped the chapter fulfill three $500 scholarships. The garage sale was organized by chapter members Fran C. Shaw, Ken Basilio, and Bill Kotziers.

■ In July, the **Thomas W. Anthony Chapter (Md.)** sponsored the seventh hole at the Services and Friends Golf Tournament held at Andrews AFB, Md.

■ Retired staff member Col. Benjamin S. Catlin III, USAF (Ret.), who was an AFA director of legislation, died Oct. 17. He was 80 years old. Catlin had served in the Army Air Corps and the Air Force for more than 30 years. He was a member of the **Northern Shenandoah Valley Chapter (Va.)** and lived in Sarasota, Fla. ■

Have AFA/AEF News?

Contributions to "AFA/AEF National Report" should be sent to *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Phone: (703) 247-5828. Fax: (703) 247-5855. E-mail: afa-aef@afa.org.

Unit Reunions

reunions@afa.org

6th BG Assn (WWII). April 29-May 2, 2004, in Savannah, GA. **Contact:** Harry George, 1170 Gulf Blvd. #703, Clearwater, FL 33767 (727-517-2577).

19th TRS. April 25-28, 2004, in Fort Walton Beach, FL. **Contact:** John Fortenberry, 446 Marion Dr., Niceville, FL 32578 (850-678-0707) (jonanom@aol.com).

862nd Engineer Aviation Battalion, Ninth AF, England, Belgium, and Germany. May 12-16, 2004, at the Embassy Suites Airport Hotel in St. Louis. **Contact:** Joseph Di Franco, 5900 SOM Center Rd., Willoughby, OH 44094 (440-725-7190 or 440-943-2700) (diajoe@worldnet.att.net).

Air traffic controllers, Hahn AB, Germany (1967-74). June 3-5, 2004, in Colorado Springs, CO. **Contacts:** Bill Mosley, 310 East Rancho Dr., Henderson, NV 89015 (702-558-0776) (wmmosley2@cox.net) or Ron Axley (msgtron@aol.com).

Berlin Airlift Veterans Assn (1948-49). May 12-16, 2004, in Kissimmee, FL. **Contact:** J.W. Studak, 3204 Benbrook Dr., Austin, TX 78757-6804 (512-452-0903). ■

Mail unit reunion notices four months ahead of the event to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information. We reserve the right to condense notices.

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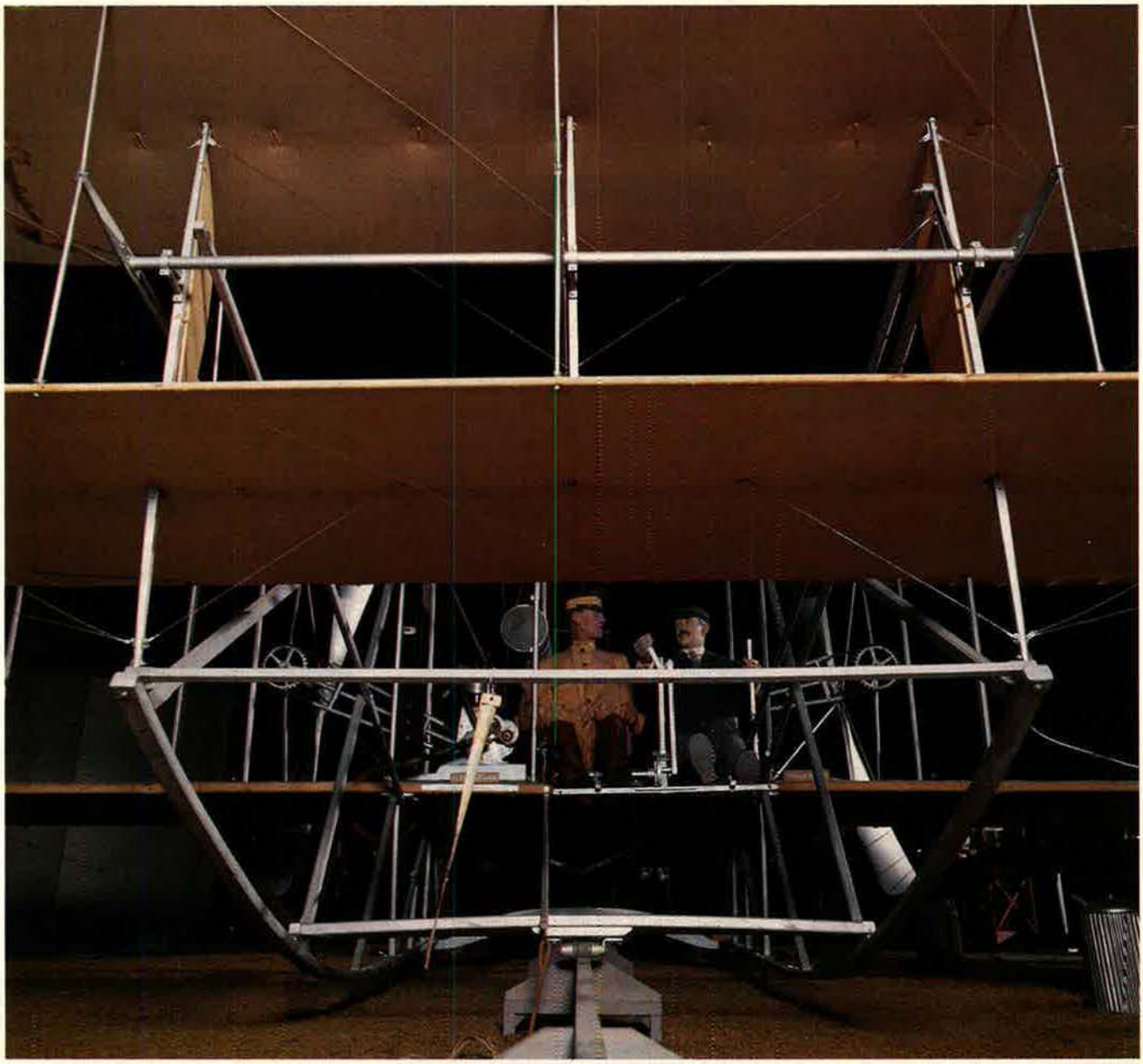
For information on the Air Force Association, see www.afa.org

Pieces of History

Photography by Paul Kennedy

Airplane No. 1



In 1907, President Theodore Roosevelt directed the Army to consider the possibilities of the airplane. The Signal Corps advertised for an aircraft that could fly for one hour and at 40 mph. This led to the Army's purchase of the Wright 1909 Military Flyer—built by Orville and Wilbur Wright. Following several successful trials at Ft. Myer, Va., the Signal Corps paid $30,000 and gave it the designation "Airplane No. 1"—the world's first military airplane. In 1911, the War Department transferred the worn-out Military Flyer to the Smithsonian Institution. It now hangs in the National Air and Space Museum. Pictured here is an exact reproduction, constructed in 1955 by the US Air Force Museum. Its engine was donated by Orville Wright and its chains, sprockets, and propellers by heirs of the Wright estate.

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