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Operation Iraqi Freedom

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May 2003, Vol. 86, No. 5

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About the cover: An eagle in flight graces the cover of *Air Force* Magazine's annual guide to the US Air Force, beginning on p. 56. Photo by Tom and Pat Leeson. Inset, USAF photo from Operation Iraqi Freedom by SSgt. D. Myles Cullen. Coverage begins on p. 10.

Operation Iraqi Freedom

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Editorial

By Robert S. Dudney, Editor in Chief

The US Air Force at War

WASHINGTON, D.C., APRIL 10

GULF War II quickly stirred up the airpower skeptics. In the aftermath of Gulf War I, President George H.W. Bush had declared that "lesson one" was the value of top-notch airpower, but Operation Iraqi Freedom touched off a negative blast.

University of Chicago Professor Robert Pape warned, "Wars can't be won only from above." Columnist George Will claimed, "Airpower alone will never supplant ground power." Retired Army officer and theorist Ralph Peters observed, "Once again, it has taken ground forces to provide the main thrust of military operations." And so on.

Worse, the 800-pound gorilla of airpower—the US Air Force—was momentarily invisible. Skittish host nations refused to allow TV crews anywhere near USAF's overseas fighter and bomber units.

The net effect was to muffle, for a time, the story of USAF at war.

Now that the facts are coming out, we see that the story is one of extraordinary success. After three weeks, the war was not yet over, but it is worth noting what airpower already had accomplished.

USAF has been the dominant airpower force. Over the first three weeks of the war, its crews flew nearly 40 percent of the combat sorties and delivered two-thirds of the munitions tonnage. The rest was divided between the Navy, Marine Corps, Royal Air Force, and Royal Australian Air Force. USAF carried out a third of Intelligence-Surveillance-Reconnaissance sorties, 70 percent of air refueling sorties, 86 percent of combat search and rescue missions, and all the airlift sorties.

The coalition swiftly seized command of the air. In the months before the war's March 20 launch, warplanes patrolling Iraqi "no-fly" zones bombed 80 air defense sites. By March 25, Defense Chief Donald H. Rumsfeld could claim, "We've got total dominance of the air."

Coalition air attacked at will. In three weeks, USAF and its friends dropped some 15,000 precision guided munitions and launched 750 cruise missiles. In contrast to the 1991 war, when nine of 10 expended weapons were unguided "dumb" bombs, about 75 percent of today's weapons are precision guided.

Late on March 21, Baghdad time, coalition air forces struck scores of Iraqi targets in an effort to force a surrender. This attempted knockout punch, which the media called the "shock and awe" phase, didn't work as planned but was worth a try.

Soon, coalition airpower shifted from strategic targets to concentrated attacks on Iraqi military forces. USAF flew roughly 300 strike sorties each day, 80 percent in direct support of ground forces.

Three weeks of war in Iraq confirmed the centrality of modern airpower.

Airborne ISR systems provided an unparalleled view of activity in the battle area. The E-8A Joint STARS has been especially busy, spotting and tracking the enemy's ground forces and missiles. Global Hawk and Predator UAVs have provided continuous real-time pictures of tanks, troops, and artillery. The Combined Forces Air Component Commander, USAF Lt. Gen. T. Michael Moseley, had access to some 50 US satellites for surveillance, warning, weather forecasting, and other needs.

In a single week, the hundreds of in-theater coalition aircraft destroyed 1,000 Iraqi tanks and reduced the strength of Republican Guard divisions by 50 percent or more—sometimes much more.

On April 5, Moseley reported: "Our sensors show that the preponderance of the Republican Guard divisions that were outside of Baghdad are now dead."

He was right. With Saddam Hussein's best forces pulverized, Army and Marine forces pushed on and reached Baghdad in two weeks—an achievement of historic proportions.

As soon as the coalition invested Baghdad, USAF activated a new concept of operations, Urban Close Air Support, to assist ground forces. Hovering over Baghdad at all times were two airborne forward air controllers and five or six pairs of fighters, armed and ready to attack.

As usual, the unsung heroes were the aerial tankers, flying gas stations that kept the bomb-droppers in action and accounted for 15 percent of all sorties.

To the surprise of no one, US airlift proved to be a critical advantage. USAF flew 4,900 airlift sorties. These included about 3,500 in-theater airlift sorties that moved 6,300 tons of cargo and 5,500 passengers. In a major nighttime airdrop, 15 long-range C-17s delivered 1,000 Army paratroopers and 40 vehicles into northern Iraq.

The war has unexpectedly renewed the debate about the future of heavy ground forces. Gulf War II's ground force was only half the size of that deployed in the 1991 war, even though the 2003 war aims were more ambitious. Some Army partisans were upset that the attack featured only one tank-heavy division. Retired Army Gen. Barry McCaffrey, a Gulf War I commander, said, "In my judgment, there should have been a minimum of two heavy divisions and an armored cavalry regiment on the ground."

However, the swift victory of the smaller ground force put such critics in an awkward spot, facing the question of whether modern airpower means commanders need fewer heavy ground forces to attain victory.

Gulf War I's "air boss," retired USAF Gen. Charles Horner, told Bill Gertz of the *Washington Times,* "They [some Army leaders] think you need a larger ground force, but I think that what we're seeing is that that is not the case."

It is impossible to judge whether Horner is correct until all the facts are in. The ultimate indicator will be the outcome of the war in all its dimensions. And all of the services were vital to success.

For the moment, however, there is every reason to believe President Bush's 1991 declaration is still valid. ■


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Letters

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No Quick Fix

Seems to me that too many people are trying to find a quick and easy way to fix the volunteer military, concerning the mix of people from all parts of the American society. *[See "Editorial: The Thirty Years' War," March, p. 2.]* Restarting the draft isn't the right fix.

I think it needs a much more difficult and deeper change. The whole idea of military service needs to change so that people from all parts of society will want to be in the military.

The editorial noted that Rep. Charles Rangel called for a reinstatement of the draft to create a "shared sacrifice" [by] all members of American society as a means of equitably distributing the burden of service to the rich as well as the poor and middle classes.

The draft isn't the answer. Oh, it may create a better sharing of the burden in the short term but we need a better solution.

To do this, military service needs to be a prerequisite for other forms of service. This is not a new idea on my part. [The idea is to] honorably complete military service (or some other form of service to the country other than elected service) before you [can be] considered a "full" citizen of the country, able to vote and hold office. Think about that concept—just because you are born in the country would not automatically make you a citizen.

Transitioning from what we have now to something like this would not be easy—it would be a major change in what people believe their rights are. This would say, "You want to be a full citizen, vote, hold office, and have a say in how the country is run—prove it! Join the military and serve the country you love first, then tell us how you think it should be run."

Lt. Col. Alton Dobbins,
USAF (Ret.)
Mustang, Okla.

Representative Rangel, politically motivated or not, does have a point: The callous free of this country have no idea what serving their country is about and thus will be in the way of our professional military if this nation ever has to defend its home soil.

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

I see a use for the draft but not to fill the ranks of our professional military. There really is no way to adequately train draftees in this century's high-tech military and still have any time left in their tour of duty to make profitable use of them. In short, the training dollars would be wasted.

Still, there is a way for military draftees to be utilized, and the amount of training investment could be minimal. Put them on our nation's borders!

Boot camp would [last] six weeks to train them in military discipline, history, etc. Then they could be taught how to fire the M-16 rifle. There would be no need for a huge network of transportation to be created or supported to get them to their assignments. The nation's commercial bus system would suffice. Train 'em and send them to the borders.

MSgt. John M. Harvey,
USAF (Ret.)
Tampa, Fla.

Driven by Weight and Volume

Your article on the Civil Reserve Air Fleet *["The Chart Page: The Current and Future State of CRAF," February, p. 28]* is very interesting. There are a couple of items regarding platform selection and utilization that I would like to clarify for your readers.

Your article stated that the Air Force uses the 747 extensively in its commercially augmented cargo operations. This is a true statement, and the reason is due to both the weight and volume capacity. Many of our requirements are for loads of 90 tons or more. The 747 meets this requirement while some other very capable widebody aircraft (that we also use) do not. We use 90 tons for the weight standard because that is an equivalent measurement to our widebody military transports (C-5 and C-17). This standard for capability gives our en route system predictability for aerial ports around the world to move equipment and personnel regardless of whether the platform is commercial or military. And while weight is an important factor for our planners, volume is also important.

Volume restrictions can be a more limiting factor in airlift than weight. Your article stated, "More than 40 percent of the 747s used in 2002 flew without full loads." While this is true with respect to weight, what was left unsaid is that all cargo carrying aircraft—not just the 747—typically "cube out" (fill the volume of the cargo compartment) before they "gross out" (exceed the allowable cargo weight). One additional point on volume is that cargo pallets built for military transports are compatible with the 747. Some widebodies that we also use for commercial augmentation require special contouring of pallets to accommodate the dimensions of their cargo compartments. The bottom line is that we use the right airframe—organic or commercial—for the right loads, and all of our CRAF partners bring important capability to the mission.

I sincerely appreciate your coverage of air mobility operations. This team—active duty, Air Force Reserve, Air National Guard, civilian employees, our CRAF, and other industry partners—is what makes America a truly expeditionary nation—anything, anywhere, anytime, to provide relief in times of suffering and combat power in times of conflict. Thanks for helping us tell this important story.

Maj. Gen. Roger A. Brady,
Director of Operations,
Air Mobility Command
Scott AFB, Ill.

The Real Challenge

Having worked in the counterforce, or attack operations portion of ballistic missile defense, through the 1990s,

Letters

I read Adam Hebert's article "Compressing the Kill Chain" in the March issue *[p. 50]* with great interest. It's exciting to learn about programs to bring Air Force weapons to bear more quickly and accurately against time sensitive targets such as pop-up, "shoot and scoot" mobile theater ballistic missiles (MTBMs). In 1991 and 1992, as part of the former Phase One Engineering Team, I led a substantial assessment of this mission area for the Ballistic Missile Defense Organization, since renamed the Missile Defense Agency.

Based on that, I concur with each point made by Mr. Hebert. However, those points were not sufficient in themselves to illuminate the counterforce problem. A still-valid conclusion from our study, which should be of primary interest and concern to system developers, was not mentioned.

We found that, independent of the specific systems involved on each side, the pacing parameter in achieving a counterforce capability is the revisit time of the detecting/identifying/tracking sensor "over" the MTBM location. The capability to have find-stage surveillance focused on the right place at the right time absolutely bounds counterforce effectiveness against MTBMs. The lack thereof can deny effectiveness even if processing, communications, and engagement functions were made to be virtually instantaneous. There is no doubt that an autonomous armed Predator could provide close to 100 percent probability of destroying an exposed MTBM on the ground in its area of coverage if it were able to see the target in time. The challenge at present is to ensure a timely view of the target.

The window of opportunity to destroy an MTBM before it launches is very small. By simple procedure and preplanning, the enemy can reduce MTBM exposure to within a very few minutes of the technical constraints of his system. The achievement of timely response capabilities in such a small window of opportunity is not impossible, but it does demand that we look at the problem in the context of total system performance.

Considering total counterforce system performance doesn't need to be rocket science. Try this. First, quantify the increments of time in the kill chain any way that seems reasonable against an MTBM of interest, starting with the assumption that the find-stage sensor is looking at the right place at the right time. If you wish, make the sensor platform armed

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and autonomous. Plot that "conditional kill chain" on grid paper.

Then, draw out a twisting valley, for example, with a reasonable number of caves or other places suitable for hiding that MTBM. Put the missile in one of those hiding places; the choice doesn't matter. Put a Predator over that valley, draw out a reasonable search pattern, and determine the revisit cycle over the MTBM area. Add this revisit time to the start of what I called the conditional kill chain, and call that the "total kill chain."

Then, quantify a reasonable exposure time for the MTBM, and plot that to the same scale on a transparency so it can be moved around over the plot of the total kill chain. Then, bring the MTBM out of hiding over a range of times relative to the start of the total kill chain, and overlay the plots. If you made the Predator armed and autonomous, the message should be clearer. The plots will probably show revisit time to be about 75 percent of the total kill chain, probably exceeding the exposure time of the MTBM by itself. Postulate reasonable reductions in the total kill chain and see where your priorities lie. Recognize that any movement or launch activity by the MTBM that starts and ends completely within the sensor's revisit interval will go unnoticed by the Predator.

Hence, in that case, the conditional kill chain will not start, and the opportunity for interdiction will be zero. It should become clear that it is in the enemy's best interest to come out of hiding as close to the start of a revisit interval as possible, regardless of the search pattern involved. Doing so gives the MTBM a head start equal to that revisit interval. Attributing the enemy with Radio Shack "fuzz-buster" technology sufficient to recognize when his location is painted by the sensor, it seems prudent to assume that, in the absence of military necessity, MTBM exposure will start at the enemy's discretion immediately after a sensor scans its area. It should become clear also that it is in our best interest to take away as much of that potential head start as possible, which can be done.

I believe this logic is clear to that part of the sensor community focusing on increased surveillance areas, dwell times, revisit rates, and related initiatives. I believe those initiatives must be afforded attention and funding priorities consistent with the con-

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Letters

tribution they can make to MTBM counterforce operations. The initiatives listed in the table on p. 53 are very impressive and surely will get weapons on time sensitive targets quicker. However, without reductions in sensor revisit times, they will not solve the counterforce problem.

Col. Robert W. Grayson, USAF (Ret.)
Alexandria, Va.

The concept of compressing the kill chain is as old as the discovery of fire. Before Find, Fix, Track, Target, Engage, and Assess, those who worked the problem simply said See, Decide, and Act.

Will advances in technology permit the "shooter" to get inside the enemy decision cycle? Probably.

Lt. Col. Robert Edwards, USAF (Ret.)
Salt Springs, Fla.

A Shorter War?

Great article by Walter J. Boyne on the history of aerial refueling as demonstrated by the flight of the *Question Mark* in 1929. *[See "Question Mark," March, p. 66.]*

He gives [Alexander P.] de Seversky of Russia the credit for the original concept, but I would prefer to give it to Lt. Godfrey L. Cabot of the US Navy who not only advocated but demonstrated the idea in 1918. Too bad the vision and planning Boyne credited to the effort was not made available to those who planned the Pacific air war where we allowed Japan to remain free from any sustained air attacks for three years after Pearl Harbor.

Yet he tells us, "For the most part, US aircraft during World War II had sufficient forward bases so that in-flight refueling was not an absolute necessity." Aerial refueling, coupled with single airplane nighttime bombing, had the potential for ending that war at least six months sooner, avoiding the use of the atomic bomb and the division of Korea that haunts us to this day.

William J. Spelliscy
Orange, Calif.

The V-22 Issue

Adam J. Hebert, senior editor for *Air Force* Magazine, reports that after two fatal crashes in 2000 the grounded V-22 has been "redesigned" and is confronted with an undisclosed "rigorous new test program." *[See "Aerospace World: Hester Expects To Field the CV-22," March, p. 12.]*

If by redesign, Mr. Hebert means numerous engineering change proposals, then he is correct, but the inherent and fatal design flaws have not been addressed—and [despite the] well over $100 million per aircraft, V-22 has yet to overcome dynamic imbalances due to prop-thrust arrangement and severe [vortex ring state] problems. Conspicuous by its absence is the FAA—not invited to certify the aircraft. Further, the reported "expensive" alternative life extension of the Pave Low MH-53 helicopters, compared to V-22, is without foundation—and blatantly false!

Lt. Col. John H. McLeaish, USAF (Ret.)
San Antonio

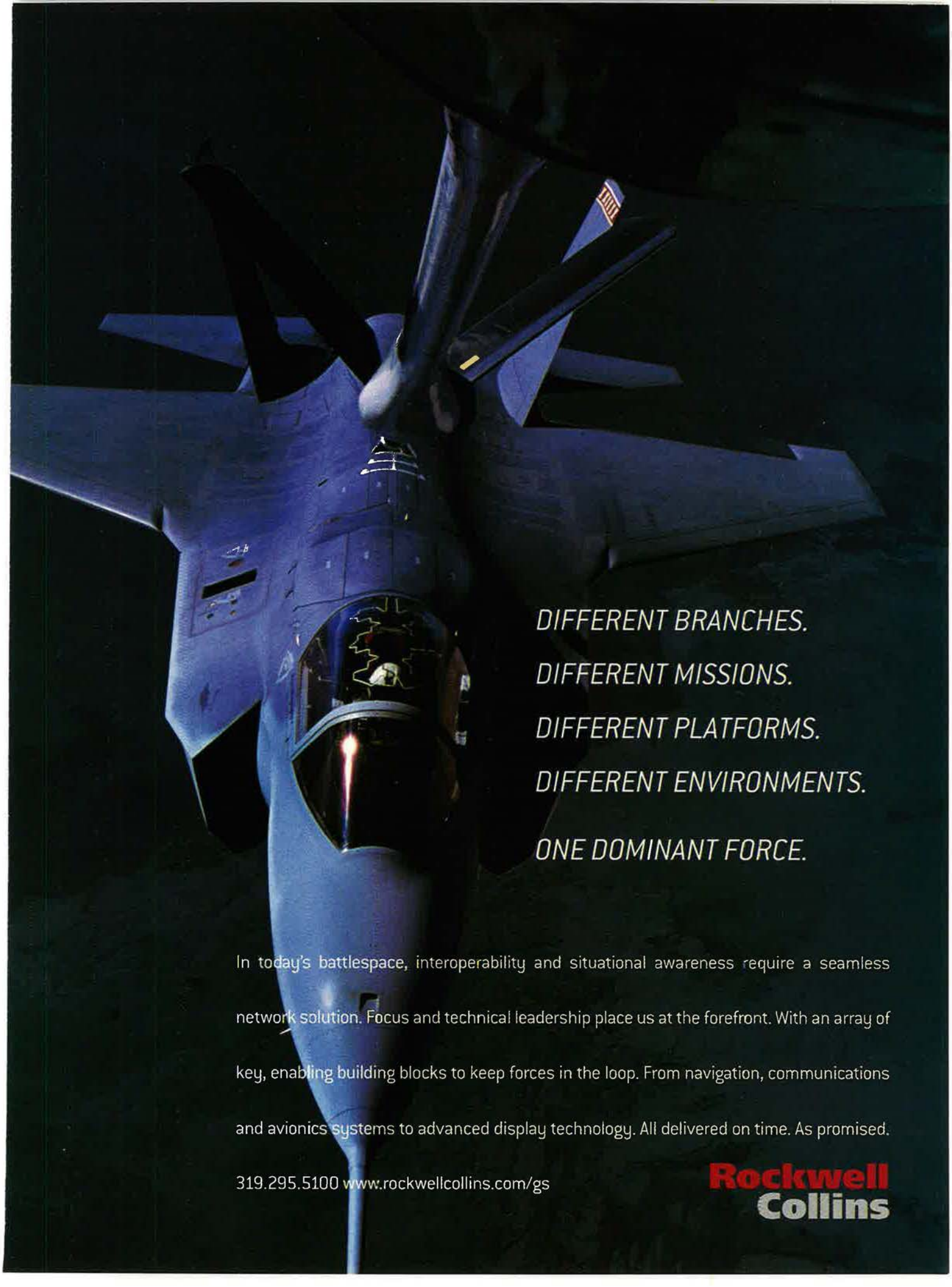
■ *The "foundation" for the quote about the cost of extending the life of the MH-53s is Lt. Gen. Paul V. Hester, commander of Air Force Special Operations Command. Here is Hester's full response to a question posed in late January on USAF options should the V-22 fail its tests: "We've got 1966 year Pave Low helicopters. We've already extended because of difficulty of the CV-22 program. We have probably extended those helicopters now out by an additional five years. If in fact the CV-22 does not pass its tests, I would expect that our immediate solution, which appears to be the only one available to us, is to go in and do an evaluation of an extended SLEP on the helicopters, hoping that that SLEP would only be for a few years. That would be an expensive program, but it would buy us time to return to industry and ask them to give us options."*—THE EDITORS

Why Not Korea?

Mr. [Stephen] Miller asks why preemption policy "applies to Iraq but not Korea." *[See "Letters: War of Fog," February, p. 4.]* I ask, has anyone said that is the case?

A holding action was basically fought in the Pacific during World War II while the main effort went to disarming the threat in Europe. This was not because Japan was viewed as a nonthreat but that Hitler was a more immediate threat to world security. I doubt anyone would argue that Korea is not a threat, except maybe Jimmy Carter. Something does need to be done about Korea. But Iraq is a more immediate threat to national security.

MSgt. Mark Young, ANG (Ret.)
Dallas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Desert Triumph

By John A. Tirpak, Executive Editor

WASHINGTON, D.C., APRIL 10

Only three weeks after launching the invasion of Iraq, coalition forces found themselves in control of most of Baghdad and battling remnants of shattered Republican Guard divisions and irregulars in the city. US–led ground forces had raced 300 miles from Kuwait to the capital, their path opened up by devastating combat airpower that had shifted back and forth between fixed strategic targets and mobile enemy forces in the field.

On April 9, US Central Command reported that Iraqi forces no longer seemed to be under any kind of central control.

With an emphasis on speed, flexibility, rapid maneuver of ground forces, surgical strikes, and information operations, Operation Iraqi Freedom was in many ways a demonstration of the "transformational" concepts and technologies championed by the Pentagon leadership.

While it's too soon to draw definitive conclusions about what has happened in Iraq, a few of those themes were prominent:

- It now appears that relatively small but highly mobile ground forces can meet and defeat a larger, entrenched defender, provided the US first establishes and then ruthlessly exploits air and space dominance.
- Information dominance—achieved in large part by a fleet of spacecraft and sensor aircraft roaming the battlespace at will—coupled with highly precise, real-time, informed targeting by massive numbers of aircraft, led to rapid victory on the ground.
- OIF showed that a prolonged air war as a set-piece prelude to ground action is not always necessary and that air and space power can indeed be extremely effective in helping ground forces wage urban warfare without inflicting massive collateral damage on civilians.
- Information operations—ranging from dispersal of leaflets to computer network attack—can sharply reduce the need for kinetic weapons.

Gulf War II had all the hallmarks of an "effects-based operation"—speed, precision, and effectiveness enhanced by use of minimum force but backed by the willingness to employ massive force where warranted to mold the enemy's perception.

In targeting, weapons and aim points were selected with an eye toward producing the desired results with the least number of steps. An attack on one target, for example, might be used to cripple others—such as striking a single pillar that holds up a whole building or a communications relay on which all others depend.

Most of the operational concepts employed in Iraq seemed to work quite well, and they did so in the absence of any new and untried "wonder weapon," as in past wars.

The ground force in this war was not as large as the one used in 1991 to eject Iraqi forces from Kuwait. However, attacks from the air were more numerous and more intense than those mounted in Operation Desert Storm. On March 19 (local Baghdad time), the coalition conducted preparatory attacks against about 1,400 aim points, including strategic targets in three major cities as well as attacks on air defenses, runways, suspected missile launch sites, and command and control nodes. The main attack began March 20. Yet all this was accomplished with far fewer aircraft than were deployed in Desert Storm.

Strikes in Five

Thanks to quick action on the part of the combined air operations center in Saudi Arabia, coalition aircraft would, in some cases, strike emerging targets in as few as five minutes after detection. After the fourth day of war, air attacks shifted dramatically from fixed targets to mostly moving, fielded targets, said DOD officials.

The ground force marshaled to drive Iraq from Kuwait in 1991 totaled about 500,000 American troops. The force assembled by Gen. Tommy R. Franks, Central Command commander, to take Iraq from Saddam

Hussein amounted to some 230,000 US personnel at the outset (rising to about 340,000 after three weeks). Only 125,000 of those were in Iraq itself. This ground force was arrayed against an Iraqi force initially numbering about 400,000 and ranging in skill from well-trained Special Republican Guards to untrained militia conscripted at gunpoint.

In 1991, Gen. H. Norman Schwarzkopf, the coalition commander, used six weeks of heavy airpower attacks to blast away half of the enemy's combat capability before ground forces even engaged. Franks, by contrast, launched his ground assault before his full air campaign. This was done in an attempt to achieve tactical surprise and thwart Saddam's forces before they could destroy oil wells and wreck port facilities.

Franks also decided to rush toward Baghdad, engaging Iraqi military when necessary but largely bypassing major cities along the way. At the same time, he used airpower to destroy the infrastructure of Saddam's power in the capital. He aimed to quickly decapitate the regime and thus leave Iraqi troops with the unpalatable choice of disorganized resistance or outright surrender.

"The Iraqi military, as an organized defense in large combat formations, doesn't really exist anymore," Central Command's air chief, USAF Lt. Gen. T. Michael Moseley told reporters on April 5. "We really do have air supremacy over this country."

Scanning the "Kill Boxes"

The air element was directly responsible for a critical strategic goal—making sure the war did not spill over onto other countries. From the outset, combat aircraft were patrolling "kill boxes" in southern and western Iraq, searching for—and in some cases finding—theater ballistic missiles that could be used against Iran, Israel, Kuwait, Saudi Arabia, or Turkey. One F-15E crew reported definitively destroying a Scud missile launcher, a weapon expressly forbidden to Iraq under UN resolutions.

The coalition weapon of choice for targets in Baghdad was the Joint Direct Attack Munition, a munition guided by Global Positioning System satellite signals. The accuracy of the weapon was described by a bomber wing commander as "to within one bomb's length." (A 2,000-pound JDAM is about 12 feet long.) Thousands rained down on Baghdad, producing a spectacular show of force as regime headquarters and Saddam's Presidential palaces went up in clouds of smoke.

The might of modern airpower was used with devastating effect against Iraqi mechanized forces massing just ahead of the Americans on the roads to Baghdad. Flushed from their defensive positions around Baghdad to meet the approaching spearhead, Iraqi armor was spotted by Joint STARS radar aircraft and quickly chewed up

by Air Force A-10s, F-15Es, F-16s, and other coalition fighters. The preferred weapon to destroy the Republican Guard armored vehicles on the move was the A-10's fearsome 30 mm Gatling gun, which was incorporated for just such a purpose when the aircraft was designed 30 years ago. Other weapons used to pick off the Guard were the infrared-guided Maverick missile, laser guided bombs, and the Sensor Fuzed Weapon.

Rather than engaging in massive tank battles, coalition ground forces encountered mostly burning hulks on their drive north, courtesy of airpower.

Sowing Doubt, Suspicion

A major psychological campaign was also conducted, with 37 million leaflets showered down on Iraqi troops beginning more than a month in advance, in an effort to convince them they could not win and that they would be spared if they surrendered. The US also gambled that most of the Iraqi people had had enough of their leader and would welcome coalition forces as liberators. In addition, the US leadership hoped to sow doubt and suspicion within the Iraqi regime, saying that it was in touch with generals who planned to defect or surrender, always speaking of Saddam's reign in the past tense and of a successful coalition invasion as virtually a fait accompli.

Before Operation Iraqi Freedom even began, Iraqi air defenses and command and control capabilities in southern Iraq had been substantially degraded. An Air Force expeditionary unit commander reported that B-1B bombers had been operating over Iraq for weeks prior to "G-Day" and "A-Day," the beginning of the ground and air elements of the campaign, respectively.

Last fall, as tensions mounted, other American and British patrol airplanes, covering the northern and southern no-fly zones, pursued "vigorous" retaliations, one US general reported, against Iraqi air defenses and communications nodes when the Iraqis fired on coalition aircraft.

Having read the leaflets and seen that air defense sites that kept their radars on too long were promptly destroyed, air defense operators would only emit briefly, then break down and move to new locations, one official said.

"If they're constantly moving, they aren't a threat," he said. "We are achieving the desired effect of denying them a chance to operate. It really doesn't matter right now if we destroy them, as long as we can go wherever we want with any platform we want."

He added that Iraqi forces had fired anti-aircraft missiles but nearly all "were unguided."

The start of the action was characterized by extraordinary flexibility. When intelligence pinpointing the location of Saddam and his senior leadership on March 20 came to American forces, Franks ordered an attack on the location. Two USAF F-117 stealth fighters, flying silhouetted against a full moon and with no jamming or fighter support whatever, struck the target with four EGBU-27 laser guided bombs. The bombs hit just four hours after the pilots had been roused from their cots and handed imagery of the target on their way to their aircraft.

Following the four penetrating bombs were more than 40 Tomahawk Land Attack Missiles, fired from ships in the Persian Gulf and the Red Sea, completing destruction of the target both above and below ground.

Even three weeks later, it was not clear whether Saddam and his lieutenants had been killed in that first raid.

US goals in Iraq were laid out by Defense Secretary Donald H. Rumsfeld in a March 21 press conference in which he listed the tasks to be performed in order of importance.

"Our goal is to defend the American people," Rumsfeld said, "and to eliminate Iraq's weapons of mass destruction and to liberate the Iraqi people."

Specific Objectives

Coalition military operations were focused on a number of specific objectives, Rumsfeld said. These he listed as, first, "to end the regime of Saddam Hussein by striking with force on a scope and scale that makes clear to Iraqis that he and his regime are finished.

"Next, to identify, isolate, and eventually eliminate Iraq's weapons of mass destruction, their delivery systems, production capabilities, and distribution networks. Third, to search for, capture, [and] drive out terrorists who have found safe harbor in Iraq. Fourth, to collect such intelligence as we can find related to terrorist networks in Iraq and beyond. Fifth, to collect such intelligence as we can find related to the global network of illicit weapons of mass destruction activity. Sixth, to end sanctions and to immediately deliver humanitarian relief, food, and medicine to the displaced and to the many needy Iraqi citizens. Seventh, to secure Iraq's oil fields and resources, which belong to the Iraqi people, and which they will need to develop their country after decades of neglect by the Iraqi regime. And last, to help the Iraqi people create the conditions for a rapid transition to a representative self-government that is not a threat to its neighbors and is committed to ensuring the territorial integrity of that country."

Two weeks later, Rumsfeld said he demanded nothing less than "unconditional surrender" of the Saddam regime.

USAF photo by SSgt. Shane A. Cuomo

USAF Boots on the Ground. *An Air Force pararescueman and HH-60G gunner prepare for a mission. Rescue units and Special Operations Forces played a silent but critical role across the war zone.*

To accomplish all this, the plan—called 1003V—had gone through many iterations and refinements over the last year, according to Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff.

Rumsfeld said the off-the-shelf plan for an invasion of Iraq—originally dubbed 1003—"was inappropriate" for the effects desired by the Bush Administration. That plan had called for more troops than the Pentagon leadership wanted to use, department officials said. It also left Saddam Hussein with too much opportunity to execute a "scorched earth" plan that would destroy Iraq's economic viability, specifically, its oil wells and pumping capability. The US wanted to use the revenue from that oil wealth to pay for the reconstruction of Iraq and give a new government there a chance to get quickly on its feet.

Franks and his staff rebuilt 1003 several times, each time relying on fewer troops and faster action.

When it was noted that the new plan seemed to have many of the features Rumsfeld has been touting for two years—chiefly, fewer, more mobile ground troops—Rumsfeld insisted, "It's Tommy Franks's plan." He added that it had been "washed through" the Joint Chiefs and regional commanders, all of whom had embraced it as "excellent."

The plan emphasized preserving Iraq's economic assets and civilian infrastructure and preventing civilian casualties. It appeared, according to former Secretary of State James A. Baker III, to be a blueprint to "win the peace" after winning the war.

USAF photo by SSgt. Cherie A. Thurlby

BONE Crusher. *Air Force heavy bombers such as the B-1B Bone dropped vast numbers of precision and standard ordnance. Here A1C Nicholas Lewis loads a 2,000-pound weapon onto the aircraft.*

The leaflets dropped on Iraq urged Iraqi troops not to fight for a doomed regime and instructed them on how to safely surrender when coalition troops arrived. The leaflets also warned that any Iraqi forces following orders to use chemical or biological weapons would be found and prosecuted as war criminals. Other leaflets implored Iraqis not to destroy their own oil wells, since this resource constituted their future livelihoods.

To guarantee the safety of the oil wells, Special Operations Forces moved in before hostilities began and perched near the wells to disarm any bombs planted on them. While many of the oil wells were indeed rigged with explosives, only seven of the several hundred wells in Iraq were actually blown.

"Shock and Awe"

The Pentagon leadership expected that the ferocity of air attacks on Saddam's facilities in Baghdad and elsewhere, coupled with swift ground force movement in southern Iraq and a perceived hatred of Saddam, would cause Iraqi forces to surrender en masse and welcome the coalition as liberators.

Military officials placed stories with the media warning that a thunderous opening attack would "shock and awe" the enemy into believing that resistance was futile. The phrase "shock and awe" came from a 1996 white paper by Harlan K. Ullman, advocating a fierce and fast campaign of bombing and swift maneuver to "enervate" an enemy and bring about quick capitulation. The strategy might help offset reduced numbers of ground troops and other forces, Ullman wrote.

Ullman later said the bombing seen in Baghdad, while impressive, was not what he'd had in mind. Moseley said, "Shock and awe [has] never been a term that I've used."

"Did we withhold a large punch?" asked Moseley. "We withheld some targets based on the initiation conditions, and based on where the surface forces were, but that's the right thing to do anyway."

Moseley said that, though relentless and devastating fire had been brought down on fielded forces and regime targets, the key goal was "to absolutely, totally minimize the col-

USAF photo by SSgt. Quinton T. Burris

Tank Plinking. *Marines near Nasiriyah inspect Iraqi tanks destroyed from the air. Spotted by space systems, UAVs, and Joint STARS, Iraq's armor was shot to pieces by coalition aircraft.*

lateral damage and absolutely, totally minimize the effect on the civilian population, so that as much of this infrastructure can be returned back to the Iraqi people after the liberation so that they can get themselves as fast as possible back to a functioning society."

So strong was the emphasis on avoiding civilian damage whenever possible that Moseley had some crews drop inert bombs—those using a guidance kit but with just a weight where the explosive should be—to achieve, through mere kinetic effect, the specific destruction wanted. He also ordered pilots to return with their bombs if they could not properly identify their targets, and many did.

"We've trained to this and ... spent a lot of time worrying about this," Moseley said. "We are very, very sensitive to not creating a mess inside [Baghdad]."

Turkish Surprise

Franks's plan called for first sending in the 230,000 ground troops, followed by a flow of reinforcements. Should the fighting not go as well or swiftly as intended, new forces would continue to arrive in theater. Should they not be needed, the flow could be turned off, Franks said.

Myers explained that the ground force was to move first, without the prelude of an air campaign, to preserve the element of surprise.

"How do you protect tactical surprise when you have 250,000 troops surrounding Iraq on D-Day?" Myers asked at an April 1 Pentagon press briefing. "Well, you do it by ... starting the ground war first, air war second."

Because of the unexpected March 20 opportunity to strike Saddam and his lieutenants, G-Day was moved up one day, as was A-Day, the start of intensive air attacks on regime targets in Baghdad, Mosul, and Tikrit.

Ballistic missiles—with or without weapons of mass destruction—were priority targets.

It was essential that Saddam not be allowed to launch missiles at Israel, which had pledged to retaliate if attacked, as it had not done in 1991. For this, coalition aircraft were deployed into kill boxes over southern and western Iraq, where mobile missiles had been detected previously.

Franks also deployed Patriot missile batteries with the new PAC-3 missile, which intercepted a few of the missiles that Iraqi forces managed to launch in the first few days of the conflict. It is thought that the launched missiles were either al Samoud or Soviet-made Frog weapons, smaller than the longer-ranged Scuds.

Franks's plan called for a sweeping action in the north, with tanks and mechanized infantry advancing from Turkey. When Turkey withheld permission to stage the forces or permit strike sorties to originate on its soil, the plan shifted. USAF C-17s deployed airborne forces that seized the northern airfield of Bashur, where airlifters began bringing in vehicles and supplies to reinforce them. (This airlift included the first-ever battlefield insertion of an M1A1 tank, by C-17.) Turkey did allow overflight by US aircraft, especially badly needed aerial tankers.

US troops, in particular Special Operations Forces, joined Kurdish rebels to apply pressure on Mosul in northern Iraq. As in Afghanistan, they worked closely with aircraft overhead, which delivered precision strikes on enemy forces. The effect was that small SOF groups, enhanced by indigenous forces and backed up by airpower, virtually substituted for a brigade of first-line troops.

In the north, American SOF elements and airpower forces attacked terrorist camps, one of which was found to harbor what appeared to be a primitive chemical/biological weapons factory.

In the west, near the Jordanian border, Special Forces took Iraq's H-2 and H-3 airfields, using them to mount more Scud-hunting raids and to serve as resupply points. Tactical C-130 transports operated from these airfields shortly after the war began, resupplying coalition troops throughout Iraq.

In the south, the advance set a blistering pace, so fast that Army and Marine units seemed to have outrun their supply lines. At several points, tip-of-the-spear units reported running low on ammunition. They were resupplied by nonstop convoys as well as combat airdrops from C-17s and C-130s.

After a week's fighting, the coalition ground advance slowed, causing many to speculate that it had been stopped by Iraqi resistance, had outrun its supply lines, or was too thinly spread out to be able to protect its flanks. In reality, it was preparing for the next push and allowing airpower to attack the Republican Guard elements that had moved out of Baghdad and its environs to meet the coalition ground force. Airpower quickly targeted and destroyed most of the Republican Guard.

Saddam's forces did not fight a brilliant defense. They failed to use the terrain to their advantage, leaving major bridges—instead of blowing them up—over the Tigris and Euphrates Rivers for the coalition to use. Saddam also used his least-dependable forces as his first line of defense and then put his best Republican Guard forces out in the open with no air cover.

By April 7, ground units had taken Saddam International Airport, closed off all major highway entrances and exits to the city of Baghdad, made several excursions in force through the city, and captured two of the

AP photo by Tam McDonald, British Ministry of Defense

Taking Basra. *UK and Australian ground and air forces were key elements of the coalition plan. British forces took the key cities of Basra and Umm Qasr in southern Iraq, paving the way for humanitarian supplies to enter the country.*

USAF photo by SSgt. Cherie A. Thurlby

Beddown in Babylon. *On April 7, US Army forces took Saddam International Airport, renaming it Baghdad International Airport. Soon, USAF C-130s were bringing in vast amounts of supplies.*

Presidential palaces. A supplies-laden C-130 Hercules landed and took off from the airport, now renamed Baghdad International Airport.

The Republican Guard had ceased to exist as a large, coherent fighting force and was reduced to resistance in small groups, which the Pentagon characterized as "militarily insignificant." And the US was preparing to install the first elements of a transitional government.

Iraq's air defense system had proved ineffective. Its constituent parts were either knocked out prior to full hostilities or were moving too frequently to mount any meaningful threat. Only one coalition aircraft was shot down by enemy fire, while accidents, including friendly fire, brought down several others during the first three weeks. Many Iraqi aircraft were destroyed on the ground, and none were launched against coalition forces.

Air Force and other coalition aircraft were based at 37 locations, including the Gulf Region, Diego Garcia in the Indian Ocean, Eastern Europe (particularly Bulgaria and Romania), the UK, and Whiteman AFB, Mo.

By the end of the first 21 days, fewer than 100 Americans had been killed by enemy fire.

Bombs for a Tyrant

During daylight hours on April 7, CENTCOM received information from human intelligence that put Saddam and his closest aides in a particular compound in the northwest portion of Baghdad. Officials fed the target data to a B-1B bomber, orbiting nearby. The bomber crew loaded the coordinates into four GBU-31 bunker-buster bombs equipped with GPS guidance. Within 12 minutes of the order, the bombs struck the structure, leaving a crater 60 feet deep.

CENTCOM later said it did not know if Saddam had been killed in the strike but that, if he had been present, he would have sustained more than just simple injuries. The next day, US forces reported that resistance seemed to lack any central control at all.

Real-time imagery from Predator and Global Hawk unmanned aerial vehicles patrolling over Baghdad aided close air support provided by AC-130 gunships and a range of aircraft, from fighters to bombers, using JDAMs.

"If you can give me a specific location in there, we have the means to hit it with precision," a Pentagon official said. "And I mean, we'll ask, 'Which window?' "

Coalition leaders pointed to astonishing gains over the previous three weeks, highlighted by the jubilation in Baghdad as residents toppled statues of Saddam Hussein.

Though the war was over, the fighting was not. Officials declined to be specific about what conditions would lead them to declare victory. For the most part, they said, the coalition's military action would end when resistance stopped and a new Iraqi government, composed of Iraqis, had been set up.

A Pentagon official said he himself was awed by the swift results of the campaign.

"Fifteen years ago, we were starting to talk about this Revolution in Military Affairs," he said. "We used to be bothered by the nighttime. Now we love the night—we can operate in it, and we get some protection from it. We used to be bothered by the weather. While we would like to have clear weather, if it's cloudy or foggy or there are obscurants like smoke or haze, that's OK, now. We can still strike with precision. We have 24/7, real-time imagery of the target. This is just unbelievable, but the proof of it is out there."

He added, "I never thought we would be here so soon." ■

A Preliminary Chronology of Key Events

(All dates are Baghdad time.)

March 19. Coalition aircraft conduct strikes to prepare the battlefield; Special Operations Forces move into southern Iraq to secure border gun positions and protect oil wells.

March 20. Two USAF F-117 stealth fighters and six US warships attack leadership targets of opportunity about 5:35 a.m. in Baghdad. About 45 minutes later (10:16 p.m. EST, March 19) in Washington, D.C., President Bush announces to the American people that operations in Iraq have commenced. The Senate passes a resolution backing the operation, 99–0. Coalition ground forces move from Kuwait into Iraq at 8 p.m., marking the start of G–Day, the ground campaign.

March 21. At 9 p.m., coalition air forces commence nearly 1,000 strike sorties, marking the beginning of A–Day, the air campaign. The House passes a resolution backing military operations, 392–11. Coalition forces seize an airfield in western Iraq, advancing 100 miles into Iraq.

March 25. British forces secure the port city of Umm Qasr, opening a key route for humanitarian supplies.

March 26. USAF C-17s air-drop some 1,000 Army paratroopers and USAF personnel into northern Iraq to open a northern front and secure the airfield at Bashur.

April 3. US ground forces take Saddam International Airport, just 10 miles from Baghdad. Coalition air strikes continue to pound the Republican Guard and provide close air support for ground troops.

April 7. British forces secure Basra. US forces push into Baghdad.

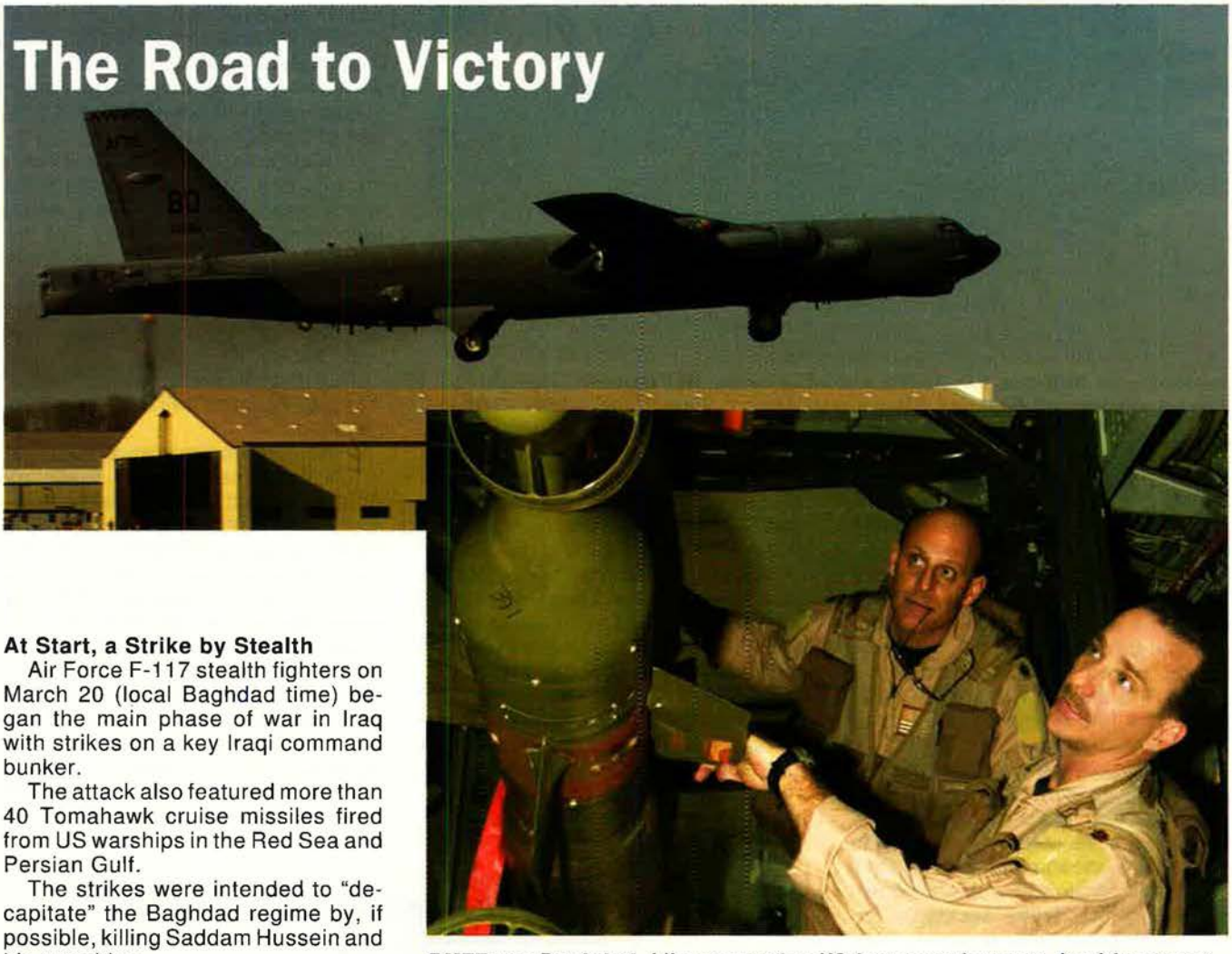
April 9. Baghdad falls.

April 16. CENTCOM officials declare end of major combat action.

Aerospace World Special: Gulf War II

By Adam J. Hebert, Senior Editor

The Road to Victory



USAF photos by A1C Stacia M. Willis

BUFFs to Baghdad. *Like many other US foes over the years, Iraqi forces got a taste of life under earth-shaking B-52 attack. Here, aircrew members from Barksdale AFB, La., inspect the bomb bay before a mission.*

At Start, a Strike by Stealth

Air Force F-117 stealth fighters on March 20 (local Baghdad time) began the main phase of war in Iraq with strikes on a key Iraqi command bunker.

The attack also featured more than 40 Tomahawk cruise missiles fired from US warships in the Red Sea and Persian Gulf.

The strikes were intended to "decapitate" the Baghdad regime by, if possible, killing Saddam Hussein and his top aides.

The attack also marked the debut of an important new munition. In the attack, a pair of F-117A stealth fighters struck the target with four 2,000-pound EGBU-27 bombs. The "E" designation on the bombs indicates that the EGBU-27 is enhanced with Global Positioning System guidance, in addition to its laser seeker system.

Air Force officers had just that day certified the Nighthawk to deliver the new munition.

Insertion of the GPS capability permits the bomb to hit its target with near-precision accuracy even if it is obscured by smoke, clouds, or sandstorms—all factors that might interfere with a laser track. The EGBU-27s also have a backup inertial navigation unit, giving them a total of three guidance systems.

According to a senior defense official, F-117s had dropped roughly 100 EGBU-27s on targets in Iraq through the first two weeks of the war.

Airmen Killed in Combat

USAF announced the deaths of three airmen—an F-15E crew and a combat controller—who were killed in action during Gulf War II.

Maj. William R. Watkins III, 37, of Danville, Va., and Capt. Eric B. Das, 30, of Amarillo, Tex., were killed April 7 when their F-15E went down over Iraq. They were assigned to the 333rd Fighter Squadron, Seymour-Johnson AFB, N.C.

Watkins was the weapon systems officer and Das the pilot. Air Force officials said the cause of the incident is still under investigation.

SSgt. Scott D. Sather, 29, of Clio, Mich., was killed April 8, but the Pentagon released no details, except that it happened at a "classified location." He was assigned to the 24th Special Tactics Squadron, Pope AFB, N.C.

Guardsman Died From Grenade

Maj. Gregory L. Stone, with the Idaho Air National Guard, on March 25 succumbed to injuries he sustained in the notorious March 22 grenade attack at Camp Pennsylvania, Kuwait. The 1:30 a.m. attack also killed a US soldier and injured 12 others.

Stone, with the ANG's 124th Air Support Operations Squadron, was serving with the Army's 101st Air-

borne Division as an air liaison officer.

Army Sgt. Asan Akbar was taken into custody and transferred to the US Army Confinement Facility in Mannheim, Germany, for allegedly throwing grenades at his colleagues.

New Air Force PGM Unveiled

The Air Force's new combination weapon—the Wind-Corrected Munitions Dispenser with the Sensor Fuzed Weapon—made its combat debut in Operation Iraqi Freedom.

On April 2, a B-52 bomber dropped six WCMDs armed with SFWs over a column of Iraqi tanks. The WCMD uses Global Positioning System signals to automatically adjust for wind to allow the weapon to strike more accurately from higher altitudes, thus ensuring the bombs arrive over their designated targets.

The SFW deploys submunitions that sense the heat of individual armored vehicles.

WCMD and SFW were used separately in Operation Enduring Freedom in Afghanistan.

Cruise Missiles Got Heavy Use

The Air Force and Navy made heavy use of cruise missiles in the opening days of Operation Iraqi Freedom.

Through April 3, a senior defense official reported, USAF B-52 bombers had launched roughly 150 Conventional Air Launched Cruise Missiles. The Navy was reported to have fired more than 725 Tomahawk cruise missiles by April 5.

The systems mostly proved to be of devastating accuracy and power.

However, according to press reports, seven Tomahawks launched from ships at sea went astray, landing in Saudi Arabia and Turkey and possibly Iran. The former two nations closed their airspace to these weapons.

There have been no reports of the bomber-launched CALCMs going significantly off course.

USAF Staged Major Paratroop Drop

Air Force C-17s delivered nearly 1,000 Army paratroopers and 40 vehicles or platforms into northern Iraq, according to a senior defense official.

Air Force participants described the March 26 operation as the largest airdrop at least since Operation Just Cause in Panama in 1989 and possibly since World War II.

It was the C-17's first use in an operational airdrop. The mission was performed so that members of the Army's 173rd Airborne Brigade could help open up a northern front in the war in Iraq. Officials said the Air Force almost immediately began using air-

US Space Forces, a Key Wartime Advantage

"The satellites have been just unbelievably capable," declared USAF Lt. Gen. T. Michael Moseley, head of the coalition air forces for Operation Iraqi Freedom.

Moseley was briefing reporters April 5 when he cited the contributions of USAF's space forces. He said all the satellites in his "quiver," not just the Global Positioning System satellites, have been supporting "conventional surface forces, the naval forces, Special Ops Forces, and the air forces themselves."

In addition to directing air operations over Iraq, Moseley also served as the space coordinating authority for the operation. Helping him in that role were some 1,000 men and women from Air Force Space Command who deployed to Southwest Asia.

Those "tip of the spear" space forces were aided by the majority of space personnel operating from their home stations, Gen. Lance W. Lord, AFSPC commander, said April 8. He described the space force contribution as an "asymmetric advantage."

"We don't just have more satellites than the enemy or faster communications," said Lord. "And we aren't the only ones with access to the global navigation and timing capabilities provided by GPS; the Iraqi forces could use them, too. The advantage we provide is more than numbers, it's more than simply the individual capabilities any one system provides."

Space forces are enabling the US to expand the capabilities of older systems, explained Lord, citing development of the Enhanced GBU-27 laser guided bomb, used for the first time in Gulf War II, as one example.

He also noted that those who thought the advent of GPS jamming systems would deny US space superiority were "sorely mistaken," as was demonstrated when "B-1B Lancers and F-117 Nighthawks bombed those six GPS jammers ... with GPS–guided munitions."

In detailing space contributions to the war in Iraq, USAF officials said AFSPC personnel:

- Conducted more than 1,500 GPS satellite uploads to provide enhanced GPS accuracy to within less than 13 feet for precision guided munitions.
- Provided warning on about 70 percent of the Iraqi missile launches.
- Supported several combat search and rescue operations.
- Provided critical reachback for space planning and execution via the air and space operations center at Vandenberg AFB, Calif.
- Conducted more than 5,000 satellite contacts from eight worldwide satellite control network sites.
- Provided high-bandwidth, protected, robust communications through communications satellites.
- Provided real-time battlespace characterization for battle damage assessment.

Rumsfeld on Precision Airpower

On March 21, not long after the start of Gulf War II's air campaign, Secretary of Defense Donald H. Rumsfeld met with Pentagon reporters. One purpose of the session was to set the record straight with respect to modern airpower.

"Just before coming down, after the air campaign began in earnest, ... I saw some of the images on television, and I heard various commentators expansively comparing what's taking place in Iraq today to some of the more famous bombing campaigns of World War II.

"There is no comparison.

"The weapons that are being used today have a degree of precision that no one ever dreamt of in a prior conflict. They didn't exist.

"And it's not a handful of weapons. It's the overwhelming majority of the weapons that have that precision.

"The targeting capabilities—and the care that goes into targeting, to see that the precise targets are struck and that other targets are not struck—is as impressive as anything anyone could see.

"The care that goes into it, the humanity that goes into it—to see that military targets are destroyed, to be sure, but that it's done in a way and in a manner and in a direction and with a weapon that is appropriate to that very particularized target.

"I think that the comparison [with World War II bombing campaigns] is unfortunate and inaccurate. And I think that will be found to be the case when ground truth is achieved."

fields in the area to continue to build up and supply ground forces.

Pentagon planners had originally expected to move the US Army's 4th Infantry Division through Turkey into Iraq, but Ankara refused to grant permission for such maneuvers.

Officials said 15 C-17s participated in the operation, which required flying in formation in total darkness using night vision goggles. The flight originated at Aviano Air Base in northern Italy.

Threat to GPS Fizzled

The Great GPS Scare turned out to be a false alarm.

In the run-up to the war, some had expressed concern that Iraqi forces could employ inexpensive jammers to disrupt the relatively weak signal emitted by Global Positioning System satellites circling the Earth. Disruption of this nature would have put a severe kink in USAF's ability to use GPS–guided weapons and navigate in the desert.

However, the problem proved to be largely unfounded, as coalition forces used GPS–guided weapons with impunity. DOD data shows that coalition forces by April 5 had dropped more than 3,000 Joint Direct Attack Munitions, just one type of GPS–guided weapon.

Early in the conflict, there were reports that Iraq had obtained several GPS jammers, possibly from a Russian supplier. Maj. Gen. Victor E. Renuart Jr., Central Command operations director, announced March 25 that coalition forces had identified six of these jammers and had destroyed all six.

SOF Quickly Seized Airfields

Early in the war, coalition Special Operations Forces seized three key airfields in Iraq's western desert and immediately began using them as bases of operation.

US, British, and Australian forces captured the first two bases, known as H-2 and H-3, on March 21. The bases are in the westernmost section of Iraq.

Details on the special operations have been scarce, but it is believed the airfields were used as coalition helicopter bases. They would be useful for missions seeking out weapons of mass destruction, Scud missiles, and for monitoring the main roads from Baghdad to Amman, Jordan, and Damascus, Syria.

Seizure of the bases, in conjunction with the airdrop that opened a northern front, allowed coalition forces by early April to put pressure on Baghdad from all directions.

MQ-1 UAV Killed AAA

A USAF Predator unmanned aerial

The Return and Fall of Peter Arnett

The first surprise was that Peter Arnett was back on network television, broadcasting for NBC from his old home stand in Baghdad.

Arnett had been dumped by CNN after his 1998 report, "Valley of Death," was exposed as bogus. It claimed that in 1970, US forces used nerve gas, killed 15 or 20 defectors, and wiped out a Laotian village of 100 people, including women and children.

He tried to put the blame on his producer, April Oliver, saying he had only read a script and was being "trashed on a daily basis by the right wing news media," but CNN exercised the exit clause in his contract anyway.

It was not Arnett's first misadventure in military reporting. In 1965, working for the Associated Press, he picked up and repeated a false allegation by Radio Hanoi that the US Army used poison gas in Vietnam. Reporting from Baghdad for CNN in 1991, he broadcast and later defended Saddam Hussein's claim that the United States had bombed a "baby milk plant," which turned out to be a biological weapons factory.

As the current war with Iraq approached, Arnett was sent to Iraq by the National Geographic Explorer series, telecast on MSNBC. He subsequently signed up to work for NBC itself. According to ABC radio in Australia, "When Peter Arnett arrived in Baghdad this year, he was treated like a celebrity by Arab and Iraqi media."

When correspondents from other American news organizations, including CNN, were expelled, Arnett was allowed to stay. "The Iraqis have thrown the CNN crew out of Baghdad and I'm still here," he gloated in an interview with *TV Guide*. "Any satisfaction in that? Ha, ha, ha, ha." The Iraqis, he said, "see me as a fellow warrior."

On March 30, state-controlled Iraqi television broadcast an interview with their fellow warrior, who began with glowing words for the cooperation of the Ministry of Information, "which has allowed me and many other reporters to cover 12 whole years since the Gulf War with a degree of freedom which we appreciate."

With little prompting, he said, "It is clear that within the United States there is a growing challenge to President Bush about the conduct of the war and also opposition to the war. So our reports about civilian casualties here, about the resistance of the Iraqi forces, are going back to the United States. It helps those who oppose the war."

"Clearly the American war planners misjudged the determination of the Iraqi forces," he said, adding that "The first war plan has failed because of Iraqi resistance. Now they are trying to write another war plan."

Arnett was wrong on several points—for example, support for Bush in the United States was rising, not falling—and, at best, he was speculating on others, such as a change in the war plan.

More important, Arnett had told Iraqi rulers what they wanted to hear, praised them to the Iraqi television audience, and gave them encouragement to continue the fight. Some, such as John Podhoretz in the *New York Post*, speculated on whether this amounted to "aid and comfort" to the enemy.

Initially, NBC spokeswoman Alison Gollust leapt to Arnett's defense, saying, "His impromptu interview with Iraqi TV was done as a professional courtesy. ... His remarks were analytical in nature and were not intended to be anything more."

Flooded with "thousands" of e-mails and telephone calls, NBC rethought its position and fired Arnett in the middle of the night March 31. National Geographic fired him, too.

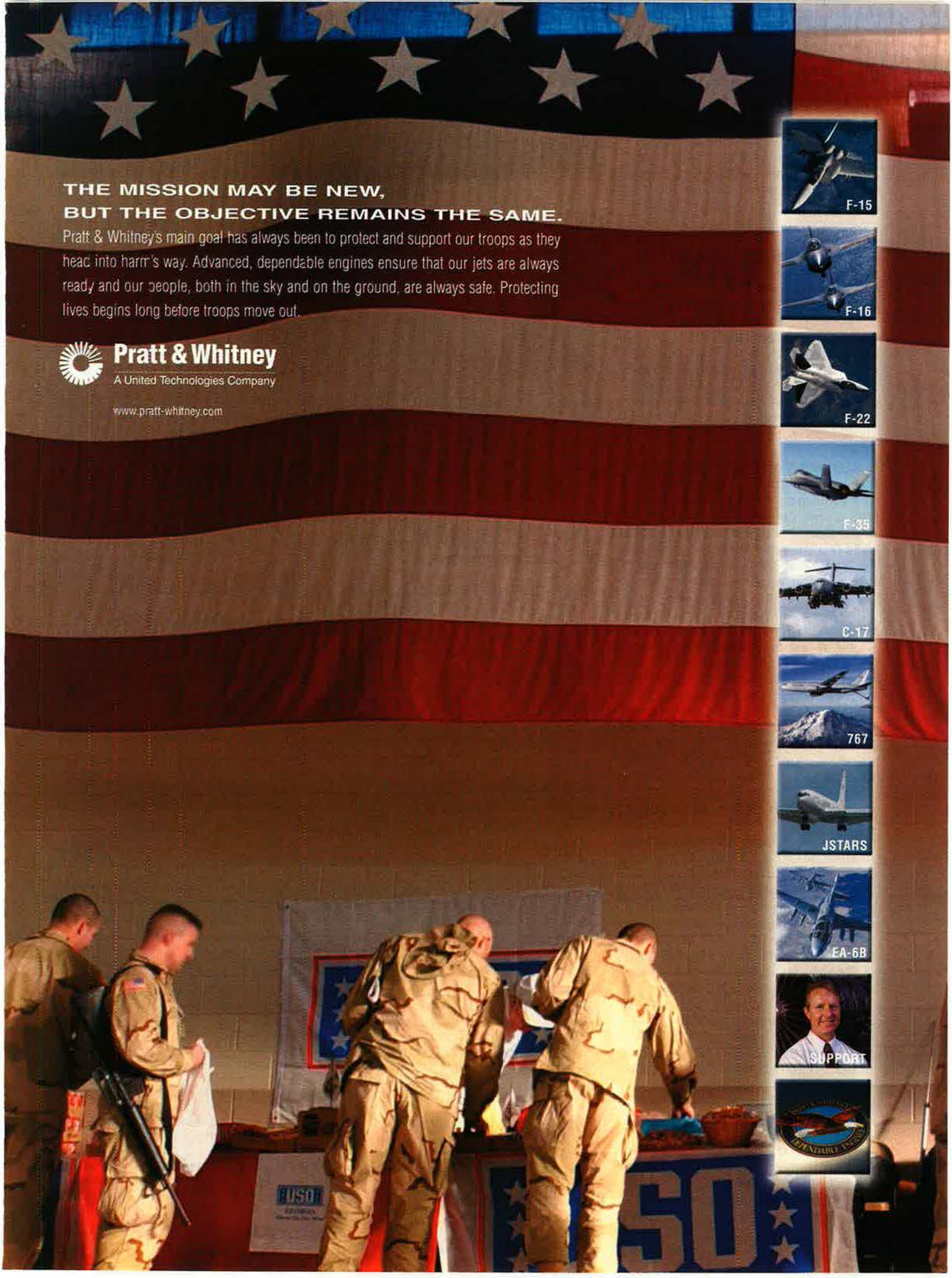
"When you give an interview to a guy in an Army uniform who works for a dictator whose government we're at war with, it raises some real questions about your judgment," said NBC News President Neal Shapiro.

Arnett was apologetic, sort of, on NBC's "Today" show. "I want to apologize to the American people for clearly making a misjudgment," he said. "I created a firestorm in the United States, and for that, I am truly sorry."

He was hired almost immediately by the stridently antiwar *Daily Mirror*, which bills itself as "Britain's brightest tabloid newspaper." In his first day on the new job, Arnett wrote that "I report the truth of what is happening in Baghdad and will not apologize for it. I am still in shock and awe at being fired. ... The right wing media and politicians are looking for an opportunity to be critical of reporters who are here. I made the misjudgment which gave them the opportunity to do so."

How Arnett felt about having his stories in the *Daily Mirror*—along with such front-page screamers as "Is Liz Queen of the Whingers?" (about actress Elizabeth Hurley; "whinging" is Britishese for whining)—was not said.

—John T. Correll


THE MISSION MAY BE NEW,
BUT THE OBJECTIVE REMAINS THE SAME.
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vehicle—designated MQ-1—fired one of its two Hellfire missiles and destroyed a radar-guided anti-aircraft artillery weapon on March 22 in southern Iraq.

The Air Force, which just began testing the use of missiles on the Predator in 2001, has begun converting its reconnaissance-only RQ-1s to armed MQ-1s. (See "USAF Gallery of Weapons," beginning on p. 160.)

Helicopters Had Some Problems

Coalition helicopters had a tough go, suffering a series of mishaps that caused numerous fatalities.

On March 21, eight British troops and four US Marines were killed in a USMC CH-46 Sea Knight helicopter crash. The next day, two Royal Navy Sea King helicopters collided, killing six British troops and one US Navy officer.

Soon after, Army AH-64 Apache attack helicopters engaged in a bitter battle with ground forces south of Baghdad, a fight that resulted in the shoot-down of one helicopter and the capture of its two crew members. According to the *New York Times,* all 32 Apaches in that mission were damaged, with at least 17 rendered unable to fly.

On March 30, a USMC UH-1N Huey helicopter went down in southern Iraq; DOD later reported two Marines dead. Then on April 2, an Army UH-60 Black Hawk helicopter crashed in central Iraq. CENTCOM said six soldiers died. On April 4, another Marine helicopter, an AH-1W Super Cobra went down; DOD reported the pilot was killed. No further details were available on any of these incidents.

Coalition Lost Seven Fixed-Wing Aircraft

Fixed-wing aircraft have not been immune to danger either, as the coalition lost a total of seven by April 8.

Two coalition fighter aircraft—Navy and British—were apparently shot down by Patriot missile batteries. The RAF GR4 Tornado was shot down March 22 and the Navy F/A-18C April 2. The Navy incident is still under investigation, per CENTCOM.

On April 1, the Navy lost an F-14 that crashed due to mechanical failure, and an S-3 Viking and USMC AV-8B Harrier had carrier landing accidents. In each of those three incidents, the pilots were safely recovered.

The Air Force lost two aircraft in Iraq. A USAF F-15E crashed April 7 and an A-10 on April 8.

USAF reported April 18 that the body of one of the two F-15E crew members had been found and reported April 23 that the second was also killed in action. The A-10 pilot was rescued unharmed.

USAF photo

Through Fire and Flak. *Capt. Kim Campbell, an A-10 pilot, inspects the battle damage to her Warthog. The A-10 took ground fire on a CAS mission, but the pilot brought the aircraft home.*

The B-2 "First" for Captain Wilson

Air Force Capt. Jennifer Wilson became the first woman pilot to fly the B-2 stealth bomber on a combat mission.

It happened April 1 when Wilson flew the B-2 on a sortie over Iraq.

Wilson, deployed to a forward location with the 393rd Expeditionary Bomb Squadron, is an experienced combat pilot, having flown B-1B combat missions during Operation Allied Force over Kosovo in 1999. She was later accepted for B-2 training and qualified in that aircraft in 2002.

Airmen Joined the Big Drop

When C-17 transports dropped 1,000 paratroopers into northern Iraq on March 26, the jumpers included 20 members of the Air Force's 86th Contingency Response Group, Ramstein AB, Germany.

The 86th CRG has security, intelli-

War Plan Critics Blasted

Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, took a verbal swipe at some Pentagon critics on April 1. He struck out at those military officers—currently serving and retired—who had been critical of the Central Command war plan.

Less than two weeks into Operation Iraqi Freedom, critics had raised a chorus of objections to the battle plan, calling the operation a failure. They declared that the air campaign did not produce "shock and awe" and said the ground campaign was ineffective because it lacked sufficient size and heavy armor to protect long supply lines and punch through Iraqi forces.

Some critics claimed that Defense Secretary Donald H. Rumsfeld forced Gen. Tommy R. Franks, commander of Central Command, to make do with less equipment than was needed to properly run the war. Additional heavy equipment was still flowing toward the Persian Gulf when hostilities began and would not be in place for more than a month.

Myers said the campaign began when it made sense.

"How do you protect tactical surprise when you have 250,000 troops surrounding Iraq?" the chairman asked. Surprise, he said, was achieved by "starting the ground war first, [the] air war second."

The war plan accomplished a string of complicated objectives, Myers observed.

Iraq's southern oil fields were secured. No Scud missiles were fired against Israel or Jordan. Humanitarian relief supplies flowed into the Iraqi port of Umm Qasr.

Achieving these objectives was possible because US forces "went in very early, even before the ground war, to secure those places," Myers said.

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gence, communications, medical, engineering, and fuels specialists to secure and prepare an enemy airfield. According to officials, these specialists made it possible for C-17s to land in northern Iraq and deliver more than one million pounds of materiel daily.

Designed to deploy on a moment's notice, the 86th CRG is one of three such Air Force units used for contingency operations.

Terrorist Camp Demolished in War

Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, reported on April 1 that coalition aircraft had attacked a terrorist camp in northeastern Iraq.

The camp's inhabitants were believed to be as many as 500 members of al Qaeda and Ansar al-Islam terrorist groups. The camp took hits from aircraft dropping precision weapons and several dozen Tomahawk cruise missiles, Myers said.

"Initial estimates indicate that a significant number of terrorists were killed," said the Chairman. "Many of the deceased appear not to be Iraqis."

He suggested the non–Iraqis were international terrorists.

US intelligence reports indicated that terrorists at the camp were "developing poisons for use against civilians in Europe and the United States," Myers said.

Huge War Fund Approved

Congress on April 3 approved nearly $80 billion in supplemental funding to finance military operations in Iraq and the ongoing war on terrorism.

The Bush Administration sent the request to lawmakers in late March. It sought $62.6 billion for Defense Department activities. The request covered rough estimates for four main areas:

- Coercive diplomacy. The US said it needed $30.3 billion to cover the cost of transporting military equipment and personnel to the Persian Gulf and bringing the troops home after concluding the campaign.
- Shooting war. A total of $13.1 billion was allowed for execution of the major conflict phase. This estimate accurately assumed a "short duration, high intensity conflict."
- Transition to peace. DOD sought $12 billion for what it called the "transitional and stability phase" of the operation. Included were DOD–led stabilizing and humanitarian operations when the fighting stopped.
- Reconstitution. After the war, the Pentagon will spend $7.2 billion to pay for unbudgeted depot maintenance, the restocking of ammunition, and parts expenses and resupply.

Battling the Friendly Fire Problem

By any measure, the frequency of American fratricide—when a unit mistakenly attacks a friendly military unit—has been lower in Gulf War II than in previous wars. Several incidents, however, served as reminders that blue-on-blue friendly fire is still a vexing problem.

The coalition has flown huge numbers of sorties, dropped thousands of precision guided and unguided bombs, fired hundreds of missiles, and unleashed massive barrages of tank, helicopter, and artillery fire, the overwhelming majority without incident. However, over the first two weeks of the war, the Army's Patriot missile defense systems engaged coalition aircraft on several occasions and caused some fatalities.

On March 22, a Patriot interceptor destroyed a Royal Air Force Tornado, killing its two crew members. The Patriot system had mistaken the aircraft for an incoming missile. Senior defense officials said shortly after the incident that electronic systems used to identify friendly aircraft had failed somehow.

On March 25, another Patriot system locked onto a USAF F-16, which detected the radar lock and promptly destroyed the system's radar dish with a High-speed Anti-Radiation Missile. No casualties resulted from this incident.

Finally, the Patriot system was blamed for downing a Navy F/A-18C fighter on April 2. The Hornet was over central Iraq when it was shot down. More than a week later, the pilot had not been recovered.

Another case of potential friendly fire occurred on April 3, when an Air Force F-15E fighter may have mistakenly bombed a convoy of US Special Operations Forces and Kurdish allies. Three Americans, one Kurdish soldier, and possibly one civilian reportedly were killed in the incident. At least five US personnel and several Kurds may have been wounded. Another incident of coalition aircraft bombing coalition forces may have occurred on April 6.

Coalition forces also experienced at least one incident in which a coalition tank fired on another coalition tank.

In the 1991 Gulf War, 35 of the 148 US battle deaths (24 percent) were the result of fratricide. The April 7 *Washington Post* reported that, in Gulf War II, 13 of 71 US fatalities (18 percent) stemmed from friendly fire.

All of these incidents in Gulf War II are under investigation.

Maintainers Set High Readiness

Air Force maintenance officials reported high mission capable rates for aircraft flying in Operation Iraqi Freedom.

Officials with the 321st Air Expeditionary Wing in the Persian Gulf said that MC rates for 46-year-old KC-135 tankers exceeded 90 percent.

Similarly, C-130 transports sup-

Tankers and Lifters Ridden Hard

In the first 16 days of Operation Iraqi Freedom, USAF airlifters and tankers carried out more than 8,000 sorties—more than half of all the Air Force's total wartime sorties.

The total included more than 3,000 refueling sorties (two-thirds of all coalition tanker missions) and 5,000 airlift sorties (all of the coalition lift missions).

A senior Pentagon official said USAF crews through April 3 had flown about 3,500 intertheater lift missions, most of them with the C-17 aircraft. C-130 crews had performed another 1,400 lift missions within the Iraqi theater.

The crews of KC-135 and KC-10 tankers, meanwhile, had delivered 32.1 million gallons of fuel to various aircraft from different US services and different nations. They had been flying virtually around the clock.

In the first 21 days of the war, more than 200 USAF active duty, Guard, and Reserve tankers operating from 15 locations had flown more than 4,700 sorties.

The high demand for mobility forces—aerial refuelers and airlifters alike—had some calling for a re-evaluation of currently declared USAF airlift requirements.

Mobility Requirements Study 2005, completed in 2001, increased the Air Force's lift requirement from 49.7 million ton-miles per day to 54.5 MTM/D. The service's actual capability has been short of this requirement from the beginning, and the requirement itself may no longer be valid.

At a March hearing, USAF Chief of Staff Gen. John P. Jumper told a House panel that "it will be worth our while" to re-evaluate the lift requirement. He said, "That number was established with a completely different set of assumptions."

Gen. John W. Handy, the commander of Transportation Command and Air Mobility Command, told *National Defense Magazine* that the war on terrorism has made the MRS-05 findings obsolete. Further, he said, existing lift assets would not be able to accommodate the demands of two major crises simultaneously.

ported by the wing's maintenance unit flew more than 500 sorties over 18 days with a 100 percent MC rate.

Officials point out that these rates have been achieved at a time of sandstorms, high humidity, and 90 degree temperature.

Maintainers supporting E-3 Airborne Warning and Control System aircraft have also succeeded despite adverse conditions, according to officers of the 405th Expeditionary Maintenance Squadron, a 45-person team deployed from Tinker AFB, Okla. Their AWACS aircraft have achieved a 99 percent MC rate.

Persian Gulf weather poses its unique problems for AWACS maintainers. Work on the E-3's rotating radar dome atop the aircraft normally takes 12 hours, but high winds can keep them from going up on the radome at all.

High temperatures can also slow things down. "If I have to hook up an air-conditioning unit to the dome, it adds two hours to the maintenance schedule, just to cool it off," said TSgt. George Lull.

The Bomb Builders Delivered

The group of "bomb builders" that deployed from the 5th Munitions Squadron at Minot AFB, N.D., to the Gulf didn't see many of their products return to base.

The units, which add fuses, take inventory of the weapons, and generally get the bombs ready for use, normally work with inert training munitions.

In an operational setting, however, "we build, they bomb," noted MSgt. Stephen Sims. "Watching an aircraft come back empty is the ultimate in job satisfaction," he added.

The Minot munitions experts represent about one-third of the deployed munitions flight, which includes additional personnel from four other bases, as well as mobilized reservists.

Heavy Load for Reserve Forces

More than 223,203 National Guard and Reserve members DOD–wide were mobilized to support current operations, as of April 16. The number had gone up by more than 2,000 in just the week earlier.

For the Air Force, more than 18,000 Air National Guard and 14,000 Air Force Reserve Command forces have been mobilized to help conduct operations at home and in Southwest Asia.

They fly fighters, bombers, tankers, airlifters, and rescue aircraft. They provide maintenance and munitions crews, medical personnel, and air traffic control and communications specialists—whatever is needed.

DOD photo

Rubbed Out. ***This before-and-after sequence shows how airpower turned an Iraqi camp (left) into unusable real estate (right). Green means light damage, yellow means severe damage, red means destroyed.***

Officials say the only way to distinguish reservists from active duty airmen is by their uniform patches.

Loggies Cut Wait Time in Half

Logisticians with the 320th Expeditionary Aerial Port Squadron initiated new customs and delivery procedures that have cut by 50 percent the time needed to receive parts.

According to USAF officials, the streamlined customs procedures per-

Antiwar Movement's "Million Mogadishus" Man

Columbia University professor Nicholas De Genova gained instant fame and infamy March 26 when he declared, "The only true heroes are those who find ways to defeat the US military" in the war in Iraq.

As the professor told it, he would be happy to see US military forces suffer "a million Mogadishus," a reference to the horrific October 1993 battle in which 18 US Army Rangers lost their lives to street thugs in the capital of Somalia.

The professor's comments, emitted at an antiwar "teach-in" on Columbia's New York campus, were immediately condemned, even by organizers of the protest.

"He and the press have hijacked this teach-in, and I'm very, very angry about it," said political science professor Jean Cohen, an organizer. The Columbia *Daily Spectator* reported that Cohen called De Genova's comments "not innocent ... This was a planned undermining of this teach-in." Another protest organizer, history professor Eric Foner, said, "If I had known what he was going to say, I would have been reluctant to have him speak."

De Genova, an assistant professor of anthropology and Latina/o studies, responded to the criticism in a March 27 letter to the *Spectator*. He accused the paper of quoting him "in a remarkably decontextualized and inflammatory manner."

Then, he promptly reaffirmed the opinions.

"Imperialism and white supremacy" have been hallmarks of US nationalism, De Genova wrote.

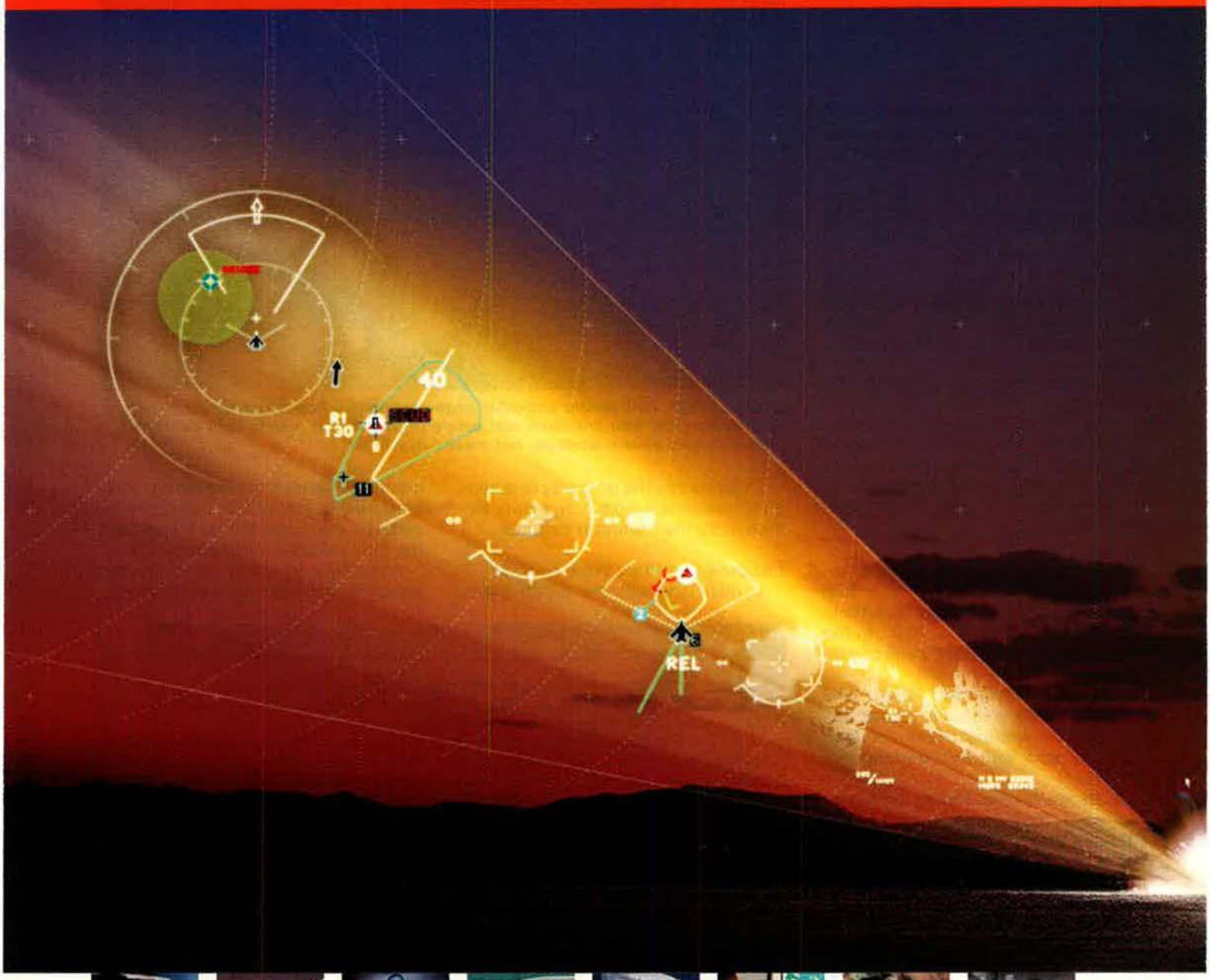
Further, said he, "The disproportionate majority of US troops come from racially subordinated and working-class backgrounds and are in the military largely as a consequence of a treacherous lack of prospects for a decent life."

His implication was that today's soldiers entered the military service because they couldn't do anything better with their lives. However, a recent study conducted by his own institution—Columbia University—said just the opposite. The study measured recruit status in four ways—family socioeconomic status, verbal and quantitative skills, educational achievement, and work orientation. It stated flatly that today's recruits "do not come from the more-marginal groups on any of four dimensions."

Undeterred by such inconvenient facts, De Genova plunged ahead, claiming that the US troops have a choice: They can serve their nation, or they can "refuse to fight and contribute toward the defeat of the US war machine."

According to De Genova, a million Mogadishus—and the accompanying deaths of the same racially subordinated and working class people he purports to support—would serve a greater good. The professor wrote that "Vietnam was a stunning defeat for US imperialism; as such, it was also a victory for the cause of human self-determination."

Precision Engagement







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mit direct delivery of the cargo to units in need, with great savings in time. Some parts were taking up to 12 days to wend their way through several bases before reaching a final destination.

"With direct delivery, we can cut that time in half," an official noted.

Air Force Materiel Command also worked to cut parts delivery times Stateside. One AFMC logistics unit was recently told to find and ship GPS antennas needed by F-16s flying OIF missions. What had once been a two-week task took less than 24 hours, officials said.

Gulf War II Had a Civilian "First"

Air Force Materiel Command officials cited a "first" in deploying a civilian to serve as an aircraft battle damage repair engineer. The command sent "Steve," one of six such engineers who signed up to deploy as a condition of employment, to Southwest Asia for Iraqi Freedom.

Steve's job is to design repairs on the spot if USAF maintainers cannot fix a damaged aircraft using standard technical orders. The task is to get the aircraft fixed fast and back into the air.

A key part of Steve's job, said Maj. William Stahl, an AFMC combat logistics support officer, is to determine whether the repaired aircraft "is safe to fly and issue any necessary flight restrictions."

Normally, AFMC looks to active duty service members first, then reservists, before turning to civilians for deployment. ABDR engineers are in short supply.

Air Traffic Control in a Crunch

USAF air traffic controllers came under heavy pressure to perform in the first days of OIF, when coalition air forces began immediately to fly more than 2,000 daily sorties in and over Iraq.

TSgt. Mark Morrison of the 46th Operations Support Squadron, Eglin AFB, Fla., deployed to the Gulf to help control the movement of Air Force A-10 and F-16 fighters, Marine Corps fighters, and British fighters.

"After a big mission, I'd say we land 15 to 20 aircraft a minute," Morrison said. "That's outrageous."

Though a normal 12-hour combat shift entailed the control, on average, of 275 aircraft, surge operations meant more than 500 aircraft needed direction.

In the forward deployed wing, nine air traffic controllers worked around the clock. ■

The Rescue of POW Lynch

A joint service special operations team on April 1 rescued Army Pfc. Jessica D. Lynch from the Iraqi hospital where she was being held prisoner.

According to Central Command, Army Rangers, Navy SEALs, Air Force combat controllers, and Marines participated in the rescue operation. "It was a classic joint operation done by some of our nation's finest warriors," said Brig. Gen. Vincent Brooks, CENTCOM deputy chief of operations, at a press briefing in Qatar.

Lynch, with the Army's 507th Ordnance Maintenance Company out of Ft. Bliss, Tex., was captured March 23 when her convoy took a wrong turn near Nasiriyah, Iraq. The convoy was ambushed by Iraqi paramilitary forces.

Several Americans were killed in the attack, and others were taken prisoner and subsequently shown on Iraqi television. Lynch was not among those POWs interrogated on Iraqi TV and was initially listed as missing by the Pentagon.

According to a DOD release, an Iraqi lawyer came across Lynch while visiting his wife in the hospital and observed an Iraqi colonel slapping the severely injured 19-year-old—first with his palm then backhandedly.

The lawyer, identified only as "Mohammad," decided to seek out US forces and walked six miles to a Marine position to inform them of the captured soldier.

Mohammad returned to the hospital to perform reconnaissance and eventually provided Marines with the information critical to Lynch's rescue, including the room in which she was being held.

Brooks said the US rescue force also found 11 bodies at the hospital. Two were in the morgue and nine others were buried in a nearby graveyard. Members of the rescue force could find no shovels, so dug with their hands to recover the bodies for return to the US. DOD identified eight of the bodies as US soldiers.

Buzz Words

The man who ran the Gulf War II air war was Air Force Lt. Gen. T. Michael Moseley, the Combined Forces Air Component Commander. The air boss, known to all as "Buzz," spoke to the press for about 90 minutes on April 5. Excerpts:

- **Iraqi forces:** "Our sensors show that the preponderance of the Republican Guard divisions that were outside of Baghdad are now dead. ... I find it interesting when folks say we're softening them up. We're not softening them up. We're killing them."
- **Iraqi aircraft:** "I believe that [Iraq's Air Force] has not flown because ... they've made a calculation that they will not survive. Now time will tell. We'll have to find an Air Force senior officer that's still alive out there one of these days and ask him that question."
- **Joint airpower:** "I'm not sure I care how we kill [an enemy] tank. ... I'd just say we've just killed a hell of a lot of them and we're going to keep moving them until they quit moving them."
- **Critics of the war plan:** "I'm amused by the way that they critique it, but at the end, it's a whole lot like listening to a cow pee on a flat rock. It just doesn't matter."
- **Shock and awe:** "The term 'shock and awe' has never been a term that I've used. I'm not sure where that came from."
- **Fast movers:** "In the south, we've had such a rapid movement of the surface forces that we've progressed straight from some strategic attack targets and interdiction targets to close air support."
- **Fate of Saddam:** "I don't know whether he's still alive, but I suspect his quality of life is not as good as it was two weeks ago."
- **The 21,000-pound "Mother of All Bombs":** "I haven't seen this MOAB. I saw it on the television."
- **Experience level:** "There are not too many captains and majors and lieutenant colonels out there in the Air Force and in the flying Navy who haven't been in combat or haven't been in this theater multiple times."
- **Efforts to jam GPS signals:** "We've killed every GPS jammer that's come up—with a GPS weapon. So that hasn't worked out very well for them."

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USAF photo by SSgt. Derrick C. Goode

An F-117 stealth fighter returns to base early on March 20 (Baghdad time), after dropping penetrating laser-guided bombs on a bunker in which Saddam Hussein and top aides were believed to be meeting. Shortly afterward, about 40 sea-launched Tomahawk missiles rained down on this "target of opportunity." The mission took place as Operation Iraqi Freedom was about to get under way; "battlefield prep" strikes against possible Scud missile launchers, air defenses, communications nodes, and artillery had begun 15 hours earlier, and Special Operations Forces were inside Iraq. Main ground forces moved the night of March 20.

USAF photo by TSgt. Richard Freeland

USAF photo by SSgt. Cherie A. Thurlby

Above, a B-52H pilot of the 40th Expeditionary Bomb Squadron on a nighttime strike. (The green glow in the cockpit comes from the night vision camera.)

At left, members of the 405th Air Expeditionary Wing load 2,000-pound Joint Direct Attack Munitions onto a long-range B-1B bomber.

USAF photos by MSgt. Terry L. Blevins

F-16CJ pilots "Lude" and "Lobo" return to flight ops after a defense-suppression mission. Armed with High-speed Anti-Radiation Missiles, the F-16s (below) either destroyed mobile radars or so intimidated their operators that they did not use their radars at all. Few, if any, of the missiles launched at coalition aircraft were guided.

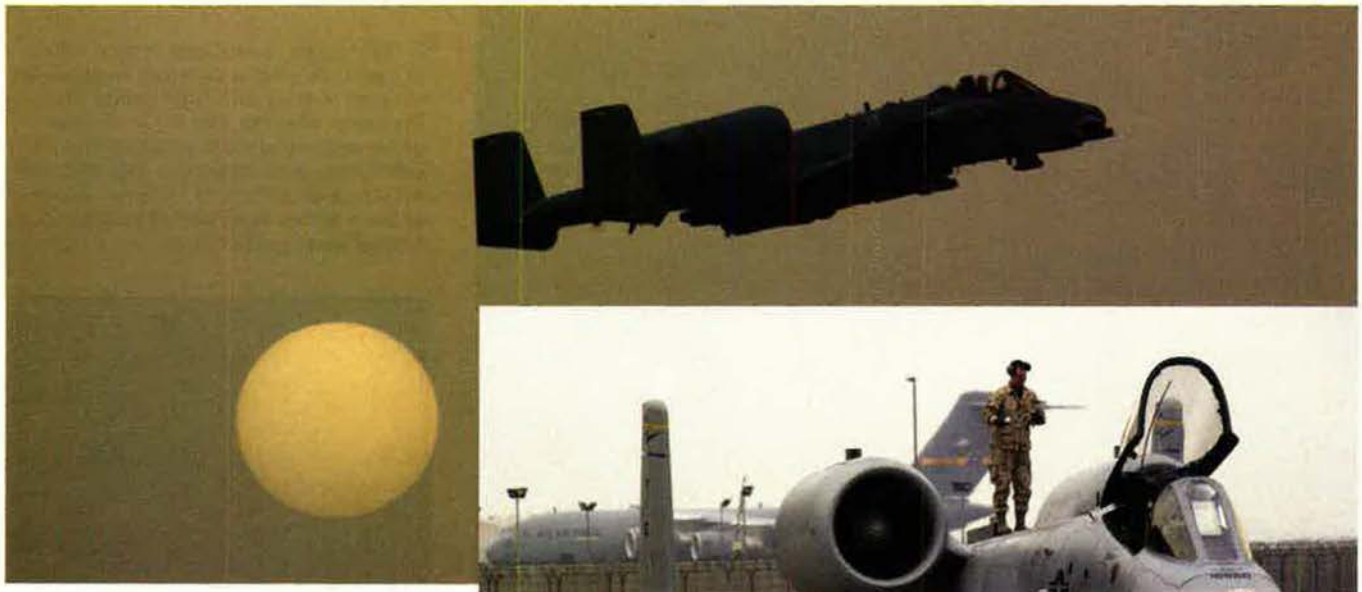
At right, an HH-60 helicopter from Air Force Reserve Command's 301st Rescue Squadron, Patrick AFB, Fla., lifts off on April 3 for a combat search and rescue mission in Iraq.

Below, two pararescuemen of the 301st escort a rescued A-10 pilot after the ride back to base. The pilot ejected safely over Baghdad after anti-aircraft fire hit his aircraft.

USAF photos by SSgt. Shane A. Cuomo

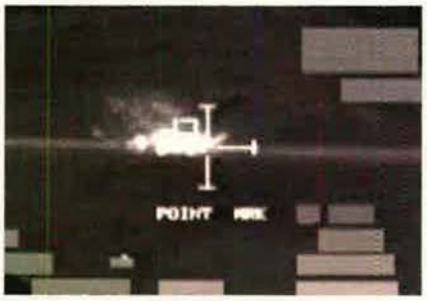
An HH-60G Pave Hawk returns to its forward base. Pave Hawk helicopters played an important role inserting and extracting special operations teams throughout Iraq.

USAF photo by SrA. JoAnn S. Makinano



USAF photo by A1C Isaac G.L. Freeman

An A-10 from the 332nd Air Expeditionary Wing heads out for a March 29 mission. In Iraq, A-10s got a chance to do what they are best at doing—using 30 mm cannons, Maverick missiles, and bombs to chew up enemy armored columns. At right, an A-10 gets an engine check.



Precision targeting, as seen from a cockpit: At left, an Iraqi truck is shredded by an A-10's 30 mm gun; at far left, a laser-guided bomb cursor is fixed on a revetted Iraqi tank. Precision was the hallmark of the operation. Airpower hit more targets in Gulf War II than in 1991—and in half the time.

USAF photos by SSgt. Shane A. Cuomo

This A-10 got a ripped-up right engine, courtesy of an Iraqi missile. However, it returned to base safely on April 8. A-10s and other aircraft largely destroyed Iraqi Republican Guard divisions arrayed outside Baghdad, giving US ground forces a big boost.

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USAF photo by TSgt. Stephen Faulisi

After Turkey declined to allow US ground forces or strike aircraft to stage from its soil, the job of opening a northern front fell to US Army paratroopers. USAF air controllers serving with the Army's 173rd Airborne Brigade board a C-17 in Europe to head for drop zones in northern Iraq.

Now it's been done in combat: Field deployment of the Army's 70-ton M1A1 Abrams tank via Air Force C-17 airlifter happens for real, as an 86th Expeditionary Contingency Response Group crew unloads a tank in northern Iraq on April 7.

USAF photos by TSgt. Rich Puckett

USAF photo by MSgt. Billy Johnston

Another loaded C-17 arrives at an airfield in Iraq. USAF crews pushed through a steady stream of troops, supplies, and equipment.

USAF photo by MSgt. Terry L. Blevins

Lt. Col. Joseph Justice and Maj. David Wright, operation center directors from the 379th Air Expeditionary Wing, coordinate the flying schedule at an air operations center in Southwest Asia. Exquisite coordination of hundreds of aircraft was the order of the day, every day.

USAF photos by SSgt. Matthew Hannen

Desert operations offer unique challenges. SSgt. Jason Nipp, a crew chief deployed from Ramstein AB, Germany, to the 363rd Expeditionary Equipment Maintenance Squadron, wears goggles and a scarf in a blistering sandstorm as he prepares a missile for an F-16CJ.

USAF photo by TSgt. Justin D. Pyle

A wounded soldier is carried off a C-141 by members of the 932nd Aeromedical Evacuation Squadron from Scott AFB, Ill., and the 86th Aeromedical Staging Facility at Ramstein AB.

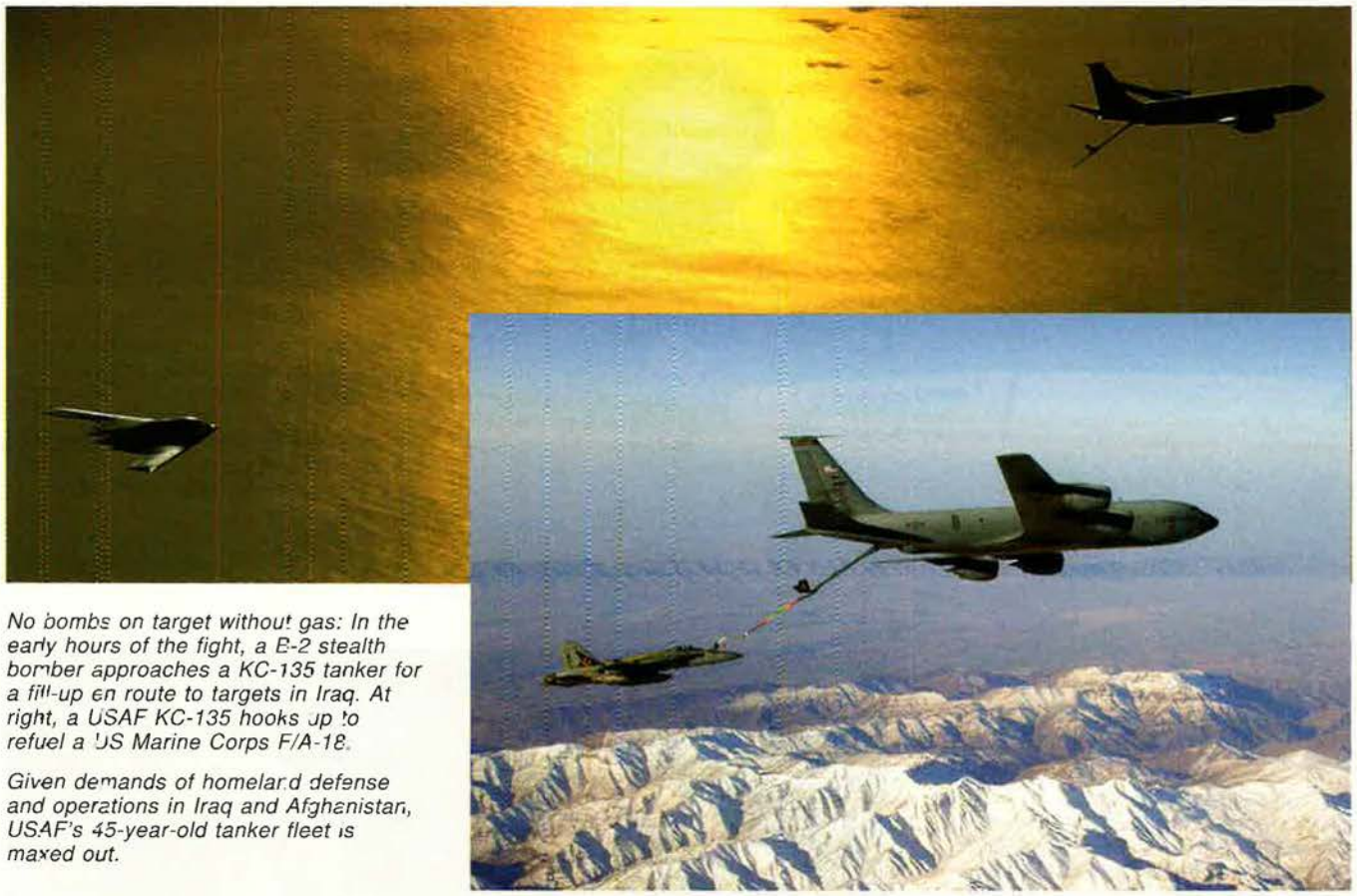
Pentagon officials reported that, as of April 17, 109 US personnel had been killed in hostile action and more than 500 wounded. Several service members, including two USAF pilots, were still listed as missing in action. (DOD reported on April 18 that one of the USAF pilots had been killed in action and on April 23, reported the second had been killed in action.)

USAF photo by Capt. John Sheets

An MQ-1 Predator is readied for action. Unmanned aerial vehicles offered round-the-clock surveillance of enemy troop concentrations and proved invaluable in watching the streets of Baghdad for signs of reinforcements and troop movements. This Predator, operated by members of the 15th Expeditionary Reconnaissance Squadron, is armed with a Hellfire missile, which can be fired using the MQ-1's laser-designator turret. USAF is reconfiguring most of its current Predator fleet so they can shoot what they observe, if need be.

USAF photo by SSgt. Tony R. Tolley

US Navy photo



No bombs on target without gas: In the early hours of the fight, a B-2 stealth bomber approaches a KC-135 tanker for a fill-up en route to targets in Iraq. At right, a USAF KC-135 hooks up to refuel a US Marine Corps F/A-18.

Given demands of homeland defense and operations in Iraq and Afghanistan, USAF's 45-year-old tanker fleet is maxed out.

USAF photo by SSgt. Tony R. Tolley

At right, a ground crew from the 28th Expeditionary Refueling Squadron cleans up after performing maintenance on the hardworking tanker fleet.

USAF photo by TSgt. Janice Cannon

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USAF photos by SSgt. Quinton T. Burris

MSgt. Donald Dougherty and SMSgt. T.J. Jones, members of the 621st Tanker Airlift Control Element, work at an airfield in Southwest Asia on April 1 as a C-130 taxis. Faced with one of the worst sandstorms in Iraq in recent memory, ground forces slowed to a crawl, but aircraft above the clouds continued to rain satellite-guided bombs on Iraqi targets.

Above, soldiers board a C-130. At left, Capt. Jeff Banks, a pilot, pumps a hydraulic jack while SSgt. Joe Sharp, crew chief, works on a C-130's flat tire. Both are from the 41st Airlift Squadron, Pope AFB, N.C.

AP photo by Bruce Adams

USMC photo by Sgt. Paul L. Anstine III

The US dropped millions of leaflets, instructing Iraqi troops on ways to avoid being killed. Those that disregarded the warnings met a grim fate. At left, a tank hit by an A-10; above, another tank on fire.

US Army photos by Sgt. Igor Paustovski

US and UK air forces for 12 years had pounded Iraqi anti-aircraft systems. Any that remained were quickly taken out during the early stages of Iraqi Freedom. Hulks here were photographed on April 2.

Retreating Iraqis left behind caches of weapons, ammunition, "suicide vests," chem/bio warfare suits, and gas masks. This missile, found in an abandoned trailer about 70 miles south of Baghdad, appears to be an Ababil-100.

Patriot missile batteries managed to intercept several Iraqi short-range missiles hurtling toward Kuwait. On March 31, coalition ground forces found two of the longer range al Samoud II missiles, prohibited under UN resolutions, in central Iraq, and an F-15E crew reported destroying at least one Scud missile near the Kuwaiti border in the opening hours of the conflict.

USMC photo by Gunnery Sgt. Mathew M. Smith

AP photo by Jerome Delay

The media billed it as the "shock and awe" campaign, but air strikes on Baghdad in the initial days were mostly calculated to penetrate hardened underground targets and destroy above-ground elements of the Iraqi regime. The effect was awesome enough, as the city shook and, one by one, the seats of repression disappeared, leaving relatively little damage to non-regime structures.

USAF photo by SSgt. Jeremy T. Lock

Information operations played a key role in the success of OIF. The leaflets dropped in Iraq drove home the message that Saddam and his cronies, not the Iraqi people, were the target. The leaflets promised humane treatment to Iraqi troops that surrendered. Thousands of underfed regular troops did pack it in, carrying the leaflets like coupons for food.

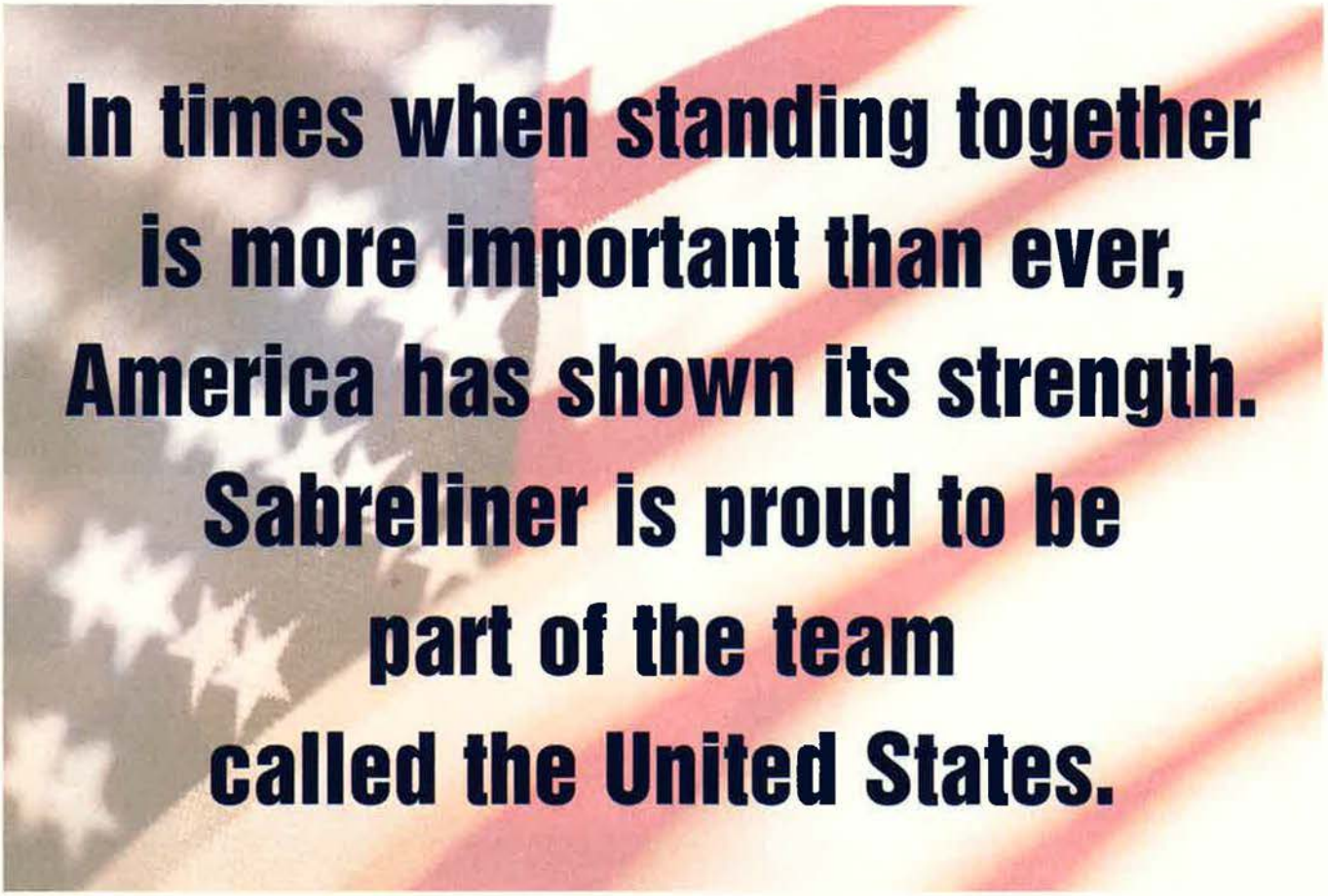
At left, an MC-130E Combat Talon loadmaster ties down boxes containing leaflets to be dropped over Iraq.

The massive job of coordinating the actions of thousands of strike, support, and cargo aircraft fell to the E-3 AWACS command and control aircraft. At right, an E-3 takes off during a sandstorm. AWACS mission crews deconflicted the airplanes aloft and passed short-notice strike instructions to fighters and bombers.

RC-135 Rivet Joint electronic surveillance aircraft, such as the one below, listened to Iraqi Army radio chatter. Air National Guard EC-130E Commando Solo airplanes broadcast messages to the Iraqi people on radio and TV. E-8 Joint STARS aircraft also played a key role.

USAF photo by SSgt. Matthew Hannen

USAF photo by TSgt. Robert J. Horstman



USAF photos by MSgt. Terry L. Blevins

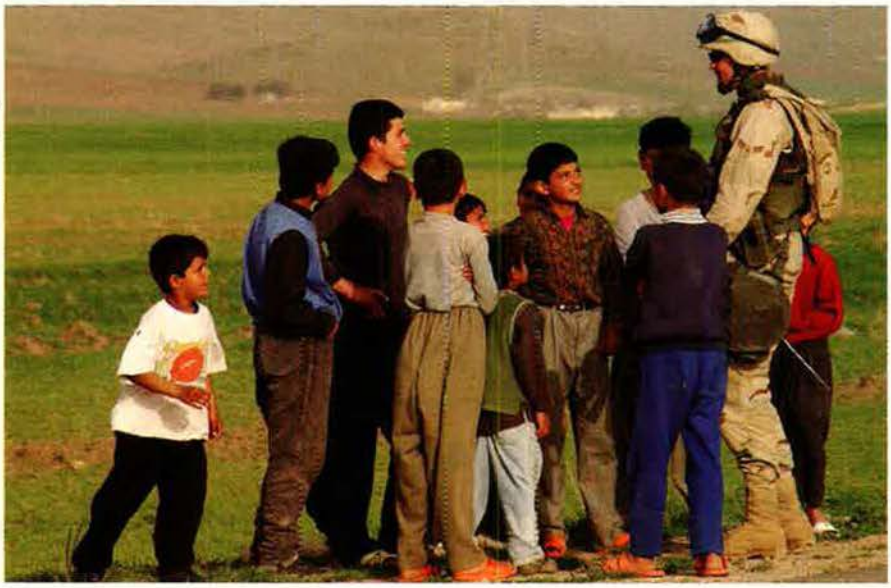
An F-15E gets the "go" signal from A1C William Gilmer of the 379th Expeditionary Aircraft Maintenance Squadron.

Below, F-15E pilots "Ginger" and "Salvo" walk to their fighter for a sortie on March 23.

A1C Nicholas Hoffman, an F-15E crew chief, prepares to launch a fighter for a Gulf War II sortie over Iraq.

Coalition air forces—US Air Force, US Navy, US Marine Corps, Royal Air Force, and Royal Australian Air Force—flew more than 42,000 sorties. Of that total, USAF accounted for some 58 percent. USAF also flew about 40 percent of all strike sorties and delivered 65 percent of munitions tonnage.

USAF photo by TSgt. Rich Puckett

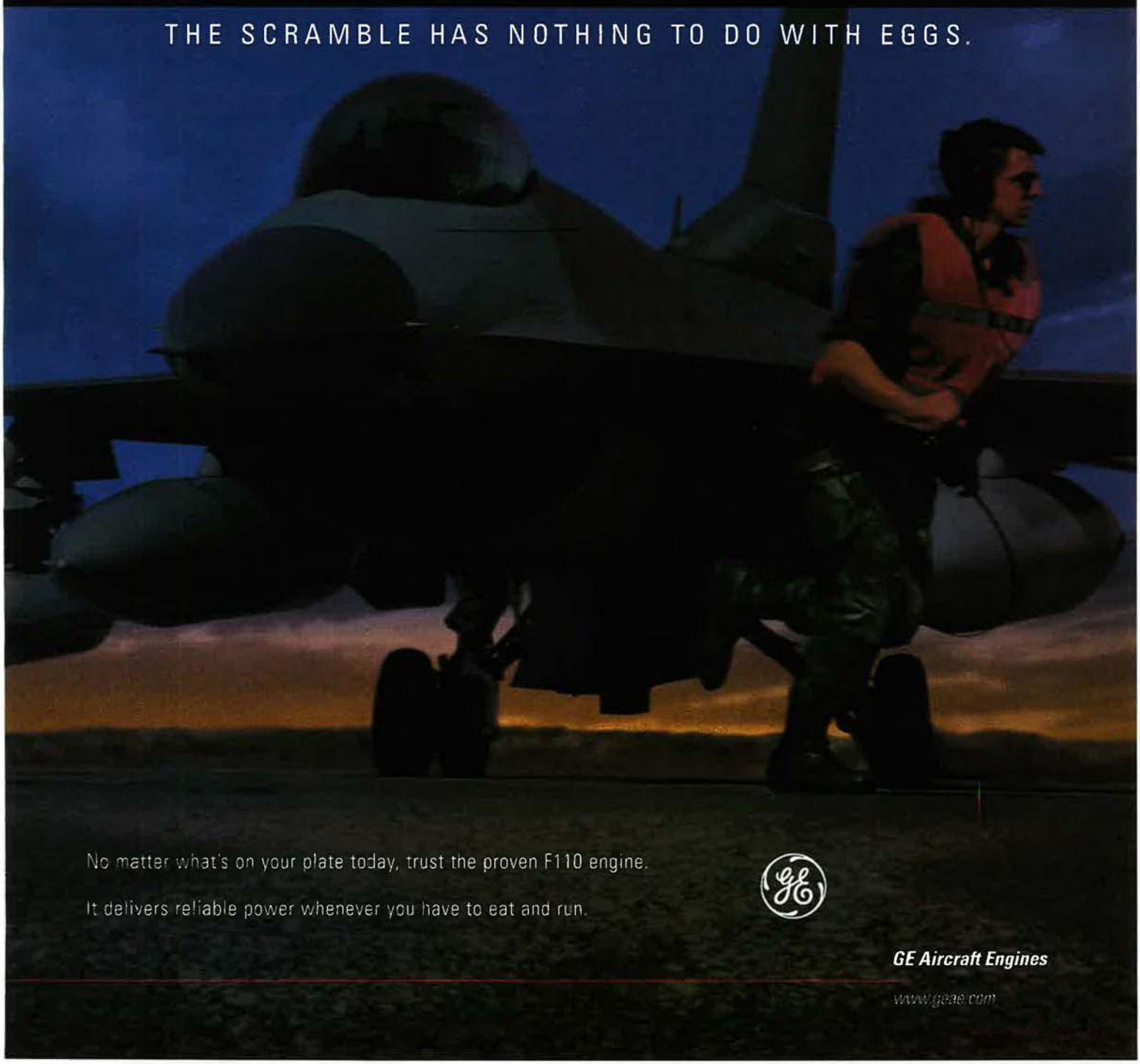


A1C Edward Crofoot, a security forces member deployed with the 86th Expeditionary Contingency Response Group, takes a moment to chat with local children while on a patrol April 9.

It was expected that many of the Iraqi people would welcome US troops, once they were certain Saddam Hussein would not return. Many did. The war, for all purposes, ended on April 9 with the fall of Baghdad. ■

SOME MORNINGS

THE SCRAMBLE HAS NOTHING TO DO WITH EGGS.



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Verbatim Special: Gulf War II

By John T. Correll, Contributing Editor

"The United Nations Security Council has not lived up to its responsibilities, so we will rise to ours. ... All the decades of deceit and cruelty have now reached an end. Saddam Hussein and his sons must leave Iraq within 48 hours. Their refusal to do so will result in military conflict, commenced at a time of our choosing."—***President Bush, address to the nation, March 17.***

"If the action is to take place without the support of the [Security] Council, its legitimacy will be questioned and the support for it will be diminished."—***UN Secretary–General Kofi Annan,*** **New York Times,** ***March 18.***

"I'm saddened, saddened that this President failed so miserably at diplomacy that we're now forced to war. Saddened that we have to give up one life because this President couldn't create the kind of diplomatic effort that was so critical for our country."—***Senate Minority Leader Thomas A. Daschle (D–S.D.), in a speech to the American Federation of State, County, and Municipal Employees,*** **Chicago Tribune,** ***March 18.***

"In placing the blame for the war, and for American deaths, not on Saddam Hussein but directly on an American President, Mr. Daschle sounded like Jacques Chirac without the savoir faire. This is remarkable stuff, especially from a Senator who only last October voted for the Iraq war resolution and who only five years ago voted with a unanimous Senate to make removing Saddam official US policy."—**Wall Street Journal** ***editorial, March 19.***

"Iraq does not today present an immediate threat warranting an immediate war."—***Declaration by French President Jacques Chirac, Embassy of France in the United States, March 18.***

"This is not about Saddam Hussein, and this is not even about regime change in Iraq or even the million people killed by Saddam Hussein or missiles or chemical weapons. It is about what has become two conflicting views of the world. It's about whether the United States is allowed to run world affairs and battle terrorism and weapons proliferation essentially with a small group of trusted allies."—***Pierre Lellouche, French legislator and close Chirac ally,*** **Washington Post,** ***March 6.***

"If the war starts and if Saddam Hussein uses chemical or biological weapons, it would completely change the situation for the French President and for the French government, and President Chirac will have to decide what we will do to help the American troops to confront this new situation."—***Jean–David Levitte, French ambassador to the US, CNN, March 18.***

"The current wave of anti–French and anti–German comments in the United States is not only unworthy of a country that in large measure owes its existence to France and that fashioned a deep and abiding postwar friendship with Germany. If such an attitude is also reflected in policy, as some American and British commentators have suggested, it would constitute a fundamental strategic mistake."—***Gen. Gordon R. Sullivan, USA (Ret.), president of the Association of the US Army,*** **International Herald Tribune,** ***March 18.***

"Mexico reiterates its support for the multilateral route to solve conflicts and regrets the path to war. ... Our relationship with the United States—our closest partner, neighbor, and friend—should not change."—***Mexican President Vicente Fox, Associated Press, March 18.***

"On my orders, coalition forces have begun striking selected targets of military importance to undermine Saddam Hussein's ability to wage war. ... Now that conflict has come, the only way to limit its duration is to apply decisive force. And I assure you, this will not be a campaign of half measures and we will accept no outcome but victory."—***President Bush, address to the nation, March 19.***

"Tonight is one of those nights, I think, in which we're all standing shoulder to shoulder. President Bush is a Republican. I'm a Democrat ... but tonight there's not an inch of distance between us."—***Sen. Joseph I. Lieberman (D–Conn.),*** **Washington Post,** ***March 21.***

"My judgment, as Prime Minister, is that this threat is real, growing, and of an entirely different nature to any conventional threat to our security that Britain has faced before. ... So our choice is clear: Back down and leave Saddam hugely strengthened; or proceed to disarm him by force. Retreat might give us a moment of respite, but years of repentance at our weakness would, I believe, follow."—***Prime Minister Tony Blair of the United Kingdom, address to his nation, March 20.***

"Today, I weep for my country. ... No more is the image of America one of strong, yet benevolent, peacekeeper. ... Around the globe, our friends mistrust us, our word is disputed, our intentions are questioned. ... We flaunt our superpower status with arrogance. ... We cannot convince the world of the necessity of this war for one simple reason. This is a war of choice."—***Sen. Robert C. Byrd (D–W.Va.), speech on the Senate floor, March 19.***

"Yet, even if this operation does not go smoothly or fast, it must go forward. Saddam Hussein has threatened his neighbors, and the United States, with war and weapons of mass destruction for two decades; he has violated the cease-fire that ended the Persian Gulf War and defied multiple disarmament orders from the United Nations Security Council. The war that has now begun stands to end the single greatest threat to peace in the Middle East; it will help establish that rogue states will not be allowed to stockpile chemical, biological, or nuclear weapons in defiance of the international community. It will also free the long-suffering Iraqi people, who have en-

dured one of the cruelest and most murderous dictatorships of the past half-century."—**Washington Post *editorial, March 20.***

"I think we should do the Oscars and have the war wait. Saddam already said he won't go away. I think the best thing is Bush should wait until Monday."—***Wolfgang Puck, "caterer to the stars," on possible disruption of a lavish dinner he was to prepare for 1,600 glitterati after the Oscar ceremony,*** **Washington Post,** ***March 20.***

"You know, I'm not into the tick-tock of every hour and every minute. We have a serious task before us, and it is to remove that regime and find the weapons of mass destruction and replace it with a government that does not want those weapons and will not threaten its neighbor and will maintain a single country. This is a process that takes some time, and it will ebb and flow. And when it's over, the regime will be gone."—***Secretary of Defense Donald H. Rumsfeld, response to question about progress of the campaign after one day, Pentagon briefing, March 20.***

"Now, therefore, be it resolved that the Senate: Commends and supports the efforts and leadership of the President, as Commander in Chief, in the conflict against Iraq. ... Expresses sincere gratitude to British Prime Minister Tony Blair and his government for their courageous and steadfast support, as well as gratitude to other allied nations for their military support, logistical support, and other assistance in the campaign against Saddam Hussein's regime."—***Senate Resolution, March 20.***

"We promise you that Iraq, its leadership and its people, will stand up to the evil invaders, and we will take them to such limits that they will lose their patience in achieving their plans, which are pushed by criminal Zionism. ... Long live jihad and long live Palestine."—***Saddam Hussein, Associated Press, March 20.***

"I think Saddam Hussein is a burned-out figure. For me, there's nothing genuine about him, including that speech. No one believes him, especially when he's talking about Islam and the Palestinians."—***Hisham Kassem, publisher of*** **Cairo Times, Los Angeles Times,** ***March 21.***

"At this difficult moment in our nation's history, I would like to express my pride in you, the British service and civilian personnel deployed in the Gulf and in the vital support roles in this country and further afield. I have every confidence in your professionalism and commitment as you face the challenges before you. Especially for those of you now waiting to go into action, may your mission be swift and decisive, your courage steady and true, and your conduct in the highest traditions of your service both in waging war and bringing peace."—***Statement by Queen Elizabeth II, March 20.***

"This Administration must also accept responsibility for the cost of conflict in blood, in money, and insecurity to our families. It may take decades to undo the damage to our safety wrought by misguided policies and the failure of diplomacy."—***Rep. Lloyd Doggett (D–Tex.), floor speech, March 20.***

"I saw some of the images on television and I heard various commentators expansively comparing what's taking place in Iraq today to some of the more famous bombing campaigns of World War II. There is no comparison. The weapons that are being used today have a degree of precision that no one ever dreamt of in a prior conflict—they didn't exist. And it's not a handful of weapons; it's the overwhelming majority of the weapons that have that precision. The targeting capabilities and the care that goes into targeting to see that the precise targets are struck and that other targets are not struck is as impressive as anything anyone could see."—***Rumsfeld, Pentagon news briefing, March 21.***

"If the Iraqis were to use any chemical weapons, then I think public opinion around the world would immediately turn against Iraq and [people] would say as well that the invasion was justified."—***Chief UN weapons inspector Hans Blix,*** **Washington Times,** ***March 22.***

"This will be a campaign unlike any other in history, a campaign characterized by shock, by surprise, by flexibility, by the employment of precise munitions on a scale never before seen, and by the application of overwhelming force."—***Army Gen. Tommy R. Franks, commander, US Central Command, CENTCOM press briefing, March 22.***

"I'm a piñata for the antiwar forces."—***Harlan K. Ullman, retired Navy commander and principal architect (along with James P. Wade) of "shock and awe,"*** **Washington Post,** ***March 22.***

"I did my share, my part, to liberate the country from Hitler, and this is the way that they repay me."—***George Wilson, 80, decorated by France for bravery in World War II, returning his medal to the French Embassy,*** **Washington Post,** ***March 22.***

"REPORT: US military used napalm in the bombing of Iraq (*Sydney Morning Herald*, March 22, 2003).
GROUND TRUTH: The United States took napalm out of service in the early 1970s. We completed destruction of all 2.7 million gallons of napalm on April 4, 2001. The claims that we are using napalm in Iraq are patently false. We have contacted the *Sydney Morning Herald* and asked for a correction. They tell us they are pulling the story."—***US Air Force Operation Iraqi Freedom Web site, undated.***

"The air campaign is achieving its objective, and the ground campaign is also achieving objective. We're slowly but surely taking control of that country so that we can free the people of Iraq and eventually clear that country of weapons of mass destruction. We've made good progress."—***Bush, at press availability, March 23.***

"Today, it is we Americans who live in infamy."—***Arthur M. Schlesinger Jr., historian and special assistant in the Kennedy Administration,*** **Los Angles Times** ***op–ed, March 23.***

"The [television] pictures made it look like we were bombing Baghdad. We were not bombing Baghdad. That is the greater Baghdad area, and in it there are a large number of command and control and regime targets. And that is what we were bombing, and it was very precise, and it made it look like the city was ablaze. The city was not ablaze. The Iraqi regime was ablaze."—***Rumsfeld, NBC's "Meet the Press," March 23.***

"We live in a time when we have fictitious election results that elect a fictitious President. We live in a time

where we have a man who's sending us to war for fictitious reasons, whether it's the fiction of duct tape or the fiction of orange alerts."***—Michael Moore, filmmaker and political activist, at Academy Awards ceremony, Associated Press, March 24.***

"We are very concerned that there are reports of ongoing cooperation and support to Iraqi military forces being provided by a Russian company that produces GPS–jamming equipment. ... There are other causes of concern, as well, involving night vision goggles and antitank guided missiles."***—White House spokesman Ari Fleischer, press briefing, March 24.***

"We know, and everyone in this brave, patient, honest, heroic nation knows, how much we tried to do what was right—so much so, perhaps, that some blamed us for how we behaved and how graciously patient we were over hardships sought by those with ulterior motives and how we responded, although it could coincide [with] the wishes of the weak or those who do not realize the intentions and goals of the American and British Administrations, which are driven by accursed Zionism."***—Saddam Hussein,* Guardian Unlimited, *March 24.***

"The forces on this battlefield are the most capable I've ever seen, whether it's by way of technology or training or motivation. Our resolve is great. The morale is good. And, as I think we always say, there is no doubt about the outcome."***—Franks, CENTCOM news briefing, March 24.***

"The outcome of the war is not in question—we are going to win. The only question is the price that we pay. By not attacking the Republican Guards in a very vicious way now, requires more of our ground forces to confront those units, and it makes us more vulnerable to bad things happening."***—Retired Air Force Lt. Gen. Buster C. Glosson,* Boston Globe, *March 24.***

"In my judgment, there should have been a minimum of two heavy divisions and an armored cavalry regiment on the ground—that's how our doctrine reads."***—Retired Army Gen. Barry R. McCaffrey,* Washington Post, *March 25.***

"This is 'Desert Lite.' As they said in briefings before the war, this force is probably adequate for the job, but it doesn't leave much room for setbacks or sandstorms."***—Anthony H. Cordesman, Center for Strategic and International Studies,* Chicago Tribune, *March 25.***

"Without question, airpower is performing magnificently in Iraq. Weapons technologies truly have improved by an order of magnitude over the past decade. The Air Force and the air arms of our other services are indispensable. But they remain most effective as part of an overall land, sea, and air military team. Once again, it has taken ground forces to provide the main thrust of military operations, to take and hold ground, to seize oil fields, airfields, and bridges, and to force the war toward a battlefield decision."***—Ralph Peters, retired Army officer, author, and theorist,* Washington Post, *March 25.***

"The Iraqi Air Force hasn't left the ground, and none of our jets has been lost to enemy fire in thousands of sorties. We have struck with such precision that the citizens of Baghdad still drive the streets while the Hussein regime is being systematically, relentlessly attacked. The enemy has fired multiple surface-to-surface missiles without a coalition casualty, thanks to a multinational air defense system."***—Air Force Maj. Gen. Daniel P. Leaf, CENTCOM air component coordinator, InsideDefense.com, March 25.***

"It is always a fine balance to try to protect those people you want to liberate and yet achieve your military objective. ... We're more likely to take a little bit more risk ourselves than to bring the population in harm's way."***—Air Force Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, ABC's "Good Morning America," March 25.***

"We've got total dominance of the air. It is not air superiority. It's dominance. They have not put an airplane up."***—Rumsfeld, Pentagon news briefing, March 25.***

"I guess you need to be standing near the point of impact to understand whether or not it's awesome."***—Marine Gen. Peter Pace, deputy chairman of the Joint Chiefs of Staff, on questions about "shock and awe," CNN's "Larry King Live," March 26.***

"We decided we would restrain the use of airpower for reasons of humanity and world image. We have imposed a burden on our campaign plan that may slow down victory and diminish the quality of the victory we achieve."***—Loren B. Thompson, Lexington Institute,* New York Times, *March 27.***

"Overall, from a strategic standpoint, we should never want to run our short-range ground power against their short-range ground power. Even though we win that fight, we lose a lot of people in that fight, too. So we should run our long-range airpower against his only strength, which is short-range ground power."***—Retired Gen. Merrill A. McPeak, former Air Force Chief of Staff, OregonLive.com, March 27.***

"The bar for President Bush is now very high: He has to deliver a large number of [biological or chemical] weapons to prove not only that Saddam Hussein was lying but also that his weapons pose such an eminent threat that war is necessary."***—Joseph Cirincione, director of Nonproliferation Project of the Carnegie Endowment for International Peace,* Washington Post, *March 27.***

"Saudi Arabia and Iraq are the richest prizes in the world. Profits are involved, but oil is power more than oil is profit. Whoever has the oil has leverage over others in the world."***—Daniel Ellsberg, leaker of the "Pentagon Papers" in 1971, arrested March 26 at antiwar protest in Washington, D.C.,* Baltimore Sun, *March 27.***

"For nearly a century, the United States and Great Britain have been allies in the defense of liberty. We've opposed all the great threats to peace and security in the world. We shared in the costly and heroic struggle against Nazism. We shared the resolve and moral purpose of the Cold War. In every challenge, we've applied the combined power of our nations to the cause of justice, and we're doing the same today."***—Bush, at press availability, Camp David, March 27.***

"I hear people constantly say to me, Europe is against what you're doing. That is not true. There is a part of Europe that is against what we are doing. There are many existing members of the European Union, and virtually all the new members of the European Union, that strongly support what we are doing."***—Blair, at press availability, Camp David, March 27.***

"I am getting increasingly concerned by humanitarian casualties in this conflict. We've just heard the reports that a missile struck a market in Baghdad, and I would want to remind all belligerents that they should respect international humanitarian law and take all necessary steps to protect civilians."***—Annan, remarks to press, March 26.***

"This is staggering. If indeed the market explosion was caused by a US missile, Annan knows that this was both entirely unintentional and a rare exception in a campaign of astonishing discrimination and accuracy. Annan's statement is doubly disgusting because he said nothing about Iraq's use of human shields, of fake surrenders, of placing a tank in a hospital compound in Nasiriyah. He says not a word about these flagrant Iraqi violations of the laws of war. Nor does he denounce the parading of POWs on television and the apparent execution of American and British POWs. He is instead moved to speak out in response to what is at most an accident."***—Charles Krauthammer,*** **Washington Post,** ***March 28.***

"The only true heroes are those who find ways to help defeat the US military. I personally would like to see a million Mogadishus."***—Nicholas De Genova, assistant professor of anthropology and Latino studies at Columbia University, referring to 1993 ambush in Somalia, where 18 American soldiers died,*** **Newsday,** ***March 28.***

"Once the crisis is past, one could think that French companies ... could be left out of contract bids. That's what French leaders are the most worried about."**—Le Figaro** ***editorial, Associated Press, March 29.***

"Great Britain is part of Europe and I hope this situation can be resolved in such a way so that it is clear that there can be no common defense policy without Britain taking part."***—German Chancellor Gerhard Schroeder, Reuters, March 28.***

"The United States, we hope, will win this war quickly."***—Francois Rivasseau, French Foreign Ministry spokesman,*** **Washington Post,** ***March 29.***

"If you want to have the maximum effect, you try to hit as many of those centers of gravity as you can, as fast as you can. When you exclude some and you attack targets serially, as they've been doing, you reduce tremendously the effect on the system."***—Retired Air Force Col. John Warden, air campaign planner, Gulf War I,*** **Washington Post,** ***March 29.***

"As I see it, this air campaign appears to come out of a book by strategic airpower advocates, who have argued that you start at the center and work your way out to disrupt and destroy whatever. We come up with the opposite view. Take away [Saddam's] ability to run the country and the ability to fight. The argument is that may cause a sufficient amount of 'shock and awe' it will force them to surrender. ... As we theoretically envisaged it, we would have gone straight after the Republican Guard and its leadership and not just with precision guided weapons."***—Ullman,*** **Washington Times,** ***March 31.***

"It has been approved by everyone who's had a look at it. It's been described as an excellent plan. I'd be delighted to take credit for it, but it wouldn't be fair, because it's a product that is essentially General Franks's, but it certainly is the result of a lot of thought from a lot of very fine military planners."***—Rumsfeld on war plan, Pentagon news briefing, March 30.***

"Airpower by itself recently won a sort of war—the 1999 no-casualty campaign, conducted from 15,000 feet, to stop Serbia's depredations in Kosovo. However, airpower alone will never supplant ground power. As has been said, no one surrenders to an airplane. But today's air dominance vastly simplifies the tasks of ground forces because they cannot be threatened from the air, and enemy ground forces cannot concentrate."***—George F. Will,*** **Newsweek,** ***March 31.***

"I was disappointed that we weren't allowed to disarm Iraq [through inspections], especially as we were very close to our goal."***—Blix in interview with French newspaper, quoted by hipakistan.com, March 31.***

"I give this pledge to the citizens of Iraq: We're coming with a mighty force to end the reign of your oppressors. We are coming to bring you food and medicine and a better life. And we are coming, and we will not stop, we will not relent, until your country is free."***—Bush, speech at Port of Philadelphia, March 31.***

"If they fly, they die. It's as simple as that. If they come up, we'll destroy them. And, as you see, if we find them, we'll destroy them."***—Army Brig. Gen. Vincent Brooks, CENTCOM spokesman, on inactivity of Iraqi Air Force, press briefing, March 31.***

"There will be no outcome to this war that leaves Saddam Hussein and his regime in power. Let there be no doubt. His time will end, and soon. The only thing that the coalition will discuss with this regime is their unconditional surrender."***—Rumsfeld, Pentagon news briefing, April 1.***

"Their assumptions were wrong. There is a view that the nature of warfare has fundamentally changed, that numbers don't count, that armor and artillery don't count. They went into battle with a plan that put a huge air and sea force into action with an unbalanced ground combat force."***—McCaffrey on planners of the campaign in Iraq,*** **New York Times,** ***April 1.***

"Once Chirac is comfortably re-elected and Bush and Blair chased from power, Paris more than ever will be the capital of the world."***—Philippe Sollers, "a novelist who has wide respect in France,"*** **International Herald Tribune,** ***April 1.***

"I do not believe it is appropriate to air it at this time. ... I do not wish to risk offending anyone who might misinterpret the meaning of this video."***—Madonna, pulling US release of her new video, which contains images of transvestite soldiers, Iraqi children, and a grenade thrown at a lookalike of President Bush,*** **Washington Times,** ***April 2.***

"Jihad is a duty and whoever dies will be rewarded by

heaven. And God will be satisfied with their sacrifice. Take your chance. This is what God requested from you."***—Muhammad Said al-Sahhaf, Iraqi information minister, reading statement attributed to Saddam Hussein,*** **New York Times,** ***April 1.***

"Mr. Saddam Hussein has asked his people to sacrifice for their country, and if the only thing that keeps the conflict going is his presence, then he should listen to his own advice."***—Prince Saud al Faisal, Saudi foreign minister, Knight Ridder News Service, April 2.***

"You failure, go to hell. You are too small to talk to the leader of Iraq, and those who will be swept away from the land of the Arab world are people like you. You are a minion and a lackey."***—Iraqi Vice President Taha Yassin Ramadan, replying to Prince Saud,*** **New York Times,** ***April 2.***

"The fact is that more ground troops are needed. And more ground troops are on the way. The relevant questions are these: Will this second infusion be sufficient, and why weren't these troops there when the war started?"***—Retired Marine Corps Gen. Joseph P. Hoar, former commander of CENTCOM,*** **New York Times,** ***April 2.***

"In my view, the war is successful so far if you talk about meeting objectives and goals. In the next few days, we're at a critical juncture, though. If the war gets extended out, I think you'll see criticism rise. If it goes well, you'll see it disappear."***—Sen. John McCain (R–Ariz.),*** **Los Angeles Times,** ***April 2.***

"I could see the Iraqis ahead of us at a crossroads. ... They were Fedayeen and I was preparing to fire at them. They were crossing the road to try and outflank us on the left, and, as they crossed, four or five of them grabbed kids by the scruff of their necks and dragged them across with them. They were using them as human shields so that I had to stop firing. The children were only five to eight years old."***—British Sgt. David Baird, Challenger 2 tank commander London's*** **Daily Telegraph,** ***April 2.***

"We hope the [Saddam Hussein] regime will collapse as soon as possible and we'll have no further loss of life—civilians or soldiers."***—German Foreign Minister Joschka Fischer, Associated Press, April 2.***

"I believe the war on Iraq is an inevitable measure to eliminate weapons of mass destruction as quickly as possible, at a time when diplomatic efforts to resolve the issue peacefully have failed."***—South Korean Pres. Roh Moo-Hyun, Channelnewsasia.com, March 20.***

"The main thing we've learned from this is that 'shock and awe' hasn't panned out. The targeting hasn't broken the back of the leadership."***—Robert A. Pape, University of Chicago professor and longtime critic of airpower,*** **New York Times,** ***March 26.***

"We might be able to do the job if airpower is effective, if we don't have close contact with enemy forces, and if the Iraqi will is broken. But those are a lot of big ifs."***—Retired Army Gen. Wesley K. Clark, former NATO commander, arguing for more ground forces in Iraq,*** **The [South Carolina] State,** ***March 26.***

"The military must struggle with the deadly calculus of how many casualties it is willing to incur among its own forces to save civilian lives. In this regard, the words of Gen. Curtis LeMay, who led the American bombing campaign against Japan in 1945, are worth remembering: 'Actually, I think it's more immoral to use less force than necessary, than it is to use more. If you use less force, you kill off more of humanity in the long run because you are merely protracting the struggle.' "***—Max Boot,*** **New York Times,** ***March 30.***

"My view of those reports—and since I don't know who you're quoting, who the individuals are—is that they're bogus. ... I've been in this process every step of the way. ...There is not one thing that General Franks [the CENTCOM commander] has asked for that he hasn't gotten on the timeline that we could get it to him. ... Every member of the Joint Chiefs of Staff signed up to this plan and the way it was executed from the first day, and they'll be signed up to the last day, because we still think it's a good plan. Every member of General Franks's component commanders signed up to this plan as it was changed over time, and as it finally came down to be the one we went to war with. And they all stood up and gave a thumbs up to the plan."***—Air Force Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, on criticism from "current and former officers" of the war plan, Pentagon news briefing, April 1.***

"Hmmm. Might this be why our pals France, Germany, and Russia aren't high on giving Saddam Hussein the bum's rush? A hush-hush Treasury report reveals that the trio hold the majority of Iraqi debt. Wanna bet how much will get repaid if a new government takes over?"***—"Washington Whispers,"*** **US News & World Report,** ***April 7.***

"It increasingly seems that Iraq is running out of real soldiers, and soon all that will be left are war criminals."***—Rumsfeld, Pentagon news briefing, April 3.***

"I am a determined nonpartisan former public official who loyally served the past two Administrations. My criticism of the brilliantly executed air–land–sea campaign to disarm Iraq was limited to the 'rolling start.' My anxieties are, of course, being rapidly washed away by the superb success of our fighting forces—and by the rapid reinforcement of the courageous initial assault elements in accordance with this very daring and successful plan."***—McCaffrey, letter to*** **Washington Times,** ***April 4.***

"We all hope that the earliest possible end to the war will keep the number of victims as low as possible. And we hope that through the defeat of the dictatorship, the Iraqi people can realize its hopes of a life in peace, freedom, and self-determination as soon as possible."***—Schroeder, calling—for the first time—for the removal of Saddam,*** **Washington Post,** ***April 4.***

Individuals quoted herein issued remarks in a variety of ways—speeches, impromptu statements, testimony, briefings, press interviews, and so forth. Date of media publication does not necessarily indicate the date of the actual utterance.

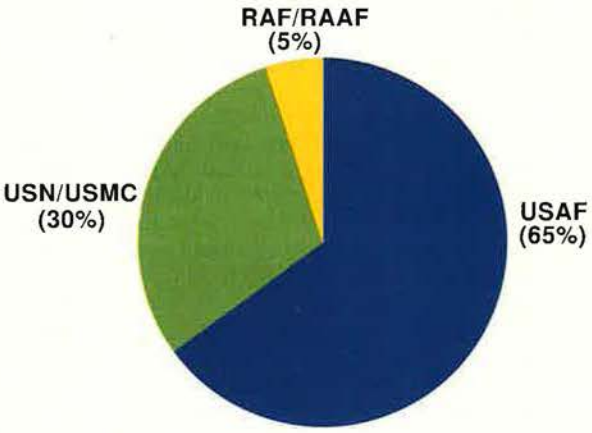
The Chart Page

By Tamar A. Mehuron, Associate Editor

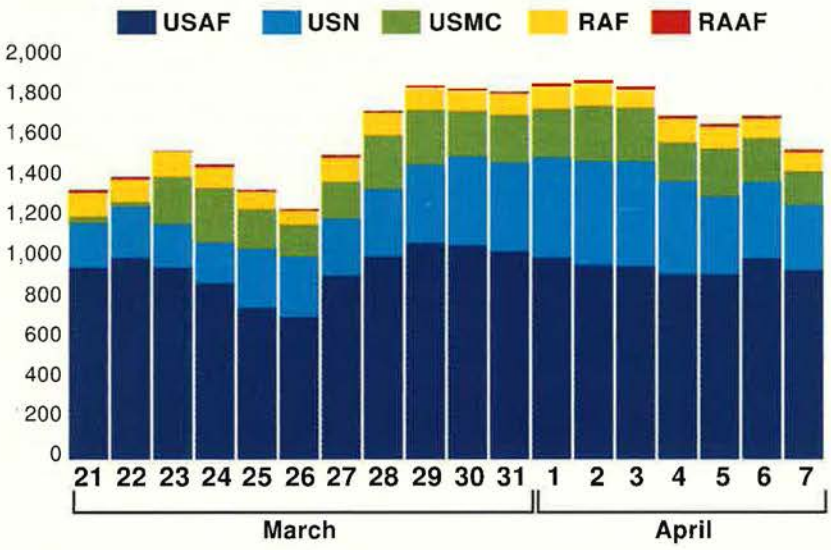
Gulf War II Air Campaign by the Numbers

In Operation Iraqi Freedom, the US Air Force led the air war. Precision airpower provided by the Air Force, Navy, Marine Corps, Royal Air Force, and Royal Australian Air Force set the stage for victory throughout Iraq with few losses and low Iraqi casualties. (Figures here are preliminary data from March 21 to April 7, except where noted.)

Munition Tonnage

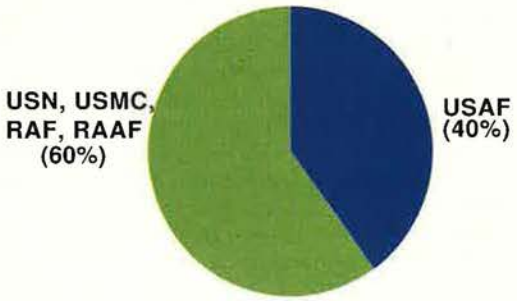


Daily Total Sorties

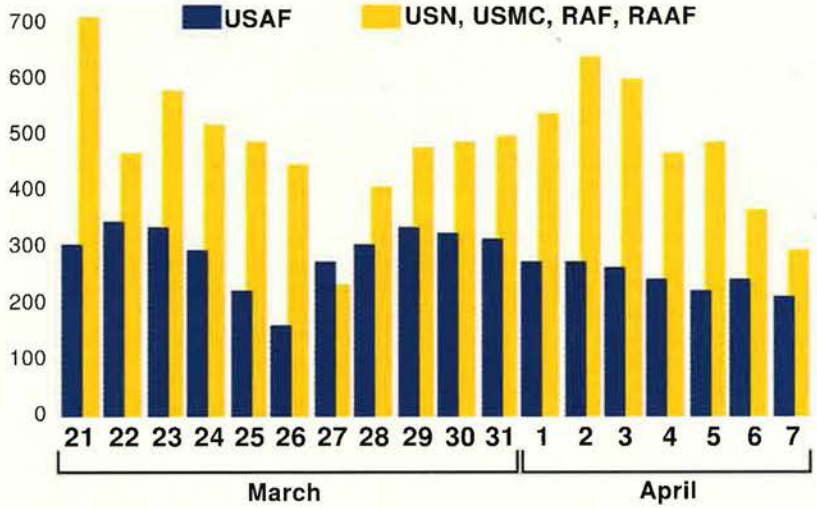


Strike Sorties

(As of April 16)

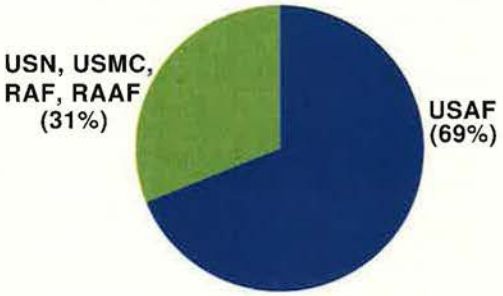


Daily Strike Sorties



Support Sorties

(As of April 16)



Source: Senior defense official

Aerospace World

By Suzann Chapman, Managing Editor

Seven Airmen Die in Afghan Ops

Seven airmen participating in Operation Enduring Freedom lost their lives in actions in Afghanistan. Officials said attacks on coalition forces increased following the start of the war in Iraq.

On March 23, six airmen on an Air Force HH-60 Pave Hawk were killed when the helicopter crashed about 12 miles north of Ghazni, Afghanistan. Officials said the cause of the crash is under investigation, but they said it was not shot down by enemy fire.

The airmen were Lt. Col. John Stein, aircraft commander; 1st Lt. Tamara Archuleta, copilot; MSgt. Michael Maltz and SrA. Jason Plite, both pararescuemen; and SSgt. Jason Hicks and SSgt. John Teal, both flight engineer. They were from the 347th Rescue Wing, Moody AFB, Ga., and were on their way to evacuate two Afghan children for medical treatment at US facilities in Bagram.

On March 29, SSgt. Jacob L. Frazier, a 24-year-old Air National Guardsman from St. Charles, Ill., was killed when the five-vehicle convoy in which he was riding near Geresk, Afghanistan, ran into an ambush. Frazier was from the 182nd Airlift Wing in Peoria, Ill., and was with an Army mounted reconnaissance unit at the time of the attack.

Officials said the ambushers were in prepared positions and fired small arms, machine guns, and rocket-propelled grenades at the convoy.

No-Fly Zone Patrols End in Iraq

As the war in Iraq got under way, coalition officials ended the aerial patrols over the northern and southern no-fly zones in Iraq. US and coalition forces had patrolled the zones to enforce UN sanctions against Iraq since Gulf War I ended in 1991.

The last Operation Northern Watch mission was flown March 17.

The last Operation Southern Watch mission was flown March 19.

T-38 Pilot Dies in Crash

AFRC announced March 24 that Maj. Pete Jahns, a Reserve instructor pilot, died March 19 after crash-landing in a T-38 trainer at Randolph AFB, Tex. A second Reserve IP, Lt. Col. Frank Gebert, survived the crash.

Both were with the 100th Flying Training Squadron at Randolph. Officials said they were conducting continuation training at the time of the accident, which is under investigation.

Danger Pay Expands

The emergency supplemental bill signed by President Bush April 16 includes an increase of $75 for imminent danger pay. The new level is $225 per month and is retroactive to Oct. 1, 2002.

Additionally, DOD announced on April 11 that more troops will receive combat zone tax relief and imminent danger pay. The new area includes troops stationed in Israel and Turkey. It also includes those deployed to the Mediterranean waters east of 30 degrees east longitude.

This change is retroactive to Jan. 1 for Israel and Turkey and April 11 for those in the Med.

Personnel serving in other Operation Iraqi Freedom combat zones were included in an earlier executive order.

ACC, AFRC Agree To Share

Air Combat Command and Air Force Reserve Command leaders signed an agreement that launched the Fighter Associate Program on April 2. The effort will pool resources of each command to ease the fighter pilot training problem.

The Air Force lost too many experienced pilots during the drawdown of the early 1990s to sustain training for the number of new fighter pilots it needs each year.

"The active force requires 330 to 380 pilots a year, but it only has the resources available to train 302," said Col. Bob Nunnally, Reserve advisor to the ACC commander and leader of the team that developed the new program.

The FAP is based upon two earlier, but more limited, programs, he said. One was the Fighter Reserve Associate Program and the other, the Total Force Absorption Program.

Under the new program, a detachment of four Reserve pilots will serve with an active duty associate unit primarily as instructor pilots. Some active units will also gain six enlisted aircraft maintenance Reservists.

Initial Reserve detachments will join active duty units at Eglin AFB, Fla.,

Tarnak Farms Investigator Says No Court-Martial

On March 20, the hearing officer investigating two Air National Guard pilots charged in the friendly fire incident at Tarnak Farms in Afghanistan recommended against court-martial. However, his recommendation is not binding.

The Air Force began an Article 32 hearing, similar to a civilian grand jury proceeding, in January against two Illinois Guardsmen, Majs. Harry Schmidt and William Umbach. They were charged in the April 17, 2002, bombing incident that left four Canadian soldiers dead and eight others wounded. (See "Aerospace World: The Case of the ANG Pilots: Blame, Support, and Conflicting Testimony," February, p. 20.)

After hearing testimony and reviewing documentation in the case, the hearing officer, Col. Patrick Rosenow, concluded there was insufficient evidence to charge the pilots and try them by court-martial. In his report, Rosenow recommended administrative rather than judicial action.

Rosenow's report went to Lt. Gen. Bruce Carlson, who is 8th Air Force commander and the general court-martial convening authority in the case. He does not have to abide by Rosenow's recommendation.

Carlson's options include referral of some or all of the charges to a court-martial, nonjudicial punishment, administrative sanctions, or dismissal of some or all of the charges, with no further action.

Hill AFB, Utah, Langley AFB, Va., Nellis AFB, Nev., and Shaw AFB, S.C. (Shaw will have two detachments.)

In turn, ACC will place three active duty pilots in an AFRC squadron. One will be experienced, the other two will be recent basic pilot training graduates.

Active associate detachments will join AFRC units at Hill, Homestead ARB, Fla., NAS JRB Fort Worth, Tex., NAS JRB New Orleans, La., and Whiteman AFB, Mo.

Readiness Remains a Concern

Today's high operations tempo is taking a huge toll on the Air Force's ability to conduct training—and that affects readiness, the service's vice chief of staff told lawmakers in mid–March.

"We have some roadblocks ahead of us," said Gen. Robert H. Foglesong. "We have a reconstitution issue facing us."

In fact, he told the legislators that if the current pace continues, it is possible the Air Force will see a "decline as training currencies and continuation training are harder to achieve."

DOD Changes Smallpox Shot Plan

Pentagon officials said April 4 they will review more closely the medical history of military members before giving them the smallpox vaccination. The change was prompted by investigations into recent cardiac deaths of a number of individuals—one a 55-year-old Air National Guardsman—who recently had been vaccinated.

DOD began vaccinating military personnel last December. The department planned to vaccinate about 500,000 military personnel beginning with emergency response personnel and those deployed to the Central Command area of operations.

Following a recommendation from the Centers for Disease Control and Prevention, which is investigating whether a series of cardiac deaths was related to the vaccine, DOD decided to exempt military personnel with three or more conditions that are considered heart-trouble risk factors. The military will review factors such as tobacco use, high blood pressure, high cholesterol, diabetes, and family history of heart disease before administering the vaccine, according to Col. John Grabenstein, the Army's deputy director for military vaccines.

Evidence so far does not link the deaths to the vaccine. However, "the investigation is not finished, and to be on the safe side, this extra precaution is being taken," said Grabenstein.

Independent Panel To Review Situation at Academy

Congress included a provision to establish an independent panel to review allegations of sexual assault and cover-ups at the USAF Academy in legislation that will provide supplemental funds for the war on terror. President Bush signed the legislation into law April 16.

Legislators have criticized the Air Force for its handling of the situation since the allegations surfaced late last year. (See "Aerospace World: USAF Leaders Vow To Make Changes at Academy," April, p. 18.)

Air Force Secretary James G. Roche and Chief of Staff Gen. John P. Jumper said they would welcome an independent review.

The review panel will have seven people appointed by the Secretary of Defense. According to Congress, these individuals are to have expertise in matters relating to sexual assault, rape, and the military academies.

The panel will determine "responsibility and accountability for the establishment or maintenance of an atmosphere at the US Air Force Academy that was conducive to sexual misconduct," states the legislation.

The Air Force investigation, led by USAF General Counsel Mary L. Walker, in February began looking into 56 cases of alleged rape, sexual assault, and sexual harassment. Briefing lawmakers on March 31, Roche said, "We are appalled and embarrassed by what we have found."

He said the investigation initially determined there is a misplaced sense of loyalty among the cadets. "Many cadets are loyal to each other, rather than loyal to the values of our Air Force," said Roche.

Roche and Jumper maintain that the academy's problems did not start with the current leadership. However, in late March, they announced plans to replace the two top officials, Lt. Gen. John R. Dallager, superintendent, and Brig. Gen. Silvanus T. Gilbert III, commandant of cadets, before the next class arrives.

For the top spot at the academy, USAF nominated Maj. Gen. John W. Rosa Jr., deputy director of current operations for the joint staff. The service named Brig. Gen. John A. Weida, a 1978 academy graduate, to be the new commandant of cadets, as well as acting superintendent until Rosa's confirmation.

The service is also replacing the vice commandant of cadets, Col. Robert D. Eskridge, and commander of cadet training, Col. Laurie S. Slavec.

Col. Debra A. Gray, now serving on the joint staff at the Pentagon and a graduate of the first USAFA class to admit women, will be the new vice commandant. Col. Clada A. Monteith, who is currently deputy director of security forces at US Air Forces in Europe, will be in charge of cadet training.

Senior Staff Changes

CHANGES: Brig. Gen. Barbara C. **Brannon,** from Cmdr., 89th Medical Gp., AMC, Andrews AFB, Md., to Asst. Surgeon General for Medical Force Dev. and ASG for Nursing Svcs., USAF, Bolling AFB, D.C. ... Maj. Gen. Walter E.L. **Buchanan III,** from Vice Cmdr., 9th Air Expeditionary Task Force, USCENTAF, Prince Sultan AB, Saudi Arabia, to Cmdr., Air Force C2 ISR Center, Langley AFB, Va. ... Brig. Gen. Daniel J. **Darnell** from Cmdr., 57th Wg., ACC, Nellis AFB, Nev., to Cmdr., Space Warfare Center, AFSPC, Schriever AFB, Colo. ... Brig. Gen. Robert J. **Elder Jr.,** from Vice Cmdr., 9th AF, USCENTAF, Shaw AFB, S.C., to Vice Cmdr., 9th Air Expeditionary Task Force, USCENTAF, Prince Sultan AB, Saudi Arabia ... Brig. Gen. Douglas M. **Fraser,** from Cmdr., Space Warfare Center, AFSPC, Schriever AFB, Colo., to Dir., Ops., AFSPC, Peterson AFB, Colo. ... Brig. Gen. (sel.) William J. **Germann,** from Command Surgeon, Medical Services & Tng., AETC, Randolph AFB, Tex., to Cmdr., 89th Medical Gp., AMC, Andrews AFB, Md. ... Brig. Gen. Silvanus T. **Gilbert III,** from Cmdr., 34th Tng. Wg., USAFA, Colorado Springs, Colo., to Spec. Asst. to Asst. Dep. Under SECAF, Intl. Affairs, Pentagon ... Brig. Gen. Arthur B. **Morrill III,** from Dir., Log., PACAF, Hickam AFB, Hawaii, to Dir., Resources, USAF, DCS, Instl. & Log., Pentagon ... Brig. Gen. (sel.) Polly A. **Peyer,** from Vice Cmdr., Oklahoma City ALC, AFMC, Tinker AFB, Okla., to Dir., Log., PACAF, Hickam AFB, Hawaii ... Brig. Gen. (sel.) Kip L. **Self,** from Spec. Asst. to 21st AF Cmdr., Global Mobility Task Force Planning, AMC, McGuire AFB, N.J., to Dep. Dir., Ops., AMC, Scott AFB, Ill. ... Brig. Gen. William L. **Shelton,** from Dir., Ops., AFSPC, Peterson AFB, Colo., to Dir., Plans & Policy, STRATCOM, Offutt AFB, Neb. ... Brig. Gen. (sel.) Larry O. **Spencer,** from Comptroller, ACC, Langley AFB, Va., to Dir., Mission Spt., AFMC, Wright–Patterson AFB, Ohio ... Brig. Gen. Johnny A. **Weida,** from Cmdr., Squadron Officer College, AU, AETC, Maxwell AFB, Ala., to Cmdr., 34th Tng. Wg., USAFA, Colorado Springs, Colo. ■

News Notes

By Tamar A. Mehuron, Associate Editor

■ DOD announced March 31 that Undersecretary of Defense for Acquisition, Technology, and Logistics Edward C. Aldridge Jr. will retire May 23. He has held that position since May 2001. Michael W. Wynne, principal deputy undersecretary, will serve as acting USD.

■ The terrorist group al Qaeda may have already produced some rudimentary biological/chemical weapons, reported the *Washington Post* March 23. Analysis of documents and information from captured al Qaeda operational planner Khalid Sheik Mohammed, who was known as "the Brain," points to a program much more advanced than previously thought.

■ Air Force officials announced April 2 they had discovered errors in service dates for 35 airmen who returned to active duty after a break in service. That incorrect information, entered by USAF and not the airmen, enabled those 35 to test for promotion last year. Because it was a service mistake, USAF will let those who were selected for promotion keep their new ranks. The service also gave promotions and retroactive pay to 23 airman who fell below the promotion cutoff level because of the ineligible airmen in the pool.

■ Pilot error led to the collision of two F-16s Dec. 18, 2002, during a four-ship training mission out of Hill AFB, Utah, USAF announced April 3. Investigators found that one pilot focused his attention on a failed gauge instead of his position in the formation. The pilots returned to the base, but officials estimated damage to the two aircraft at almost $1.8 million.

■ DOD announced March 26 that it has teamed with USA Freedom Corps to launch "On the Home Front," a new resource for people seeking to support military personnel and their families. A number of community volunteer organizations exist to help match volunteers with local military families. Contacts are available by calling 1-877-USA-CORPS or online at http://www.usafreedomcorps.gov.

■ On March 31, Air Force Space Command successfully launched the ninth Global Positioning System IIR satellite via a Delta II booster from Cape Canaveral AFS, Fla.

■ Pilot error caused the crash of a USAF RQ-1 Predator UAV Oct. 25, 2002, according to an Air Combat Command investigative report released March 14. The UAV crashed nine miles west of Indian Springs AFAF, Nev. Inattention to the aircraft's altitude by the ground crew was the immediate cause of the accident. The UAV was being flown over mountainous terrain, which obstructed the data link and caused the operators to lose electronic contact with the aircraft. Attempts to restore the link failed, as did emergency procedures designed to safeguard the aircraft, and the UAV crashed 16 seconds later.

■ The F/A-22 achieved 3,000 hours of safe flight tests Feb. 26 at Edwards AFB, Calif. Raptor 4005 and Raptor 4006 were airborne at the same time when they reached the milestone.

■ The Global Vigilance Combined Test Force, Edwards AFB, Calif., is training ACC airmen to become Global Hawk pilots. The goal is to have 17 trainees qualified by mid-summer 2003. The developmental Global Hawk aircraft and ground systems are currently being controlled by personnel from Air Force Materiel Command's test and evaluation community. ACC plans to activate the first operational Global Hawk squadron—the 12th Reconnaissance Squadron—at Beale AFB, Calif.

■ Richard Perle resigned March 27 as chairman of the Defense Policy Board, as a result of criticism alleging conflict of interest concerning his work with the telecommunications company Global Crossing. In a letter to Defense Secretary Donald H. Rumsfeld, Perle said, "I know that this [controversy] will inevitably distract from the urgent challenge in which you are now engaged. ... You have my assurance that I have respected and abided by the rules that apply to the Defense Policy Board." Perle remains a member of the board.

■ The Navy announced March 20 that it had accelerated and deployed a software upgrade program enabling F-14D Tomcats to carry Joint Direct Attack Munitions. In just 17 days, a team modified all forward deployed F-14Ds and trained more than 90 aircrew and maintainers. The Tomcat can carry four JDAMs, each weighing 2,000 pounds.

■ Pilot error caused the Dec. 20, 2002, midair collision between two T-37 trainer aircraft from Sheppard AFB, Tex., USAF announced March 25. One of the pilots did not ensure enough separation space between the two aircraft while practicing formation maneuvers. The student pilots involved were flying their third formation sorties. There were no injuries, but one T-37 crashed after the pilots ejected. The other was flyable and returned to Sheppard.

■ Air Force Reserve Command announced March 25 selection of 776 out of 1,797 captains for promotion to major.

■ Facing a shortage of depot maintenance technicians, the Air Force began training 19 civilians to serve as instructors at its air logistics centers. Previously Air Force Materiel Command had only been able to schedule training for about 1,000 technicians per year. With dedicated civilian instructors in place, AFMC officials said they hope to boost that number to 4,000 per year to help meet the demand caused by the turnover of an aging workforce.

■ The 95th Security Forces Squadron and the Marine Aircraft Group 46, Det. Bravo, teamed up to increase security at Edwards AFB, Calif., by conducting random aerial surveillance of the base. The joint effort is the best way to deter potential threats to the 470-square-mile base, according to the 95th SFS commander, Lt. Col. Charles Beck. He said the aerial surveillance will be done routinely but not on a regular time schedule.

■ Northrop Grumman delivered the 15th E-8C Joint Surveillance Target Attack Radar System aircraft to the 116th Air Control Wing at Robins AFB, Ga., Feb. 25. This was the first aircraft delivered to the new "blended" wing of active duty and Air National Guard members. The delivery was five weeks ahead of schedule.

■ A new palletized seating system will increase the number of troops a USAF C-17 airlifter can carry from 102 to 189. A similar system was used with the C-141. Each seat pallet can be set up for either 10 or 15 seats. Officials also said the new seats are more comfortable than current ones.

■ USAF awarded Northrop Grumman a contract valued at $19.7 million to upgrade ANG F-16 Litening targeting and navigation systems to the new advanced targeting system configuration. The Litening AT version provides enhanced image processing, multitarget cueing, precision target coordinate generation, and improved air-to-air capabilities.

■ Two F-15C aircraft on March 17 collided in midair over the Nevada desert about 65 miles northeast of Nellis AFB, Nev. One fighter crashed in the desert after its pilot, Capt. Mat-

thew Zamiska, ejected safely, while Maj. Steve Early was able to return his aircraft to the base. Both pilots are with the 422nd Test and Evaluation Squadron at Nellis and were on an air-to-air training mission. A board of Air Force officers is investigating the cause of the accident.

■ F-16s from Eielsen AFB, Alaska, arrived at Andersen AFB, Guam, March 24 to boost the base's homeland security measures. With the outset of operations in Iraq, Pacific Command decided to strengthen its defensive posture in the Pacific region.

■ The Air Force Flight Test Center, Edwards AFB, Calif., has developed a new aeronautical telemetry capability that enables "aeronautical test vehicles to occupy half the spectrum size of test vehicles using traditional telemetry systems," said officials. The increased complexity of today's test vehicles requires higher telemetry data rates at a time when DOD has had to make a large reduction in the electromagnetic spectrum it could allocate to flight test. The new telemetry transmitter will speed up systems acquisition flight testing and help reduce testing costs.

■ USAF's 2002 Command Post Controllers of the Year are MSgt. Joseph A. Howell Jr., Yokota AB, Japan; SSgt. Rodney D. Force, Kadena AB, Japan; and SrA. Demetria Z. Perez, Vance AFB, Okla.

■ Second Lt. Rickie Banister, a 319th Missile Squadron missileer, was crowned best bowler in the US armed forces at the DOD tournament March 20 at Lackland AFB, Tex. He overcame a final-day, 50-pin deficit to snare the title. Airmen earned all the gold medals, claiming their fifth consecutive interservice team title and 15th overall since 1976.

■ Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, and Maj. Gen. John J. Batbie Jr., AFRC vice commander, received Gray Eagle awards March 21 in recognition of their status as the pilots with the longest continuous aviation service. Myers first claimed the active duty Gray Eagle trophy in 1999. This is the first one for Batbie, who began his aviation career as an Army helicopter pilot.

■ USAF announced on March 24 winners of the 2002 Lt. Gen. Leo Marquez Maintenance Awards for aircraft maintenance: Maj. David M. Coley, Travis AFB, Calif.; Capt. Larry N. Hancock, Little Rock AFB, Ark.; SMSgt. Joel W. Coppolino, Dyess AFB, Tex.; TSgt. Jason M. Hanks, Charleston AFB, S.C.; SrA. Diogenes Baez Cruz, Tinker AFB, Okla.; and civilians Anthony E. Hannula and Sydney J. Welch, both of Elmendorf AFB, Alaska.

■ The 2002 Marquez Maintenance Award winners for munitions and missile maintenance are Lt. Col. Marcus Novak, RAF Lakenheath, UK; 1st Lt. Randall R. Austill, Hill AFB, Utah; SMSgt. Daniel Brown, Mountain Home AFB, Idaho; TSgt. Chuck M. Jenkins, Eielson AFB, Alaska; A1C Amanda K. Young and civilian Kathryn J. Steinbacher, both of Holloman AFB, N.M.; and civilian John M. Long, Eglin AFB, Fla.

■ For communications–electronics maintenance, the 2002 Marquez Maintenance Award winners are Maj. Aaron M. Smith, Hurlburt Field, Fla.; Capt. Bradley L. Pyburn, Kadena AB, Japan; MSgt. Bobby E. Simmons, Kadena; SSgt. Shane R. Bohl, Elmendorf; SrA. Angel M. Ramos and civilian Herb M. Reid, Hurlburt; and civilian Douglas D. Schinn, Elmendorf.

■ Civil Air Patrol's Board of Governors on March 1 elected retired USAF Col. Robert C. Bess as its new chairman and retired USAF Lt. Gen. Nicholas B. Kehoe its new vice chairman. Bess also serves as CAP national director of homeland security. Kehoe formerly served as board chairman.

■ DOD announced April 1 that Hurlburt Field, Fla., was one of five military installations presented with the 2003 Commander in Chief Annual Award for Installation Excellence.

■ For the second time in three years, Paul Phillips, a member of the Air Force Flight Test Center at Edwards AFB, Calif., has received one of NASA's highest safety awards. He accepted NASA's Quality and Safety Achievement Recognition Award March 7. Phillips is a member of the Access to Space Office at Edwards.

■ On April 4, Civil Air Patrol accepted the National Aeronautics Association's 2002 Frank G. Brewer Aerospace Education Trophy for the work CAP does to promote aerospace education. Of special note, NAA said, was CAP's new textbook, *Aerospace: The Journey of Flight,* for CAP cadets, high schools, and colleges. CAP also produced a six-volume curriculum, titled "Aerospace Dimensions," for middle schools.

■ The Smithsonian's National Air and Space Museum rolled the first artifact into the new Steven F. Udvar–Hazy Center at Dulles Airport in northern Virginia March 17. It was a diminutive Piper J-3 Cub, which will be joined by some 200 other aircraft, including the World War II B-29 bomber, the *Enola Gay.* The center opens to the public Dec. 15. ■

Index to Advertisers

Washington Watch

By Adam J. Hebert, Senior Editor

Peacetime Budget, Wartime Force

The Air Force's Fiscal 2004 spending plan was prepared before the start of war in Iraq, and there is much uncertainty about "steady-state" requirements.

NEXT year's Air Force budget is notable for what it does not include. There is no money for new refueling tankers, for additional Air Force end strength, or for fighting the wars in Afghanistan and Iraq, and, despite an increased topline, the budget leaves $4 billion in unfunded requirements.

Under the Air Force's budget plan for Fiscal 2004, the top priorities of previous years remain but are influenced by a new focus on real-world needs. With two new major operations going on—and the buildup for the third—while the budget was being prepared, many future needs were poorly understood. The new budget was prepared before Operation Iraqi Freedom began in March, and there was already uncertainty about what the new "steady state" of requirements would be.

Future personnel levels and maintenance requirements are still unknown. This is leading the Air Force to stick with existing programs, to accept risk in some areas, and to plan for supplemental funding.

Overall, the Air Force's $113.7 billion request is up from the $108 billion the service is enacting this year. The budget is also $3 billion more than USAF expected to need when it submitted its 2003 request, in early 2002.

The $5.7 billion increase over 2003 makes it possible to boost funding for the Air Force's personnel, readiness, and modernization accounts.

Infrastructure funding loses in this ecuation. However, current policy calls for eliminating nonessential military construction since the Defense Department gained Congressional approval to conduct a new round of base closures in 2005. Overall, funding for military construction and family housing will decline from about $3.0 billion this year to $2.6 billion next year.

Of the main funding categories, the biggest increase is seen in the research, development, test, and evaluation account. RDT&E will grow by nearly $2 billion, to $20.3 billion next year.

Procurement will be increased by $1.8 billion to $29.3 billion; military personnel accounts are up $1.4 billion, to $26.7 billion; and operations and maintenance funding grows by just over a billion to $34.8 billion.

It is important to note these figures are essentially "peacetime budgets" to be enacted in wartime. Nearly all the costs of the war on terrorism, including Operation Iraqi Freedom, will be obtained separately, through supplemental funding.

New Priorities

One expense that was not on the books two years ago is the homeland air defense mission, Operation Noble Eagle. Although the round-the-clock combat air patrols initiated after the Sept. 11 terrorist attacks have largely yielded to random patrols and more aircraft on strip alert, officials note that this is still a new requirement.

On 9/11, USAF had 14 fighters on alert at any given time. Today, there are 35, joined on alert by eight tankers and two Airborne Warning and Control System aircraft. In February, Air Force Secretary James G. Roche said the homeland air defense mission is not really an operation. "It is our future," he said. "It is never going to go away."

Senior officials also note that the impact of the existing operations on aircraft is poorly understood. Typical missions are now longer but less stressful. How this will affect long-term maintenance requirements is still unknown.

All figures refer to new budget authority in constant 2004 dollars.

Despite the uncertainties, one thing is known for sure: In a time of limited acquisitions, aging systems are becoming an ever larger drain on resources. Operation and maintenance costs are steadily rising, and the budget adds more than $1 billion to cover these expenses.

In addition, USAF decided to take a novel approach to offset the problems caused by its aging aircraft. Instead of continuing to spend billions on O&M for older aircraft, service leaders plan to retire some of those aircraft early to free up money to help pay for their replacements.

The Air Force announced that by 2009, it will send 114 fighter and 115 mobility aircraft into early retirement. According to Pentagon officials, this move will save the Air Force nearly $3 billion in 2004 and $21 billion over the six-year spending plan.

The exact aircraft to be retired was still undecided by late March, however. Officials said that primarily they will be early model F-16, and some F-15, fighters and older C-130 airlifters. The service also hopes to retire 68 of the oldest KC-135 tankers as soon as possible.

A senior Defense Department official said in February that the move creates some short-term risk. But, the official noted, these aircraft, while not useless, do not add enough marginal capability to justify their continuing operation when new systems are struggling for funding.

The biggest beneficiaries of the freed-up dollars will be accounts considered transformational or critical for near-term needs. These include the F/A-22, the F-35 Joint Strike Fighter, unmanned aerial vehicles such as Predator and Global Hawk, and precision guided munitions.

The Big Investments

The Air Force's top modernization priority, the F/A-22 Raptor, is also its largest current investment program. F/A-22 funding is ramping up as the aircraft nears its planned in-

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troduction to the combat fleet in 2005. The $5.2 billion allocated in 2004 for the F/A-22 should enable the service to purchase 22 of the next generation fighters while continuing test and development. USAF is buying 20 Raptors this year and expects to purchase 24 more in 2005.

These quantities are subject to change, based on the program's buy-to-budget strategy.

The service is purchasing as many Raptors as possible with fixed funding each year. If developmental problems arise, as happened last year, dollars will be pulled from F/A-22 production to cover additional developmental funding. On the other hand, if USAF's cost savings initiatives are successful, the service will be able to purchase more Raptors.

The current estimate is that the Air Force will be able to purchase 276 F/A-22s with $43 billion in total funding. However, USAF officials remain committed to obtaining 381 Raptors—the number the service needs to populate its 10 rotating air and space expeditionary forces.

USAF's No. 2 investment program is the C-17 airlifter, to which it devoted $3.7 billion in 2004. This will purchase 11 aircraft, down from the 15 being purchased this year, but the program is now on track for an eventual purchase of 180 C-17s.

Other top investment programs include:

- The F-35 Joint Strike Fighter. Next year, the Air Force will spend $2.2 billion to continue development of the triservice F-35. The USAF version, the F-35A, is scheduled to enter service in 2011. Although the Navy and Marine Corps have scaled back their F-35 requirements, based on a planned merger of their fighter squadrons, the Air Force still plans for a fleet of 1,763 F-35s.
- Science and technology. The service allocated $2.1 billion to S&T programs, a subset of the $20 billion earmarked for RDT&E. Officials stress the importance of S&T programs to help develop breakthrough technologies and consider S&T an investment program. The stealth aircraft capabilities and the Global Positioning System satellites critical to warfighting today were developed in defense laboratories. Today, DOD is emphasizing S&T programs that can quickly bring new capabilities to the field.

Overall, the Air Force says its top 20 investment programs will receive $21.8 billion next year. The list includes such high-profile systems as the Space Based Infrared System for missile launch warning; intercontinental ballistic missiles, which need upgrades and funding for some scheduled retirements; and the Evolved Expendable Launch Vehicle program, designed to ensure that USAF has reliable space launch capabilities.

Growth Areas

Some capabilities not at the top in terms of dollars are nonetheless receiving substantial new investment. These include some systems viewed as transformation in the medium term (such as the Transformational Communications System) or that have proved their effectiveness in recent operations (such as UAVs).

The Pentagon hopes to alleviate bandwidth shortages through TCS, which will utilize lasers for satellite communications. Funding for TCS will nearly quadruple next year, to $450 million.

Officials say the program will offer 10 times the capacity and 100 times the connectivity of existing military satellite communications systems. The first launch for the five-satellite TCS constellation is planned for 2009.

Also on the horizon is the Multisensor Command and Control Aircraft, the newly designated E-10A. The Air Force will spend roughly $300 million on E-10 development next year, so that C2 missions currently performed by aircraft such as the E-8 Joint STARS and AWACS can migrate to a single, modern platform.

Testifying before a Senate panel in February, Chief of Staff Gen. John P. Jumper said the E-10 will "horizontally integrate, at the machine level, manned, unmanned, and space platforms ... and it will be able to join in quickly with naval and land forces to do rapid targeting."

To that end, the service also seeks to end Joint STARS production at 17 aircraft and terminate the E-8 production line. The service did not budget for the line shutdown, however, and seeks $20 million through a separate request to meet this contractual obligation.

Unmanned systems are similarly due for substantial new investment. Officials have praised the Predator and Global Hawk UAVs for the ability to effectively perform missions too dangerous or mundane to be efficiently handled by manned aircraft.

After successful reconnaissance and strike missions in the war on terrorism, the Air Force is moving ahead quickly with plans to acquire the weaponized Predator A, designated MQ-1. Roughly $275 million will be spent on the multipurpose drones next year, up from $174 million this year.

The cost of developing a larger, higher-flying, jet-powered version, called Predator B and designated MQ-9, means USAF will purchase only 14 Predators in 2004 (25 are being bought this year). Of the 14, 10 will be B models and four the less-capable Predator As.

Both the MQ-1 and MQ-9 will carry missiles as well as conduct reconnaissance. To arm them, USAF will spend $23 million on 280 Hellfire missiles.

Jumper told the Senators the MQ-9 Predator B will provide "great leverage" on the battlefield. According to DOD's "Unmanned Aerial Vehicles Roadmap," it will be able to carry up to 10 missiles and loiter above a combat zone for 30 hours.

The Air Force is similarly pressing ahead with plans to develop an even more capable system, the X-45 unmanned combat air vehicle. In 2004, USAF will spend $161 million on UCAV, a joint program with the Defense Advanced Research Projects Agency, to create an unmanned aircraft designed specifically for attack missions.

The Pentagon recently announced its intention to develop a C model X-45 that would be larger than the B model Boeing is currently building. There are also plans to create a joint UCAV program office, as it did for the JSF program, to integrate separate Air Force and Navy UCAV efforts. It is unknown, however, whether an X-45C can meet requirements for both services.

USAF is also moving forward on the Global Hawk high-altitude, endurance UAV, designated RQ-4. Officials describe it as a "key transformation program providing persistent theater surveillance." Funding for RQ-4s will increase more than $100 million, to $610 million. The funding boost will enable USAF to purchase four of the aircraft, as opposed to three this year.

Precision munition stocks are also being bolstered. In 2004, the military services will spend $1.7 billion to purchase more than 45,000 precision munitions. At least 20,000 of those will be Joint Direct Attack Munitions for the Air Force, at a cost of $427 million.

Both the Air Force and the Navy had planned to increase JDAM production dramatically even before the war with Iraq began, as the near-precision bombs are in constant demand.

For 2005, PGM purchases—not including the weapons needed to replenish those used in Iraq and Afghanistan—will be even greater than in 2004. JDAM kits, which cost roughly $21,000 each, convert traditional gravity bombs into highly accurate, satellite-guided weapons, enabling them to destroy select targets at minimal cost.

What's Not There

According to a list of unfunded requirements the service sent to Congress in February, USAF's most urgent unfunded need is in depot maintenance.

Depot purchased equipment maintenance funding is the lowest it has been over the past 10 years. Simply to restore it to its traditional level, USAF would need an additional $516 million. Without the money, service officials explained, maintenance backlogs could develop, taking critical weapons systems out of service for extended periods.

Gen. Robert H. Foglesong, USAF's vice chief of staff, said the Air Force has "taken some risks" with DPEM funding. The shortage developed primarily due to the rising costs of maintaining aging systems, he told a House panel in March. Deferring maintenance on engines and aircraft could affect readiness, emphasized Foglesong.

One of the most contentious aspects of the 2004 budget is that it contains no money for either a lease or purchase of aerial refueling aircraft. USAF needs new tankers because its KC-135s are more than 40 years old and are becoming unacceptably difficult to maintain. The Air Force has proposed plans either to lease or purchase 100 Boeing 767s that would be converted into tankers.

USAF officials say they would prefer to lease the aircraft, because it would allow more new tankers to enter service sooner. However, some Congressmen and Administration officials believe purchasing the aircraft would be far less expensive in the long run. At a March hearing, Arizona Sen. John McCain (R) went so far as to call the proposed lease a "military–industrial rip-off."

When the war in Iraq began, competing lease and buy proposals were still being reviewed at the Pentagon, with no decision in sight. The service did, however, include options for either a lease or purchase in the unfunded priorities list it submitted to Congress.

The lease option would require $132 million to jump-start a lease agreement for 67 tankers by 2009 and all 100 by 2011.

Alternately, $154 million could accelerate a KC-135 replacement program, enabling up to 16 tankers to be acquired by 2009, with the full fleet delivered by 2014.

Another contentious issue in the budget is the decision by USAF leadership to forego a request to boost manpower. Senior officials said they will not push for an increase in end strength until they have a better understanding of what the new steady-state requirements will be.

Jumper said the Air Force has identified some 12,000 military members in positions that actually do not require uniformed personnel, so those individuals could be realigned to address some of the most critical manpower shortages. Those positions could be filled by civilians or contracted out.

In a related manpower review, the service identified another 12,000 airmen working outside the Air Force, either in joint positions or with defense agencies. Roche told a Senate panel in March that the service would try to return half of those airmen to Air Force positions. "We're trying to bring at least 6,000 of them back in," said Roche. (In an interview, Brig. Gen. William P. Ard, USAF's director of manpower and organization, said 166 of them had already returned to the Air Force, and 111 more are on their way back.)

According to service leaders, the Air Force contributes some 36 percent of the military members working in assignments outside the service, although it only constitutes 26 percent of overall military end strength.

One of USAF's most critical personnel shortages is in security forces. Force protection requirements skyrocketed after the 9/11 attacks, and to meet the new demands, USAF temporarily has turned to the Army for help. Nearly 9,000 Army National Guardsmen were brought in to defend Air Force bases and relieve Air National Guardsmen who would otherwise have gone into a second year of mobilization.

Officials note it will take time to recruit and train new forces for the stressed career fields even when additional manpower slots become available. In the meantime, USAF seeks $141 million through its "wish list" to begin investing in anti-terrorism and force protection technologies that could reduce the demand for manpower in security.

The bottom line: Both Roche and Jumper maintain that the personnel shortage problem must first be attacked by shifting resources and adding technology. As Roche told Congress, "As of right now, we do not see asking for an end strength increase." ■

USAF Almanac

USAF photo by SSgt D. Myles Cullen

ac 2003

About the Almanac

On the following pages appears a variety of information and statistical material about the US Air Force—its people, organization, equipment, funding, activities, bases, and heroes. This "Almanac" section was compiled by the staff of *Air Force* Magazine. We especially acknowledge the help of the Secretary of the Air Force Office of Public Affairs, Air Staff agencies, major commands, and reserve components in bringing up to date the comparable data from last year's Almanac.

A word of caution: Personnel figures that appear in this section in different forms will not always agree (nor will they always agree with figures in major command, field operating agency, and direct reporting unit reports or in the "Guide to USAF Installations Worldwide") because of different cutoff dates, rounding, differing methods of reporting, or categories of personnel that are excluded in some cases. These figures do illustrate trends, however, and may be helpful in placing force fluctuations in perspective.

—THE EDITORS

Photo © Tom and Pat Leeson

Edited by **Tamar A. Mehuron,** Associate Editor

The Air Force in Facts and Figures

2003 USAF Almanac

Structure of the Force

How the Air Force Is Organized

There is considerable variation in how the major commands and subordinate units of the Air Force are organized. This overview describes both the typical organization chain and USAF's Expeditionary Air and Space Force.

The **Department of Defense (DOD)** is a Cabinet agency headed by the Secretary of Defense. It was created in 1947 to consolidate preexisting military agencies—the War Department and the Navy Department. Subordinate to DOD are the three military departments (Army, Navy, and Air Force), each headed by a civilian secretary.

The **Joint Chiefs of Staff (JCS)** constitute the corporate military leadership of DOD. The chairman and vice chairman of the JCS serve full-time in their positions. The service chiefs are the military heads of their respective services, although JCS responsibilities take precedence.

The **Department of the Air Force** is headed by the Secretary of the Air Force, who is supported by a staff called the Secretariat. The Chief of Staff, USAF, heads the Air Staff, and the military heads of the major commands report to the Chief of Staff.

Most units of the Air Force are assigned to one of the **major commands.** Major commands are headed by general officers and have broad functional responsibilities. Commands may be divided into **numbered air forces.**

The fundamental unit of the working Air Force is the **wing.** The typical air force base is built around a wing. Some wings are commanded by a general officer, while others are headed by a colonel. An objective wing contains an **operations group,** which includes aircrews, intelligence units, and others; a **maintenance group,** which includes maintenance squadrons; a **support group,** which includes such functions as civil engineers, logistics readiness, and security forces; and a **medical group.**

Most individual officers and airmen are assigned to a **squadron,** which may be composed of several **flights.**

In addition to these units, there are numerous others, including centers, field operating agencies, and direct reporting units.

The Expeditionary Air and Space Force

To help solve chronic deployment problems stemming from back-to-back contingencies and long-standing operations, the Air Force developed the Expeditionary Air and Space Force concept. The EAF groups USAF's power projection and support forces into 10 "buckets of capability," called Air and Space Expeditionary Forces **(AEF).** The 10 AEFs are divided into five pairs. All five pairs of AEFs rotate through a 15-month cycle, which is divided into five 90-day periods. During each 90-day period, a different pair of AEFs is vulnerable to deployment. Each standard AEF has a lead combat wing, plus various active duty, ANG, and AFRC Combat Air Forces **(CAF)** units tasked to support it.

Each AEF rotation cycle also features on-call forces, headed by two active duty Air Expeditionary Wings **(AEWs),** and Mobility Air Forces **(MAF),** headed by a lead mobility wing. The designated AEWs, supported by on-call ANG and AFRC units, provide additional combat capability to handle pop-up crises. The AEWs and MAFs operate on 120-day rotational periods. (USAF announced in 2002 that it planned to merge later this year the forces of its two AEWs into the 10 AEFs to help cover operational demands.)

USAF's critical enablers, including battle management, combat search and rescue, command and control, and reconnaissance assets, are not assigned to a particular AEF, since these low-density, high-demand **(LD/HD)** forces are in near constant use.

EAF The Expeditionary Air and Space Force

AEF Rotation Cycle, Standard Combat Air Forces (plan as of Sept. 30, 2002)

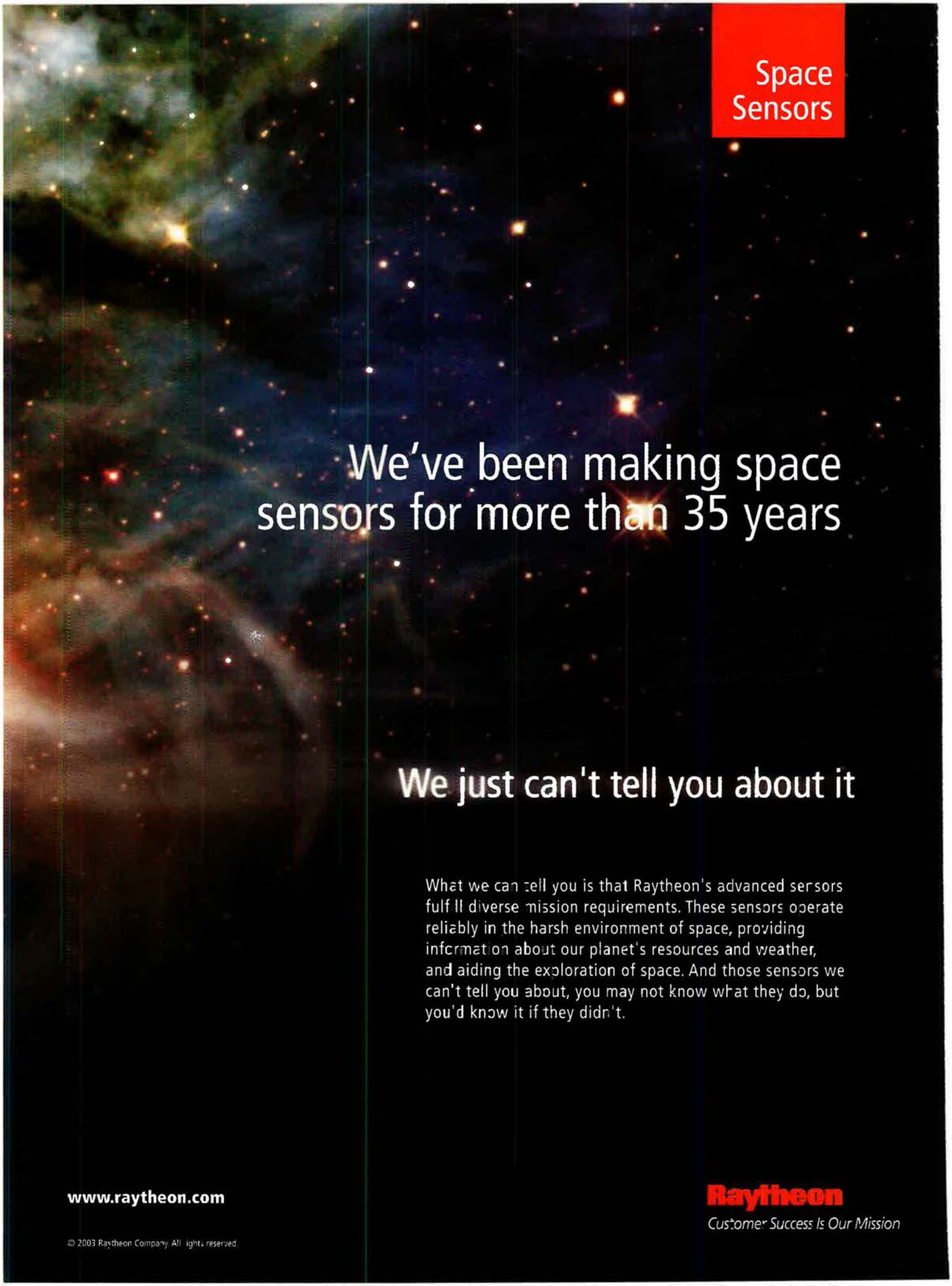
	March 1, 2002–May 31, 2002		June 1, 2002–Aug. 31, 2002		Sept. 1, 2002–Nov. 30, 2002		Dec. 1, 2002–Feb. 28, 2003		March 1, 2003–May 31, 2003	
	AEF 1	**AEF 2**	**AEF 3**	**AEF 4**	**AEF 5**	**AEF 6**	**AEF 7**	**AEF 8**	**AEF 9**	**AEF 10**
Lead CAF Wing	388th FW	7th BW	366th Wing*	48th FW	355th Wing	20th FW	27th FW	28th BW	2nd BW	1st FW
Active Squadrons	12th FS 74th FS 79th FS 96th BS 421st FS	9th BS 23rd FS 58th FS 494th FS	4th FS 19th FS 75th FS 77th FS 90th FS 96th BS	9th BS 60th FS 492nd FS 493rd FS	13th FS 23rd BS 44th FS 354th FS 510th FS	27th FS 78th FS	14th FS 20th BS 67th FS 524th FS 555th FS	37th BS 55th FS 94th FS	20th BS 22nd FS 81st FS	18th FS 34th FS 34th BS 71st FS 355th FS 523rd FS
ANG Units	115th FW 183rd FW 192nd FW 150th FW			169th FW	174th FW 122nd FW 144th FW	119th FW 148th FW 188th FW 120th FW 132nd FW 138th FW 180th FW 116th BW 184th BW	104th FW 111th FW 175th Wing 110th FW 124th Wing 103rd FW	114th FW 181st FW 127th Wing	102nd FW 113th Wing 125th FW 131st FW 140th Wing 142nd FW 147th FW 154th Wing 158th FW 159th FW 177th FW 187th FW	
AFRC Units		442nd FW 926th FW					917th Wing	301st FW 419th FW 482nd FW		
Aircraft	A-10 B-52 F-15C F-16C F-16CG F-16CJ KC-135	A-10 B-1B F-15C F-15E F-16CJ KC-135	A-10 B-52 F-15C F-15E F-16CG F-16CJ	B-1B F-15C F-15E F-16CJ KC-10	A-10 B-52 F-15C F-16C F-16CG F-16CJ KC-10	B-1B F-15C F-16C F-16CG F-16CJ KC-10	A-10 B-52 F-15C F-16CG F-16CJ KC-10	B-1B F-15C F-16C F-16CG F-16CJ KC-10	A-10 B-52 F-15C F-16C F-16CG F-16CJ KC-10	A-10 B-1B F-15C F-16C F-16CG KC-10

Note: The current AEF rotation cycle is designated "Cycle 3." Cycle 1 covered the period Oct. 1, 1999–Nov. 31, 2000. Cycle 2 covered the period Dec. 1, 2000–Feb. 28, 2002.
*The 366th Wing, normally an on-call wing, switched with 3rd Wing to lead AEF 3 for Cycle 3. (The 366th Wing is now the 366th Fighter Wing.) This information does not reflect a realignment of AEF forces for Operation Iraqi Freedom.

AEF Rotation Cycle, On-Call Combat Air Forces (plan as of Sept. 30, 2002)

	Dec–Jan–Feb–Mar 2001–02	**Apr–May–Jun–Jul 2002**	**Aug–Sep–Oct–Nov 2002**	**Dec–Jan–Feb–Mar 2002–03**	**Apr–May–Jun–Jul 2003**
On-Call AEW	4th FW	3rd Wing*	4th FW	366th Wing	4th FW
Active	9th FS 325th BS 335th FS 336th FS 522nd FS 91st ARS 99th ARS	8th FS 389th FS 390th FS 391st FS 393rd BS 91st ARS	9th FS 325th BS 335th FS 336th FS 522nd FS 99th ARS	8th FS 389th FS 390th FS 391st FS 393rd BS	9th FS 325th BS 335th FS 336th FS 522nd FS 91st ARS
Aircraft	B-2 F-15E F-16C F-117 KC-135	B-2 F-15C F-15E F-16CJ F-117 KC-135	B-2 F-15E F-16C F-117 KC-135	B-2 F-15C F-15E F-16CJ F-117	B-2 F-15E F-16C F-117 KC-135

*The 3rd Wing normally covers AEF 3 but switched with 366th Wing for Cycle 3.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AEF Rotation Cycle, Mobility Air Forces (plan as of Sept. 30, 2002)

	Dec–Jan–Feb–Mar 2001–02	Apr–May–Jun–Jul 2002	Aug–Sep–Oct–Nov 2002	Dec–Jan–Feb–Mar 2002–03	Apr–May–Jun–Jul 2003
Lead MAF Wing	92nd ARW	60th AMW	305th AMW	60th AMW	305th AMW
Active	314th AG	43rd Wing	317th AG	43rd Wing	40th AG
ANG	118th AW 145th AW	118th AW 123rd AW 143rd AW 156th AW	118th AW 166th AW	145th AW 167th AW 179th AW	146th AW 176th AW 182nd AW
AFRC	913th AW 934th AW	302nd AW 910th AW 914th AW	440th AW 908th AW 910th AW	910th AW 911th AW 913th AW 934th AW	440th AW 908th AW 910th AW 914th AW
Aircraft	C-130	C-130	C-130	C-130	C-130

AEF Low-Density, High-Demand Forces* (plan as of Sept. 30, 2002)

Unit	Aircraft	Mission	Home Base
11th RS	RQ-1 Predator	Reconnaissance	Indian Springs AFAF, Nev.
12th ACCS	E-8 Joint STARS	Surveillance/battle management/C2	Robins AFB, Ga.
15th RS	RQ-1 Predator	Reconnaissance	Indian Springs AFAF, Nev.
16th ACCS	E-8 Joint STARS	Surveillance/battle management/C2	Robins AFB, Ga.
17th RS	RQ-1 Predator	Reconnaissance	Indian Springs AFAF, Nev.
38th RS	RC-135 Rivet Joint	Electronic reconnaissance	Offutt AFB, Neb.
41st RQS	HH-60	Combat search & rescue	Moody AFB, Ga.
41st ECS	EC-130H Compass Call	Electronic warfare	Davis–Monthan AFB, Ariz.
42nd ACCS	EC-130E ABCCC	Airborne C2	Davis–Monthan AFB, Ariz.
43rd ECS	EC-130H Compass Call	Electronic warfare	Davis–Monthan AFB, Ariz.
66th RQS	HH-60	CSAR	Nellis AFB, Nev.
71st RQS	HC-130	Aerial refueling/CSAR	Moody AFB, Ga.
99th RS	U-2	Reconnaissance	Beale AFB, Calif.
603rd ACS	—	Air control	Aviano AB, Italy
606th ACS	—	Air control	Spangdahlem AB, Germany
726th ACS	—	Air control	Mountain Home AFB, Idaho
728th ACS	—	Air control	Eglin AFB, Fla.
729th ACS	—	Air control	Hill AFB, Utah
963rd AACS	E-3 AWACS	Airborne warning and control	Tinker AFB, Okla.
964th AACS	E-3 AWACS	Airborne warning and control	Tinker AFB, Okla.
965th AACS	E-3 AWACS	Airborne warning and control	Tinker AFB, Okla.

*ANG and AFRC forces provide LD/HD augmentation.

Senior enlisted members of the 447th Air Expeditionary Group's civil engineering unit build up a bare base for use during coalition operations in Iraq.

USAF photo by SrA. Tammy L. Grider

Lt. Col. Matt Meloy, 67th Fighter Squadron, Kadena AB, Japan, adjusts his visor as he prepares to taxi for takeoff in his F-15. Two of three American flags he is carrying are visible at the front of the canopy. (Meloy is also pictured in the photo on p. 34–35.

USAF photo by SSgt. D. Myles Cullen

Home Bases of AEF Rotation Units

Lead/On-Call Wings

1st FW	Langley AFB, Va
2nd BW	Barksdale AFB, La.
3rd Wing	Elmendorf AFB, Alaska
4th FW	Seymour Johnson AFB, N.C.
7th BW	Dyess AFB, Tex.
20th FW	Shaw AFB, S.C.
27th FW	Cannon AFB, N.M.
28th BW	Ellsworth AFB, S.D.
48th FW	RAF Lakenheath, UK
60th AMW	Travis AFB, Calif.
92nd ARW	Fairchild AFB, Wash.
305th AMW	McGuire AFB, N.J.
355th Wing	Davis–Monthan AFB, Ariz.
366th Wing	Mountain Home AFB, Idaho
388th FW	Hill AFB, Utah

Active Units (not a lead wing unit)

8th FS	Holloman AFB, N.M.
9th FS	Holloman AFB, N.M.
13th FS	Misawa AB, Japan
14th FS	Misawa AB, Japan
18th FS	Eielson AFB, Alaska
22nd FS	Spangdahlem AB, Germany
23rd FS	Spangdahlem AB, Germany
40th AG	Pope AFB, N.C.
43rd Wing	Pope AFB, N.C.
44th FS	Kadena AB, Japan
58th FS	Eglin AFB, Fla.
60th FS	Eglin AFB, Fla.
67th FS	Kadena AB, Japan
74th FS	Pope AFB, N.C.
75th FS	Pope AFB, N.C.
81st FS	Spangdahlem AB, Germany
91st ARS	MacDill AFB, Fla.
99th ARS	Robins AFB, Ga.
314th AG	Little Rock AFB, Ark.
317th AG	Dyess AFB, Tex.
325th BS	Whiteman AFB, Mo.
393rd BS	Whiteman AFB, Mo.
510th FS	Aviano AB, Italy
522nd FS	Cannon AFB, N.M.
555th FS	Aviano AB, Italy
963rd AACS	Tinker AFB, Okla.
964th AACS	Tinker AFB, Okla.
965th AACS	Tinker AFB, Okla.

Air National Guard

102nd FW	Otis ANGB, Mass.
103rd FW	Bradley Arpt., Conn.
104th FW	Barnes Arpt., Mass.
110th FW	W.K. Kellogg Arpt., Mich.
111th FW	NAS JRB Willow Grove, Pa.
113th Wing	Andrews AFB, Md.
114th FW	Joe Foss Field, S.D.
115th FW	Truax Field, Wis.
116th BW	Robins AFB, Ga.
118th AW	Nashville Arpt., Tenn.
119th FW	Hector Arpt., N.D.
120th FW	Great Falls Arpt., Mont.
122nd FW	Fort Wayne Arpt., Inc.
123rd AW	Louisville Arpt./AGS, Ky.
124th Wing	Boise Air Terminal, Idaho
125th FW	Jacksonville Arpt., Fla.
127th Wing	Selfridge ANGB, Mich.
131st FW	Lambert–St. Louis Arpt., Mo.
132nd FW	Des Moines Arpt., Iowa
138th FW	Tulsa Arpt., Okla.
140th Wing	Buckley AFB, Colo.
142nd FW	Portland Arpt., Ore.
143rd AW	Quonset State Arpt., R.I.
144th FW	Fresno Yosemite Arpt., Calif.
145th AW	Charlotte/Douglas Arpt., S.C.
146th AW	NAS Pt. Mugu, Calif.
147th FW	Ellington Field, Tex.
148th FW	Duluth Arpt., Minn.
150th FW	Kirtland AFB, N.M.
154th Wing	Hickam AFB, Hawaii
156th AW	Luis Munoz Marin Arpt., Puerto Rico
158th FW	Burlington Arpt., Vt.
159th FW	NAS JRB New Orleans JRB, La.
166th AW	New Castle County Arpt., Del.
167th AW	Eastern W. Va. Arpt., W.Va.
169th FW	McEntire ANGS, S.C.
174th FW	Hancock Field, N.Y.
175th Wing	Martin State Arpt., Md.
176th AW	Kulis ANGB, Alaska
177th FW	Atlantic City Arpt., N.J.
179th AW	Mansfield Lahm Arpt., Ohio
180th FW	Toledo Express Arpt., Ohio
181st FW	Hulman Arpt., Ind.
182nd AW	Greater Peoria Arpt., Ill.
183rd FW	Capital Arpt., Ill.
184th BW	McConnell AFB, Kan.
187th FW	Dannelly Field, Ala.
188th FW	Fort Smith Arpt., Ark.
192nd FW	Richmond Arpt., Va.

Air Force Reserve Command

301st FW	NAS JRB Fort Worth, Tex.
302nd AW	Peterson AFB, Colo.
419th FW	Hill AFB, Utah
440th AW	General Mitchell Arpt., Wis.
442nd FW	Whiteman AFB, Mo.
482nd FW	Homestead ARB, Fla.
908th AW	Maxwell AFB, Ala.
910th AW	Youngstown–Warren Arpt./ARS, Ohio
911th AW	Pittsburgh Arpt., Pa.
913th AW	NAS JRB Willow Grove, Pa.
914th AW	Niagara Falls Arpt./ARS, N.Y.
917th Wing	Barksdale AFB, La.
926th FW	NAS JRB New Orleans, La.
934th AW	Minneapolis–St. Paul Arpt., Minn.

Acronyms

AACS	Airborne Air Control Squadron
ABCCC	Airborne Battlefield Command & Control Center
ACS	Air Control Squadron
ACCS	Airborne Command & Control Squadron
AG	Airlift Group
AMW	Air Mobility Wing
ARS	Air Refueling Squadron
ARW	Air Refueling Wing
AW	Airlift Wing
AWACS	Airborne Warning and Control System
BS	Bomb Squadron
BW	Bomb Wing
ECS	Electronic Combat Squadron
FS	Fighter Squadron
FW	Fighter Wing
RS	Reconnaissance Squadron
RQS	Rescue Squadron
STARS	Surveillance Target Attack Radar System

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Designation	Commander (at highest rank)	Dates of Service
Aeronautical Division, US Signal Corps	**Chief, Aeronautical Division**	
Aug. 1, 1907–July 18, 1914	Capt. Charles deForest Chandler	Aug. 1, 1907–June 30, 1910
	Capt. Arthur S. Cowan	July 1, 1910–June 19, 1911
	Capt. Charles deForest Chandler	June 20, 1911–Sept. 9, 1913
	Maj. Samuel Reber	Sept. 10, 1913–July 17, 1914
Aviation Section, US Signal Corps	**Chief, Aviation Section**	
July 18, 1914–May 20, 1918	Lt. Col. Samuel Reber	July 18, 1914–May 5, 1916
	Lt. Col. George O. Squier	May 20, 1916–Feb. 19, 1917
	Lt. Col. John B. Bennet	Feb. 19, 1917–May 20, 1918
Division of Military Aeronautics, Secretary of War	**Director of Military Aeronautics**	
May 20, 1918–May 24, 1918	Maj. Gen. William L. Kenly (Kept same title three months into absorption by Air Service)	May 20, 1918–August 1918
Army Air Service	**Director of Air Service**	
May 24, 1918–July 2, 1926	John D. Ryan	Aug. 28, 1918–Nov. 27, 1918
	Maj. Gen. Charles T. Menoher	Jan. 2, 1919–June 4, 1920
	Chief of Air Service	
	Maj. Gen. Charles T. Menoher	June 4, 1920–Oct. 4, 1921
	Maj. Gen. Mason M. Patrick	Oct. 5, 1921–July 2, 1926
Army Air Corps	**Chief of Air Corps**	
July 2, 1926–Sept. 18, 1947[a]	Maj. Gen. Mason M. Patrick	July 2, 1926–Dec. 13, 1927
	Maj. Gen. James E. Fechet	Dec. 14, 1927–Dec. 19, 1931
	Maj. Gen. Benjamin D. Foulois	Dec. 20, 1931–Dec. 21, 1935
	Maj. Gen. Oscar Westover	Dec. 22, 1935–Sept. 21, 1938
	Maj. Gen. Henry H. Arnold	Sept. 29, 1938–June 20, 1941
Army Air Forces	**Chief, Army Air Forces**	
June 20, 1941–Sept. 18, 1947	Lt. Gen. Henry H. Arnold	June 20, 1941–March 9, 1942
	Commanding General, AAF	
	Gen. of the Army Henry H. Arnold	March 9, 1942–Feb. 9, 1946
	Gen. Carl A. Spaatz	Feb. 9, 1946–Sept. 26, 1947
United States Air Force	**Chief of Staff, USAF**	
Sept. 18, 1947	Gen. Carl A. Spaatz	Sept. 26, 1947–April 29, 1948

The title General of the Army for Henry H. Arnold was changed to General of the Air Force by an Act of Congress May 7, 1949. The position of Chief of Staff was established by a DOD-approved Army-Air Force Transfer Order issued Sept. 28, 1947.

[a]The Army Air Corps became a subordinate element of the Army Air Forces June 20, 1941. Since the Army Air Corps had been established by statute in 1926, its disestablishment required an Act of Congress, which did not take place until 1947. Between March 9, 1942, and Sept. 18, 1947, the Army Air Corps continued to exist as a combatant arm, and personnel of the Army Air Forces were still assigned to the Army Air Corps.

USAF Leaders Through the Years

Secretaries of the Air Force

Stuart Symington	Sept. 18, 1947	April 24, 1950
Thomas K. Finletter	April 24, 1950	Jan. 20, 1953
Harold E. Talbott	Feb. 4, 1953	Aug. 13, 1955
Donald A. Quarles	Aug. 15, 1955	April 30, 1957
James H. Douglas Jr.	May 1, 1957	Dec. 10, 1959
Dudley C. Sharp	Dec. 11, 1959	Jan. 20, 1961
Eugene M. Zuckert	Jan. 24, 1961	Sept. 30, 1965
Harold Brown	Oct. 1, 1965	Feb. 15, 1969
Robert C. Seamans Jr.	Feb. 15, 1969	May 14, 1973
John L. McLucas (acting)	May 15, 1973	July 18, 1973
John L. McLucas	July 18, 1973	Nov. 23, 1975
James W. Plummer (acting)	Nov. 24, 1975	Jan. 1, 1976
Thomas C. Reed	Jan. 2, 1976	April 6, 1977
John C. Stetson	April 6, 1977	May 18, 1979
Hans Mark (acting)	May 18, 1979	July 26, 1979
Hans Mark	July 26, 1979	Feb. 9, 1981
Verne Orr	Feb. 9, 1981	Nov. 30, 1985
Russell A. Rourke	Dec. 9, 1985	April 7, 1986
Edward C. Aldridge Jr. (acting)	April 8, 1986	June 8, 1986
Edward C. Aldridge Jr.	June 9, 1986	Dec. 16, 1988
James F. McGovern (acting)	Dec. 16, 1988	April 29, 1989
John J. Welch Jr. (acting)	April 29, 1989	May 21, 1989
Donald B. Rice	May 22, 1989	Jan. 20, 1993
Michael B. Donley (acting)	Jan. 20, 1993	July 13, 1993
Gen. Merrill A. McPeak (acting)	July 14, 1993	Aug. 5, 1993
Sheila E. Widnall	Aug. 6, 1993	Oct. 31, 1997
F. Whitten Peters (acting)	Nov. 1, 1997	July 30, 1999
F. Whitten Peters	July 30, 1999	Jan. 20, 2001
Lawrence J. Delaney (acting)	Jan. 20, 2001	June 1, 2001
James G. Roche	June 1, 2001	

USAF Chiefs of Staff

Gen. Carl A. Spaatz	Sept. 26, 1947	April 29, 1948
Gen. Hoyt S. Vandenberg	April 30, 1948	June 29, 1953
Gen. Nathan F. Twining	June 30, 1953	June 30, 1957
Gen. Thomas D. White	July 1, 1957	June 30, 1961
Gen. Curtis E. LeMay	June 30, 1961	Jan. 31, 1965
Gen. John P. McConnell	Feb. 1, 1965	July 31, 1969
Gen. John D. Ryan	Aug. 1, 1969	July 31, 1973
Gen. George S. Brown	Aug. 1, 1973	June 30, 1974
Gen. David C. Jones	July 1, 1974	June 20, 1978
Gen. Lew Allen Jr.	July 1, 1978	June 30, 1982
Gen. Charles A. Gabriel	July 1, 1982	June 30, 1986
Gen. Larry D. Welch	July 1, 1986	June 30, 1990
Gen. Michael J. Dugan	July 1, 1990	Sept. 17, 1990
Gen. John Michael Loh (acting)	Sept. 18, 1990	Oct. 29, 1990
Gen. Merrill A. McPeak	Oct. 30, 1990	Oct. 25, 1994
Gen. Ronald R. Fogleman	Oct. 26, 1994	Sept. 1, 1997
Gen. Ralph E. Eberhart (acting)	Sept. 2, 1997	Oct. 5, 1997
Gen. Michael E. Ryan	Oct. 6, 1997	Sept. 6, 2001
Gen. John P. Jumper	Sept. 6, 2001	

USAF Vice Chiefs of Staff

Gen. Hoyt S. Vandenberg	Oct. 10, 1947	April 28, 1948
Gen. Muir S. Fairchild	May 27, 1948	March 17, 1950
Lt. Gen. Lauris Norstad (acting)	May 22, 1950	Oct. 9, 1950
Gen. Nathan F. Twining	Oct. 10, 1950	June 29, 1953
Gen. Thomas D. White	June 30, 1953	June 30, 1957
Gen. Curtis E. LeMay	July 1, 1957	June 30, 1961
Gen. Frederic H. Smith Jr.	July 1, 1961	June 30, 1962
Gen. Willliam F. McKee	July 1, 1962	July 31, 1964
Gen. John P. McConnell	Aug. 1, 1964	Jan. 31, 1965
Gen. William H. Blanchard	Feb. 19, 1965	May 31, 1966
Lt. Gen. Hewitt T. Wheless (acting)	June 13, 1966	July 31, 1966
Gen. Bruce K. Holloway	Aug. 1, 1966	July 31, 1968
Gen. John D. Ryan	Aug. 1, 1968	July 31, 1969
Gen. John C. Meyer	Aug. 1, 1969	April 30, 1972
Gen. Horace M. Wade	May 1, 1972	Oct. 31, 1973
Gen. Richard H. Ellis	Nov. 1, 1973	Aug. 18, 1975
Gen. William V. McBride	Sept. 1, 1975	March 31, 1978
Gen. Lew Allen Jr.	April 1, 1978	June 30, 1978
Gen. James A. Hill	July 1, 1978	Feb. 29, 1980
Gen. Robert C. Mathis	March 1, 1980	May 31, 1982
Gen. Jerome F. O'Malley	June 1, 1982	Oct. 5, 1983
Gen. Lawrence A. Skantze	Oct. 6, 1983	July 31, 1984
Gen. Larry D. Welch	Aug. 1, 1984	July 31, 1985
Gen. John L. Piotrowski	Aug. 1, 1985	Jan. 31, 1987
Gen. Monroe W. Hatch Jr.	Feb. 1, 1987	May 24, 1990
Gen. John Michael Loh	May 25, 1990	March 25, 1991
Gen. Michael P.C. Carns	May 16, 1991	July 28, 1994
Gen. Thomas S. Moorman Jr.	July 29, 1994	July 11, 1997
Gen. Ralph E. Eberhart	July 11, 1997	May 26, 1999
Gen. Lester L. Lyles	May 27, 1999	April 17, 2000
Gen. John W. Handy	April 17, 2000	Nov. 5, 2001
Gen. Robert H. Foglesong	Nov. 5, 2001	

Chief Master Sergeants of the Air Force

CMSAF Paul W. Airey	April 3, 1967	July 31, 1969
CMSAF Donald L. Harlow	Aug. 1, 1969	Sept. 30, 1971
CMSAF Richard D. Kisling	Oct. 1, 1971	Sept. 30, 1973
CMSAF Thomas N. Barnes	Oct. 1, 1973	July 31, 1977
CMSAF Robert D. Gaylor	Aug. 1, 1977	July 31, 1979
CMSAF James M. McCoy	Aug. 1, 1979	July 31, 1981
CMSAF Arthur L. Andrews	Aug. 1, 1981	July 31, 1983
CMSAF Sam E. Parish	Aug. 1, 1983	June 30, 1986
CMSAF James C. Binnicker	July 1, 1986	July 31, 1990
CMSAF Gary R. Pfingston	Aug. 1, 1990	Oct. 25, 1994
CMSAF David J. Campanale	Oct. 26, 1994	Nov. 4, 1996
CMSAF Eric W. Benken	Nov. 5, 1996	July 30, 1999
CMSAF Frederick J. Finch	July 30, 1999	July 1, 2002
CMSAF Gerald R. Murray	July 1, 2002	

Air Combat Command

Gen. John Michael Loh	June 1, 1992	June 22, 1995
Gen. Joseph W. Ralston	June 23, 1995	Feb. 27, 1996
Lt. Gen. Brett M. Dula (acting)	Feb. 28, 1996	April 4, 1996
Gen. Richard E. Hawley	April 5, 1996	June 11, 1999
Gen. Ralph E. Eberhart	June 11, 1999	Feb. 8, 2000
Gen. John P. Jumper	Feb. 8, 2000	Sept. 6, 2001
Lt. Gen. Donald G. Cook (acting)	Sept. 6, 2001	Nov. 14, 2001
Gen. Hal M. Hornburg	Nov. 14, 2001	

Air (Aerospace) Defense Command

Lt. Gen. George E. Stratemeyer	March 27, 1946	Nov. 30, 1948
Maj. Gen. Gordon P. Saville	Dec. 1, 1948	Sept. 1, 1949
Lt. Gen. Ennis C. Whitehead	Jan. 1, 1951	Aug. 24, 1951
Gen. Benjamin W. Chidlaw	Aug. 25, 1951	May 31, 1955
Maj. Gen. Frederic H. Smith Jr. (acting)	June 1, 1955	July 19, 1955
Gen. Earle E. Partridge	July 20, 1955	Sept. 16, 1956
Lt. Gen. Joseph H. Atkinson	Sept. 17, 1956	Feb. 28, 1961
Lt. Gen. Robert M. Lee	March 1, 1961	July 5, 1963
Maj. Gen. Robert H. Terrill (acting)	July 6, 1963	July 31, 1963
Lt. Gen. Herbert B. Thatcher	Aug. 1, 1963	July 31, 1967
Lt. Gen. Arthur C. Agan Jr.	Aug. 1, 1967	Feb. 28, 1970
Lt. Gen. Thomas K. McGehee	March 1, 1970	June 30, 1973
Gen. Seth J. McKee	July 1, 1973	Sept. 30, 1973
Gen. Lucius D. Clay Jr.	Oct. 1, 1973	Aug. 31, 1975
Gen. Daniel James Jr.	Sept. 1, 1975	Dec. 6, 1977
Gen. James E. Hill	Dec. 6, 1977	Dec. 31, 1979
Gen. James V. Hartinger	Jan. 1, 1980	March 31, 1980

Established March 21, 1946. Reassigned to Continental Air Command (1948). Discontinued July 1, 1950. Re-established as a major command and organized Jan. 1, 1951. Redesignated Aerospace Defense Command Jan. 15, 1968. Inactivated March 31, 1980.

Air Education and Training Command

Lt. Gen. John K. Cannon	April 13, 1946	Oct. 13, 1948
Lt. Gen. Robert W. Harper	Oct. 14, 1948	June 30, 1954
Maj. Gen. Glenn O. Barcus (acting)	July 1, 1954	July 25, 1954
Lt. Gen. Charles T. Myers	July 26, 1954	July 31, 1958
Lt. Gen. Frederic H. Smith Jr.	Aug. 1, 1958	July 31, 1959
Lt. Gen. James E. Briggs	Aug. 1, 1959	July 31, 1963
Lt. Gen. Robert W. Burns	Aug. 1, 1963	Aug. 10, 1964
Lt. Gen. William W. Momyer	Aug. 11, 1964	June 30, 1966
Lt. Gen. Sam Maddux Jr.	July 1, 1966	Aug. 30, 1970
Lt. Gen. George B. Simler	Sept. 1, 1970	Sept. 9, 1972
Lt. Gen. William V. McBride	Sept. 9, 1972	Aug. 31, 1974
Lt. Gen. George H. McKee	Sept. 1, 1974	Aug. 28, 1975
Gen. John W. Roberts	Aug. 29, 1975	April 1, 1979
Gen. Bennie L. Davis	April 1, 1979	July 28, 1981
Gen. Thomas M. Ryan Jr.	July 29, 1981	June 22, 1983
Gen. Andrew P. Iosue	June 23, 1983	Aug. 27, 1986
Lt. Gen. John A. Shaud	Aug. 28, 1986	June 5, 1988
Lt. Gen. Robert C. Oaks	June 6, 1988	June 24, 1990
Lt. Gen. Joseph W. Ashy	June 25, 1990	Dec. 9, 1992
Gen. Henry Viccellio Jr.	Dec. 10, 1992	June 19, 1995
Gen. Billy J. Boles	June 20, 1995	March 17, 1997
Gen. Lloyd W. Newton	March 17, 1997	June 22, 2000
Gen. Hal M. Hornburg	June 22, 2000	Nov. 14, 2001
Lt. Gen. John D. Hopper Jr. (acting)	Nov. 14, 2001	Dec. 17, 2001
Gen. Donald G. Cook	Dec. 17, 2001	

Established as Army Air Corps Flying Training Command Jan. 23, 1942. Redesignated AAF Flying Training Command March 1942, then AAF Training Command July 31, 1943. Redesignated ATC July 1, 1946. Redesignated AETC July 1, 1993.

Air Force Communications Command

Maj. Gen. Harold W. Grant	July 1, 1961	Feb. 15, 1962
Maj. Gen. Kenneth P. Bergquist	Feb. 16, 1962	June 30, 1965
Maj. Gen. J. Francis Taylor (acting)	July 1, 1965	Oct. 18, 1965
Maj. Gen. Richard P. Klocko	Oct. 19, 1965	July 2, 1967
Maj. Gen. Robert W. Paulson	July 15, 1967	Aug. 1, 1969
Maj. Gen. Paul R. Stoney	Aug. 1, 1969	Oct. 31, 1973
Maj. Gen. Donald L. Werbeck	Nov. 1, 1973	Aug. 24, 1975
Maj. Gen. Rupert H. Burris	Aug. 25, 1975	Oct. 31, 1977
Maj. Gen. Robert E. Sadler	Nov. 1, 1977	June 21, 1979
Maj. Gen. Robert T. Herres	June 22, 1979	July 27, 1981
Maj. Gen. Robert F. McCarthy	July 27, 1981	June 1, 1984
Maj. Gen. Gerald L. Prather	June 1, 1984	Aug. 28, 1986
Maj. Gen. John T. Stihl	Aug. 28, 1986	March 29, 1988
Maj. Gen. James S. Cassity Jr.	March 29, 1988	May 16, 1989
Maj. Gen. Robert H. Ludwig	May 16, 1989	Nov. 9, 1990
Maj. Gen. John S. Fairfield	Nov. 9, 1990	July 1, 1991

Formerly Air Force Communications Service. Redesignated Air Force Communications Command Nov. 15, 1979. Redesignated Air Force Command, Control, Communications, and Computer Agency, an FOA, July 1, 1991.

Air Force Intelligence Command

Maj. Gen. Gary W. O'Shaughnessy	Oct. 1, 1991	June 1, 1993
Maj. Gen. Kenneth A. Minihan	June 2, 1993	Oct. 1, 1993

See Electronic Security Command.

Air Force Logistics Command

Lt. Gen. Nathan F. Twining	March 9, 1946	Oct. 13, 1947
Gen. Joseph T. McNarney	Oct. 14, 1947	Aug. 31, 1949
Lt. Gen. Benjamin W. Chidlaw	Sept. 1, 1949	Aug. 20, 1951
Gen. Edwin W. Rawlings	Aug. 21, 1951	Feb. 28, 1959
Lt. Gen. William F. McKee (acting)	March 1, 1959	March 14, 1959
Gen. Samuel E. Anderson	March 15, 1959	July 31, 1961
Gen. William F. McKee	Aug. 1, 1961	June 30, 1962
Gen. Mark E. Bradley Jr.	July 1, 1962	July 31, 1965
Gen. Kenneth B. Hobson	Aug. 1, 1965	July 31, 1967
Gen. Thomas P. Gerrity	Aug. 1, 1967	Feb. 24, 1968
Lt. Gen. Lewis L. Mundell (acting)	Feb. 24, 1968	March 28, 1968
Gen. Jack G. Merrell	March 29, 1968	Sept. 11, 1972
Gen. Jack J. Catton	Sept. 12, 1972	Aug. 31, 1974
Gen. William V. McBride	Sept. 1, 1974	Aug. 31, 1975
Gen. F. Michael Rogers	Sept. 1, 1975	Jan. 31, 1978
Gen. Bryce Poe II	Feb. 1, 1978	July 31, 1981
Gen. James P. Mullins	Aug. 1, 1981	Nov. 1, 1984
Gen. Earl T. O'Loughlin	Nov. 1, 1984	July 31, 1987
Gen. Alfred G. Hansen	July 31, 1987	Oct. 31, 1989
Gen. Charles C. McDonald	Oct. 31, 1989	July 1, 1992

Organized as AAF Materiel and Services July 17, 1944. Redesignated AAF Technical Service Command Aug. 31, 1944. Redesignated Air Technical Service Command July 1, 1945. Redesignated Air Materiel Command March 9, 1946. Redesignated Air Force Logistics Command April 1, 1961. Inactivated July 1, 1992.

Air Force Materiel Command

Gen. Ronald W. Yates	July 1, 1992	June 30, 1995
Gen. Henry Viccellio Jr.	June 30, 1995	May 9, 1997
Lt. Gen. Kenneth E. Eickmann (acting)	May 9, 1997	May 29, 1997
Gen. George T. Babbitt Jr.	May 29, 1997	April 20, 2000
Gen. Lester L. Lyles	April 20, 2000	

Air Force Reserve Command

Maj. Gen. Rollin B. Moore Jr.	Aug. 1, 1968	Jan. 26, 1972
Brig. Gen. Alfred Verhulst (acting)	Jan. 27, 1972	March 15, 1972
Maj. Gen. Homer I. Lewis	March 16, 1972	April 8, 1975
Maj. Gen. William Lyon	April 16, 1975	April 16, 1979
Maj. Gen. Richard Bodycombe	April 17, 1979	Oct. 31, 1982
Maj. Gen. Sloan R. Gill	Nov. 1, 1982	Oct. 31, 1986
Maj. Gen. Roger P. Scheer	Nov. 1, 1986	Oct. 31, 1990
Maj. Gen. John J. Closner III	Nov. 1, 1990	Oct. 31, 1994
Maj. Gen. Robert A. McIntosh	Nov. 1, 1994	June 9, 1998
Maj. Gen. David R. Smith (acting)	June 9, 1998	Sept. 25, 1998
Lt. Gen. James E. Sherrard III	Sept. 25, 1998	

Formerly Air Force Reserve, AFRC became a major command Feb. 17, 1997.

Air Force Space Command

Gen. James V. Hartinger	Sept. 1, 1982	July 30, 1984
Gen. Robert T. Herres	July 30, 1984	Oct. 1, 1986
Maj. Gen. Maurice C. Padden	Oct. 1, 1986	Oct. 29, 1987
Lt. Gen. Donald J. Kutyna	Oct. 29, 1987	March 29, 1990
Lt. Gen. Thomas S. Moorman Jr.	March 29, 1990	March 23, 1992
Gen. Donald J. Kutyna	March 23, 1992	June 30, 1992
Gen. Charles A. Horner	June 30, 1992	Sept. 13, 1994
Gen. Joseph W. Ashy	Sept. 13, 1994	Aug. 26, 1996
Gen. Howell M. Estes III	Aug. 26, 1996	Aug. 14, 1998
Gen. Richard B. Myers	Aug. 14, 1998	Feb. 22, 2000
Gen. Ralph E. Eberhart	Feb. 22, 2000	April 19, 2002
Gen. Lance W. Lord	April 19, 2002	

Air Force Special Operations Command

Maj. Gen. Thomas E. Eggers	May 22, 1990	June 30, 1991
Maj. Gen. Bruce L. Fister	June 30, 1991	July 22, 1994
Maj. Gen. James L. Hobson Jr.	July 22, 1994	July 9, 1997
Maj. Gen. Charles R. Holland	July 9, 1997	Aug. 5, 1999
Lt. Gen. Maxwell C. Bailey	Aug. 5, 1999	Jan. 16, 2002
Lt. Gen. Paul V. Hester	Jan. 16, 2002	

Air Force Systems Command

Maj. Gen. David M. Schlatter	Feb. 1, 1950	June 24, 1951
Lt. Gen. Earle E. Partridge	June 24, 1951	June 20, 1953
Lt. Gen. Donald L. Putt	June 30, 1953	April 14, 1954
Lt. Gen. Thomas S. Power	April 15, 1954	June 30, 1957
Maj. Gen. John W. Sessums (acting)	July 1, 1957	July 31, 1957
Lt. Gen. Samuel E. Anderson	Aug. 1, 1957	March 9, 1959
Maj. Gen. John W. Sessums (acting)	March 10, 1959	April 24, 1959
Gen. Bernard A. Schriever	April 25, 1959	Aug. 31, 1966
Gen. James Ferguson	Sept. 1, 1966	Aug. 30, 1970
Gen. George S. Brown	Sept. 1, 1970	July 31, 1973
Gen. Samuel C. Phillips	Aug. 1, 1973	Aug. 31, 1975
Gen. William J. Evans	Sept. 1, 1975	July 31, 1977
Gen. Lew Allen Jr.	Aug. 1, 1977	March 13, 1978
Gen. Alton D. Slay	March 14, 1978	Feb. 1, 1981
Gen. Robert T. Marsh	Feb. 1, 1981	Aug. 1, 1984
Gen. Lawrence A. Skantze	Aug. 1, 1984	July 17, 1987
Gen. Bernard P. Randolph	July 17, 1987	April 1, 1990
Gen. Ronald W. Yates	April 1, 1990	July 1, 1992

Formerly Air Research and Development Command. Redesignated Air Force Systems Command April 1, 1961. Inactivated July 1, 1992.

Air Mobility Command

Gen. Hansford T. Johnson	June 1, 1992	Aug. 22, 1992
Gen. Ronald R. Fogleman	Aug. 23, 1992	Oct. 17, 1994
Gen. Robert L. Rutherford	Oct. 18, 1994	July 15, 1996
Gen. Walter Kross	July 15, 1996	Aug. 3, 1998
Gen. Charles T. Robertson Jr.	Aug. 3, 1998	Nov. 5, 2001
Gen. John W. Handy	Nov. 5, 2001	

Air National Guard

Col. William A.R. Robertson	Nov. 28, 1945	October 1948
Maj. Gen. George G. Finch	October 1948	Sept. 25, 1950
Maj. Gen. Earl T. Ricks	Oct. 13, 1950	Jan. 4, 1954
Maj. Gen. Winston P. Wilson	Jan. 26, 1954	Aug. 5, 1962
Maj. Gen. I.G. Brown	Aug. 6, 1962	April 19, 1974
Maj. Gen. John J. Pesch	April 20, 1974	Jan. 31, 1977
Maj. Gen. John T. Guice	Feb. 1, 1977	April 1, 1981
Maj. Gen. John B. Conaway	April 1, 1981	Nov. 1, 1988
Maj. Gen. Philip G. Killey	Nov. 1, 1988	Jan. 28, 1994
Maj. Gen. Donald W. Shepperd	Jan. 28, 1994	Jan. 28, 1998
Maj. Gen. Paul A. Weaver Jr.	Jan. 28, 1998	Dec. 3, 2001
Brig. Gen. David A. Brubaker (acting)	Dec. 3, 2001	June 3, 2002
Lt. Gen. Daniel James III	June 3, 2002	

Air Proving Ground Command

Maj. Gen. Carl A. Brandt	October 1946	August 1948
Maj. Gen. William E. Kepner	August 1948	June 1950
Maj. Gen. Bryant L. Boatner	July 1950	July 1952
Maj. Gen. Patrick W. Timberlake	July 1952	April 1955
Maj. Gen. Robert W. Burns	August 1955	July 1957

Designated a center December 1957.

Air University

Maj. Gen. Muir S. Fairchild	March 15, 1946	May 17, 1948
Maj. Gen. Robert W. Harper	May 17, 1948	Oct. 15, 1948
Gen. George C. Kenney	Oct. 16, 1948	July 27, 1951
Lt. Gen. Idwal H. Edwards	July 28, 1951	Feb. 28, 1953
Maj. Gen. John DeF. Barker (acting)	March 1, 1953	April 14, 1953
Lt. Gen. Laurence S. Kuter	April 15, 1953	May 31, 1955
Lt. Gen. Dean C. Strother	June 1, 1955	June 30, 1958
Lt. Gen. Walter E. Todd	July 15, 1958	July 31, 1961
Lt. Gen. Troup Miller Jr.	Aug. 1, 1961	Dec. 31, 1963
Lt. Gen. Ralph P. Swofford Jr.	Jan. 1, 1964	July 31, 1965
Lt. Gen. John W. Carpenter III	Aug. 1, 1965	July 31, 1968
Lt. Gen. Albert P. Clark	Aug. 1, 1968	July 31, 1970
Lt. Gen. Alvan C. Gillem II	Aug. 1, 1970	Oct. 31, 1973
Lt. Gen. F. Michael Rogers	Nov. 1, 1973	Aug. 31, 1975
Lt. Gen. Raymond B. Furlong	Sept. 1, 1975	July 1, 1979
Lt. Gen. Stanley M. Umstead	July 1, 1979	July 24, 1981
Lt. Gen. Charles G. Cleveland	July 24, 1981	Aug. 1, 1984
Lt. Gen. Thomas C. Richards	Aug. 1, 1984	Nov. 6, 1986
Lt. Gen. Truman Spangrud	Nov. 6, 1986	July 12, 1988
Lt. Gen. Ralph E. Havens	July 12, 1988	Oct. 6, 1989
Maj. Gen. David C. Reed	Oct. 6, 1989	Jan. 4, 1990
Lt. Gen. Charles G. Boyd	Jan. 4, 1990	Oct. 26, 1992
Lt. Gen. Jay W. Kelley	Oct. 27, 1992	June 30, 1993

Established as AAF School of Applied Tactics Oct. 16, 1943 (assumed history of Air Services School, dating from 1920). Redesignated AAF School June 1, 1945. Given Majcom status Nov. 29, 1945. Redesignated AU May 12, 1946. Part of ATC between May 1978 and July 1983. Ceased to be a Majcom and was assigned to AETC July 1, 1993.

Alaskan Air Command

Brig. Gen. Joseph H. Atkinson	Oct. 1, 1946	Feb. 25, 1949
Brig. Gen. Frank A. Armstrong Jr.	Feb. 26, 1949	Dec. 27, 1950
Maj. Gen. William D. Old	Dec. 27, 1950	Oct. 14, 1952
Brig. Gen. W.R. Agee	Oct. 27, 1952	Feb. 26, 1953
Maj. Gen. George R. Acheson	Feb. 26, 1953	Feb. 1, 1956
Brig. Gen. T. Alan Bennett (acting)	Feb. 1, 1956	Feb. 24, 1956
Lt. Gen. Joseph H. Atkinson	Feb. 24, 1956	July 16, 1956
Maj. Gen. Frank A. Armstrong Jr.	July 17, 1956	Oct. 23, 1956
Maj. Gen. James H. Davies	Oct. 24, 1956	June 27, 1957
Lt. Gen. Frank A. Armstrong Jr.	June 28, 1957	Aug. 18, 1957
Brig. Gen. Kenneth H. Gibson	Aug. 19, 1957	Aug. 13, 1958
Maj. Gen. C.F. Necrason	Aug. 14, 1958	July 19, 1961
Brig. Gen. Jack A. Gibbs (acting)	July 20, 1961	July 25, 1961
Maj. Gen. Wendell W. Bowman	July 26, 1961	Aug. 8, 1963
Col. Alfred Walton (acting)	Aug. 9, 1963	Aug. 14, 1963
Maj. Gen. James C. Jensen	Aug. 15, 1963	Nov. 14, 1966
Maj. Gen. Thomas E. Moore	Nov. 15, 1966	July 24, 1969
Maj. Gen. Joseph A. Cunningham	July 25, 1969	July 31, 1972
Maj. Gen. Donavon F. Smith	Aug. 1, 1972	June 5, 1973
Maj. Gen. Charles W. Carson Jr.	June 18, 1973	March 2, 1974
Col. David T. Stockman (acting)	March 3, 1974	March 18, 1974
Maj. Gen. Jack K. Gamble	March 19, 1974	June 30, 1975
Lt. Gen. James E. Hill	July 1, 1975	Oct. 14, 1976
Lt. Gen. M.L. Boswell	Oct. 15, 1976	June 30, 1978
Lt. Gen. Winfield W. Scott Jr.	July 1, 1978	April 1, 1981
Lt. Gen. Lynwood E. Clark	April 1, 1981	Aug. 31, 1983
Lt. Gen. Bruce K. Brown	Sept. 1, 1983	Sept. 26, 1985
Lt. Gen. David L. Nichols	Sept. 27, 1985	May 22, 1988
Lt. Gen. Thomas G. McInerney	May 22, 1988	Aug. 9, 1990

Activated as Alaskan Air Force (1942). Redesignated Eleventh Air Force (1942). Redesignated Alaskan Air Command (1945). Redesignated 11th Air Force Aug. 9, 1990, under PACAF.

Continental Air Command

Lt. Gen. George E. Stratemeyer	Dec. 1, 1948	April 15, 1949
Lt. Gen. Ennis C. Whitehead	April 15, 1949	Dec. 14, 1950
Maj. Gen. Willis H. Hale	Dec. 14, 1950	Feb. 18, 1952
Lt. Gen. Leon W. Johnson	Feb. 18, 1952	Dec. 14, 1955
Lt. Gen. Charles B. Stone III	Dec. 15, 1955	June 30, 1957
Lt. Gen. William E. Hall	July 1, 1957	Sept. 30, 1961
Lt. Gen. Gordon A. Blake	Sept. 30, 1961	June 30, 1962
Lt. Gen. Edward J. Timberlake	July 1, 1962	July 1966
Lt. Gen. Henry Viccellio Sr.	Aug. 1, 1966	Aug. 1, 1968

Established Dec. 1, 1948. Inactivated Aug. 1, 1968.

Electronic Security Command

Col. Roy H. Lynn	Oct. 26, 1948	July 5, 1949
Col. Travis M. Hetherington	July 6, 1949	Feb. 21, 1951
Maj. Gen. Roy H. Lynn	Feb. 22, 1951	Feb. 13, 1953
Maj. Gen. Harold H. Bassett	Feb. 14, 1953	Jan. 3, 1957
Maj. Gen. Gordon L. Blake	Jan. 4, 1957	Aug. 5, 1959
Maj. Gen. John B. Ackerman	Aug. 6, 1959	Sept. 20, 1959
Maj. Gen. Millard Lewis	Sept. 21, 1959	Aug. 31, 1962
Maj. Gen. Richard P. Klocko	Sept. 1, 1962	Oct. 15, 1965
Maj. Gen. Louis E. Coira	Oct. 16, 1965	July 18, 1969
Maj. Gen. Carl W. Stapleton	July 19, 1969	Feb. 23, 1973
Maj. Gen. Walter T. Galligan	Feb. 24, 1973	May 16, 1974
Maj. Gen. Howard P. Smith	May 17, 1974	July 31, 1975
Maj. Gen. Kenneth D. Burns	Aug. 1, 1975	Jan. 18, 1979
Maj. Gen. Doyle E. Larson	Jan. 19, 1979	July 31, 1983
Maj. Gen. John B. Marks	Aug. 1, 1983	April 16, 1985
Maj. Gen. Paul H. Martin	April 17, 1985	Aug. 14, 1989
Maj. Gen. Gary W. O'Shaughnessy	Aug. 15, 1989	Oct. 1, 1991

Formerly USAF Security Service. Redesignated: Electronic Security Command Aug. 1, 1979; Air Force Intelligence Command Oct. 1, 1991; Air Intelligence Agency, Oct. 1, 1993.

Headquarters Command

Brig. Gen. Burton M. Hovey	Jan. 3, 1946	Dec. 13, 1948
Brig. Gen. Sydney D. Grubbs	Dec. 14, 1948	Oct. 1, 1950
Brig. Gen. Morris J. Lee	Oct. 2, 1950	June 13, 1952
Brig. Gen. Stoyte O. Ross	June 14, 1952	July 4, 1956
Maj. Gen. Reuben C. Hood Jr.	Aug. 1, 1956	June 30, 1959
Maj. Gen. Brooke E. Allen	Aug. 3, 1959	Dec. 31, 1965
Maj. Gen. Rollen H. Anthis	Jan. 10, 1966	Nov. 30, 1967
Maj. Gen. Milton B. Adams	Dec. 1, 1967	June 30, 1968
Maj. Gen. Nils O. Ohman	July 5, 1968	April 30, 1972
Maj. Gen. John L. Locke	May 1, 1972	Feb. 25, 1974
Maj. Gen. Maurice R. Reilly	Feb. 26, 1974	August 1975
Maj. Gen. William C. Norris	Sept. 1, 1975	June 30, 1976

Established as Bolling Field Command (1946). Redesignated Headquarters Command, USAF, March 17, 1958. Inactivated in 1976.

Military Airlift Command

Maj. Gen. Robert W. Harper	July 1, 1947	June 1, 1948
Lt. Gen. Laurence S. Kuter	June 1, 1948	Oct. 28, 1951
Lt. Gen. Joseph Smith	Nov. 15, 1951	June 30, 1958
Lt. Gen. William H. Tunner	July 1, 1958	May 31, 1960
Gen. Joe W. Kelly Jr.	June 1, 1960	July 18, 1964
Gen. Howell M. Estes Jr.	July 19, 1964	July 31, 1969
Gen. Jack J. Catton	Aug. 1, 1969	Sept. 12, 1972
Lt. Gen. Jay T. Robbins (acting)	Sept. 12, 1972	Sept. 25, 1972
Gen. Paul K. Carlton	Sept. 26, 1972	March 31, 1977
Gen. William G. Moore Jr.	April 1, 1977	June 30, 1979
Gen. Robert E. Huyser	July 1, 1979	June 26, 1981
Gen. James R. Allen	June 26, 1981	June 30, 1983
Gen. Thomas M. Ryan Jr.	July 1, 1983	Sept. 19, 1985
Gen. Duane H. Cassidy	Sept. 20, 1985	Sept. 20, 1989
Gen. Hansford T. Johnson	Sept. 20, 1989	June 1, 1992

Antecedents: AAC Ferrying Command (1941); AAF Ferrying Command (1942); Air Transport Command (1942, inactivated June 1, 1948). Military Air Transport Service established June 1, 1948. Redesignated Military Airlift Command Jan. 1, 1966. In 1982, the inactivated Air Transport Command was consolidated with MAC. Inactivated June 1, 1992.

Northeast Air Command

Maj. Gen. Lyman P. Whitten	Oct. 6, 1950	March 14, 1952
Maj. Gen. Charles T. Myers	March 14, 1952	July 26, 1954
Lt. Gen. Glenn O. Barcus	July 26, 1954	March 31, 1957

Newfoundland Base Command, part of Military Air Transport Service, reorganized and redesignated Northeast Air Command, a new major command, Oct. 1, 1950. Inactivated March 31, 1957.

Pacific Air Command/Seventh Air Force

Maj. Gen. Ralph H. Wooten	April 1947	Aug. 31, 1948
Brig. Gen. Robert F. Travis	Sept. 1, 1948	June 1, 1949

Formerly Seventh Air Force. Redesignated Pacific Air Command Dec. 15, 1947. Discontinued June 1, 1949.

Pacific Air Forces

Lt. Gen. Ennis C. Whitehead	Dec. 30, 1945	April 25, 1949
Lt. Gen. George E. Stratemeyer	April 26, 1949	May 20, 1951
Lt. Gen. Earle E. Partridge (acting)	May 21, 1951	June 9, 1951
Gen. Otto P. Weyland	June 10, 1951	March 25, 1954
Gen. Earle E. Partridge	March 26, 1954	May 31, 1955
Gen. Laurence S. Kuter	June 1, 1955	July 31, 1959
Gen. Emmett O'Donnell Jr.	Aug. 1, 1959	July 31, 1963
Gen. Jacob E. Smart	Aug. 1, 1963	July 31, 1964
Gen. Hunter Harris Jr.	Aug. 1, 1964	Jan. 31, 1967
Gen. John D. Ryan	Feb. 1, 1967	July 31, 1968
Gen. Joseph J. Nazzaro	Aug. 1, 1968	July 31, 1971
Gen. Lucius D. Clay Jr.	Aug. 1, 1971	Sept. 30, 1973
Gen. John W. Vogt	Oct. 1, 1973	June 30, 1974
Gen. Louis L. Wilson Jr.	July 1, 1974	May 31, 1977
Lt. Gen. James A. Hill	June 1, 1977	June 14, 1978
Lt. Gen. James D. Hughes	June 15, 1978	July 1, 1981
Lt. Gen. Arnold W. Braswell	July 1, 1981	Sept. 30, 1983
Gen. Jerome F. O'Malley	Oct. 8, 1983	Nov. 1, 1984
Gen. Robert W. Bazley	Nov. 1, 1984	Dec. 16, 1986
Gen. Jack I. Gregory	Dec. 16, 1986	July 22, 1988
Gen. Merrill A. McPeak	July 22, 1988	Oct. 30, 1990
Lt. Gen. James B. Davis	Nov. 5, 1990	Feb. 19, 1991
Gen. Jimmie V. Adams	Feb. 19, 1991	Jan. 25, 1993
Gen. Robert L. Rutherford	Jan. 26, 1993	Oct. 12, 1994
Gen. John G. Lorber	Oct. 12, 1994	July 7, 1997
Gen. Richard B. Myers	July 7, 1997	July 23, 1998
Gen. Patrick K. Gamble	July 23, 1998	April 9, 2001
Lt. Gen. Lansford E. Trapp (acting)	April 9, 2001	May 4, 2001
Gen. William J. Begert	May 4, 2001	

Activated as Far East Air Forces Aug. 3, 1944. Redesignated Pacific Air Command, US Army, Dec. 6, 1945. Redesignated FEAF Jan. 1, 1947. Redesignated Pacific Air Forces July 1, 1957.

Strategic Air Command

Gen. George C. Kenney	March 21, 1946	Oct. 18, 1948
Gen. Curtis E. LeMay	Oct. 19, 1948	June 30, 1957
Gen. Thomas S. Power	July 1, 1957	Nov. 30, 1964
Gen. John D. Ryan	Dec. 1, 1964	Jan. 31, 1967
Gen. Joseph J. Nazzaro	Feb. 1, 1967	July 28, 1968
Gen. Bruce K. Holloway	July 29, 1968	April 30, 1972
Gen. John C. Meyer	May 1, 1972	July 31, 1974
Gen. Russell E. Dougherty	Aug. 1, 1974	July 31, 1977
Gen. Richard H. Ellis	Aug. 1, 1977	July 31, 1981
Gen. Bennie L. Davis	Aug. 1, 1981	July 31, 1985
Gen. Larry D. Welch	Aug. 1, 1985	June 30, 1986
Gen. John T. Chain	July 1, 1986	Jan. 31, 1991
Gen. George L. Butler	Feb. 1, 1991	June 1, 1992

Established as Continental Air Forces Dec. 13, 1944. Redesignated Strategic Air Command March 21, 1946. Inactivated June 1, 1992.

Tactical Air Command

Lt. Gen. Elwood R. Quesada	March 21, 1946	Nov. 23, 1948
Maj. Gen. Robert M. Lee	Dec. 24, 1948	June 20, 1950
Maj. Gen. Glenn O. Barcus	July 17, 1950	Jan. 25, 1951
Gen. John K. Cannon	Jan. 25, 1951	March 31, 1954
Gen. Otto P. Weyland	April 1, 1954	July 31, 1959
Gen. Frank F. Everest	Aug. 1, 1959	Sept. 30, 1961
Gen. Walter C. Sweeney Jr.	Oct. 1, 1961	July 31, 1965
Gen. Gabriel P. Disosway	Aug. 1, 1965	July 31, 1968
Gen. William W. Momyer	Aug. 1, 1968	Sept. 30, 1973
Gen. Robert J. Dixon	Oct. 1, 1973	April 30, 1978
Gen. William L. Creech	May 1, 1978	Nov. 1, 1984
Gen. Jerome F. O'Malley	Nov. 1, 1984	April 20, 1985
Gen. Robert D. Russ	May 22, 1985	March 26, 1991
Gen. John Michael Loh	March 27, 1991	June 1, 1992

Established March 21, 1946. Reassigned to Continental Air Command (1948). Removed from CAC and returned to major command status Dec. 1, 1950. Inactivated June 1, 1992.

US Air Forces in Europe

Brig. Gen. John F. McBlain (acting)	Aug. 14, 1947	Oct. 20, 1947
Lt. Gen. Curtis E. LeMay	Oct. 20, 1947	Oct. 15, 1948
Lt. Gen. John K. Cannon	Oct. 16, 1948	Jan. 20, 1951
Gen. Lauris Norstad	Jan. 21, 1951	July 26, 1953
Lt. Gen. William H. Tunner	July 27, 1953	June 30, 1957
Gen. Frank F. Everest	July 1, 1957	July 31, 1959
Gen. Frederic H. Smith Jr.	Aug. 1, 1959	June 30, 1961
Gen. Truman H. Landon	July 1, 1961	July 31, 1963
Gen. Gabriel P. Disosway	Aug. 1, 1963	July 31, 1965
Gen. Bruce K. Holloway	Aug. 1, 1965	July 31, 1966
Gen. Maurice A. Preston	Aug. 1, 1966	July 31, 1968
Gen. Horace M. Wade	Aug. 1, 1968	Jan. 31, 1969
Gen. Joseph R. Holzapple	Feb. 1, 1969	Aug. 31, 1971
Gen. David C. Jones	Sept. 1, 1971	June 30, 1974
Gen. John W. Vogt	July 1, 1974	Aug. 31, 1975
Gen. Richard H. Ellis	Sept. 1, 1975	July 31, 1977
Gen. William J. Evans	Aug. 1, 1977	Aug. 1, 1978
Gen. John W. Pauly	Aug. 1, 1978	Aug. 1, 1980
Gen. Charles A. Gabriel	Aug. 1, 1980	June 30, 1982
Gen. Billy M. Minter	July 1, 1982	Nov. 1, 1984
Gen. Charles L. Donnelly Jr.	Nov. 1, 1984	May 1, 1987
Gen. William L. Kirk	May 1, 1987	April 12, 1989
Gen. Michael J. Dugan	April 12, 1989	June 26, 1990
Gen. Robert C. Oaks	June 26, 1990	July 29, 1994
Gen. James L. Jamerson	July 29, 1994	July 16, 1995
Gen. Richard E. Hawley	July 17, 1995	April 4, 1996
Gen. Michael E. Ryan	April 4, 1996	Oct. 5, 1997
Lt. Gen. William J. Begert (acting)	Oct. 6, 1997	Dec. 5, 1997
Gen. John P. Jumper	Dec. 5, 1997	Jan. 13, 2000
Gen. Gregory S. Martin	Jan. 13, 2000	

Activated as 8th Air Force (1942). Redesignated Eighth Air Force Sept. 18, 1942. Redesignated US Strategic Air Forces in Europe (1944). Redesignated USAFE Aug. 7, 1945.

US Air Forces Southern Command/Caribbean

Maj. Gen. Hubert R. Harmon	July 31, 1946	Oct. 3, 1947
Brig. Gen. Glen C. Jamison (acting)	Oct. 4, 1947	Nov. 12, 1947
Maj. Gen. Willis H. Hale	Nov. 13, 1947	Oct. 19, 1949
Brig. Gen. Rosenham Beam	Oct. 20, 1949	Nov. 5, 1950
Brig. Gen. Emil C. Kiel	Nov. 6, 1950	June 10, 1953
Maj. Gen. Reuben C. Hood Jr.	June 11, 1953	June 16, 1956
Maj. Gen. Truman H. Landon	June 20, 1956	June 1, 1959
Maj. Gen. Leland S. Stranathan	Aug. 3, 1959	Sept. 8, 1963
Maj. Gen. Robert A. Breitweiser	Sept. 11, 1963	July 9, 1966
Maj. Gen. Reginald J. Clizbe	Aug. 6, 1966	June 14, 1968
Maj. Gen. Kenneth O. Sanborn	June 14, 1968	April 7, 1972
Maj. Gen. Arthur G. Salisbury	April 7, 1972	October 1974
Maj. Gen. James M. Breedlove	October 1974	Jan. 1, 1976

Activated as Panama Canal Air Force (1940). Redesignated Caribbean Air Force (1941). Redesignated 6th Air Force Feb. 5, 1942, then Sixth Air Force Sept. 18, 1942. Redesignated Caribbean Air Command July 31, 1946. Redesignated US Air Forces Southern Command July 8, 1963. Inactivated Jan. 1, 1976.

USAF Academy Superintendents

Lt. Gen. Hubert R. Harmon	July 27, 1954	July 27, 1956
Maj. Gen. James E. Briggs	July 28, 1956	Aug. 16, 1959
Maj. Gen. William S. Stone	Aug. 17, 1959	June 30, 1962
Maj. Gen. Robert H. Warren	July 1, 1962	June 30, 1965
Lt. Gen. Thomas S. Moorman Sr.	July 1, 1965	July 31, 1970
Lt. Gen. Albert P. Clark	Aug. 1, 1970	July 31, 1974
Lt. Gen. James R. Allen	Aug. 1, 1974	June 27, 1977
Lt. Gen. Kenneth L. Tallman	June 28, 1977	June 15, 1981
Maj. Gen. Robert E. Kelley	June 16, 1981	June 15, 1983
Lt. Gen. Winfield W. Scott Jr.	June 16, 1983	June 25, 1987
Lt. Gen. Charles R. Hamm	June 26, 1987	July 1, 1991
Lt. Gen. Bradley C. Hosmer	July 1, 1991	July 7, 1994
Lt. Gen. Paul E. Stein	July 8, 1994	July 31, 1997
Lt. Gen. Tad J. Oelstrom	Aug. 1, 1997	June 9, 2000
Lt. Gen. John R. Dallager	June 9, 2000	June 1, 2003
Maj. Gen. John W. Rosa Jr.*	June 1, 2003	

*Nominated

DOD Leaders Through the Years

Secretaries of Defense

James V. Forrestal	Sept. 17, 1947	March 28, 1949
Louis A. Johnson	March 28, 1949	Sept. 19, 1950
George C. Marshall	Sept. 21, 1950	Sept. 12, 1951
Robert A. Lovett	Sept. 17, 1951	Jan. 20, 1953
Charles E. Wilson	Jan. 28, 1953	Oct. 8, 1957
Neil H. McElroy	Oct. 9, 1957	Dec. 1, 1959
Thomas S. Gates	Dec. 2, 1959	Jan. 20, 1961
Robert S. McNamara	Jan. 21, 1961	Feb. 29, 1968
Clark M. Clifford	March 1, 1968	Jan. 20, 1969
Melvin R. Laird	Jan. 22, 1969	Jan. 29, 1973
Elliot L. Richardson	Jan. 30, 1973	May 24, 1973
James R. Schlesinger	July 2, 1973	Nov. 19, 1975
Donald H. Rumsfeld	Nov. 20, 1975	Jan. 20, 1977
Harold Brown	Jan. 21, 1977	Jan. 20, 1981
Caspar W. Weinberger	Jan. 21, 1981	Nov. 23, 1987
Frank C. Carlucci	Nov. 23, 1987	Jan. 20, 1989
Richard B. Cheney	March 21, 1989	Jan. 20, 1993
Les Aspin	Jan. 21, 1993	Feb. 3, 1994
William J. Perry	Feb. 3, 1994	Jan. 23, 1997
William S. Cohen	Jan. 24, 1997	Jan. 20, 2001
Donald H. Rumsfeld	Jan. 20, 2001	

Chairmen of the Joint Chiefs of Staff

Gen. of the Army Omar N. Bradley	Aug. 16, 1949	Aug. 15, 1953
Adm. Arthur W. Radford, USN	Aug. 15, 1953	Aug. 15, 1957
Gen. Nathan F. Twining, USAF	Aug. 15, 1957	Sept. 30, 1960
Gen. Lyman L. Lemnitzer, USA	Oct. 1, 1960	Sept. 30, 1962
Gen. Maxwell D. Taylor, USA	Oct. 1, 1962	July 1, 1964
Gen. Earle G. Wheeler, USA	July 3, 1964	July 2, 1970
Adm. Thomas H. Moorer, USN	July 2, 1970	July 1, 1974
Gen. George S. Brown, USAF	July 1, 1974	June 20, 1978
Gen. David C. Jones, USAF	June 21, 1978	June 18, 1982
Gen. John W. Vessey Jr., USA	June 18, 1982	Sept. 30, 1985
Adm. William J. Crowe Jr., USN	Oct. 1, 1985	Sept. 30, 1989
Gen. Colin L. Powell, USA	Oct. 1, 1989	Sept. 30, 1993
Adm. David Jeremiah, USN (acting)	Oct. 1, 1993	Oct. 24, 1993
Gen. John M. Shalikashvili, USA	Oct. 25, 1993	Sept. 30, 1997
Gen. Henry H. Shelton, USA	Oct. 1, 1997	Oct. 1, 2001
Gen. Richard B. Myers, USAF	Oct. 1, 2001	

Vice Chairmen of the Joint Chiefs of Staff

Gen. Robert T. Herres, USAF	Feb. 6, 1987	Feb. 28, 1990
Adm. David E. Jeremiah, USN	March 1, 1990	Feb. 28, 1994
Adm. William A. Owens, USN	March 1, 1994	Feb. 27, 1996
Gen. Joseph W. Ralston, USAF	March 1, 1996	Feb. 29, 2000
Gen. Richard B. Myers, USAF	March 1, 2000	Oct. 1, 2001
Gen. Peter Pace, USMC	Oct. 1, 2001	

US Central Command

Gen. Robert C. Kingston, USA	Jan. 1, 1983	Nov. 27, 1985
Gen. George B. Crist, USMC	Nov. 27, 1985	Nov. 23, 1988
Gen. H. Norman Schwarzkopf, USA	Nov. 23, 1988	Aug. 9, 1991
Gen. Joseph P. Hoar, USMC	Aug. 9, 1991	Aug. 5, 1994
Gen. J.H. Binford Peay III, USA	Aug. 5, 1994	Aug. 13, 1997
Gen. Anthony C. Zinni, USMC	Aug. 13, 1997	July 6, 2000
Gen. Tommy R. Franks, USA	July 6, 2000	

US European Command

Gen. Matthew B. Ridgway, USA	Aug. 1, 1952	July 11, 1953
Gen. Alfred M. Gruenther, USA	July 11, 1953	Nov. 20, 1956
Gen. Lauris Norstad, USAF	Nov. 20, 1956	Nov. 1, 1962
Gen. Lyman L. Lemnitzer, USA	Nov. 1, 1962	May 5, 1969
Gen. Andrew J. Goodpaster, USA	May 5, 1969	Nov. 1, 1974
Gen. Alexander M. Haig Jr., USA	Nov. 1, 1974	June 27, 1979
Gen. Bernard W. Rogers, USA	June 27, 1979	June 25, 1987
Gen. John R. Galvin, USA	June 25, 1987	June 23, 1992
Gen. John M. Shalikashvili, USA	June 23, 1992	Oct. 21, 1993
Gen. George A. Joulwan, USA	Oct. 21, 1993	July 10, 1997
Gen. Wesley K. Clark, USA	July 10, 1997	May 2, 2000
Gen. Joseph W. Ralston, USAF	May 2, 2000	Jan. 16, 2003
Gen. James L. Jones, USMC	Jan. 16, 2003	

US Joint Forces Command

Adm. William H.P. Blandy, USN	Feb. 3, 1947	Feb. 1, 1950
Adm. William M. Fechteler, USN	Feb. 1, 1950	Aug. 15, 1951
Adm. Lynde D. McCormick, USN	Aug. 15, 1951	April 12, 1954
Adm. Jerauld Wright, USN	April 12, 1954	Feb. 28, 1960
Adm. Robert L. Dennison, USN	Feb. 28, 1960	April 30, 1963
Adm. Harold P. Smith, USN	April 30, 1963	April 30, 1965
Adm. Thomas H. Moorer, USN	April 30, 1965	June 17, 1967
Adm. Ephraim P. Holmes, USN	June 17, 1967	Sept. 30, 1970
Adm. Charles K. Duncan, USN	Sept. 30, 1970	Oct. 31, 1972
Adm. Ralph W. Cousins, USN	Oct. 31, 1972	May 30, 1975
Adm. Isaac C. Kidd Jr., USN	May 30, 1975	Sept. 30, 1978
Adm. Harry D. Train II, USN	Sept. 30, 1978	Sept. 30, 1982
Adm. Wesley D. McDonald, USN	Sept. 30, 1982	Nov. 27, 1985
Adm. Lee Baggett Jr., USN	Nov. 27, 1985	Nov. 22, 1988
Adm. Frank B. Kelso II, USN	Nov. 22, 1988	May 18, 1990
Adm. Leon A. Edney, USN	May 18, 1990	July 13, 1992
Adm. Paul D. Miller, USN	July 13, 1992	Oct. 31, 1994
Gen. John J. Sheehan, USMC	Oct. 31, 1994	Sept. 24, 1997
Adm. Harold W. Gehman Jr., USN	Sept. 24, 1997	Sept. 5, 2000
Gen. William F. Kernan, USA	Sept. 5, 2000	Oct. 2, 2002
Adm. Edmund P. Giambastiani, USN	Oct. 2, 2002	

Formerly US Atlantic Command, established Dec. 1, 1947, redesignated Oct. 7, 1999.

US Northern Command

Gen. Ralph E. Eberhart, USAF	Oct. 1, 2002

US Pacific Command

Adm. John H. Towers, USN	Jan. 1, 1947	Feb. 28, 1947
Adm. Louis E. Denfeld, USN	Feb. 28, 1947	Dec. 3, 1947
Adm. Dewitt C. Ramsey, USN	Dec. 3, 1947	April 30, 1949
Adm. Arthur W. Radford, USN	April 30, 1949	July 10, 1953
Adm. Felix B. Stump, USN	July 10, 1953	July 31, 1958
Adm. Harry D. Felt, USN	July 31, 1958	June 30, 1964
Adm. U.S. Grant Sharp, USN	June 30, 1964	July 31, 1968
Adm. John S. McCain Jr., USN	July 31, 1968	Sept. 1, 1972
Adm. Noel A.M. Gayler, USN	Sept. 1, 1972	Aug. 30, 1976
Adm. Maurice E. Weisner, USN	Aug. 30, 1976	Oct. 31, 1979
Adm. Robert L.J. Long, USN	Oct. 31, 1979	July 1, 1983
Adm. William J. Crowe Jr., USN	July 1, 1983	Sept. 18, 1985
Adm. Ronald J. Hays Jr., USN	Sept. 18, 1985	Sept. 30, 1988
Adm. Huntington Hardisty, USN	Sept. 30, 1988	March 1, 1991
Adm. Charles R. Larson, USN	March 1, 1991	July 11, 1994
Lt. Gen. Harold T. Fields, USA	July 11, 1994	July 19, 1994
Adm. Richard C. Macke, USN	July 19, 1994	Jan. 31, 1996
Adm. Joseph W. Prueher, USN	Jan. 31, 1996	Feb. 20, 1999
Adm. Dennis C. Blair, USN	Feb. 20, 1999	May 2, 2002
Adm. Thomas B. Fargo, USN	May 2, 2002	

US Southern Command

Lt. Gen. Willis Crittenberger, USA	November 1947	June 1948
Lt. Gen. Matthew B. Ridgway, USA	June 1948	October 1949
Lt. Gen. William H.H. Morris, USA	October 1949	April 1952
Lt. Gen. Horace L. McBride, USA	April 1952	June 1954
Lt. Gen. William K. Harrison, USA	June 1954	January 1957
Lt. Gen. Robert M. Montague, USA	January 1957	February 1958
Lt. Gen. Ridgely Gaither, USA	April 1958	July 1960
Lt. Gen. Robert F. Sink, USA	July 1960	January 1961
Lt. Gen. Andrew P. O'Meara, USA	January 1961	June 1963
Gen. Andrew P. O'Meara, USA	June 1963	February 1965
Gen. Robert W. Porter, USA	February 1965	February 1969
Gen. George R. Mather, USA	February 1969	September 1971
Gen. George V. Underwood, USA	September 1971	January 1973
Gen. William B. Rosson, USA	January 1973	July 1975
Lt. Gen. Dennis P. McAuliffe, USA	August 1975	September 1979
Lt. Gen. Wallace H. Nutting, USA	October 1979	May 1983
Gen. Paul F. Gorman, USA	May 1983	March 1985
Gen. John R. Galvin, USA	March 1985	June 1987
Gen. Fred F. Woerner, USA	June 1987	July 1989
Gen. Maxwell R. Thurman, USA	September 1989	November 1990
Gen. George A. Joulwan, USA	November 1990	November 1993
Maj. Gen. W.A. Worthington, USA	December 1993	January 1994
Gen. Barry McCaffrey, USA	February 1994	February 1996
RAdm. James Perkins, USN	March 1996	June 1996
Gen. Wesley K. Clark, USA	July 1996	July 1997
Gen. Charles E. Wilhelm, USMC	August 1997	Sept. 8, 2000
Gen. Peter Pace, USMC	Sept. 8, 2000	Sept. 30, 2001
Maj. Gen. G.D. Speer, USA (acting)	Sept. 30, 2001	Aug. 18, 2002
Gen. James T. Hill, USA	Aug. 18, 2002	

Formerly US Caribbean Command (1947). Activated in 1963.

US Space Command

Gen. Robert T. Herres, USAF	Sept. 23, 1985	Feb. 5, 1987
Gen. John L. Piotrowski, USAF	Feb. 6, 1987	March 30, 1990
Gen. Donald J. Kutyna, USAF	April 1, 1990	June 30, 1992
Gen. Charles A. Horner, USAF	June 30, 1992	Sept. 12, 1994
Gen. Joseph W. Ashy, USAF	Sept. 13, 1994	Aug. 26, 1996
Gen. Howell M. Estes III, USAF	Aug. 27, 1996	Aug. 13, 1998
Gen. Richard B. Myers, USAF	Aug. 14, 1998	Feb. 22, 2000
Gen. Ralph E. Eberhart, USAF	Feb. 22, 2000	Oct. 1, 2002

Deactivated Oct. 1, 2002, when its functions merged with US Strategic Command.

US Special Operations Command

Gen. James J. Lindsay, USA	April 16, 1987	June 27, 1990
Gen. Carl W. Stiner, USA	June 27, 1990	May 20, 1993
Gen. Wayne A. Downing, USA	May 20, 1993	Feb. 29, 1996
Gen. Henry H. Shelton, USA	Feb. 29, 1996	Sept. 25, 1997
Gen. Peter J. Schoomaker, USA	Nov. 5, 1997	Oct. 27, 2000
Gen. Charles R. Holland, USAF	Oct. 27, 2000	

US Strategic Command

Gen. G. Lee Butler, USAF	June 1, 1992	Feb. 13, 1994
Adm. Henry G. Chiles Jr., USN	Feb. 14, 1994	Feb. 21, 1996
Gen. Eugene E. Habiger, USAF	Feb. 22, 1996	June 25, 1998
Adm. Richard W. Mies, USN	June 26, 1998	Nov. 30, 2001
Adm. James O. Ellis Jr., USN	Nov. 30, 2001	

Merged the functions of US Space Command into STRATCOM Oct. 1, 2002.

US Transportation Command

Gen. Duane H. Cassidy, USAF	July 1, 1987	Sept. 21, 1989
Gen. H.T. Johnson, USAF	Sept. 22, 1989	Aug. 24, 1992
Gen. Ronald R. Fogleman, USAF	Aug. 25, 1992	Oct. 17, 1994
Gen. Robert L. Rutherford, USAF	Oct. 18, 1994	July 14, 1996
Gen. Walter Kross, USAF	July 15, 1996	Aug. 2, 1998
Gen. Charles T. Robertson Jr., USAF	Aug. 3, 1998	Nov. 5, 2001
Gen. John W. Handy, USAF	Nov. 5, 2001	

NORAD Leaders Through the Years

North American Aerospace Defense Command

Gen. Earle E. Partridge, USAF	Sept. 12, 1957	July 30, 1959
Gen. Laurence S. Kuter, USAF	Aug. 1, 1959	July 30, 1962
Gen. John K. Gerhart, USAF	Aug. 1, 1962	March 30, 1965
Gen. Dean C. Strother, USAF	April 1, 1965	July 29, 1966
Gen. Raymond J. Reeves, USAF	Aug. 1, 1966	July 31, 1969
Gen. Seth J. McKee, USAF	Aug. 1, 1969	Sept. 30, 1973
Gen. Lucius D. Clay Jr., USAF	Oct. 1, 1973	Aug. 29, 1975
Gen. Daniel James Jr., USAF	Sept. 1, 1975	Dec. 5, 1977
Gen. James E. Hill, USAF	Dec. 6, 1977	Dec. 31, 1979
Gen. James V. Hartinger, USAF	Jan. 1, 1980	July 30, 1984
Gen. Robert T. Herres, USAF	July 30, 1984	Feb. 5, 1987
Gen. John L. Piotrowski, USAF	Feb. 6, 1987	March 30, 1990
Gen. Donald J. Kutyna, USAF	April 1, 1990	June 30, 1992
Gen. Charles A. Horner, USAF	June 30, 1992	Sept. 12, 1994
Gen. Joseph W. Ashy, USAF	Sept. 13, 1994	Aug. 26, 1996
Gen. Howell M. Estes III, USAF	Aug. 27, 1996	Aug. 13, 1998
Gen. Richard B. Myers, USAF	Aug. 14, 1998	Feb. 22, 2000
Gen. Ralph E. Eberhart, USAF	Feb. 22, 2000	

People

2003 USAF Almanac

USAF Total Force

(As of Sept. 30, 2002)

	FY97	FY98	FY99	FY00	FY01	FY02	FY03
Air Force active duty							
Officers	73,983	71,892	70,318	69,023	68,862	72,032	69,500
Enlisted	299,373	291,590	286,169	282,356	280,410	292,061	285,500
Cadets	4,029	3,988	4,103	4,275	4,299	4,158	4,000
Total Air Force active duty	**377,385**	**367,470**	**360,590**	**355,654**	**353,571**	**368,251**	**359,000**
Career re-enlistments (second term)	34,900	31,300	30,392	32,042	30,380	34,093	29,193
Rate*	86%	85%	84%	84%	84%	88%	85%
First-term re-enlistments	12,300	10,400	8,196	9,917	10,485	10,666	11,000
Rate*	56%	54%	49%	52%	56%	72%	55%
Civilian personnel							
Direct hire (excluding technicians)	139,517	133,332	126,685	122,312	121,321	124,392	125,000
ANG	23,404	23,388	22,892	22,781	24,228	24,109	24,109
Technicians: AFRC	9,422	9,376	9,470	9,583	9,871	8,480	9,936
Indirect hire—foreign nationals	6,841	6,749	6,693	6,508	6,450	6,331	6,450
Total civilian personnel	**179,184**	**172,845**	**165,740**	**161,184**	**161,870**	**163,312**	**165,495**
Guard and Reserve							
Air National Guard, Selected Reserve	110,023	108,098	105,715	106,366	108,486	108,485	106,600
AFRC, Selected Reserve	73,311	71,970	71,772	71,357	74,869	76,680	75,600
AFRC, Individual Ready Reserve	66,827	56,459	54,271	50,307	47,944	41,095	45,000
Total Ready Reserve	**250,161**	**236,527**	**231,758**	**228,030**	**231,299**	**226,260**	**227,200**
Standby	14,500	16,042	17,129	16,470	17,827	17,430	17,500
Total Guard and Reserve	**264,661**	**252,569**	**248,887**	**244,500**	**249,126**	**243,690**	**244,700**

Numbers are rounded and may not sum to totals. FYs 1997–2002 are actual figures; FY 2003 is an estimate. *FY02 rates higher due to Stop-Loss.

Armed Forces Manpower Trends, End Strength in Thousands

(As of Sept. 30, 2002)

	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04
Active duty military								
Air Force	377	367	361	356	354	368	359	359
Army	492	484	479	482	481	487	480	480
Marine Corps	174	173	173	173	173	174	175	175
Navy	396	382	373	373	378	383	376	374
Total	**1,439**	**1,407**	**1,386**	**1,384**	**1,385**	**1,412**	**1,390**	**1,388**
Selected Guard and Reserve								
Air National Guard	110	108	106	106	109	108	107	106
AFRC	72	72	71	71	74	73	74	75
Army National Guard	370	362	344	353	350	350	350	350
Army Reserve	213	205	222	206	204	205	205	205
Marine Corps Reserve	42	41	39	40	40	42	42	42
Naval Reserve	95	93	89	86	88	84	85	86
Total	**902**	**881**	**871**	**864**	**866**	**863**	**863**	**864**
Direct-hire civilian[a]								
Air Force[b]	237	174	162	156	155	151	151	152
Army[b]	214	237	209	204	199	173	172	171
Navy/Marine Corps	175	211	193	186	178	175	171	166
Defense agencies	135	126	117	113	112	109	108	106
Total[b]	**760**	**748**	**681**	**659**	**644**	**608**	**601**	**595**

Numbers are rounded and may not sum to totals.

FY04 numbers are programmed manpower.

[a]Full-time equivalents.

[b]Includes Army and Air National Guard technicians, who were converted from state to federal employees in FY 1969.

USAF Educational Levels

(As of Dec. 31, 2002)

	Number	Percent
Enlisted		
High school	28,626	9.8
Some college (< 2 years)	209,144	71.6
AA/AS degree or equivalent hours	40,018	13.7
Bachelor's degree	12,268	4.2
Master's degree	2,044	0.7
Total	**292,101**	**100**
Officers		
Bachelor's degree	34,935	48.9
Master's degree	29,291	41.0
Doctoral degree	1,000	1.4
Professional degree	6,215	8.7
Total	**71,442**	**100**

Numbers are rounded. Does not include 4,158 cadets.

USAF Marital Status

(As of Dec. 31, 2002)

Total percent married	59
Percent of enlisted	56
Percent of officers	71
Number of USAF couples	20,479
Number married to members of other services	1,363

Numbers are rounded.

Air Force Personnel Strength

(As of Sept. 30, 2002)

Year	Strength	Year	Strength	Year	Strength
1907	3	1939	23,455	1971	755,107
1908	13	1940	51,165	1972	725,635
1909	27	1941	152,125	1973	690,999
1910	11	1942	764,415	1974	643,795
1911	23	1943	2,197,114	1975	612,551
1912	51	1944	2,372,292	1976	585,207
1913	114	1945	2,282,259	1977	570,479
1914	122	1946	455,515	1978	569,491
1915	208	1947	305,827	1979	559,450
1916	311	1948	387,730	1980	557,969
1917	1,218	1949	419,347	1981	570,302
1918	195,023	1950	411,277	1982	582,845
1919	25,603	1951	788,381	1983	592,044
1920	9,050	1952	973,474	1984	597,125
1921	11,649	1953	977,593	1985	601,515
1922	9,642	1954	947,918	1986	608,199
1923	9,441	1955	959,946	1987	607,035
1924	10,547	1956	909,958	1988	576,446
1925	9,670	1957	919,835	1989	570,880
1926	9,674	1958	871,156	1990	535,233
1927	10,078	1959	840,028	1991	510,432
1928	10,549	1960	814,213	1992	470,315
1929	12,131	1961	820,490	1993	444,351
1930	13,531	1962	883,330	1994	426,327
1931	14,780	1963	868,644	1995	400,409
1932	15,028	1964	855,802	1996	389,001
1933	15,099	1965	823,633	1997	377,385
1934	15,861	1966	886,350	1998	367,470
1935	16,247	1967	897,426	1999	360,590
1936	17,233	1968	904,759	2000	355,654
1937	19,147	1969	862,062	2001	353,571
1938	21,089	1970	791,078	2002	368,251
				2003	359,000

2003 number is programmed.

Active Duty Force Demographics

(As of Sept. 30, 2002)

Grade	Total	Blacks	Women	Other Minorities
Officers				
General	272	13	12	0
Colonel	3,760	201	396	73
Lieutenant Colonel	10,609	651	1,360	307
Major	15,542	936	2,357	799
Captain	22,648	1,599	4,562	2,129
First Lieutenant	8,724	682	1,911	973
Second Lieutenant	10,477	824	2,314	1,609
Total	**72,032**	**4,906**	**12,912**	**5,890**
Enlisted				
Chief Master Sergeant of the Air Force	1			
Chief Master Sergeant	2,921	523	352	82
Senior Master Sergeant	5,769	1,148	653	227
Master Sergeant	31,607	6,530	3,339	1,584
Technical Sergeant	44,846	8,632	5,946	2,671
Staff Sergeant	73,073	12,517	15,373	6,306
Sergeant/Senior Airman	51,371	9,639	12,305	5,956
Airman First Class	53,865	9,724	12,607	3,192
Airman	12,916	2,414	3,680	153
Airman Basic	15,692	2,346	3,658	85
Total	**292,061**	**53,473**	**57,913**	**20,256**
Total personnel	**364,093**	**58,379**	**70,825**	**26,146**

Average ages of military personnel: Officers **35,** Enlisted **28**

Total does not include 4,158 cadets.

The Civilian Force

(As of Sept. 30, 2002)

General Schedule/ Other

Grade	Force
1	10
2	57
3	357
4	2,652
5	8,604
6	5,937
7	8,856
8	1,204
9	12,677
10	714
11	15,972
12	18,144
13	10,607
14	3,109
15	1,098
16	0
17	0
18	0
ST[a]	31
SES[b]	181
Other	91
Total	**90,401**

Wage Grade

Grade	Force
1	6
2	130
3	374
4	134
5	1,204
6	894
7	1,718
8	3,701
9	2,727
10	12,182
11	3,243
12	1,540
13	195
14	44
15	2
16	0
17	0
18	0
Total	**28,094**

Wage Grade Leader

Grade	Force
1	0
2	8
3	3
4	4
5	15
6	22
7	49
8	102
9	220
10	671
11	146
12	66
13	6
14	0
15	1
16	0
17	0
18	0
Total	**1,313**

Wage Grade Supervisory

Grade	Force
1	24
2	17
3	22
4	24
5	57
6	88
7	141
8	188
9	807
10	1,033
11	420
12	222
13	137
14	186
15	92
16	33
17	29
18	13
Total	**3,533**

Air Force Civilian Personnel: Average Age and Length of Service

General schedule	**47**
Federal wage system	**46**
Average age	**47**
Average length of service (overall)	**17.13 years**

Includes active Title 5 civilians with permanent appointments, US citizens only.

Excludes Title 32 technicians, temporary employees, and foreign/local nationals.

[a]Scientific and Technical.

[b]Senior Executive Service (Includes ES, IE, and IP).

USAF Personnel Strength by Commands, FOAs, and DRUs

(As of Sept. 30, 2002)

	Military	Civilian	Total
Major commands			
Air Combat Command (ACC)	91,156	10,018	101,174
Air Education and Training Command (AETC)	72,296	14,713	87,009
Air Force Materiel Command (AFMC)	23,279	56,838	80,117
Air Force Reserve Command (AFRC)	424	13,532	13,956
Air Force Space Command (AFSPC)	19,097	6,325	25,422
Air Force Special Operations Command (AFSOC)	9,121	672	9,793
Air Mobility Command (AMC)	51,892	8,229	60,121
Pacific Air Forces (PACAF)	33,354	8,276	41,630
United States Air Forces in Europe (USAFE)	26,450	4,882	31,332
Total major commands	**327,069**	**123,485**	**450,554**
Field Operating Agencies (FOAs)			
Air Force Agency for Modeling and Simulation	18	14	32
Air Force Audit Agency	0	784	784
Air Force Center for Environmental Excellence	34	373	407
Air Force Civil Engineering Support Agency	92	117	209
Air Force C2ISR Center*	250	43	293
Air Force Communications Agency	210	299	509
Air Force Cost Analysis Agency	24	26	50
Air Force Flight Standards Agency	129	34	163
Air Force Frequency Management Agency	11	18	29
Air Force Historical Research Agency	4	51	55
Air Force History Support Office	4	25	29
Air Force Inspection Agency	110	18	128
Air Force Legal Services Agency	373	109	482
Air Force Logistics Management Agency	56	23	79
Air Force Manpower & Innovation Agency	127	79	206
Air Force Medical Operations Agency	89	48	137
Air Force Medical Support Agency	41	31	72
AFNSEPA*	21	5	26
Air Force News Agency	286	89	375
AFNWCA*	4	12	16
Air Force Office of Special Investigations	1,494	489	1,983
Air Force Operations Group	142	4	146
Air Force Pentagon Communications Agency	436	231	667
Air Force Personnel Center	1,004	1,041	2,045
Air Force Personnel Operations Agency	32	8	40
Air Force Program Executive Office	29	11	40
Air Force Real Property Agency	0	189	189
Air Force Review Boards Agency	10	59	69
Air Force Safety Center	67	50	117
Air Force Security Forces Center	311	13	324
Air Force Services Agency	74	170	244
Air Force Technical Applications Center	523	0	523
Air Force Weather Agency	545	201	746
Air Intelligence Agency	9,852	1,998	11,850
Air National Guard Readiness Center	130	440	570
Total FOAs	**16,532**	**7,102**	**23,634**
Direct Reporting Units (DRUs)			
Air Force Doctrine Center	70	14	84
Air Force Operational Test and Evaluation Center	538	199	737
Air Force Studies and Analyses Agency	69	21	90
United States Air Force Academy	2,515	1,501	4,016
11th Wing	1,680	814	2,494
Total DRUs	**4,872**	**2,549**	**7,421**
Other			
Other units	15,620	30,176	45,796
USAFA cadets	4,158	0	4,158
Total for all categories	**368,251**	**163,312**	**531,563**

*AFC2ISR Center is Air Force Command & Control, Intelligence, Surveillance, and Reconnaissance Center; AFNSEPA is Air Force National Security Emergency Preparedness Agency; AFNWCA is Air Force Nuclear Weapons & Counterproliferation Agency.

USAF Personnel by Geographic Area

(As of Sept. 30, 2002)

Total military personnel	**368,251**
US territory and special locations	**310,029**
Total in foreign countries	**58,222**
Western and southern Europe	**34,098**
Germany	15,449
UK	9,429
Italy	4,455
Turkey	1,728
Spain	272
All other countries	2,765
East Asia and Pacific	**23,235**
Japan/Okinawa	14,094
South Korea	8,973
All other countries	168
Africa, Near East, South Asia	**479**
Saudi Arabia	229
Egypt	54
All other countries	196
Western hemisphere	**377**
Canada	79
All other countries	298
Other areas	**33**

Active Duty Force by Grade

(As of Sept. 30, 2002)

Grade	Number
Officers	
General	13
Lieutenant General	38
Major General	83
Brigadier General	138
Colonel	3,760
Lieutenant Colonel	10,609
Major	15,542
Captain	22,648
First Lieutenant	8,724
Second Lieutenant	10,477
Total	**72,032**
Cadets	4,158
Enlisted	
Chief Master Sergeant of the Air Force	1
Chief Master Sergeant	2,921
Senior Master Sergeant	5,769
Master Sergeant	31,607
Technical Sergeant	44,846
Staff Sergeant	73,073
Sergeant/Senior Airman	51,371
Airman First Class	53,865
Airman	12,916
Airman Basic	15,692
Total	**292,061**
Total strength	**368,251**

Specialties in the Enlisted Force

(As of Sept. 30, 2002)

Code	Career Field	Assigned	Percent
1A	Aircrew Operations	7,799	2.7
1C	Command Control Systems Operations	12,800	4.4
1N	Intelligence	10,313	3.5
1S	Safety	365	0.1
1T	Aircrew Protection	2,758	0.9
1W	Weather	2,516	0.9
2A	Manned Aerospace Maintenance	62,638	21.4
2E	Communications–Electronics Systems	12,251	4.2
2F	Fuels	4,155	1.4
2G	Logistics Plans	700	0.2
2M	Missile & Space Systems Maintenance	2,463	0.8
2P	Precision Measurement	1,132	0.4
2R	Maintenance Management Systems	1,814	0.6
2S	Supply	10,317	3.5
2T	Transportation & Vehicle Maintenance	12,852	4.4
2W	Munitions & Weapons	15,049	5.2
3A	Information Management	10,500	3.6
3C	Communications–Computer Systems	14,418	4.9
3E	Civil Engineering	19,847	6.8
3H	Historian	104	0.0
3M	Morale, Welfare, Recreation, & Services	4,803	1.6
3N	Public Affairs	1,495	0.5
3P	Security Forces	24,074	8.2
3S	Mission Support	9,138	3.1
3U	Manpower	667	0.2
3V	Visual Information	1,288	0.4
4A–V	Medical	19,993	6.8
4Y	Dental	2,533	0.9
5J	Paralegal	939	0.3
5R	Chapel Services Support	434	0.1
6C	Contracting	1,318	0.5
6F	Financial	3,219	1.1
7S	Special Investigation	776	0.3
8	Special Duty Identifiers	6,886	2.4
9	Reporting Identifiers	9,361	3.2
	Unassigned	346	0.1
	Total	**292,061**	**100**

Percentages have been rounded.

Specialties in the Officer Force

(As of Sept. 30, 2002)

Code	Utilization Field Title	Assigned	Percent
X0	Commander & Director	921	1.3
11	Pilot	11,437	15.9
12	Navigator	4,194	5.8
13	Space, Missile, Command & Control	4,904	6.8
14	Intelligence	2,890	4.0
15	Weather	675	0.9
16	Operations Support	1,399	1.9
21	Aircraft Maintenance & Munitions	4,209	5.8
31	Security Forces	865	1.2
32	Civil Engineering	1,349	1.9
33	Communications–Computer Systems	4,270	5.9
34	MWR & Services	421	0.6
35	Public Affairs	458	0.6
36	Personnel	1,716	2.4
38	Manpower	356	0.5
4X	Medical	11,836	16.4
51	Law	1,312	1.8
52	Chaplain	593	0.8
61	Scientific/Research	876	1.2
62	Developmental Engineering	2,254	3.1
63	Acquisition	2,682	3.7
64	Contracting	981	1.4
65	Financial	951	1.3
71	Special Investigations	407	0.6
8X	Special Duty Identifiers	1,816	2.5
9X	Reporting Identifiers	5,924	8.2
	Other	2,336	3.2
	Total	**72,032**	**100**

Total does not include 4,158 cadets. Percentages have been rounded.

USAF photo by SrA. Tammy L. Grider

Combat rescue officers and pararescue personnel of the 38th Rescue Squadron, Moody AFB, Ga., and 58th Rescue Squadron, Nellis AFB, Nev., practice administering first aid during a training exercise. The rescue personnel were deployed for Operation Enduring Freedom in Afghanistan.

Budgets 2003 USAF Almanac

Terms Explained

Funding levels can be expressed in several ways. **Budget authority** is the value of new obligations that the federal government is authorized to incur. These include some obligations to be met in later years. Figures can also be expressed in **outlays** (actual expenditures, some of which are covered by amounts that were authorized in previous years).

Another difference concerns the value of money. When funding is in **current** or **then-year** dollars, no adjustment for inflation has taken place. This is the actual amount of dollars that has been or is to be spent, budgeted, or forecast. When funding is expressed in **constant dollars,** or **real dollars,** the effect of inflation has been factored out to make direct comparisons between budget years possible. A specific year, often the present one, is chosen as a baseline for constant dollars.

Normally, Congress first authorizes payment, then appropriates it. **Authorization** is an act of Congress that establishes or continues a federal program or agency and sets forth guidelines to which it must adhere. **Appropriation** is an act of Congress that enables federal agencies to spend money for specific purposes.

Air Force Budget—A 10-Year Perspective

(Budget authority in current and FY04 constant $ millions)

Current dollars	**FY94**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01**	**FY02**	**FY03**
Military personnel	18,168	19,602	19,309	19,186	19,111	19,357	20,217	20,956	24,751	25,307
Operations & maintenance	24,525	24,561	23,519	22,728	25,174	27,107	27,254	29,328	34,364	33,669
Procurement	17,716	16,529	15,558	14,247	15,258	18,434	18,755	22,054	23,229	27,538
RDT&E	12,021	11,787	12,427	14,017	14,265	13,807	14,511	14,297	14,519	18,451
Military construction	1,554	816	1,285	1,567	1,537	862	1,174	1,410	1,806	1,479
Family housing	923	1,106	1,124	1,135	1,114	1,082	1,158	1,084	1,374	1,539
Rev. & mgmt. funds	n/a	n/a	n/a	790	234	1,510	434	515	292	24
Trust & receipts	-332	-470	-231	-453	-409	-248	-453	-95	-108	-118
Total	**74,575**	**73,932**	**72,992**	**73,216**	**76,284**	**81,914**	**83,050**	**89,549**	**100,228**	**107,891**
Constant FY04 dollars										
Military personnel	25,269	26,617	25,636	24,777	23,734	23,317	23,263	23,334	26,106	25,819
Operations & maintenance	30,734	30,487	28,540	26,817	28,647	30,191	30,031	30,746	35,276	34,338
Procurement	20,212	18,522	17,157	15,543	16,492	19,675	19,720	22,922	23,904	27,964
RDT&E	13,902	13,378	13,840	15,361	15,480	14,795	15,297	14,834	14,916	18,735
Military construction	1,771	913	1,418	1,711	1,662	920	1,235	1,467	1,860	1,502
Family housing	1,054	1,243	1,240	1,236	1,200	1,155	1,220	1,122	1,410	1,564
Rev. & mgmt. funds	n/a	n/a	n/a	854	252	1,610	456	531	299	24
Trust & receipts	-380	-528	-254	-490	-439	-265	-476	-98	-110	-120
Total	**92,562**	**90,631**	**87,577**	**85,809**	**87,027**	**91,399**	**90,746**	**94,858**	**103,661**	**109,826**
Percentage real growth										
Military personnel	-11.9	5.3	-3.7	-3.4	-4.2	-1.8	-0.2	0.3	11.9	-1.1
Operations & maintenance	8.7	-0.8	-6.4	-6.0	6.8	5.4	-0.5	2.4	14.7	-2.7
Procurement	-20.2	-8.4	-7.4	-9.4	6.1	19.3	0.2	16.2	4.3	17.0
RDT&E	-9.0	-3.8	3.5	11.0	0.8	-4.4	3.4	-3.0	0.6	25.6
Military construction	44.8	-48.5	55.3	20.7	-2.9	-44.7	34.3	18.8	26.8	-19.2
Family housing	-25.4	17.9	-0.2	-0.4	-2.9	-3.8	5.6	-8.0	25.7	10.9
Total	**-7.4**	**-2.1**	**-3.4**	**-2.0**	**1.4**	**5.0**	**-0.7**	**4.5**	**9.3**	**5.9**

Numbers do not add due to rounding.

Air Force Major Force Programs

(Total obligation authority in FY04 constant $ billions)

	FY94	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01**	**FY02**	**FY03**
Forces										
Strategic Forces	7.0	5.8	5.7	4.4	4.9	4.8	4.4	4.2	4.8	5.1
General-Purpose Forces	19.7	18.9	18.9	18.5	18.9	20.3	21.1	23.8	27.9	28.3
Airlift Forces	9.4	10.0	9.6	9.5	10.0	11.5	11.4	11.1	12.7	13.2
Guard and Reserve Forces	8.4	8.7	8.3	8.2	8.5	8.8	9.1	9.2	9.4	10.2
Special Operations Forces	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Total	**45.0**	**43.9**	**43.0**	**41.1**	**42.8**	**45.9**	**46.5**	**48.8**	**55.3**	**57.4**
Support										
Intelligence & Communications	22.3	19.5	19.9	19.7	20.5	21.2	20.8	22.7	23.7	26.5
Research & Development	8.1	9.0	9.1	8.8	8.7	7.8	8.2	7.5	7.2	8.7
Central Supply & Maintenance	5.0	5.0	4.6	4.5	4.5	4.9	5.0	5.3	5.2	4.8
Training, Medical, & Personnel	10.0	10.4	10.3	9.7	9.8	9.8	9.9	10.1	11.0	11.5
Administration & Other	2.0	1.7	1.9	1.9	1.9	2.0	1.9	2.1	2.2	2.1
Total	**47.4**	**45.6**	**45.8**	**44.6**	**45.4**	**45.7**	**45.8**	**47.7**	**49.3**	**53.6**

Defense Department Budget Topline

(In current and FY04 constant $ billions)

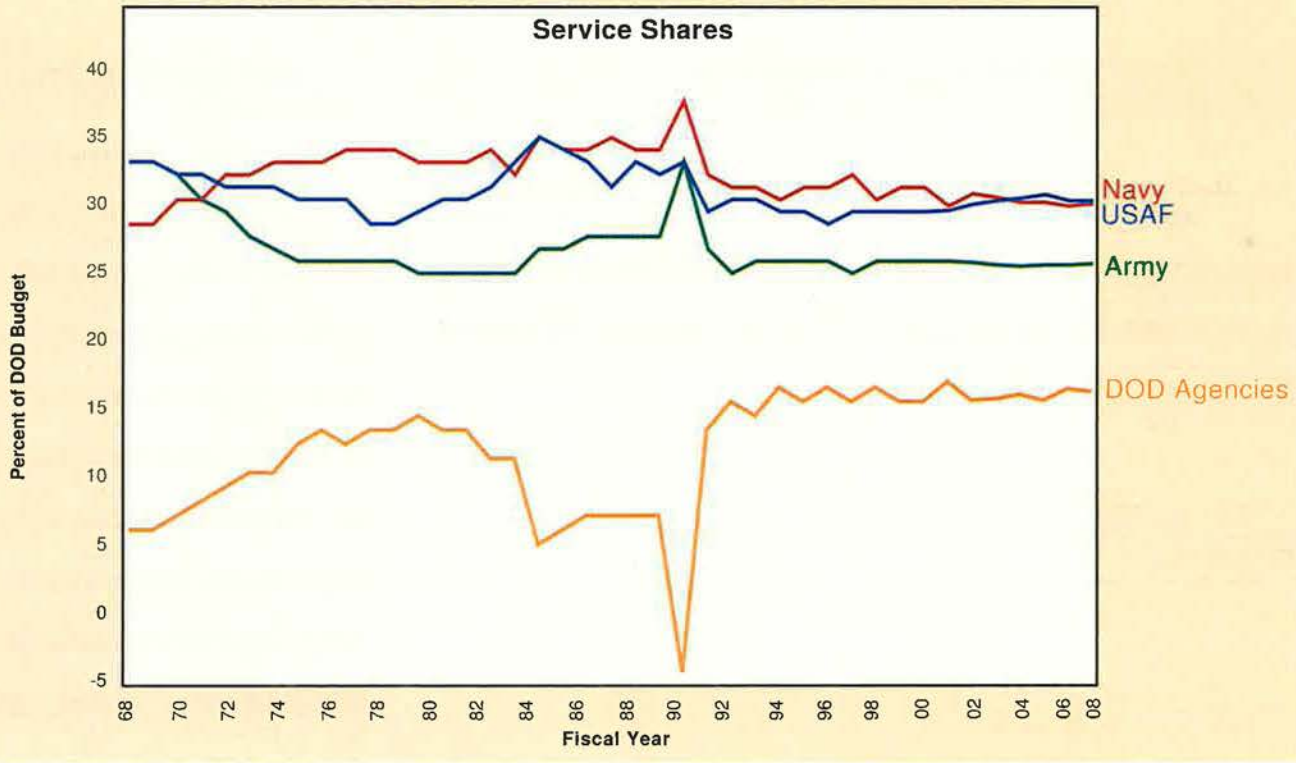
	FY02	FY03	FY04	FY05	FY06	FY07	FY08
Budget authority (current $)	344.4	364.6	379.9	399.8	419.8	440.5	461.8
Budget authority (constant FY04 $)	358.6	371.7	379.9	390.7	400.7	410.6	420.3
Outlays (current $)	333.2	358.8	370.9	389.9	402.9	416.5	441.2
Outlays (constant FY04 $)	346.0	365.7	370.9	381.3	385.1	388.9	402.4

Numbers have been rounded.

Service Shares

(In FY04 constant $ billions)

Budget authority	FY02	FY03	FY04	FY05	FY06	FY07	FY08
Air Force	104.2	110.1	113.7	117.7	121.7	122.8	125.5
Army	89.5	92.5	93.7	96.0	98.8	101.4	104.0
Navy	105.9	113.3	114.6	116.3	119.6	121.0	124.9
Defense agencies, DOD–wide	58.9	56.0	57.9	60.7	60.6	65.4	65.9
Total	358.6	371.7	379.9	390.7	400.7	410.6	420.3
Percent of budget authority							
Air Force	29.1%	29.6%	29.9%	30.1%	30.4%	29.9%	29.9%
Army	25.0%	24.9%	24.7%	24.6%	24.7%	24.7%	24.8%
Navy	29.5%	30.5%	30.2%	29.8%	29.8%	29.5%	29.7%
Defense agencies, DOD–wide	16.4%	15.1%	15.2%	15.5%	15.1%	15.9%	15.7%



Monthly Military Basic Rates of Pay

(Effective Jan. 1, 2003)

Commissioned Officers

Pay Grade	Years of Service														
	<2	2	3	4	6	8	10	12	14	16	18	20	22	24	26
O-10[a]												12,078	12,137	12,389	12,829
O-9[a]												10,564	10,716	10,936	11,320
O-8[a]	7,745	7,719	7,882	7,927	8,129	8,469	8,547	8,869	8,961	9,238	9,639	10,009	10,256	10,256	10,256
O-7[a]	6,211	6,499	6,633	6,739	6,931	7,121	7,340	7,559	7,779	8,469	9,051	9,051	9,051	9,051	9,097
O-6	4,603	5,057	5,389	5,389	5,410	5,641	5,672	5,672	5,995	6,564	6,899	7,233	7,424	7,616	7,990
O-5	3,838	4,323	4,622	4,679	4,865	4,977	5,223	5,403	5,636	5,992	6,162	6,329	6,520		
O-4	3,311	3,833	4,089	4,146	4,383	4,638	4,955	5,201	5,373	5,471	5,528				
O-3	2,911	3,300	3,562	3,884	4,070	4,274	4,406	4,623	4,736						
O-2	2,515	2,865	3,299	3,411	3,481										
O-1	2,184	2,273	2,747												
O-3E[b]				3,884	4,070	4,274	4,406	4,623	4,806	4,911	5,054	5,054			
O-2E[b]				3,411	3,481	3,592	3,779	3,923	4,031	4,031	4,031	4,031			
O-1E[b]				2,747	2,934	3,042	3,153	3,262	3,411	3,411	3,411	3,411			

Enlisted Members

E-9							3,564	3,645	3,747	3,867	3,987	4,181	4,344	4,506	4,757
E-8						2,975	3,061	3,141	3,238	3,342	3,530	3,626	3,788	3,878	4,099
E-7	2,069	2,258	2,344	2,428	2,516	2,668	2,753	2,838	2,990	3,066	3,139	3,183	3,332	3,428	3,671
E-6	1,771	1,948	2,034	2,117	2,204	2,401	2,477	2,562	2,637	2,663	2,710	2,710	2,710	2,710	
E-5	1,625	1,734	1,817	1,904	2,037	2,152	2,237	2,283	2,283	2,283	2,283	2,283			
E-4	1,503	1,580	1,665	1,749	1,824	1,824	1,824	1,824							
E-3	1,357	1,442	1,529	1,529											
E-2	1,290	1,290													
E-1 4 mos.+	1,151														
E-1<4 mos.	1,065														

Amounts have been rounded to the nearest dollar.
[a]Basic pay for pay grades O-7 through O-10 is limited to $11,874.90. Basic pay for O-6 and below is limited to $10,449.90.
[b]Commissioned officers with more than four years' active service as enlisted members.
While serving as Chairman of the Joint Chiefs of Staff or Chief of Staff of the Air Force, basic pay is $14,155.50.
For the Chief Master Sergeant of the Air Force, basic pay is $5,732.70.

Aviation Career Incentive Pay

(Effective Jan. 1, 2003)

Monthly Rate	Years of Aviation Service as an Officer
125	2 or fewer
156	more than 2
188	more than 3
206	more than 4
650	more than 6
840	more than 14
585	more than 22
495	more than 23
385	more than 24
250	more than 25

Provided to qualified rated officers.

Officers in pay grade O-7 are paid $200 per month. Officers in pay grade O-8 or above are paid $206 per month.

Continuous pay ends following the 25th year of service.

Hazardous Duty Pay

(Effective Jan. 1, 2003)

Pay Grade	Monthly Rate
O-10	150
O-9	150
O-8	150
O-7	150
O-6	250
O-5	250
O-4	225
O-3	175
O-2	150
O-1	150
E-9	240
E-8	240
E-7	240
E-6	215
E-5	190
E-4	165
E-3	150
E-2	150
E-1	150

Annual Pay for Federal Civilians

(Effective Jan. 1, 2003)

General Schedule

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
GS-1	15,214	15,722	16,228	16,731	17,238	17,536	18,034	18,538	18,559	19,031
GS-2	17,106	17,512	18,079	18,559	18,767	19,319	19,871	20,423	20,975	21,527
GS-3	18,664	19,286	19,908	20,530	21,152	21,774	22,396	23,018	23,640	24,262
GS-4	20,952	21,650	22,348	23,046	23,744	24,442	25,140	25,838	26,536	27,234
GS-5	23,442	24,223	25,004	25,785	26,566	27,347	28,128	28,909	29,690	30,471
GS-6	26,130	27,001	27,872	28,743	29,614	30,485	31,356	32,227	33,098	33,969
GS-7	29,037	30,005	30,973	31,941	32,909	33,877	34,845	35,813	36,781	37,749
GS-8	32,158	33,230	34,302	35,374	36,446	37,518	38,590	39,662	40,734	41,806
GS-9	35,519	36,703	37,887	39,071	40,255	41,439	42,623	43,807	44,991	46,175
GS-10	39,115	40,419	41,723	43,027	44,331	45,635	46,939	48,243	49,547	50,851
GS-11	42,976	44,409	45,842	47,275	48,708	50,141	51,574	53,007	54,440	55,873
GS-12	51,508	53,225	54,942	56,659	58,376	60,093	61,810	63,527	65,244	66,961
GS-13	61,251	63,293	65,335	67,377	69,419	71,461	73,503	75,545	77,587	79,629
GS-14	72,381	74,794	77,207	79,620	82,033	84,446	86,859	89,272	91,685	94,098
GS-15	85,140	87,978	90,816	93,654	96,492	99,330	102,168	105,006	107,844	110,682

Senior Executive Service

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6
116,500	122,000	127,500	133,800	134,000	134,000

NOTE: Since January 1994, locality-based comparability payments have been applied to General Schedule (GS) and Senior Executive Service (ES) positions in the continental United States. In other words, pay is higher in areas of the US where nonfederal salaries are higher. Because there are 30 locality pay areas recognized by the Office of Personnel Management, there are in effect 30 different GS and ES pay schedules based on the schedule above. Locality pay adjustments do not apply to employees already receiving special salary rates that exceed the locality rate nor to overseas employees.

Housing Allowance

(Effective Jan. 1, 2003)

Pay Grade	With Dependents	Without Dependents
O-10	1,256.40	1,020.90
O-9	1,256.40	1,020.90
O-8	1,256.40	1,020.90
O-7	1,256.40	1,020.90
O-6	1,131.00	936.60
O-5	1,090.20	901.80
O-4	960.90	835.50
O-3	795.00	669.90
O-2	678.60	531.30
O-1	607.20	447.60
O-3E	854.40	723.30
O-2E	771.00	614.70
O-1E	712.50	528.90
E-9	816.30	619.20
E-8	752.70	568.50
E-7	698.70	485.40
E-6	645.90	439.50
E-5	580.90	405.30
E-4	504.60	352.50
E-3	469.80	345.90
E-2	447.60	281.10
E-1	447.60	250.80

Subsistence Allowance

(Effective Jan. 1, 2003)

	Cash/In-Kind
Officers	167.20/month
Enlisted Members Standard	242.81/month
When rations in-kind are not available	262.50/month

Historical Federal Budget Data

Current $ billions

Year	Total Outlays	Deficit/ Surplus	Entitlements	Defense
1962	106.8	5.9	34.7	52.6
1963	111.3	4.0	36.2	53.7
1964	118.5	6.5	38.9	55.0
1965	118.2	1.6	39.7	51.0
1966	134.5	3.1	43.4	59.0
1967	157.5	12.6	50.9	72.0
1968	178.1	27.7	59.7	82.2
1969	183.6	0.5	64.6	82.7
1970	195.6	8.7	72.5	81.9
1971	210.2	26.1	86.9	79.0
1972	230.7	26.4	100.8	79.3
1973	245.7	15.4	116.0	77.1
1974	269.4	8.0	130.9	80.7
1975	332.3	55.3	169.4	87.6
1976	371.8	70.5	189.1	89.9
1977	409.2	49.8	203.7	97.5
1978	458.7	54.9	227.4	104.6
1979	504.0	38.7	247.0	116.8
1980	590.9	72.7	291.2	134.6
1981	678.2	73.9	339.4	158.0
1982	745.7	120.0	370.8	185.9
1983	808.4	208.0	410.6	209.9
1984	851.9	185.6	405.6	228.0
1985	946.4	221.7	448.2	253.1
1986	990.4	237.9	461.8	273.8
1987	1,004.1	169.3	474.2	282.5
1988	1,064.5	194.0	505.0	290.9
1989	1,143.6	205.2	548.6	304.0
1990	1,253.2	277.8	626.9	300.1
1991	1,324.4	321.5	702.3	319.7
1992	1,381.7	340.5	716.8	302.6
1993	1,409.5	300.4	738.0	292.4
1994	1,461.9	258.9	786.1	282.3
1995	1,515.8	226.4	818.5	273.6
1996	1,560.5	174.1	858.7	266.0
1997	1,601.3	103.3	896.3	271.7
1998	1,652.6	30.0	938.6	270.2
1999	1,701.9	+1.9	976.8	275.5
2000	1,788.8	+86.6	1,029.8	295.0
2001	1,863.9	33.4	1,095.2	306.1
2002	2,011.0	317.5	1,197.0	348.9

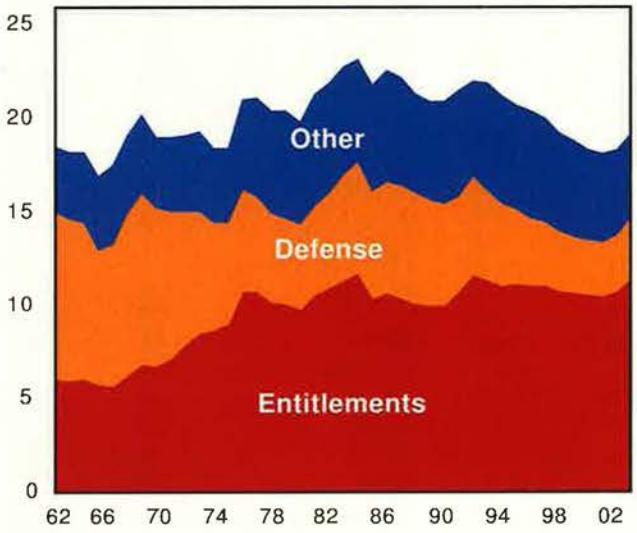
Constant FY04 $ billions

Year	Total Outlays	Deficit/ Surplus	Entitlements	Defense
1962	665.3	36.8	216.2	327.7
1963	684.5	24.6	222.6	330.2
1964	719.4	39.5	236.1	333.9
1965	706.3	9.6	237.2	304.7
1966	781.0	18.0	252.0	342.6
1967	887.1	71.0	286.7	405.5
1968	962.6	149.7	322.7	444.3
1969	940.6	2.6	331.0	423.7
1970	948.1	42.2	351.4	397.0
1971	975.9	121.2	403.5	366.8
1972	1,037.9	118.8	453.5	356.8
1973	1,040.8	65.2	491.4	326.6
1974	1,028.1	30.5	499.6	308.0
1975	1,162.4	193.4	592.6	306.4
1976	1,229.3	233.1	625.2	297.2
1977	1,270.3	154.6	632.4	302.7
1978	1,323.4	158.4	656.1	301.8
1979	1,306.5	100.3	640.3	302.8
1980	1,349.6	166.0	665.1	307.4
1981	1,404.3	153.0	702.8	327.2
1982	1,453.9	234.0	723.0	362.5
1983	1,527.3	393.0	775.8	396.6
1984	1,543.2	336.2	734.7	413.0
1985	1,654.8	387.6	783.7	442.5
1986	1,699.4	408.2	792.4	469.8
1987	1,663.0	280.4	785.4	467.9
1988	1,693.6	308.7	803.5	462.8
1989	1,736.2	311.5	832.9	461.5
1990	1,805.1	400.1	903.0	432.3
1991	1,830.7	444.4	970.8	441.9
1992	1,854.3	457.0	962.0	406.1
1993	1,836.5	391.4	961.6	381.0
1994	1,856.5	328.8	998.3	358.5
1995	1,872.5	279.7	1,011.1	338.0
1996	1,871.6	208.8	1,029.9	319.0
1997	1,877.4	121.1	1,050.8	318.5
1998	1,907.0	34.6	1,083.1	311.8
1999	1,921.6	+2.1	1,102.9	311.1
2000	1,953.3	+94.6	1,124.5	322.1
2001	1,979.9	35.5	1,163.4	325.1
2002	2,102.5	331.9	1,251.5	364.8

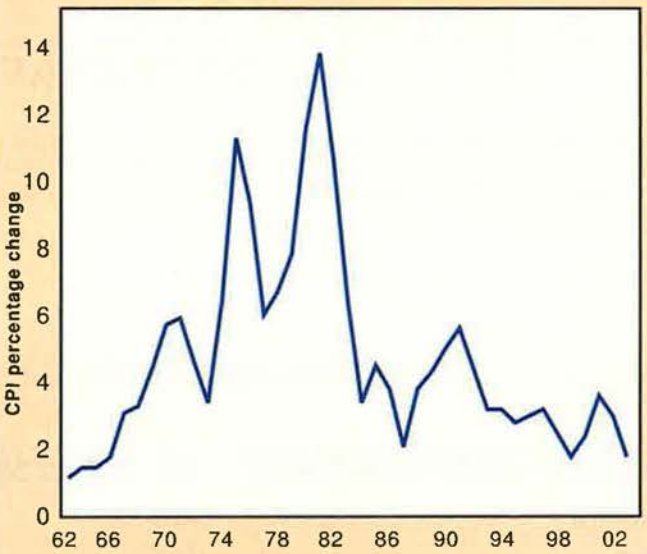
Source: "The Economic and Budget Outlook: Fiscal Years 2004–13," published by the Congressional Budget Office, January 2003. (Constant dollar figures are derived.)

Percentages of GDP

Year	Total Outlays	Deficit/ Surplus	Entitlements	Defense
1962	18.8	1.0	6.1	9.2
1963	18.5	0.7	6.0	8.9
1964	18.5	1.0	6.1	8.6
1965	17.2	0.2	5.8	7.4
1966	17.8	0.4	5.7	7.8
1967	19.4	1.6	6.3	8.9
1968	20.5	3.2	6.9	9.4
1969	19.3	0.1	6.8	8.7
1970	19.3	0.9	7.2	8.1
1971	19.4	2.4	8.0	7.3
1972	19.6	2.2	8.6	6.7
1973	18.7	1.2	8.8	5.9
1974	18.7	0.6	9.1	5.6
1975	21.3	3.5	10.9	5.6
1976	21.4	4.1	10.9	5.2
1977	20.7	2.5	10.3	4.9
1978	20.7	2.5	10.2	4.7
1979	20.1	1.5	9.9	4.7
1980	21.6	2.7	10.7	4.9
1981	22.2	2.4	11.1	5.2
1982	23.1	3.7	11.5	5.8
1983	23.5	6.0	11.9	6.1
1984	22.1	4.8	10.5	5.9
1985	22.9	5.4	10.8	6.1
1986	22.5	5.4	10.5	6.2
1987	21.6	3.6	10.2	6.1
1988	21.2	3.9	10.1	5.8
1989	21.2	3.8	10.1	5.6
1990	21.8	4.8	10.9	5.2
1991	22.3	5.4	11.8	5.4
1992	22.2	5.5	11.5	4.9
1993	21.5	4.6	11.2	4.5
1994	21.0	3.7	11.3	4.1
1995	20.7	3.1	11.2	3.7
1996	20.3	2.3	11.2	3.5
1997	19.5	1.3	10.9	3.3
1998	19.1	0.3	10.8	3.1
1999	18.6	0.0	10.7	3.0
2000	18.4	0.9	10.6	3.0
2001	18.6	0.3	10.9	3.0
2002	19.5	3.1	11.6	3.4



Inflation Rates



CPI=Consumer Price Index

Year	% change
1962	1.0
1963	1.3
1964	1.3
1965	1.6
1966	2.9
1967	3.1
1968	4.2
1969	5.5
1970	5.7
1971	4.4
1972	3.2
1973	6.2
1974	11.0
1975	9.1
1976	5.8
1977	6.5
1978	7.6
1979	11.3
1980	13.5
1981	10.3
1982	6.2
1983	3.2
1984	4.3
1985	3.6
1986	1.9
1987	3.6
1988	4.1
1989	4.8
1990	5.4
1991	4.2
1992	3.0
1993	3.0
1994	2.6
1995	2.8
1996	3.0
1997	2.3
1998	1.6
1999	2.2
2000	3.4
2001	2.8
2002	1.6

Equipment
2003 USAF Almanac

Total active inventory (TAI): aircraft assigned to operating forces for mission, training, test, or maintenance. Includes primary, backup, and attrition aircraft.
Primary aircraft inventory (PAI): aircraft assigned to meet primary aircraft authorization (PAA).

Active Duty Inventory

(As of Sept. 30, 2002)

Type	TAI	PAI
Bomber		
B-1	78	50
B-2	21	16
B-52	84	50
Total	**183**	**116**
Fighter/Attack		
A-10	125	114
OA-10	83	66
F-15	609	515
F-16	751	642
F-117	52	44
F/A-22	8	8
YF-117	3	3
Total	**1,631**	**1,392**
Helicopter		
HH-60	64	43
UH-1	62	44
Total	**126**	**87**
Reconnaissance/BM/C3I		
E-3	31	25
E-4	4	3
E-8	14	11
EC-130	20	16
EC-135	2	0
M/RQ-1	8	7
NC-135	1	0
OC-135	2	2
RC-135	21	16
RQ-4	3	0
U-2	31	29
WC-135	2	0
Total	**139**	**109**
Special Ops Forces		
AC-130	21	16
MC-130	45	41
MH-53	36	34
Total	**102**	**91**
Tanker		
HC-130	13	11
KC-10	59	54
KC-135	247	212
NKC-135	3	3
Total	**322**	**280**
Trainer		
AT-38	31	25
T-1	180	140
T-3	110	0
T-6	81	62
T-37	404	342
T-38	458	342
T-39	3	3
T-41	4	4
T-43	10	9
TC-18	2	0
TC-135	2	2
TE-8	1	0
TG-3	3	3
TG-4	14	12
TG-7	9	9
TG-9	4	4
TG-10	16	0
TG-11	2	2
TG-14	5	0
TU-2	4	4
UV-18	3	2
Total	**1,346**	**965**
Transport		
C-5	81	70
C-9	23	22
C-12	27	23
C-17	92	82
C-20	12	7
C-21	76	72
C-32	4	4
C-37	9	3
C-41	2	2
C-130	192	164
C-135	2	2
C-141	14	8
NC-130	2	1
VC-25	2	2
Total	**538**	**462**
Total Active	**4,387**	**3,502**

Air National Guard Inventory

(As of Sept. 30, 2002)

Type	TAI	PAI
Fighter/Attack		
A-10	76	72
OA-10	26	18
F-15	126	101
F-16	570	457
Total	**798**	**648**
Helicopter		
HH-60G	18	15
Reconnaissance/BM/C3I		
EC-130	7	5
Special Ops Forces		
MC-130	4	4
Tanker		
HC-130	9	7
KC-135	231	204
Total	**240**	**211**
Transport		
C-5	13	12
C-21	2	2
C-22	2	0
C-26	11	11
C-38	2	2
C-40	2	0
C-130	223	208
C-135	1	0
C-141	17	16
LC-130	10	10
Total	**283**	**261**
Total ANG	**1,350**	**1,144**

Air Force Reserve Command Inventory

(As of Sept. 30, 2002)

Type	TAI	PAI
Bomber		
B-52	9	8
Fighter/Attack		
A-10	44	39
OA-10	8	6
F-16	70	59
Total	**122**	**104**
Helicopter		
HH-60	23	21
Reconnaissance/BM/C3I		
WC-130	16	6
Special Ops Forces		
MC-130	14	12
Tanker		
HC-130	10	10
KC-135	68	64
Total	**78**	**74**
Transport		
C-5	32	28
C-130	107	100
C-141	45	40
Total	**184**	**168**
Total AFRC	**446**	**393**

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Total Number of USAF Aircraft in Service Over Time

(As of Sept. 30, 2002)

Type of aircraft	FY96	FY97	FY98	FY99	FY00	FY01	FY02
Bomber	185	177	179	179	181	181	183
Tanker	314	310	317	317	316	317	309
Fighter/interceptor/attack	1,637	1,631	1,613	1,594	1,595	1,556	1,569
Reconnaissance/electronic warfare	257	252	211	211	209	187	187
Transport	654	612	610	592	570	549	541
Search & rescue (fixed wing)	9	9	9	10	12	13	13
Helicopter (includes rescue)	174	178	165	165	168	164	162
Trainer	1,193	1,234	1,247	1,247	1,261	1,282	1,335
Utility/observation/other	98	98	96	98	89	89	88
Total active duty	**4,521**	**4,501**	**4,447**	**4,413**	**4,401**	**4,338**	**4,387**
Air National Guard	1,426	1,375	1,351	1,360	1,362	1,361	1,350
AFRC	447	454	430	430	442	445	446
Total active duty, ANG, and AFRC	**6,394**	**6,330**	**6,228**	**6,203**	**6,205**	**6,144**	**6,183**
Total aircraft, including foreign-government-owned	6,476	6,412	6,327	6,302	6,304	6,245	6,286

Age of the Active Duty Fleet

(As of Sept. 30, 2002)

	Age in Years										
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Total	Average
A/OA-10							114	94		208	20.8
B-1					29	49				78	15.2
B-2		2	13	5	1					21	8.1
B-52									84	84	40.8
C-5					31	19			31	81	20.8
C-9									23	23	31.5
KC-10					3	32	19	5		59	17.7
C-12					4		8	1	14	27	22.1
C-17	37	28	19	8						92	4.3
C-18[a]							2			2	20.3
C-20			2			8	2			12	14.6
C-21						51	25			76	17.7
C-25[a]				1	1					2	11.9
C-32		4								4	4.0
C-37	7	2								9	1.7
C-41	2									2	2.0
C-130[a]			14	17	8	11			243	293	30.0
C-135[a]									282	282	40.7
C-141[a]									14	14	35.7
E-3							9	10	12	31	22.7
E-4									4	4	28.3
E-8[a]	9	4	1	1						15	3.3
F-15	14	3	9	92	121	106	117	140	7	609	16.4
F-16	22	9	132	234	242	93	11	8		751	11.6
F/A-22	6	2								8	2.3
F-117[b]				55						55	11.4
H-1[a]									62	62	31.7
H-53[a]									36	36	32.2
H-60[a]		8		24	22		10			64	12.3
M/RQ-1	4	4								8	3.1
RQ-4		3								3	3.9
T-1		24	106	50						180	7.9
T-3			110							110	7.6
T-6	80	1								81	1.0
T-37									404	404	39.1
T-38[a]									489	489	35.5
T-39									3	3	41.6
T-41									4	4	33.1
T-43									10	10	28.5
TG-3				2	1					3	11.6
TG-4			4	1	1		1	3	4	14	17.0
TG-7					4		5			9	17.0
TG-9						4				4	15.6
TG-10	15		1							16	0.7
TG-11			2							2	7.2
TG-14	5									5	0.1
U-2					6	14	10	1	4	35	19.0
UV-18		1							2	3	18.5
Total	201	95	413	490	474	387	333	262	1,732	4,387	22.2
Percent[c]	**5%**	**2%**	**9%**	**11%**	**11%**	**9%**	**8%**	**6%**	**40%**		

[a]Includes all types. [b]Includes YF-117. [c]Percentages are rounded.

Age of the Air National Guard Fleet

(As of Sept. 30, 2002)

	Age in Years										
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Total	Average
A-10							33	69		102	21.8
C-5									13	13	31.4
C-21						2				2	15.0
C-22						2				2	17.7
C-26			8	3						11	8.3
C-38		2								2	4.5
C-40	2									2	0.0
C-130	11	9	44	25	22	31	14	19	78	253	20.4
C-135									232	232	42.3
C-141									17	17	36.1
F-15						1	2	47	76	126	24.3
F-16			18	49	185	226	89	3		570	15.2
H-60			5	2	11					18	11.8
Total	13	11	75	79	218	262	138	138	416	1,350	22.5
Percent	**1%**	**1%**	**6%**	**6%**	**16%**	**19%**	**10%**	**10%**	**31%**		

Percentages have been rounded.

Age of the Air Force Reserve Command Fleet

(As of Sept. 30, 2002)

	Age in Years										
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Total	Average
A-10							4	48		52	22.0
B-52									9	9	40.5
C-5									32	32	31.3
C-130	7	7	24	9	18	18	6		58	147	21.5
C-135									68	68	41.7
C-141									45	45	35.9
F-16					44	26				70	14.7
H-60				16	7					23	12.1
Total	7	7	24	25	69	44	10	48	212	446	25.6
Percent	**2%**	**2%**	**5%**	**6%**	**16%**	**10%**	**2%**	**11%**	**48%**		

Percentages have been rounded.

ICBMs and Spacecraft in Service

(As of Sept. 30, 2002)

Type of system	FY96	FY97	FY98	FY99	FY00	FY01	FY02
Minuteman III ICBM	530	530	530	500	500	500	500
Peacekeeper ICBM	50	50	50	50	50	50	50
Total ICBMs	**580**	**580**	**580**	**550**	**550**	**550**	**550**
DMSP satellite	2	2	2	2	2	2	2
DSCS satellite	5	5	5	5	5	5	5
DSP satellite (data classified)	—	—	—	—	—	—	—
GPS satellite	26	26	26	26	24	27	28
Milstar satellite	2	2	2	2	2	3	4
Total satellites	**35**	**35**	**35**	**35**	**33**	**37**	**39**

DMSP: Defense Meteorological Satellite Program **DSCS:** Defense Satellite Communications System **DSP:** Defense Support Program **GPS:** Global Positioning System
As of FY02, satellite data show the number of satellites that are primary mission capable.

USAF Aircraft Flying Hours

(In thousands, as of Sept. 30, 2002)

	FY96	FY97	FY98	FY99	FY00	FY01	FY02
Active duty	1,657	1,680	1,644	1,633	1,555	1,579	1,768
ANG	380	375	361	357	342	341	410
AFRC	144	150	149	142	139	146	186
Total	**2,181**	**2,205**	**2,154**	**2,132**	**2,036**	**2,066**	**2,364**

USAF Squadrons by Mission Type

(As of Sept. 30, 2002)

	FY98	FY99	FY00	FY01	FY02
Active forces					
Bomber	10	10	10	9	9
Air refueling	25	24	26	26	26
Strategic command & control	2	2	2	2	2
Fighter	47	46	46	46	46
Reconnaissance	0	0	1	4	4
Electronic warfare	3	3	3	2	2
Special Operations Forces	13	13	14	14	21
Ground theater air control	8	8	7	7	2
Airborne theater air control	8	8	8	8	8
Rescue	7	7	7	6	6
Theater airlift	11	12	12	12	12
Long-range airlift	20	20	20	18	18
Aeromedical airlift	3	3	3	3	3
ICBM	14	14	14	14	14
Space operations	10	10	8	8	8
Space communications	1	1	1	1	0
Space warning	8	8	7	7	8
Space surveillance	6	6	6	4	3
Space launch	5	5	3	3	3
Range	2	2	2	2	2
Space control	1	1	2	3	3
Total	**204**	**203**	**202**	**199**	**200**
Reserve forces					
ANG Selected Reserve					
Flying	88	88	88	88	89
Space operations	0	0	0	1	1
Space warning	0	0	0	1	1
AFRC					
Flying	62	68	70	75	66
Space operations	2	3	4	4	4
Space warning	0	1	1	1	1
Total	**152**	**160**	**163**	**170**	**162**
Grand total	**356**	**363**	**365**	**369**	**362**

Aircraft per Active Duty USAF Squadron

(As of Sept. 30, 2002)

Aircraft	Number
A/OA-10	18/24
AC-130H	8
AC-130U	13
B-1B	12/18
B-2	8
B-52	12
C-5	16
C-9A	6
C-17	15
C-130	15
C-141B	10
E-3	2/5
E-8	8
EC-130H	6/10
F-15	18/24
F-15E	18/24
F-16	18/24
F-117A	18
HC-130P/N	11
HH-60G	9
KC-10A	15
KC-135	27
MC-130E	14
MC-130H/P	7
MH-53	12
U-2	29

Air National Guard Air Defense Unit Fin Flashes

Description	Aircraft	Unit and Location
Minuteman over Massachusetts	F-15A/B	102nd FW, Otis ANGB, Mass.
Subdued eagle and "Oregon" logo	F-15A/B	114th FS (173rd FW), Klamath Falls Arpt., Ore.[b]
Red stripe with "Happy Hooligans" logo	F-16A/B	119th FW, Hector Arpt., N.D.
Dark gray bison's skull against prairie/mountain profile	F-16A/B	120th FW, Great Falls Arpt., Mont.[a]
Subdued hawk with banner in talons	F-15A/B	123rd FS (142nd FW), Portland Arpt., Ore.
Gray lightning bolt	F-15A/B	125th FW, Jacksonville Arpt., Fla.
Black falcon with talons extended and "California" logo	F-16C/D	144th FW, Fresno Yosemite Arpt., Calif.
Texas star on subdued jagged stripes with "Houston" logo	F-16C/D	147th FW, Ellington Field, Tex.[a]
Stars of Little Dipper constellation and "Duluth" logo	F-16A/B	148th FW, Duluth Arpt., Minn.
Subdued "Vermont" on top of tail with figure of Ethan Allen	F-16C/D	158th FW, Burlington Arpt., Vt.[a]
Starburst state flag and "Arizona" logo	F-16A/B	162nd FW, Tucson Arpt., Ariz.[b]
Subdued "Atlantic City" at top of tail	F-16C/D	177th FW, Atlantic City Arpt., N.J.[a]

[a]General-purpose units (no longer air defense only).
[b]ANG training units.

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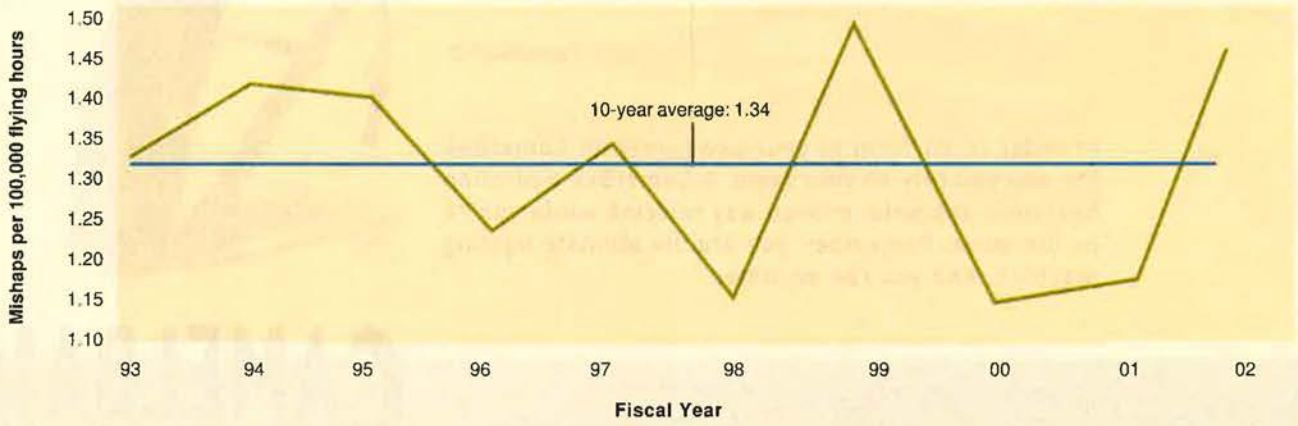
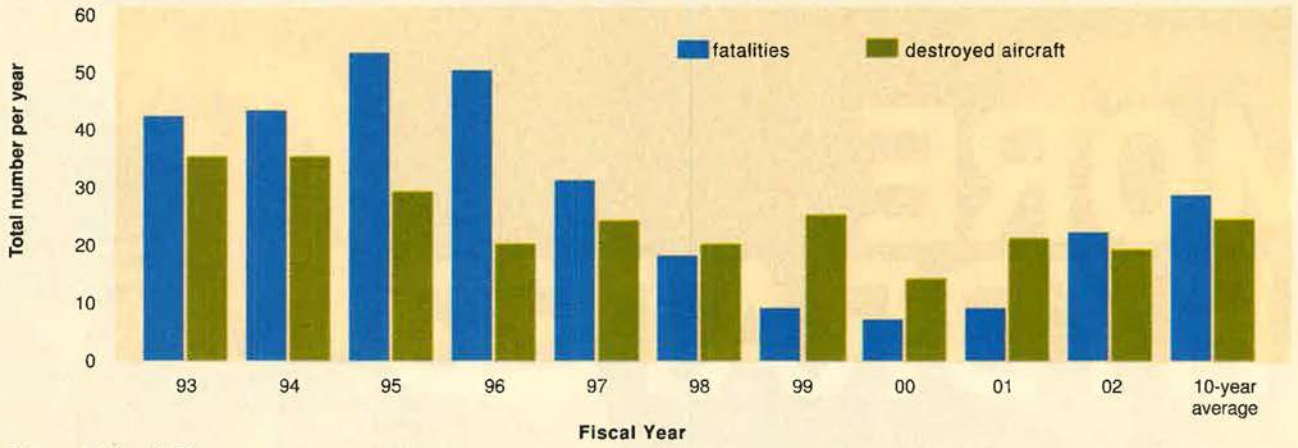
Class A Aircraft Mishaps

(As of Sept. 30, 2002)

(Loss of life, permanent total disability, destroyed aircraft, or more than $1 million in property damage)





Data provided by USAF.

USAF photo by MSgt. Dean V. Kuhlman

An F-16A Fighting Falcon from the 148th Fighter Wing, Minnesota Air National Guard, escorts home a new F-16C.

USAF Aircraft Tail Markings

Code	Aircraft	Unit and Location
AC	F-16	177th FW (ANG), Atlantic City Arpt., N.J.
AF	C-150, gliders, T-41, UV-18	34th OG, USAF Academy, Colo.
AK	C-12, C-130H, F-15C/D/E	3rd Wing, Elmendorf AFB, Alaska
AK	A/OA-10A, F-16C/D	354th FW, Eielson AFB, Alaska
AL	F-16C/D	187th FW (ANG), Dannelly Fld., Ala.
AL	KC-135	117th ARW (ANG), Birmingham Arpt., Ala.
AN	C-130H, HC-130N, HH-60G	176th Wing (ANG), Kulis ANGB, Alaska
AV	F-16C/D	31st FW, Aviano AB, Italy
AZ	F-16A/B/C/D	162nd FW (ANG), Tucson Arpt., Ariz.
BB	T-38A, U-2	9th RW, Beale AFB, Calif.
BC	A/OA-10A	110th FW (ANG), W.K. Kellogg Arpt., Mich.
BD	B-52H, A/OA-10A	917th Wing (AFRC), Barksdale AFB, La.
CA	HC-130P, HH-60G	129th RQW (ANG), Moffett Fed Afld., Calif.
CB	T-1, T-37B, T-38A/C	14th FTW, Columbus AFB, Miss.
CC	F-16C/D	27th FW, Cannon AFB, N.M.
CI	C-130E	146th AW, Channel Islands ANGS, Calif.
CO	F-16C/D	140th Wing, Buckley AFB, Colo., 302nd
CR	C-130H	302nd AW (AFRC), Peterson AFB, Colo.
CT	A/OA-10A	103rd FW (ANG), Bradley Arpt., Conn.
DC	F-16C/D	113th Wing (ANG), Andrews AFB, Md.
DE	C-130H	166th AW (ANG), New Castle Co. Arpt., Del.
DM	A/OA-10A, EC-130E/H	355th Wing, Davis–Monthan AFB, Ariz.
DR	HH-60G	305th RQS (AFRC), Davis–Monthan AFB, Ariz.
DY	B-1B	7th BW, Dyess AFB, Tex.
ED	Various	412th TW, Edwards AFB, Calif.
EF	F-16C/D	147th FW (ANG), Ellington Fld., Tex.
EG	F-15C/D	33rd FW, Eglin AFB, Fla.
EL	B-1B	28th BW, Ellsworth AFB, S.D.
EN	AT-38B, T-37B, T-38A	80th FTW, Sheppard AFB, Tex.
ET	A-10A, F-15A/B/C/D/E, F-16A/B/C/D, UH-1N	46th TW, Eglin AFB, Fla.
FC	UH-1N	336th TG, Fairchild AFB, Wash.
FE	UH-1N	90th SPW, F.E. Warren AFB, Wyo.
FF	F-15C/D	1st FW, Langley AFB, Va.
FL	HC-130P/N, HH-60G	920th RQG (AFRC), Patrick AFB, Fla.
FM	F-16C/D	482nd FW (AFRC), Homestead ARB, Fla.
FS	F-16A/B	188th FW (ANG), Fort Smith Arpt., Ark.
FT	A/OA-10A	23rd FG, Pope AFB, N.C.
FW	F-16C/D	122nd FW (ANG), Fort Wayne Arpt., Ind.
GA	B-1B	116th BW (ANG), Robins AFB, Ga.
GA	E-8C, TE-8A	116th ACW (ANG), Robins AFB, Ga.
GA	C-130H	165th AW (ANG), Savannah Arpt., Ga.
HA	F-16C/D	185th FW (ANG), Sioux Gateway Arpt., Iowa
HD	QF-4	53rd WEG, Holloman AFB, N.M.
HH	C-130H, F-15A/B, KC-135R	154th Wing, Hickam AFB, Hawaii
HI	F-16C/D	419th FW (AFRC), Hill AFB, Utah
HL	F-16C/D	388th FW, Hill AFB, Utah
HO	F-117A, T-38A	49th FW, Holloman AFB, N.M.
HO	F-4F	Luftwaffe RTU, Holloman AFB, N.M.
HT	AT-38B, C-12, F-15A	46th TG, Holloman AFB, N.M.
HV	UH-1N	30th SPW, Vandenberg AFB, Calif.
ID	A/OA-10A, C-130E	124th Wing (ANG), Boise Air Term., Idaho
IL	C-130E	182nd AW (ANG), Greater Peoria Arpt., Ill.
IS	HH-60G	85th Group, NAS Keflavik, Iceland
JZ	F-15A/B	159th FW (ANG), NAS JRB New Orleans
KC	A/OA-10	442nd FW (AFRC), Whiteman AFB, Mo.
LA	B-52H	2nd BW, Barksdale AFB, La.
LI	HC-130P, HH-60G	106th RW (ANG), F.S. Gabreski Arpt., N.Y.
LN	F-15C/D/E	48th FW, RAF Lakenheath, UK
LR	F-16C/D	944th FW (AFRC), Luke AFB, Ariz.
MA	F-15A/B	102nd FW (ANG), Otis ANGB, Mass.
MA	A/OA-10A	104th FW (ANG), Barnes Arpt., Mass.
MD	A/OA-10A, C-130J	175th Wing (ANG), Martin State Arpt., Md.
MI	F-16C/D, C-130E	127th Wing (ANG), Selfridge ANGB, Mich.
MI	KC-135E	927th ARW (AFRC), Selfridge ANGB, Mich.
MM	UH-1N	341st SPW, Malmstrom AFB, Mont.
MN	C-130H	133rd AW (ANG), Minn.–St. Paul Arpt./ARS
MN	F-16A/B	148th FW (ANG), Duluth Arpt., Minn.
MO	F-15C/D/E, F-16CJ, KC-135R	366th FW, Mountain Home AFB, Idaho
MT	B-52H	5th BW, Minot AFB, N.D.
MT	UH-1N	91st SPW, Minot AFB, N.D.
MY	HC-130P, HH-60G	347th Rescue Wing, Moody AFB, Ga.
MY	AT-38B, T-6A, T-38C	479th FTG (AETC), Moody AFB, Ga.
NM	F-16C/D	150th FW (ANG), Kirtland AFB, N.M.
NO	A/OA-10A	926th FW (AFRC), NAS JRB New Orleans
NV	C-130E	152nd AW (ANG), Reno/Tahoe Arpt., Nev.
NY	F-16C/D	174th FW (ANG), Hancock Fld., N.Y.
OF	Various	55th Wing, Offutt AFB, Neb.
OH	F-16C/D	178th FW (ANG), Springfield–Beckley Arpt., Ohio
OH	C-130H	179th AG (ANG), Mansfield Lahm Arpt., Ohio
OH	F-16C/D	180th FW (ANG), Toledo Exp. Arpt., Ohio
OK	C-130H	137th AW (ANG), Will Rogers World Arpt., Okla.
OK	F-16C/D	138th FW (ANG), Tulsa Arpt., Okla.
OK	E-3B/C, TC-18E	552nd ACW, Tinker AFB, Okla.
OS	A/OA-10A, C-12, F-16C/D	51st FW, Osan AB, South Korea
OT	B-1, B-2, B-52, F/A-22, F-15A/C/D/E, F-16C/D,RQ-1A, RQ-4A	85th TES, 53rd Wing (ACC), Eglin AFB, Fla.
OT	F/A-22, F-15, F-16A/C	422nd TES, 53rd Wing, Nellis AFB, Nev.
OT	F-117	Det. 1, 53rd WEG, Holloman AFB, N.M.
PA	A/OA-10A	111th FW (ANG), NAS JRB Willow Grove, Pa.
PD	HH-60G	939th RW (AFRC), Portland Arpt., Ore.
PR	C-130E	156th AW (ANG), Luis Munoz Marin Arpt., Puerto Rico
RA	T-1A, T-6A, T-37B, T-38A, T-43A	12th FTW, Randolph AFB, Hondo Arpt, Tex.
RI	C-130E	143rd AW (ANG), Quonset State Arpt., R.I.
RS	C-130E	86th AW, Ramstein AB, Germany
SA	F-16C/D	149th FW (ANG), Kelly Fld., Tex.
SC	F-16C/D	169th FW (ANG), McEntire ANGS, S.C.
SD	F-16C/D	114th FW (ANG), Joe Foss Fld., S.D.
SI	F-16C/D	183rd FW (ANG), Capital Arpt., Ill.
SJ	F-15E	4th FW, Seymour Johnson AFB, N.C.
SL	F-15A/B A/OA-10A, F-16CJ/D	131st FW (ANG), Lambert–St. Louis Arpt., Mo.
SP	Various	52nd FW, Spangdahlem AB, Germany
ST	F-16C/J	82nd TW, Sheppard AFB, Tex.
SW	QF-4	20th FW, Shaw AFB, S.C.
TD	F-16C/D	53rd Wing, Tyndall AFB, Fla.
TH	C-130H	181st FW (ANG), Hulman Arpt., Ind.
TX	F-16C/D	136th AW (ANG), NAS JRB F.W., Tex.
TX	F-15C/D, F/A-22	301st FW (AFRC), NAS JRB F.W., Tex.
TY	F-16C/D	325th FW, Tyndall AFB, Fla.
VA	T-1A, T-37B, T-38A	192nd FW (ANG), Richmond Arpt., Va.
VN	A-10, F-15C/D/E,	71st FTW, Vance AFB, Okla.
WA	F-16A/B/C/D, HH-60, RQ-1 E-9A	57th Wing, Nellis AFB, Nev.
WE	F-16C/D	53rd WEG, Tyndall AFB, Fla.
WI	B-2A, T-38A	115th FW (ANG), Truax Fld., Wis.
WM	F-16C/D	509th BW, Whiteman AFB, Mo.
WP	C-130H	8th FW, Kunsan AB, South Korea
WV	C-130E	130th AW (ANG), Yeager Arpt., W.Va.
WV	F-16C/D	167th AW (ANG), East. W.Va. Arpt., W.Va.
WW	C-130H	35th FW, Misawa AB, Japan
WY	T-1A, T-6A, T-37B, T-38A C-130H	153rd AW (ANG), Cheyenne Arpt., Wyo.
XL	C-21A, C-130E/H,	47th FTW, Laughlin AFB, Tex.
XP	UH-1N E-3B, F-15C/D,	139th AW (ANG), Rosecrans Arpt., Mo.
YJ	KC-135R, HH-60G	374th AW, Yokota AB, Japan
ZZ		18th Wing, Kadena AB, Japan

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USAF Grades and Insignia

Officer

Second Lieutenant
(O-1)

Brigadier General
(O-7)

First Lieutenant
(O-2)

Major General
(O-8)

Captain
(O-3)

Lieutenant General
(O-9)

Major
(O-4)

General
(O-10)

Lieutenant Colonel
(O-5)

Colonel
(O-6)

Enlisted

Airman Basic
(E-1)
No insignia

Airman
(E-2)

Airman First Class
(E-3)

Senior Airman
(E-4)

Staff Sergeant
(E-5)

Technical Sergeant
(E-6)

Master Sergeant
(E-7)

Senior Master Sergeant
(E-8)

Chief Master Sergeant
(E-9)

Chief Master Sergeant of
the Air Force

First Sergeant
The diamond device, shown here on senior master sergeant stripes, denotes an E-7 through E-9 who advises and assists a squadron commander in managing unit activities.

Command Chief Master Sergeant
The star device shown here denotes an E-9 who serves in a 9E000 position, formerly known as a senior enlisted advisor.

Awards and Decorations—Currently Awarded Ribbons

(2.)

*Also awarded with gold, silver, or bronze devices. The gold frame on the ribbon denotes a unit citation; without, an individual citation.

Awards and Decorations—Previously Awarded Ribbons

Pre–World War I

Mexican Service Medal

World War I

Victory Medal

World War II through Korean War (in order of precedence)

American Defense Service Medal

Women's Army Corps Service Medal

American Campaign Medal

Asiatic–Pacific Campaign Medal

European–African–Middle Eastern Campaign Medal

World War II Victory Medal

Army of Occupation Medal

Medal for Humane Action

Korean Service Medal

Philippine Defense Ribbon

Philippine Liberation Ribbon

Philippine Independence Ribbon

Philippine Presidential Unit Citation

ROK Presidential Unit Citation

United Nations Service Medal

Republic of Korea Korean War Service Medal

Currently Awarded Devices

Bronze Star
represents participation in campaigns or operations, multiple qualifications, or an additional award to any of the various ribbons on which it is authorized.

Bronze Oak Leaf Cluster
represents second and subsequent entitlements of awards.

Valor Device
represents valor and does not denote an additional award. Only one may be earned on any ribbon. It is worn to the wearer's right of any clusters on the same ribbon.

Mobility Device
is worn with the Armed Forces Reserve Medal to denote active duty for at least one day during a contingency. A number to the right of the device denotes the total number of mobilizations.

Silver Star
is worn in the same manner as the bronze star, but each is worn in lieu of five bronze service stars.

Silver Oak Leaf Cluster
represents the sixth, 11th, etc., entitlements or is worn in lieu of five bronze OLCs.

A Device
is worn with the Overseas Ribbon—Short to denote service north of the Arctic Circle. Only one is worn on the ribbon. It is worn to the wearer's right of any clusters on the same ribbon.

Hourglass Device
is issued for the Armed Forces Reserve Medal in bronze for 10 years of service, silver for 20, and gold for 30 years.

Silver and Bronze Stars
When worn together on a single ribbon, silver stars will be worn to the wearer's right of any bronze star.

Silver/Bronze Oak Leaf Clusters
Silver OLCs are worn to the wearer's right of the bronze OLCs on the same ribbon.

Previously Awarded Devices

Berlin Airlift Device
is worn with the Army of Occupation Medal to denote service of 90 consecutive days in direct support of the Berlin Airlift, June 26, 1948, to Sept. 30, 1949.

Arrowhead Device
is worn with Army and Air Force campaign medals to denote participation in combat parachute, glider, or amphibious assault landing.

Disk "Wintered Over" Device
is worn with the Antarctica Service Medal to denote multiple "winters over"—bronze for one winter; gold, two; silver, three.

Wings and Badges

Shown here and on p. 95 are current wings and badges. The basic level of wings or badges is illustrated. Most wings and badges have two other categories of accomplishment—senior and either commander, master, or chief. A star centered above the badge indicates the senior level, while a star surrounded by a wreath above the badge represents the master level.

Astronaut

The astronaut designator indicates a USAF rated officer qualified to perform duties in space (50 miles and up) and who has completed at least one operational mission. Pilot wings are used here to illustrate the position of the designator on the wings.

Pilot

Navigator/Observer

Enlisted Aircrew

Flight Surgeon

Flight Nurse

Officer Aircrew Member

Air Battle Manager

Missile with Operations Designator

Missile

Berets

Five USAF career fields are authorized to wear a colored beret along with the crest of that particular field. Below are those badges on their particular beret color.

Combat Control Team

Combat Weather

The parachutist badge indicates the wearer is at the master level.

Force Protection

Officers display their rank in a plain blue shield above the motto "Defensor Fortis."

Pararescue

Tactical Air Control Party

Badges, continued

Acquisition and Financial Management

Air Traffic Control

Band

Chaplain Service Support

Civil Engineer

Command and Control

Commander

Communications and Information

Explosive Ordnance Disposal

Force Protection

Historian

Information Management

Intelligence

Judge Advocate

Logistics

Maintenance

Manpower and Personnel

Meteorologist

Operations Support

Parachutist

Paralegal

Public Affairs

Services

Space/Missile

Supply/Fuels

Transportation

Weapons Director

Medical

Biomedical Science Corps

Dental Corps

Enlisted Medical

Medical Corps

Medical Service Corps

Nurse Corps

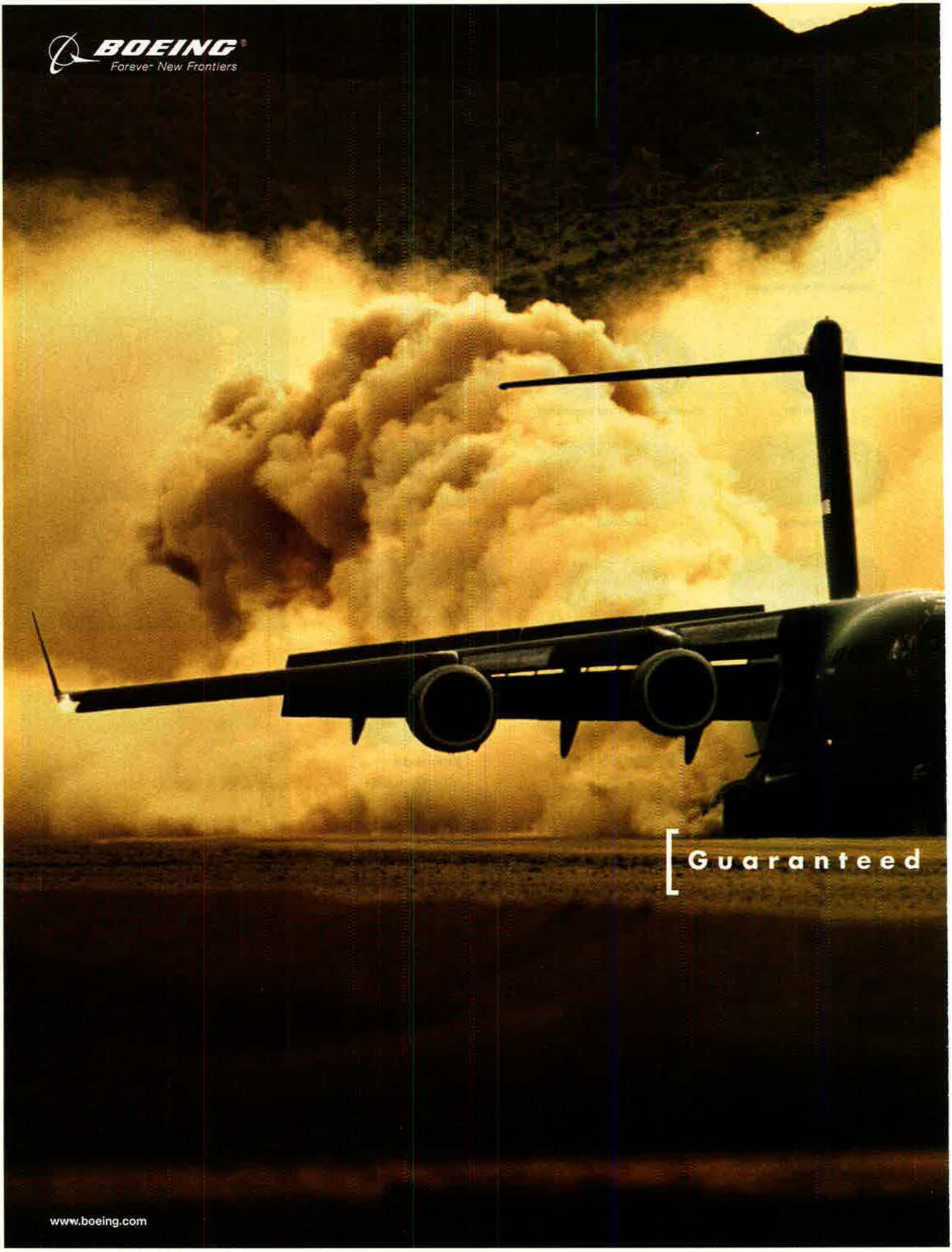
Chaplain

Buddhist

Christian

Jewish

Muslim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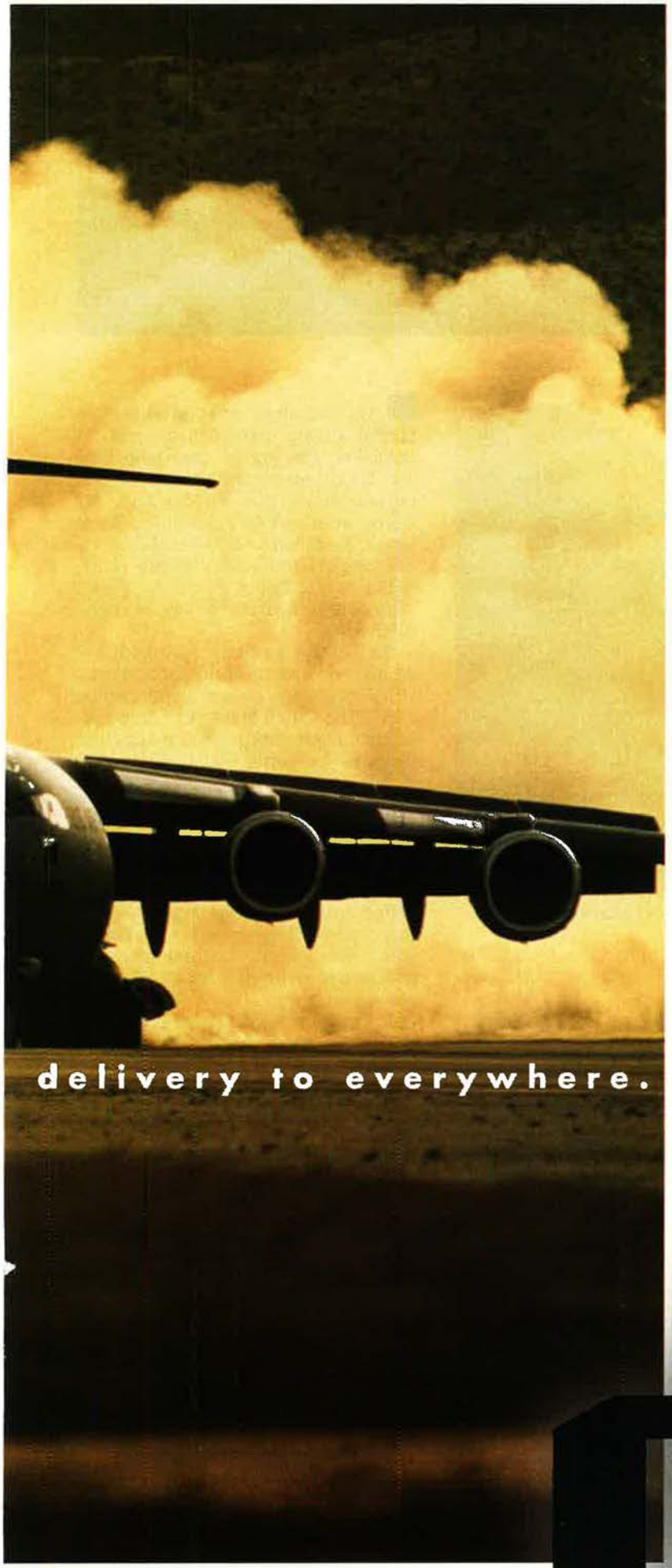

The C-17 Globemaster III's remarkable capabilities allow it to take on airlift missions other airlifters can't. Its unique strength and range means it can carry even outsize payloads farther and faster. And with its one-of-a-kind landing capabilities, it can touch down on even the most austere

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airfields in 3000 feet or less. A reassuring thought to those waiting for help anywhere. Even if it's in the middle of nowhere.

C-17

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AIR FORCE Magazine's

Guide to Aces and Heroes

2003 USAF Almanac

Striking a pose in front of Capt. Eddie Rickenbacker's airplane are (l–r) 1st Lt. Joseph Eastman, Capt. James Meissner (8 victories), Rickenbacker (26), 1st Lt. Reed Chambers (7), and 1st Lt. Thorne C. Taylor (2).

Some Famous US Fighter Firsts

May 28, 1918	First AEF–trained AEF ace: Capt. Edward V. Rickenbacker
Dec. 7, 1941	First AAF victories (WW II at Pearl Harbor): Lts. Harry W. Brown, Philip M. Rasmussen, Lewis M. Sanders, Gordon H. Sterling Jr., Kenneth M. Taylor, George S. Welch
Dec. 16, 1941	First AAF ace (WW II): 1st Lt. Boyd D. Wagner
Nov. 8, 1950	First jet-to-jet victory (Korean War): 1st Lt. Russell J. Brown
May 20, 1951	First USAF ace of the Korean War: Capt. James Jabara
Nov. 30, 1951	First USAF ace of two wars (WW II and Korea): Maj. George A. Davis Jr. (7 in WW II and 14 in Korea)
Jan. 2, 1967	First (and only) USAF ace with victories in WW II and Vietnam: Col. Robin Olds (12 in WW II and 4 in Vietnam)
Aug. 28, 1972	First USAF ace of Vietnam: Capt. Richard S. Ritchie

By tradition, anyone with five official victory credits is an ace. In compiling this list of aces who flew with the US Air Force and predecessor organizations (the Air Service, Air Corps, and Army Air Forces), *Air Force* Magazine relied on USAF's official accounting of aerial victory credits, which is the responsibility of the Air Force Historical Research Agency, Maxwell AFB, Ala.

Air Force historians have kept the official records of aerial victories by USAF pilots and crew members since 1957. The Office of the Air Force Historian initially published four separate listings—for World War I, World War II, the Korean War, and the Vietnam War. The four volumes have been corrected, updated, and combined into one comprehensive volume.

In each war in which its members flew and fought, the Air Force established criteria for awarding aerial victory credits. These criteria varied from war to war, and therefore one cannot make direct comparisons of aces across all wars.

In many cases during World War I, several aviators worked together to down a single aircraft. The Air Service awarded one whole credit to each aviator who contributed to the victory. A single victory could—and often did—result in three or four victory credits.

In World War II and Korea, the criteria were changed. The service divided one credit among all aviators who contributed to destruction of an enemy airplane. With the awarding of fractional credits, a single victory could result in no more than one credit.

The rules were changed again in the Vietnam War. When an F-4 downed an enemy aircraft, USAF would award two full aerial victory credits—one to the frontseater and one to the backseater. As in World War I, a single victory resulted in multiple victory credits.

Thus, the standards for World War II and Korea were more restrictive than those for World War I and Vietnam.

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International Relations
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American Aces of World War I

Capt. Eddie Rickenbacker (26)

In World War I, pilots who shared victories were each given one credit. This list uses the World War I counting rule.

Rickenbacker, Capt. Edward V.	26
Luke, 2nd Lt. Frank Jr.	18
Vaughn, 1st Lt. George A.	13
Kindley, 1st Lt. Field E.	12
Springs, 1st Lt. Elliott W.	12
Landis, 1st Lt. Reed G.	10
Swaab, 1st Lt. Jacques M.	10
Baer, 1st Lt. Paul P.	9
Cassady, 1st Lt. Thomas G.	9
Hamilton, 1st Lt. Lloyd A.	9
Wright, 1st Lt. Chester E.	9
Clay, 1st Lt. Henry R. Jr.	8
Coolidge, Capt. Hamilton	8
Donaldson, 2nd Lt. John O.	8
Erwin, 1st Lt. William P.	8
Hunter, 1st Lt. Frank O'D.	8
Jones, 2nd Lt. Clinton	8
Meissner, Capt. James A.	8
Stenseth, 1st Lt. Martinus	8
White, 2nd Lt. Wilbert W.	8
Burdick, 2nd Lt. Howard	7
Chambers, 1st Lt. Reed M.	7
Cook, 1st Lt. Harvey W.	7
Creech, 1st Lt. Jesse O.	7
Holden, 1st Lt. Lansing C.	7
Robertson, 1st Lt. Wendel A.	7
Rummell, 1st Lt. Leslie J.	7
Schoen, 1st Lt. Karl J.	7
Sewall, 1st Lt. Sumner	7
Beane, 1st Lt. James D.	6
Biddle, Capt. Charles J.	6
Campbell, 1st Lt. Douglas	6
Curtis, 1st Lt. Edward P.	6
Guthrie, 1st Lt. Murray K.	6
Hammond, 1st Lt. Leonard C.	6
Hays, 2nd Lt. Frank K.	6
Hudson, 1st Lt. Donald	6
Knotts, 2nd Lt. Howard C.	6
Lindsay, 1st Lt. Robert O.	6
MacArthur, 2nd Lt. John K.	6
Ponder, 2nd Lt. William T.	6
Putnam, 1st Lt. David E.	6
Stovall, 1st Lt. William H.	6
Tobin, 1st Lt. Edgar G.	6
Vasconcells, 1st Lt. Jerry C.	6
Badham, 2nd Lt. William T.	5
Bair, 1st Lt. Hilbert L.	5
Bissell, 1st Lt. Clayton L.	5
Brooks, 2nd Lt. Arthur R.	5
Buckley, 1st Lt. Harold R.	5
Cook, 1st Lt. Everett R.	5
D'Olive, 1st Lt. Charles R.	5
Easterbrook, 1st Lt. Arthur L.	5
Furlow, 1st Lt. George W.	5
George, 1st Lt. Harold H.	5
Grey, 1st Lt. Charles G.	5
Haight, 1st Lt. Edward M.	5
Healy, 1st Lt. James A.	5
Knowles, 1st Lt. James Jr.	5
Larner, 1st Lt. G. DeFreest	5
Luff, 1st Lt. Frederick E.	5
O'Neill, 2nd Lt. Ralph A.	5
Owens, 2nd Lt. John S.	5
Porter, 2nd Lt. Kenneth L.	5
Ralston, 1st Lt. Orville A.	5
Seerley, 1st Lt. John J.	5
Strahm, Capt. Victor H.	5
Todd, 2nd Lt. Robert M.	5
Vernam, 1st Lt. Remington D.	5
Wehner, 1st Lt. Joseph F.	5

2nd Lt. Frank Luke Jr. (18)

Army Air Forces Aces of World War II

Maj. Richard Bong (40)

Ranks are as of last victory in World War II.

Bong, Maj. Richard I.	40
McGuire, Maj. Thomas B. Jr.	38
Gabreski, Lt. Col. Francis S.	28
Johnson, Capt. Robert S.	27
MacDonald, Col. Charles H.	27
Preddy, Maj. George E.	26.83
Meyer, Lt. Col. John C.	24
Schilling, Col. David C.	22.50
Johnson, Lt. Col. Gerald R.	22
Kearby, Col. Neel E.	22
Robbins, Maj. Jay T.	22
Christensen, Capt. Fred J.	21.50
Wetmore, Capt. Ray S.	21.25
Voll, Capt. John J.	21
Mahurin, Maj. Walker M.	20.75
Lynch, Lt. Col. Thomas J.	20
Westbrook, Lt. Col. Robert B.	20
Gentile, Capt. Don S.	19.83
Duncan, Col. Glenn E.	19.50
Carson, Capt. Leonard K.	18.50
Eagleston, Maj. Glenn T.	18.50
Beckham, Maj. Walter C.	18
Green, Maj. Herschel H.	18
Herbst, Lt. Col. John C.	18
Zemke, Lt. Col. Hubert	17.75
England, Maj. John B.	17.50
Beeson, Capt. Duane W.	17.33
Thornell, 1st Lt. John F. Jr.	17.25

Maj. Thomas McGuire Jr. (38)

Varnell, Capt. James S. Jr.	17
Johnson, Maj. Gerald W.	16.50
Godfrey, Capt. John T.	16.33
Anderson, Capt. Clarence E. Jr.	16.25
Dunham, Lt. Col. William D.	16
Harris, Lt. Col. Bill	16
Welch, Capt. George S.	16
Beerbower, Capt. Don M.	15.50
Brown, Maj. Samuel J.	15.50
Peterson, Capt. Richard A.	15.50
Whisner, Capt. William T. Jr.	15.50
Bradley, Lt. Col. Jack T.	15
Cragg, Maj. Edward	15
Foy, Maj. Robert W.	15
Hofer, 2nd Lt. Ralph K.	15
Homer, Capt. Cyril F.	15
Landers, Lt. Col. John D.	14.50
Powers, Capt. Joe H.	14.50
Brown, Capt. Henry W.	14.20
Carr, 1st Lt. Bruce W.	14
Curtis, Maj. Robert C.	14
Dahlberg, Capt. Kenneth H.	14
DeHaven, Capt. Robert M.	14
Emmer, Capt. Wallace N.	14
Goodson, Maj. James A.	14
Jeffrey, Lt. Col. Arthur F.	14
McComas, Lt. Col. Edward O.	14
Roberts, Capt. Daniel T. Jr.	14
West, Capt. Richard L.	14
Bochkay, Maj. Donald H.	13.83
Strait, Maj. Donald J.	13.50
Bryan, Capt. Donald S.	13.33
Carpenter, Maj. George	13.33
Brooks, 1st Lt. James L.	13
Hampshire, Capt. John F. Jr.	13
Head, Capt. Cotesworth B. Jr.	13
Hively, Maj. Howard D.	12
Ladd, Capt. Kenneth G.	12
Moore, Maj. Robert W.	12
Olds, Maj. Robin	12
Schreiber, Capt. Leroy A.	12
Skogstad, 1st Lt. Norman C.	12
Sloan, 1st Lt. William J.	12
Watkins, Capt. James A.	12
Megura, Capt. Nicholas	11.83
Blakeslee, Col. Donald J.M.	11.50
Conger, Maj. Paul A.	11.50

Capt. Robert Johnson (27) **and Lt. Col. Francis Gabreski** (28)

Holloway, Col. Bruce K.	13
Millikan, Capt. Willard W.	13
Moran, 1st Lt. Glennon T.	13
Parker, Capt. Harry A.	13
Stephens, Maj. Robert W.	13
Williamson, Capt. Felix D.	13
Brueland, Maj. Lowell K.	12.50
Brown, Maj. Quince L.	12.33
Brezas, 1st Lt. Michael	12
Chase, Lt. Col. Levi R.	12
East, Capt. Clyde B.	12
Gleason, Capt. George W.	12
Kirla, 1st Lt. John A.	11.50
McDonald, Maj. Norman L.	11.50
Stewart, Maj. James C.	11.50
Yeager, Capt. Charles E.	11.50
Norley, Maj. Louis H.	11.33
Frantz, 1st Lt. Carl M.	11
Goebel, Capt. Robert J.	11
Lawler, Capt. John B.	11
Lent, 1st Lt. Francis J.	11
Leverette, Lt. Col. William L.	11
Loisel, Maj. John S.	11
Lowry, 1st Lt. Wayne L.	11
McCorkle, Col. Charles M.	11
McKennon, Maj. Pierce W.	11
Mitchell, Lt. Col. John W.	11
Molland, Capt. Leland P.	11
Quirk, Capt. Michael J.	11
Riddle, 1st Lt. Robert E.	11
Shubin, 1st Lt. Murray J.	11
Smith, Capt. Cornelius M. Jr.	11
Sparks, 1st Lt. Kenneth C.	11
Turner, Maj. Richard E.	11
O'Connor, Capt. Frank Q.	10.75
Ceuleers, Lt. Col. George F.	10.50
Clark, Lt. Col. James A. Jr.	10.50
Doersch, Capt. George A.	10.50
Halton, Maj. William T.	10.50
Hovde, Maj. William J.	10.50
Littge, Capt. Raymond H.	10.50
Storch, Lt. Col. John A.	10.50
Glover, Maj. Fred W.	10.33
Anderson, 1st Lt. Charles F.	10
Aschenbrener, Capt. Robert W.	10

Col. Hubert Zemke (17.75)

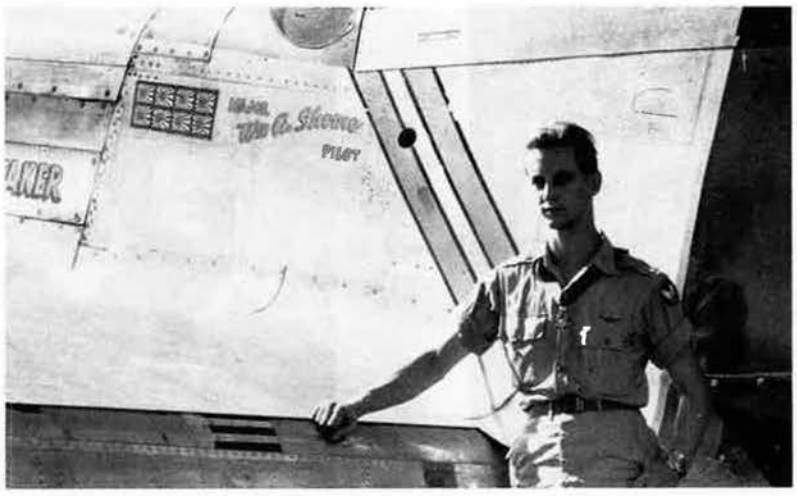
Maj. Donald Strait (13.50)

Capt. John Godfrey (16.33)

Blickenstaff, Lt. Col. Wayne K.	10
England, Maj. James J.	10
Giroux, Capt. William K.	10
Gladych,* SL Michael	10
Goehausen, Capt. Walter J. Jr.	10
Harris, Capt. Ernest A.	10
Lines, 1st Lt. Ted E.	10
Rankin, 1st Lt. Robert J.	10
Reynolds, 1st Lt. Andrew J.	10
Scott, Col. Robert L. Jr.	10
Stanch, Capt. Paul M.	10
Summer, Capt. Elliot	10
Bankey, Capt. Ernest E. Jr.	9.5
Spencer, 1st Lt. Dale F.	9.5
Adams, Capt. Fletcher E.	9
Andrew, Maj. Stephen W.	9
Banks, Maj. William M.	9
Beyer, Capt. William R.	9
Boggs, Capt. Hampton E.	9
Champlin, Capt. Frederic F.	9
Collins, Maj. Frank J.	9
Curdes, 1st Lt. Louis E.	9
Dahl, Capt. Perry J.	9
Dalglish, Maj. James B.	9
Dunkin, Capt. Richard W.	9
Emmons, 1st Lt. Eugene H.	9
Fanning, 1st Lt. Grover E.	9
Feld, 1st Lt. Sylvan	9
Fiebelkorn, 1st Lt. Ernest C.	9
Forster, 1st Lt. Joseph M.	9
Gallup, Lt. Col. Kenneth W.	9
Hill, Capt. Allen E.	9
Hurlbut, Flight Officer Frank D.	9
Juchheim, Capt. Alwin M.	9
Kiser, Capt. George E.	9
Lesicka, 1st Lt. Joseph J.	9
Meroney, Capt. Virgil K.	9
Morrill, 1st Lt. Stanley B.	9
Overfield, 1st Lt. Loyd J.	9
Paris, Capt. Joel B. III	9
Roberts, Lt. Col. Eugene P.	9
Smith, Lt. Col. Meryl M.	9
Stewart, Capt. John S.	9
White, Capt. Robert H.	9
Wolfe, Capt. Judge E.	9
Bennett, Capt. Joseph H.	8.5
Cesky, Capt. Charles J.	8.5
Dorsch, Capt. Frederick J. Jr.	8.5
Hayes, Lt. Col. Thomas L. Jr.	8.5
Hoefker, Capt. John H.	8.5
Jenkins, 2nd Lt. Otto D.	8.5
Johnson, 1st Lt. Arthur G. Jr.	8.5
Luksic, 1st Lt. Carl J.	8.5
McDowell, 1st Lt. Don	8.5
McGratten, Capt. Bernard L.	8.5
Moats, 1st Lt. Sanford K.	8.5
Schlegel, Capt. Albert L.	8.5
Ainlay, 1st Lt. John M.	8
Allen, 1st Lt. David W.	8
Benz, Maj. Walter G. Jr.	8
Booth, 1st Lt. Robert J.	8
Bostwick, Maj. George E.	8
Broadhead, Maj. Joseph E.	8
Carroll, 1st Lt. Walter J. Jr.	8
Cruikshank, Maj. Arthur W. Jr.	8
Damstrom, 1st Lt. Fernley H.	8
Elder, Maj. John L. Jr.	8
Fiedler, Capt. Arthur C. Jr.	8
Fowle, 1st Lt. James M.	8
Gardner, Capt. William A.	8
Gaunt, Capt. Frank L.	8
Gerard, Capt. Francis R.	8
Grosshuesch, Capt. Leroy V.	8
Harris, Capt. Frederick A.	8
Hart, 1st Lt. Kenneth F.	8
Ilfrey, Capt. Jack M.	8
Jackson, Maj. Michael J.	8
Jones, Capt. John L.	8
Kinnard, Lt. Col. Claiborne H. Jr.	8
Maloney, Capt. Thomas E.	8
Momyer, Col. William W.	8
Novotny, 1st Lt. George P.	8
O'Neill, 1st Lt. John G.	8
Richardson, Maj. Elmer W.	8
Roddy, Capt. Edward F.	8
Rowland, Col. Robert R.	8
Sangermano, 1st Lt. Philip	8
Schiltz, 1st Lt. Glen D. Jr.	8

Lt. Col. Boyd Wagner (8)

Shaw, 1st Lt. Robert M.	8
Shomo, Capt. William A.	8
Smith, Maj. Carroll C.	8
Stanton, Maj. Arland	8
Sublett, Capt. John L.	8
Tapp, Maj. James B.	8
Tovrea, 1st Lt. Philip E. Jr.	8
Tyler, Maj. James O.	8
Vogt, Maj. John W. Jr.	8
Wagner, Lt. Col. Boyd D.	8
Warford, Maj. Victor E.	8
Weaver, Capt. Charles E.	8
Lang, Capt. Joseph L.	7.83
Stewart, Lt. Col. Everett W.	7.83
Bryan, Maj. William E. Jr.	7.5
Cutler, Capt. Frank A.	7.5
Davis, Capt. Glendon V.	7.5
Glenn, Maj. Maxwell H.	7.5
Karger, 1st Lt. Dale E.	7.5
Lamb, Maj. George M.	7.5
Lasko, Capt. Charles W.	7.5
Lowell, Lt. Col. John H.	7.5
Miklajcyk, Capt. Henry J.	7.5
Righetti, Lt. Col. Elwyn G.	7.5
Garrison, 1st Lt. Vermont	7.33



Capt. William Shomo (8)

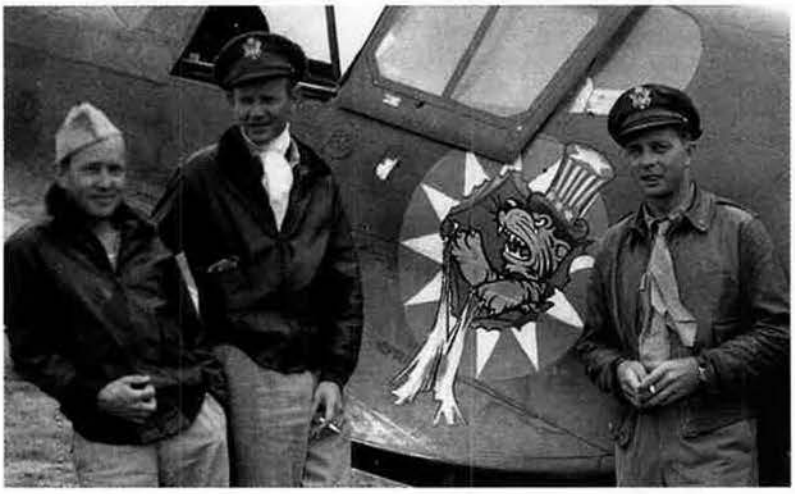
*Squadron Leader Gladych was Polish and flew in service with American units, but because the Polish government in exile was headquartered in London, Polish pilots had British designations.

Morris, Capt. James M.	7.33
Goodnight, 1st Lt. Robert E.	7.25
Adams, Capt. Burnell W.	7
Allen, 1st Lt. Calvin D. Jr.	7
Anderson, 1st Lt. William Y.	7
Becker, Capt. Robert H.	7
Blair, Capt. Samuel V.	7
Browning, Capt. James W.	7
Carder, 1st Lt. John B.	7
Chapman, Maj. Philip G.	7
Cramer, Maj. Darrell S.	7
Crenshaw, 1st Lt. Claude J.	7
Davis, 1st Lt. George A. Jr.	7
Dean, 1st Lt. Zach W.	7
Douglas, Lt. Col. Paul P. Jr.	7
Duke, Capt. Walter F.	7
Dunaway, 1st Lt. John S.	7
Edens, 2nd Lt. Billy G.	7
Elliot, 1st Lt. Vincent T.	7
Fisher, Capt. Edwin O.	7
Fisk, Capt. Jack A.	7
Franklin, 1st Lt. Dwaine R.	7
Graham, Lt. Col. Gordon M.	7
Grant, 1st Lt. Marvin E.	7
Gregg, 1st Lt. Lee O.	7
Griffin, Maj. Joseph H.	7
Hennon, Capt. William J.	7
Hill, Maj. Frank A.	7
Hockery, Capt. John J.	7
Howard, Col. James H.	7
Jackson, Lt. Col. Willie O. Jr.	7
Jamison, Capt. Gilbert L.	7
Jett, Capt. Verl E.	7
Johnson, Capt. Clarence O.	7
King, Capt. Benjamin H.	7
Kinsey, 2nd Lt. Claude R. Jr.	7
Klibbe, 2nd Lt. Frank W.	7
Kuentzel, 2nd Lt. Ward A.	7
Lamb, Capt. Robert A.	7
Lewis, Maj. Warren R.	7
Lewis, Lt. Col. William H.	7
Liebers, 2nd Lt. Lawrence P.	7
Little, 1st Lt. James W.	7
Lombard, Maj. John D.	7
Maguire, Capt. William J.	7
Marshall, Maj. Bert W. Jr.	7
McLaughlin, Capt. Murray D.	7
Moore, Maj. John T.	7
Morehead, 1st Lt. James B.	7
O'Brien, 1st Lt. Gilbert M.	7
Older, Lt. Col. Charles H.	7
Pierce, 1st Lt. Joseph F.	7
Pierce, 1st Lt. Sammy A.	7
Poindexter, Capt. James N.	7
Popek, Maj. Edward S.	7
Purdy, 1st Lt. John E.	7
Reynolds, 1st Lt. Robert	7
Rogers, Capt. Felix M.	7
Ross, Maj. Herbert E.	7
Sears, 1st Lt. Meldrum L.	7
Shafer, Lt. Col. Dale E. Jr.	7
Shipman, 1st Lt. Ernest	7
Shuler, 1st Lt. Lucien B.	7
Simmons, 1st Lt. John M.	7
Smith, Maj. Leslie C.	7
Smith, 1st Lt. Richard E.	7
Stone, 2nd Lt. Robert J.	7
Strand, Capt. William H.	7
Truluck, 1st Lt. John H.	7
Turner, Lt. Col. William L.	7
Tyler, 1st Lt. Gerald E.	7
Vaughn, Maj. Harley C.	7
Waters, 1st Lt. Edward T.	7
Wheadon, Capt. Elmer M.	7
Whittaker, Capt. Roy E.	7
Wicker, Maj. Samuel J.	7
Wilkinson, Capt. James W.	7
Wire, 1st Lt. Calvin C.	7
Woods, Lt. Col. Sidney S.	7
Woody, Capt. Robert E.	7
Zoerb, Capt. Daniel J.	7
Murphy, Lt. Col. John B.	6.75
Cummings, Capt. Donald M.	6.5
Gray, Maj. Rockford V.	6.5
Hoffman, 1st Lt. James E. Jr.	6.5
Hubbard, Lt. Col. Mark E.	6.5
Hunt, 1st Lt. Edward E.	6.5
Koenig, 1st Lt. Charles W.	6.5
Kruzel, Lt. Col. Joseph J.	6.5
Moseley, Capt. Mark L.	6.5
Rader, 1st Lt. Valentine S.	6.5
Riley, 1st Lt. Paul S.	6.5
Welden, 1st Lt. Robert D.	6.25
Adams, 1st Lt. Charles E. Jr.	6
Alison, Lt. Col. John R.	6
Anderson, 1st Lt. Wyman D.	6
Andrews, 1st Lt. Stanley O.	6
Baker, 1st Lt. Ellis C. Jr.	6
Baseler, Lt. Col. Robert L.	6
Bille, Maj. Henry S.	6
Blumer, Capt. Laurence E.	6
Brown, 1st Lt. Harley L.	6
Brown, Capt. Harry W.	6
Brown, Capt. Meade M.	6
Buck, Capt. George T. Jr.	6
Callaway, Maj. Raymond H.	6
Campbell, 1st Lt. Richard A.	6
Candelaria, 1st Lt. Richard G.	6
Care, Capt. Raymond C.	6
Carlson, Capt. Kendall E.	6
Carter, Capt. James R.	6
Chick, Lt. Col. Lewis W. Jr.	6
Coffey, Lt. Col. Robert L. Jr.	6
Collingsworth, Capt. J.D.	6
Cook, Capt. Walter V.	6
Crawford, 2nd Lt. Ray	6
Crim, Maj. Harry C. Jr.	6

Col. James Howard (7)

1st Lt. Urban Drew (6)

Cundy, 1st Lt. Arthur C.	6
Czarnecki, 1st Lt. Edward J.	6
Davis, 1st Lt. Barrie S.	6
Dean, 2nd Lt. Cecil O.	6
Degraffenreid, 2nd Lt. Edwin L.	6
Dent, Capt. Elliott E. Jr.	6
Dillard, Capt. William J.	6
Drew, 1st Lt. Urban L.	6
Drier, Capt. William C.	6
Eason, 1st Lt. Hoyt A.	6
Emerson, Capt. Warren S.	6
Emmert, 1st Lt. Benjamin H.	6
Evans, Lt. Col. Andrew J. Jr.	6
Evans, Maj. Roy W.	6
Everhart, Capt. Lee R.	6
Fleischer, Capt. Richard H.	6
Foulis, Capt. William B. Jr.	6
Froning, 1st Lt. Alfred C.	6
Gallup, Capt. Charles S.	6
Goss, Maj. Edmund R.	6
Gresham, 1st Lt. Billy M.	6
Gumm, 1st Lt. Charles F. Jr.	6
Hagerstrom, 1st Lt. James P.	6
Hall, 1st Lt. George F.	6
Hanes, 1st Lt. William F. Jr.	6
Harmeyer, 1st Lt. Raymond F.	6
Hart, Capt. Cameron M.	6
Haviland, Capt. Fred R. Jr.	6
Hill, Col. David L.	6
Hogg, Capt. Roy B.	6
Holloway, 1st Lt. James D.	6
Howard, 1st Lt. Robert L.	6
Howes, 1st Lt. Bernard H.	6
Hurd, 1st Lt. Richard F.	6
Ince, 1st Lt. James C.	6
Johnston, Lt. Col. Robert D.	6
Jones, 1st Lt. Cyril W. Jr.	6
Jordan, Maj. Wallace R.	6
Karr, Capt. Robert A.	6
Keen, 1st Lt. Robert J.	6
Kemp, 2nd Lt. William T.	6
Kienholz, 1st Lt. Donald D.	6
Knapp, Capt. Robert H.	6
Lane, 1st Lt. John H.	6
Larson, Maj. Donald A.	6
Larson, 2nd Lt. Leland A.	6
Lubner, Capt. Martin W.	6
Lucas, Capt. Paul W.	6



Maj. John Alison (6), **Maj. David Hill** (6), **and Capt. Albert Baumler** (5)

Lustic, 1st Lt. Stanley J.	6
McDaniel, 1st Lt. Gordon H.	6
McGee, Capt. Donald C.	6
McKeon, Capt. Joseph T.	6
Meigs, 1st Lt. Henry II	6
Meuten, 1st Lt. Donald W.	6
Miller, Capt. Armour C.	6
Mills, Maj. Henry L.	6
Mugavero, 1st Lt. James D.	6
Murphey, Capt. Paul C. Jr.	6
Murphy, Capt. Alva C.	6
Ohr, Capt. Fred F.	6
Olson, Capt. Norman E.	6
Pietz, 1st Lt. John Jr.	6
Pissanos, 1st Lt. Spiros N.	6
Pugh, Capt. John F.	6
Reed, Capt. William N.	6
Reeves, 1st Lt. Horace B.	6
Reeves, 1st Lt. Leonard R.	6
Roberson, 1st Lt. Arval J.	6
Scheible, Capt. Wilbur R.	6
Schildt, 1st Lt. William J.	6
Schimanski, Capt. Robert G.	6
Simmons, 1st Lt. William J.	6
Smith, 1st Lt. John C.	6
Starck, Capt. Walter E.	6
Starnes, Capt. James R.	6
Taylor, Capt. Ralph G. Jr.	6
Thwaites, Capt. David F.	6
Turley, 2nd Lt. Grant M.	6
Vincent, Col. Clinton D.	6
Walker, 1st Lt. Thomas H.	6
Wandrey, Capt. Ralph H.	6
Welch, Capt. Robert E.	6
Wenige, 1st Lt. Arthur E.	6
Whalen, 1st Lt. William E.	6
White, 2nd Lt. Thomas A.	6
Williams, 1st Lt. James M.	6
Witt, Capt. Lynn E. Jr.	6
Wright, Capt. Ellis W. Jr.	6
Zubarik, 1st Lt. Charles J.	6
Fortier, Capt. Norman J.	5.83
Koraleski, Capt. Walter J. Jr.	5.53
Amoss, 1st Lt. Dudley M.	5.5
Bickel, 1st Lt. Carl G.	5.5
Burdick, 1st Lt. Clinton D.	5.5
Buttke, Capt. Robert L.	5.5
Compton, Capt. Gordon B.	5.5
Edwards, 1st Lt. Edward B. Jr.	5.5
Gailer, 1st Lt. Frank L.	5.5
Graham, Capt. Lindol F.	5.5
Hatala, Capt. Paul R.	5.5
Heller, Capt. Edwin L.	5.5
Holmes, 1st Lt. Besby F.	5.5
Horne, 1st Lt. Francis W.	5.5
King, 1st Lt. William B.	5.5
Lampe, 1st Lt. Richard C.	5.5
Lenfest, Capt. Charles W.	5.5
Long, Capt. Maurice G.	5.5
McCauley, 1st Lt. Frank E.	5.5
Minchew, Capt. Leslie D.	5.5
O'Brien, Capt. William R.	5.5
Pascoe, 1st Lt. James J.	5.5
Pompetti, 1st Lt. Peter E.	5.5
Ruder, 1st Lt. Leroy A.	5.5
Shoup, 1st Lt. Robert L.	5.5
Smith, 1st Lt. Donovan F.	5.5
Tanner, Capt. William F.	5.5
Vanden Heuvel, 1st Lt. George R.	5.5
Waits, 1st Lt. Joe W.	5.5
Wang, 1st Lt. Kuang Fu	5.5

Col. Clinton Vincent (6)

Winks, 1st Lt. Robert P.	5.5
Biel, 1st Lt. Hipolitus T.	5.33
Vinson, Capt. Arnold E.	5.33
Dorris, Maj. Harry W.	5.25
Miller, 2nd Lt. Thomas F.	5.25
Duffy, Capt. James E. Jr.	5.2
Abernathy, Capt. Robert W.	5
Adams, 1st Lt. Robert H.	5
Ambort, 2nd Lt. Ernest J.	5
Ammon, 1st Lt. Robert H.	5
Andersen, 1st Lt. Leslie E.	5
Anderson, 1st Lt. Richard H.	5
Arasmith, 1st Lt. Lester L.	5
Archibald, 1st Lt. David B.	5
Aron, 1st Lt. William E.	5
Aust, Capt. Abner M. Jr.	5
Axtell, 1st Lt. Eugene D.	5
Baccus, Lt. Col. Donald A.	5
Bade, 1st Lt. Jack A.	5
Bank, 1st Lt. Raymond M.	5
Barber, 1st Lt. Rex T.	5
Barkey, 1st Lt. Robert M.	5
Barnes, 1st Lt. Truman S.	5
Baumler, Capt. Albert J.	5
Bearden, 2nd Lt. Aaron L.	5
Beavers, Capt. Edward H. Jr.	5
Benne, 1st Lt. Louis	5
Bolyard, Capt. John W.	5
Bonner, 1st Lt. Stephen J.	5
Bostrom, 1st Lt. Ernest O.	5
Bradley, Maj. John L.	5
Brown, Capt. Gerald	5
Byrne, 1st Lt. Robert J.	5
Byrnes, Capt. Robert C.	5
Castle, 2nd Lt. Nial K.	5
Chandler, Capt. George T.	5
Chandler, 1st Lt. Van E.	5
Cleaveland, 2nd Lt. Arthur B.	5
Clinger, Capt. Dallas A.	5
Cloud, Capt. Vivian A.	5
Cochran, 2nd Lt. Paul R.	5
Colman, 1st Lt. Philip E.	5
Comstock, Maj. Harold E.	5
Condon, Capt. Henry L. II	5
Coons, Capt. Merle M.	5
Cox, Capt. Ralph L.	5
Cranfill, Maj. Niven K.	5
Cullerton, 1st Lt. William J.	5
Curton, 1st Lt. Warden D.	5
Daniel, 1st Lt. J.S.	5
Daniel, Col. William A.	5
Davis, Capt. Clayton E.	5
Day, 1st Lt. William C. Jr.	5
Deakins, 1st Lt. Richard S.	5
Della, 1st Lt. George	5
Dick, Capt. Frederick E.	5
Dikovitsky, 1st Lt. Michael	5
Donaldson, 2nd Lt. I.B. Jack	5
Dregne, Lt. Col. Irwin H.	5
Dubisher, Maj. Francis E.	5
Dubois, 1st Lt. Charles H.	5
Duffy, 2nd Lt. Richard E.	5
Egan, 1st Lt. Joseph L. Jr.	5
Elder, Maj. Robert A.	5
Empey, 1st Lt. James W.	5
Ernst, 1st Lt. Herman E.	5
Faxon, 1st Lt. Richard D.	5

Capt. Edwin Heller (5.5)

Felts, 1st Lt. Marion C.	5
Fenex, Capt. James E. Jr.	5
Fiedler, 1st Lt. William F. Jr.	5
Fields, Capt. Virgil C. Jr.	5
Fischette, 1st Lt. Charles R.	5
Fisher, 1st Lt. Rodney W.	5
Fisk, Capt. Harry E.	5
Flack, Capt. Nelson D. Jr.	5
Ford, Maj. Claude E.	5
Gardner, Maj. Warner F.	5
Gerick, 2nd Lt. Steven	5
Gholson, Capt. Grover D.	5
Gibb, 1st Lt. Robert D.	5
Gladen, 1st Lt. Cyrus R.	5
Goodrich, 1st Lt. Burdett C.	5
Gordon, Capt. Mathew M. Jr.	5
Graham, 2nd Lt. Robert F.	5
Griffith, 1st Lt. Robert C.	5
Gross, Capt. Clayton K.	5
Grosvenor, Capt. William Jr.	5
Gupton, 1st Lt. Cheatham W.	5
Hammer, 1st Lt. Samuel E.	5
Hanna, 2nd Lt. Harry T.	5
Hanseman, 1st Lt. Chris J.	5
Harris, Capt. Thomas L.	5
Hartley, Capt. Raymond E. Jr.	5
Hatch, 2nd Lt. Herbert B. Jr.	5
Hauver, 1st Lt. Charles D.	5
Haworth, 1st Lt. Russell C.	5
Hendricks, Maj. Randall W.	5
Hill, Maj. James E.	5
Hiro, Maj. Edwin W.	5
Hnatio, 1st Lt. Myron M.	5
Hodges, Capt. William R.	5
Hoffman, 1st Lt. Cullen J.	5
Howe, 1st Lt. David W.	5
Hoyt, Capt. Edward R.	5
Hunter, Capt. Alvaro J.	5
Icard, 2nd Lt. Joe W.	5
Jones, Capt. Curan L.	5
Jones, Capt. Frank C.	5
Jones, Capt. Lynn F.	5
Jones, 2nd Lt. Warren L.	5
Julian, Maj. William H.	5
Kennedy, 1st Lt. Daniel	5
King, Maj. Charles W.	5
King, 1st Lt. David L.	5
Kirby, 1st Lt. Marion F.	5
Kirkland, 1st Lt. Lenton F. Jr.	5
Knott, 1st Lt. Carroll S.	5
Kopsel, 1st Lt. Edward H.	5
Lathrope, 2nd Lt. Franklin C.	5
Lazear, 1st Lt. Earl R. Jr.	5
Lee, 1st Lt. Richard J.	5
Leikness, Capt. Marlow J.	5
Lenox, 2nd Lt. Jack Jr.	5
Liles, Maj. Robert L.	5
London, Capt. Charles P.	5
Loving, Capt. George G. Jr.	5
Lutton, 1st Lt. Lowell C.	5
Mackay, 2nd Lt. John A.	5
Magoffin, Col. Morton D.	5
Mahon, Capt. Keith	5
Mahony, Lt. Col. Grant	5
Mankin, Capt. Jack C.	5
Markham, Capt. Gene E.	5
Marsh, 1st Lt. Lester C.	5
Martin, Col. Kenneth R.	5
Mason, Col. Joe L.	5
Mathis, 1st Lt. William H.	5
Mathre, 2nd Lt. Milden E.	5
Matte, 1st Lt. Joseph Z.	5
Maxwell, Capt. Chester K.	5
McArthur, 1st Lt. Paul G.	5
McArthur, Capt. T.H.	5
McDonough, Maj. William F.	5
McElroy, Capt. James N.	5
McGinn, Lt. Col. John L.	5
McGuyrt, 1st Lt. John W. Jr.	5
McMinn, Flight Officer Evan D.	5
Merritt, Maj. George L. Jr.	5
Miller, 1st Lt. Everett	5
Miller, Capt. Joseph E. Jr.	5
Milliken, 1st Lt. Robert C.	5
Monk, 1st Lt. Franklin H.	5
Mooney, 2nd Lt. Raymond P.	5
Morriss, Capt. Paul V.	5
Mullhollem, 1st Lt. Robert F.	5
Myers, 1st Lt. Jennings L.	5
Myers, Lt. Col. Raymond B.	5
Nichols, Maj. Franklin A.	5
Nollmeyer, Maj. Edward M.	5
Oberhansly, Maj. Jack J.	5
O'Neill, 1st Lt. Lawrence F.	5
Osher, Capt. Ernest K.	5
Overcash, 1st Lt. Robert J.	5
Owens, Maj. Joel A. Jr.	5
Paisley, 1st Lt. Melvyn R.	5

Lt. Col. Harrison Thyng (5)

Parham, Capt. Forrest F.	5
Paulk, 2nd Lt. Edsel	5
Payne, Capt. Carl W.	5
Perdomo, 1st Lt. Oscar F.	5
Pool, 1st Lt. Kenneth R.	5
Porter, 1st Lt. Philip B.	5
Powers, 2nd Lt. Macarthur	5
Price, Maj. Jack C.	5
Priest, 1st Lt. Royce W.	5
Pryor, Capt. Roger C.	5
Quigley, Maj. Donald L.	5
Ray, 1st Lt. C.B.	5
Reese, 1st Lt. William C.	5
Ritchie, 1st Lt. Andrew J.	5
Roberts, Capt. Newell O.	5
Rose, 1st Lt. Franklin Jr.	5
Rounds, 1st Lt. Gerald L.	5
Rudolph, 1st Lt. Henry S.	5
Rynne, Capt. William A.	5
Schank, 1st Lt. Thomas D.	5
Schriber, Capt. Louis	5
Schuh, 1st Lt. Duerr H.	5
Schultz (Shoals), Capt. Robert B.	5
Sears, 1st Lt. Alexander F.	5
Seidman, 1st Lt. Robert K.	5
Smith, Capt. Jack R.	5
Smith, Capt. Kenneth G.	5
Smith, 1st Lt. Paul A.	5
Smith, 1st Lt. Virgil H.	5
Stangel, Capt. William J.	5
Stanley, 1st Lt. Morris A.	5
Suehr, 1st Lt. Richard C.	5
Sullivan, Capt. Charles P.	5
Sutcliffe, 1st Lt. Robert C.	5
Sykes, 1st Lt. William J.	5
Talbot, Maj. Gilbert F.	5
Taylor, Col. Oliver B.	5
Thompson, 1st Lt. Robert D.	5
Thyng, Lt. Col. Harrison R.	5
Tierney, 1st Lt. Robert E.	5
Tilley, 1st Lt. John A.	5
Tordoff, Capt. Harrison B.	5
Trafton, 1st Lt. Frederick O.J.	5
Troxell, Capt. Clifton H.	5
Vaught, Capt. Robert H.	5
Visscher, 1st Lt. Herman W.	5
Waggoner, 1st Lt. Horace Q.	5
Walker, 1st Lt. Walter B. Jr.	5
Warner, Capt. Jack A.	5
Warren, Capt. Jack R.	5
Watson, Maj. Ralph J.	5
Watts, Capt. Oran S.	5
Weatherford, 1st Lt. Sidney W.	5
Webb, Maj. Willard J.	5
Welch, Capt. Darrell G.	5
Wesson, 1st Lt. Warren M.	5
White, 1st Lt. John H.	5
Wilhelm, Capt. David C.	5
Wilkins, 2nd Lt. Paul H.	5
Williams, 1st Lt. Russell D.	5
Wilson, Capt. William F.	5
Wire, Maj. Ralph L.	5
Wiseman, Capt. Lee V.	5
Wolford, 1st Lt. John L.	5
Wright, Capt. Max J.	5
Yaeger, Capt. Robert R. Jr.	5
York, 1st Lt. Robert M.	5

USAF Aces of the Korean War

Capt. Joseph McConnell Jr. (16)

McConnell, Capt. Joseph C. Jr.	16
Jabara, Maj. James	15
Fernandez, Capt. Manuel J. Jr.	14.50
Davis, Maj. George A. Jr.	14
Baker, Col. Royal N.	13
Blesse, Maj. Frederick C.	10
Fischer, Capt. Harold E.	10
Garrison, Lt. Col. Vermont	10
Johnson, Col. James K.	10
Moore, Capt. Lonnie R.	10
Parr, Capt. Ralph S. Jr.	10
Foster, Capt. Cecil G.	9
Low, 1st Lt. James F.	9
Hagerstrom, Maj. James P.	8.50
Risner, Capt. Robinson	8
Ruddell, Lt. Col. George I.	8
Buttelmann, 1st Lt. Henry	7
Jolley, Capt. Clifford D.	7
Lilley, Capt. Leonard W.	7
Adams, Maj. Donald E.	6.50
Gabreski, Col. Francis S.	6.50
Jones, Lt. Col. George L.	6.50
Marshall, Maj. Winton W.	6.50
Kasler, 1st Lt. James H.	6
Love, Capt. Robert J.	6
Whisner, Maj. William T. Jr.	5.50
Baldwin, Col. Robert P.	5
Becker, Capt. Richard S.	5
Bettinger, Maj. Stephen C.	5
Creighton, Maj. Richard D.	5
Curtin, Capt. Clyde A.	5
Gibson, Capt. Ralph D.	5
Kincheloe, Capt. Iven C. Jr.	5
Latshaw, Capt. Robert T. Jr.	5
Moore, Capt. Robert H.	5
Overton, Capt. Dolphin D. III	5
Thyng, Col. Harrison R.	5
Wescott, Maj. William H.	5

Maj. William Whisner Jr. (5.50)

USAF Aces of the Vietnam War

DeBellevue, Capt. Charles B.	6
Feinstein, Capt. Jeffrey S.	5
Ritchie, Capt. Richard S.	5

Capt. Jeffrey Feinstein (5)

Capts. Charles DeBellevue (6) **and Richard Ritchie** (5)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AAF/USAF Aces With Victories in Both World War II and a Later War

	WW II	Korean/Other	Total
Gabreski, Col. Francis S.	28	6.50	34.50
Meyer, Col. John C.	24	2	26
Mahurin, Col. Walker M.	20.75	3.50	24.25
Davis, Maj. George A. Jr.	7	14	21
Whisner, Maj. William T. Jr.	15.50	5.50	21
Eagleston, Col. Glenn T.	18.50	2	20.50
Garrison, Lt. Col. Vermont	7.33	10	17.33
Baker, Col. Royal N.	3.50	13	16.50
Jabara, Maj. James	1.50	15	16.50
Olds, Col. Robin	12	4[a]	16
Mitchell, Col. John W.	11	4	15
Brueland, Maj. Lowell K.	12.50	2	14.50
Hagerstrom, Maj. James P.	6	8.50	14.50
Hovde, Lt. Col. William J.	10.50	1	11.50
Johnson, Col. James K.	1	10	11
Ruddell, Lt. Col. George I.	2.50	8	10.50
Thyng, Col. Harrison R.	5	5	10
Colman, Capt. Philip E.	5	4	9
Heller, Lt. Col. Edwin L.	5.50	3.50	9
Chandler, Maj. Van E.	5	3	8
Hockery, Maj. John J.	7	1	8
Creighton, Maj. Richard D.	2	5	7
Emmert, Lt. Col. Benjamin H.	6	1	7
Bettinger, Maj. Stephen C.	1	5	6
Visscher, Maj. Herman W.	5	1	6
Liles, Capt. Brooks J.	1	4	5
Mattson, Capt. Conrad E.	1	4	5
Shaeffer, Maj. William F.	2	3	5

[a]Olds's four additional victories came during the Vietnam War.

Lt. Col. John Meyer (26)

Maj. George Davis Jr. (21)

Leading Air Service/AAF/USAF Aces of All Wars

Bong, Maj. Richard I.	40	WW II
McGuire, Maj. Thomas B. Jr.	38	WW II
Gabreski, Col. Francis S.	34.50	WW II, Korea
Johnson, Capt. Robert S.	27	WW II
MacDonald, Col. Charles H.	27	WW II
Preddy, Maj. George E.	26.83	WW II
Meyer, Col. John C.	26	WW II, Korea
Rickenbacker, Capt. Edward V.	26[b]	WW I
Mahurin, Col. Walker M.	24.25	WW II, Korea
Schilling, Col. David C.	22.50	WW II
Johnson, Lt. Col. Gerald R.	22	WW II
Kearby, Col. Neel E.	22	WW II
Robbins, Maj. Jay T.	22	WW II
Christensen, Capt. Fred J.	21.50	WW II
Wetmore, Capt. Ray S.	21.25	WW II
Davis, Maj. George A. Jr.	21	WW II, Korea
Voll, Capt. John J.	21	WW II
Whisner, Capt. William T. Jr.	21	WW II, Korea
Eagleston, Col. Glenn T.	20.50	WW II, Korea
Lynch, Lt. Col. Thomas J.	20	WW II
Westbrook, Lt. Col. Robert B.	20	WW II
Gentile, Capt. Don S.	19.83	WW II

[b]Under World War II and Korean War counting rules, Rickenbacker would have been credited with 24.33 victories. The change would not alter his position on this list.

Maj. George Preddy (26.83)

USAF Recipients of the Medal of Honor

*Living Medal of Honor recipient.

Names, Alphabetically by Wars, and Rank at Time of Action	Place of Birth	Date of Action	Place of Action
World War I			
Bleckley, 2nd Lt. Erwin R.	Wichita, Kan.	Oct. 6, 1918	Binarville, France
Goettler, 1st Lt. Harold E.	Chicago	Oct. 6, 1918	Binarville, France
Luke, 2nd Lt. Frank Jr.	Phoenix	Sept. 29, 1918	Murvaux, France
Rickenbacker, 1st Lt. Edward V.	Columbus, Ohio	Sept. 25, 1918	Billy, France
World War II			
Baker, Lt. Col. Addison E.	Chicago	Aug. 1, 1943	Ploesti, Romania
Bong, Maj. Richard I.	Superior, Wis.	Oct. 10–Nov. 15, 1944	Southwest Pacific
Carswell, Maj. Horace S. Jr.	Fort Worth, Tex.	Oct. 26, 1944	South China Sea
Castle, Brig. Gen. Frederick W.	Manila, Philippines	Dec. 24, 1944	Liège, Belgium
Cheli, Maj. Ralph	San Francisco	Aug. 18, 1943	Wewak, New Guinea
Craw, Col. Demas T.	Traverse City, Mich.	Nov. 8, 1942	Port Lyautey, French Morocco
Doolittle, Lt. Col. James H.	Alameda, Calif.	April 18, 1942	Tokyo
Erwin, SSgt. Henry E.	Adamsville, Ala.	April 12, 1945	Koriyama, Japan
Femoyer, 2nd Lt. Robert E.	Huntington, W.Va.	Nov. 2, 1944	Merseburg, Germany
Gott, 1st Lt. Donald J.	Arnett, Okla.	Nov. 9, 1944	Saarbrücken, Germany
Hamilton, Maj. Pierpont M.	Tuxedo Park, N.Y.	Nov. 8, 1942	Port Lyautey, French Morocco
Howard, Lt. Col. James H.	Canton, China	Jan. 11, 1944	Oschersleben, Germany
Hughes, 2nd Lt. Lloyd H.	Alexandria, La.	Aug. 1, 1943	Ploesti, Romania
Jerstad, Maj. John L.	Racine, Wis.	Aug. 1, 1943	Ploesti, Romania
Johnson, Col. Leon W.	Columbia, Mo.	Aug. 1, 1943	Ploesti, Romania
Kane, Col. John R.	McGregor, Tex.	Aug. 1, 1943	Ploesti, Romania
Kearby, Col. Neel E.	Wichita Falls, Tex.	Oct. 11, 1943	Wewak, New Guinea
Kingsley, 2nd Lt. David R.	Portland, Ore.	June 23, 1944	Ploesti, Romania
Knight, 1st Lt. Raymond L.	Houston	April 25, 1945	Po Valley, Italy
Lawley, 1st Lt. William R. Jr.	Leeds, Ala.	Feb. 20, 1944	Leipzig, Germany
Lindsey, Capt. Darrell R.	Jefferson, Iowa	Aug. 9, 1944	Pontoise, France
Mathies, Sgt. Archibald	Scotland	Feb. 20, 1944	Leipzig, Germany
Mathis, 1st Lt. Jack W.	San Angelo, Tex.	March 18, 1943	Vegesack, Germany
McGuire, Maj. Thomas B. Jr.	Ridgewood, N.J.	Dec. 25–26, 1944	Luzon, Philippines
Metzger, 2nd Lt. William E. Jr.	Lima, Ohio	Nov. 9, 1944	Saarbrücken, Germany
Michael, 1st Lt. Edward S.	Chicago	April 11, 1944	Brunswick, Germany
Morgan, 2nd Lt. John C.	Vernon, Tex.	July 28, 1943	Kiel, Germany
Pease, Capt. Harl Jr.	Plymouth, N.H.	Aug. 7, 1942	Rabaul, New Britain
Pucket, 1st Lt. Donald D.	Longmont, Colo.	July 9, 1944	Ploesti, Romania
Sarnoski, 2nd Lt. Joseph R.	Simpson, Pa.	June 16, 1943	Buka, Solomon Islands
Shomo, Maj. William A.	Jeannette, Pa.	Jan. 11, 1945	Luzon, Philippines
Smith, Sgt. Maynard H.	Caro, Mich.	May 1, 1943	St. Nazaire, France
Truemper, 2nd Lt. Walter E.	Aurora, Ill.	Feb. 20, 1944	Leipzig, Germany
Vance, Lt. Col. Leon R. Jr.	Enid, Okla.	June 5, 1944	Wimereaux, France
Vosler, TSgt. Forrest L.	Lyndonville, N.Y.	Dec. 20, 1943	Bremen, Germany
Walker, Brig. Gen. Kenneth N.	Cerrillos, N.M.	Jan. 5, 1943	Rabaul, New Britain
Wilkins, Maj. Raymond H.	Portsmouth, Va.	Nov. 2, 1943	Rabaul, New Britain
Zeamer, Maj. Jay Jr.*	Carlisle, Pa.	June 16, 1943	Buka, Solomon Islands
Korea			
Davis, Maj. George A. Jr.	Dublin, Tex.	Feb. 10, 1952	Sinuiju,Yalu River, N. Korea
Loring, Maj. Charles J. Jr.	Portland, Maine	Nov. 22, 1952	Sniper Ridge, N. Korea
Sebille, Maj. Louis J.	Harbor Beach, Mich.	Aug. 5, 1950	Hamch'ang, S. Korea
Walmsley, Capt. John S. Jr.	Baltimore	Sept. 14, 1951	Yangdok, N. Korea
Vietnam			
Bennett, Capt. Steven L.	Palestine, Tex.	June 29, 1972	Quang Tri, S. Vietnam
Day, Maj. George E.*	Sioux City, Iowa	Conspicuous gallantry while POW	
Dethlefsen, Maj. Merlyn H.	Greenville, Iowa	March 10, 1967	Thai Nguyen, N. Vietnam
Fisher, Maj. Bernard F.*	San Bernardino, Calif.	March 10, 1966	A Shau Valley, S. Vietnam
Fleming, 1st Lt. James P.*	Sedalia, Mo.	Nov. 26, 1968	Duc Co, S. Vietnam
Jackson, Lt. Col. Joe M.*	Newnan, Ga.	May 12, 1968	Kham Duc, S. Vietnam
Jones, Col. William A. III	Norfolk, Va.	Sept. 1, 1968	Dong Hoi, N. Vietnam
Levitow, A1C John L.	Hartford, Conn.	Feb. 24, 1969	Long Binh, S. Vietnam
Pitsenbarger, A1C William H.	Piqua, Ohio	April 11, 1966	Cam My, S. Vietnam
Sijan, Capt. Lance P.	Milwaukee	Conspicuous gallantry while POW	
Thorsness, Maj. Leo K.*	Walnut Grove, Minn.	April 19, 1967	N. Vietnam
Wilbanks, Capt. Hilliard A.	Cornelia, Ga.	Feb. 24, 1967	Dalat, S. Vietnam
Young, Capt. Gerald O.	Anacortes, Wash.	Nov. 9, 1967	Khesahn, S. Vietnam
Peacetime			
Lindbergh, Col. Charles A.	Detroit	May 20–21, 1927	New York City–Paris record flight
Mitchell, Maj. Gen. W.C. "Billy"	Milwaukee	Posthumous award	Foresight in military aviation

USAF Almanac

Major Commands

A major command is a subdivision of the Air Force assigned a major part of the Air Force mission and directly subordinate to Hq. USAF. In general, there are two types of major commands: functional and geographical.

ACC Air Combat Command

Headquarters Langley AFB, Va.

Established June 1, 1992

Commander Gen. Hal M. Hornburg

MISSIONS

Operate USAF bombers (active and ANG and AFRC gained); USAF's CONUS–based (active and gained) fighter and attack, reconnaissance, rescue, battle management, and command and control aircraft and intelligence and surveillance systems

Organize, train, equip, and maintain combat-ready forces for rapid deployment and employment to meet the challenges of peacetime air sovereignty, wartime defense, and military operations other than war

Provide air combat forces to America's warfighting commands (Central, European, Northern, Pacific, and Southern); nuclear forces to USSTRATCOM; air defense forces to NORAD

COROLLARY MISSIONS

Monitor and intercept illegal drug traffic

Test new combat equipment

FORCE STRUCTURE

Three Numbered Air Forces: **8th,** Barksdale AFB, La.; **9th,** Shaw AFB, S.C.; **12th,** Davis–Monthan AFB, Ariz.

Four primary subordinate units: Air and Space Expeditionary Force Center, Langley AFB, Va.; Air Force Rescue Coordination Center, Langley AFB, Va.; Air Intelligence Agency, Lackland AFB, Tex.; Air Warfare Center, Nellis AFB, Nev.
25 wings

OPERATIONAL ACTIVITY

Flying hours: 32,000 per month

Major operations
Enduring Freedom (Afghanistan); Iraqi Freedom (Iraq); Noble Eagle (US); Northern/Southern Watch (Iraq)

Major training exercises
Air Warrior and AW II; Amalgam Warrior; Baltops; Blue Advance; Blue Flag; Bright Star; Cooperative Zenith; Fuertas Defensas; Global Guardian; Initial Link; Internal Look; JTFEX; Linked Seas; Maple Flag; New Horizons; Northern Viking; Red Flag; Roving Sands; Rugged Arch; Strong Resolve

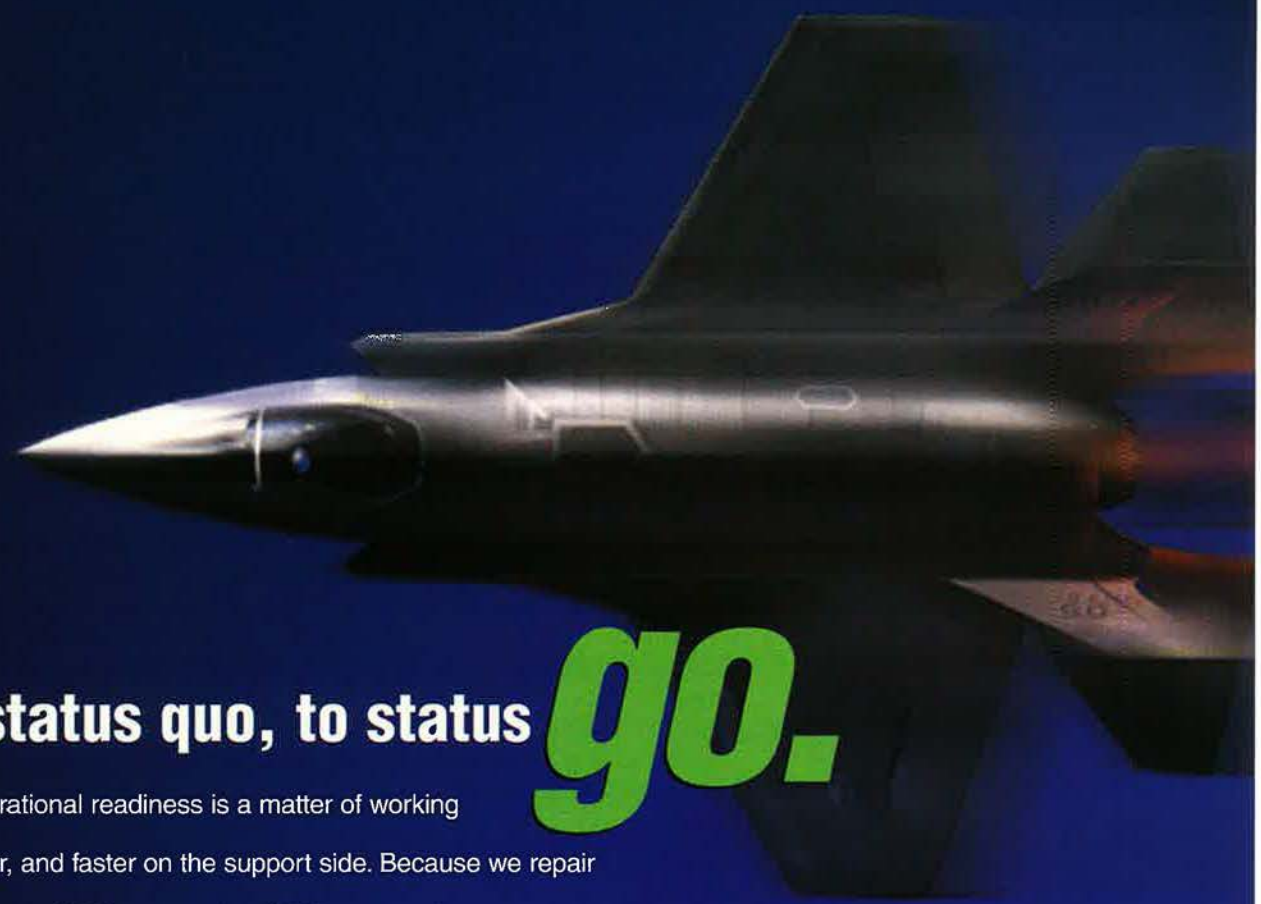
PERSONNEL

(as of Sept. 30, 2002)

Active duty	91,156
Officers	12,978
Enlisted	78,178
Reserve components	61,624
ANG	50,780
AFRC	10,844
Civilian	10,018
Total	**162,798**

USAF photo by SSgt. Michael Gaddis

The B-2* Spirit of Pennsylvania *starts up its engines at Whiteman AFB, Mo., recorded by Amn. John Calvano of the 509th Communications Squadron. The stealthy, multirole Spirits are ACC's most sophisticated bombers.



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AIR COMBAT COMMAND, LANGLEY AFB, VA.

EQUIPMENT

(Primary Aircraft Inventory as of Sept. 30, 2002)

Bombers (B-1B, B-2, B-52H)	112
Fighter/Attack (A/OA-10, F-15, F-16, F-117)	686
Helicopter (HH-60)	32
Recon/BM/C3I (E-3, E-4, E-8, E-9, EC-130, OC-135, RC-135, RQ-1, U-2, WC-135)	107
Tanker (HC-130)	11
Trainer (T-38, TC-135, TU-2)	30

UNIT	BASE	WEAPONS
1st Fighter Wing	Langley AFB, Va.	F-15C/D
2nd Bomb Wing	Barksdale AFB, La.	B-52H
4th Fighter Wing	Seymour Johnson AFB, N.C.	F-15E
5th Bomb Wing	Minot AFB, N.D.	B-52H
7th Bomb Wing	Dyess AFB, Tex.	B-1
9th Reconnaissance Wing	Beale AFB, Calif.	T-38, U-2R/S
20th Fighter Wing	Shaw AFB, S.C.	F-16C/CJ/D
23rd Fighter Group	Pope AFB, N.C.	A/OA-10
27th Fighter Wing	Cannon AFB, N.M.	F-16C/D
28th Bomb Wing	Ellsworth AFB, S.D.	B-1
33rd Fighter Wing	Eglin AFB, Fla.	F-15C/D
49th Fighter Wing	Holloman AFB, N.M.	AT-38B, F-117A, German F-4F
53rd Wing	Eglin AFB, Fla.	F-15C/E, F-16C/D, HH-60, Predator, Global Hawk
53rd Weapons Evaluation Group[a]	Tyndall AFB, Fla.	E-9, BQM-34, MQM-107, QF-4
55th Wing	Offutt AFB, Neb.	E-4B, EC-130H[b], OC-135B, RC-135S/U/V/W, TC-135S/W, WC-135C/W
57th Wing	Nellis AFB, Nev.	A-10, F-15C/D/E, F-16C/D, HH-60, Predator
67th Information Operations Wing	Lackland AFB, Tex.	—
70th Intelligence Wing	Ft. Meade, Md.	—
98th Range Wing	Nellis AFB, Nev.	—
99th Air Base Wing	Nellis AFB, Nev. (support)	—
116th Air Control Wing	Robins AFB, Ga.	E-8C
347th Rescue Wing	Moody AFB, Ga.	HC-130, HH-60
355th Wing	Davis–Monthan AFB, Ariz.	A/OA-10
366th Fighter Wing	Mountain Home AFB, Idaho	F-15C/D/E, F-16CJ/D
388th Fighter Wing	Hill AFB, Utah	F-16C/D
509th Bomb Wing	Whiteman AFB, Mo.	B-2, T-38
552nd Air Control Wing	Tinker AFB, Okla.	E-3B/C

[a]Part of 53rd Wing.
[b]Located at Davis–Monthan AFB, Ariz.
[c]Blended wing with activy duty and ANG personnel.

An A-10 pilot from the 332nd Air Expeditionary Wing prepares for takeoff from a forward location during Operation Iraqi Freedom.

USAF photo by SrA. JoAnn S. Makinano

8th AIR FORCE (ACC), BARKSDALE AFB, LA.

Commander
Lt. Gen. Bruce A. Carlson

2nd Bomb Wing
Barksdale AFB, La.
(B-52H)

5th Bomb Wing
Minot AFB, N.D.
(B-52H)

9th Reconnaissance Wing
Beale AFB, Calif.
(T-38, U-2R/S)

55th Wing
Offutt AFB, Neb.
(E-4B, EC-130H*, OC-135B, RC-135S/U/V/W, TC-135S/W, WC-135C/W)

67th Information Operations Wing
Lackland AFB, Tex.

70th Intelligence Wing
Ft. Meade, Md.

116th Air Control Wing
Robins AFB, Ga.
(E-8C)

509th Bomb Wing
Whiteman AFB, Mo.
(B-2, T-38)

552nd Air Control Wing
Tinker AFB, Okla.
(E-3B/C)

*Located at Davis-Monthan AFB, Ariz.

9th AIR FORCE (ACC), SHAW AFB, S.C.

Commander
Lt. Gen. T. Michael Moseley

1st Fighter Wing
Langley AFB, Va.
(F-15C/D)

4th Fighter Wing
Seymour Johnson AFB, N.C.
(F-15E)

20th Fighter Wing
Shaw AFB, S.C.
(F-16C/CJ/D)

33rd Fighter Wing
Eglin AFB, Fla.
(F-15C/D)

347th Rescue Wing
Moody AFB, Ga.
(HC-130, HH-60)

12th AIR FORCE (ACC), DAVIS-MONTHAN AFB, ARIZ.

Commander
Lt. Gen. William T. Hobbins

- **7th Bomb Wing** — Dyess AFB, Tex. (B-1)
- **27th Fighter Wing** — Cannon AFB, N.M. (F-16C/D)
- **28th Bomb Wing** — Ellsworth AFB, S.D. (B-1)
- **49th Fighter Wing** — Holloman AFB, N.M. (AT-38B, F-117A, German F-4F)
- **355th Wing** — Davis-Monthan AFB, Ariz. (A/OA-10)
- **366th Fighter Wing** — Mountain Home AFB, Idaho (F-15C/D/E, F-16CJ/D)
- **388th Fighter Wing** — Hill AFB, Utah (F-16C/D)

AETC
Air Education and Training Command

Headquarters Randolph AFB, Tex.

Established July 1, 1993

Commander Gen. Donald G. Cook

MISSIONS
Recruit, train, and educate quality people
Provide basic military training, initial and advanced technical training, flying training, and professional military and degree-granting professional education
Conduct joint, medical service, readiness, and Air Force security assistance training

OTHER RESPONSIBILITIES
Recall of Individual Ready Reservists. Mobility and contingency tasking support to combatant commanders

FORCE STRUCTURE
Two Numbered Air Forces and an educational headquarters: **2nd,** Keesler AFB, Miss.; **19th,** Randolph AFB, Tex.; **Air University,** Maxwell AFB, Ala.
Three DRUs: Air Force Recruiting Service and Air Force Security Assistance Training Squadron, Randolph AFB, Tex., and 59th Medical Wing, Lackland AFB, Tex.
16 wings

OPERATIONAL ACTIVITY
Flying hours: 48,403 per month

Staff photo by Guy Aceto

From basic military training to advanced technical training to college degrees, training and education are continuous during a USAF career. Here, the 95th Fighter Squadron trains the next generation of fighter pilots at Tyndall AFB, Fla.

PERSONNEL

(as of Sept. 30, 2002)

Active duty		72,296
Officers	15,042	
Enlisted	57,254	
Reserve components		7,984
ANG	4,611	
AFRC	3,373	
Civilian		14,713
Total		**94,993**

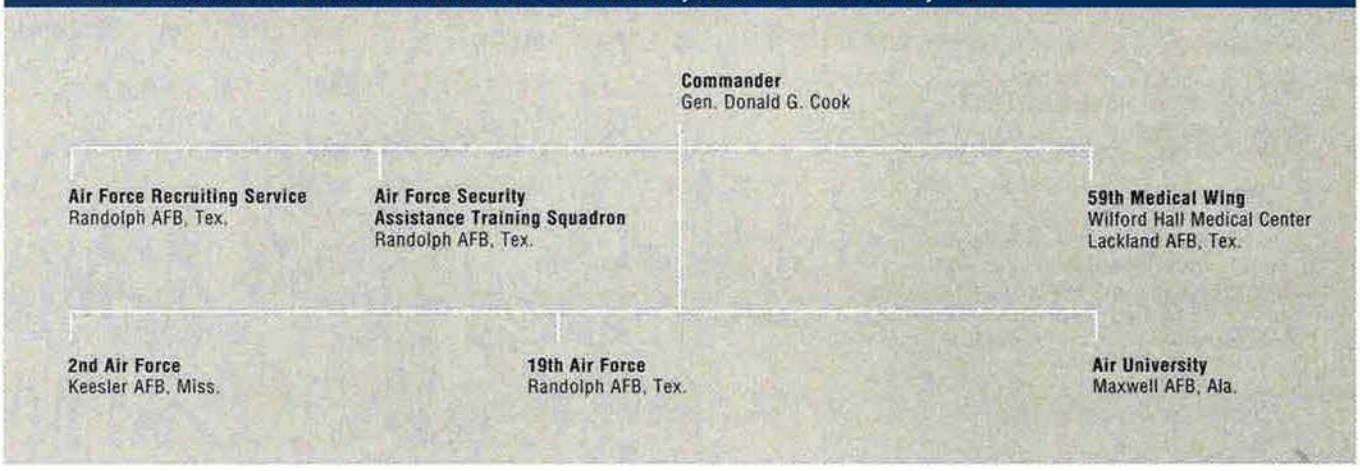
EQUIPMENT

(PAI as of Sept. 30, 2002)

Fighter/Attack (F-15, F-16)	211
Helicopter (UH-1)	7
Special Operations Forces (MC-130, MH-53)	16
Tanker (KC-135)	24
Trainer (AT/T-38, T-1, T-6, T-37, T-43)	883
Transport (C-5, C-17, C-21, C-130)	57

UNIT	BASE	WEAPONS/ACTIVITIES
Flying/Aircrew Training Units (Active)		
12th Flying Training Wing	Randolph AFB, Tex.	T-1, T-6, T-37, T-38, T-43
14th Flying Training Wing	Columbus AFB, Miss.	T-1, T-37, T-38
45th Airlift Squadron	Keesler AFB, Miss.	C-21
47th Flying Training Wing	Laughlin AFB, Tex.	T-1, T-6, T-37, T-38
56th Fighter Wing	Luke AFB, Ariz.	F-16
58th Special Operations Wing	Kirtland AFB, N.M.	MC-130H, MC-130P, MH-53, UH-1
71st Flying Training Wing	Vance AFB, Okla.	T-1, T-37, T-38
80th Flying Training Wing	Sheppard AFB, Tex.	AT/T-38, T-37
97th Air Mobility Wing	Altus AFB, Okla.	C-5, C-17, KC-135
314th Airlift Wing	Little Rock AFB, Ark.	C-130E
325th Fighter Wing	Tyndall AFB, Fla.	F-15, Undergraduate Controller and Air Battle Manager Training
336th Training Group	Fairchild AFB, Wash.	UH-1, Aircrew Survival Training
479th Flying Training Group	Moody AFB, Ga.	AT-38, T-6, T-38C
Technical Training Units		
17th Training Wing	Goodfellow AFB, Tex.	
37th Training Wing	Lackland AFB, Tex.	
81st Training Wing	Keesler AFB, Miss.	
82nd Training Wing	Sheppard AFB, Tex.	
381st Training Group	Vandenberg AFB, Calif.	
Other Major Units		
Air University	Maxwell AFB, Ala.	
Air Force Recruiting Service	Randolph AFB, Tex.	
42nd Air Base Wing	Maxwell AFB, Ala.	
59th Medical Wing	Lackland AFB, Tex.	

AIR EDUCATION AND TRAINING COMMAND, RANDOLPH AFB, TEX.



2nd AIR FORCE (AETC), KEESLER AFB, MISS.

Commander
Maj. Gen. John F. Regni

- **17th Training Wing** — Goodfellow AFB, Tex.
- **37th Training Wing** — Lackland AFB, Tex.
- **81st Training Wing** — Keesler AFB, Miss.
- **82nd Training Wing** — Sheppard AFB, Tex.
- **381st Training Group**[a] — Vandenberg AFB, Calif.

[a]Tenant unit.

19th AIR FORCE (AETC), RANDOLPH AFB, TEX.

Commander
Maj. Gen. James E. Sandstrom

- **12th Flying Training Wing** — Randolph AFB, Tex. (T-1, T-6, T-37, T-38, T-43)
- **14th Flying Training Wing** — Columbus AFB, Miss. (T-1, T-37, T-38)
- **47th Flying Training Wing** — Laughlin AFB, Tex. (T-1, T-6, T-37, T-38)
- **56th Fighter Wing** — Luke AFB, Ariz. (F-16)
- **58th Special Operations Wing**[a] — Kirtland AFB, N.M. (MC-130H, MC-130P, MH-53, UH-1)
- **71st Flying Training Wing** — Vance AFB, Okla. (T-1, T-37, T-38)
- **80th Flying Training Wing**[a] — Sheppard AFB, Tex. (AT/T-38, T-37)
- **97th Air Mobility Wing** — Altus AFB, Okla. (C-5, C-17, KC-135)
- **314th Airlift Wing** — Little Rock AFB, Ark. (C-130E)
- **325th Fighter Wing** — Tyndall AFB, Fla. (F-15)
- **336th Training Group**[a] — Fairchild AFB, Wash. (UH-1)
- **479th Flying Training Group**[a] — Moody AFB, Ga. (AT-38, T-6, T-38C)

[a]Tenant unit.

AIR UNIVERSITY (AETC), MAXWELL AFB, ALA.

Commander
Lt. Gen. Donald A. Lamontagne

- **Civil Air Patrol–USAF** — Maxwell AFB, Ala.
- **Air Command and Staff College** — Maxwell AFB, Ala.
- **Air Force Institute for Advanced Distributed Learning** — Maxwell AFB, Ala.
- **Air Force Institute of Technology** — Wright–Patterson AFB, Ohio
- **Air Force Officer Accession and Training Schools** — Maxwell AFB, Ala.
- **Air University Library** — Maxwell AFB, Ala.
- **Air War College** — Maxwell AFB, Ala.
- **College of Aerospace Doctrine, Research, and Education** — Maxwell AFB, Ala.
- **College for Enlisted Professional Military Education** — Maxwell AFB, Gunter Annex, Ala.
- **Community College of the Air Force** — Maxwell AFB, Ala.
- **Ira C. Eaker College for Professional Development** — Maxwell AFB, Ala.
- **School of Advanced Airpower Studies** — Maxwell AFB, Ala.
- **Squadron Officer College** — Maxwell AFB, Ala.
- **42nd Air Base Wing** — Maxwell AFB, Ala.

Air Force Materiel Command

Headquarters Wright–Patterson AFB, Ohio

Established July 1, 1992

Commander Gen. Lester L. Lyles

MISSIONS

Provide research and development, testing, acquisition, and sustainment of weapon systems for the warfighter

Design, develop, and acquire advanced technology to achieve air superiority

Operate major product, logistics, and test centers and the Air Force Research Laboratory

FORCE STRUCTURE

Three major product centers
Two test centers
Three air logistics centers
Three specialized centers
One laboratory,10 directorates, at various locations

OPERATIONAL ACTIVITY

Flying hours: 1,800 per month

PERSONNEL

(as of Sept. 30, 2002)

Active duty		23,279
Officers	6,941	
Enlisted	16,338	
Reserve components		5,702
ANG	2,331	
AFRC	3,371	
Civilian		56,838
Total		**85,819**

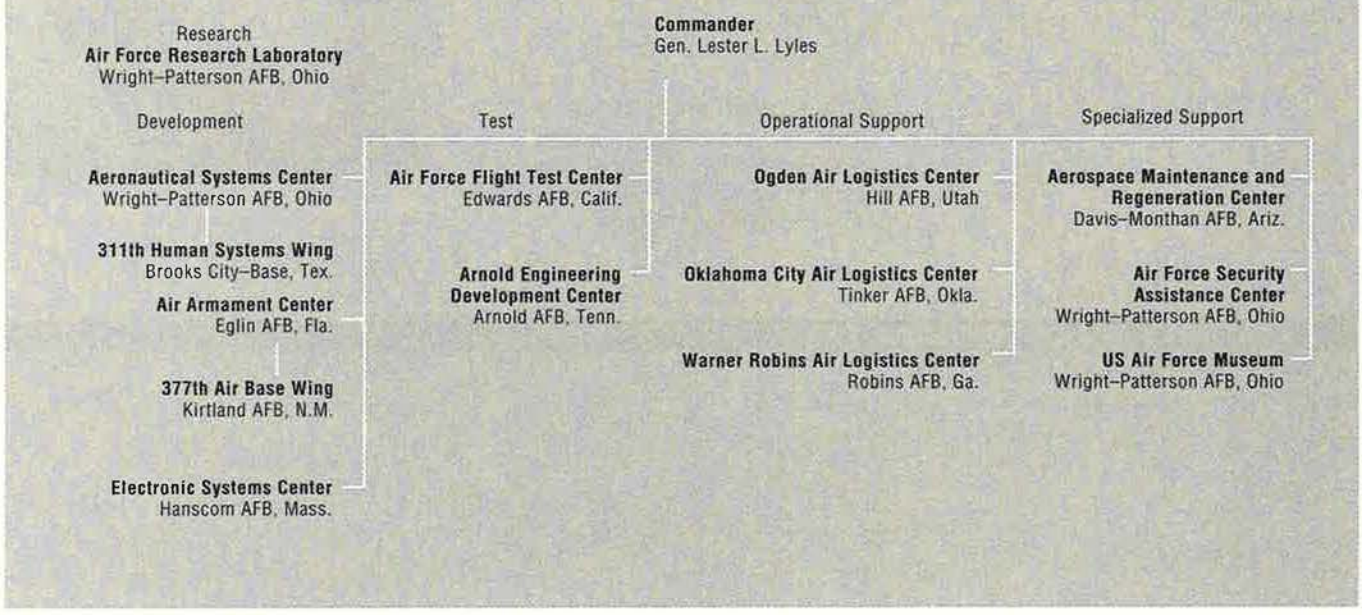
EQUIPMENT

(PAI as of Sept. 30, 2002)

Bomber (B-1B, B-52)	4
Fighter/Attack (A-10, F-15, F-16, F-22, F-117)	58
Helicopter (HH-60, UH-1)	5
Tanker (NKC/KC-135)	4
Trainer (AT/T-38, T-39)	16
Transport (C-12, C-17, C-135, NC-130)	22

UNIT	BASE
Aeronautical Systems Center	Wright–Patterson AFB, Ohio
Air Armament Center	Eglin AFB, Fla.
Electronic Systems Center	Hanscom AFB, Mass.
Air Force Flight Test Center	Edwards AFB, Calif.
Arnold Engineering Development Center	Arnold AFB, Tenn.
Ogden Air Logistics Center	Hill AFB, Utah
Oklahoma City Air Logistics Center	Tinker AFB, Okla.
Warner Robins Air Logistics Center	Robins AFB, Ga.
Aerospace Maintenance & Regeneration Center	Davis–Monthan AFB, Ariz.
Air Force Security Assistance Center	Wright–Patterson AFB, Ohio
311th Human Systems Wing	Brooks City–Base, Tex.
Air Force Research Laboratory	Wright–Patterson AFB, Ohio
377th Air Base Wing	Kirtland AFB, N.M.
US Air Force Museum	Wright–Patterson AFB, Ohio

AIR FORCE MATERIEL COMMAND, WRIGHT-PATTERSON AFB, OHIO



Air Force Space Command

Headquarters Peterson AFB, Colo.

Established Sept. 1, 1982

Commander Gen. Lance W. Lord

MISSIONS

Operate and test USAF ICBM forces for USSTRATCOM; missile warning radars, sensors, and satellites; national space-launch facilities and operational boosters; worldwide space surveillance radars and optical systems; worldwide space environmental systems
Provide command and control for DOD satellites; ballistic missile warning to NORAD and USSTRATCOM; space weather support to entire DOD
Produce and acquire advanced space systems

COROLLARY MISSIONS

Develop and integrate space support for the warfighter
Serve as lead command for all USAF UH-1 helicopter programs

OTHER RESPONSIBILITIES

Provide communications, computer, and base support to NORAD; technology safeguard monitors to support launches of US satellites on foreign launch vehicles
Supply range and launch facilities for military, civil, and commercial space launch

FORCE STRUCTURE

Two Numbered Air Forces: **14th,** Vandenberg AFB, Calif.; **20th,** F.E. Warren AFB, Wyo.
One major product center
One DRU: Space Warfare Center, Schriever AFB, Colo.
Eight wings

PERSONNEL

(as of Sept. 30, 2002)

Active duty		19,097
Officers	4,983	
Enlisted	14,114	
Reserve components		1,412
ANG	475	
AFRC	937	
Civilian		6,325
Total		**26,834**

EQUIPMENT

(as of Sept. 30, 2002)

Ballistic missile warning systems: Defense Support Program satellites, Ballistic Missile Early Warning System, Pave PAWS radars, Perimeter Acquisition Radar Attack Characterization System, conventional radars

Boosters: Delta II, Atlas II, Titan II, Titan IV, Delta IV, Atlas V

Helicopters: 18

ICBMs:

Peacekeeper: 50
Minuteman III: 500

Satellite command and control system:

Air Force Satellite Control Network (worldwide system of eight tracking stations providing communications links to satellites to monitor their status)

Satellite systems
(as of Jan. 1, 2003):

GPS: Block II/IIA/IIR: 28
DMSP: 4
DSCS III: 11
Milstar: 4
Milsatcom Polar System: 1

Space surveillance systems:

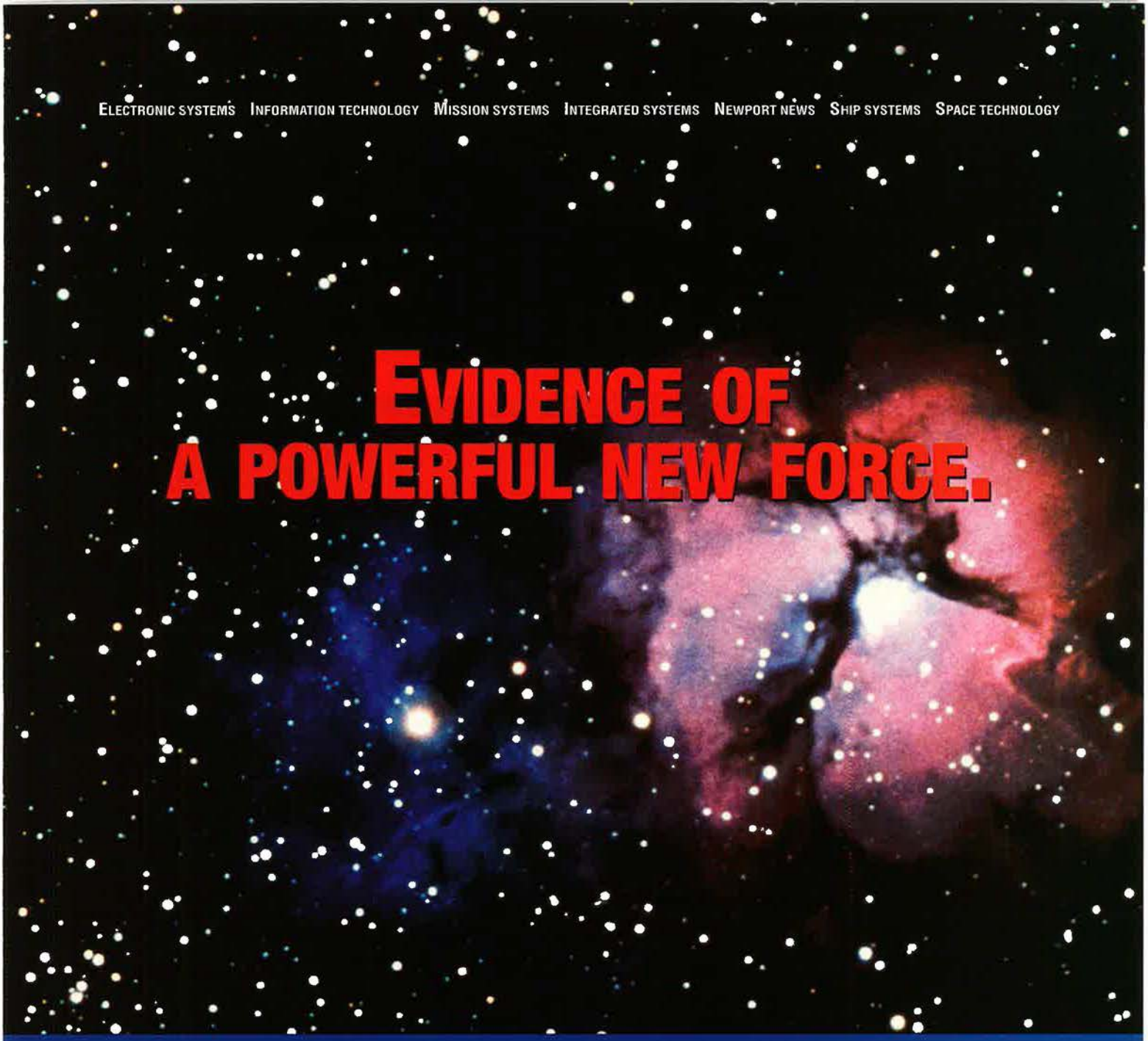
Electro-Optical Deep Space Surveillance System, phased-array radars, mechanical tracking radars, passive surveillance radars

Photo by Carlton Bailie, Boeing

AIR FORCE SPACE COMMAND, PETERSON AFB, COLO.

Commander
Gen. Lance W. Lord

- **14th Air Force**, Vandenberg AFB, Calif.
- **Space and Missile Systems Center**, Los Angeles AFB, Calif.
- **Space Warfare Center**, Schriever AFB, Colo.
- **20th Air Force**, F.E. Warren AFB, Wyo.



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14th AIR FORCE (AFSPC), VANDENBERG AFB, CALIF.

Commander
Maj. Gen. Michael A. Hamel

- **21st Space Wing**, Peterson AFB, Colo.
  - **460th Air Base Wing**, Buckley AFB, Colo.
- **30th Space Wing**, Vandenberg AFB, Calif. (UH-1)
- **45th Space Wing**, Patrick AFB, Fla.
- **50th Space Wing**, Schriever AFB, Colo.

20th AIR FORCE (AFSPC), F.E. WARREN AFB, WYO.

Commander
Maj. Gen. Timothy J. McMahon

- **90th Space Wing**, F.E. Warren AFB, Wyo. (Minuteman III, Peacekeeper, UH-1)
- **91st Space Wing**, Minot AFB, N.D. (Minuteman III, UH-1)
- **341st Space Wing**, Malmstrom AFB, Mont. (Minuteman III, UH-1)

UNIT	BASE	WEAPONS/ACTIVITIES
21st Space Wing	Peterson AFB, Colo.	Missile warning and space surveillance
30th Space Wing	Vandenberg AFB, Calif.	Polar-orbiting launches, launch R&D tests, range operations for DOD, NASA, ballistic missile and aeronautical systems, and commercial launches; test support for DOD space and ICBM systems; UH-1, Delta II, Atlas IIAS, Titan II, Titan IV, Pegasus, Taurus
45th Space Wing	Patrick AFB, Fla.	Launch, range operations for DOD, NASA, and commercial space launches; shuttle program support and US Navy Trident test support; Delta II, Atlas II, Titan IV, Delta IV, Atlas V
50th Space Wing	Schriever AFB, Colo.	Command and control of DOD and allied nations' satellites
90th Space Wing	F.E. Warren AFB, Wyo.	Minuteman III and Peacekeeper ICBMs, UH-1
91st Space Wing	Minot AFB, N.D.	Minuteman III ICBM, UH-1
341st Space Wing	Malmstrom AFB, Mont.	Minuteman III ICBM, UH-1
460th Air Base Wing	Buckley AFB, Colo.	Missile warning and space communications
Space & Missile Systems Center	Los Angeles AFB, Calif.	R&D, purchase of military space systems

AFSOC
Air Force Special Operations Command

Headquarters Hurlburt Field, Fla.

Established May 22, 1990

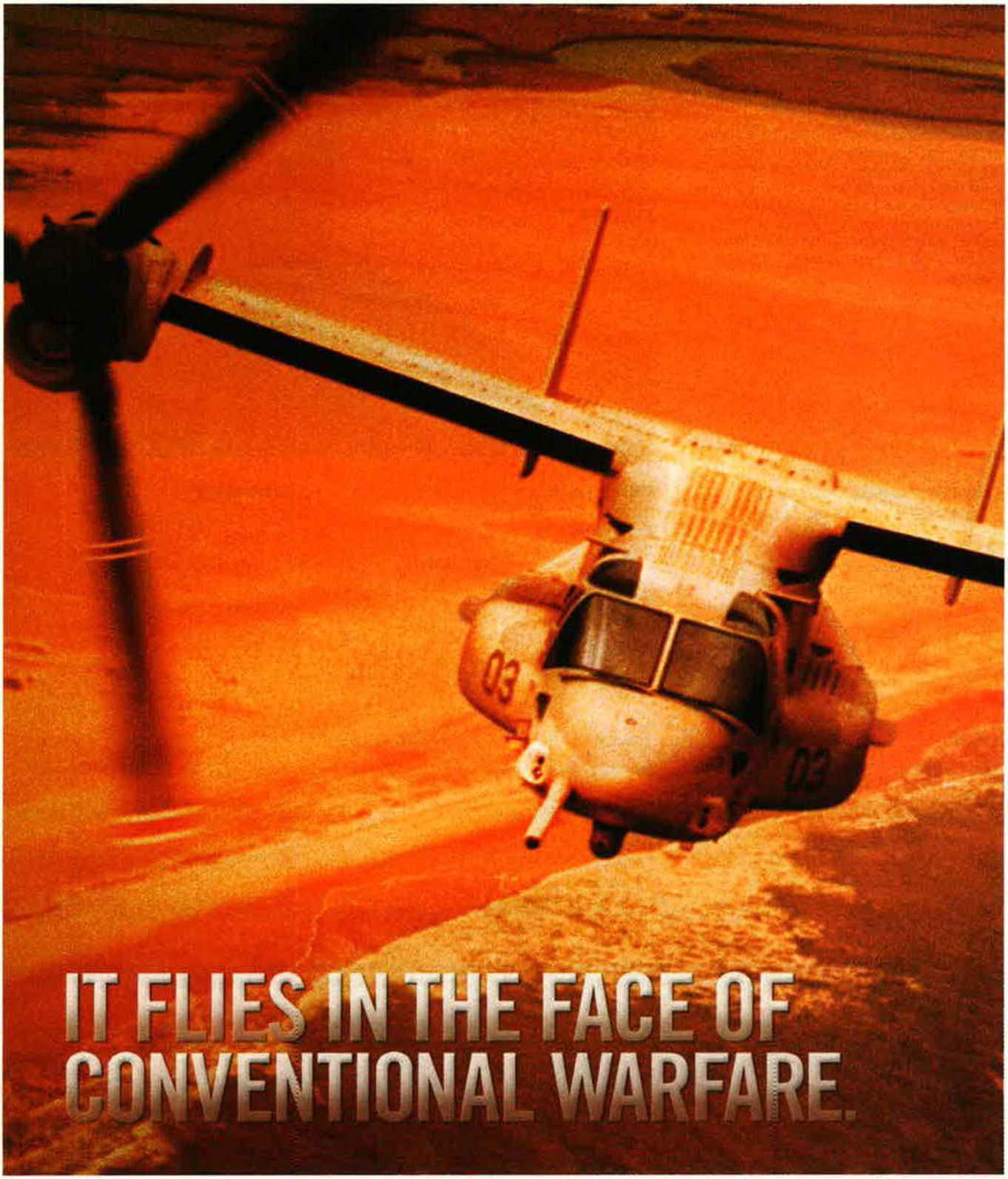
Commander Lt. Gen. Paul V. Hester

MISSIONS

Serve as the Air Force component of USSOCOM
Deploy specialized airpower, delivering special operations combat power anywhere, anytime
Provide Air Force Special Operations Forces for worldwide deployment and assignment to regional unified commands to conduct unconventional warfare, direct action, special reconnaissance, counterterrorism, foreign internal defense, counterproliferation, civil affairs, humanitarian assistance, psychological operations, personnel recovery, and counternarcotics operations

FORCE STRUCTURE

One active duty, one ANG, and one AFRC special operations wings
Three groups (two special operations, one special tactics)
USAF Special Operations School



It is the V-22 Osprey. One of the most revolutionary aircraft ever to enter service with the U.S. military. An aircraft with the flexibility to change from helicopter to airplane flight mode in seconds. And an aircraft that is continually improving in reliability and performance with every test it passes. Soon, it will not only change the way we fight wars, but how we wage peace. The V-22 Osprey. Unique aircraft – unparalleled capabilities.

Bell Helicopter a Textron Company / The Boeing Company / BAE SYSTEMS / Engineered Fabrics Corporation / EFW Inc. / General Dynamics Advanced Information Systems
Honeywell / ITT Industries / Middle River Aircraft Systems / MOOG / Northrop Grumman / Raytheon / Rolls-Royce / Smiths Aerospace / Vought Aircraft

Team Osprey

A combat controller trains at a firing range while deployed for Operation Enduring Freedom in March. The combat controller teams of Air Force Special Operations Command establish and control air assault zones and conduct other missions supporting special operations forces.

USAF photo by SSgt. Jeremy T. Lock

OPERATIONAL ACTIVITY

Flying hours: 4,300 per month

Major operations
Enduring Freedom (Afghanistan);
Iraqi Freedom (Iraq);

PERSONNEL

(as of Sept. 30, 2002)

Active duty		9,121
Officers	1,525	
Enlisted	7,596	
Reserve components		2,673
ANG	1,320	
AFRC	1,353	
Civilian		672
Total		**12,466**

EQUIPMENT

(PAI as of Sept. 30, 2002)

Helicopter (UH-1)	2
SOF (AC-130, MC-130, MH-53)	75
Transport (C-41)	2

UNIT	BASE	WEAPONS
16th Special Operations Wing	Hurlburt Field, Fla.	AC-130H/U, C-41A, C-130, MC-130H, MC-130P, MH-53J/M, UH-1N
18th Flight Test Squadron	Hurlburt Field, Fla.	—
352nd Special Operations Group	RAF Mildenhall, UK	MC-130H, MC-130P, MH-53M
353rd Special Operations Group	Kadena AB, Japan	MC-130H, MC-130P
720th Special Tactics Group	Hurlburt Field, Fla.	—
USAF Special Operations School	Hurlburt Field, Fla.	—

AIR FORCE SPECIAL OPERATIONS COMMAND, HURLBURT FIELD, FLA.

Air Mobility Command

Headquarters Scott AFB, Ill.

Established June 1, 1992

Commander Gen. John W. Handy

MISSIONS

Provide rapid global mobility and sustainment through tactical and strategic airlift and aerial refueling for US armed forces

COROLLARY MISSIONS

Provide special duty and operational support aircraft and global humanitarian support

Perform peacetime and wartime aeromedical evacuation missions

FORCE STRUCTURE

Two Numbered Air Forces: **15th,** Travis AFB, Calif.; **21st,** McGuire AFB, N.J.

Three DRUs: Air Mobility Warfare Center, Ft. Dix, N.J.; Tanker Airlift Control Center, Scott AFB, Ill.; Defense Courier Service, Ft. Meade, Md.

12 wings (six airlift, three air mobility, three air refueling)

Three groups (two airlift, one air refueling)

OPERATIONAL ACTIVITY

Flying hours: 38,361 per month

Major operations

Deep Freeze (Antarctic); Enduring Freedom (Afghanistan); Iraqi Freedom (Iraq); Noble Eagle (US); Northern/Southern Watch (Iraq); Wildland Wildfire (fire fighting)

Major training exercises

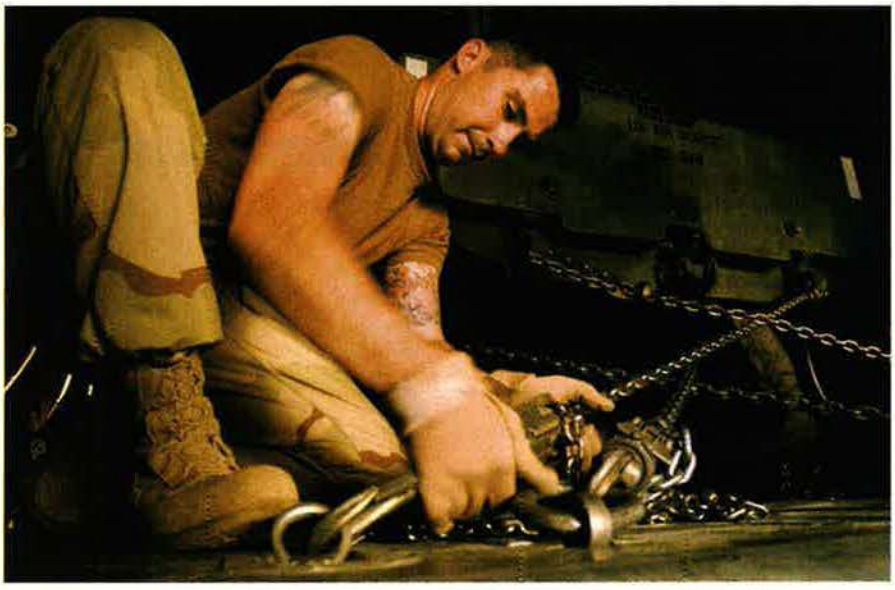
Adventure Exchange; Adventure Express 02; Affirmative Alert; Arctic Sarex; Battle Griffin; Blue Game; Cobra Gold; Dynamic Mix; Hungarian Response 02; Medceur/ Resceur; Medflag; Millennium Challenge; New Horizons; Strong Resolve

PERSONNEL

(as of Sept. 30, 2002)

Active duty		51,892
Officers	8,879	
Enlisted	43,013	
Reserve components		86,366
ANG	39,449	
AFRC	46,917	
Civilian		8,229
Total		**146,487**

USAF photo by SSgt. Mitch Fuqua



USAF photo by SSgt. Cherie A. Thurlby

Above, in the early morning light, C-17s wait to be loaded with cargo for Operation Iraqi Freedom. At left, SSgt. Matthew Woodcock, 621st Air Mobility Group, McGuire AFB, N.J., secures a forklift to a C-130.

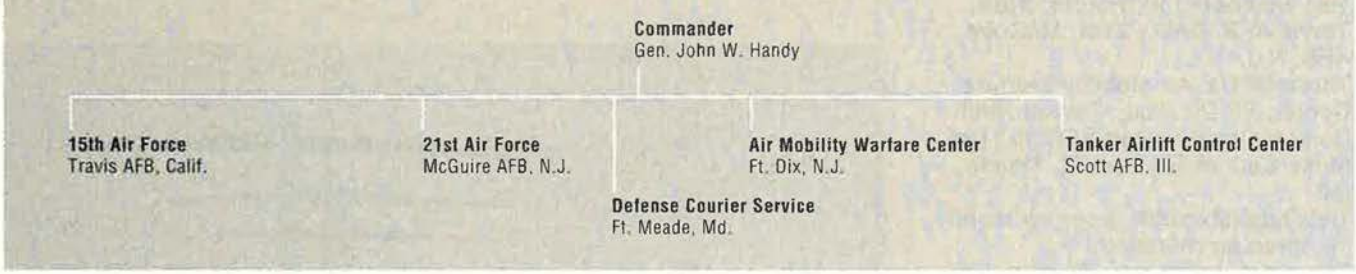
EQUIPMENT

(PAI as of Sept. 30, 2002)

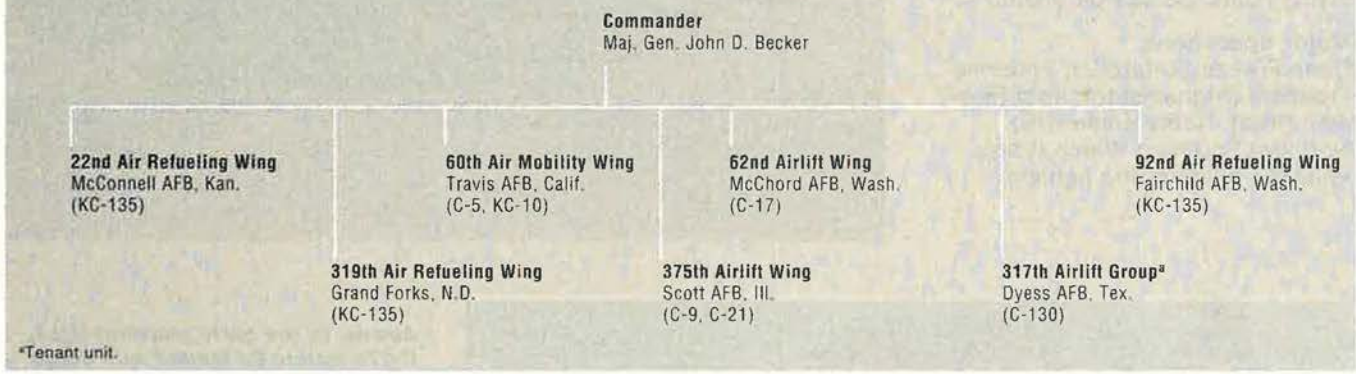
Helicopter (UH-1)	15
Tanker (KC-10, KC-135)	218
Transport (C-5, C-9, C-17, C-20, C-21, C-32, C-37, C-130, C-141, VC-25)	307

UNIT	BASE	WEAPONS
6th Air Mobility Wing	MacDill AFB, Fla.	C-37, KC-135
19th Air Refueling Group	Robins AFB, Ga.	KC-135
22nd Air Refueling Wing	McConnell AFB, Kan.	KC-135
43rd Airlift Wing	Pope AFB, N.C.	C-130
60th Air Mobility Wing	Travis AFB, Calif.	C-5, KC-10
62nd Airlift Wing	McChord AFB, Wash.	C-17
89th Airlift Wing	Andrews AFB, Md.	C-9, C-20, C-32, C-37, VC-25, UH-1
92nd Air Refueling Wing	Fairchild AFB, Wash.	KC-135
305th Air Mobility Wing	McGuire AFB, N.J.	C-141, KC-10
317th Airlift Group	Dyess AFB, Tex.	C-130
319th Air Refueling Wing	Grand Forks AFB, N.D.	KC-135
375th Airlift Wing	Scott AFB, Ill.	C-9, C-21
436th Airlift Wing	Dover AFB, Del.	C-5
437th Airlift Wing	Charleston AFB, S.C.	C-17
463rd Airlift Group	Little Rock AFB, Ark.	C-130

AIR MOBILITY COMMAND, SCOTT AFB, ILL.

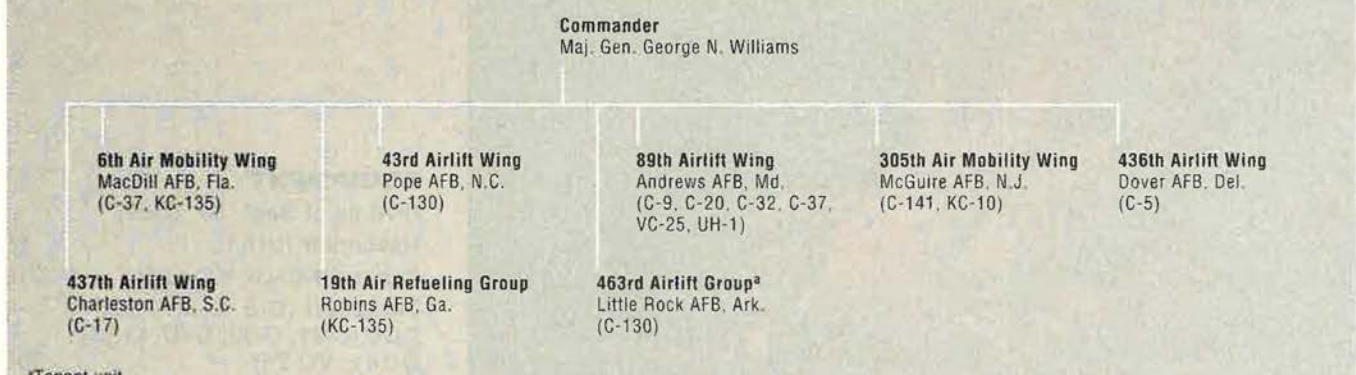


15th AIR FORCE (AMC), TRAVIS AFB, CALIF.



*Tenant unit.

21st AIR FORCE (AMC), MCGUIRE AFB, N.J.



*Tenant unit.

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Pacific Air Forces

Headquarters Hickam AFB, Hawaii

Established July 1, 1957

Commander Gen. William J. Begert

MISSIONS

Provide ready air and space power to promote US interests in the Asia–Pacific region during peacetime, crisis, and war

FORCE STRUCTURE

Four Numbered Air Forces: **5th,** Yokota AB, Japan; **7th,** Osan AB, South Korea; **11th,** Elmendorf AFB, Alaska; **13th,** Andersen AFB, Guam
Nine wings (two multimission, four fighter, one airlift, two air base)

OPERATIONAL ACTIVITY

Flying hours: 10,473 per month

Major training exercises

Balikatan (Philippines); Cobra Gold (Thailand); Commando Sling (Singapore); Cope India (India); Cope North (Japan); Cope Thunder (Alaska); Cope Tiger (Thailand); Foal Eagle (South Korea); Geronimo Thrust (Alaska); Keen Sword (Japan); Positive Force (Pacific); Reception Staging Onward Movement and Integration (South Korea); Tandem Thrust (Guam, Northern Marianas); Ulchi Focus Lens (South Korea)

USAF photo by SSgt. D. Myles Cullen

A1C Caridad O'Hara, from PACAF's 67th Fighter Squadron, Kadena AB, Japan, observes a pilot check the rudders on his F-15. O'Hara was deployed with the 363rd Expeditionary Aircraft Maintenance Squadron.

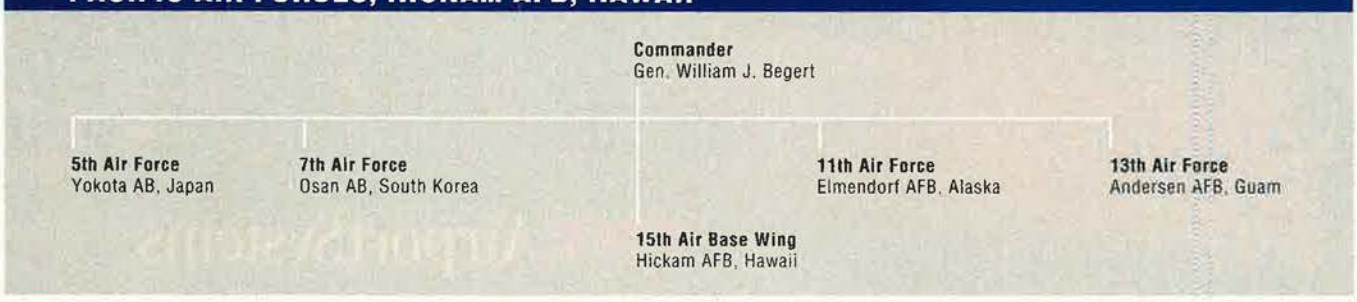
PERSONNEL

(as of Sept. 30, 2002)

Active duty		33,354
Officers	4,306	
Enlisted	29,048	
Reserve components		5,143
ANG	4,675	
AFRC	468	
Civilian		8,276
Total		**46,773**

UNIT	BASE	WEAPONS
3rd Wing	Elmendorf AFB, Alaska	C-12, C-130H, E-3B/C, F-15C/D, F-15E
8th Fighter Wing	Kunsan AB, South Korea	F-16C/D
15th Air Base Wing	Hickam AFB, Hawaii	—
18th Wing	Kadena AB, Japan	E-3B/C, F-15C/D, KC-135R, HH-60G
35th Fighter Wing	Misawa AB, Japan	F-16C/D
36th Air Base Wing	Andersen AFB, Guam	—
51st Fighter Wing	Osan AB, South Korea	A/OA-10A, C-12, F-16C/D
354th Fighter Wing	Eielson AFB, Alaska	A/OA-10A, F-16C/D
374th Airlift Wing	Yokota AB, Japan	C-9A, C-21A, C-130E/H

PACIFIC AIR FORCES, HICKAM AFB, HAWAII



5th AIR FORCE (PACAF), YOKOTA AB, JAPAN

Commander
Lt. Gen. Thomas C. Waskow

18th Wing
Kadena AB, Japan
(E-3B/C, F-15C/D, KC-135R, HH-60G)

35th Fighter Wing
Misawa AB, Japan
(F-16C/D)

374th Airlift Wing
Yokota AB, Japan
(C-9A, C-21A, C-130E/H)

7th AIR FORCE (PACAF), OSAN AB, SOUTH KOREA

Commander
Lt. Gen. Lance L. Smith

8th Fighter Wing
Kunsan AB, South Korea
(F-16C/D)

51st Fighter Wing
Osan AB, South Korea
(A/OA-10A, C-12, F-16C/D)

11th AIR FORCE (PACAF), ELMENDORF AFB, ALASKA

Commander
Lt. Gen. Carrol H. Chandler

3rd Wing
Elmendorf AFB, Alaska
(C-12, C-130H, E-3B/C, F-15C/D, F-15E)

354th Fighter Wing
Eielson AFB, Alaska
(A/OA-10A, F-16C/D)

EQUIPMENT

(PAI as of Sept. 30, 2002)

Fighter/Attack (A/OA-10, F-15, F-16)	264
Helicopter (HH-60)	8
Recon/BM/C3I (E-3)	2
Tanker (KC-135)	8
Transport (C-9, C-12, C-21, C-37, C-130)	40

USAF photo by SSgt. Matthew Hannen

An F-16CJ pilot from the 14th Fighter Squadron, Misawa AB, Japan, waits for maintenance crew members to pull weapons pins from his aircraft before he takes off for an Iraqi Freedom mission.

13th AIR FORCE (PACAF), ANDERSEN AFB, GUAM

Commander
Maj. Gen. Dennis R. Larsen

36th Air Base Wing
Andersen AFB, Guam

497th Fighter Training Squadron
Paya Lebar Airfield, Singapore[a]

[a]Base owned by Singapore government.

USAFE
US Air Forces in Europe

Headquarters Ramstein AB, Germany

Established Aug. 7, 1945

Commander Gen. Gregory S. Martin

MISSIONS

Provide the joint force commander rapidly deployable expeditionary aerospace forces

COROLLARY MISSIONS

Plan, conduct, coordinate, and support aerospace operations to achieve US national and NATO objectives based on USEUCOM taskings
Develop and maintain light, lean, lethal, and rapid expeditionary aerospace forces
Establish and maintain expeditionary bases
Support US military plans and operations in Europe, the Mediterranean, the Middle East, and Africa

FORCE STRUCTURE

Two Numbered Air Forces: **3rd,** RAF Mildenhall, UK; **16th,** Aviano AB, Italy
Seven wings (one air base, one multimission, one air refueling, one airlift, and three fighter)

Staff photo by Guy Aceto

An F-16CJ from the 52nd Fighter Wing flies a training mission from Spangdahlem AB, Germany. USAFE has two other fighter wings—the 31st FW at Aviano AB, Italy, and the 48th FW at RAF Lakenheath, UK.

OPERATIONAL ACTIVITY

Flying hours: 7,400 per month

Major operations
Enduring Freedom (Afghanistan); Iraqi Freedom (Iraq); Joint Forge (Bosnia); Joint Guardian (Kosovo); Northern/Southern Watch (Iraq)

Major training exercises
Able Ally; Able Gain; African Eagle; African Lion; Agile Leader; Agile Response; Anatolian Eagle; Atlas Drop; Baltops; Blue Game; Cannon Cloud; Clean Hunter; Combined Endeavor; Cooperative Key; Destined Glory; Dimming Sun; Flintlock; Immediate Response; Juniper Stallion; Medflag; Positive Force; Rescuer/Medceur;

US AIR FORCES IN EUROPE, RAMSTEIN AB, GERMANY

Commander
Gen. Gregory S. Martin

3rd Air Force
RAF Mildenhall, UK

16th Air Force
Aviano AB, Italy

The USAFE organizational chart above shows peacetime lines of command. The chart below shows the NATO wartime command lines.

Allied Command Europe (ACE)

Allied Forces Southern Europe (AFSOUTH)
Naples, Italy

Allied Forces North Europe (AFNORTH)
Brunssum, Netherlands

Allied Air Forces Southern Europe (AIRSOUTH)
Naples, Italy

Allied Air Forces North Europe (AIRNORTH)
Ramstein AB, Germany

5th Combined Air Operations Center
Vicenza, Italy

6th Combined Air Operations Center
Eskisehir, Turkey

Interim Deployable CAOC
Ramstein AB, Germany

Senior Commander Warfighting Seminar; Sentry White Eagle; Union Flash; Victory Strike

PERSONNEL

(as of Sept. 30, 2002)

Active duty		26,450
Officers	3,549	
Enlisted	22,901	
Reserve components		421
ANG	210	
AFRC	211	
Civilian		4,882
Total		**31,753**

EQUIPMENT

(PAI as of Sept. 30, 2002)

Fighter/Attack (A/OA-10, F-15, F-16)	173
Tanker (KC-135)	15
Transport (C-9, C-20, C-21, C-130)	34

Staff photo by Guy Aceto

At Ramstein AB, Germany, SSgt. Sean Morris and SSgt. Susan Clawson check medical equipment in preparation for medevac missions. USAFE has been headquartered at the base since 1973.

UNIT	BASE	WEAPONS
31st Fighter Wing	Aviano AB, Italy	F-16C/D
39th Wing	Incirlik AB, Turkey	Tactical range and contingency support, rotational aircraft
48th Fighter Wing	RAF Lakenheath, UK	F-15C/D, F-15E
52nd Fighter Wing	Spangdahlem AB, Germany	A/OA-10, F-16C/D
65th Air Base Wing	Lajes Field, the Azores	—
85th Group	Keflavik, Iceland	HH-60
86th Airlift Wing	Ramstein AB, Germany	C-9, C-20, C-21, C-130E
100th Air Refueling Wing	RAF Mildenhall, UK	KC-135R

3rd AIR FORCE (USAFE), RAF MILDENHALL, UK

Commander
Maj. Gen. Michael W. Wooley

- **48th Fighter Wing** — RAF Lakenheath, UK (F-15C/D, F-15E)
- **52nd Fighter Wing** — Spangdahlem AB, Germany (A/OA-10, F-16C/D)
- **65th Air Base Wing** — Lajes Field, the Azores
- **86th Airlift Wing** — Ramstein AB, Germany (C-9, C-20, C-21, C-130E)
- **100th Air Refueling Wing** — RAF Mildenhall, UK (KC-135R)
- **85th Group** — Keflavik, Iceland (HH-60)

16th AIR FORCE (USAFE), AVIANO AB, ITALY

Commander
Lt. Gen. Glen W. Moorehead III

- **31st Fighter Wing** — Aviano AB, Italy (F-16C/D)
- **39th Wing** — Incirlik AB, Turkey (Tactical range and contingency support, rotational aircraft)

Air Reserve Components

The Air Reserve Components for USAF are the Air National Guard and Air Force Reserve Command. Air Force Reserve Command stood up as a major command Feb. 17, 1997. The change in status, authorized by Congress in the Fiscal 1997 National Defense Authorization Act, was based on the experience gained from the Air Force Reserve component mobilization for Operations Desert Shield and Desert Storm.

Air Force Reserve Command

Headquarters Robins AFB, Ga.

Established Feb. 17, 1997

Commander Lt. Gen. James E. Sherrard III

MISSIONS

Support the active duty force
Serve in such missions as fighter, bomber, airlift, aerial refueling, rescue, special operations, aeromedical evacuation, aerial fire fighting, weather reconnaissance, space operations, airborne air control, flying training, and flight testing
Provide support and disaster relief in the US
Support national counterdrug efforts

FORCE STRUCTURE

Air Reserve Personnel Center, Denver
Three Numbered Air Forces: **4th,** March ARB, Calif.; **10th,** NAS Fort Worth JRB, Tex.; **22nd,** Dobbins ARB, Ga.
35 flying wings
Flying groups (one air refueling, one air control, one flying training, one space, and four regional support)

OPERATIONAL ACTIVITY

Enduring Freedom (Afghanistan); Iraqi Freedom (Iraq); Noble Eagle (US); Northern/Southern Watch (Iraq)

PERSONNEL

(as of Sept. 30, 2002)

Total (selected reserve)*		76,680
Officers	17,303	
Enlisted	59,377	
Civilians (non–ART)		4,611
Total		**81,291**

*Numbers for AFRC personnel assigned to Majcoms, FOAs, and DRUs are included here.

USAF photo by SSgt. Shane A. Cuomo

An HH-60 Pave Hawk and C-130 from AFRC's 301st Rescue Squadron carry out an aerial refueling in April at a forward deployed location during Iraqi Freedom. The 301st is based at Patrick AFB, Fla.

EQUIPMENT

(PAI as of Sept. 30, 2002)

Bomber (B-52)	8	Recon/BM/C3I (WC-130)	6
Fighter/Attack (A/OA-10, F-16)	104	SOF (MC-130)	12
Helicopter (HH-60)	21	Tanker (HC-130, KC-135)	74
		Transport (C-5, C-130, C-141)	168

AIR FORCE RESERVE COMMAND, ROBINS AFB, GA.

Commander
Lt. Gen. James E. Sherrard III

4th Air Force
March ARB, Calif.

10th Air Force[c]
NAS JRB Fort Worth, Tex.

22nd Air Force
Dobbins ARB, Ga.

Air Reserve Personnel Center
Col. K.C. McClain
Denver

4th AIR FORCE (AMC), MARCH ARB, CALIF.

Commander
Maj. Gen. James P. Czekanski

349th Air Mobility Wing
Travis AFB, Calif.
(C-5A/B, KC-10[a])

446th Airlift Wing
McChord AFB, Wash.
(C-17A[a])

927th Air Refueling Wing
Selfridge ANGB, Mich.
(KC-135E)

433rd Airlift Wing
Lackland AFB, Tex.
(C-5A)

452nd Air Mobility Wing
March ARB, Calif.
(C-141C, KC-135R)

932nd Airlift Wing
Scott AFB, Ill.
(C-9A[a])

434th Air Refueling Wing
Grissom ARB, Ind.
(KC-135R)

507th Air Refueling Wing
Tinker AFB, Okla.
(KC-135R)

940th Air Refueling Wing
Beale AFB, Calif.
(KC-135E)

445th Airlift Wing
Wright–Patterson AFB, Ohio
(C-141C)

916th Air Refueling Wing
Seymour Johnson AFB, N.C.
(KC-135R)

931st Air Refueling Group
McConnell AFB, Kan.
(KC-135R[a])

10th AIR FORCE (ACC), NAS JRB FORT WORTH, TEX.

Commander
Maj. Gen. David E. Tanzi

301st Fighter Wing[c]
NAS JRB Fort Worth, Tex.
(F-16C/D)

919th Special Ops Wing
Duke Field, Fla.
(MC-130E[d]/P[a])

310th Space Group
Schriever AFB, Colo.

419th Fighter Wing
Hill AFB, Utah
(F-16C/D)

926th Fighter Wing[c]
NAS JRB New Orleans
(OA-10A)

340th Flying Training Group
Randolph AFB, Tex.
(AT/T-38, T-1, T-6, T-37)[a]

442nd Fighter Wing
Whiteman AFB, Mo.
(OA-10A)

939th Rescue Wing
Portland Arpt., Ore.
(HC-130P, HH-60G, KC-135R)

513th Air Control Group
Tinker AFB, Okla.
(E-3[a])

482nd Fighter Wing
Homestead ARB, Fla.
(F-16C/D)

920th Rescue Group
Patrick AFB, Fla.
(HC-130P/N, HH-60G)

917th Wing
Barksdale AFB, La.
(B-52H, A/OA-10A)

944th Fighter Wing
Luke AFB, Ariz.
(F-16C/D)[b]

Det. 1
Shaw AFB, S.C.
(F-16C/D)[a]

22nd AIR FORCE (AMC), DOBBINS ARB, GA.

Commander
Maj. Gen. James D. Bankers

94th Airlift Wing
Dobbins ARB, Ga.
(C-130H)

439th Airlift Wing
Westover ARB, Mass.
(C-5A)

514th Air Mobility Wing
McGuire AFB, N.J.
(C-141B, KC-10A)[a]

913th Airlift Wing
NAS JRB Willow Grove, Pa.
(C-130E)

302nd Airlift Wing
Peterson AFB, Colo.
(C-130H3)

440th Airlift Wing
General Mitchell Arpt./ARS,
Wis. (C-130H)

908th Airlift Wing
Maxwell AFB, Ala.
(C-130H2)

914th Airlift Wing
Niagara Falls Arpt./ARS, N.Y.
(C-130H3)

315th Airlift Wing
Charleston AFB, S.C.
(C-17[a])

459th Airlift Wing
Andrews AFB, Md.
(C-141C)

910th Airlift Wing
Youngstown–Warren
Regional Arpt./ARS, Ohio
(C-130H2)

934th Airlift Wing
Minneapolis–St. Paul Arpt./
ARS, Minn. (C-130E)

403rd Wing
Keesler AFB, Miss.
(C-130J, WC-130H/J)

512th Airlift Wing
Dover AFB, Del.
(C-5A/B[a])

911th Airlift Wing
Pittsburgh Arpt./ARS
(C-130H2)

[a]Associate aircraft.
[b]AFRC–owned and associate aircraft.
[c]Tenant unit on naval base.
[d] Active–associate (owned by AFRC, flown by active).

ANGB Air National Guard Base
ARB Air Reserve Base
Arpt. Airport
ARS Air Reserve Station
JRB Joint Reserve Base
NAS Naval Air Station

Air National Guard

Headquarters Washington, D.C.

Established Sept. 18, 1947

Director Lt. Gen. Daniel James III

MISSIONS

Provide trained units and individuals in support of national military objectives, as a full partner in the Total Air Force

Support state governors by providing equipment and trained individuals to help preserve peace, order, and public safety

FORCE STRUCTURE

One NAF: **1st,** Tyndall AFB, Fla.
91 flying wings
Two space squadrons (one space warning and one space operations)

OPERATIONAL ACTIVITY

Enduring Freedom (Afghanistan); Iraqi Freedom (Iraq); Noble Eagle (US); Northern/Southern Watch (Iraq)

PERSONNEL

(as of Sept. 30, 2002)

Total ANG military*		112,075
Officers	13,932	
Enlisted	98,143	
Civilian		1,241
Total		**113,316**

*Includes ANG personnel assigned to Majcoms, FOAs, and DRUs.

USAF photo by SMSgt. Edward E. Snyder

A weapons crew from the 157th Aircraft Maintenance Unit reloads GBU-31A munitions. The South Carolina Air National Guard unit was deployed as part of the 379th Air Expeditionary Wing in Southwest Asia.

EQUIPMENT

(PAI as of Sept. 30, 2002)

Fighter/Attack (A/OA-10, F-15, F-16)	648
Helicopter (HH-60)	15
Recon/BM/C3I (EC-130)	5
Special Ops (MC-130)	4
Tanker (HC-130, KC-135)	211
Transport (C-5, C-21, C-22, C-26, C-38, C-130, C-141)	261

1st AIR FORCE (ACC), TYNDALL AFB, FLA.

Commander
Maj. Gen. Craig R. McKinley

Southeast Air Defense Sector (ANG)
Tyndall AFB, Fla.

Northeast Air Defense Sector (ANG)
Rome, N.Y.

Western Air Defense Sector (ANG)
McChord AFB, Wash.

The Air National Guard by Major Command Assignment

(As of April 1, 2003)

Air Combat Command

A/OA-10A	
103rd Fighter Wing	Bradley Arpt., Conn.
104th Fighter Wing	Barnes Arpt., Mass.
110th Fighter Wing	W.K. Kellogg Arpt., Mich.
111th Fighter Wing	NAS JRB Willow Grove, Pa.
124th Wing[a]	Boise Air Terminal, Idaho
175th Wing[a]	Martin State Arpt., Md.
E-8C	
116th Air Control Wing[a]	Robins AFB, Ga.
F-15	
131st Fighter Wing	Lambert–St. Louis Arpt., Mo.
159th Fighter Wing	NAS JRB New Orleans, La.
F-15—air defense	
102nd Fighter Wing	Otis ANGB, Mass.
125th Fighter Wing	Jacksonville Arpt., Fla.
142nd Fighter Wing	Portland Arpt., Ore.
F-16	
113th Wing	Andrews AFB, Md.
114th Fighter Wing	Joe Foss Field, S.D.
115th Fighter Wing	Truax Field, Wis.
119th Fighter Wing	Hector Arpt., N.D.
120th Fighter Wing	Great Falls Arpt., Mont.
122nd Fighter Wing	Fort Wayne Arpt., Ind.
127th Wing[b]	Selfridge ANGB, Mich.
132nd Fighter Wing	Des Moines Arpt., Iowa
138th Fighter Wing	Tulsa Arpt., Okla.
140th Wing	Buckley AFB, Colo.
147th Fighter Wing	Ellington Field, Tex.
148th Fighter Wing	Duluth Arpt., Minn.
150th Fighter Wing	Kirtland AFB, N.M.
158th Fighter Wing	Burlington Arpt., Vt.
169th Fighter Wing	McEntire ANGS, S.C.
174th Fighter Wing	Hancock Field, N.Y.
177th Fighter Wing	Atlantic City Arpt., N.J.
180th Fighter Wing	Toledo Express Arpt., Ohio
181st Fighter Wing	Hulman Arpt., Ind.
183rd Fighter Wing	Capital Arpt., Ill.
185th Fighter Wing	Sioux Gateway Arpt., Iowa
187th Fighter Wing	Dannelly Field, Ala.
188th Fighter Wing	Fort Smith Arpt., Ark.
192nd Fighter Wing	Richmond Arpt., Va.
F-16—air defense	
144th Fighter Wing	Fresno Yosemite Arpt., Calif.
HC-130/HH-60	
106th Rescue Wing	Francis S. Gabreski Arpt., N.Y.
MC-130/HH-60	
129th Rescue Wing	Moffett Federal Airfield, Calif.[c]

Air Education and Training Command

F-15	
173rd Fighter Wing	Klamath Falls Arpt., Ore.
F-16	
149th Fighter Wing	Kelly Field, Tex.
162nd Fighter Wing	Tucson Arpt., Ariz.
178th Fighter Wing	Springfield–Beckley Arpt., Ohio
C-130 (training)	
189th Airlift Wing	Little Rock AFB, Ark.

Air Force Space Command

137th Space Warning Sq.	Greeley ANGB, Colo.
148th Space Ops Sq.	Vandenberg AFB, Calif.

Air Force Special Operations Command

EC-130E	
193rd Special Ops Wing	Harrisburg Arpt., Pa.

Air Mobility Command

C-5A	
105th Airlift Wing	Stewart ANGB, N.Y.
C-130	
109th Airlift Wing	Schenectady County Arpt., N.Y.
118th Airlift Wing	Nashville Arpt., Tenn.
123rd Airlift Wing	Louisville Arpt./AGS, Ky.
130th Airlift Wing	Yeager Arpt., W.Va.
133rd Airlift Wing	Minneapolis–St. Paul Arpt./ARS, Minn.
136th Airlift Wing	NAS JRB Fort Worth, Tex.
137th Airlift Wing	Will Rogers World Arpt., Okla.
139th Airlift Wing	Rosecrans Memorial Arpt., Mo.
143rd Airlift Wing	Quonset State Arpt., R.I.
145th Airlift Wing	Charlotte/Douglas Arpt., N.C.
146th Airlift Wing	Channel Islands ANGS, Calif.
152nd Airlift Wing	Reno/Tahoe Arpt., Nev.
153rd Airlift Wing	Cheyenne Arpt., Wyo.
156th Airlift Wing	Luis Munoz Marin Arpt., Puerto Rico
165th Airlift Wing	Savannah Arpt., Ga.
166th Airlift Wing	New Castle County Arpt., Del.
167th Airlift Wing	Eastern West Virginia Arpt., W.Va.
179th Airlift Wing	Mansfield Lahm Arpt., Ohio
182nd Airlift Wing	Greater Peoria Arpt., Ill.
C-141C	
164th Airlift Wing	Memphis Arpt., Tenn.
172nd Airlift Wing	Allen C. Thompson Field, Miss.
KC-135	
101st Air Refueling Wing	Bangor Arpt., Maine
107th Air Refueling Wing	Niagara Falls Arpt./ARS, N.Y.
108th Air Refueling Wing	McGuire AFB, N.J.
117th Air Refueling Wing	Birmingham Arpt., Ala.
121st Air Refueling Wing	Rickenbacker ANGB, Ohio
126th Air Refueling Wing	Scott AFB, Ill.
128th Air Refueling Wing	General Mitchell Arpt./ARS, Wis.
134th Air Refueling Wing	McGhee Tyson ANGB, Tenn.
141st Air Refueling Wing	Fairchild AFB, Wash.
151st Air Refueling Wing	Salt Lake City Arpt.
155th Air Refueling Wing	Lincoln Arpt., Neb.
157th Air Refueling Wing	Pease Intl. Tradeport ANGS, N.H.
161st Air Refueling Wing	Sky Harbor Arpt., Ariz.
163rd Air Refueling Wing	March ARB, Calif.
171st Air Refueling Wing	Pittsburgh Arpt./ARS
186th Air Refueling Wing	Key Field, Miss.
190th Air Refueling Wing	Forbes Field, Kan.

Pacific Air Forces

C-130	
154th Wing (204th Airlift Sq.)	Hickam AFB, Hawaii
176th Wing[d]	Kulis ANGB, Alaska
F-15	
154th Wing[e] (199th FS)	Hickam AFB, Hawaii
HC-130/HH-60	
176th Wing (210th RQS)	Kulis ANGB, Alaska
KC-135	
154th Wing (203rd ARS)	Hickam AFB, Hawaii
168th Air Refueling Wing	Eielson AFB, Alaska

[a] Blended wing with active duty and ANG personnel
[b] Also flies C-130s.
[c] NASA installation.
[d] Includes 210th Rescue Squadron with HC-130 and HH-60G aircraft.
[e] Includes 203rd Air Refueling Squadron with KC-135 aircraft.

Field Operating Agencies

A field operating agency is a subdivision of the Air Force that carries out field activities under the operational control of an Hq. USAF functional manager. Though the FOAs have the same administrative and organizational responsibilities as the major commands, their missions remain separate from those of the major commands.

Air Force Agency for Modeling and Simulation

Hq.: Orlando, Fla.
Estab.: June 3, 1996
Cmdr.: Col. Grant F. Herring

MISSION, PURPOSE, OPERATIONS

Serve as lead for the Distributed Mission Operations initiative
Support Air Force modeling and simulation training, analysis, acquisition, and operations and corporate M&S planning and requirements generation
Promote Air Force M&S science and technology improvement and innovation and professional development and education for the Air Force M&S workforce
Operate and maintain Air Force M&S Information Service

STRUCTURE

Four divisions in Orlando, Fla.
Theater battle arena, Pentagon

PERSONNEL

Active duty		18
Officers	15	
Enlisted	3	
Civilians		14
Total		**32**

Air Force Audit Agency

Hq.: Washington, D.C.
Estab.: July 1, 1948
Dir.: James R. Speer

MISSION, PURPOSE, OPERATIONS

Provide all levels of Air Force management with independent and quality audit services
Produce audit products that evaluate the efficiency, effectiveness, and economy of Air Force programs and activities

STRUCTURE

Four directorates at Arlington, Va., Brooks City–Base, Tex., March ARB, Calif., and Wright–Patterson AFB, Ohio
Three regional offices
18 field offices

PERSONNEL

Civilians	784

The director of AFAA is the auditor general of the Air Force.

Air Force Center for Environmental Excellence

Hq.: Brooks City–Base, Tex.
Estab.: July 23, 1991
Dir.: Gary M. Erickson

MISSION, PURPOSE, OPERATIONS

Provide Air Force leaders the comprehensive expertise to protect, preserve, restore, develop, and sustain the nation's environmental and installation resources

STRUCTURE

Four directorates
Three regional environmental offices

PERSONNEL

Active duty		34
Officers	32	
Enlisted	2	
Reserve components		8
ANG	0	
AFRC	8	
Civilians		373
Total		**415**

Air Force Civil Engineer Support Agency

Hq.: Tyndall AFB, Fla.
Estab.: Aug. 1, 1991
Cmdr.: Col. Bruce R. Barthold

MISSION, PURPOSE, OPERATIONS

Provide the best tools, practices, and professional support to maximize Air Force civil engineer capabilities in base and contingency operations

STRUCTURE

Four directorates

PERSONNEL

Active duty		92
Officers	18	
Enlisted	74	
Reserve components		25
ANG	0	
AFRC	25	
Civilians		117
Total		**234**

Air Force Command and Control and Intelligence, Surveillance, and Reconnaissance Center

Hq.: Langley AFB, Va.
Estab.: Sept. 12, 1997
Cmdr.: Maj. Gen. Robert F. Behler

MISSION, PURPOSE, OPERATIONS

Integrate and influence command and control, intelligence, surveillance, and reconnaissance for the Air Force
Build air and space C2 and ISR modernization strategies
Serve as Air Force lead for the establishment of all C2 and ISR related joint tactics, techniques, and procedures
Ensure roadmaps, requirements, and architectures are linked to Air Force modernization, strategic, and transformation plans

STRUCTURE

Two major field units
16 subordinate organizations

PERSONNEL

Active duty		250
Officers	200	
Enlisted	50	
Civilians		43
Total		**293**

Air Force Communications Agency

Hq.: Scott AFB, Ill.
Estab.: June 13, 1996
Cmdr.: Col. David J. Kovach

MISSION, PURPOSE, OPERATIONS

Serve as center of excellence for command, control, communications, computers, and information technology
Provide seamless connectivity for C2 of air and space forces.
Drive innovative information superiority solutions
Deploy specialized strike teams and network assessment capabilities for assured USAF communications and information combat power
Serve as leader for USAF–wide information infrastructure and information protection

Evaluate commercial information technologies for potential USAF use

STRUCTURE
Five functional areas

PERSONNEL

Active duty		210
Officers	90	
Enlisted	120	
Civilians		299
Total		**509**

Air Force Cost Analysis Agency

Hq.: Arlington, Va.
Estab.: Aug. 1, 1992
Exec. Dir.: Joseph T. Kammerer

MISSION, PURPOSE, OPERATIONS
Develop independent life-cycle cost estimates of major weapon and information systems; estimates and cost factors for modernization planning, long-range planning, divestiture, and flying hour program; cost-estimation tools, techniques, methodologies, and databases
Conduct special cost reviews for the Air Force Secretariat and for other organizations as directed
Research emerging changes in technologies, acquisition priorities, and industry

STRUCTURE
Five divisions

PERSONNEL

Active duty		24
Officers	22	
Enlisted	2	
Civilians		26
Total		**50**

Air Force Flight Standards Agency

Hq.: Andrews AFB, Md.
Estab.: Oct. 1, 1991
Cmdr.: Col. Scott L. Grunwald

MISSION, PURPOSE, OPERATIONS
Develop, standardize, evaluate, and certify USAF policy, procedures, and equipment for global flight operations and centrally manage the Air Force air traffic control and landing systems
Perform worldwide flight inspection of airfields and flight instrument/navigation systems during combat, contingencies, and JCS exercises
Represent USAF in FAA airspace management and ATC issues; DOD in international airspace and ATC issues
Provide procedures for ATC, airfield, operational evaluation of ATC systems, airspace management, and terminal instrument procedures

STRUCTURE
Two detachments at Oklahoma City and Washington, D.C.
Three directorates

USAF photo by SSgt. Quinton T. Burris

SSgts. Shane Cuomo and Mark Kenyon document events March 30, 2003, during Operation Iraqi Freedom. They are deployed from the 1st Combat Camera Squadron, Charleston AFB, S.C.

PERSONNEL

Active duty		129
Officers	64	
Enlisted	65	
Reserve components		6
ANG	0	
AFRC	6	
Civilians		34
Total		**169**

Air Force Frequency Management Agency

Hq.: Alexandria, Va.
Estab.: Oct. 1, 1991
Cmdr.: Col. Steven L. Woolf

MISSION, PURPOSE, OPERATIONS
Obtain radio frequency spectrum access for Air Force and selected DOD activities in support of national policy objectives, systems development, and global operations
Coordinate Air Force radio frequency spectrum policy and guidance. Responsible for USAF representation in spectrum negotiations with civil, military, national, and international regulatory organizations
Provide curriculum oversight for the Electromagnetic Spectrum Management Course and Joint Task Force Spectrum Management Course

STRUCTURE
Two directorates
Technical director

PERSONNEL

Active duty		11
Officers	3	
Enlisted	8	
Civilians		18
Total		**29**

Air Force Historical Research Agency

Hq.: Maxwell AFB, Ala.
Estab.: May 25, 1979
Cmdr.: Col. Dieter Barnes

MISSION, PURPOSE, OPERATIONS
Collect, preserve, and manage USAF historical document collection and oral history program
Answer requests for historical information
Operate research facilities; a USAF–wide automated historical data system
Determine the lineage and honors of Air Force organizations
Maintain official emblem records of Air Force organizations
Verify Air Force aerial victory credits
Prepare historical data, analyses, and manuscripts

STRUCTURE
Two divisions

PERSONNEL

Active duty		4
Officers	2	
Enlisted	2	
Reserve components		20
ANG	0	
AFRC	20	
Civilians		51
Total		**75**

Air Force History Support Office

Hq.: Bolling AFB, D.C.
Estab.: Sept. 30, 1994
Cmdr.: Col. Carol S. Sikes

MISSION, PURPOSE, OPERATIONS

Research, write, and publish books and other studies on the history of the Air Force
Provide historical support to USAF, DOD, and other government agencies
Support scholars with research and teaching materials
Record and disseminate USAF history to enable decision-makers and planners to formulate strategy, plans, and doctrine; educate USAF students at professional military institutions; inform the public about the role of USAF and airpower in national security

STRUCTURE

Two divisions

PERSONNEL

Active duty		4
Officers	2	
Enlisted	2	
Reserve components		3
ANG	0	
AFRC	3	
Civilians		25
Total		**32**

Air Force Inspection Agency

Hq.: Kirtland AFB, N.M.
Estab.: Aug. 1, 1991
Cmdr.: Col. J. Worth Carter

MISSION, PURPOSE, OPERATIONS

Provide USAF leadership with independent assessments to improve USAF operations and support
Serve as single comprehensive inspection agency of USAF medical organizations
Recommend improvements to existing processes, practices, and programs for fulfilling peacetime, contingency, and wartime missions
Conduct special reviews and inquiries
Conduct compliance inspections for FOAs and DRUs that don't otherwise have inspector general oversight
Publish *TIG Brief* magazine

STRUCTURE

Four directorates

PERSONNEL

Active duty		110
Officers	85	
Enlisted	25	
Reserve components		4
ANG	1	
AFRC	3	
Civilians		18
Total		**132**

Air Force Legal Services Agency

Hq.: Bolling AFB, D.C.
Estab.: Sept. 1, 1991
Cmdr.: Col. David L. Thomas

MISSION, PURPOSE, OPERATIONS

Provide commanders and personnel with specialized legal services: administering military justice to protect individual rights and ensure good order and discipline; preserving command freedom of action through robust defense of USAF interests in civil litigation; training and advising the headquarters and field in military justice and civil law matters; providing programs to benefit the Air Force family; and supporting legal services worldwide with state-of-the-art, specialized information technology

STRUCTURE

Three directorates

PERSONNEL

Active duty		373
Officers	260	
Enlisted	113	
Civilians		109
Total		**482**

Air Force Logistics Management Agency

Hq.: Maxwell AFB, Gunter Annex, Ala.
Estab.: Sept. 30, 1975
Cmdr.: Col. Ronne G. Mercer

MISSION, PURPOSE, OPERATIONS

Develop, analyze, test, evaluate, and recommend new or improved concepts, methods, systems, policies, and procedures to enhance logistics efficiency and effectiveness
Publish the *Air Force Journal of Logistics*

STRUCTURE

Seven divisions

PERSONNEL

Active duty		56
Officers	34	
Enlisted	22	
Civilians		23
Total		**79**

Air Force Manpower and Innovation Agency

Hq.: Randolph AFB, Tex.
Estab.: Sept. 1, 1999
Cmdr.: Col. Ronnie D. Sullivan

MISSION, PURPOSE, OPERATIONS

Determine current and future resource requirements, through manpower studies, to improve mission performance of USAF organizations
Research and develop innovative management concepts and best practices; studies to identify optimal staffing, resource allocation, and outsourcing and privatization options
Serve as USAF focal point for emerging government and industry manpower/quality issues
Develop and manage USAF–level manpower training architecture

STRUCTURE

Two squadrons and two divisions

PERSONNEL

Active duty		127
Officers	44	
Enlisted	83	
Civilians		79
Total		**206**

Air Force Medical Operations Agency

Hq.: Bolling AFB, D.C.
Estab.: July 1, 1992
Cmdr.: Brig. Gen. Gary H. Murray

MISSION, PURPOSE, OPERATIONS

Develop and execute policies and programs to improve aerospace medicine and preventive and clinical health care services to enhance the capabilities of the Air Force

STRUCTURE

Nine divisions
Four offices

PERSONNEL

Active duty		89
Officers	69	
Enlisted	20	
Civilians		48
Total		**137**

Air Force Medical Support Agency

Hq.: Brooks City–Base, Tex.
Estab.: July 1, 1992
Cmdr.: Col. Andrew Love

MISSION, PURPOSE, OPERATIONS

Improve global performance and capability of the Medical Service in supporting combat forces and maintaining the health of beneficiaries
Serve as the Air Force surgeon general's focal point for policy development, strategies, plans, consultant services, and validated requirements dealing with facilities, supplies, equipment, acquisition, information systems, and resources

STRUCTURE

Three divisions
Two offices

PERSONNEL

Active duty		41
Officers	32	
Enlisted	9	
Civilians		31
Total		**72**

Air Force National Security Emergency Preparedness Agency

Hq.: Arlington, Va.
Estab.: Sept. 1, 1988
Cmdr.: Col. Larry Garrison

MISSION, PURPOSE, OPERATIONS

Facilitate domestic support to civil authorities for national security emergencies and, when required, critical events of national interest
Facilitate the use of Air Force resources to assist federal, state, and local authorities in alleviating suffering and damage that may result from disasters or emergencies and in response to requests for assistance from these agencies

STRUCTURE

Four divisions (Operations, Support, Plans and Training, and Reserve Management)
Five offices in Arlington, Va., Ft. McPherson, Ga., Naval Station Norfolk, Va., Hickam AFB, Hawaii, and the Pentagon
Reserve personnel assigned to every state and several US terrorities

PERSONNEL

Active duty		21
Officers	10	
Enlisted	11	
Reserve components		74
ANG	0	
AFRC	74	
Civilians		18
Total		**100**

Air Force News Agency

Hq.: San Antonio
Estab.: June 1, 1978
Cmdr.: Col. Anthony J. Epifano

MISSION, PURPOSE, OPERATIONS

Create, print, and broadcast Web–based products that support Air Force and DOD communication goals
Provide news, information, and entertainment programs through American Forces Radio and Television Service
Provide senior Air Force leaders with the means of communicating news and information to the Air Force community and the public
Organize, train, and equip AFNEWS to accomplish its mission
Create an IT environment that ensures the efficient and secure production and delivery of information

STRUCTURE

Air Force Broadcasting Service
Army and Air Force Hometown News Service
Air Force News Service
Command Resources and Readiness
Communications and Information Systems

PERSONNEL

Active duty		286
Officers	16	
Enlisted	270	
Reserve components		33
ANG	0	
AFRC	33	
Civilians		89
Total		**408**

Air Force Nuclear Weapons and Counterproliferation Agency

Hq.: Pentagon
Estab.: August 1998
Dir.: Bill Mullins

MISSION, PURPOSE, OPERATIONS

Oversee nuclear stockpile stewardship programs, including planning, development, and sustainment of USAF nuclear weapons
Provide technical analysis on counterproliferation issues and counterforce technologies
Provide technical advice to Air Staff, major commands, unified commands, and OSD on nuclear weapons, counterproliferation, and arms control issues

STRUCTURE

One field office at Kirtland AFB, N.M.

PERSONNEL

Active Duty		4
Officers	4	
Enlisted	0	
Civilians		12
Total		**16**

Air Force Office of Special Investigations

Hq.: Andrews AFB, Md.
Estab.: Aug. 1, 1948
Cmdr.: Brig. Gen. Leonard E. Patterson

MISSION, PURPOSE, OPERATIONS

Provide professional criminal and counterintelligence investigative services to commanders of all Air Force activities
Identify and resolve crime impacting Air Force readiness or good order and discipline
Detect and provide early warning of worldwide threats to the Air Force
Combat threats to Air Force information systems and technologies
Defeat and deter fraud in the acquisition of Air Force prioritized weapons systems
Serve as DOD's executive agent for Defense Cyber Crime Center

STRUCTURE

Eight regional offices
Eight squadrons
180 detachments and operating locations
USAF Special Investigations Academy

PERSONNEL

Active duty		1,494
Officers	405	
Enlisted	1,089	
Reserve components		482
ANG	0	
AFRC	482	
Civilians		489
Total		**2,465**

Air Force Operations Group

Hq.: Pentagon
Estab.: July 26, 1977
Cmdr.: Col. Dave P. Jones

MISSION, PURPOSE, OPERATIONS

Support USAF Chief of Staff and DCS for Air and Space Operations on current operational issues, including a 24-hour watch on all current operations and processing emergency messages
Provide facilities, policy, procedures, training, and staffing for Crisis Action Team during crises, contingencies, and exercises
Coordinate actions among major USAF organizations for JCS and USAF taskings
Prepare and provide weather data to the President, Secretary of Defense, JCS, NMCC, Army Operations Center, and other federal agencies

STRUCTURE

Five divisions

PERSONNEL

Active duty		142
Officers	84	
Enlisted	58	
Reserve components		5
ANG	0	
AFRC	5	
Civilians		4
Total		**151**

Air Force Pentagon Communications Agency

Hq.: Pentagon
Estab.: Oct. 1, 1984
Cmdr.: Col. Gerald A. Alexander Jr.

MISSION, PURPOSE, OPERATIONS

Provide effective and timely information systems services and capabilities for Hq. USAF, OSD, and Joint Staff for military operations and missions

STRUCTURE

Eight directorates

PERSONNEL

Active duty		436
Officers	68	
Enlisted	368	
Reserve Components		2
ANG	0	
AFRC	2	
Civilians		231
Total		**669**

Air Force Personnel Center

Hq.: Randolph AFB, Tex.
Estab.: Oct. 1, 1995
Cmdr.: Maj. Gen. Thomas A. O'Riordan

MISSION, PURPOSE, OPERATIONS

Provide Air Force commanders, military members, and civilian employees world-class personnel service

STRUCTURE

Eight directorates

PERSONNEL

Active duty		1,004
Officers	291	
Enlisted	713	
Reserve components		19
ANG	2	
AFRC	17	
Civilians		1,041
Total		**2,064**

AFPC was formerly the Air Force Military Personnel Center and the Air Force Civilian Personnel Management Center.

Air Force Personnel Operations Agency

Hq.: Pentagon
Estab.: Aug. 15, 1993
Dir.: William A. Kelly

MISSION, PURPOSE, OPERATIONS

Provide in-depth analytical insight across the personnel life cyle to DCS for Personnel decision-makers
Develop and operate officer, enlisted, and civilian models
Support DCS for Personnel

STRUCTURE

One division

PERSONNEL

Active duty		32
Officers	19	
Enlisted	13	
Civilians		8
Total		**40**

Air Force Program Executive Office

Hq.: Pentagon
Estab.: November 1990
Exec.: Marvin R. Sambur

MISSION, PURPOSE, OPERATIONS

Manage and account for the execution of major and selected Air Force acquisition programs

STRUCTURE

Program Executive Officers:
Brig. Gen. Ted F. Bowlds, Airlift & Trainers
Brig. Gen. (sel.) Robert E. Dehnert Jr., Command & Control
Brig. Gen. Richard B.H. Lewis, Fighter & Bomber Programs
Timothy A. Beyland, Services
Judy A. Stokley, Weapons

PERSONNEL

Active duty		29
Officers	27	
Enlisted	2	
Civilians		11
Total		**40**

Air Force Real Property Agency

Hq.: Arlington, Va.
Estab.: Nov. 1, 2002
Dir.: Albert F. Lowas, Jr.

MISSION, PURPOSE, OPERATIONS

Execute Air Force acquisition and disposal of all Air Force–controlled real property worldwide and environmental programs and real and personal property disposal for major Air Force bases being closed or realigned under the authorities of the Base Closure and Realignment Act of 1988 and the Defense Base Closure and Realignment Act of 1990
Assist communities in the conversion of closing and realigning bases from military to civilian use and ensure that property at these Air Force installations is made available for reuse as safely and efficiently as possible

STRUCTURE

Regional divisions
Base-level operating locations

PERSONNEL

Active duty		0
Officers	0	
Enlisted	0	
Civilians		189
Total		**189**

Formerly Air Force Base Conversion Agency and Air Force Real Estate Division

Air Force Review Boards Agency

Hq.: Andrews AFB, Md.
Estab.: June 1, 1980
Dir.: Joe G. Lineberger

MISSION, PURPOSE, OPERATIONS

Manage military and civilian appellate processes for the Secretary of the Air Force
Develop overall policy and act for the Secretary of the Air Force in deciding individual cases before the boards and civilian appellate processes
Ensure due process and fair and impartial treatment in all cases

STRUCTURE

Air Force Board for Correction of Military Records
Air Force Civilian Appellate Review Office
Air Force Personnel Council

PERSONNEL

Active duty		10
Officers	5	
Enlisted	5	
Reserve components		6
ANG	1	
AFRC	5	
Civilians		59
Total		**75**

Air Force Safety Center

Hq.: Kirtland AFB, N.M.
Estab.: Jan. 1, 1996
Cmdr.: Maj. Gen. Kenneth W. Hess

MISSION, PURPOSE, OPERATIONS

Manage USAF mishap prevention programs and the Nuclear Surety Program
Develop regulatory guidance
Provide technical assistance in flight, ground, and weapons and space safety disciplines
Maintain USAF database for all safety mishaps
Oversee all major command mishap investigations and evaluate corrective actions for applicability and implementation USAF–wide
Direct safety education programs for all safety disciplines

STRUCTURE

Five divisions

PERSONNEL

Active duty		67
Officers	47	
Enlisted	20	
Reserve components		1
ANG	0	
AFRC	1	
Civilians		50
Total		**118**

The commander is also the Air Force chief of safety. AFSC publishes *Flying Safety, Road and Rec,* and *Weapons Journal.*

Air Force Security Forces Center

Hq.: Lackland AFB, Tex.
Estab.: March 17, 1997
Cmdr.: Col. Donald T. Knowles

MISSION, PURPOSE, OPERATIONS

Develop USAF security forces guidance, policy, and training requirements to safeguard and protect personnel and resources
Prepare guidance on air base defense operations and security forces continuation training; mission-related security and law enforcement operations; resource protection; anti-terrorism
Develop and implement base-level and combat arms training and ground combat weapons maintenance programs
Manage USAF corrections program and activities; DOD military working dog activities; contingency requirement taskings

STRUCTURE

Four divisions
Force Protection Battlelab
Three detachments at Ft. Leavenworth, Kan., NAS Miramar, Calif., and Charleston NWC, S.C.

PERSONNEL

Active duty		311
Officers	48	
Enlisted	263	
Reserve components		12
ANG	1	
AFRC	11	
Civilians		13
Total		**336**

Air Force Services Agency

Hq.: San Antonio
Estab.: Feb. 5, 1991
Cmdr.: Col. Joseph W. Mazzola

MISSION, PURPOSE, OPERATIONS

Support the bases, major commands, and Air Staff by providing technical assistance, fielding new initiatives, developing procedures, and managing selected central support functions to ensure successful service programs
Manage Air Force nonappropriated central funds and operate central systems, such as banking, investments, purchasing, data flow, insurance, and benefit programs

STRUCTURE

Eight directorates

PERSONNEL

Active duty		74
Officers	28	
Enlisted	46	
Reserve components		11
ANG		
AFRC	11	
Civilians		170
Total		**255**

Air Force Technical Applications Center

Hq.: Patrick AFB, Fla.
Estab.: July 7, 1959
Cmdr.: Col. Craig V. Bendorf

MISSION, PURPOSE, OPERATIONS

Monitor compliance with several international treaties, including the 1974 Threshold Test Ban Treaty and 1976 Peaceful Nuclear Explosions Treaty
Operate the US Atomic Energy Detection System, a global network of subsurface, surface, airborne, and space-based sensors that detect nuclear explosions
Operate analytical laboratories that provide national authorities with technical measurements with which to monitor foreign nuclear tests

STRUCTURE

Analysis Center, Patrick AFB, Fla.
Operational sites/detachments in 18 countries

PERSONNEL

Active duty		523
Officers	123	
Enlisted	400	
Total		**523**

EQUIPMENT

25 seismic arrays and 11 single-instrument locations consisting of seismometers and associated data acquisition systems and workstations
Seven hydroacoustic recording locations
More than 100 sensors and 35 satellites, with associated ground systems instrumentation and data-processing equipment
Ground-based equipment to collect nuclear event debris

Air Force Weather Agency

Hq.: Offutt AFB, Neb.
Estab.: Oct. 15, 1997
Cmdr.: Col. Charles L. Benson Jr.

MISSION, PURPOSE, OPERATIONS

Enhance the nation's combat capability by delivering timely, accurate, and reliable weather support worldwide to Air Force and Army forces, unified commands, national programs, and national leaders

STRUCTURE

Air Force Combat Climatology Center, Asheville, N.C.
Air Force Combat Weather Center, Hurlburt Field, Fla.
Six solar observatories around the world
Nine operating locations worldwide

PERSONNEL

Active duty		545
Officers	112	
Enlisted	433	
Reserve components		7
ANG	0	
AFRC	7	
Civilians		201
Total		**753**

Formerly Air Weather Service, established July 1, 1937.

ANG Readiness Center

Hq.: Andrews AFB, Md.
Estab.: August 1997
Cmdr.: Brig. Gen. David A. Brubaker

MISSION, PURPOSE, OPERATIONS

Provide combat capability to the warfighter and security to the homeland

STRUCTURE

201st Mission Support Squadron
14 directorates

PERSONNEL

Active duty		130
Officers	70	
Enlisted	60	
Reserve Components		498
ANG	494	
AFRC	4	
Civilians		440
Total		**1,068**

USAF photo by SSgt. Shane Cuomo

A security forces specialist, known as a Raven, stands guard over an aircraft April 2, 2003, at a forward deployed location in southern Iraq. Ravens provide protection for airlift aircraft and other assets at unsecured locations.

Direct Reporting Units

2003 USAF Almanac

A direct reporting unit is a subdivision of the Air Force, directly subordinate to Hq. USAF, separate from any major command or FOA because of a unique mission, legal requirements, or other factors. DRUs have the same administrative and organizational responsibilities as major commands.

Air Force Doctrine Center

Hq.: Maxwell AFB, Ala.
Estab.: Feb. 24, 1997
Cmdr.: Maj. Gen. David F. MacGhee Jr.

MISSION, PURPOSE, OPERATIONS

Provide a focal point for air, space, and information operational doctrine
Develop basic and operational doctrine for USAF Total Force
Advocate doctrinally correct representation and execution at the operational level of war in service, joint, and multinational operations, exercises, and other events
Collect inputs from exercises and operations for lessons learned
Participate in the investigation of future operational concepts and strategies to capture emerging doctrine
Present USAF doctrine to Air Force, other service, and joint audiences

STRUCTURE

Det. 1, Langley AFB, Va.
Six operating locations
Joint and Air Staff Liaison, Pentagon

PERSONNEL

Active duty		70
Officers	62	
Enlisted	8	
Reserve components		12
ANG	0	
AFRC	12	
Civilians		14
Total		**96**

Air Force Operational Test and Evaluation Center

Hq.: Kirtland AFB, N.M.
Estab.: Jan. 1, 1974
Cmdr.: Maj. Gen. Felix Dupre

MISSION, PURPOSE, OPERATIONS

Assess the capability of new systems to meet warfighter needs by planning, executing, and reporting independent operational evaluations
Provide effectiveness, suitability, and operational impact expertise in the battlespace environment

STRUCTURE

Six detachments at Edwards AFB, Calif., Eglin AFB, Fla., Peterson AFB, Colo., and Kirtland AFB, N.M.
More than 20 operating locations

PERSONNEL

Active duty		538
Officers	359	
Enlisted	179	
Civilians		199
Total		**737**

Air Force Studies and Analyses Agency

Hq.: Pentagon
Estab.: May 1, 2001
Dir.: Jacqueline R. Henningsen

MISSION, PURPOSE, OPERATIONS

Provide independent, timely, and objective analyses of key Air Force programs and critical operational issues that inform decisions and quantify risk-mitigating options in direct support of senior USAF decision-makers
Ensure Air Force defense review, modernization, warfighting, and resource allocation studies set the standard for DOD analysis
Highlight the Air Force role in emerging DOD issues
Protect Air Force capability and investment positions
Enhance USAF analytic capabilities including combat analyst career development

STRUCTURE

Senior Analysis Review Group
Four directorates

PERSONNEL

Active duty		69
Officers	60	
Enlisted	9	
Reserve components		1
ANG	0	
AFRC	1	
Civilians		21
Total		**91**

US Air Force Academy

Hq.: Colorado Springs, Colo.
Estab.: April 1, 1954
Supt.: Lt. Gen. John R. Dallager

MISSION, PURPOSE, OPERATIONS

Develop and inspire young men and women to become Air Force officers with knowledge, character, and discipline
Produce dedicated Air Force officers and leaders
Instill leadership through academics, military training, athletic conditioning, and character development

STRUCTURE

The cadet student body is designated the Cadet Wing. The wing is composed of four groups consisting of nine squadrons each, with more than 100 cadets assigned to a squadron. Each squadron consists of members of all four classes

PERSONNEL

Active duty		2,515
Officers	1,202	
Enlisted	1,313	
Reserve components		36
ANG	1	
AFRC	35	
Civilians		1,501
Total		**4,052**

EQUIPMENT

36 aircraft (T-41Ds, TG-3As, TG-4As, TG-7As, TG-9As, TG-11As, UV-18Bs)

Cadets complete four years of study for a bachelor of science degree, choosing from 30 different academic majors. Four primary areas of military development are stressed in military art and science, theoretical and applied leadership experiences, aviation science and airmanship programs, and military training.

11th Wing

Hq.: Bolling AFB, D.C.
Estab.: July 15, 1994
Cmdr.: Col. William A. Chambers

MISSION, PURPOSE, OPERATIONS

Provide administrative and ceremonial support to USAF members in the National Capital Region, all 50 states, and more than 100 countries
Support the President, SECAF, and CSAF via the United States Air Force Band and Honor Guard
Provide personnel, operations, comptroller, accounting and finance, and recreation services for wing assets, including the day-to-day operations of Bolling
Manage physical, personal, electronic, and information security within the Pentagon

STRUCTURE

Objective wing

PERSONNEL

Active duty		1,680
Officers	202	
Enlisted	1,478	
Reserve components		36
ANG	0	
AFRC	36	
Civilians		814
Total		**2,530**

Guide to Air Force Installations Worldwide

2003 USAF Almanac

Major Active Duty Installations

Altus AFB, Okla. 73523-5000; 120 mi. SW of Oklahoma City. **Phone:** 580-482-8100; DSN 866-1110. **Majcom:** AETC. **Host:** 97th Air Mobility Wing. **Mission:** trains aircrew members for C-5, C-17, and KC-135 aircraft. **History:** activated January 1943; inactivated May 1945; reactivated January 1953. **Area:** 6,593 acres. **Runways:** 13,440 ft., 9,000-ft. parallel runway, and 3,500-ft. assault strip. **Altitude:** 1,381 ft. **Personnel:** permanent party military, 1,886; DOD civilians, 1,566. **Housing:** single family, officer, 212, enlisted, 758; unaccompanied, UAQ/UEQ, 478; visiting, VOQ, 320, VAQ/VEQ, 272, TLF, 50. **Clinic.**

Andersen AFB, Guam, APO AP 96543-5000; 2 mi. N of Yigo. **Phone:** (cmcl, from CONUS) 671-366-1110; DSN 315-366-1110. **Majcom:** PACAF. **Host:** 36th Air Base Wing. **Mission:** Pacific center for power projection, regional cooperation, and multinational training; serves as a logistic support and staging base for aircraft operating in the Pacific and Indian Oceans. **Major tenants:** 13th Air Force (PACAF); Det. 5, 22nd Space Operations Sq. (AFSPC); 613th Contingency Response Sq. (AMC); 734th Air Mobility Sq. (AMC); Helicopter Combat Support Sc. 5 (US Navy). **History:** activated 1945. Named for Gen. James Roy Andersen, who was chief of staff, Hq. AAF, Pacific Ocean Areas, and lost at sea in February 1945. **Area:** 20,270 acres. **Runways:** 11,182 ft. and 10,555 ft. **Altitude:** 612 ft. **Personnel:** permanent party military, 2,108; DOD civilians, 1,561. **Housing:** single family, officer, 236, enlisted, 1,153; unaccompanied, UOQ, 74, UAQ/UEQ, 1,018; visiting, VOQ, 74, VAQ/VEQ, 204, TLF, 18. **Clinic.**

Andrews AFB, Md. 20762-5000; 10 mi. SE of Washington, D.C. **Phone:** 301-981-1110; DSN 858-1110. **Majcom:** AMC. **Host:** 89th Airlift Wing. **Mission:** gateway to nation's capital and home of Air Force One. Provides worldwide airlift for the President, vice president, top US officials, and foreign heads of state. Also responsible for Presidential support and base operations; supports all branches of the armed services, several major commands, and federal agencies. **Major tenants:** Air Force Flight Standards Agency; Hq. AFOSI; AFOSI Academy; Air National Guard Readiness Center; 113th Wing (ANG), F-16; 459th AW (AFRC), C-141; Naval Air Facility; Marine Aircraft Gp. 49, Det. A; Air Force Review Boards Agency. **History:** activated May 1943. Named for Lt. Gen. Frank M. Andrews, military air pioneer and WWII commander of the European Theater, killed in aircraft accident May 3, 1943, in Iceland. **Area:** 6,853 acres. **Runways:** 9,755 ft. and 9,300 ft. **Altitude:** 281 ft. **Personnel:** permanent party military, 4,444; DOD civilians, 2,872. **Housing:** single family, officer, 479 (including 96 govt.-leased), enlisted, 1,997 (including 318 govt.-leased); unaccompanied, UAQ/UEQ, 927; TLF, 68. **Hospital.**

Arnold AFB, Tenn. 37389; approx. 7 mi. SE of Manchester. **Phone:** 931-454-3000; DSN 340-3000. **Majcom:** AFMC. **Host:** Arnold Engineering Development Center. **Mission:** supports acquisition of new aerospace systems by conducting research, development, and evaluation testing for DOD, other government agencies, and commercial aerospace firms with the world's largest complex of wind tunnels, jet and rocket engine test cells, space simulation chambers, and hyperballistic ranges. **History:** base dedicated June 25, 1951. Named for Gen. of the Army H.H. "Hap" Arnold, wartime Chief of the Army Air Forces. **Area:** 39,081 acres. **Runway:** 6,000 ft. **Altitude:** 1,100 ft. **Personnel:** permanent party military, 103; DOD civilians, 179; **Housing:** single family, officer, 14, enlisted, 25; unaccompanied, UAQ/UEQ, 974; visiting, VQ, 38. **Medical aid station and small VA clinic.**

Aviano AB, Italy, APO AE 09604; adjacent to Aviano, 50 mi. N of Venice. **Phone:** (cmcl, from CONUS) 011-39-0434-66-7111; DSN 632-1110. **Majcom:** USAFE. **Host:** 31st Fighter Wing. **Mission:** maintains two LANTIRN–equipped F-16 fighter squadrons, the 510th and the 555th. **Major tenants:** 16th Air Force (USAFE); Hq. 16th Aerospace Expeditionary Wing. **Geographically Separated Units:** 2nd Expeditionary Air Support Operations Sq., Camp Bondsteel, Kosovo; 16th Ex. Air Support Ops Gp., Sarajevo, Bosnia; 16th Ex. Ops Gp., Istres AB, France; 16th Ex. Support Sq., Rhein–Main AB, Germany; 31st RED HORSE Flt. and 31st Munitions Sq., Camp Darby, Italy; 31st Munitions Support Sq., Ghedi AB, Italy; 99th Ex. Recon. Sq., NAS Sigonella, Italy; 401st Ex. Air Base Gp., Tuzla, Bosnia; 406th Ex. ABG, Taszar AB, Hungary; 496th Air Base Sq., Morón AB, Spain; 620th Ex. ABG, Camp Able Sentry, Macedonia; Det. 1, Ex. Air Control Sq., Jacotenente, Italy. **History:** one of the oldest Italian air bases, dating to 1911. USAF began operations 1954. **Area:** 1,467 acres. **Runway:** 8,596 ft. **Altitude:** 413 ft. **Personnel:** permanent party military, 3,900; DOD civilians, 200. **Housing:** single family, officer, 206 (including 184 govt.-leased), enlisted, 888 (including 380 govt.-leased); unaccompanied, UAQ/UEQ, 680; visiting, VOQ, 8, VAQ/VEQ, 12. **Clinic** (contracted with local hospital).

Barksdale AFB, La. 71110-5000; in Bossier City. **Phone:** 318-456-1110; DSN 781-1110. **Majcom:** ACC. **Host:** 2nd Bomb Wing. **Mission:** B-52H operations and training. **Major tenants:** 8th Air Force (ACC); 917th Wing (AFRC), A-10, B-52H; 8th Air Force Museum. **History:** activated Feb. 3, 1933. Named for Lt. Eugene H. Barksdale, WWI airman killed in an August 1926 crash. **Area:** 22,000 acres (18,000 acres reserved for recreation). **Runway:** 11,300 ft. **Altitude:** 166 ft. **Personnel:** permanent party military, 6,935; DOD civilians, 1,850. **Housing:** single family, officer, 186, enlisted, 647; unaccompanied, 876; visiting, VOQ, 140, VAQ/VEQ, 100, TLF, 24. **Superclinic.**

Beale AFB, Calif. 95903-5000; 13 mi. E of Marysville. **Phone:** 530-634-1110; DSN 368-1110. **Majcom:** ACC. **Host:** 9th Reconnaissance Wing. **Mission:** RC-135 and U-2 operations. **Major tenants:** 940th ARW (AFRC), KC-135; 7th Space Warning Sq. (AFSPC), Pave Paws; 13th and 48th Intelligence Sqs. (ACC). **History:** originally US Army's Camp Beale; transferred to Air Force April 1948; became Air Force base in November 1951. Named for Brig. Gen. E.F. Beale, Indian agent in California prior to Civil War. **Area:** 22,944 acres. **Runway:** 12,000 ft. **Altitude:** 113 ft. **Personnel:** permanent party military, 3,782; DOD civilians, 923. **Housing:** single family, officer, 159, enlisted, 1,285; unaccompanied, 449; visiting, VOQ, 53, VAQ/VEQ, 125, TLF, 29. **Clinic.**

Bolling AFB, D.C. 20332-5000; 3 mi. S of US Capitol. **Phone:** 703-545-6700; DSN 227-0101. **Host:** 11th Wing, which includes the USAF Band and USAF Honor Guard. **Mission:** Hq. USAF direct reporting unit with support responsibilities for 40,000 USAF members worldwide. **Major tenants:** Air Force Chief of Chaplains; Air Force Surgeon General; Air Force History Support Office; Air Force Medical Operations Agency; Defense Intelligence Agency; Air Force Legal Services Agency; 497th Intelligence Gp. (ACC). **History:** activated October 1917. Named for Col. Raynal C. Bolling, first high-ranking Army Air Service officer killed in WWI. **Area:** 607 acres. **Runway:** Helipad only. **Altitude:** 20 ft.

Personnel: permanent party military, 2,002; DOD civilians, 1,002. **Housing:** single family, officer, 285, enlisted, 1,090; unaccompanied, UAQ/UEQ, 331; visiting, VOQ, 56, VAQ/VEQ, 67, TLF, 100. **Clinic.**

Brooks City–Base, Tex. 78235; in SE San Antonio. **Phone:** 210-536-1110; DSN 240-1110. **Majcom:** AFMC. **Host:** 311th Human Systems Wing. **Mission:** force protection, centered around aerospace medicine and the human in the system; assesses and manages health, safety, and environmental risks for USAF and DOD; trains 6,000+ aeromedical personnel annually; manages more than 140 technical acquisition and sustainment programs. **Major tenants:** USAF School of Aerospace Medicine; Human Effectiveness Directorate (Armstrong Research site) of the Air Force Research Laboratory; Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis; Air Force Medical Support Agency; Air Force Center for Environmental Excellence; Medical Systems Implementation and Training Element; Air Force Outreach Program Office. **History:** activated Dec. 8, 1917. Named for Cadet Sidney J. Brooks Jr., killed Nov. 13, 1917, on his commissioning flight. On July 22, 2002, the base's land, facilities, and utilities were officially conveyed to the Brooks Development Agency and the name changed to Brooks City–Base. USAF now leases land and facilities from BDA. **Area:** 1,310 acres. **Runway:** none. **Altitude:** 600 ft. **Personnel:** permanent party military, 1,489; DOD civilians, 1,463. **Housing:** single family, officer, 36, enlisted, 134; unaccompanied, UAQ/UEQ, 95; visiting, VOQ, 175, TLF, 8. **Clinic.**

Buckley AFB, Colo. 80011-9524; 8 mi. E of Denver. **Phone:** 303-677-9011; DSN 877-9011. **Majcom:** AFSPC. **Host:** 460th Air Base Wing. **Mission:** provides space-based missile warning data, space communications processing and relay; focal point for transition to Space Based Infrared System. **Major tenants:** 2nd SWS, 140th Wing (ANG); Aerospace Data Facility; Navy/Marine Reserve Center; Army Aviation Support Facility. **History:** activated April 1, 1942, as a gunnery training facility. Named for Lt. John H. Buckley, National Guardsman, killed Sept. 17, 1918. ANG assumed control from US Navy in 1959. Became active duty Air Force base Oct. 2, 2000. **Area:** 3,832 acres. **Runway:** 11,000 ft. **Altitude:** 5,663 ft. **Personnel:** permanent party military, 6,719; DOD civilians, 836. **Housing:** unaccompanied, UAQ/UEQ, 236 dorm rooms. **Clinic.**

Cannon AFB, N.M. 88103-5000; 7 mi. W of Clovis. **Phone:** 505-784-4131; DSN 681-1110. **Majcom:** ACC. **Host:** 27th FW. **Mission:** F-16 operations. **History:** activated August 1942. Named for Gen. John K. Cannon, WWII commander of all Allied air forces in the Mediterranean Theater and former commander, Tactical Air Command. **Area:** 87,929 acres. **Runways:** 10,000 ft. and 8,200 ft. **Altitude:** 4,295 ft. **Personnel:** permanent party military, 3,425; DOD civilians, 542. **Housing:** single family, officer, 143, enlisted, 1,579; unaccompanied, 834; visiting, VOQ, 6, VAQ, 18, VQ, 39. TLF, 36. **Ambulatory care clinic.**

Charleston AFB, S.C. 29404-5000; 10 mi. from downtown Charleston. **Phone:** 843-963-2100; DSN 673-2100. **Majcom:** AMC. **Host:** 437th Airlift Wing. **Mission:** C-17 operations. **Major tenant:** 315th AW (AFRC Assoc.), C-141. **History:** activated October 1942; inactivated March 1946; reactivated August 1953. **Area:** 6,033 acres (including auxiliary airfield). **Runway:** 9,000 ft.; joint-use airfield. **Altitude:** 46 ft. **Personnel:** permanent party military, 3,630; DOD civilians, 1,344. **Housing:** single family, officer, 148, enlisted, 1,226; unaccompanied, UAQ/UEQ, 587; visiting, VOQ, 108, VAQ/VEQ, 44, TLF, 40. **Clinic.**

Columbus AFB, Miss. 39710-1000; 7.5 mi. NW of Columbus. **Phone:** 662-434-7322; DSN 742-1110. **Majcom:** AETC. **Host:** 14th Flying Training Wing. **Mission:** Specialized Undergraduate Pilot Training. **History:** activated 1941 for pilot training. **Area:** 6,017 acres. **Runways:** 12,000 ft., 8,000 ft., and 6,300 ft. **Altitude:** 219 ft. **Personnel:** permanent party military, 923; DOD civilians, 1,324. **Housing:** single family, officer, 276, enlisted, 228; unaccompanied, UOQ, 180, UAQ/UEQ, 166; visiting, VOQ, 17, VAQ/VEQ, 28, TLF, 20. **Clinic.**

Davis–Monthan AFB, Ariz. 85707-5000; within Tucson. **Phone:** 520-228-1110; DSN 228-1110. **Majcom:** ACC. **Host:** 355th Wing. **Mission:** A-10 combat crew training; OA-10 and FAC training and operations; and EC-130E and EC-130H operations. **Major tenants:** 12th Air Force (ACC); Aerospace Maintenance and Regeneration Center (AFMC), storage location for excess DOD aerospace vehicles; 305th Rescue Sq., HH-60; US Customs. **History:** activated 1927. Named for two local aviators: 2nd Lt. Samuel H. Davis, killed Dec. 28, 1921, and 2nd Lt. Oscar Monthan, killed March 27, 1924. **Area:** 10,633 acres. **Runway:** 13,643 ft. **Altitude:** 2,404 ft. **Personnel:** permanent party military, 6,489; DOD civilians, 1,312. **Housing:** single family, officer, 125, enlisted, 1,129; unaccompanied, 756; visiting, VOQ, 20, VAQ, 61, VQ, 165, TLF, 50. **Clinic.**

Dover AFB, Del. 19902-7219; 3 mi. SE of Dover. **Phone:** 302-677-3000; DSN 445-3000. **Majcom:** AMC. **Host:** 436th AW. **Mission:** provides 25 percent of nation's intertheater airlift capability; only combat-ready C-5 wing capable of employing airdrop and special operations tactics for worldwide airlift; operates largest DOD aerial port facility; houses military's East Coast mortuary. **Major tenant:** 512th AW (AFRC Assoc.). **History:** activated December 1941; inactivated 1946; reactivated February 1951. **Area:** 3,908 acres. **Runway:** 12,900 ft. **Altitude:** 28 ft. **Personnel:** permanent party military, 3,927; DOD civilians, 992. **Housing:** single family, officer, 122, enlisted, 1,306; unaccompanied, UAQ/UEQ, 725; visiting, VOQ, 137, VAQ/VEQ, 103, TLF, 19. **Clinic.**

Dyess AFB, Tex. 79607-1980; WSW border of Abilene. **Phone:** 915-696-1110; DSN 461-1110. **Majcom:** ACC. **Host:** 7th BW. **Mission:** B-1 operations. **Major tenant:** 317th Airlift Gp. (AMC), C-130. **History:** activated April 1942; deactivated December 1945; reactivated as Abilene AFB September 1955. In December 1956, renamed for Lt. Col. William E. Dyess, WWII fighter pilot who escaped from a Japanese prison camp, killed in P-38 crash in December 1943. **Area:** 6,342 acres (including offbase sites). **Runway:** 13,500 ft. **Altitude:** 1,789 ft. **Personnel:** permanent party military, 5,160; DOD civilians, 526. **Housing:** single family, officer, 166, enlisted, 1,228; unaccompanied, 808; visiting, VOQ, 77, VAQ/VEQ, 96, TLF, 39. **Clinic.**

Edwards AFB, Calif. 93524; adjacent to Rosamond. **Phone:** 661-277-1110; DSN 527-3510. **Majcom:** AFMC. **Host:** Air Force Flight Test Center. **Mission:** conducts developmental and follow-on testing and evaluation of manned and unmanned aircraft and related avionics, and flight-control and weapon systems. AFFTC also operates the USAF Test Pilot School, which trains test pilots, flight-test engineers, and flight-test navigators. Base is a secondary landing site for space shuttle missions. **Major tenants:** AFRL's Propulsion Directorate (AFMC); Dryden Flight Research Center (NASA); USMC Air Sqs. HMM 764 and HMM 769. **History:** activities began September 1933. Originally Muroc AAF; renamed in 1949 for Capt. Glen W. Edwards, killed June 5, 1948, in crash of a YB-49 "Flying Wing." **Area:** 301,000 acres. **Runways:** 21, from 4,000 to 39,000 ft. **Altitude:** 2,302 ft. **Personnel:** permanent party military, 3,544; DOD civilians, 2,796. **Housing:** single family, officer, 310, enlisted, 1,360; unaccompanied, UOQ, 60, UAQ/UEQ, 86; visiting, VOQ, 67, VAQ/VEQ, 82, TLF, 50. **Clinic.**

Eglin AFB, Fla. 32542; 2 mi. SW of the twin cities of Niceville and Valparaiso; 7 mi. NE of Fort Walton Beach. **Phone:** 850-882-1110; DSN 872-1110. **Majcom:** AFMC. **Host:** Air Armament Center. **Mission:** responsible for development, acquisition, testing, deployment, and sustainment of all air-delivered weapons. **Major tenants:** AFRL's Munitions Directorate (AFMC); 33rd FW (ACC), F-15; 53rd Wing (ACC); 919th Special Operations Wing (AFRC) at Duke Field, MC-130; Air Force Armament Museum; Army 6th Ranger Battalion; Naval Explosive Ordnance Disposal School. **History:** activated 1935. Named for Lt. Col. Frederick I. Eglin, WWI flier killed in aircraft accident Jan. 1, 1937. **Area:** 463,452 acres. Eglin is the nation's largest Air Force base in terms of acreage, covering an area roughly two-thirds the size of Rhode Island. **Runways:** 12,000 ft. and 10,000 ft. **Altitude:** 85 ft. **Personnel:** permanent party military, 4,616; DOD civilians, 2,910 (excluding Hurlburt Field). **Housing:** single family, officer, 218, enlisted, 2,116; unaccompanied, UAQ/UEQ, 1,212; visiting, VOQ, 169, VAQ/VEQ, 154, TLF, 87. **Hospital.**

Eielson AFB, Alaska 99702-5000; 26 mi. SE of Fairbanks. **Phone:** 907-377-1110; DSN 317-377-1110. **Majcom:** PACAF. **Host:** 354th FW. **Mission:** F-16C/D and A/OA-10 operations. **Major tenants:** Arctic Survival School (AETC); 168th Air Refueling Wing (ANG), KC-135. **History:** activated October 1944. Named for Carl Ben Eielson, Arctic aviation pioneer who died in an Arctic rescue mission in November 1929. **Area:** 19,790 acres (including 16 remote sites, 63,195 acres). **Runway:** 14,500 ft. **Altitude:** 534 ft. **Personnel:** permanent party military, 2,901; DOD civilians, 771. **Housing:** single family, officer, 181, enlisted, 1,243; unaccompanied, UOQ, 8, UAQ, 522, UEQ, 16; visiting, VOQ, 206, VAQ/VEQ, 328, TLF, 58. **Outpatient clinic.**

Ellsworth AFB, S.D. 57706-5000; 12 mi. ENE of Rapid City. **Phone:** 605-385-5056; DSN 675-5056. **Majcom:** ACC. **Host:** 28th BW. **Mission:** B-1 operations. **Major tenants:** Det. 2, 79th Test and Evaluation Sq. (AFMC); Det. 4, 57th Wing (ACC); Det. 8, 372nd Training Sq. (AETC); South Dakota Air and Space Museum. **History:** activated January 1942 as Rapid City AAB; renamed June 13, 1953, for Brig. Gen. Richard E. Ellsworth, killed March 18, 1953, in RB-36 crash. **Area:** 5,411 acres. **Runway:** 13,497 ft. **Altitude:** 3,276 ft. **Personnel:** permanent party military, 3,305; DOD civilians, 611. **Housing:** single family, officer, 429, enlisted, 1,607; unaccompanied, 742; visiting, VQ, 88, TLF, 30. **Clinic.**

Elmendorf AFB, Alaska 99506-5000; bordering Anchorage. **Phone:** 907-552-1110; DSN 317-552-1110. **Majcom:** PACAF. **Host:** 3rd Wing. **Mission:** F-15C/D, F-15E, C-130, C-12, and E-3 Airborne Warning and Control System operations. Hub for air traffic to and from Far East. **Major tenants:** Alaskan Command; 11th Air Force (PACAF); Alaskan NORAD Region.

History: activated July 1940. Named for Capt. Hugh Elmendorf, killed Jan. 13, 1933. **Area:** 13,100 acres. **Runways:** 10,000 ft. and 7,500 ft. **Altitude:** 213 ft. **Personnel:** permanent party military, 6,458; DOD civilians, 1,080. **Housing:** single family, officer, 172, enlisted, 1,640; unaccompanied, UAQ/UEQ, 938; visiting, VOQ, 196, VAQ/VEQ, 203, TLF, 100. **Hospital.**

Fairchild AFB, Wash. 99011-5000; 12 mi. WSW of Spokane. **Phone:** 509-247-1110; DSN 657-1110. **Majcom:** AMC. **Host:** 92nd ARW. **Mission:** KC-135R and KC-135T operations. **Major tenants:** 336th Training Gp. (USAF Survival School, AETC); 141st ARW (ANG), KC-135E. **History:** activated January 1942. Named for Gen. Muir S. Fairchild, USAF vice chief of staff at his death in 1950. **Area:** 4,529 acres. **Runway:** 13,901 ft. **Altitude:** 2,426 ft. **Personnel:** permanent party military, 2,850; DOD civilians, 440. **Housing:** single family, officer, 150, enlisted, 1,179; unaccompanied, UAQ/UEQ, 787; visiting, VOQ, 120, VAQ/VEQ, 187, TLF, 18. **Clinic.**

F.E. Warren AFB, Wyo. 82005-5000; adjacent to Cheyenne. **Phone:** 307-773-1110; DSN 481-1110. **Majcom:** AFSPC. **Host:** 90th Space Wing. **Mission:** controls, maintains, and operates 50 Peacekeeper and 150 Minuteman III ICBMs; UH-1N. **Major tenants:** 20th Air Force (AFSPC); Air Force ICBM Museum. **History:** activated as Ft. D.A. Russell July 4, 1867; under Army jurisdiction until 1949, when reassigned to USAF; renamed in 1930 for Francis Emory Warren, Wyoming Senator and first state governor. **Area:** 5,866 acres. Missile site area covering more than 12,600 sq. mi. in Wyoming, Colorado, and Nebraska. **Runway:** none. **Altitude:** 6,142 ft. **Personnel:** permanent party military, 3,514; DOD civilians, 937. **Housing:** single family, officer, 114, enlisted, 717; unaccompanied, UAQ/UEQ, 776; visiting, VQ, 40, TLF, 35. **Clinic.**

Goodfellow AFB, Tex. 76908-4410; SE of San Angelo. **Phone:** 915-654-3231; DSN 477-3231. **Majcom:** AETC. **Host:** 17th Training Wing. **Mission:** trains intelligence, fire protection, and special instruments personnel for US military and DOD and international agencies. **Major tenants:** 344th Military Intelligence Battalion (US Army); Navy Technical Training Center det.; Marine Corps det.; NCO Academy. **History:** activated January 1941. Named for Lt. John J. Goodfellow Jr., WWI observation airplane pilot killed in combat Sept. 14, 1918. **Area:** 1,135 acres. **Runway:** none. **Altitude:** 1,877 ft. **Personnel:** permanent party military, 1,450; DOD civilians, 775. **Housing:** single family, officer, 2, enlisted, 296; unaccompanied, UOQ, 144, UAQ/UEQ, 1,298; visiting, VOQ, 117, VAQ/VEQ, 410, TLF, 29. **Clinic.**

Grand Forks AFB, N.D. 58205-5000; 16 mi. W of Grand Forks. **Phone:** 701-747-3000; DSN 362-3000. **Majcom:** AMC. **Host:** 319th ARW. **Mission:** KC-135R operations. **History:** activated 1956. Named after town of Grand Forks, whose citizens bought the property for the Air Force. **Area:** 5,418 acres. **Runway:** 12,351 ft. **Altitude:** 911 ft. **Personnel:** permanent party military, 2,750; DOD civilians, 367. **Housing:** single family, officer, 274, enlisted, 1,489; unaccompanied, UOQ, 18, UAQ/UEQ, 613; visiting, VOQ, 31, VAQ/VEQ, 34, TLF, 24. **Hospital.**

Hanscom AFB, Mass. 01731-5000; 17 mi. NW of Boston. **Phone:** 781-377-4441; DSN 478-5980. **Majcom:** AFMC. **Host:** Electronic Systems Center (AFMC). **Mission:** manages development and acquisition of command and control systems. **Major tenants:** AFRL's Space Vehicles Directorate–Hanscom; AFRL's Sensors Directorate–Hanscom. **History:** activated 1941. Named for Laurence G. Hanscom, a pre–WWII advocate of private aviation, killed in a lightplane accident in 1941. **Area:** 846 acres. **Runway:** no flying mission; transient USAF aircraft use runways of Laurence G. Hanscom Field, state-operated airfield adjoining the base. **Altitude:** 133 ft. **Personnel:** permanent party military, 1,502; DOD civilians, 1,460. **Housing:** single family, officer, 359, enlisted, 491; unaccompanied, UOQ, 17, UAQ/UEQ, 220; visiting, VOQ 25, VAQ/VEQ, 93, TLF, 39. **Clinic.**

Air Force Installations

Major installations	FY98	FY99	FY00	FY01	FY02	FY03
US and possessions	74	74	74	74	72	72
Foreign	13	13	13	13	13	13
Worldwide	87	87	87	87	84	84
Minor installations						
US and possessions	80	81	80	80	80	80
Foreign	3	3	3	2	2	2
Worldwide	83	84	83	82	82	82

Includes Air National Guard and Air Force Reserve Command.

Hickam AFB, Hawaii 96853-5000; 9 mi. W of Honolulu. **Phone:** 808-449-7110 (Oahu military operator); DSN 315-449-7110. **Majcom:** PACAF. **Host:** 15th Air Base Wing. **Mission:** provides base and logistical support for 140 associate and tenant units in Hawaii and other Pacific–region locations; airlift for commander, US Pacific Command, and commander, PACAF; and maintenance and refueling support for aircraft transiting between the US mainland and the western Pacific. **Major tenants:** PACAF; 154th Wing (ANG), C-130, F-15, KC-135; Central Identification Lab (Army). **History:** activated September 1938. Named for Lt. Col. Horace M. Hickam, aviation pioneer killed in crash Nov. 5, 1934. **Area:** 2,761 acres. **Runways:** Four joint-use runways shared with Honolulu Arpt.: 12,357 ft., 12,000 ft., 9,000 ft., and 6,952 ft.; Johnson Atoll runway, 9,000 ft. **Altitude:** 13 ft. **Personnel:** permanent party military, 4,579; DOD civilians, 1,316. **Housing:** single family, officer, 615, enlisted, 1,545; unaccompanied, UOQ, 15, UAQ/UEQ, 766; visiting, VOQ, 225, VAQ/VEQ, 219, TLF, 40. **Clinic.**

Hill AFB, Utah 84056-5990; 25 mi. N. of Salt Lake City. **Phone:** 801-777-1110; DSN 777-1110. **Majcom:** AFMC. **Host:** Ogden Air Logistics Center. **Mission:** provides worldwide engineering and logistics management for F-16s; maintains the A-10, C-130, and F-16; handles logistics management and maintenance for Minuteman and Peacekeeper ICBMs; provides sustainment and logistics support for space and C3I programs; overhauls and repairs landing gear for all USAF (and 70 percent of DOD) aircraft; leading provider of rocket motors, small missiles, air munitions and guided bombs, photonics imaging and reconnaissance equipment, simulators and training devices, avionics, hydraulics and pneudraulics instruments, and software. **Major tenants:** 388th FW (ACC); 419th FW (AFRC), F-16; Area Command Ogden; Hill Aerospace Museum; Defense Information Systems Agency; 372nd USAF Recruiting Group; Defense Logistics Agency. **History:** activated 1940. Named for Maj. Ployer P. Hill, killed Oct. 30, 1935, while test flying the first B-17. **Area:** 6,698 acres; manages 962,076 acres (Utah Test and Training Range). **Runway:** 13,500 ft. **Altitude:** 4,788 ft. **Personnel:** permanent party military, 2,304; DOD civilians, 9,136. **Housing:** single family, officer, 179, enlisted, 962; unaccompanied, UAQ/UEQ, 628; visiting, VOQ, 5, VAQ/VEQ, 169, TLF, 61. **Clinic.**

Holloman AFB, N.M. 88310; 8 mi. SW of Alamogordo. **Phone:** 505-572-1110; DSN 572-1110. **Majcom:** ACC. **Host:** 49th FW. **Mission:** F-117 operations. **Major tenants:** 46th Test Gp. (AFMC); 4th Space Surveillance Sq. (AFSPC); German Air Force Flying Training Center. **History:** activated 1942. Named for Col. George Holloman, guided-missile pioneer. **Area:** 58,000 acres. **Runways:** 12,000 ft., 10,500 ft., and 8,000 ft. **Altitude:** 4,350 ft. **Personnel:** permanent party military, 3,633; DOD civilians, 1,195. **Housing:** single family, officer, 190, enlisted, 1,250; unaccompanied, 1,047; visiting, VQ, 194,TLF, 50. **Clinic.**

Hurlburt Field, Fla. 32544-5000; 5 mi. W of Fort Walton Beach. **Phone:** 850-884-7464; DSN 579-7464. **Majcom:** AFSOC. **Host:** 16th SOW. **Mission:** specialized airpower, equipped with AC-130H/U, C-130, MC-130H, MC-130P, MH-53J/M (located at Eglin AFB), and UH-1. **Major tenants:** Air Force Special Operations Command; USAF C2 Training Innovation Gp.; 823rd RED HORSE Sq.; USAF Combat Weather Center; C2 Warrior School; USAF Special Operations School; Joint Special Operations University. **History:** activated 1943. Named for Lt. Donald W. Hurlburt, WWII pilot killed Oct. 1, 1943. **Area:** 6,600 acres. **Runway:** 6,900 ft. **Altitude:** 38 ft. **Personnel:** permanent party military, 7,770; DOD civilians, 640. **Housing:** single family, officer, 52, enlisted, 628; unaccompanied, UAQ/UEQ, 1,103; visiting, VOQ, 165, VAQ/VEQ, 53, TLF, 24. **Clinic.**

Incirlik AB, Turkey, APO AE 09824; 6 mi. E of Adana. **Phone:** (cmcl, from CONUS) 011-90-322-316-0114; DSN (from CONUS) 676-1110. **Majcom:** USAFE. **Host:** 39th Wing. **Mission:** supports rotational weapons training deployments and contingency actions, as well as Operation Northern Watch with Combined Task Force assets, including Turkish KC-135s, British Jaguars and VC-10s, and USAF, USN, and USMC air assets, including the C-12, C-130, E-3, EA-6B, EP-3, F-15, F-16, KC-135, HH-60, and MH-60. **History:** activated May 1954. Present unit began operations March 1966. Incirlik, in Turkish, means fig orchard. **Area:** 3,400 acres. **Runway:** 10,000 ft. **Altitude:** 240 ft. **Personnel:** permanent party military, 1,600; DOD civilians, 114; **Housing:** single family, officer, 135, enlisted, 667; unaccompanied, UOQ, 50 townhouses, UAQ/UEQ, 692;

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visiting, VOQ, 127, VAQ/VEQ, 235, TLF, 80. **Hospital.**

Kadena AB, Japan, APO AP 96368-5000; 15 mi. N of Naha. **Phone:** (cmcl, from CONUS) 011-81-6117-34-1110; DSN 315-634-1110. **Majcom:** PACAF. **Host:** 18th Wing. **Mission:** E-3, F-15C/D, KC-135R, and HH-60 operations. **Major tenants:** Support Center Pacific (AFMC); 353rd Special Operations Gp. (AFSOC), 390th Intelligence Sq.; 82nd Reconnaissance Sq. (ACC); 633rd Air Mobility Support Sq. (AMC); Commander, Fleet Activities Kadena (US Navy). **History:** occupied by US forces in April 1945. Named for city of Kadena, Okinawa. **Area:** 11,210 acres. **Runway:** 12,100 ft. **Altitude:** 146 ft. **Personnel:** permanent party military, 7,200; DOD civilians, 1,300. **Housing:** single family, officer, 1,768, enlisted, 6,367; unaccompanied, UOQ, 62, UAQ/UEQ, 1,935; visiting, VOQ, 229, VAQ/VEQ, 201, TLF, 122. **Clinic.**

Keesler AFB, Miss. 39534-5000; located in Biloxi. **Phone:** 228-377-1110; DSN 597-1110. **Majcom:** AETC. **Host:** 81st Training Wing. **Mission:** conducts Air Force, joint service, and international training for avionics, communications, electronics, radar systems, computer and C2 systems, weather precision equipment, physician residencies, specialized nursing, and medical technicians. **Major tenants:** 2nd Air Force (AETC); 45th Airlift Flight (AETC), C-21; 403rd Wing (AFRC), C-130, WC-130. **History:** activated June 12, 1941. Named for 2nd Lt. Samuel R. Keesler Jr., a native of Mississippi and WWI aerial observer killed in action Oct. 9, 1918. **Area:** 3,554 acres. **Runway:** 5,630 ft. **Altitude:** 26 ft. **Personnel:** permanent party military, 4,308; DOD civilians, 1,922. **Housing:** single family, officer, 287, enlisted, 1,660; unaccompanied, UAQ/UEQ, 907; visiting, VOQ, 317, VAQ/VEQ, 1,172, TLF, 70. **Keesler Medical Center.**

Kirtland AFB, N.M. 87117-5606; SE quadrant of Albuquerque. **Phone:** 505-846-0011; DSN 246-0011. **Majcom:** AFMC. **Host:** 377th Air Base Wing. **Mission:** provides munitions maintenance; worldwide training; research, development, and testing; base operating support. **Major tenants:** 58th SOW (AETC), MC-130, MH-53, UH-1; Air Force Operational Test and Evaluation Center; Air Force Research Laboratories (AFMC); 150th FW (ANG), F-16; Defense Threat Reduction Agency, Albuquerque Field Operations; Sandia National Laboratories; DOE's Albuquerque Operations Office; Defense Nuclear Weapons School; Air Force Inspection Agency; Air Force Safety Center. **History:** activated January 1941. Named for Col. Roy C. Kirtland, aviation pioneer who died May 2, 1941. **Area:** 52,678 acres. **Runways:** 13,000 ft., two, each 10,000 ft., and 6,000 ft. **Altitude:** 5,352 ft. **Personnel:** permanent party military, 2,807; DOD civilians, 1,817. **Housing:** single family, officer, 280, enlisted, 1,503; unaccompanied, UAQ/UEQ, 751; visiting, VOQ, 189, VAQ/VEQ, 169, TLF, 38. **Air Force–VA joint medical center.**

Kunsan AB, Republic of Korea, APO AP 96264-5000; 8 mi. SW of Kunsan City. **Phone:** (cmcl, from CONUS) 011-82-63-470-1110; DSN 782-1110. **Majcom:** PACAF. **Host:** 8th FW. **Mission:** F-16C/D operations; home of the "Wolf Pack" and the first active overseas F-16 wing (September 1981). **Major tenants:** US Army's Echo and Foxtrot Batteries, 1st Battalion, 143rd Air Defense Artillery; US Army Contracting Command Korea. **History:** built by the Japanese in 1938. **Area:** 2,556 acres. **Runway:** 9,000 ft. **Altitude:** 29 ft. **Personnel:** permanent party military, 2,511; DOD civilians, 48. **Housing:** unaccompanied, UOQ, 247, UAQ/UEQ, 1,733; visiting, VOQ, 28, VAQ/VEQ, 108. **Clinic.**

Lackland AFB, Tex. 78236-5000; 8 mi. SW of downtown San Antonio. **Phone:** 210-671-1110; DSN 473-1110. **Majcom:** AETC. **Host:** 37th Training Wing. **Mission:** largest USAF training wing. Its four primary training functions graduate more than 75,000 students annually. Provides basic military training for civilian recruits entering Air Force, ANG, and AFRC; conducts courses in base support functions, English language training for international and US military students, and professional operations and management training in Spanish to military forces and government agencies from Latin American and Caribbean nations. **Major tenants:** 59th Medical Wing; Air Force Security Forces Center; Force Protection Battlelab; Cryptologic Systems Group. **History:** activated 1941. Named for Brig. Gen. Frank D. Lackland, early commandant of Kelly Field flying school, who died in 1943. **Area:** 6,725 acres. **Runway:** none. **Altitude:** 745 ft. **Personnel:** permanent party military, 3,208; DOD civilians, 2,275. **Housing:** single family, officer, 151, enlisted, 1,084; unaccompanied, UAQ/UEQ, 1,230; visiting, VOQ, 904, VAQ/VEQ, 1,763, TLF, 98. **Wilford Hall Medical Center.**

Lajes Field, Azores, Portugal, APO AE 09720-5000; Terceira Island, 900 mi. W of Portugal. **Phone:** (cmcl, from CONUS) 011-351-295-57-1110; DSN from US 535-1110, from Europe 245-1110. **Majcom:** USAFE. **Host:** 65th Air Base Wing. **Mission:** provides support to US and allied aircraft and personnel transiting the Atlantic, through US military and host-nation coordination. **Major tenants:** US Forces Azores; 629th AMSS (AMC). **History:** US operations began at Lajes Field 1946. **Area:** 1,179 acres. **Runway:** 10,865 ft. **Altitude:** 180 ft. **Personnel:** permanent party military, 900; DOD civilians, 75. **Housing:** single family, officer, 68, enlisted, 380; unaccompanied, UOQ, 31, UAQ/UEQ, 325; visiting, VOQ, 190, VAQ/VEQ, 173, TLF, 30. **Clinic.**

Langley AFB, Va. 23665-5000; 3 mi. N of Hampton. **Phone:** 757-764-1110; DSN 574-1110. **Majcom:** ACC. **Host:** 1st FW. **Mission:** F-15 air superiority operations. **Major tenants:** Air Combat Command; Air Force Rescue Coordination Center; Aerospace C2ISR Center; USAF Heritage of America Band; 12th Airlift Flight (AMC); 480th Intelligence Gp. (ACC); Air and Space Expeditionary Force Center (ACC). **History:** activated Dec. 30, 1916. Langley is the first military base in the US purchased and built specifically for military aviation. Named for aviation pioneer and scientist Samuel Pierpont Langley, who died in 1906. **Area:** 2,900 acres. **Runway:** 10,000 ft. **Altitude:** 11 ft. **Personnel:** permanent party military, 7,600; DOD civilians, 2,090. **Housing:** single family, officer, 380, enlisted, 1,132; unaccompanied, 861; visiting, VOQ, 101, VAQ/VEQ, 169, TLF, 100. **Hospital.**

Laughlin AFB, Tex. 78843-5000; 6 mi. E of Del Rio. **Phone:** 830-298-3511; DSN 732-1110. **Majcom:** AETC. **Host:** 47th FTW. **Mission:** SUPT. **History:** activated July 1942. Named for 1st Lt. Jack Thomas Laughlin, Del Rio native, B-17 pilot, killed Jan. 29, 1942. **Area:** 4,516 acres. **Runways:** 8,858 ft., 8,310 ft., and 6,246 ft. **Altitude:** 1,082 ft. **Personnel:** permanent party military, 900; DOD civilians, 945. **Housing:** single family, officer, 320, enlisted, 238; unaccompanied, UOQ, 288, UAQ/UEQ, 264; visiting, VOQ, 36, TLF, 20. **Clinic.**

Little Rock AFB, Ark. 72099-4940; 17 mi. NE of Little Rock (Jacksonville). **Phone:** 501-987-1110; DSN 731-1110. **Majcom:** AETC. **Host:** 314th AW. **Mission:** largest C-130 training base in DOD; trains crew members from all services and 27 foreign countries. **Major tenants:** 463rd AG (AMC), C-130; 189th AW (ANG), C-130; Air Mobility Warfare Center Combat Aerial Delivery School (AMC); Hq. Ark. ANG. **History:** activated Oct. 9, 1955. **Area:** 6,130 acres. **Runway:** 12,000 ft. **Altitude:** 310 ft. **Personnel:** permanent party military, 4,608; DOD civilians, 423. **Housing:** single family, officer, 185, enlisted, 1,350; unaccompanied, UAQ/UEQ, 764; visiting, VOQ, 184, VAQ/VEQ, 140. **Clinic.**

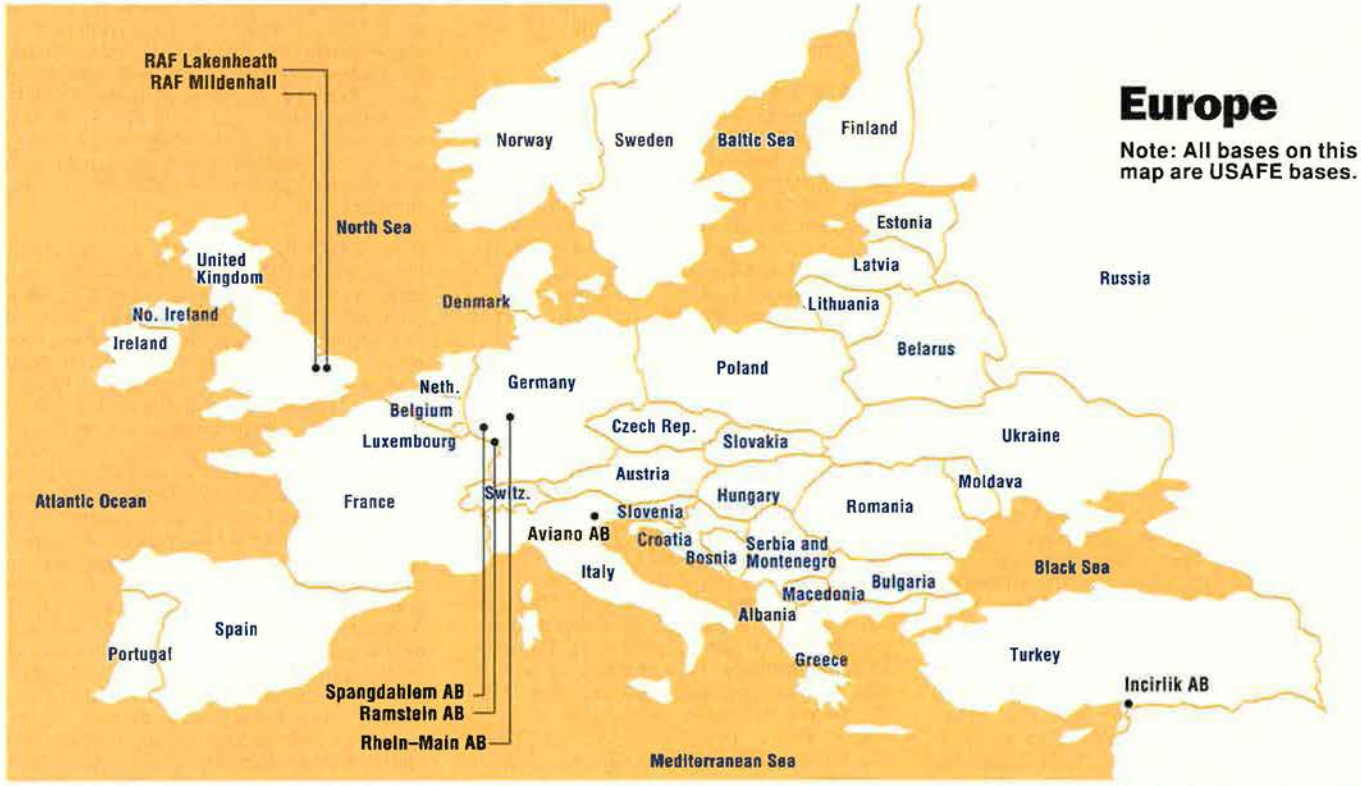
Los Angeles AFB, Calif. 90245-4657; in El Segundo, 3 mi. SE of Los Angeles Arpt.; base housing and support facilities 18 mi. S of the main base, in San Pedro. **Phone:** 310-363-1110; DSN 833-1110. **Majcom:** AFSPC. **Host:** Space and Missile Systems Center. **Mission:** responsible for research, development, acquisition, on-orbit testing, and sustainment of military space and missile systems. **History:** activated as Air Research and Development Command's Western Development Division July 1, 1954. **Area:** 112 acres at Los Angeles AFB and 127 acres at Ft. MacArthur Military Family Housing Annex. **Runway:** none. **Altitude:** 95 ft. **Personnel:** permanent party military, 1,517; DOD civilians, 1,419. **Housing:** single family, officer, 290, enlisted, 350; unaccompanied, UOQ, 1, UAQ/UEQ, 50; visiting, VQ, 22, TLF, 22. **Clinic.**

Luke AFB, Ariz. 85309-5000; 20 mi. WNW of downtown Phoenix. **Phone:** 602-856-7411; DSN 896-1110. **Majcom:** AETC. **Host:** 56th FW. **Mission:** F-16 operations; conducts USAF and allied F-16 aircrew training. **Major tenant:** 944th FW (AFRC), F-16. **History:** activated 1941. Named for 2nd Lt. Frank Luke Jr., observation balloon–busting ace of WWI and first American aviator to receive the Medal of Honor, killed in action Sept. 29, 1918. Luke is the largest fighter training base in the world. **Area:** 4,200 acres, plus 2.7-million-acre Barry M. Goldwater Range. **Runways:** 10,000 ft. and 9,910 ft. **Altitude:** 1,090 ft. **Personnel:** permanent party military, 5,425; DOD civilians, 2,251. **Housing:** single family, 724; unaccompanied, UAQ/UEQ, 730; visiting, VOQ, 196, VAQ/VEQ, 65, TLF, 39. **Hospital.**

MacDill AFB, Fla. 33621-5000; on the Interbay Peninsula in southern Tampa. **Phone:** 813-828-1110; DSN 968-1110. **Majcom:** AMC. **Host:** 6th ARW. **Mission:** KC-135 operations; provides worldwide air refueling and combatant commander support. **Major tenants:** US Special Operations Command; US Central Command; Joint Communications Support Element; NOAA Aircraft Operations Center. **History:** activated April 15, 1941. Named for Col. Leslie MacDill, killed in aircraft accident Nov. 8, 1938. **Area:** 5,767 acres. **Runways:** 11,420 ft. and 7,167 ft. **Altitude:** 6 ft. **Personnel:** permanent party military, 4,938; DOD civilians, 1,030. **Housing:** single family, officer, 22, enlisted, 684; unaccompanied, UAQ/UEQ, 610; visiting, VOQ, 109, VAQ/VEQ, 122, TLF, 50. **Hospital.**

Malmstrom AFB, Mont. 59402-5000; 1.5 mi. E of Great Falls. **Phone:** 406-731-1110; DSN 632-1110. **Majcom:** AFSPC. **Host:** 341st Space Wing. **Mission:** Minuteman III ICBM operations, UH-1N. **Major tenant:** 819th RED HORSE Sq. (ACC). **History:** activated Dec. 15, 1942. Named for Col. Einar A. Malmstrom, WWII fighter commander killed in air accident Aug. 21, 1954. Site of SAC's first Minuteman wing. **Area:** 4,041 acres, plus about 24,000 sq. mi. for missile sites. **Runway:** closed. **Altitude:** 3,525 ft. **Personnel:** permanent party military, 3,363; DOD

Major Air Force Installations Overseas



Bases in Gulf Cooperation Council nations do not meet criteria for major installations; however, thousands of USAF personnel are deployed in these locations.

civilians, 370. **Housing:** single family, officer, 200, enlisted, 1,206; unaccompanied, UAQ/UEQ, 882; visiting, VQ, 53, TLF, 30. **Clinic.**

Maxwell AFB, Ala. 36112-5000; 1 mi. WNW of Montgomery. **Phone:** 334-953-1110; DSN 493-1110. **Majcom:** AETC. **Host:** 42nd Air Base Wing. **Mission:** Air University conducts professional military, graduate, and professional continuing education for precommissioned and commissioned officers, enlisted personnel, and civilians. **Major tenants:** Air University; Air War College; Air Command and Staff College; Air University Library; College of Aerospace Doctrine, Research, and Education; School of Advanced Airpower Studies; Air Force Officer Accession and Training Schools; Ira C. Eaker College for Professional Development; College for Enlisted Professional Military Education; Community College of the Air Force; Air Force Institute for Advanced Distributed Learning; Squadron Officer College; Civil Air Patrol; 908th AW (AFRC), C-130; Air Force Historical Research Agency; Air Force Doctrine Center; Standard Systems Gp. **History:** activated 1918. Named for 2nd Lt. William C. Maxwell, killed in air accident Aug. 12, 1920. **Area:** 3,903 acres (includes Gunter Annex). **Runway:** 8,000 ft. **Altitude:** 172 ft. **Personnel:** permanent party military, 4,154; DOD civilians, 2,594. **Housing:** single family, officer, 372, enlisted, 596; unaccompanied, UAQ/UEQ, 370; visiting, VOQ, 1,543, VAQ/VEQ, 506, TLF, 30. **Clinic.**

McChord AFB, Wash. 98438-5000; 10 mi. S of Tacoma. **Phone:** 253-982-1110; DSN 382-1110. **Majcom:** AMC. **Host:** 62nd AW. **Mission:** C-17 operations. Base is adjacent to Ft. Lewis, its primary customer for strategic airlift worldwide. **Major tenants:** 446th AW (AFRC Assoc.); Western Air Defense Sector (ANG); 22nd Special Tactics Sq. (AFSOC). **History:** activated May 5, 1938. Named for Col. William C. McChord, killed Aug. 18, 1937. **Area:** 4,616 acres. **Runway:** 10,100 ft. **Altitude:** 323 ft. **Personnel:** permanent party military, 3,665; DOD civilians, 1,392. **Housing:** single family, officer, 115, enlisted, 868; unaccompanied, UOQ, 2, UAQ/UEQ, 752; visiting, VOQ, 68, VAQ/VEQ, 293, TLF, 20. **Dispensary.** Madigan Army Medical Center is located 4 mi. SE.

McConnell AFB, Kan. 67221-5000; SE corner of Wichita. **Phone:** 316-759-6100; DSN 734-1110. **Majcom:** AMC. **Host:** 22nd ARW. **Mission:** KC-135 operations. **Major tenants:** 184th BW (ANG); 931st Air Refueling Gp. (AFRC Assoc.). **History:** activated June 5, 1951. Named for the three McConnell brothers, WWII B-24 pilots from Wichita—Lt. Col. Edwin M. McConnell (died Sept. 1, 1997), Capt. Fred J. McConnell (died in a private airplane crash Oct. 25, 1945), and 2nd Lt. Thomas L. McConnell (killed July 10, 1943). **Area:** 3,113 acres. **Runways:** two, 12,000 ft. each. **Altitude:** 1,371 ft. **Personnel:** permanent party military, 2,700; DOD civilians, 385. **Housing:** single family, officer, 83, enlisted, 506; unaccompanied, UAQ/UEQ, 615; visiting, VOQ, 20, VAQ/VEQ, 65, TLF, 45. **Clinic.**

McGuire AFB, N.J. 08641-5000; 18 mi. SE of Trenton. **Phone:** 609-754-1100; DSN 650-1100. **Majcom:** AMC. **Host:** 305th AMW. **Mission:** C-141 and KC-10 operations. **Major tenants:** 21st Air Force (AMC); Air Mobility Warfare Center, Ft. Dix, N.J.; N.J. Civil Air Patrol; 108th ARW (ANG), KC-135; 514th AMW (AFRC Assoc.). **History:** adjoins Army's Ft. Dix. Formerly Ft. Dix AAB; activated as Air Force base 1949. Named for Maj. Thomas B. McGuire Jr., P-38 pilot, second leading US ace of WWII, Medal of Honor recipient, killed in action Jan. 7, 1945. **Area:** 3,598 acres. **Runways:** 10,001 ft. and 7,129 ft. **Altitude:** 133 ft. **Personnel:** permanent party military, 5,081, DOD civilians, 1,095. **Housing:** single family, officer, 244, enlisted, 1,621; unaccompanied, UAQ/UEQ, 1,162; visiting, VOQ, 33, VAQ/VEQ, 274, TLF, 60. **Clinic.**

Minot AFB, N.D. 58705-5000; 13 mi. N of Minot. **Phone:** 701-723-1110; DSN 453-1110. **Majcom:** ACC. **Host:** 5th BW. **Mission:** B-52 operations. **Major tenant:** 91st Space Wing (AFSPC), Minuteman III, UH-1N. **History:** activated January 1957. Named after the city of Minot, whose citizens donated $50,000 toward purchase of the land for USAF. **Area:** 5,049 acres, plus additional 8,500 acres for missile sites. **Runway:** 13,200 ft. **Altitude:** 1,668 ft. **Personnel:** permanent party military, 4,761; DOD civilians, 676. **Housing:** single family, officer, 474, enlisted, 1,913; unaccompanied, 935; visiting, VOQ, 39, VAQ, 31, TLF, 33. **Clinic.**

Misawa AB, Japan, APO AP 96319-5000; within Misawa city limits. **Phone:** (cmcl, from CONUS) 011-81-176-53-5181 ext. 226-3075; DSN 315-226-5181. **Majcom:** PACAF. **Host:** 35th FW. **Mission:** F-16C/D operations. **Major tenants:** 301st Intelligence Sq. (ACC); Naval Air Facility; Naval Security Gp. Activity; 750th Military Intelligence Det. (US Army); Co. E, US Marine Support Battalion; Northern Air Defense Force (JASDF). **History:** occupied by US forces September 1945. **Area:** 3,865 acres. **Runway:** 10,000 ft. **Altitude:** 119 ft. **Personnel:** permanent party military, 4,564; DOD civilians, 122. **Housing:** single family, officer, 298, enlisted, 1,810; unaccompanied, UOQ, 40, UAQ/UEQ, 951; visiting, VOQ, 82, VAQ/VEQ, 44, TLF, 40. **Hospital.**

Moody AFB, Ga. 31699-5000; 10 mi. NNE of Valdosta. **Phone:** 229-257-1110; DSN 460-1110. **Majcom:** ACC. **Host:** 347th Rescue Wing. **Mission:** HC-130, and HH-60 operations. **Major tenants:** 479th Flying Training Gp. (AETC); 820th Security Forces Gp. (ACC). **History:** activated June 1941. Named for Maj. George P. Moody, killed May 5, 1941. **Area:** 6,050 acres. **Runways:** 9,300 ft. and 8,000 ft. **Altitude:** 235 ft. **Personnel:** permanent party military, 3,714; DOD civilians, 659. **Housing:** single family, officer, 57, enlisted,549; unaccompanied, 694; visiting, VOQ, 37, VAQ/VEQ, 19, TLF, 16. **Clinic.**

Mountain Home AFB, Idaho 83648-5000; 45 mi. SE of Boise. **Phone:** 208-828-6800; DSN 728-1110. **Majcom:** ACC. **Host:** 366th Fighter Wing. **Mission:** USAF's Air Expeditionary Wing, and F-15C/D, F-15E, and F-16CJ/D operations. **Major tenant:** Air Expeditionary Force Battlelab. **History:** activated August 1943. **Area:** 9,112 acres. **Runway:** 13,500 ft. **Altitude:** 3,000 ft. **Personnel:** permanent party military, 4,071; DOD civilians, 575. **Housing:** single family, officer, 186, enlisted, 1,344; unaccompanied, 882; visiting, VOQ, 45, VAQ/VEQ, 54, TLF, 16. **Hospital.**

Nellis AFB, Nev. 89191-5000; 8 mi. NE of Las Vegas. **Phone:** 702-652-1110; DSN 682-1110. **Majcom:** ACC. **Host:** 99th Air Base Wing. **Mission:** Air Warfare Center manages advanced pilot training and tactics development and integrates test and evaluation programs; its 98th Range Wing oversees Tonopah Test Range, several electronic scoring site GSUs, 5,000-sq.-mile Nellis Range Complex, and two emergency airfields. 57th Wing, A-10A, F-15C/D/E, F-16C/D, HH-60G, and Predator RQ-1A UAV. 57th Wing missions include Red Flag exercises (414th Combat Training Sq.); graduate-level pilot training (USAF Weapons School); support for US Army exercises (549th Combat Training Sq.); training for international personnel in joint firepower procedures and techniques (Hq. USAF Air Ground Operations School); USAF Air Demonstration Sq. (Thunderbirds). 53rd Wing, at 17 locations nationwide, serves as focal point for combat air forces in electronic warfare, armament and avionics, chemical defense, reconnaissance, and aircrew training devices; and operational testing and evaluation of proposed new equipment and systems. **Major tenants:** Aerospace Integration Center, OSD Joint Suppression of Enemy Air Defenses, Triservice Reserve Center, 67th Intelligence Gp. (ACC), 820th RED HORSE Sq. (ACC); 896th Munitions Sq. (AFMC). **History:** activated July 1941 as Las Vegas AAF with Army Air Corps Flexible Gunnery School; closed 1947; reopened 1949. Named for 1st Lt. William H. Nellis, WWII P-47 fighter pilot, killed Dec. 27, 1944. **Area:** Main base is 14,000 acres. NRC occupies 2.9 million acres of restricted air–land use and an additional 7,000-sq.-mile military operating area shared with civilian aircraft. **Runways:** 10,119 ft. and 10,051 ft. **Altitude:** 1,868 ft. **Personnel:**

Minor Active Duty Installations

In addition to the installations listed above, the Air Force has a number of minor installations. These air stations perform various missions, including space operations and missile warning. Here is a listing of such installations with state (or APO), ZIP code, and major command.

Cape Canaveral AFS, Fla. 32925-5000 (AFSPC)	DSN 467-1110
Cape Cod AFS, Mass. 02561-0428 (AFSPC)	DSN 557-2235
Cavalier AFS, N.D. 58220-9314 (AFSPC)	DSN 330-3695
Cheyenne Mountain AFS, Colo. 80914-6066 (AFSPC)	DSN 268-1110
Clear AFS, Alaska, APO AP 99704-0013 (AFSPC)	DSN 317-585-6110
Indian Springs AFAF, Nev. 89018-1230 (ACC)	DSN 682-1110
Onizuka AFS, Calif. 94088-3430 (AFSPC)	DSN 561-3000
Thule AB, Greenland, APO AE 09704-5000 (AFSPC) (ask for Thule operator)	DSN 268-3840

permanent party military, 7,798; DOD civilians, 1,380. **Housing:** single family, officer, 183, enlisted, 1,115; unaccompanied, 1,190; visiting, VOQ, 340, VAQ/VEQ, 354, TLF, 60. **Air Force–VA joint hospital.**

Offutt AFB, Neb. 68113-5000; 8 mi. S of Omaha. **Phone:** 402-294-1110; DSN 271-1110. **Majcom:** ACC. **Host:** 55th Wing. **Mission:** provides worldwide reconnaissance, C2, and combat support to warfighting commanders and national leadership. **Major tenants:** US Strategic Command; Joint Intelligence Center (STRATCOM); Air Force Weather Agency; National Airborne Operations Center (JCS); USAF Heartland of America Band. **History:** activated 1896 as Army's Ft. Crook. Landing field named for 1st Lt. Jarvis J. Offutt, WWI pilot who died Aug. 13, 1918. **Area:** 4,039 acres. **Runway:** 11,700 ft. **Altitude:** 1,048 ft. **Personnel:** permanent party military, 7,528; DOD civilians, 1,014. **Housing:** single family, officer, 337, enlisted, 211; unaccompanied, 966; visiting, VQ, 171, TLF, 60. **Hospital.**

Osan AB, Republic of Korea, APO AP 96278-5000; 38 mi. S of Seoul. **Phone:** (cmcl, from CONUS) 011-82-31-661-1110; DSN 315-784-1110. **Majcom:** PACAF. **Host:** 51st FW. **Mission:** A/OA-10, C-12, and F-16C/D operations. **Major tenant:** 7th Air Force (PACAF); 5th RS (ACC); 31st SOS (AFSOC); 33rd Rescue Sq. (PACAF); 303rd Intelligence Sq. (AIA); 731st Air Mobility Sq. (AMC). **History:** originally designated K-55; runway opened December 1952. Renamed Osan AB in 1956 for nearby town that was the scene of first fighting between US and North Korean forces in July 1950. **Area:** 1,674 acres. **Runway:** 9,000 ft. **Altitude:** 38 ft. **Personnel:** permanent party military, 6,300; DOD civilians, 235. **Housing:** single family, 211; unaccompanied, UOQ, 310, UAQ/UEQ, 3,561; visiting, VOQ, 57, VAQ/VEQ, 235, TLF, 15. **Hospital.**

Patrick AFB, Fla. 32925-3237; 2 mi. S of Cocoa Beach. **Phone:** 321-494-1110; DSN 854-1110. **Majcom:** AFSPC. **Host:** 45th Space Wing. **Mission:** supports DOD, NASA, US Navy (Trident), and other government agency and commercial missile and space programs. Host responsibilities include Cape Canaveral AFS and tracking stations on Antigua and Ascension islands. **Major tenants:** Defense Equal Opportunity Management Institute; Air Force Technical Applications Center; 920th Rescue Gp. (AFRC), HC-130, HH-60; Army Training Support Brigade; Joint Task Force for Joint STARS at Melbourne, Fla. **History:** activated 1940. Named for Maj. Gen. Mason M. Patrick, Chief of AEF's Air Service in WWI and Chief of the Air Service/Air Corps, 1921–27. **Area:** 2,341 acres. **Runway:** 9,000 ft. **Altitude:** 9 ft. **Personnel:** permanent party military, 2,200; DOD civilians, 1,550. **Housing:** single family, officer, 231, enlisted, 1,003; unaccompanied, UAQ/UEQ, 278; visiting, VOQ, 45, VAQ/VEQ, 60, TLF, 70. **Clinic.**

Peterson AFB, Colo. 80914-5000; at eastern edge of Colorado Springs. **Phone:** 719-556-7321; DSN 834-7321. **Majcom:** AFSPC. **Host:** 21st Space Wing. **Mission:** provides missile warning and space control; detects, tracks, and catalogs objects in space. **Major tenants:** NORAD; Air Force Space Command; Army Space Command; 302nd AW (AFRC), C-130; Edward J. Peterson Air and Space Museum. **History:** activated 1942. Named for 1st Lt. Edward J. Peterson, killed Aug. 8, 1942. **Area:** 1,277 acres. **Runway:** shared with city. **Altitude:** 6,200 ft. **Personnel:** permanent party military, 5,542; DOD civilians, 4,427. **Housing:** single family, officer, 107, enlisted, 384; unaccompanied, UAQ/UEQ, 704; visiting, VQ, 100, VAQ/VEQ, 54, TLF, 68. **Clinic.**

Pope AFB, N.C. 28308-2391; 12 mi. NNW of Fayetteville. **Phone:** 910-394-1110; DSN 424-1110. **Majcom:** AMC. **Host:** 43rd AW. **Mission:** C-130 operations. Adjoins Army's Ft. Bragg and provides intratheater combat airlift and close air support for airborne forces and other personnel, equipment, and supplies. **Major tenants:** 23rd Fighter Group (ACC), A/OA-10; 18th Air Support Operations Gp. (ACC); 21st and 24th STSs (AFSOC); USAF Combat Control School. **History:** activated 1919. Named after 1st Lt. Harley H. Pope, WWI pilot, killed Jan. 7, 1919. **Area:** 2,198 acres. **Runway:** 7,500 ft. **Altitude:** 218 ft. **Personnel:** permanent party military, 4,427; DOD civilians, 527. **Housing:** single family, officer, 84, enlisted, 543; unaccompanied, UAQ/UEQ, 600; visiting, VOQ, 124, VAQ/VEQ, 70, TLF, 22. **Clinic.**

RAF Lakenheath, United Kingdom, APO AE 09464-5000; 70 mi. NE of London; 25 mi. NE of Cambridge. **Phone:** (cmcl, from CONUS) 011-44-1638-52-3000; DSN 226-1110. **Majcom:** USAFE. **Host:** 48th FW (USAFE). **Mission:** F-15C/D and F-15E operations. **History:** activated 1941. US forces arrived August 1948; the 48th FW arrived January 1960. Named after nearby village. **Area:** 2,004 acres. **Runway:** 9,000 ft. **Altitude:** 32 ft. **Personnel:** permanent party military, 4,700; DOD civilians, 380; **Housing:** single family, officer, 354, enlisted, 1,967; unaccompanied, UAQ/UEQ, 984; visiting, VOQ, 88, VAQ/VEQ, 46, TLF, 33. **Regional medical center.**

RAF Mildenhall, United Kingdom, APO AE 09459-5000; 20 mi. NE of Cambridge. **Phone:** (cmcl, from CONUS) 011-44-1638-54-3000; DSN 238-3000. **Majcom:** USAFE. **Host:** 100th ARW. **Mission:** KC-135R operations. **Major tenants:** 3rd Air Force (USAFE); 352nd SOG (AFSOC), MC-130, MH-53; 95th RS (ACC); 488th Intelligence Sq. (ACC); Naval Air Facility, UC-12M aircraft. **GSUs:** 422nd Air Base Support, RAF Croughton; 423rd ABS, RAF Molesworth; 424th ABS, RAF Fairford; 426th ABS, Stavanger, Norway. **History:** activated 1934; US presence began July 1950. Named after nearby town. **Area:** 1,144 acres. **Runway:** 9,227 ft. **Altitude:** 33 ft. **Personnel:** permanent party military, 4,600; DOD civilians, 225. **Housing:** single family, officer, 40, enlisted, 61; unaccompanied, UAQ/UEQ, 783; visiting, VQ, 300, TLF, 36.

Ramstein AB, Germany, APO AE 09094-0385; adjacent to the city of Ramstein, 10 mi. W of Kaiserslautern. **Phone:** (cmcl, from CONUS) 011-49-6371-47-1110; DSN 480-1110. **Majcom:** USAFE. **Host:** 86th AW. **Mission:** C-9, C-20, C-21, and C-130E operations; provides inter- and intratheater airlift, intratheater aeromedical evacuation, and CONUS staging and aeromedical evacuation. Wing commander also serves as commander of the Kaiserslautern Military Community. **Major Tenant:** USAFE. **History:** activated and US presence began 1953. **Area:** 10,261 acres. **Runway:** 8,015 ft. **Altitude:** 782 ft. **Personnel:** permanent party military, 13,900; DOD civilians, 2,140. **Housing:** single family, officer, 473, enlisted, 4,588; unaccompanied, UOQ, 32, UAQ/UEQ, 1,795; visiting, VOQ/VEQ, 547, TLF, 70. **Clinic.**

Randolph AFB, Tex. 78150-5000; 17 mi. ENE of San Antonio. **Phone:** 210-652-1110; DSN 487-1110. **Majcom:** AETC. **Host:** 12th FTW. **Mission:** conducts AT-38, T-1A, T-6, T-37, and T-38 instructor pilot training; Introduction to Fighter Fundamentals in AT-38; Joint Undergraduate Navigator Training in the T-43; electronic warfare officer training; C-21A airlift. **Major tenants:** AETC; 19th Air Force; Air Force Personnel Center; Air Force Manpower and Innovation Agency; Air Force Services Agency; Air Force Recruiting Service. **History:** dedicated June 1930. Named for Capt. William M. Randolph, killed Feb. 17, 1928. **Area:** 5,044 acres. **Runways:** 9,350 ft. and 8,350 ft. **Altitude:** 761 ft. **Personnel:** permanent party military, 5,493; DOD civilians, 3,640. **Housing:** single family, officer, 218, enlisted, 548; unaccompanied, UOQ, 202, UAQ/UEQ, 316; visiting, VOQ, 353, VAQ/VEQ, 179, TLF, 30. **Clinic.**

Rhein–Main AB, Germany, APO AE 09050-5000; 5 mi. S of Frankfurt. **Phone:** (cmcl, from CONUS) 011-49-69-699-1110; DSN 330-1110. **Majcom:** USAFE. **Host:** 469th Air Base Gp. **Mission:** Contingency operations; provides support for major airlift contingencies. **Major tenants:** 726th Air Mobility Sq., US Army 64th Replacement Co. **History:** activated July 1936. US forces began operations March 1945. Named after the confluence of the Rhein and Main Rivers west of Frankfurt. Base returns to Germany Dec. 31, 2005. **Area:** 532 acres. **Runways:** three, each 13,123 ft. **Altitude:** 365 ft. **Personnel:** permanent party military, 590; DOD civilians, 1,100. **Housing:** single family, officer, 61, enlisted, 235; visiting, VOQ, 72, VAQ/VEQ, 83, TLF, 12. **Clinic.**

Robins AFB, Ga. 31098; 15 mi. SSE of Macon at Warner Robins. **Phone:** 478-926-1110; DSN 468-1001. **Majcom:** AFMC. **Host:** Warner Robins Air Logistics Center. **Mission:** provides worldwide logistics management for the C-5, C-130, C-141, and F-15, helicopters, missiles, and remotely piloted vehicles; LANTIRN system, JTIDS, avionics, most Air Force airborne electronic warfare equipment, airborne communications equipment, airborne bomb- and gun-directing systems, fire-fighting equipment, general-purpose vehicles, and the USAF portion of the Global Command and Control System. **Major tenants:** Air Force Reserve Command; 116th Air Control Wing (ACC), E-8; 116th BW (ANG), B-1B; 19th ARG (AMC), KC-135; 5th Combat Communications Gp. (ACC). **History:** activated March 1942. Named for Brig. Gen. Augustine Warner Robins, an early chief of the Materiel Division of the Army Air Corps, who died June 16, 1940. **Area:** more than 8,700 acres. **Runway:** 12,000 ft. **Altitude:** 294 ft. **Personnel:** permanent party military, 2,136; DOD civilians, 10,436. **Housing:** single family, officer, 243, enlisted, 1,226; unaccompanied, 676; visiting, VOQ, 137, VAQ/VEQ, 140, TLF, 50. **Clinic.**

Schriever AFB, Colo. 80912-5000; 10 mi. E of Colorado Springs. **Phone:** 719-567-1110; DSN 560-1110. **Majcom:** AFSPC. **Host:** 50th Space Wing. **Mission:** Command and Control of DOD satellites. **Major tenants:** Joint National Test Facility; Space Warfare Center; Space Battlelab; 310th Space Gp. (AFRC). **History:** activated October 1985 as Falcon AFB. Renamed in June 1998 for Gen. Bernard A. Schriever. **Area:** 3,840 acres. **Runway:** none. **Altitude:** 6,267 ft. **Personnel:** permanent party military, 2,107; DOD civilians, 475. **Housing:** none. **Medical aid station and dental clinic.**

Scott AFB, Ill. 62225-5000; 6 mi. ENE of Belleville. **Phone:** 618-256-1110; DSN 576-1110. **Majcom:** AMC. **Host:** 375th AW. **Mission:** C-9 and C-21 operations. **Major tenants:** US Transportation Command; Air Mobility Command; Air Force Communications Agency; Defense Information Technology Contracting Office; 126th ARW (ANG), KC-135; 932nd AW (AFRC), C-9. **History:** activated June 14, 1917.

Named for Cpl. Frank S. Scott, the first enlisted man to die in an aircraft accident, killed Sept. 28, 1912. **Area:** 3,230 acres. **Runways:** 10,000 ft. and 8,000 ft. (joint-use airfield). **Altitude:** 453 ft. **Personnel:** permanent party military, 6,200; DOD civilians, 2,300. **Housing:** single family, officer, 305, enlisted, 1,122; unaccompanied, UAQ/UEQ, 564; visiting, VOQ, 220, VAQ/VEQ, 169, TLF, 36. **Hospital.**

Seymour Johnson AFB, N.C. 27531; within city limits of Goldsboro. **Phone:** 919-722-1110; DSN 722-1110. **Majcom:** ACC. **Host:** 4th FW. **Mission:** F-15E operations and training. **Major tenant:** 916th ARW (AFRC), KC-135R. **History:** activated June 12, 1942. Named for Navy Lt. Seymour A. Johnson, Goldsboro native, killed March 5, 1941. **Area:** 4,107 acres. **Runway:** 11,758 ft. **Altitude:** 110 ft. **Personnel:** permanent party military, 4,247; DOD civilians, 1,296. **Housing:** single family, officer, 157, enlisted, 1,534; unaccompanied, 724; visiting, VOQ, 72, VAQ/VEQ, 38, TLF, 69. **Clinic.**

Shaw AFB, S.C. 29152-5000; 10 mi. WNW of Sumter. **Phone:** 803-895-1110; DSN 965-1110. **Majcom:** ACC. **Host:** 20th FW. **Mission:** F-16CJ operations. **Major tenants:** 9th Air Force (ACC); US Central Command Air Forces. **History:** activated Aug. 30, 1941. Named for 1st Lt. Ervin D. Shaw, one of the first Americans to see air action in WWI, killed in France July 9, 1918. **Area:** 3,363 acres; supports another 13,000 acres. **Runways:** 10,000 ft. and 8,000 ft. **Altitude:** 242 ft. **Personnel:** permanent party military, 5,460; DOD civilians, 570. **Housing:** single family, officer, 170, enlisted, 1,532; unaccompanied, 1,112; visiting, VQ, 97, TLF, 39. **Hospital** (no emergency room).

Sheppard AFB, Tex. 76311-5000; 4 mi. N of Wichita Falls. **Phone:** 940-676-2511; DSN 736-2511. **Majcom:** AETC. **Host:** 82nd Training Wing. **Mission:** largest of AETC's four technical training centers. Conducts resident training in aircraft maintenance, civil engineering, communications, comptroller, transportation, and various medical specialties; provides instruction in a wide range of specialties at more than 40 USAF installations worldwide. **Major tenant:** 80th FTW (AETC), conducts T-37 and T-38 UPT, instructor pilot training in the Euro–NATO Joint Jet Pilot Training program, and Introduction to Fighter Fundamentals course with AT-38 aircraft. **History:** activated June 14, 1941. Named for US Sen. Morris E. Sheppard, who died April 9, 1941. **Area:** 6,158 acres. **Runways:** 13,100 ft., 8,800 ft., 7,000 ft., and 6,000 ft. **Altitude:** 1,015 ft. **Personnel:** permanent party military, 3,577; DOD civilians, 1,376. **Housing:** single family, officer, 200, enlisted, 1,088; unaccompanied, UOQ, 196, UAQ/UEQ, 330; visiting, VOQ, 426, VAQ/VEQ, 1,448, TLF, 80. **Clinic.**

Spangdahlem AB, Germany, APO AE 09126-5000; 20 mi. NE of Trier; 9 mi. E of Bitburg. **Phone:** (cmcl, from CONUS) 011-49-6565-61-1110; DSN 452-1110. **Majcom:** USAFE. **Host:** 52nd FW. **Mission:** A/OA-10A and HARM–equipped F-16CJ operations; air control squadron ops with logistics responsibilities at dozens of GSUs. **History:** built by the French in 1951 and turned over to US in 1952. Named after nearby town. **Area:** 1,282 acres. **Runway:** 10,000 ft. **Altitude:** 1,196 ft. **Personnel:** permanent party military, 5,500; DOD civilians, 193. **Housing:** single family, officer, 131, enlisted, 1,952; unaccompanied, UAQ/UEQ, 937; visiting, VOQ/VEQ, 119, TLF, 47. **Hospital.**

Tinker AFB, Okla. 73145-3010; 8 mi. SE of Oklahoma City. **Phone:** 405-732-7321; DSN 884-1110. **Majcom:** AFMC. **Host:** Oklahoma City Air Logistics Center. **Mission:** manages and provides logistics support and depot maintenance for more than 850 aircraft, including the B-1B, B-2, B-52, E-3, E-6, and KC-135. **Major tenants:** 552nd Air Control Wing (ACC), E-3; 507th ARW (AFRC), KC-135; 513th Air Control Gp. (AFRC Assoc.); Navy Strategic Communications Wing One; Defense Logistics Agency's Defense Distribution Depot Oklahoma City; 3rd Combat Communications Gp. (ACC); 38th Engineering Installation Gp. (AFMC); Defense Megacenter Oklahoma City. **History:** activated March 1942. Named for Maj. Gen. Clarence L. Tinker, who went down at sea June 7, 1942. **Area:** 5,020 acres. **Runways:** 11,100 ft. and 10,000 ft. **Altitude:** 1,291 ft. **Personnel:** permanent party military, 1,546; DOD civilians, 13,265. **Housing:** single family, officer, 107, enlisted, 623; unaccompanied, UAQ/UEQ, 932; visiting, VOQ, 109, VAQ/VEQ, 50, TLF, 40. **Clinic.**

Travis AFB, Calif. 94535-5000; 50 mi. NE of San Francisco at Fairfield. **Phone:** 707-424-1110; DSN 837-1110. **Majcom:** AMC. **Host:** 60th AMW. **Mission:** C-5 and KC-10 operations. **Major tenants:** 15th Air Force (AMC); 349th AMW (AFRC Assoc.); USAF Band of the Golden West; Air Museum. **History:** activated May 17, 1943. Named for Brig. Gen. Robert F. Travis, killed Aug. 5, 1950. **Area:** 6,383 acres. **Runways:** two, each approx. 11,000 ft. **Altitude:** 62 ft. **Personnel:** permanent party military, 7,315; DOD civilians, 3,494. **Housing:** single family, officer, 262, enlisted, 2,474; unaccompanied, UAQ/UEQ, 1,627; visiting, VOQ, 138, VAQ/VEQ, 134, TLF, 84. **David Grant Medical Center.**

Tyndall AFB, Fla. 32403-5000; 12 mi. E of Panama City. **Phone:** 850-283-1113; DSN 523-1113. **Majcom:** AETC. **Host:** 325th FW. **Mission:** F-15 operations; trains USAF F-15 air-to-air pilots. **Major tenants:** 1st Air Force (ANG); Southeast Air Defense Sector (ANG); 53rd Weapons Evaluation Gp. (ACC); Air Force Civil Engineer Support Agency. **History:** activated Dec. 7, 1941. Named for 1st Lt. Frank B. Tyndall, WWI fighter pilot killed July 15, 1930. **Area:** 29,102 acres. **Runways:** 10,000 ft., 8,075 ft., and 7,000 ft. **Altitude:** 18 ft. **Personnel:** permanent party military, 2,572; DOD civilians, 449. **Housing:** single family, officer, 123, enlisted, 934; unaccompanied, UAQ/UEQ, 448; visiting, VOQ, 219, VAQ/VEQ, 406, TLF, 40. **Clinic.**

US Air Force Academy, Colo. 80840-5025; N of Colorado Springs. **Phone:** 719-333-1110; DSN 333-1110. **Host:** USAFA. **Mission:** inspires and develops outstanding young men and women to become Air Force officers with knowledge, character, and discipline. **History:** established April 1, 1954. Moved to permanent location August 1958. **Area:** 18,325 acres. **Runways:** 4,500 ft., 3,500 ft., and 2,300 ft. **Altitude:** 7,200 ft. **Personnel:** permanent party military, 2,000; DOD civilians, 1,500. **Housing:** single family, officer, 346, enlisted, 895; unaccompanied, 161; visiting, VQ, 83, TLF, 30. **Hospital.**

Vance AFB, Okla. 73705-5000; 3 mi. SSW of Enid. **Phone:** 580-213-7111; DSN 448-7110. **Majcom:** AETC. **Host:** 71st FTW. **Mission:** provides Joint SUPT in T-1, T-37, and T-38 aircraft. **History:** activated November 1941. Named for Lt. Col. Leon R. Vance Jr., Enid native, 1939 West Point graduate, and Medal of Honor recipient, killed July 26, 1944. **Area:** 4,555 acres. **Runways:** two, each 9,200 ft., 5,100 ft., 5,038 ft., and 4,956 ft. **Altitude:** 1,007 ft. **Personnel:** permanent party military, 804; DOD civilians, 212. **Housing:** single family, officer, 132, enlisted, 98; unaccompanied, UOQ, 210, UAQ/UEQ, 109; visiting, VQ, 48, TLF, 10. **Clinic.**

Vandenberg AFB, Calif. 93437-5000; 8 mi. NNW of Lompoc. **Phone:** 805-606-1110; DSN 276-1110. **Majcom:** AFSPC. **Host:** 30th Space Wing. **Mission:** conducts polar-orbiting space launches and supports R&D tests and launch range operations for DOD, USAF, and NASA space, ballistic missile, and aeronautical systems and commercial space launches; provides test support for DOD space and ICBM systems; furnishes facilities and essential services to more than 36 aerospace contractors. **Major tenants:** 14th Air Force (AFSPC); 381st Training Gp. (AETC); 576th Flight Test Sq. (Space Warfare Center). **History:** originally Army's Camp Cooke. Activated October 1941; taken over by USAF June 7, 1957. Renamed for Gen. Hoyt S. Vandenberg, USAF's second Chief of Staff. **Area:** 98,400 acres. **Runway:** 15,000 ft. **Altitude:** 367 ft. **Personnel:** permanent party military, 3,400; DOD civilians, 1,400. **Housing:** single family, officer, 413, enlisted, 1,524; unaccompanied, UOQ, 70, UAQ/UEQ, 670; visiting, VOQ, 129, VAQ/VEQ, 122, TFL, 26. **Clinic.**

Whiteman AFB, Mo. 65305-5000; 2 mi. S of Knob Noster. **Phone:** 660-687-1110; DSN 975-1110. **Majcom:** ACC. **Host:** 509th BW. **Mission:** B-2 operations. **Major tenants:** 442nd FW (AFRC), OA-10; 1st Battalion, 135th Aviation Regiment (ARNG); Mobile Inshore Undersea Warfare Unit 114 (Navy Reserve). **History:** activated 1942. Named for 2nd Lt. George A. Whiteman, first pilot to die in aerial combat during the attack on Pearl Harbor. **Area:** 5,219 acres. **Runway:** 12,400 ft. **Altitude:** 871 ft. **Personnel:** permanent party military, 3,443; DOD civilians, 841. **Housing:** single family, officer, 94, enlisted, 1,164; unaccompanied, 669; visiting, VOQ, 3, VQ, 88, TFL, 32. **Clinic.**

Wright–Patterson AFB, Ohio 45433; 10 mi. ENE of Dayton. **Phone:** 937-257-1110; DSN 787-1110. **Majcom:** AFMC. **Host:** Aeronautical Systems Center. **Mission:** develops, acquires, modernizes, and sustains aerospace systems. **Major tenants:** Air Force Materiel Command; Air Force Research Laboratory (AFMC); Air Force Security Assistance Center (AFMC); 445th AW (AFRC), C-141; Air Force Institute of Technology (AETC); USAF Museum. **History:** originally separate, Wright Field and Patterson Field were merged and redesignated Wright–Patterson AFB Jan. 13, 1948. Named for aviation pioneers Orville and Wilbur Wright and for 1st Lt. Frank S. Patterson, killed June 19, 1918. The Wright brothers did much of their early flying on Huffman Prairie, now in Area C of present base. The prairie is part of the Dayton Aviation Heritage National Historical Park. Site of US Air Force Marathon, held annually on Saturday nearest Sept. 18. **Area:** 8,357 acres. **Runway:** 12,600 ft. **Altitude:** 824 ft. **Personnel:** permanent party military, 4,564; DOD civilians, 8,400. **Housing:** single family, officer, 545, enlisted, 1,603; unaccompanied, UAQ/UEQ, 364; visiting, VQ, 422, TLF, 40. **Wright–Patterson Medical Center.**

Yokota AB, Japan, APO AP 96328-5000; approx. 28 mi. W of downtown Tokyo. **Phone:** (cmcl, from CONUS) 011-81-311-755-1110; DSN 315-225-1110. **Majcom:** PACAF. **Host:** 374th AW. **Mission:** C-9, C-21, C-130, and UH-1N operations. Primary aerial port in Japan. **Major tenants:** US Forces, Japan; 5th Air Force (PACAF); 630th AMSS (AMC); Det. 1, Air Force Band of the Pacific; American Forces Network Tokyo. **History:** opened as Tama AAF by the Japanese in 1939. **Area:** 1,750 acres. **Runway:** 11,000 ft. **Altitude:** 457 ft. **Personnel:** permanent party military, 3,017; DOD civilians, 226. **Housing:** single family, officer, 823, enlisted, 1,886; unaccompanied, UOQ, 388, UAQ/UEQ, 824; visiting, VOQ, 197, VAQ/VEQ, 111, TLF, 188. **Hospital.**

ANG and AFRC Installations

This section consolidates Air National Guard and Air Force Reserve Command facilities into a single listing. Units are listed by base names or according to the airports whose facilities they share. In addition, some ANG and AFRC units are located on USAF bases and are included as major tenants on those bases in the "Major Active Duty Installations" section.

ANG and AFRC personnel are organized into two categories. Part-time personnel are traditional Guardsmen and Reservists who work in the private sector during the week, serve in ANG or AFRC one weekend each month, and go on active duty for two weeks during the year. If called up by the President, they go on active military status.

ANG's second category, full-time support personnel, are Title 32 Active Guard Reserve (AGR), Title 32 civilians, and Title 5 civilians. Guard AGR positions are controlled by the state. They do not serve at the national level. They receive the same benefits as regular active duty military. Title 32 civilian personnel are civilians employed full-time by the Guard and must also serve in military status one weekend per month and for two weeks of training per year. They can also be activated and mobilized during times of national crisis. Title 5 civilian personnel are federal civilian employees who hold administrative positions in ANG.

AFRC's second category, full-time support personnel, are Title 32 AGR, Title 32 Air Reserve Technicians (ART), and Title 5 civilians. Reservists in AGR positions serve primarily in flight training and flight testing units, as recruiters, or at the headquarters level. They receive the same benefits as regular active duty military. Title 32 ARTs are full-time federal civilian employees who serve in the same position as Reservists at least one weekend per month and for two weeks of training per year. They can also be activated and mobilized during times of national crisis. Title 5 personnel are federal civilian employees who hold administrative positions in AFRC.

Allen C. Thompson Field, Miss. 39232-8881; 6 mi. E of Jackson. **Phone:** 601-936-8370; DSN 731-9370. **Unit:** 172nd Airlift Wing (ANG). **Area:** 140 acres. **Runway:** 8,500 ft. **Altitude:** 346 ft. **Full-time personnel:** 284.

Alpena County Arpt., Mich. 49707; 5 mi W of Alpena. **Phone:** 989-354-6210; DSN 741-3210. **Unit:** Combat Readiness Training Center (ANG). **Area:** 610 acres. **Runways:** 9,000 ft. and 5,030 ft. **Altitude:** 682 ft. **Full-time personnel:** 76.

Atlantic City Arpt., N.J. 08234-9500; 9 mi. NW of Atlantic City. **Phone:** 609-645-6000; DSN 455-6000. **Unit:** 177th Fighter Wing (ANG). **Area:** 296 acres. **Runways:** 10,000 ft. and 6,144 ft. **Altitude:** 71 ft. **Full-time personnel:** 274.

AGS	**Air Guard Station**
ANGB	**Air National Guard Base**
ANGS	**Air National Guard Station**
ARB	**Air Reserve Base**
Arpt.	**Airport**
ARS	**Air Reserve Station**
JRB	**Joint Reserve Base**
NAS	**Naval Air Station**

Bangor Arpt., Maine 04401-3051; within city of Bangor. **Phone:** 207-990-7700; DSN 698-7700. **Units:** 101st Air Refueling Wing (ANG); 776th Radar Sq. (ACC). **Area:** 503 acres. **Runway:** 11,400 ft. **Altitude:** 178 ft. **Full-time personnel:** 307. Commissary; exchange.

Barnes Arpt., Mass. 01085-1482; 3 mi. N of downtown Westfield. **Phone:** 413-568-9151; DSN 636-9210. **Unit:** 104th Fighter Wing (ANG). **Area:** 186 acres. **Runway:** 9,000 ft. **Altitude:** 271 ft. **Full-time personnel:** 269.

Birmingham Arpt., Ala. 35217-3545, 7 mi. E of Birmingham. **Phone:** 205-714-2000; DSN 778-2210. **Unit:** 117th Air Refueling Wing (ANG). **Area:** 145 acres. **Runway:** 10,000 ft. **Altitude:** 644 ft. **Full-time personnel:** 251.

Boise Air Terminal (Gowen Field), Idaho 83705-8006; 1 mi. S of Boise. **Phone:** 208-422-5322; DSN 422-5322. **Units:** 124th Wing (ANG). Also host for the Army National Guard (ARNG); Army Reserve; Army Research Institute; Navy/Marine Corps Reserves; and Civil Air Patrol. **History:** named for Lt. Paul R. Gowen, killed in B-10 crash in Panama July 11, 1938. **Area:** 576 acres. **Runway:** 9,800 ft. **Altitude:** 2,836 ft. **Full-time personnel:** 490. Limited transient facilities available during ARNG camps.

Bradley Arpt., Conn. 06026-9309; 15 mi. N of Hartford. **Phone:** 860-292-2526; DSN 636-8310. **Units:** 103rd Fighter Wing (ANG); ARNG aviation battalion. **History:** named for Lt. Eugene M. Bradley, killed in P-40 crash August 1941. **Area:** 148 acres. **Runway:** 9,600 ft. **Altitude:** 172 ft. **Full-time personnel:** 278.

Burlington Arpt., Vt. 05403-5872; 1 mi. E of Burlington. **Phone:** 802-660-5215; DSN 220-5215. **Unit:** 158th Fighter Wing (ANG). **Area:** 230 acres. **Runway:** 7,800 ft. **Altitude:** 355 ft. **Full-time personnel:** 296.

Capital Arpt., Ill. 62707-5001; 4 mi. NW of Springfield. **Phone:** 217-757-1219; DSN 892-8219. **Unit:** 183rd Fighter Wing (ANG). **Area:** 91 acres. **Runways:** 8,000 ft., 7,000 ft., and 5,300 ft. **Altitude:** 588 ft. **Full-time personnel:** 312.

Channel Islands ANGS, Calif. 93041-4002, 3 mi. SE of Oxnard. **Phone:** 805-986-8000; DSN 893-7000. **Unit:** 146th Airlift Wing (ANG). **Area:** 206 acres. **Runway:** 11,100 ft. **Altitude:** 12 ft. **Full-time personnel:** 262.

Charlotte/Douglas Arpt., N.C. 28208, 6 mi. W of downtown Charlotte. **Phone:** 704-391-4100; DSN 583-9129. **Unit:** 145th Airlift Wing (ANG). **Area:** 79 acres. **Runway:** 10,000 ft. **Altitude:** 745 ft. **Full-time personnel:** 294.

Cheyenne Arpt., Cheyenne, Wyo. 82009. **Phone:** 307-772-6110; DSN 943-6110. **Unit:** 153rd Airlift Wing (ANG). **Area:** 77 acres. **Runway:** 9,400 ft. **Altitude:** 6,250 ft. **Full-time personnel:** 263.

Dannelly Field, Ala. 36108; 7 mi. SW of downtown Montgomery. **Phone:** 334-394-7200; DSN 358-9200. **Units:** 187th Fighter Wing (ANG); 232nd Combat Communications Sq. **History:** named for Ens. Clarence Dannelly, Navy pilot killed during WWII. **Area:** 143 acres. **Runway:** 9,000 ft. **Altitude:** 221 ft. **Full-time personnel:** 273.

Des Moines Arpt., Iowa 50321-2799; within Des Moines. **Phone:** 515-256-8210; DSN 946-8210. **Unit:** 132nd Fighter Wing (ANG). **Area:** 162 acres. **Runway:** 9,000 ft. **Altitude:** 942 ft. **Full-time personnel:** 306.

Dobbins ARB, Ga. 30069-5010; 16 mi. NW of Atlanta. **Phone:** 678-655-5000; DSN 625-1110. **Units:** Hq. 22nd Air Force (AFRC); 94th Airlift Wing (AFRC); Hq. Ga. ANG; Army Aviation Group (Ga. ARNG); US Army Reserve Center; 283rd Combat Communications Sq.; and Marine Corps Reserve Center Atlanta. **History:** activated 1943. Named for Capt. Charles Dobbins, pilot killed in WWII. **Area:** 1,660 acres. NAS Atlanta and Lockheed Martin Aeronautical Systems Co./Air Force Plant 6 adjoin Dobbins ARB and use airfield facilities. **Runway:** 10,000 ft. **Altitude:** 193 ft. **Full-time personnel:** AFRC, 656; ANG, 37.

Duke Field, Fla. 32542-6644; 6 mi. S of Crestview. **Phone:** 850-883-6347; DSN 875-6347. **Unit:** 919th Special Operations Wing (AFRC). **History:** Named for Lt. Robert L. Duke, pilot killed Dec. 29, 1943, in test flight. **Area:** 1,348 acres. **Runway:** 8,000 ft. **Altitude:** 193 ft. **Full-time personnel:** active duty, 300; ARTs, 300.

Duluth Arpt., Minn. 55811-6036; 5 mi. WNW of Duluth. **Phone:** 218-788-7210; DSN 825-7210. **Unit:** 148th Fighter Wing (ANG). **Area:** 285 acres. **Runway:** 10,150 ft. **Altitude:** 1,430 ft. **Full-time personnel:** 286.

Eastern West Virginia Arpt. (Shepherd Field), W. Va. 25401-7702; 4 mi. S of Martinsburg. **Phone:** 304-262-5100; DSN 242-9210. **Unit:** 167th Airlift Wing (ANG). **Area:** 206 acres. **Runway:** 7,000 ft. **Altitude:** 557 ft. **Full-time personnel:** 287.

Ellington Field, Tex. 77034-5586; a city of Houston airport 10 mi. SE of downtown Houston. **Phone:** 281-929-2337; DSN 454-2337. **Units:** 147th Fighter Wing (ANG); 111th FIS, NASA Flight Operations; US Coast Guard; ARNG; FAA. **History:** named for Lt. Eric L. Ellington, pilot killed November 1913. **Area:** 190 acres. **Runway:** 9,000 ft. **Altitude:** 1,000 ft. **Full-time personnel:** 263.

Forbes Field, Kan. 66619-5370; 6 mi. S of Topeka. **Phone:** 785-861-4210; DSN 720-4210. **Unit:** 190th Air Refueling Wing (ANG). **History:** named for Maj. Daniel H. Forbes Jr., pilot killed June 5, 1948, test-flying the Northrop YB-49 "Flying Wing." **Area:** 193 acres. **Runway:** 12,819 ft. **Altitude:** 1,079 ft. **Full-time personnel:** 272.

Fort Smith Arpt., Ark. 72903; within Fort Smith. **Phone:** 501-648-5210; DSN 962-8210. **Unit:** 188th Fighter Wing (ANG). **Area:** 130 acres. **Runway:** 8,000 ft. **Altitude:** 468 ft. **Full-time personnel:** 280.

Fort Wayne Arpt., Ind. 46809-0122; 8 mi. SSW of downtown Fort Wayne. **Phone:** 219-478-3210; DSN 786-1210. **Unit:** 122nd Fighter Wing (ANG). **Area:** 166 acres. **Runway:** 12,000 ft. **Altitude:** 802 ft. **Full-time personnel:** 282.

Francis S. Gabreski Arpt., N.Y. 11978-1201; 1 mi. N of Westhampton Beach. **Phone:** 631-288-7335; DSN 456-7335. **Unit:** 106th Rescue Wing (ANG). **History:** named for Col. Francis S. Gabreski, WWII and Korean War ace. **Area:** 88 acres. **Runways:** 9,000 ft., 5,000 ft., and 3,000 ft. **Altitude:** 68 ft. **Full-time personnel:** 245.

Fresno Yosemite Arpt., Calif. 93727-2199; within Fresno. **Phone:** 559-454-5100; DSN 949-9100. **Unit:** 144th Fighter Wing (ANG). **Area:** 111 acres. **Runway:** 9,222 ft. **Altitude:** 332 ft. **Full-time personnel:** 290.

General Mitchell Arpt./ARS, Wis. 53207-6299; SW corner of Milwaukee. **AFRC phone:** 414-482-5000; DSN 741-5000. **ANG phone:** 414-944-8410; DSN 580-8410. **Units:** 440th Airlift Wing (AFRC); 128th Air Refueling Wing (ANG). **History:** named for Maj. Gen. William "Billy" Mitchell. **Area:** AFRC, 103 acres; ANG, 70 acres. **Runway:** 9,690 ft. **Altitude:** 670 ft. **Full-time personnel:** AFRC, 371; ANG, 274.

Greater Peoria Arpt., Ill. 61607-5023; 5 mi. SW of Peoria. **Phone:** 309-633-5210; DSN 724-5210. **Unit:** 182nd Airlift Wing (ANG). **Area:** 339 acres. **Runways:** 10,000 ft. and 8,006 ft. **Altitude:** 656 ft. **Full-time personnel:** 285.

Great Falls Arpt., Mont. 59404-5570; 5 mi. SW of Great Falls. **Phone:** 406-791-6285; DSN 279-2285. **Unit:** 120th Fighter Wing (ANG). **Area:** 141 acres. **Runways:** 10,502 ft. and 6,357 ft. **Altitude:** 3,679 ft. **Full-time personnel:** 290.

Grissom ARB, Ind. 46971-5000; 15 mi. N of Kokomo. **Phone:** 765-688-5211; DSN 928-1110. **Unit:** 434th Air Refueling Wing (AFRC). **History:** activated January 1943 as Bunker Hill NAS. Reactivated June 1954 as Bunker Hill AFB. Renamed in May 1968 for Lt. Col. Virgil I. "Gus" Grissom, killed Jan. 27, 1967, in Apollo capsule fire. Realigned as an AFRC base Oct. 1, 1994. **Area:** 1,127 acres. **Runway:** 12,500 ft. **Altitude:** 800 ft. **Housing:** 485 transient. **Full-time personnel:** 589.

Gulfport–Biloxi Arpt., Miss. 39507; within Gulfport. **Phone:** 228-214-6002; DSN 363-6002. **Units:** Combat Readiness Training Center; 255th Air Control Sq. (ANG); 209th Civil Engineering Sq. An air-to-ground gunnery range is located 70 mi. N of site. **History:** established as a Permanent Field Training Site in 1954 and redesignated as a CRTC in 1990. **Area:** 224 acres. **Runway:** 9,000 ft. **Altitude:** 26 ft. **Full-time personnel:** 119.

Hancock Field, N.Y. 13211-7099; 4 mi. NE of Syracuse. **Phone:** 315-454-6100; 1-800-982-3696; DSN 489-9100. **Units:** 174th Fighter Wing (ANG); 152nd Air Operations Gp.; 274th Air Support Operations Sq. (N.Y. ARNG). **Area:** 356 acres. **Runways:** 9,300 ft. and 7,500 ft. **Altitude:** 410 ft. **Full-time personnel:** 331.

Harrisburg Arpt., Pa. 17057; 6 mi. SE of Harrisburg. **Phone:** 717-948-2200; DSN 423-2200. **Unit:** 193rd Special Operations Wing (ANG). **Area:** 39 acres. **Runway:** 9,501 ft. **Altitude:** 355 ft. **Full-time personnel:** 309.

Hector Arpt., Fargo, N.D. 58102. **Phone:** 701-241-7241; DSN 362-8110. **Unit:** 119th Fighter Wing (ANG). **Area:** 250 acres. **Runway:** 9,545 ft. **Altitude:** 896 ft. **Full-time personnel:** 317.

Homestead ARB, Fla. 33039-1299; 5 mi. NE of Homestead. **Phone:** 305-224-7000; DSN 791-7000. **Units:** 482nd Fighter Wing (AFRC); Det. 1, 125th Fighter Wing (Fla. ANG, NORAD); US Customs Miami Aviation Branch; Fla. ARNG 50th ASG; Defense Logistics Agency; Civil Air Patrol Sq. 279; AFOSI; Naval Intelligence; FBI. **Area:** approx. 1,000 acres. **Runway:** 11,200 ft. **Altitude:** 11 ft. **Full-time personnel:** AFRC, 642; ANG, 14. Billeting available.

Hulman Arpt., Ind. 47803; 6 mi. E of Terre Haute. **Phone:** 812-877-5210; DSN 724-1210. **Unit:** 181st Fighter Wing (ANG). **Area:** 279 acres. **Runways:** 9,025 ft. and 7,250 ft. **Altitude:** 585 ft. **Full-time personnel:** 272.

Jacksonville Arpt., Fla. 32218-7933; within Jacksonville. **Phone:** 904-741-7100; DSN 641-7100. **Unit:** 125th Fighter Wing (ANG). **Area:** 332 acres. **Runway:** 10,000 ft. **Altitude:** 25 ft. **Full-time personnel:** 360.

Joe Foss Field, S.D. 57104-0264; N side of Sioux Falls. **Phone:** 605-988-5700; DSN 798-7700. **Unit:** 114th Fighter Wing (ANG). **History:** named for Brig. Gen. Joseph J. Foss, WWII ace, former governor, former AFA national president, and founder of the S.D. ANG. **Area:** 214 acres. **Runways:** 9,000 ft. and 5,070 ft. **Altitude:** 1,420 ft. **Full-time personnel:** 281.

Kelly Field, Tex. 78236-0112; 5 mi. SW of San Antonio. **Phone:** 210-671-1110; DSN 473-1110. **Units:** 149th Fighter Wing (ANG); 433rd Airlift Wing (AFRC). **History:** activated Nov. 21, 1916, and deactivated July 13, 2001. Named for Lt. George E.M. Kelly, first Army pilot to lose his life flying a military aircraft, killed May 10, 1911. **Area:** 4,660 acres. **Runway:** 11,550 ft. **Altitude:** 689 ft. **Full-time personnel:** 588.

Key Field, Miss. 39307-7112; 3 mi. S of Meridian. **Phone:** 601-484-9000; DSN 778-9000. **Units:** 186th Air Refueling Wing (ANG); 238th Air Support Operations Sq. (ANG). **History:** named after Fred and Al Key, pioneers in air-to-air refueling and holders of flight endurance record (27 continuous days) in 1935 in *Ole Miss,* on permanent display at the National Air and Space Museum. **Area:** 117 acres. **Runways:** 10,000 ft. and 5,000 ft. **Altitude:** 295 ft. **Full-time personnel:** 316.

Klamath Falls Arpt./Kingsley Field, Ore. 97603; 5 mi. S of Klamath Falls. **Phone:** 541-885-6350; DSN 830-6350. **Units:** 173rd Fighter Wing (ANG); 114th FS (ANG); 116th OLAA (ANG); 270th ATCS (ANG). **Area:** 381 acres. **Runway:** 10,301 ft. **Altitude:** 4,088 ft. **Full-time personnel:** 422.

Kulis ANGB, Alaska 99502-1988. **Phone:** 907-249-1176; DSN 317-626-1176. **Units:** 176th Wing (ANG); 144th Airlift Sq. (ANG); 210th Air Rescue Sq. (ANG). **History:** named for Lt. Albert Kulis, killed in training flight in 1954. **Area:** 129 acres. **Runway:** 10,897 ft. **Altitude:** 94 ft. **Full-time personnel:** 470.

Lambert–St. Louis Arpt., Mo. 63044-2371; 20 mi. NW of downtown St. Louis. **Phone:** 314-263-6222; DSN 693-6222. **Unit:** 131st Fighter Wing (ANG). **Area:** 48 acres. **Runway:** 11,000 ft. **Altitude:** 604 ft. **Full-time personnel:** 357.

Lincoln Arpt., Neb. 68524-1880; 4 mi. NW of downtown Lincoln. **Phone:** 402-458-1234; DSN 946-1234. **Units:** 155th Air Refueling Wing (ANG); ARNG unit. **Area:** 179 acres. **Runways:** 13,500 ft. and 8,620 ft. **Altitude:** 1,050 ft. **Full-time personnel:** 290.

Louisville Arpt./AGS (Standiford Field), Ky. 40213; 5 mi. S of downtown Louisville. **Phone:** 502-364-9400; DSN 989-4400. **Units:** 123rd Airlift Wing (ANG); 223rd Communications Sq. (ANG). **Area:** 81 acres. **Runways:** 10,000 ft. and 7,800 ft. **Altitude:** 500 ft. **Full-time personnel:** 312.

Luis Munoz Marin Arpt., Puerto Rico 00979-1502; E of San Juan. **Phone:** 787-253-5101; DSN 860-9101. **Units:** 156th Airlift Wing (ANG); 612th ASOS Det. Coronet Oak. **Area:** 95 acres. **Runway:** 10,000 ft. **Altitude:** 6 ft. **Full-time personnel:** 274.

Mansfield Lahm Arpt., Ohio 44903-0179; 3 mi. N of Mansfield. **Phone:** 419-520-6100; DSN 696-6100. **Unit:** 179th Airlift Wing (ANG). **History:** named for nearby city and aviation pioneer Brig. Gen. Frank P. Lahm in 1948. **Area:** 67 acres. **Runways:** 9,000 ft. and 6,795 ft. **Altitude:** 1,299 ft. **Full-time personnel:** 237.

March ARB, Calif. 92518-9888; 9 mi. SE of downtown Riverside. **Phone:** 909-655-1110; DSN 447-1110. **ANG Phone:** 909-655-2556; DSN 947-2556. **Units:** 4th Air Force (AFRC); 452nd Air Mobility Wing (AFRC); 144th FW (Calif. ANG); 163rd Air Refueling Wing (Calif. ANG); 4th Combat Camera Sq.; American Forces Radio and Television Broadcast Center; Defense Visual Information Center; Air Force Audit Agency directorate; US Customs Service Domestic Air Interdiction Coordination Center. **History:** activated March 1, 1918; named for 2nd Lt. Peyton C. March Jr., who died of crash injuries Feb. 18, 1918. **Area:** 2,300 acres. **Runway:** 13,300 ft. **Altitude:** 1,530 ft. **Full-time personnel:** AFRC, 1,155; ANG, 274. **Housing:** VOQ, 138, VAQ, 302.

Martin State Arpt., Md. 21220-2899; 8 mi. NE of Baltimore. **Phone:** 410-918-6210; DSN 243-6210. **Unit:** 175th Wing (ANG). **Area:** 175 acres. **Runway:** 8,100 ft. **Altitude:** 21 ft. **Full-time personnel:** 419.

McEntire ANGS, S.C. 29044; 15 mi. E of Columbia. **Phone:** 803-647-8300; DSN 583-8201. **Units:** 169th Fighter Wing (ANG); 240th Combat Communications Sq. (ANG); 245th Air Traffic Control Sq. (ANG); Combined Support Maintenance Shop (ARNG); 1/151st Aviation Battalion (ARNG). **History:** named for ANG Brig. Gen. B.B. McEntire Jr., killed in 1961 F-104 accident. **Area:** 2,301 acres. **Runway:** 9,000 ft. **Altitude:** 252 ft. **Full-time personnel:** 343.

McGhee Tyson ANGB, Tenn. 37777; 10 mi. SW of Knoxville. **Phone:** 865-985-3200; DSN 266-3200. **Units:** 134th Air Refueling Wing (ANG); 119th Air Control Sq.; 228th Combat Communications Sq.; ANG's I.G. Brown Training and Education Center. **Area:** 346 acres. **Runway:** 9,008 ft. **Altitude:** 923 ft. **Full-time personnel:** 336.

Memphis Arpt., Tenn. 38118; within Memphis. **Phone:** 901-541-7120; DSN 726-7120. **Unit:** 164th Airlift Wing (ANG). **Area:** 103 acres. **Runway:** 11,120 ft. **Altitude:** 332 ft. **Full-time personnel:** 257. Fitness center and mini-exchange.

Minneapolis–St. Paul Arpt./ARS, Minn. 55450-2000; in Minneapolis, near confluence of the Mississippi and Minnesota Rivers. **AFRC phone:** 612-713-1110; DSN 783-1000. **ANG phone:** 612-713-2501; DSN 783-2501. **Units:** 934th Airlift Wing (AFRC), C-130; 133rd Airlift Wing (ANG), C-130; 210th Engineering Installation Sq. (ANG); Naval Reserve Readiness Command, Region 16; Civil Air Patrol, NCLR, and MNLO; Rothe Development Inc. (AFRC). **Area:** AFRC, 300 acres; ANG, 128 acres. **Runways:** 11,006 ft., 10,000 ft., and 8,200 ft. **Altitude:** 840 ft. **Full-time personnel:** AFRC, 338; ANG, 267. Lodging, clubs, fitness center, and exchange.

Moffett Federal Airfield, Calif. 94035; 2 mi. N of Mountain View. **Phone:** 650-603-9129; DSN 359-9129. **Unit:** 129th Rescue Wing (ANG). **Area:** 97 acres. **Runway:** 9,200 ft. **Altitude:** 34 ft. **Full-time personnel:** 203.

NAS JRB Fort Worth, Tex. 76127-6200, 7 mi. NW of Fort Worth. **Navy hosted switchboard:** 817-782-5000; DSN 739-5000. **ANG Phone:** 817-852-3202; DSN 874-3202. **Units:** 10th Air Force and 301st Fighter Wing (AFRC); 136th Airlift Wing (ANG). **Area:** Navy hosted base is 1,805 acres; ANG, 81 acres. **Runway:** 12,000 ft. **Altitude:** 650 ft. **Full-time personnel:** AFRC, 958; ANG, 138.

NAS JRB New Orleans, La. 70143-0050, 15 mi. S of New Orleans. **ANG Phone:** 504-391-8600; DSN 457-8600. **AFRC Phone:** 504-678-9673; DSN 678-9673. **Units:** 159th Fighter Wing (ANG); 926th Fighter Wing (AFRC). **Area:** 3,239 acres. **Runways:** 8,000 ft. and 6,000 ft. **Altitude:** 3 ft. **Full-time personnel:** ANG, 323; AFRC, 337.

NAS JRB Willow Grove, Pa. 19090-5203; 14 mi. N of Philadelphia. **AFRC phone:** 215-443-1000;

DSN 991-1000. **ANG phone:** 215-443-1500; DSN 991-1500. **Units:** 913th Airlift Wing (AFRC); 111th Fighter Wing (ANG). **History:** activated August 1958. **Area:** AFRC, 162 acres; ANG, 55 acres. **Altitude:** 356 ft. **Runway:** share use of NAS JRB Willow Grove runway (8,000 ft.). **Full-time personnel:** AFRC, 313; ANG, 266. **Nashville Arpt.,** Tenn. 37217-2538; 6 mi. SE of downtown Nashville. **Phone:** 615-399-5410; DSN 788-6210. **Unit:** 118th Airlift Wing (ANG). **Area:** 88 acres. **Runway:** 11,150 ft. **Altitude:** 570 ft. **Full-time personnel:** 290.

New Castle County Arpt., Del. 19720; 5 mi. S of Wilmington. **Phone:** 302-323-3500; DSN 445-7500. **Unit:** 166th Airlift Wing (ANG). **Area:** 79 acres. **Runways:** 7,170 ft. and 7,000 ft. **Altitude:** 80 ft. **Full-time personnel:** 243.

Niagara Falls Arpt./ARS, N.Y. 14304-5001; 6 mi. E of Niagara Falls. **Phone:** 716-236-2000; DSN 238-2000. **Units:** 914th Airlift Wing (AFRC), C-130H; 107th Air Refueling Wing (ANG), KC-135. **History:** activated January 1952. **Area:** 979 acres; ANG area, 108 acres. **Runway:** 9,135 ft. **Altitude:** 590 ft. **Full-time personnel:** AFRC, 367; ANG, 276. Lodging, exchange, and consolidated club.

Otis ANGB, Mass. 02542-1330; 7 mi. NNE of Falmouth. **Phone:** 508-968-4667; DSN 557-4667. **Units:** 102nd Fighter Wing (ANG), F-15A/B; 101st Fighter Sq. (ANG). **Tenant Units:** 202nd Weather Flt. (ANG); 253rd CCG (ANG); 267th CCS (ANG). **History:** named for 1st Lt. Frank J. Otis, Mass. ARNG flight surgeon and pilot killed in 1937 crash. **Area:** 4,069 acres. **Runways:** 9,500 ft. and 8,000 ft. **Altitude:** 103 ft. **Full-time personnel:** 361.

Pease Intl. Tradeport ANGS, Portsmouth, N.H. 03803-0157. **Phone:** 603-430-2453; DSN 852-2453. **Unit:** 157th Air Refueling Wing (ANG). **Area:** 218 acres. **Runway:** 11,318 ft. **Altitude:** 101 ft. **Full-time personnel:** 828.

Pittsburgh Arpt./ARS, Pa. 15108-4403; 12 mi. NW of Pittsburgh. **AFRC phone:** 412-474-8000; DSN 277-8000. **ANG phone:** 412-474-7359; DSN 277-7359. **Units:** 911th Airlift Wing, C-130H; 171st Air Refueling Wing (ANG), KC-135E. **History:** activated 1943. **Area:** AFRC, 115 acres; ANG, 179 acres. **Runway:** 11,500 ft. **Altitude:** 1,203 ft. **Full-time personnel:** AFRC, 332; ANG, 402. **Housing:** VOQ, 24, VEQ, 230. No on-base housing. Limited exchange.

Portland Arpt., Portland, Ore. 97218-2797. **Phone:** 503-335-4000; DSN 638-4000. **Units:** 142nd Fighter Wing (ANG); 244th Combat Communications Sq. (ANG); 272nd Combat Communications Sq. (ANG); Oregon Wing, CAP; 939th Rescue Wing (AFRC); Ore. ARNG. **Area:** 246 acres. **Runways:** 11,000 ft., 8,000 ft., and 7,000 ft. **Altitude:** 18 ft. **Full-time personnel:** ANG, 419; AFRC, 287.

Quonset State Arpt., R.I. 02852; 20 mi. S of Providence. **Phone:** 401-886-1210; DSN 476-3210. **Unit:** 143rd Airlift Wing (ANG). **Area:** 94 acres. **Runway:** 7,800 ft. **Altitude:** 19 ft. **Full-time personnel:** 237.

Reno/Tahoe Arpt. (May Field), Nev. 89502; 5 mi. SE of downtown Reno at 1776 ANG Way. **Phone:** 775-788-4500; DSN 830-4500. **Unit:** 152nd Airlift Wing (ANG). **History:** named for Maj. Gen. James A. May, Nevada adjutant general, 1947–67. **Area:** 64 acres. **Runways:** 10,00 ft., 9,000 ft., and 6,101 ft. **Altitude:** 4,660 ft. **Full-time personnel:** 293.

Richmond Arpt. (Byrd Field), Va. 23150; 7 mi. SE of downtown Richmond. **Phone:** 804-236-6000; DSN 864-6000. **Unit:** 192nd Fighter Wing (ANG). **History:** named for Adm. Richard E. Byrd, Arctic and Antarctic explorer. **Area:** 143 acres. **Runway:** 9,000 ft. **Altitude:** 168 ft. **Full-time personnel:** 289.

Rickenbacker ANGB, Ohio 43217-5931; 13 mi. SSE of Columbus. **Phone:** 614-492-4468; DSN 950-4468. **Units:** 121st Air Refueling Wing (ANG); Naval Air Reserve and Naval Construction; 164th Weather Flight (ANG); 52nd CST; Army Aviation Support Facility (ARNG). **History:** activated 1942. Formerly Lockbourne AFB; renamed May 7, 1974, for Capt. Edward V. Rickenbacker. Base transferred from SAC to ANG April 1, 1980. **Area:** 203 acres. **Runway:** 12,100 ft. **Altitude:** 744 ft. **Full-time personnel:** 364.

Rosecrans Memorial Arpt., Mo. 64503; 4 mi. W of St. Joseph. **Phone:** 816-236-3300; DSN 956-3300. **Unit:** 139th Airlift Wing (ANG). **Area:** 102 acres. **Runway:** 8,059 ft. **Altitude:** 813 ft. **Full-time personnel:** 308.

Salt Lake City Arpt., Utah 84116; 3 mi. W of downtown Salt Lake City. **Phone:** 801-245-2200; DSN 245-2200. **Units:** 151st Air Refueling Wing (ANG); 169th Electronic Security Sq. (ANG); 130th Engineering Installation Sq. (ANG); 109th Tactical Control Flt. (ANG). **Area:** 135 acres. **Runway:** 9,600 ft. **Altitude:** 4,226 ft. **Full-time personnel:** 379.

Savannah Arpt., Ga. 31408; 4 mi. NW of Savannah. **Phone:** 912-966-8204; DSN 860-8204. **Units:** 165th Airlift Wing (ANG); Combat Readiness Training Center. **Area:** 234 acres. **Runway:** 9,351 ft. **Altitude:** 51 ft. **Full-time personnel:** 313.

Schenectady County Arpt. (Stratton ANGB), N.Y. 12302-9752; 2 mi. N of Schenectady. **Phone:** 518-344-2300; DSN 974-9300. **Unit:** 109th Airlift Wing (ANG), 14 C-130s, 10 with skis for Antarctic and Greenland missions. **Area:** 122 acres. **Runway:** 7,000 ft. **Altitude:** 328 ft. **Full-time personnel:** 481.

Selfridge ANGB, Mich. 48045-5046; 3 mi. NE of Mount Clemens. **Phone:** 586-307-4011; DSN 273-4011. **Units:** 127th Wing (ANG); 927th Air Refueling Wing (AFRC); Air Force, Army, Navy, and Marine Corps Reserve units; ARNG; US Coast Guard Air Station for Detroit. **History:** activated July 1917; transferred to Mich. ANG July 1971. Named for 1st Lt. Thomas E. Selfridge, killed Sept. 17, 1908, at Ft. Myer, Va., when airplane piloted by Orville Wright crashed. **Area:** 3,070 acres. **Runway:** 9,000 ft. **Altitude:** 580 ft. **Full-time personnel:** ANG, 462; AFRC, 247.

Sioux Gateway Arpt., Iowa 51111-1300; 7 mi. S of downtown Sioux City. **Phone:** 712-233-0210; DSN 585-0210. **Unit:** 185th Fighter Wing (ANG). **Area:** 288 acres. **Runway:** 9,000 ft. **Altitude:** 1,089 ft. **Full-time personnel:** 285.

Sky Harbor Arpt., Phoenix, Ariz. 85034. **Phone:** 602-302-9000; DSN 853-9000. **Unit:** 161st Air Refueling Wing (ANG). **Area:** 60 acres. **Runway:** 12,000 ft. **Altitude:** 1,000 ft. **Full-time personnel:** 271.

Springfield–Beckley Arpt., Ohio 45502-8783; 5 mi. S of Springfield. **Phone:** 937-327-2100; DSN 346-2100. **Units:** 178th Fighter Wing (ANG); 251st Combat Communications Gp. (ANG); 269th Combat Communications Sq. (ANG). **Area:** 114 acres. **Runway:** 8,999 ft. **Altitude:** 1,053 ft. **Full-time personnel:** 363.

Stewart ANGB, N.Y. 12550-5042; 15 mi. N of US Military Academy (West Point). **Phone:** 914-563-2001; DSN 636-2001. **Units:** 105th Airlift Wing (ANG). **History:** Stewart AFB until 1969; acquired by state of New York in 1970. **Area:** ANG, 267 acres. **Runway:** 12,000 ft. **Altitude:** 491 ft. **Full-time personnel:** 608 (ANG). Most military services available through West Point or subpost.

Toledo Express Arpt., Ohio 43558; 14 mi. W of Toledo. **Phone:** 419-868-4180; DSN 580-4180. **Unit:** 180th Fighter Wing (ANG). **Area:** 135 acres. **Runways:** 10,600 ft. and 5,600 ft. **Altitude:** 664 ft. **Full-time personnel:** 269.

Truax Field, Wis. 53704-2591; at Dane County Arpt. 2 mi. N of downtown Madison. **Phone:** 608-245-4300; DSN 724-8300. **Unit:** 115th Fighter Wing (ANG). **History:** activated June 1942 as AAF base; taken over by Wis. ANG April 1968. Named for Lt. T.L. Truax, killed in P-40 training accident in 1941. **Area:** 130 acres. **Runway:** 12,000 ft. **Altitude:** 800 ft. **Full-time personnel:** 274.

Tucson Arpt., Ariz. 85706-6099; within Tucson. **Phone:** 520-295-6210; DSN 924-6210. **Unit:** 162nd Fighter Wing (ANG). **Area:** 92 acres. **Runways:** 11,000 ft., 9,000 ft., and 7,000 ft. **Altitude:** 2,556 ft. **Full-time personnel:** 925.

Tulsa Arpt., Okla. 74115-1699; 6 mi. NE of downtown Tulsa. **Phone:** 918-833-7370; DSN 894-7370. **Units:** 138th Fighter Wing (ANG); 219th Engineering Installation Sq. **Area:** 81 acres. **Runway:** 10,000 ft. **Altitude:** 677 ft. **Full-time personnel:** 291.

Volk Field ANGB, Wis. 54618-5001; 87 mi. NW of Madison. **Phone:** 608-427-1210; DSN 946-3210. **Units:** Combat Readiness Training Center (ANG) featuring air-to-air and air-to-ground gunnery ranges; 128th Air Control Sq. **History:** named for Lt. Jerome A. Volk, first Wis. ANG pilot to be killed in the Korean War. **Area:** 2,336 acres. **Runway:** 9,000 ft. **Altitude:** 912 ft. **Full-time personnel:** 112.

W.K. Kellogg Arpt., Mich. 49015-5512; 1 mi. W of Battle Creek. **Phone:** 616-969-3400; DSN 580-3210. **Unit:** 110th Fighter Wing (ANG). **Area:** 320 acres. **Runway:** 10,003 ft. **Altitude:** 929 ft. **Full-time personnel:** 256.

Westover ARB, Mass. 01022-1654; 10 mi. NE of Springfield. **Phone:** 413-557-1110; DSN 589-1110. **Units:** 439th Airlift Wing (AFRC); Army, Navy, and Marine Corps Reserve units. **History:** dedicated April 6, 1940. Named for Maj. Gen. Oscar Westover, Chief of the Air Corps, killed Sept. 21, 1938. **Area:** 2,386 acres. **Runway:** 11,600 ft. **Altitude:** 245 ft. **Full-time personnel:** 794. **Housing:** VOQ, 41, VAQ, 142 beds.

Will Rogers World Arpt., Oklahoma City. 73179-1090; 9 mi. SW of downtown. **Phone:** 405-686-5210; DSN 940-5210. **Units:** 137th Airlift Wing (ANG); 205th Electronic Installation Sq. (ANG). **Area:** 133 acres. **Runways:** two, each 9,800 ft., and 7,800 ft. **Altitude:** 1,272 ft. **Full-time personnel:** 267.

Yeager Arpt., W.Va. 25311; 4 mi. NE of downtown Charleston. **Phone:** 304-341-6126; DSN 366-6210. **Unit:** 130th Airlift Wing (ANG). **History:** named for Brig. Gen. Charles E. "Chuck" Yeager. **Area:** 109 acres. **Runway:** 6,300 ft. **Altitude:** 982 ft. **Full-time personnel:** 245.

Youngstown–Warren Arpt./ARS, Ohio 44473-5910; 14 mi. N of Youngstown. **Phone:** 330-609-1000; DSN 346-1000. **Units:** 910th Airlift Wing (AFRC); Army Corps of Engineers; Army, Navy, and Marine Corps Reserve units; FAA. **History:** activated 1953. **Area:** 230 acres. **Runways:** three, primary length 9,000 ft. **Altitude:** 1,196 ft. **Full-time personnel:** 469. **Lodging:** 142 beds. Limited exchange.

Records and Trophies

2003 USAF Almanac

Absolute Aviation World Records

The desirability of a standard procedure to certify air records was recognized early in the history of powered flight. In 1905, representatives of Belgium, France, Germany, Great Britain, Italy, Spain, Switzerland, and the US met in Paris to form the Federation Aeronautique Internationale, the world body of national aeronautic sporting interests. The FAI today comprises the national aero clubs of 77 nations and certifies national records as world records. Since 1922, the National Aeronautic Association, based in Arlington, Va., has been the US representative to the FAI. The NAA supervises all attempts at world and world-class records in the United States. Absolute world records are the supreme achievements of all the records open to flying machines.

Speed around the world, nonstop, nonrefueled: 115.65 mph (186.11 kph). Richard G. Rutan and Jeana L. Yeager in *Voyager* experimental aircraft at Edwards AFB, Calif., Dec. 14–23, 1986.

Great circle distance without landing: 24,986.727 miles (40,212.139 kilometers). Richard G. Rutan and Jeana L. Yeager in *Voyager* at Edwards AFB, Calif., Dec. 14–23, 1986.

Distance in a closed circuit without landing: 24,986.727 miles (40,212.139 kilometers). Richard G. Rutan and Jeana L. Yeager in *Voyager* at Edwards AFB, Calif., Dec. 14–23, 1986.

Altitude: 123,523.58 feet (37,650.00 meters). Alexander Fedotov flying E-266M, a modified MiG-25, at Podmoskovnoye, USSR, Aug. 31, 1977.

Altitude in an aircraft launched from a carrier airplane: 314,750.00 feet (95,935.99 meters). USAF Maj. Robert M. White flying North American X-15 No. 3 at Edwards AFB, Calif., July 17, 1962.

Altitude in horizontal flight: 85,068.997 feet (25,929.031 meters). USAF Capt. Robert C. Helt (pilot) and USAF Maj. Larry A. Elliott (RSO) in Lockheed SR-71A Blackbird at Beale AFB, Calif., July 28, 1976.

Speed over a straight course: 2,193.16 mph (3,529.56 kph). USAF Capt. Eldon W. Joersz (pilot) and USAF Maj. George T. Morgan Jr. (RSO) in Lockheed SR-71A Blackbird at Beale AFB, Calif., July 28, 1976.

Speed over a closed circuit: 2,092.294 mph (3,367.221 kph). USAF Majs. Adolphus H. Bledsoe Jr. (pilot) and John T. Fuller (RSO) in Lockheed SR-71A Blackbird at Beale AFB, Calif., July 27, 1976.

Launched from a B-52 mothership, X-15 test pilot Maj. Robert M. White flew to a world record–setting altitude of more than 59 miles in 1962.

The Robert J. Collier Trophy

This award, presented by the National Aeronautic Association, is the most prestigious in American aviation. It recognizes the "greatest achievement in aeronautics or astronautics in America, with respect to improving the performance, efficiency, and safety of air or space vehicles, the value of which has been thoroughly demonstrated by actual use during the preceding year." The award is named for a prominent publisher, sportsman, and aviator. Collier, the first person to purchase a Wright airplane for personal use, commissioned the trophy and presented it to the Aero Club of America (the forerunner of the NAA) in 1911.

1911 **Glenn H. Curtiss.** Hydro-aeroplane.
1912 **Glenn H. Curtiss.** Flying boat.
1913 **Orville Wright.** Automatic stabilizer.
1914 **Elmer A. Sperry.** Gyroscopic control.
1915 **W. Sterling Burgess.** Burgess–Dunne hydro-aeroplane.
1916 **Elmer A. Sperry.** Drift indicator.
1917–20 **No award.**
1921 **Grover Loening.** Aerial yacht.
1922 **US Air Mail Service.** One year without fatality.
1923 **US Air Mail Service.** Commercial night flying.
1924 **US Army Air Service.** First aerial flight around world.
1925 **S. Albert Reed.** Metal propeller.
1926 **Maj. E.L. Hoffman.** Practical parachute.
1927 **Charles L. Lawrance.** Radial air-cooled engine.
1928 **Commerce Dept., Aeronautics Branch.** Airways, air navigation facilities.
1929 **National Advisory Committee for Aeronautics.** Cowling for radial air-cooled engines.
1930 **Harold Pitcairn and staff.** Autogiro.
1931 **Packard Motor Car Co.** Diesel aircraft engine.
1932 **Glenn L. Martin.** Two-engined, high-speed, weight-carrying airplane.
1933 **Hamilton Standard Propeller Co., Frank W. Caldwell.** Controllable-pitch propeller.
1934 **Maj. Albert F. Hegenberger.** Blind-landing experiments.
1935 **Donald Douglas and staff.** DC-2.
1936 **Pan American Airways.** Trans–Pacific and overwater operations.
1937 **Army Air Corps.** Design, flight test of XC-35 first pressurized cabin.
1938 **Howard Hughes and crew.** Around-the-world flight.
1939 **US airlines.** Air travel safety record.
1940 **Sanford Moss, Army Air Corps.** Turbo-supercharger.
1941 **US Army Air Forces and US airlines.** Pioneering worldwide operations.
1942 **Gen. H.H. Arnold.** Leadership of US Army Air Forces.
1943 **Capt. Luis De Florez (USNR).** Synthetic training devices.
1944 **Gen. Carl A. Spaatz.** US air campaign against Germany.
1945 **Luis W. Alvarez.** Ground-control approach radar landing system.
1946 **Lewis A. Rodert.** Thermal ice-prevention system.
1947 **Lawrence D. Bell, John Stack, Capt. Charles E. Yeager.** Supersonic flight.
1948 **Radio Technical Commission for Aeronautics.** All-weather air traffic control system.
1949 **William P. Lear.** F-5 automatic pilot, automatic approach control coupler system.
1950 **Helicopter industry, military services, Coast Guard.** Rotary-wing aircraft in air rescue.
1951 **John Stack, associates at Langley Aeronautical Laboratory, NACA.** Transonic wind tunnel throat.
1952 **Leonard S. Hobbs.** J57 jet engine.
1953 **James H. Kindelberger, Edward H. Heinemann.** Supersonic airplanes (F-100, F4D).
1954 **Richard Travis Whitcomb.** Discovery, verification of area rule, yielding higher speed and greater range.
1955 **William M. Allen, Boeing Airplane Co., Gen. Nathan F. Twining, US Air Force.** B-52 bomber.
1956 **Charles J. McCarthy; Chance–Vought Aircraft; Vice Adm. James S. Russell; US Navy Bureau of Aeronautics.** F8U Crusader.
1957 **Edward P. Curtis.** "Aviation Facilities Planning" report. **USAF/Lockheed/GE F-104 team.** F-104.
1958 **Clarence L. Johnson,** airframe design; **Neil Burgess, Gerhard Neumann,** J79 turbojet engines; **Maj. Howard C. Johnson,** landplane altitude record; **Capt. Walter W. Irwin,** straightaway speed record.
1959 **USAF, General Dynamics–Convair, Space Technology Laboratories.** Atlas ICBM.
1960 **Vice Adm. William F. Raborn.** Polaris ballistic missile.
1961 **A. Scott Crossfield, Cmdr. Forrest Petersen, Joseph A. Walker, Maj. Robert M. White.** X-15 test flights.
1962 **Lt. Col. John H. Glenn Jr. (USMC), Cmdr. Walter M. Schirra Jr., Cmdr. Alan B. Shepard Jr., Lt. Cmdr. M. Scott Carpenter, Maj. L. Gordon Cooper, Maj. Virgil I. Grissom, Maj. Donald K. Slayton.** Pioneering US manned spaceflight.
1963 **Clarence L. Johnson.** A-11 (A-12) Mach 3 aircraft.
1964 **Gen. Curtis E. LeMay.** Expanding frontiers of American aeronautics and astronautics.
1965 **James E. Webb, Hugh L. Dryden.** Gemini spaceflight program.
1966 **James S. McDonnell.** F-4 Phantom and Gemini space vehicles.
1967 **Lawrence A. Hyland, Hughes Aircraft Co., Jet Propulsion Laboratory, associated organizations.** Surveyor program.
1968 **Col. Frank Borman, Capt. James A. Lovell Jr. (USN), Lt. Col. William A. Anders.** Apollo 8, first manned lunar orbit mission.
1969 **Col. Edwin E. Aldrin Jr., Neil A. Armstrong, Col. Michael Collins.** Apollo 11 moon landing.
1970 **Boeing with Pratt & Whitney and Pan Am.** Commercial 747 service.
1971 **Robert T. Gilruth, Col. James B. Irwin, Col. David R. Scott, Lt. Col. Alfred M. Worden.** Apollo 15 mission.
1972 **Adm. Thomas H. Moorer, USAF 7th and 8th Air Forces, Navy Task Force 77.** Operation Linebacker II.
1973 **Skylab Program, William C. Schneider, Skylab astronauts.** Skylab operations.
1974 **John F. Clark, NASA; Daniel J. Fink, GE; RCA; Hughes.** Resource and environmental management in space technology; LANDSAT.
1975 **David S. Lewis, General Dynamics, USAF–industry team.** F-16 aviation technologies.
1976 **USAF, Rockwell, B-1 industry team.** B-1 bomber.
1977 **Gen. Robert J. Dixon; Tactical Air Command.** Red Flag.
1978 **Sam B. Williams, Williams Research Corp.** Turbofan cruise missile engines.
1979 **Paul B. MacCready, AeroEnvironment, Inc., Bryan Allen.** *Gossamer Albatross.*

1980 **NASA's Voyager mission team, Edward Stone.** Voyager flyby of Saturn.
1981 **NASA, Rockwell, Martin Marietta, Thiokol, government–industry shuttle team,** and astronauts **Capt. Robert L. Crippen (USN), Col. Joe H. Engle, Capt. Richard H. Truly (USN), John W. Young.** First flights of *Columbia,* first shuttle.
1982 **T.A. Wilson, Boeing, supported by FAA, industry, airlines.** 757 and 767 airliners.
1983 **US Army, Hughes Helicopters, industry team.** AH-64A Apache helicopter.
1984 **NASA, Martin Marietta, Walter W. Bollendonk,** astronaut **Capt. Bruce McCandless II (USN), Charles E. Whitsett Jr.** Manned maneuvering units, satellite rescues.
1985 **Russell W. Meyer, Cessna Aircraft, Cessna Citation business jets.** Outstanding safety.
1986 **Jeana L. Yeager, Richard G. Rutan, Elbert L. Rutan, Bruce Evans, team of volunteers.** *Voyager* flight.
1987 **NASA Lewis Research Center, NASA–industry team.** Advanced turboprop propulsion concepts.
1988 **Rear Adm. Richard H. Truly.** Manned space recovery program.
1989 **Ben R. Rich, Lockheed–USAF team.** F-117A.
1990 **Bell–Boeing team.** V-22 Osprey.
1991 **Northrop–USAF industry team.** B-2.
1992 **Global Positioning System team: USAF, US Naval Research Lab, Aerospace Corp., Rockwell, IBM Federal Systems.** Navstar GPS system.
1993 **Hubble Space Telescope recovery team.** Successful orbital recovery and repair.
1994 **USAF, McDonnell Douglas, US Army, C-17 industry team.** C-17.
1995 **Boeing 777 team.** Boeing 777.
1996 **Cessna Citation X design team.** Cessna Citation X.
1997 **Gulfstream Aerospace Corp., Gulfstream V industry team.** Gulfstream V.
1998 **Lockheed Martin Corp., GE Aircraft Engines, NASA, Air Combat Command, Defense Intelligence Agency.** U-2S/ER-2.
1999 **Boeing, Hornet industry team, and US Navy.** F/A-18E/F.
2000 **Northrop Grumman, Rolls Royce, Raytheon, L-3 Communications, USAF, DARPA.** Global Hawk.
2001 **Pratt & Whitney, Rolls Royce, Lockheed Martin Corp., Northrop Grumman Corp., BAE Systems, JSF Program Office.** Integrated lift fan propulsion system.

The Mackay Trophy

The Mackay Trophy was established by Clarence H. Mackay, an industrialist, philanthropist, communications pioneer, and aviation enthusiast. Presented by the National Aeronautic Association, the trophy recognizes "the most meritorious flight of the year" by an Air Force member, members, or organization.

1912 2nd Lt. Henry H. Arnold.
1913 2nd Lts. Joseph E. Carberry and Fred Seydel.
1914 Capt. Townsend F. Dodd and Lt. S.W. Fitzgerald
1915 Lt. B.Q. Jones.
1916–17 No award.
1918 Capt. Edward V. Rickenbacker.
1919 Lt. Col. Harold E. Hartney; Capts. John O. Donaldson, Lowell H. Smith, and F. Steinle; Lts. B.G. Bagby, D.B. Gish, E.M. Manzelman (posthumously), Belvin N. Maynard, R.S. Northington, and Alexander Pearson Jr.
1920 Capt. St. Clair Streett; 1st Lt. Clifford C. Nutt; 2nd Lts. C.H. Crumrine, Ross C. Kirkpatrick, and Eric H. Nelson; Sgts. Joe E. English, Edmond Henriques, and Albert T. Vierra.
1921 Lt. John A. Macready.
1922 Lts. John A. Macready and Oakley G. Kelly.
1923 Lts. John A. Macready and Oakley G. Kelly.
1924 Capt. Lowell H. Smith; 1st Lts. Leslie P. Arnold, Eric H. Nelson, and Leigh Wade; 2nd Lts. John Harding Jr. and Henry H. Ogden.
1925 Lts. Cyrus K. Bettis and Jimmy Doolittle.
1926 Pan American Goodwill Fliers: Maj. H.A. Dargue; Capts. Ira C. Eaker, A.B. McDaniel, and C.F. Woolsey (posthumously); 1st Lts. J.W. Benton (posthumously), M.S. Fairchild, C.McK. Robinson, B.S. Thompson, L.D. Weddington, and E.C. Whitehead.
1927 Lts. Albert F. Hegenberger and Lester J. Maitland.
1928 1st Lt. Harry A. Sutton.
1929 Capt. A.W. Stevens.
1930 Maj. Ralph Royce.
1931 Brig. Gen. Benjamin D. Foulois.
1932 11th Bombardment Sq., March Field, Calif., 1st Lt. Charles H. Howard.
1933 Capt. Westside T. Larson.
1934 Brig. Gen. Henry H. Arnold.
1935 Capts. O.A. Anderson and A.W. Stevens.
1936 Capt. Richard E. Nugent; 1st Lts. Joseph A. Miller and Edwin G. Simenson; 2nd Lts. Burton W. Armstrong, Herbert Morgan Jr., and William P. Ragsdale Jr.; TSgt. Gilbert W. Olson; SSgt. Howard M. Miller; Cpl. Air Mechanic 2nd Class Frank B. Connor.
1937 Capts. Carl J. Crane and George V. Holloman.
1938 2nd Bombardment Group, Lt. Col. Robert Olds.
1939 Majs. Caleb V. Haynes and William D. Old; Capt. John A. Samford; 1st Lts. Richard S. Freeman and Torgils G. Wold; MSgt. Adolph Cattarius; TSgts. William J. Heldt, Henry L. Hines, and David L. Spicer; SSgts. Russell E. Junior and James E. Sands.
1940–46 No award.
1947 Capt. Charles E. Yeager.
1948 Lt. Col. Emil Beaudry.
1949 Capt. James G. Gallagher and crew of *Lucky Lady II.*
1950 27th Fighter Wing.
1951 Col. Fred J. Ascani.
1952 Majs. Louis H. Carrington Jr. and Frederick W. Shook; Capt. Wallace D. Yancey.
1953 40th Air Division, SAC.
1954 308th Bombardment Wing (M) and 38th Air Div., SAC.
1955 Col. Horace A. Hanes.
1956 Capt. Iven C. Kincheloe Jr., Air Research and Development Command.
1957 93rd Bombardment Wing, SAC.
1958 TAC Air Strike Force, X-Ray Tango.
1959 US Air Force Thunderbirds.
1960 6593rd Test Sq., Hickam AFB, Hawaii.
1961 Lt. Col. William R. Payne and Majs. William L. Polthemus and Raymond R. Wagener, 43rd Bomb Wing, SAC.

1962 Maj. Robert G. Sowers and Capts. Robert MacDonald and John T. Walton.
1963 Capts. Donald R. Mack, John R. Ordemann, and Warren P. Tomsett; TSgt. Edsol P. Inlow; SSgts. Frank C. Barrett and Jack E. Morgan.
1964 464th Troop Carrier Wing, TAC.
1965 YF-12A Test Force (Col. Robert L. Stephens; Lt. Col. Daniel Andre; Majs. Walter F. Daniel and Noel T. Warner; Capt. James P. Cooney).
1966 Lt. Col. Albert R. Howarth.
1967 Maj. John H. Casteel; Capts. Dean L. Hoar and Richard L. Trail; MSgt. Nathan C. Campbell.
1968 Lt. Col. Daryl D. Cole.
1969 49th Tactical Fighter Wing, TAC.
1970 Capt. Alan D. Milacek and AC-119K crew (Capts. Roger E. Clancy, Ronald C. Jones, Brent C. O'Brien, and James A. Russell; TSgt. Albert A. Nash; SSgts. Adolfo Lopez Jr. and Ronald R. Wilson; Sgt. Kenneth E. Firestone; A1C Donnell H. Cofer).
1971 Lt. Col. Thomas B. Estes and Maj. Dewain C. Vick.
1972 Capts. Charles B. DeBellevue, Jeffrey S. Feinstein, and Richard S. "Steve" Ritchie.
1973 MAC aircrews.
1974 Majs. Willard R. MacFarlane, David W. Peterson, and Roger J. Smith.
1975 Maj. Robert W. Undorf.
1976 Capt. James A. Yule.
1977 C-5 aircrew (Capt. David M. Sprinkel and crew).
1978 C-5 aircrews (Lt. Col. Robert F. Schultz and crew and Capt. Todd H. Hohberger and crew, 436th Military Airlift Wing).
1979 Maj. James E. McArdle Jr.
1980 Crews S-21 and S-31, 644th Bombardment Sq.
1981 Capt. John J. Walters.
1982 B-52 Crew E-21, 19th Bombardment Wing.
1983 Capt. Robert J. Goodman and his crew, 42nd Bombardment Wing, SAC.
1984 Lt. Col. James L. Hobson Jr.
1985 Lt. Col. David E. Faught.
1986 KC-10 crew (Capts. M.D. Felman and T.M. Ferguson; MSgts. C. Bridges Jr., P.S. Kennedy, and G.G. Treadwell; TSgts. L.G. Bouler and G.M. Lewis; SSgts. S.S. Flores, S.A. Helms, and G.L. Smith), 68th Air Refueling Group, SAC.
1987 Det. 15, USAF Plant Representative Office, and B-1B SPO.
1988 C-5 crew, 436th Military Airlift Wing.
1989 B-1B crew, 96th Bomb Wing.
1990 AC-130 crew, 16th Special Operations Sq.
1991 MH-53 crew, 20th Special Operations Sq.
1992 C-130 crew, 310th Airlift Sq., ACC, Howard AFB, Panama.
1993 B-52 crew, 668th Bomb Sq., ACC.
1994 HH-60G crew of Air Force Rescue 206 and 208, 56th Rescue Sq., ACC, NAS Keflavik, Iceland.
1995 Aircrew BAT-01, Dyess AFB, Tex.
1996 Aircrew Duke 01, 2nd Bomb Wing, Barksdale AFB, La.
1997 Crew of Whiskey-05, 7th Special Operations Sq., RAF Mildenhall, UK.
1998 Crew of Air Force Rescue 470, 210th Rescue Sq., Kulis ANGB, Alaska.
1999 Capt. Jeffrey G.J. Hwang, 173rd FW, Oregon ANG, Klamath Falls Airport, Ore.
2000 Crew of Airevac 10E1/10E2, 86th AES and 75th AS, Ramstein AB, Germany.
2001 Crew of Knife 04, 20th SOS, Hurlburt Field, Fla.

The crew of Knife 04 (shown here with their Pave Low MH-53) from the 20th Special Operations Squadron, Hurlburt Field, Fla., received the 2001 Mackay Trophy for performing "extraordinary acts of valor and heroism" during the rescue of the crew of another MH-53 stranded behind enemy lines in the mountains of Afghanistan.

The Gen. Thomas D. White USAF Space Award

The Gen. Thomas D. White USAF Space Award is named for the fourth Air Force Chief of Staff, a longtime champion of USAF's role in space. The Air Force selects the recipients among USAF individuals or organizations that made the year's outstanding progress in the field of aerospace. It was established in 1961 and, until 1996, sponsored by the National Geographic Society. It is now an AFA national award sponsored by the Gen. B.A. Schriever Los Angeles Chapter.

1961 Capt. Virgil I. Grissom.
1962 Maj. Robert M. White.
1963 Maj. L. Gordon Cooper.
1964 Air Force Systems Command.
1965 Lt. Col. Edward H. White II.
1966 Alexander H. Flax.
1967 Gen. John P. McConnell.
1968 Col. Frank Borman, Capt. James A. Lovell Jr. (USN), Lt. Col. William A. Anders.
1969 Col. Edwin E. Aldrin Jr., Neil A. Armstrong, Col. Michael Collins.
1970 Brig. Gen. Robert A. Duffy.
1971 Lt. Gen. Samuel C. Phillips.
1972 Hon. Robert C. Seamans Jr.
1973 Lt. Col. Henry Hartsfield Jr.
1974 No award.
1975 Maj. Gen. Thomas P. Stafford.
1976 Gen. William J. Evans.
1977 Lt. Col. Charles G. Fullerton, Fred W. Haise Jr.
1978 No award.
1979 Maj. Gen. John E. Kulpa Jr.
1980 Gen. Lew Allen Jr.
1981 Col. Joe Engle, Capt. Richard H. Truly (USN).
1982 Lt. Gen. Richard C. Henry.
1983 Gen. James V. Hartinger.
1984 Lt. Gen. Forrest S. McCartney.
1985 Maj. Gen. Donald W. Henderson.
1986 Gen. Donald J. Kutyna.
1987 Col. Victor W. Whitehead.
1988 Robert R. Barthelemy.
1989 Launch Systems Directorate, Space Systems Division.
1990 Gen. John L. Piotrowski, USAF (Ret.), Lt. Gen. Donald L. Cromer.
1991 Lt. Gen. Thomas S. Moorman Jr.
1992 Maj. Gen. Nathan J. Lindsay, USAF (Ret.).
1993 Gen. Merrill A. McPeak.
1994 Gen. Charles A. Horner.
1995 Gen. Joseph W. Ashy.
1996 No award.
1997 Lt. Gen. Patrick P. Caruana.
1998 Gen. Howell M. Estes III.
1999 Lt. Gen. Lance W. Lord.
2000 Gen. Richard B. Myers.
2001 Gen. Ralph E. Eberhart.

The Raytheon Hughes Achievement Award

The Raytheon Hughes Achievement Award (formerly the Hughes Trophy) is presented annually to the top Air Force squadron with an air defense/air superiority mission.

Year	Unit, Base	Aircraft
1953	58th FIS, Otis AFB, Mass.	F-94C
1954	96th FIS, New Castle County Airport, Del.	F-94C
1955	496th FIS, Landstuhl AB, West Germany	F-86D
1956	317th FIS, McChord AFB, Wash.	F-86D/F-102A
1957	512th FIS, RAF Bentwaters, UK	F-86D
1958	31st FIS, Elmendorf AFB, Alaska	F-102A
1959	54th FIS, Ellsworth AFB, S.D.	F-89J
1960	460th FIS, Portland Arpt., Ore.	F-102A
1961	83rd FIS, Hamilton AFB, Calif.	F-101B
1962	444th FIS, Charleston AFB, S.C.	F-101B
1963	497th FIS, Torrejon AB, Spain	F-102A
1964	329th FIS, George AFB, Calif.	F-106A/B
1965	317th FIS, Elmendorf AFB, Alaska	F-102A
1966	32nd FIS, Soesterberg AB, Netherlands	F-102A
1967	317th FIS, Elmendorf AFB, Alaska	F-106A/B
1968	64th FIS, Clark AB, Philippines	F-102A
1969	71st FIS, Malmstrom AFB, Mont.	F-106A/B
1970	57th FIS, NAS Keflavik, Iceland	F-102A
1971	48th FIS, Langley AFB, Va.	F-106A/B
1972	43rd TFS, Elmendorf AFB, Alaska	F-4E
1973	555th TFS, Udorn RTAB, Thailand	F-4D
1974	119th FIG (ANG), Hector Field, N.D.	F-101B
1975	318th FIS, McChord AFB, Wash.	F-106A/B
1976	57th FIS, NAS Keflavik, Iceland	F-4C
1977	43rd TFS, Elmendorf AFB, Alaska	F-4E
1978	49th FIS, Griffiss AFB, N.Y.	F-106A/B
1979	32nd TFS, Soesterberg AB, Netherlands	F-15A/B
1980	32nd TFS, Soesterberg AB, Netherlands	F-15A/B
1981	12th TFS, Kadena AB, Japan	F-15C/D
1982	44th TFS, Kadena AB, Japan	F-15C/D
1983	67th TFS, Kadena AB, Japan	F-15C/D
1984	318th FIS, McChord AFB, Wash.	F-15A/B
1985	120th FIG (ANG), Great Falls Arpt., Mont.	F-106A/B
1986	67th TFS, Kadena AB, Japan	F-15C/D
1987	57th FIS, NAS Keflavik, Iceland	F-15C/D
1988	22nd TFS, Bitburg AB, West Germany	F-15C/D
1989	67th TFS, Kadena AB, Japan	F-15C/D
1990	58th TFS, Eglin AFB, Fla.	F-15C/D
1991	58th TFS, Eglin AFB, Fla.	F-15C/D
1992	59th FS, Eglin AFB, Fla.	F-15C/D
1993	71st FS, Langley AFB, Va.	F-15C
1994	178th FS (ANG), Hector Arpt., N.D.	F-16A/B
1995	27th FS, Langley AFB, Va.	F-15C/D
1996	60th FS, Eglin AFB, Fla.	F-15C/D
1997	493rd FS, RAF Lakenheath, UK	F-15C
1998	71st FS, Langley AFB, Va.	F-15C/D
1999	493rd FS, RAF Lakenheath, UK	F-15C
2000	19th FS, Elmendorf AFB, Alaska	F-15C/D
2001	71st FS, Langley AFB, Va.	F-15C/D

Gallery of USAF Weapons

2003 USAF Almanac

By Susan H.H. Young

Note: Inventory numbers are Total Active Inventory figures as of Sept. 30, 2002.

***B-1B** Lancer* (SrA. Christina M. Rumsey)

Bombers

B-1 Lancer

Brief: A long-range, air refuelable multirole bomber capable of flying missions over intercontinental range, then penetrating enemy defenses with a heavy load of ordnance.

Function: Long-range conventional bomber.

Operator: ACC.

First Flight: Dec. 23, 1974 (B-1A); Oct. 18, 1984 (B-1B).

Delivered: June 1985–May 1988.

IOC: Oct. 1, 1986, Dyess AFB, Tex. (B-1B).

Production: 104.

Inventory: 78.

Unit Location: Active: Dyess AFB, Tex., Ellsworth AFB, S.D.

Contractor: Boeing; AIL Systems; General Electric.

Power Plant: four General Electric F101-GE-102 turbofans, each 30,780 lb thrust.

Accommodation: four, pilot, copilot, and two systems officers (offensive and defensive), on zero-zero ejection seats.

Dimensions: span spread 137 ft, swept aft 79 ft, length 146 ft, height 34 ft.

Weights: empty equipped 192,000 lb, max operating weight 477,000 lb.

Ceiling: more than 30,000 ft.

Performance: max speed at low level high subsonic; 900+ mph (Mach 1.2 at S/L); range intercontinental.

Armament: three internal weapons bays capable of accommodating a wide range of weapons including up to 84 Mk 82 (500-lb) bombs or Mk 62 naval mines; up to 30 CBU-87/89 cluster munitions and CBU-97 Sensor Fuzed Weapons (SFWs), to be fitted with the Wind-Corrected Munitions Dispenser (WCMD) kits in 2003 and up to 24 GBU-31 (2,000 lb) Joint Direct Attack Munitions (JDAMs); AGM-54 Joint Standoff Weapon (JSOW) and AGM-158 Joint Air-to-Surface Standoff Missile (JASSM) from 2004.

COMMENTARY

Of blended wing/body configuration, the B-1's variable-geometry design and turbofan engines combine to provide greater range and high speed at low level, with enhanced survivability. Unswept wing settings provide for maximum range during high-altitude cruise. The fully swept position is used in supersonic flight and for high subsonic, low-altitude penetration.

The bomber's offensive avionics include synthetic aperture radar (SAR), ground moving target indicator (GMTI), ground moving target track (GMTT), and terrain-following radar (TFR), an extremely accurate Global Positioning System/inertial navigation system (GPS/INS), computer-driven avionics, and a strategic Doppler radar, enabling aircrews to navigate, update target coordinates in flight, and precision bomb.

The current defensive avionics package, built around the ALQ-161 electronic countermeasures (ECM) system, is supplemented by the ALE-50 towed decoy and chaff and flares to protect against radar-guided and heat-seeking missiles. Aircraft structure and radar-absorption materials reduce the aircraft's radar signature to approximately one percent that of a B-52. The ALE-50 provides greater protection against RF threats.

B-1A. USAF acquired four prototype flight-test models of this new strategic bomber in the 1970s, but the program was canceled in 1977. Flight-test of the four B-1A models continued through 1981.

B-1B. Initiated in 1981, the first production model of the improved variant B-1 flew in October 1984. USAF produced a total of 100. The B-1 was first used in combat in support of operations against Iraq during Desert Fox in December 1998. USAF began implementing the planned reduction of its B-1B inventory from 93 to 60 aircraft in August 2002, with fleet consolidation at Dyess AFB, Tex., and Ellsworth AFB, N.D. Cost savings in operations and maintenance are to fund upgrades and spares for the remaining fleet.

B-1B's speed, superior handling qualities, and large payload make it a key element of any joint/composite strike force, with the flexibility to deliver a wide range of weapons or to carry additional fuel, as required. Integration of the 2,000-lb GPS–guided GBU-31 JDAM was completed in FY02.

An ongoing conventional mission upgrade program (CMUP) is significantly enhancing B-1B lethality and survivability through the integration of precision and standoff weapons and a robust ECM suite. CMUP includes GPS receivers, a MIL-STD-1760 weapon interface, secure interoperable radios, and improved computers to support precision weapons, initially the GBU-31 JDAM, with follow-on computer and software upgrades permitting simultaneous carriage of mixed guided and unguided weapons.

In December 2002, USAF canceled the defensive system upgrade program, incorporating the ALE-55 fiber-optic towed decoy, ALR-56M radar warning receiver (RWR), and ALQ-214 receiver/processor, because of escalating cost growth and schedule delays. Officials announced plans to fund other B-1 modernization programs, including upgrading its existing ALQ-161 ECM system.

B-2 Spirit

Brief: Stealthy, long-range multirole bomber that can deliver conventional and nuclear munitions anywhere on the globe by flying through previously impenetrable defenses.

Function: Long-range heavy bomber.

Operator: ACC.

First Flight: July 17, 1989.

Delivered: Dec. 11, 1993–present.

IOC: April 1997, Whiteman AFB, Mo.

Production: 21.

Inventory: 21.

Unit Location: Whiteman AFB, Mo.

Contractor: Northrop Grumman; Boeing; LTV.

Power Plant: four General Electric F118-GE-100 turbofans, each 17,300 lb thrust.

Accommodation: two, mission commander and pilot, on zero/zero ejection seats.

Dimensions: span 172 ft, length 69 ft, height 17 ft.

Weight: empty 125,000–153,700 lb, typical T-O weight 336,500 lb.

Ceiling: 50,000 ft.

Performance: minimum approach speed 140 mph, typical estimated unrefueled range for a hi-lo-hi mission with 16 B61 nuclear free-fall bombs 5,000 miles, with one aerial refueling more than 10,000 miles.

Armament: in a nuclear role: up to 16 nuclear weapons (B61, B61 Mod II, B83). In a conventional role: up to 16 GBU-31 (2,000-lb) JDAMs or a penetration version of a BLU-109, or 16 Mk 84 2,000-lb bombs; up to eight 4,700-lb GBU-37 (GAM-113) near-precision guided weapons. JASSM and JSOW are being added to B-2 Block 30 aircraft through FY03.

COMMENTARY

The B-2 bomber is a unique, highly advanced system, combining sophisticated technologies, notably low observable (LO) stealth design, with high aerodynamic efficiency, enabling it to attack heavily defended targets and neutralize enemy defenses and, thereby, making way for less stealthy systems to operate.

Based on the flying wing concept, the B-2 has no vertical tail surfaces. The smoothly blended "fuselage" section accommodates two flight crew and two large weapons bays side by side in the lower centerbody. These bays contain rotary launchers or bomb rack assemblies capable of carrying a total weapons load of 40,000 lb.

Four nonafterburning turbofan engines are mounted in pairs within the wing structure, with scalloped overwing intake ducts and shielded over-wing trailing-edge nozzles. The aircraft has a quadruple-redundant fly-by-wire digital flight-control system, actuating moving surfaces at the wing trailing edges that combine aileron, elevator, and rudder functions. A landing gear track of 40 ft enables the B-2 to use any runway that can handle a Boeing 727 airliner.

B-2A. B-2 production represents three successive blocks of capability. Block 10 aircraft carried B83 nuclear bombs or 16 Mk 84 2,000-lb conventional munitions. Block 20 aircraft additionally carried the B61/7 and B61/11 nuclear gravity bombs, as well as two types of GPS-aided munitions (GAMs), the GBU-37 and GBU-36B, or two rotary launcher assemblies, providing an interim, near-precision strike capability. All Block 10 and 20 aircraft have now been upgraded to Block 30.

B-2 Spirit (TSgt. Michael R. Nixon)

(The last original Block 20 B-2, used as a test aircraft at Edwards AFB, Calif., was refurbished as an operational bomber and entered operational service in September 2002.)

Block 30 configuration retains weapons capability introduced in Block 10 and 20 and adds significant new capability. Using the rotary launcher assembly, all B-2s are capable of employing 16 Mk 84 JDAMs, 16 JSOWs, or eight GAM-113s (to be replaced by EGBU-28), with JASSM capability slated for 2004. All B-2s are also capable of substituting bomb-rack assemblies in place of the rotary launchers, providing the capability to employ 80 500-lb Mk 82s, 36 750-lb M117s, 34 tactical munitions dispensers, or 80 Mk 62 sea mines. Modifications to the bomb racks will allow carriage of 80 independently targeted Mk 82 (500-lb) JDAMs in 2004. Future capability is expected to include the 250-lb Small Diameter Bomb (SDB). Other Block 30 enhancements include fully operational defensive and offensive avionics, a more sophisticated mission planning system, and additional operating modes for the SAR.

Beyond Block 30, USAF plans to add UHF and EHF satellite communications systems and Link 16 digital data sharing capability and to replace the current mechanically scanned phased-array antenna with an active electronically scanned array (AESA).

The first use of B-2s in combat took place March 24, 1999, against Serb targets in Allied Force, with two aircraft each dropping 16 JDAMs. USAF deployed B-2s to Diego Garcia in the Indian Ocean for Gulf War II.

B-52 Stratofortress

Brief: A long-range, heavy multirole bomber that can carry nuclear or conventional ordnance or Air Launched Cruise Missiles (ALCMs), with worldwide precision navigation capability.

Function: Long-range heavy bomber.

Operator: ACC, AFRC.

First Flight: April 15, 1952 (YB-52 prototype).

Delivered: November 1955–October 1962.

IOC: June 19, 1955.

Production: 744.

Inventory: 93.

Unit Location: Barksdale AFB, La. (ACC, AFRC), Minot AFB, N.D.

Contractor: Boeing.

Power Plant: eight Pratt & Whitney TF33-P-3 turbofans, each 17,000 lb thrust.

Accommodation: two pilots, side by side, plus navigator, radar navigator, and electronic warfare officer.

Dimensions: span 185 ft, length 159.3 ft, height 40.7 ft.

Weight: empty approx 188,000 lb, gross 488,000 lb.

Ceiling: 50,000 ft.

Performance (approx): max level speed 449 mph, range more than 10,000 miles.

Armament: 12 AGM-86B ALCMs or AGM-129A Advanced Cruise Missiles (ACMs) externally, with provision for eight more ALCMs or gravity weapons internally. Conventional weapons incl AGM-86C/D Conventional ALCMs (CALCMs), bombs up to 2,000 lb, CBU 87/89/97 cluster munitions, WCMDs, GBU-31 JDAMs, JSOWs, JASSMs in 2003, and on some aircraft, three to four AGM-142A Have Nap missiles or eight AGM-84 Harpoons in under-wing clusters.

COMMENTARY

The B-52's still-expanding weapons capability reflects its continuing ability to perform a wide range of missions including show of force, maritime operations, long-range precision strikes, offensive counterair, air interdiction, and defense suppression. USAF is considering using some B-52s as jamming electronic warfare platforms.

Equipment includes an electro-optical (EO) viewing system that uses forward-looking infrared (FLIR) and high-resolution low-light-level television (LLLTV) sensors to augment the targeting, battle assessment, flight safety, and terrain avoidance systems, thus improving combat ability and low-level flight capability. Pilots have night vision goggles (NVGs) to further enhance night operation. The B-52's ECM suite uses a combination of electronic detection, jamming, and infrared (IR) countermeasures to protect against hostile air defense systems. The aircraft can also detect and counter missile attack from the rear.

Several versions of the Stratofortress were produced, including:

B-52A. Initial production version, with J57-P-1W engines and provision for in-flight refueling. First flown Aug. 5, 1954, the three aircraft built were used by Boeing for technical development purposes. Delivered to SAC November 1957. Finally retired 1969.

B-52B. First operational version, 23 of which were built. Also, 27 RB-52B dual-role bomber/reconnaissance variants. First flown January 1955, with deliveries between June 1955–August 1956; powered by J57-P-1W, -19W, -29W, or -29WA engines. Retired in the mid–1960s.

B-52C. Multimission version with increased gross weight and larger under-wing tanks. Powered by J57-P-19W or -29WA engines. First flown March 1956; 35 were delivered June–December 1956. Majority retired 1971.

B-52D. Long-range bomber version, first flown June 1956. Total of 170 built, with deliveries beginning late 1956. Retired 1982–83.

B-52E. Version with improved bombing, navigation, and electronics systems. First flown October 1957. One hundred delivered October 1957–June 1958. Retired 1969–70.

B-52F. Version with uprated J57-P-43WA engines, first flown in May 1958. Eighty-nine delivered June 1958–February 1959. Retired 1978.

B-52G. Introduced important design changes, including a redesigned wing containing integral fuel tanks for increased range, fixed under-wing external tanks, a shorter tail fin of greater chord, and a remotely controlled tail gun turret that allowed the gunner to be repositioned with the rest of the crew. Initial flight August 1958, with the first of 193 aircraft entering service in February 1959. Withdrawn 1994.

B-52H. The only version still in service, the H introduced TF33 turbofans, providing increased unrefueled range, and improved defensive armament. First flown July 1960, 102 were built, with deliveries between May 1961 and October 1962.

Following deployment of the B-1 and B-2 the primary role of the B-52 changed to cruise missile carrier with, typically, multiple cruise missile launches at high altitude, often followed by B-52 low-level descent to attack additional targets using gravity weapons.

Ongoing modernization of its conventional capabilities is extending the B-52's service life well into this century, with the ability to provide massive firepower in low- to mid-threat environments supplemented by a standoff attack capability. Upgrades include the installation of GPS, ARC-210 radios, Have Quick II antijam radio, KY-100 secure radio, and MIL-STD-1760 interfaces; improved weapons capability includes naval mines, precision guided weapons, and advanced weapons, such as JDAM, JSOW, JASSM, and WCMD. Modification of heavy stores adapter beams will enable aircraft to carry all B-52–certified munitions. Avionics improvements include the avionics midlife improvement (AMI) program, which replaces the current system processors and data transfer cartridges. Electronic attack improvements include the situational awareness defensive improvement (SADI) panoramic threat receiver and the ECM improvement upgrade to the ALQ-172 set. Recently installed Link 16 data link provides updated targeting information.

Current plans encompass a force of 76 aircraft.

B-52H Stratofortress (MSgt. Andrew E. Lynch)

Fighter and Attack Aircraft

A-10 Thunderbolt II

Brief: A simple, effective, and survivable twin-engine aircraft specifically designed for close air support (CAS) of ground forces and which can be used against all ground targets, including tanks and other armored vehicles.

Function: Attack aircraft.

Operator: ACC, AFMC, PACAF, USAFE, ANG, AFRC.

First Flight: Feb. 15, 1975 (preproduction).

Delivered: November 1975–March 1984.

IOC: October 1977.

Production: 713.

Inventory: 362.

Unit Location: Active: Davis–Monthan AFB, Ariz., Eglin AFB, Fla.; Eielson AFB, Alaska, Nellis AFB, Nev., Osan AB, South Korea, Pope AFB, N.C., Spangdahlem AB, Germany. ANG: Barnes Arpt., Mass., Boise Air Terminal, Idaho, Bradley Arpt., Conn., Martin State Arpt., Md., W.K. Kellogg Arpt., Mich., Willow Grove ARS, Pa. AFRC: Barksdale AFB, La., NAS JRB New Orleans, La., Whiteman AFB, Mo.

Contractor: Fairchild Republic; now Lockheed Martin.

Power Plant: two General Electric TF34-GE-100 turbofans, each 9,065 lb thrust.

Accommodation: pilot only, on zero-height/518 mph–zero-speed ejection seat.

Dimensions: span 57.5 ft, length 53.3 ft, height 14.7 ft.

Weight: empty 28,000 lb, max gross 51,000 lb.

Ceiling: 37,000 ft.

Performance: speed 518 mph, combat range with 9,500 lb of weapons and 1.7 hr loiter, 20 min reserve, 288 miles.

Armament: one 30 mm, seven-barrel GAU-8 Gatling gun with accuracy beyond 30,000 ft.; eight under-wing

hardpoints and three under fuselage for up to 16,000 lb of ordnance, incl various types of free-fall or guided bombs, combined effects munition (CEM) dispensers, gun pods, up to six AGM-65 Maverick missiles, up to four AIM-9 Sidewinder missiles, and jammer pods. Chaff and flares carried internally to counter radar-directed or IR-directed threats. The centerline pylon and the two flanking fuselage pylons cannot be occupied simultaneously.

COMMENTARY

Supporting the CAS mission, the A-10 combines large military load, long loiter, and wide combat radius with the ability to operate under 1,000-ft ceilings, with 1.5-mile visibility, and in darkness with NVGs. In a typical anti-armor mission, the A-10, nicknamed Warthog, can fly 150 miles and remain on station for an hour. The 30 mm GAU-8 gun provides a cost-effective weapon with which to defeat the whole array of ground targets, including tanks. The large bubble canopy provides all-around vision for the pilot, and the cockpit is protected with titanium armor, capable of withstanding projectiles up to 23 mm. An A-10 structural enhancement is strengthening the wing center section and outer panels. Used extensively in Desert Storm (Iraq) and recently in Enduring Freedom (Afghanistan) and Iraqi Freedom (Iraq), the A-10 is projected to serve well into the 2020s.

A-10A equipment includes an enhanced GPS/INS (EGI), head-up display (HUD), NVGs, the low-altitude safety and targeting enhancement (LASTE) system for ground collision avoidance, Pave Penny laser target identification pod, ECM, target penetration aids, self-protection systems, and AGM-65 Maverick and AIM-9 Sidewinder missiles. A precision engagement upgrade will provide the A-10 with new cockpit displays, a digital stores management system, a Joint Tactical Radio System (JTRS) data link and integration of the JDAM and WCMD. A targeting pod is also planned. Low-rate initial production (LRIP) of upgrade kits is scheduled to begin in 2004. Additionally, an upgraded automated chaff and flare system is planned for all aircraft by 2008.

OA-10A. Redesignated A-10s, used for forward air control of fighter aircraft, combat escort, search and rescue, and visual reconnaissance. The 30 mm GAU-8/A gun is retained, but under-wing stores are normally restricted to canisters of white phosphorous rockets for target marking. The first OA-10 unit reached initial operational capability (IOC) in October 1987.

AC-130 Gunship

Brief: Heavily armed aircraft using side-firing weapons integrated with sophisticated sensor, navigation, and fire-control systems to provide precise firepower or area saturation for long periods, at night and in adverse weather.

Function: Attack aircraft.

Operator: AFSOC.

First Flight: 1967.

Delivered: 1968–95.

IOC: 1972 (AC-130H); 1995 (AC-130U).

Production: 39; one further C-130 conversion recently contracted.

Inventory: 8 (AC-130H); 13 (AC-130U).

Unit Location: Hurlburt Field, Fla.

Contractor: Lockheed Martin (airframe); Boeing (AC-130H); Rockwell (AC-130U).

Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp.

Accommodation: AC-130H crew of 14; AC-130U crew of 13.

Dimensions: span 132.6 ft, length 99 ft, height 38.5 ft.

Weight: gross 155,000 lb.

Ceiling: 25,000 ft.

***A-10A** Thunderbolt II* (SSgt. Johnny Saldivar)

Performance: speed 289 mph, range 1,500 miles, with air refueling unlimited.

Armament: two 20 mm Vulcan cannons with 3,000 rd (AC-130H); one 25 mm Gatling gun (AC-130U); one 40 mm Bofors cannon with 256 rd, and one 105 mm Howitzer with 100 rd.

COMMENTARY

The AC-130 is a C-130 modified with gun systems, electronic and EO sensors, fire-control systems, enhanced navigation systems, sophisticated communications, defensive systems, and in-flight refueling capability. These systems give the gunship crew the capability to acquire and identify targets day or night, coordinate with ground forces and command and control (C2) agencies, and deliver surgical firepower in support of both conventional and special operations missions. During operations in Afghanistan the AC-130 Spectre has worked in conjunction with the RQ-1 Predator, the latter providing live video and target referencing information.

AC-130A was the initial version, deployed in Vietnam 1968–69. Eighteen produced.

AC-130E, an improved version, of which eight were built. Converted to H standard after service in Vietnam.

AC-130H Spectres serve with the 16th SOW. The unit has eight, each equipped with a digital fire-control computer. They employ EO sensors and target-acquisition systems, including FLIR and LLLTV, and are capable of in-flight refueling. Fire-control computers, navigation, communications, and sensor suites have been upgraded; an infrared suppression system (IRSS) overhaul is under way. In addition, USAF is to evaluate wingtip tanks as replacements for the existing underwing tanks as a means of improving performance.

AC-130U Spookys are the most recent gunship conversions, converted by Rockwell, of which 13 were delivered to the 16th SOW's 4th SOS in 1994–95. These aircraft have greater altitude capability and combine increased firepower, reliability, and superior accuracy with the latest methods of target location. The two 20 mm cannon of the H model are replaced with one trainable 25 mm Gatling gun. All weapons can be subordinated to the APQ-180 digital fire-control radar, FLIR, or all-light-level television (ALLTV) for adverse weather attack operations.

Although the AC-130H Spectre and AC-130U Spooky gunships use dissimilar avionics and other systems, fire support to troops on the ground is generally comparable. The AC-130U will not be required for most fire support missions but provides benefits under certain circumstances (weather, dual target attack, and defensive avionics).

***AC-130U** Spooky*

F-15 Eagle

Brief: A supersonic, all-weather, highly maneuverable tactical fighter designed to permit USAF to swiftly gain and maintain air superiority in aerial combat.

Function: Air superiority fighter.

Operator: ACC, AETC, AFMC, PACAF, USAFE, ANG.

First Flight: July 27, 1972.

Delivered: November 1974–85.

IOC: September 1975.

Production: 874.

Inventory: 518.

Unit Location: Active: Eglin AFB, Fla., Elmendorf AFB, Alaska, Kadena AB, Japan, Langley AFB, Va., Mountain Home AFB, Idaho, Nellis AFB, Nev., RAF Lakenheath, UK, Robins AFB, Ga., Tyndall AFB, Fla. ANG: Hickam AFB, Hawaii, Jacksonville Arpt., Fla., Kingsley Field, Ore., Lambert–St. Louis Arpt., Mo., NAS JRB New Orleans, La., Otis ANGB, Mass., Portland Arpt., Ore.

Contractor: McDonnell Douglas (now Boeing); Raytheon.

Power Plant: F-15C: two Pratt & Whitney F100-PW-220 turbofans, each 25,000 lb thrust, with max afterburner.

Accommodation: pilot only in F-15A/C; two seats in F-15B/D.

Dimensions: span 42.8 ft, length 63.8 ft, height 18.7 ft.

Weight: empty 28,600 lb, gross 68,000 lb.

Ceiling: 55,000 ft.

Performance: F-15C: max speed Mach 2.5, T-O run 900 ft, landing run without braking parachute 3,500 ft, ferry range with external fuel tanks more than 2,878 miles.

Armament: one internally mounted M61A1 20 mm six-barrel cannon; up to four AIM-9L/M Sidewinder and up to four AIM-7 Sparrow air-to-air missiles, or up to eight AIM-120 Advanced Medium-Range Air-to-Air Missiles (AMRAAMs), carried externally. Future weapons incl AIM-9X.

COMMENTARY

Superior maneuverability and acceleration, range, weapons, and avionics enable the F-15 to penetrate hostile defenses and establish air superiority over enemy systems. F-15 fighters deployed to the Persian Gulf for Desert Storm accounted for 34 of the 37 USAF air-to-air victories.

F-15A (single-seat) and **F-15B** (two-seat) fighters became USAF's front-line fighter immediately upon introduction in the mid–1970s. A multimission avionics system includes APG-63 pulse–Doppler radar for long-range detection and tracking of small high-speed objects down to treetop level and effective weapons delivery, a HUD for close-in combat, identification, friend or foe (IFF), and INS. A/Bs now serve with ANG.

F-15C (single-seat) and **F-15D** (two-seat) models followed in June 1979. Improvements include 2,000 lb of additional internal fuel and provision for carrying conformal fuel tanks (CFTs), reducing in-flight refueling requirements and increasing time in the combat zone. Since 1983 tactical capabilities have been enhanced extensively through the multistaged improvement program (MSIP), an ongoing program of installation of new or modification of existing avionics equipment, allowing for the carriage of more advanced weapons, and increased self-protection. The last 43 aircraft included improved APG-70 radar, and additional F-15C/Ds are receiving an APG-63 upgrade, the APG-63(V)1. One squadron in Alaska has received the later APG-63(V)2, featuring an advanced

***F-15C** Eagle* (Guy Aceto)

AESA radar antenna. F-15C/D aircraft are also to be modified with the Joint Helmet Mounted Cueing System (JHMCS), a "look and shoot" head-mounted system that significantly enhances lethality in close-range aerial combat. Other modifications include improved engines and GPS equipment. All types are being equipped with Link 16 fighter data link.

F-15E Strike Eagle

Brief: A heavily modified, two-seat, dual-role variant of the original F-15, with weapons systems totally integrated for all-weather deep interdiction missions as well as air-to-air combat.

Function: Dual-role fighter.

Operator: ACC, AFMC, PACAF, USAFE.

First Flight: Dec. 11, 1986.

Delivered: April 1988–2004.

IOC: May 1989.

Production: 236 scheduled.

Inventory: 217.

Unit Location: Eglin AFB, Fla., Elmendorf AFB, Alaska, Mountain Home AFB, Idaho, Nellis AFB, Nev., RAF Lakenheath, UK, Robins AFB, Ga., Seymour Johnson AFB, N.C.

Contractor: McDonnell Douglas (now Boeing); Raytheon.

Power Plant: two Pratt & Whitney F100-PW-220, each 25,000 lb thrust; or F100-PW-229 turbofans, each 29,000 lb thrust with max afterburner.

Accommodation: crew of two, on zero/zero ejection seats.

Dimensions: span 42.8 ft, length 63.8 ft, height 18.5 ft.

Weight: empty 45,000 lb, gross 81,000 lb.

Ceiling: 50,000 ft.

Performance: max level speed at altitude Mach 2.5, ferry range with CFTs 3,000 miles.

Armament: one internally mounted M61A1 20 mm six-barrel cannon; up to four AIM-9 Sidewinder and up to four AIM-7 Sparrow air-to-air missiles, or up to eight AIM-120 AMRAAMs; up to six AGM-65 Maverick air-to-surface missiles; AGM-130; EGBU-15 and GBU 10/12/15/24/28 guided munitions; CBU 87/89/97 cluster munitions; unguided munitions; and nuclear weapons. JSOW, JDAM, and WCMD capability from FY03.

COMMENTARY

F-15E has a strengthened airframe for increased gross weight at takeoff and maneuver at nine Gs throughout the flight envelope. Cockpit controls and displays are improved, and a wide-field-of-view (WFOV) HUD is included.

For low-altitude, high-speed penetration and precision attack on tactical targets at night and in adverse weather, the F-15E carries a high-resolution APG-70 SAR and LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) pods, with wide-field FLIR. The APG-70 gives the F-15E, with its AMRAAM, AIM-7, and AIM-9 load, a true multirole capability with the inherent air-to-air capability of the F-15C. The triple-redundant digital flight-control system, in combination with the LANTIRN navigation pod and the WFOV HUD, permits automatic terrain following. Other improvements include an EGI and Link 16 data link. Strike capability will be enhanced with the addition of the JHMCS. Smart weapon (JSOW, JDAM, and WCMD) capability is added from 2003. In addition, USAF has equipped some F-15E aircraft with Litening targeting pods for improved precision attack capability. External CFTs, adapted to carry ordnance tangentially, can be fitted to reduce drag while increasing combat range.

During Desert Storm, 48 USAF F-15Es were deployed to the Persian Gulf where they operated mainly at night, hunting Scud missile launchers and artillery sites using the LANTIRN system. They also operated successfully with Joint STARS radar aircraft.

Congress authorized 10 additional aircraft with deliveries beginning in FY02 through FY04. These new F-15Es include upgraded programmable armament control (PAC) and software for compatibility with JDAM, JSOW, and WCMD, as well as an enhanced night vision capability.

F-16 Fighting Falcon

Brief: A compact, versatile, and low-cost multirole fighter aircraft that is highly maneuverable and has repeatedly proved itself in air-to-air combat and air-to-surface attack.

Function: Multirole fighter.

Operator: ACC, AETC, AFMC, PACAF, USAFE, ANG, AFRC.

First Flight: Dec. 8, 1976 (full-scale development).

Delivered: August 1978–2007 (planned).

IOC: October 1980, Hill AFB, Utah.

Production: 2,206.

Inventory: 1,391.

Unit Location: 13 active wings, 27 ANG, and four AFRC units (one Associate).

***Block 50 F-16CJ** Fighting Falcon* (Guy Aceto)

Contractor: Lockheed Martin; Northrop Grumman.

Power Plant: one augmented turbofan. General Electric F110-GE-100 (27,600 lb thrust) and Pratt & Whitney F100-PW-220 (23,450 lb thrust) are alternative standard engines. Increased performance engines (IPEs) in aircraft delivered from late 1991: Block 50: F110-GE-129 (29,000 lb thrust); Block 52: F100-PW-229 (29,100 lb thrust).

Accommodation: pilot only, on zero/zero ejection seat.

Dimensions: wingspan with missiles 32.7 ft, length overall 49.4 ft, height 16.7 ft.

Weight: (F-16C) empty (F100-PW-229) 18,591 lb, (F110-GE-129) 18,917 lb; gross, with external load (Block 40/42) 42,000 lb.

Ceiling: 50,000 ft.

Performance: max speed Mach 2, radius of action: Block 40 with two 2,000-lb bombs, two AIM-9 missiles, and external fuel, hi-lo-lo-hi 852 miles; combat range 575 miles.

Armament: one M61A1 20 mm multibarrel cannon, with 511 rd, mounted in fuselage; wingtip-mounted missiles; seven other external stores stations for fuel tanks and a range of air-to-air and air-to-surface munitions.

COMMENTARY

The F-16 is the workhorse of the USAF fighter fleet. The 200+ USAF F-16 multimission fighters deployed to the Persian Gulf Theater flew more sorties than any other type during Desert Storm, with 13,500 missions.

F-16A (single-seat) and **F-16B** (two-seat) versions, which entered service with the 388th TFW, Hill AFB, Utah, incorporated advanced technologies from the start, making these aircraft two of the most maneuverable fighters built. Equipment includes a multimode radar with a clutter-free look-down capability, advanced RWR, HUD, internal chaff/flare dispensers, and a 500-rd 20 mm internal gun.

Production of the F-16A and B for USAF ended in 1985. Most now belong to ANG. USAF and NATO operators have cooperated in an operational capabilities upgrade. Under this midlife update program, the radar, fire-control computer, stores-management computer, and avionics software are improved, giving F-16A/Bs the ability to use next generation air-to-air and air-to-surface weapons.

Reliability and maintainability improvements include a ring-laser gyro INS and installation of the upgraded F100-PW-220E turbofan.

The Multinational Staged Improvement Program, implemented in 1980, ensured the aircraft could accept systems under development, thereby minimizing retrofit costs. All F-16s delivered since November 1981 have had built-in structural and wiring provisions and systems architecture that expand the single-seater's multirole flexibility to perform precision strike, night attack, and beyond-visual-range intercept missions.

F-16C (single-seat) and **F-16D** (two-seat) aircraft were introduced at production Block 25 with MSIP II improvements in the cockpit, airframe, and core avionics and an increased-range APG-68 radar. Deliveries began in 1984. With the exception of AFMC, all of the active and many of the Guard and Reserve units have since converted to F-16C/Ds.

Block 40/42 F-16s specialize in night attack operations with precision guided weapons. Follow-on improvements include ALE-47 improved defensive countermeasures, ALR-56M advanced RWR (Block 40 only), Very High Speed Integrated Circuit (VHSIC) technology in the APG-68(V5) fire-control radar, a ring-laser gyro INS, a LANTIRN nav/attack system, and IPEs. System improvements also introduced at Block 40/42 include core avionics hardware, installation of a LANTIRN nav/attack system, GPS, enhanced-envelope gunsight, digital flight controls, automatic terrain following, increased takeoff weight and maneuvering limits, an 8,000-hour airframe, and expanded envelope nine–G capability.

Block 50/52 F-16CJs have MSIP Stage III improvements, which also show up in selected retrofits of earlier F-16 blocks. These aircraft incorporate the latest cockpit control and display technology, including a wide-angle HUD. Weapons improvements include multishot AMRAAM compatibility, AGM-154 JSOW, and WCMD. ANG and AFRC Block 25/30 F-16s are being upgraded under the combat upgrade plan integration details (CUPID) program to near Block 50 standard. Improvements include EGI, situation awareness data link (SADL), and an ECM management system. Advanced IFF will also be retrofitted to Block 25/30 aircraft.

In another program, Block 50/52 USAF F-16C/Ds, followed by Block 40/42 from 2005, are being retrofitted with a new modular mission computer being developed under an F-16 common configuration implementation program (CCIP), aimed at extending operational flexibility. This effort includes the participating European governments of the F-16 Multinational Fighter Program. Other improvements to be incorporated include color displays, Sniper XR targeting pod, JHMCS,

***X-35A** Lockheed Martin Joint Strike Fighter concept demonstrator* (Tom Reynolds)

AIM-9X, Link 16 data link, and improved weapons capabilities. First delivery made January 2002. The Block 50/52 aircraft will have dual/alternate carriage of High-speed Anti-Radiation Missile (HARM) targeting system (HTS)/smart targeting and identification via networked geolocation (STING) and advanced targeting pods (ATP) in Fiscal 2006.

F-16CG designated aircraft are equipped with LANTIRN for precision day or night attack.

F-16CJ/DJ designated Block 50 aircraft are equipped with the HTS for suppression of enemy air defenses (SEAD).

F-35 Joint Strike Fighter

Brief: An affordable, highly common family of next generation strike aircraft.

Function: Multirole fighter.

Operator: ACC for USAF.

First Flight: Oct. 24, 2000 (concept demonstrator).

Delivery: 2008 (anticipated first production aircraft).

IOC: 2011 (USAF).

Production: planned: 1,763 F-35A (USAF), 480 F-35B (USMC), 609 F-35C (USN), 150 (UK).

Inventory: TBD.

Unit Location: TBD.

Contractor: Lockheed Martin, with Northrop Grumman and BAE Systems; Pratt & Whitney is primary propulsion contractor; General Electric is alternate engine contractor.

Power Plant: one Pratt & Whitney F135 or General Electric F136 turbofan (production), in 35,000-lb thrust class.

Accommodation: pilot only, on zero/zero ejection seat.

Dimensions: TBD.

Weight: TBD.

Ceiling: TBD.

Performance (design targets): max level speed at S/L 724.5 miles calibrated airspeed for Navy and short takeoff and vertical landing (STOVL) variants, Mach 1 for USAF variant, combat radius more than 590 miles for USAF variant, 600 miles for Navy variant, and 450 miles for STOVL variant.

Armament: (main weapons bay): USAF variant: one internal gun, two AMRAAMs, and two 2,000-lb JDAMs. USN variant: two AMRAAMs and two 2,000-lb JDAMs. STOVL variant: two AMRAAMs and two 1,000-lb JDAMs. External carriage will also be available. (Note: Numerous other weapons capabilities will be added as system development continues.)

COMMENTARY: The Joint Strike Fighter (JSF) is a multinational cooperative development program that will develop and field an affordable, highly common family of next generation strike fighters. USAF is developing the JSF to replace its current force of F-16 and A-10 aircraft with a stealthy multirole fighter that will comprise the bulk of USAF's fighter fleet for up to 50 years. This advanced multimission fighter is designed to penetrate high-threat enemy airspace and engage all enemy targets in any conflict. In addition to its advanced stealth design, the JSF incorporates maneuverability, long range, and highly advanced avionics to accomplish the bulk of USAF missions. Its fully integrated avionics and weapons systems will permit simultaneous engagement of multiple targets in enemy airspace.

The concept demonstration phase (CDP) of the program commenced November 1996, with competitive contract awards to Lockheed Martin (X-35A) and Boeing (X-32A). CDP concluded in fall 2001 with Lockheed Martin declared the winner. The system development and demonstration (SDD) phase, begun in October 2001, focuses on system development, test and evaluation, logistics support, and LRIP. Flight testing is projected to begin in August 2005. The JSF is powered by a derivative of the Pratt & Whitney F119 engine, called the F135. General Electric is to develop an alternative power plant, the F136, for competitive production.

***F-117** Nighthawk* (SSgt. Andy Dunaway)

F-117 Nighthawk

Brief: World's first operational aircraft designed to exploit low observable (LO) stealth technology to expand the range of heavily defended strategic targets that can be attacked.

Function: Attack aircraft.

Operator: ACC, AFMC.

First Flight: June 18, 1981.

Delivered: 1982–summer 1990.

IOC: October 1983.

Production: 59.

Inventory: 55 (52 F-117A; 3 YF-117).

Unit Location: Eglin AFB, Fla., Holloman AFB, N.M.

Contractor: Lockheed Martin; Raytheon.

Power Plant: two General Electric F404-GE-F1D2 nonafterburning turbojets, each 9,040 lb thrust.

Accommodation: pilot only, on zero/zero ejection seat.

Dimensions: span 43.3 ft, length 65.9 ft, height 12.4 ft.

Weight: empty (estimated) 29,500 lb, max gross 52,500 lb.

Ceiling: 35,000 ft.

Performance: high subsonic, top speed 646 mph (0.9 Mach), mission radius, unrefueled (5,000-lb weapons load) 656 miles.

Armament: full internal carriage of a variety of tactical weapons, incl laser- and GPS-guided 2,000-lb munitions, unguided general-purpose bombs and cluster munitions.

COMMENTARY

F-117 is the Air Force's primary strategic attack aircraft for penetrating high-threat target areas with precision weapons and is the only stealthy, true precision capability currently in the Global Strike Task Force. Its small radar signature and LO technologies allow the aircraft to penetrate dense threat environments and to deliver precision weapons against highly defended, high-value targets with pinpoint accuracy. Primary missions include strategic attack, air interdiction, SEAD, and special operations.

Acknowledged publicly in November 1988, the F-117's first operational deployment was to Panama in 1989 for Just Cause. During Gulf War I in 1991, a fleet of more than 40 F-117As undertook 1,270 missions. No aircraft were lost or damaged by hostile fire. Twenty-four F-117s participated extensively in combat operations during Allied Force. One F-117 was lost March 27, 1999, during that conflict.

F-117A development and manufacture began simultaneously in November 1978 within a highly classified environment, using many parts either transferred or modified from existing aircraft. The F-117As were deployed with the 4450th Tactical Group (redesignated 37th Tactical Fighter Wing in 1989) at Tonopah Test Range Airfield, Nev., up until 1992 where operations were restricted mainly to night flying to maintain secrecy.

To achieve the aircraft's minimal radar signature, the skin panels of the arrowhead-shaped airframe are divided into many small, perfectly flat surfaces (facets), which deflect at a variety of angles all signals from probing hostile ground or airborne radars. In addition, much of the aircraft's external surface is made of composites and radar-absorbent materials. The F-117A's dull black finish reflects little light, and the engine air intakes and exhaust nozzles are above the wings and rear fuselage, respectively, to shield them from IR seekers below. The two nonafterburning turbofans give the aircraft low noise signature and high subsonic performance.

Key features include a state-of-the-art digital avionics suite integrating sophisticated navigation and attack systems, complemented by a specially developed automated mission-planning system. A high-precision INS coupled to GPS is installed. An upgraded dual-turret IR targeting system, combined with boresight laser designators and autotracker, ensures precision attack.

Other improvements since 1989 have included upgraded cockpit display and instrumentation and adverse weather capability via advanced weapons. Current modification aims at providing a single, optimal LO configuration, adverse weather capability via additional advanced weapons, and maintaining the fleet through its service life. The F-117 is expected to remain in USAF service into the 2020s.

F/A-22 Raptor

Brief: High-technology follow-on for the F-15C. An all-weather, multirole fighter that combines an extremely maneuverable airframe with stealth technologies, supercruise, and integrated avionics to help it penetrate through advanced anti-air threats and achieve air dominance.

Function: Fighter.

Operator: ACC, AETC, AFMC.

First Flight: Sept. 7, 1997.

Delivery: 2001 (first production representative aircraft)–2013 (planned).

IOC: December 2005.

Production: TBD.

Inventory: eight.

Unit Location: Langley AFB, Va. (first operational location); Nellis AFB, Nev.; Tyndall AFB, Fla. (fighter training unit), with deliveries from July 2003.

Contractor: Lockheed Martin; Boeing.

Power Plant: two Pratt & Whitney F119-PW-100 turbofans, each in 35,000-lb thrust class.

Accommodation: pilot only, on zero/zero ejection seat.

Dimensions: span 44.5 ft, length 62 ft, height 16.6 ft.

Weight: gross 50,000 lb.

Ceiling: 50,000 ft.

Performance (design target): max level speed at S/L 900+ mph, range more than 2,000 miles.

Armament: (projected) one internal M61A2 20 mm gun, two AIM-9 Sidewinders stored internally in the side weapons bays; six AIM-120 AMRAAMs in the main weapons bay; approx eight SDBs internally; for ground attack, two 1,000-lb JDAMs replace four AMRAAMs internally.

COMMENTARY

The recent redesignation from F-22 to F/A-22 reflects increased emphasis on high-speed attack, in addition to rapidly achieving air dominance. The F/A-22 will counter multiple anti-access threats, such as advanced integrated air defense system (IADS), fighters, cruise missiles, theater ballistic missile (TBM) sites, and weapons of mass destruction through the application of unmatched air-to-air capabilities coupled with inherent air-to-ground capability. The F/A-22's unique combination of stealth, supercruise (ability to cruise at supersonic speed without using its afterburners), maneuverability, and integrated avionics leads USAF's initial "kick down the door" force, enabling 24-hour stealth operations across the spectrum of missions. Its fully integrated avionics and weapons systems will permit simultaneous engagement of multiple targets. Advanced maneuverability is achieved through the combination of the avionics system, structural strength, and thrust vectoring nozzles. A Raytheon common integrated processor ties together various avionics functions.

Two prototypes were built for competitive evaluation with Northrop/McDonnell Douglas YF-23 prototypes. First flight was Sept. 29, 1990, with the **YF-22** selected as winner in April 1991.

F/A-22A. Production-configured version entered engineering and manufacturing development (EMD) phase in August 1991. USAF is receiving nine single-seat F/A-22As, three without avionics to explore flight characteristics, flutter, loads, propulsion, and envelope expansion and six as avionics test beds. Under EMD, USAF also received one static test and one fatigue test airframe.

F/A-22 EMD flight test continues as the F/A-22 expands the flight envelope and tests the evolutionary integrated avionics. Development flight testing is in preparation for entry into dedicated initial operational test and evaluation (DIOT&E) this year. The F/A-22 was approved for LRIP on Aug. 14, 2001, with 10 aircraft subsequently ordered. A second LRIP decision has contracted for 13 aircraft. USAF has plans for a fleet of 339 F/A-22s, but states a requirement for at least 381.

USAF has asked Lockheed Martin to do minimal preliminary design of a dedicated attack variant, tentatively called **FB-22.** The aircraft would be longer than the F/A-22, with much larger wings and greater fuel and weapons capacity, with three times the range of the baseline aircraft. While still stealthy, the FB-22 would lack thrust vectoring and other features necessary for dogfighting. The FB-22 could be 80 percent common with the standard F/A-22.

X-45 UCAV

Brief: A concept demonstrator for a stealthy unmanned combat air vehicle (UCAV) that will be capable of carrying a large weapons payload for the SEAD mission. The system may be stored in "smart boxes" until required, then reassembled and made mission-ready within a very short period. The UCAV may also be made air refuelable for self-deployment.

Function: Concept demonstrator UCAV for the SEAD mission.

First Flight: May 22, 2002

Contractor: Boeing.

Inventory: two.

Power Plant: Honeywell F124 turbofan.

Dimensions: span around 34 ft, length 27 ft.

COMMENTARY

A USAF/Defense Advanced Research Projects Agency (DARPA) program to develop UCAV technology for the SEAD mission. The Boeing **X-45A** concept demonstrator is a Y-shaped airplane, designed for stealth and able to carry two tons of ordnance, including GPS-guided munitions. Equipment will include an EW suite and SAR. Work on a longer range **X-45C** version is under way, replacing the now-canceled X-45B.

YAL-1A Attack Airborne Laser

Brief: The prototype YAL-1A, using a modified 747-400F platform, will be the world's first operational airborne high-energy laser weapon system. It will employ a Chemical-Oxygen Iodine Laser (COIL) system, running down the interior of the aircraft. Laser fire will emerge through a large ball turret in the nose. Intended targets are TBMs in their boost, or very earliest, phase of flight. The system will track TBMs and maintain laser focus on their skin, which, when sufficiently heated, will cause the pressurized fuel within to explode. The Airborne Laser (ABL) can target TBMs hundreds of miles away and thus can remain over friendly territory to kill TBMs as they are launched.

Function: Airborne laser.

Operator: ACC.

First Flight: July 18, 2002 (Block 2004 test bed).

Delivered: First aircraft in flight test, undergoing installation of laser system.

IOC: FY12 (planned).

Production: TBD.

Inventory: TBD.

Unit Location: TBD.

Contractor: Boeing (ABL platform; battle management (BM) system), TRW (COIL and subsystems), Lockheed Martin (beam control system).

Power Plant: four GE CF6-80 turbofans, each 61,500 lb thrust.

Accommodation: flight crew of two, plus four mission specialists.

Dimensions: span 211.4 ft, length 228.8 ft, height 63.7 ft.

Weight: empty 423,882 lb, gross 800,000 lb.

Ceiling: 45,000 ft.

Performance: max operating speed Mach 0.83, max laser weapon range hundreds of miles, unrefueled endurance at 40,000 ft with operational laser weapon load approx six hr. Chemical fuel carried on board will enable more than 20 shots.

COMMENTARY

The Airborne Laser will become the first directed energy weapon in the US arsenal. The Missile Defense Agency (MDA) assumed overall direction and budget authority for the program in summer 2001. USAF continues to man and develop the program through its Airborne Laser System Program Office at Kirtland AFB, N.M.

Air Combat Command will have operational responsibility and currently plans to base the attack laser in CONUS but could deploy the ABL with minimal airlift support to any region of the world. It will arrive in theater with its crew, laser fuel, and initial spares ready to fight. Operational concepts call for ABLs to fly continuous patrols over deployed US forces, at an altitude of 40,000 feet. The aircraft will detect and shoot down any TBMs launched at US forces or nearby allied nations. The ABL will also have the capability of determining hostile launch locations and passing that information to other US assets. As US forces achieve air superiority, ABL will be able to move closer to enemy territory. ABLs represent the only near-term boost-phase missile defense. Once the decision is made to proceed with full production, USAF's acquisition community will assume responsibility for procurement; fleet size has not been determined.

The attack laser's main armament is a lightweight, megawatt-class COIL. This laser technology can deliver high energy over a great distance largely because of its IR wavelength. In addition to the COIL, the ABL house three other lasers: the active ranger system which provides preliminary tracking data; the track illuminator laser, which produces more refined data; and the beacon illuminator laser, which measures atmospheric disturbance.

Following a two-year structural modification, the ABL platform's first flight took place July 18, 2002, from Boeing's Wichita, Kan., facility. A 10-month laser module test was completed in 2002, and, in late 2002, the platform was flown to Edwards AFB, Calif., where system components will be installed and tested. A test destruction of a boosting ballistic missile is projected for early 2005.

The test aircraft will offer limited operational capability; this aircraft will eventually be converted to a fully operational model.

***F/A-22** Raptor* (Lockheed)

Reconnaissance and Surveillance Aircraft

E-3 Sentry

Brief: Modified Boeing 707, fitted with a rotating radar dome 30 ft wide and 6 ft thick, which provides all-weather air surveillance and C3 for tactical and air defense forces.

Function: Airborne early warning, BM, C3 aircraft.

Operator: ACC, PACAF, AFRC (Assoc.).

First Flight: Oct. 31, 1975 (full avionics).

Delivered: March 1977–84.

IOC: 1977.

Production: 34.

Inventory: 31.

Unit Location: Elmendorf AFB, Alaska, Kadena AB, Japan, Tinker AFB, Okla.

***E-3C** Sentry* (Ted Carlson)

***E-8C** Joint STARS* (Ted Carlson)

Contractor: Boeing; Northrop Grumman (radar); Lockheed Martin (computer).
Power Plant: four Pratt & Whitney TF33-PW-100/100A turbofans, each 21,000 lb thrust.
Accommodation: flight crew of four; 13–19 mission specialists.
Dimensions: span 145.8 ft, length 152.9 ft, height 41.5 ft.
Weight: gross 347,000 lb.
Ceiling: 38,000 ft.
Performance: optimum cruise Mach 0.78, endurance eight hr unrefueled.
COMMENTARY
The E-3 Airborne Warning and Control System (AWACS) aircraft is capable of surveillance from Earth's surface up to the stratosphere, over land or water, at more than 200 miles.
E-3A. Of the 24 built for USAF in standard production configuration, 22 were later upgraded.
An improved US/NATO Standard E-3A configuration was initiated with the 25th USAF Sentry, delivered in December 1981, with a larger-memory computer and a maritime detection capability. Nine were built new for USAF, and one of the original E-3As was upgraded.
E-3B is the upgraded earliest version E-3A. Twenty-two production models and two prototypes were produced. Improvements include much-enhanced computer capabilities, jam-resistant communications, austere maritime surveillance capability, additional radio communications, and five additional display consoles.
E-3C is an upgrade to the original 10 US/NATO Standard E-3A aircraft, with additional radio, console, and radar capabilities. Redelivered 1984.
A series of major sustainability, reliability, and availability upgrades for USAF E-3s has been undertaken. Mission system upgrades include new passive detection systems, known as electronic support measures (ESM), that complement the active beaming radar, enabling the aircraft to detect signals emitted by both hostile and friendly targets. Additional enhancements include upgrade of the Joint Tactical Information Distribution System (JTIDS), jam-resistant communications, increased computer capacity, and GPS capability. Radar system improvements permit AWACS aircraft operating in the pulse–Doppler mode to detect smaller, stealthier targets. Future improvement and management support are being handled within a single, long-term contract awarded May 2001.

E-8 Joint STARS
Brief: A modified Boeing 707 equipped with a large, canoe-shaped radome mounted under the forward part of the fuselage, housing long-range, air-to-ground radar capable of locating, classifying, and tracking vehicles moving on Earth's surface out to distances in excess of 124 miles. Such data are then transmitted via data link to ground stations or other aircraft.
Function: Ground surveillance, BM, C2 aircraft.
Operator: ACC, ANG.
First Flight: December 1988.
Delivered: May 1996–present
IOC: Dec. 18, 1997.
Production: 17 planned.
Inventory: 14.
Unit Location: Robins AFB, Ga.
Contractor: Northrop Grumman; Motorola; Cubic; Raytheon.
Power Plant: four Pratt & Whitney TF33-102C turbojets, each 19,200 lb thrust.
Accommodation: mission crew of 21 Air Force/Army operators (can be augmented to 34).
Dimensions: span 145.8 ft, length 152.9 ft, height 42.5 ft.
Weight: gross 336,000 lb.
Ceiling: 42,000 ft.
Performance: max operating speed Mach 0.84, endurance with one in-flight refueling 20 hr.
COMMENTARY
Joint STARS (Surveillance Target Attack Radar System) is a BM platform capable of providing theater commanders with C2 of air-to-ground forces and simultaneous near-real-time wide area surveillance as well as downlink of targeting information to air and ground commanders. Joint STARS battle managers, in combination with a robust communications suite, conduct C2 of air operations to engage enemy forces in day, night, and adverse weather conditions. Joint STARS also conducts near-real-time surveillance and reporting for use by air and ground forces. The radar subsystem features a multimode, side-looking, phased-array radar that provides interleaved moving target indicator (MTI), SAR, and fixed target indicator (FTI) imagery. Joint STARS downlinks via a secure, jam-resistant digital data link. Multiple receivers are in use, predominantly the US Army's Common Ground Station and Joint Services Work Station.
As part of their operational test and evaluation, Joint STARS aircraft flew more than 150 operational missions during Desert Storm (with two E-8A development aircraft) and Joint Endeavor (with one E-8A and one test bed E-8C).
E-8A. Prototype version, with specialized equipment installed aboard two specially modified 707-300 airframes. One was converted to an in-flight pilot trainer in 1997, and the second has been placed in long-term storage.
E-8C. Production version, based on former commercial 707-300 airframes. Equipped with 18 operations and control consoles, two of which double as communications stations. The first E-8C flew in March 1994 and served as the preproduction test bed. The last seven production aircraft will feature more advanced computer systems, which will be retrofitted on the 10 earlier aircraft. Planned improvements include Link 16 upgrade for data transmission to attack aircraft; enhanced SAR; new satellite radios; upgrades to allow Joint STARS to assume the Airborne Battlefield Command and Control Center (ABCCC) mission of attack support to ground force commanders; and global air traffic management (GATM) upgrades to permit use of optimum altitudes and flight routes in European airspace.

MQ-1 Predator A
Brief: A medium-altitude, long-endurance unmanned aerial vehicle (UAV), flown remotely. Joint force commander multimission asset, combining imagery sensors with strike capability.
Function: Unmanned reconnaissance aircraft.
Operator: ACC.
First Flight: July 1994.
Delivered: July 1994 (USAF from 1996)–present.
IOC: 2003.
Production: 100 air vehicles (planned).
Inventory: eight air vehicles.
Unit Location: Indian Springs AFAF, Nev.
Contractor: General Atomics Aeronautical Systems.
Power Plant: one Rotax 914 turbocharged engine.
Accommodation: unmanned system.
Dimensions: length 27 ft, height 7.2 ft, span 48.7 ft.
Weight: empty 950 lb, gross 2,250 lb.
Ceiling: 25,000 ft.
Performance: cruise speed 80 mph, up to 138 mph, endurance 24 hours (460 miles with 16 hours on station).
Armament: Two Hellfire missiles on multispectral targeting system (MTS)–equipped vehicles.
COMMENTARY
USAF has activated three Predator squadrons, the 11th, 15th, and 17th RS. The 11th conducts mission qualification training, as well as operational deployments. The Predator system includes four air vehicles, a ground control station, satellite link, and about 55 personnel for 24-hour operations. The Predator crew comprises a pilot and two sensor operators.
DOD first used the advanced concept technology demonstration (ACTD) Predator in 1995 to support Provide Promise. In 1997, DOD named USAF to take over the Predator program. In 1999, while the UAV was still in development, USAF began to deploy the system operationally for surveillance missions over Bosnia and Iraq. In July 2001, USAF successfully experimented with Predators armed with Hellfire missiles. In Enduring Freedom, Predators provided live video feeds directly to AC-130 gunships, and Hellfire–armed Predators struck time sensitive targets. USAF changed the designation for Predator A to MQ-1 to denote its multimission capability for both reconnaissance and strike.
MQ-1 designates the weaponized Predator A. It carries an MTS sensor ball supplied by Raytheon in place of the Wescam sensor ball. The MTS provides a laser target designator with EO/IR sensors in a single package, where, previously one video camera had to be removed to house a laser designator. The SAR is removed to make room for some of the laser designator equipment. The MQ-1 can carry two Hellfire antitank missiles.
RQ-1A designates the ACTD version of Predator A, all of which are slated to retire soon.
RQ-1B, the reconnaissance-only version of Predator A, has an internal 450-lb surveillance payload that includes two EO and one IR video cameras carried in a ball-shaped turret under the nose and produced by Wescam. The internal sensor payload also includes a SAR still imagery camera for a day/night, all-weather reconnaissance capability. USAF is retrofitting most RQ-1Bs to MQ-1 status.

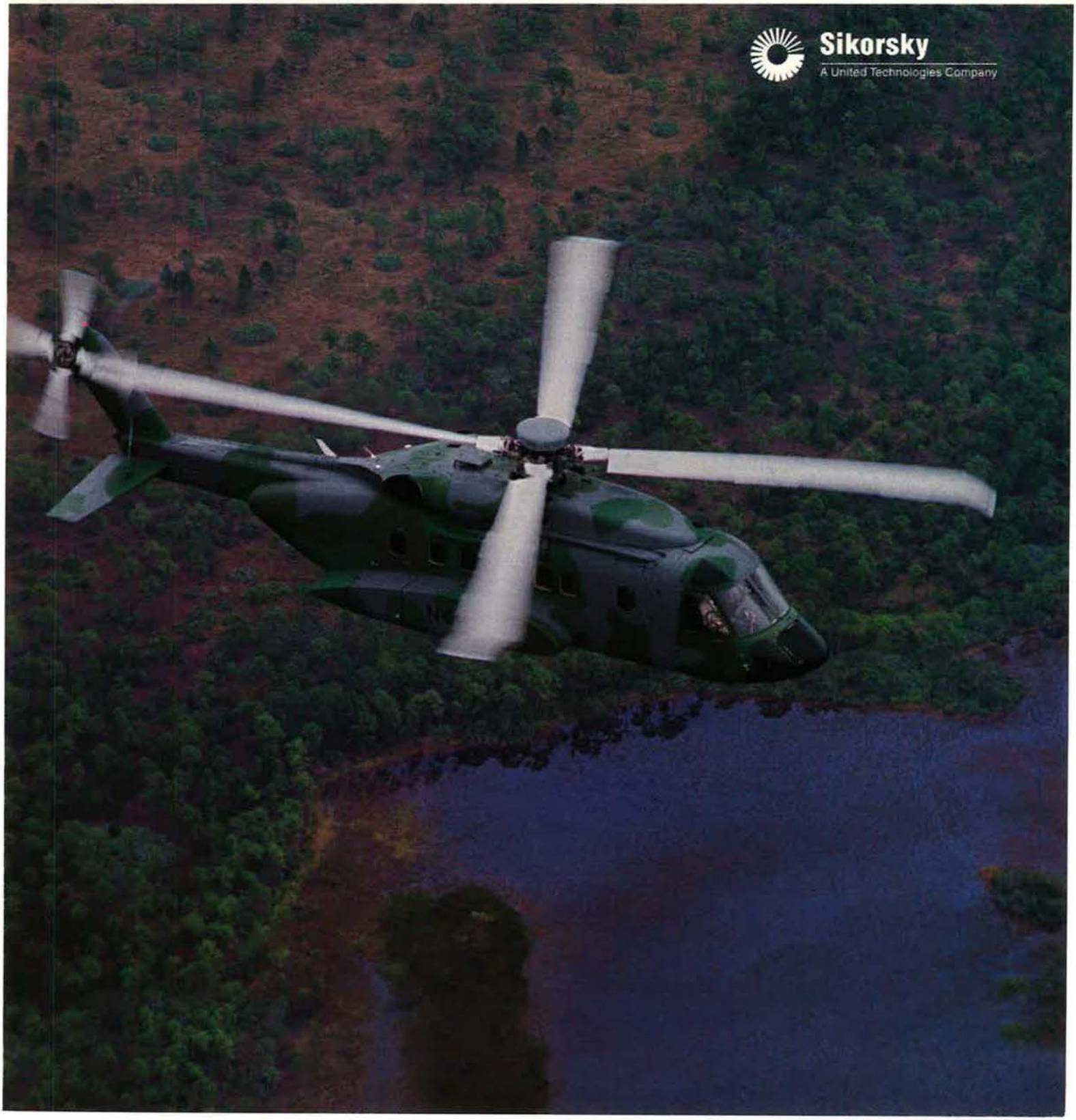
MQ-9 Predator B
Brief: A high-altitude, long-endurance UAV, flown remotely. Joint force commander multimission asset combining imagery sensors with expanded strike capability.
Function: Unmanned reconnaissance aircraft.
Operator: ACC.
First Flight: February 2001.
Delivered: November 2003 (planned).

***RQ-1A** Predator* (TSgt. Scott Reed)

Not all helicopters are created equal.

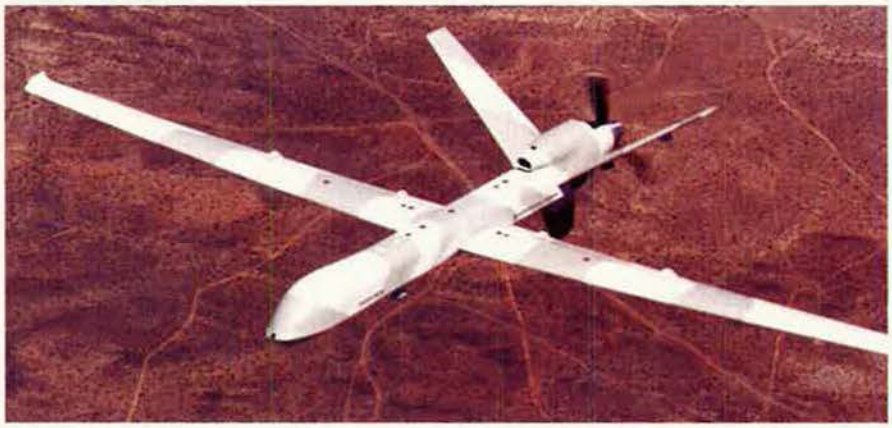
But all Sikorsky helicopters are.

The S-92 has received the 2002 Collier Trophy for its achievement in research, technology, and innovation. Sikorsky puts that same standard of excellence into every one of its civilian and military helicopters. Winning the Collier Trophy is more than an award for the S-92. It is a reflection on the whole Sikorsky family.



IOC: TBD.
Production: Nine (planned).
Inventory: TBD.
Unit Location: Indian Springs AFAF, Nev.
Contractor: General Atomics Aeronautical Systems.
Power Plant: one Honeywell TPE-331-10T turboprop engine or Williams FJ44-2A turbojet engine.
Accommodation: unmanned system.
Dimensions: length 36.2 ft, span 64 ft.
Weight: empty 6,000 lb, gross 10,000 lb.
Ceiling: 50,000+ ft.
Performance: cruise speed 172 mph, up to 230 mph, endurance 30+ hours.
Armament: 10 AGM-114 Hellfire missiles.
COMMENTARY
Predator B, an enhanced version of the Predator A, was developed jointly, in 2000, by NASA and General Atomics Aeronautical Systems for high-altitude research. In October 2001, USAF acquired both prototypes to evaluate the UAV's capability as a weapons platform and to carry an increased sensor payload. In December 2002, USAF issued a contract for two Predator Bs, with the designation **MQ-9.** Current funding plans call for purchase of nine MQ-9s.

***RQ-4** Global Hawk* (TSgt. Jack Braden)



***MQ-9** Predator B* (General Atomics Aeronautical Systems)

The MQ-9 hunter–killer UAV flies higher, faster, and has 50 percent greater payload capacity than the MQ-1. With its 800-lb internal sensor payload capacity, the MQ-9 will be able to carry simultaneously numerous payloads, such as a larger, more capable camera system, SAR, MTS, and other detection systems. Its 3,000-lb external payload capacity will enable it to carry up to 10 Hellfire missiles. USAF is exploring other weapons and a possible air-to-air role.

OC-135 Open Skies
Brief: A modified C-135 aircraft that flies unarmed observation and verification flights over nations that are parties to the 1992 Open Skies Treaty.
Function: Reconnaissance aircraft.
Operator: ACC.
First Flight: June 1993.
Delivered: October 1993–96.
IOC: October 1993.
Production: three.
Inventory: two.
Unit Location: Offutt AFB, Neb.
Contractor: Boeing.
Power Plant: four Pratt & Whitney TF33-P-5 turbofans, each 16,050 lb thrust.
Accommodation: seating for 38.
Dimensions: span 131 ft, length 135 ft, height 42 ft.
Weight: gross 297,000 lb.
Ceiling: 50,000 ft (basic C-135).
Performance: speed: 500+ mph, unrefueled range 3,900 miles.
COMMENTARY
A modified version of the WC-135, used for specialized reconnaissance with an IR linescanner, SAR, and forward- and vertical-looking video cameras installed in the rear of the aircraft.
OC-135B modifications include one vertical and two oblique KS-87 framing cameras, used for low-altitude photography approximately 3,000 ft above the ground, and one KA-91 pan camera, which pans from side to side to provide a wide sweep for each picture, used for high-altitude photography at approximately 35,000 ft. Data is processed and recorded by the Miletus camera annotation system.

RC-135
Brief: Specially configured variant of the Boeing C-135 Stratolifter, having an elongated nose and cheeks containing highly advanced electronic signal collection systems. Used to acquire real-time electronic intelligence (Elint) data for theater and tactical commanders.
Function: Electronic reconnaissance aircraft.
Operator: ACC.
First Flight: not available.
Delivered: circa 1973–99.
IOC: circa 1973 (Rivet Joint).
Production: (converted).
Inventory: 21.
Unit Location: Offutt AFB, Neb.
Contractor: Boeing (airframe); Raytheon; Textron.
Power Plant: four Pratt & Whitney TF33-P-5/9 turbofans, each 18,000 lb thrust. (Replaced with CFM International CFM-56s in one W version.)
Accommodation: flight crew of four; 25–35 mission crew.
Dimensions: (Cobra Ball) span 131 ft, length 140 ft, height 42 ft; (Cobra Sent) span 135 ft, length 136 ft; (Rivet Joint) height 38 ft.
Weight: max gross 299,000 lb.
Ceiling: 35,000 ft.
Performance: speed 500 mph plus, range, with air refueling, unlimited.
COMMENTARY
The 55th Wing at Offutt AFB, Neb., operates a highly specialized fleet for worldwide reconnaissance missions. All are due to be re-engined and are subject to ongoing modernization, with upgrade of avionics and primary mission equipment to expand capability and maintain effectiveness.
RC-135S Cobra Ball. Three aircraft are measurement and signature intelligence (MASINT) collection platforms. The Cobra Ball can deploy anywhere in the world in 24 hours and provide on-scene EO reconnaissance for treaty verification and TBM proliferation. Equipment includes wide-area IR sensors, long-range optical cameras, and an advanced communications suite.
RC-135U Combat Sent. Two aircraft with precision signals intelligence (Sigint) reconnaissance gear and a larger tailcone and fin fairing, used for measuring and analyzing foreign electronic and IR equipment. Combat Sent can deploy anywhere in the world within 24 hours and provide on-scene precision measurement of potential threat emitters. IOC 1967.
RC-135 V/W Rivet Joint. Used for electronic surveillance. RC-135 Rivet Joints loiter near battlefields and provide near-real-time data updates on enemy defensive and offensive activities to warfighters via secure voice and data link networks. The aircraft's recon systems are continuously upgraded to keep pace with new threats.
TC-135S/W. Used for training purposes.

RQ-4 Global Hawk
Brief: A high-altitude, long-range, long-endurance UAV.
Function: Unmanned reconnaissance aircraft.
Operator: ACC.
First Flight: Feb. 28, 1998.
Delivered: five.
IOC: currently in EMD; used operationally in Afghanistan.
Production: LRIP. (Initial plans call for 30 air vehicles, incl 12 image intelligence (Imint) and 12 Sigint. Requirements exist for up to 51 aircraft through 2030.)
Inventory: three air vehicles.
Unit Location: Beale AFB, Calif.
Contractor: Northrop Grumman (prime); Raytheon.
Power Plant: one Rolls Royce–Allison AE 3007H turbofan, 7,600 lb thrust.
Accommodation: unmanned system.
Dimensions: length 44 ft, height 15.2 ft, span 116 ft.
Weight: empty 9,200 lb, gross 25,600 lb.
Ceiling: 65,000+ ft.
Performance: design goals incl endurance of up to 40 hr at a cruise speed of 400 mph and at an altitude of 65,000 ft. This would allow loiter on station 1,380 miles from base for 24 hr. Combat range 15,525 miles.
Armament: none.
COMMENTARY
A high-altitude endurance UAV carrying a 1,960-lb payload, incorporating EO/IR and SAR sensors that permit switching among radar, IR, and visible wavelengths as required. Objective system will add Sigint and improved GMTI capability. Navigation is by GPS/INS. Global Hawk flies autonomously from takeoff to landing, providing near-real-time imagery products for tactical and theater commanders. Vehicle ground track and mission plan can be updated in real time to respond to changing air traffic control needs and/or mission collection needs.
Global Hawk began as an advanced concept technology demonstrator. The No. 2 aircraft crashed March 29, 1999. Vehicle No. 3 was damaged Dec. 6, 1999, after a test flight. Vehicle No. 1 resumed test flights March 11, 2000, after a precautionary stand-down. During test it completed more than 100 flights and flew in excess of 66,000 ft altitude and 31 hours endurance, and accumulated more than 1,300 hours total flight time. Global Hawk flew over water to Alaska, completing the first transoceanic crossing to Portugal and back. In spring 2001, Global Hawk flew to Australia for six weeks of demonstrations. In March 2001 it entered into EMD. Although still a development system, Global Hawk first deployed operationally to support Enduring Freedom in November 2001.
Global Hawk provides continuous, all-weather, day/night, wide area surveillance. It will operate in low-to-moderate air defense threat environments with the ability to fly above or stand off from enemy defenses. It is considered the likely successor to the U-2 aircraft. The Navy is also considering purchase of Global Hawk.
Total buy TBD.

U-2 Dragon Lady
Brief: Single-seat, single-engine, high-altitude endurance reconnaissance aircraft carrying a wide variety of sensors and cameras, providing continuous day or night, high-altitude, all-weather area surveillance in direct support of US forces.

Function: High-altitude reconnaissance.
Operator: ACC, USAFE.
First Flight: August 1955 (U-2); 1967 (U-2R); October 1994 (U-2S).
Delivered: 1955–October 1989.
IOC: circa 1956.
Production: 35 (U-2S/ST).
Inventory: 35.
Unit Location: Aviano AB, Italy, Beale AFB, Calif.
Contractor: Lockheed Martin.
Power Plant: F118-GE-101 turbojet.
Accommodation: one (two for trainer).
Dimensions: span 103 ft, length 63 ft, height 16 ft.
Weight: gross 40,000 lb.
Ceiling: above 70,000 ft.
Performance: speed 475 mph; range more than 4,500 miles; max endurance 10+ hr.
COMMENTARY
The U-2 remains the Air Force's premier high-altitude reconnaissance platform, capable of carrying Imint and Elint sensors simultaneously.

More than $1.5 billion has been invested in the U-2 since 1994. Completed or ongoing improvements include a new GE F118-101 engine, a complete electrical system replacement, a new glass cockpit utilizing up-front controls and multifunction displays (MFDs), and a new EW system. Sensors upgrades include the ASARS-2A radar sensor, which provides enhanced imaging modes and improves geo-location accuracy; the SYERS-2 EO imagery system, which provides multispectral and IR capability; enhanced RF-intelligence capability; and new data links enabling the U-2 to connect in near real time with network-centric hubs as well as line-of-sight ground stations, airborne data relays, and beyond-line-of-sight satellite data relays.

U-2R (single-seat) and **U-2RT** (two-seat) aircraft, derived from the original version that had a key role in the Cuban Missile Crisis of 1962, were significantly larger and more capable than the earlier aircraft. The last U-2R aircraft were delivered to USAF in October 1989. In 1992, all existing U-2s and tactical TR-1s were consolidated under the designation U-2R.

U-2S (single-seat) and **U-2ST** (two-seat) are the current designations of all 35 aircraft (30 U-2S mission aircraft, five U-2ST trainers) in the inventory, having completed conversion to S model configuration with the new GE F118 engine, incorporating significant improvements in reliability and performance over the U-2R. The Air Force accepted the first U-2S in October 1994. NASA has two ER-2 versions of the U-2 for high-altitude scientific and atmospheric research.

WC-130 Hercules
Brief: A high-wing, medium-range aircraft flown by AFRC for weather reconnaissance missions. It flies into the eye of tropical cyclones or hurricanes, collecting weather data from within the storm's environment.
Function: Weather reconnaissance aircraft.
Operator: AFRC.
First Flight: circa 1959.
Delivered: October 1999–2002.
IOC: 1959 (B model), 1962 (E), 1964 (H).
Production: (no new-build WC-130H); 10 WC-130J.
Inventory: 10 (H); 6 (J).
Unit Location: Keesler AFB, Miss.
Contractor: Lockheed Martin.
Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp.
Accommodation: six.
Dimensions: span 132.5 ft, length 99.3 ft, height 38.5 ft.
Weight: gross 155,000 lb.
Ceiling: 33,000 ft at 100,000 lb gross T-O weight.
Performance: speed 374 mph at 20,000 ft, range 4,000 miles.
COMMENTARY
The WC-130 is flown by AFRC organizations known as the Hurricane Hunters. The hurricane reconnaissance area includes the Atlantic Ocean, Caribbean Sea, Gulf of Mexico, and central Pacific Ocean areas.

WC-130B/E. Earlier version C-130 modifications used for weather reconnaissance. Now retired.

WC-130H. Improved version, currently operated by the 53rd WRS for weather reconnaissance duties, including penetration of tropical storms, to obtain data for forecasting storm movements. It is equipped with two external 1,400-gallon fuel tanks, an internal 1,800-gallon fuel tank, and uprated engines. An average weather reconnaissance mission might last 11 hours and cover almost 3,500 miles while the crew collects and reports weather data every minute. Results are transmitted via satellite to the National Hurricane Center, Miami. WC-130H aircraft will be converted to HC-130Ps.

WC-130J. Weather-reconnaissance version of the latest C-130 model, powered by four Allison AE2100D3 turboprops. First of 10 aircraft replacing the WC-130H was delivered Oct. 12, 1999.

***EC-130E** Commando Solo* (MSgt. David Hawkins)

Special Duty Aircraft

E-4B National Airborne Operations Center
Brief: A four-engine, swept-wing, long-range, high-altitude airplane providing a modern, highly survivable C3 center allowing national/defense leaders to direct US forces, execute emergency war orders, and coordinate actions by civil authorities.
Function: Airborne operations center.
Operator: ACC.
First Flight: June 13, 1973 (E-4A); June 10, 1978 (E-4B).
Delivered: December 1974–85.
IOC: December 1974 (E-4A); January 1980 (E-4B).
Production: four.
Inventory: four.
Unit Location: Offutt AFB, Neb.
Contractor: Boeing; Rockwell; Raytheon E-Systems.
Power Plant: four General Electric CF6-50E2 turbofans, each 52,500 lb thrust.
Accommodation: up to 114 (63 crew/battle staff; 51 passengers.
Dimensions: span 195.7 ft, length 231.3 ft, height 63.4 ft.
Weight: gross 800,000 lb.
Ceiling: above 40,000 ft.
Performance: 6,900+ miles; unrefueled endurance in excess of 12 hr; with aerial refueling up to 72 hr.
COMMENTARY
A militarized version of the Boeing 747-200, E-4B aircraft perform the National Airborne Operations Center (NAOC) mission. The E-4B fleet provides a survivable C3 platform throughout the full threat spectrum, including sustained operations in a nuclear environment. First operational mission was flown in March 1980.

E-4Bs are hardened against the effects of nuclear explosions, including electromagnetic pulse, and have in-flight refueling capability. A 1,200-kVA electrical system supports advanced system electronics as well as state-of-the-art communications and data processing equipment such as EHF Milstar satellite terminals and six-channel International Maritime Satellite (INMARSAT). A triband radome also houses the E-4B's super high frequency (SHF) frequency demand multiple access (FDMA) communications antenna, the only such system on an airborne platform.

The E-4B system is capable of linking with commercial telephone and radio networks and could be used for radio broadcasts to the general population. E-4Bs also support the Federal Emergency Management Agency (FEMA).

In early 2000, the E-4B entered the SDD phase of a modernization program aimed at updating the electronic infrastructure supporting the aircraft's primary mission equipment and increasing the bandwidth of external communications and onboard data transfer. These updates, along with programmed changes to the aircraft's interior configuration, internal noise reduction modifications, BM improvements, and GATM avionics modifications, will ensure the E-4B aircraft can effectively execute its NAOC mission, providing C3 in the homeland security environment and beyond for the foreseeable future.

EC-18
Brief: A heavily modified Boeing 707 used as a flexible airborne telemetry and other data recording and relay station in tests of aircraft, spacecraft, and missiles.
Function: Electronic surveillance.
Operator: AFMC.
First Flight: February 1985.
Delivered: January 1986.
IOC: January 1986.
Production: six.
Inventory: two.
Unit Location: Edwards AFB, Calif.
Contractor: Boeing.
Power Plant: four Pratt & Whitney TF33 turbofans, each 18,000 lb thrust.
Accommodation: 16–24 in EC-18B.
Dimensions: span 145.8 ft, length 152.9 ft, height 42.4 ft.
Weight: gross 326,000 lb.
Ceiling: 42,000 ft.
Performance: max cruise speed 470 mph, range 7,610 miles.
COMMENTARY
EC-18B Advanced Range Instrumentation Aircraft (ARIA). Retired 2001.
EC-18D Cruise Missile Mission Control Aircraft (CMMCA) are Boeing 707s, modified by Chrysler, to include an AN/APG-63 surveillance radar, telemetry receiver, and weather radar. Operated by the 452nd FTS, the two aircraft support USAF and USN missile testing and are also capable of monitoring and controlling UAVs. To retire in FY03.

EC-130E/J
Brief: A heavily modified C-130 with variants used for battlefield command, EW, and electronic combat.
Function: C2; psychological warfare.
Operator: ACC, ANG.
First Flight: January 1990.
Delivered: March 1990.
IOC: December 1990.
Production: (no USAF new-build EC-130Es); five (J).
Inventory: eight (E); five (J).
Unit Location: ANG: Harrisburg Arpt., Pa.
Contractor: Lockheed Martin; Raytheon; General Dynamics.
Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp; (EC-130E) T-56-A-1S turboprops, each 4,200 shp; (EC-130J) four Rolls Royce–Allison AE2100D turboprops, each 4,591 shp.
Accommodation: four flight crew, 15 mission personnel.
Dimensions: span 132.6 ft, length 99 ft, height 38 ft.
Weight: gross 155,000 lb; (C-130J) 175,000 lb.
Ceiling: 20,000 ft; (C-130J) 30,560 ft.
Performance: speed 299 mph, range in excess of 2,100 miles; (C-130J) 393 mph, range 4,140 miles.
COMMENTARY
EC-130E ABCCC Airborne Battlefield Command and Control Center. Seven aircraft were updated by Unisys to ABCCC III standard. The advanced JTIDS received data transmitted by AWACS aircraft and other systems, enabling the crew to see a real-time picture of air operations over a combat area. Now retired.

EC-130E Commando Solo. Version used by the ANG as a broadcasting station for psychological warfare operations. Specialized modifications include enhanced navigation systems, self-protection equipment, and worldwide color television configuration. Commando Solo aircraft have been used in numerous military operations. They also have a role in civil emergencies. Secondary mission is electronic attack in the military frequency spectrum. Five flight crew, six mission.

EC-130J Commando Solo II. Five specialist versions of the latest C-130 aircraft, ordered to replace aging Es, with current mission equipment transferred

***KC-10** Extender* (SSgt. Michael Gaddis)

from the older aircraft. Entered service mid–2001 with the 193rd Special Operations Wing (ANG), Harrisburg.

EC-130H Compass Call
Brief: A heavily modified C-130 for electronic combat.
Function: Electronic Warfare.
Operator: ACC.
First Flight: 1981.
Delivered: 1982.
IOC: 1983; (Block 30) February 1999.
Production: (converted).
Inventory: 14.
Unit Location: Davis–Monthan AFB, Ariz.
Contractor: Lockheed Martin.
Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp.
Accommodation: standard crew 13.
Dimensions: span 132.6 ft, length 99 ft, height 38 ft.
Weight: 155,000 lb.
Ceiling: 25,000 ft.
Performance: speed 374 mph at 20,000 ft.
COMMENTARY
A variant used as an airborne communications jamming and information warfare platform. Modifications include ECM system and air refueling capability. Further upgrades, including an updated receiver subsystem, will improve reliability and expand the EC-130H's offensive counterinformation (OCI) capability against modern C2 systems. Completion expected FY07.

Tanker Aircraft

HC-130N/P King
Brief: An extended-range, combat search and rescue (CSAR)–configured C-130 that extends the range of rescue helicopters through in-flight refueling and performs tactical delivery of pararescue jumper (PJ) specialists and/or equipment in hostile environments.
Function: Aerial refueling/transport.
Operator: ACC, ANG, AFRC.
First Flight: Dec. 8, 1964 (as HC-130H).
Delivered: from 1965.
IOC: 1986.
Production: (converted).
Inventory: 32.
Unit Location: Active: Moody AFB, Ga.; ANG: Davis–Monthan AFB, Ariz.; Francis S. Gabreski Arpt., N.Y., Kulis ANGB, Alaska; AFRC: Patrick AFB, Fla., Portland Arpt., Ore.
Contractor: Lockheed (now Lockheed Martin).
Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp.
Accommodation: four flight crew, plus mission crew.
Dimensions: span 132.6 ft, length 98.8 ft, height 38.5 ft.
Weight: gross 155,000 lb.
Ceiling: 33,000 ft.
Performance: speed 289 mph, range more than 4,000 miles.
COMMENTARY
The HC-130 can perform extended visual/electronic searches over land or water and operate from unimproved airfields. A three-man PJ team, trained in emergency trauma medicine, harsh environment survival, and assisted evasion, is part of the normal mission crew complement.
Combat air forces' HC-130 aircraft are equipped with an integrated GPS/INS navigation package, radar/missile warning receivers, and chaff/flare countermeasures dispensers. Some aircraft have FLIR systems and personnel locating systems (PLS) compatible with aircrew survival radios. Ongoing modifications include an improved digital low-power color radar, integrated satellite communications radio, NVG–compatible interior/exterior lighting, and cockpit armor. The C-130 avionics modernization program (AMP) provides for complete update of the HC-130 avionics. USAF plans to convert four recently retired EC-130E ABCCC aircraft to HC-130 standard.

***KC-135R** Stratotanker* (MSgt. Keith Reed)

KC-10 Extender
Brief: A modified McDonnell Douglas DC-10 that combines in a single aircraft the operations of aerial refueling and long-range cargo transport.
Function: Aerial refueling/transport.
Operator: AMC, AFRC (Assoc.).
First Flight: April 1980.
Delivered: March 1981–April 1990.
IOC: August 1982.
Production: 60.
Inventory: 59.
Unit Location: McGuire AFB, N.J., Travis AFB, Calif.
Contractor: McDonnell Douglas (now Boeing).
Power Plant: three General Electric CF6-50C2 turbofans, each 52,500 lb thrust.
Accommodation: crew of four; additional seating possible for up to 75 persons with 17 pallets; max 27 pallets; max cargo payload 169,409 lb.
Dimensions: span 165.4 ft, length 181.6 ft, height 58.1 ft.
Weight: gross 593,000 lb.
Ceiling: 42,000 ft.
Performance: cruising speed Mach 0.825, range with max cargo 4,400 miles.
COMMENTARY
The KC-10 combines the tasks of tanker and cargo aircraft in a single unit, enabling it to support worldwide fighter deployments, strategic airlift, strategic reconnaissance, and conventional operations.
The KC-10 can be air refueled by a KC-135 or another KC-10, increasing its range and diminishing the need for forward bases, leaving vital fuel supplies in the theater of operations untouched.
KC-10A is a DC-10 Series 30CF, modified to include fuselage fuel cells, an air refueling operator's station, aerial refueling boom and integral hose reel/drogue unit, a receiver refueling receptacle, and military avionics. More recently installed wing-mounted pods have enhanced the aircraft's capabilities. Other modifications include the addition of communications, navigation, and surveillance equipment to meet civil air traffic control requirements.
Because it has both types of tanker refueling equipment installed, the KC-10A can service USAF, USN, USMC, and allied aircraft on the same mission. Special lighting permits night operations.

KC-135 Stratotanker
Brief: A short- to medium-range tanker aircraft, meeting the air refueling needs of USAF bomber, fighter, cargo, and reconnaissance forces. It also supports USN, USMC, and allied aircraft.
Function: Aerial refueling/airlift.
Operator: AETC, AFMC, AMC, PACAF, USAFE, ANG, AFRC.
First Flight: August 1956.
Delivered: January 1957–66.
IOC: June 1957, Castle AFB, Calif.
Production: 732.
Inventory: 546.
Unit Location: Altus AFB, Okla., Aviano AB, Italy, Fairchild AFB, Wash., Grand Forks AFB, N.D., Kadena AB, Japan, MacDill AFB, Fla., McConnell AFB, Kan., RAF Mildenhall, UK, Robins AFB, Ga. ANG: 20 units. AFRC: seven units.
Contractor: Boeing.
Power Plant: KC-135R/T: four CFM International F108-CF-100 turbofans, each 22,224 lb thrust; KC-135E: four Pratt & Whitney TF33-PW-102 turbofans, each 18,000 lb thrust.
Accommodation: crew of four; up to 80 passengers.
Dimensions: span 130.8 ft, length 136.2 ft, height 38.3 ft.
Weight: empty 119,231 lb, gross 322,500 lb (KC-135E 301,600 lb).
Ceiling: 50,000 ft.
Performance: max speed at 30,000 ft 610 mph, range with max fuel 11,015 miles.
COMMENTARY
Mainstay of the USAF tanker fleet, the long-serving KC-135 is similar in size and appearance to commercial 707 aircraft but was designed to military specifications, incorporating different structural details and materials. The KC-135 fuel tanks are located in the "wet wings" and in fuel tanks below the floor in the fuselage.
KC-135A. Original version with J57 turbojets. USAF built 732, since modified to other standards.
KC-135E. The JT3D re-engining program upgraded 161 AFRC and ANG KC-135As to KC-135E standard with JT3D turbofans removed from surplus commercial 707s; fuel carrying capacity is increased by 20 percent.
KC-135R/T. Designation of re-engined KC-135As with CFM56 turbofans. They embody modifications to 25 major systems and subsystems and not only carry more fuel farther but have reduced maintenance costs, are able to use shorter runways, and meet Stage III requirements. The first KC-135R flight was in October 1982, and redeliveries began in July 1984. KC-135T aircraft (formerly KC-135Q) were capable of refueling the now-retired SR-71s.
Ongoing modifications are extending the capability and operational utility of the KC-135 well into this century. Renewal of the lower wing skin added 27,000 flying hours to the aircraft. The Pacer CRAG avionics modernization program concluded Oct. 1, 2002. The six-year upgrade program included installation of a new compass, radar, and GPS navigation systems, a

traffic alert and collision avoidance system (TCAS), and new digital multifunctional cockpit displays. Reduced vertical separation minima and GATM upgrades are also planned for the entire fleet.

Forty-five KC-135Rs are being fitted with wing-mounted hose-and-drogue refueling pods to enhance interoperability and support to the USN, USMC, NATO, and other allied receiver aircraft. IOC February 2000.

MC-130P Combat Shadow

Brief: Aircraft that flies clandestine or low-visibility, low-level missions into denied areas to provide air refueling for Special Operations Forces (SOF) helicopters or to air-drop small special operations teams, small bundles, and zodiac and combat rubber raiding craft.

Function: Air refueling for SOF helicopters/airdrop.
Operator: AETC, AFSOC, ANG, AFRC.
First Flight: Dec. 8, 1964 (as HC-130H).
Delivered: from 1965.
IOC: 1986.
Production: (converted).
Inventory: 27.
Unit Location: Active: Eglin AFB, Fla., Kadena AB, Japan, Kirtland AFB, N.M., RAF Mildenhall, UK. ANG: Kulis ANGB, Alaska. AFRC: Duke Field, Fla.
Contractor: Lockheed Martin (airframe); Boeing.
Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp.
Accommodation: four flight crew, plus four mission crew.
Dimensions: span 132.6 ft, length 98.8 ft, height 38.5 ft.
Weight: gross 155,000 lb.
Ceiling: 33,000 ft.
Performance: speed 289 mph, range more than 4,000 miles.
COMMENTARY

MC-130P Combat Shadow aircraft are currently tasked with clandestine formation or single-ship intrusion of hostile territory to provide aerial refueling of special operations helicopters and the infiltration, exfiltration, and resupply of SOF by airdrop or air-land operations. To perform these missions, depending upon the enemy threat, crews navigate using both visual and electronic means or visual means only. Primary emphasis is on NVG operations.

Modifications include improved secure communications, advanced integrated navigation equipment, including digital scan radar, ring-laser gyro INS, FLIR, GPS, and dual nav stations, as well as new missile warning systems and countermeasures for refueling missions in hostile environments. Some aircraft have been modified with an inflight refueling system allowing them to be air refuelable.

C-5 Galaxy (MSgt. Richard Loomis)

Strategic Transports

C-5 Galaxy

Brief: A heavy-lift, air refuelable cargo transport for massive strategic airlift over long ranges, including outsize cargo. Supports special operations missions.

Function: Cargo and troop transport.
Operator: AETC, AFMC, AMC, ANG, AFRC.
First Flight: June 30, 1968.
Delivered: October 1969–April 1989.
IOC: September 1970.
Production: 131.
Inventory: 126.
Unit Location: Active: Altus AFB, Okla., Dover AFB, Del., Travis AFB, Calif. ANG: Stewart Arpt., N.Y. AFRC: Dover AFB, Del., Lackland AFB, Tex., Travis AFB, Calif., Westover ARB, Mass.
Contractor: Lockheed.
Power Plant: four General Electric TF39-GE-1C turbofans, each 41,000 lb thrust.
Accommodation: normal crew of six (two pilots, two engineers, and two loadmasters), plus rest area for 15 (relief crew, etc.) and seating for 73. There is no piece of Army combat equipment the C-5 can't carry. Possible loads: six Apache helicopters, two M1 main battle tanks (each weighing 135,400 lb), six Bradley vehicles, three CH-47 helicopters, the 74-ton mobile bridge, a quarter-million pounds of relief supplies, or a maximum of 340 passengers in an airbus configuration. Airdrop capability for single platforms weighing up to 42,000 lb.
Dimensions: span 222.8 ft, length 247.9 ft, height 65.1 ft.
Weight: empty 374,000 lb, gross 769,000 (wartime 840,000) lb.
Ceiling: 45,000 ft.
Performance: max speed at 25,000 ft 571 mph, 35,750 ft, T-O run at S/L 8,300 ft, landing run, max landing weight at S/L 2,380 ft, range with max payload 3,434 miles, range with max fuel 7,245 miles. Normal cruising speed at altitude 518 mph (Mach 0.77), unlimited range with in-flight air refueling.
COMMENTARY

One of the world's largest aircraft, the C-5 is able to carry unusually large and heavy cargo for intercontinental ranges at jet speeds. It can take off and land in relatively short distances and taxi on substandard surfaces during emergency operations. Front and rear cargo openings permit simultaneous drive-through loading and off-loading.

C-5A. USAF took delivery of 81 of these basic models between December 1969 and May 1973. A major wing modification was subsequently undertaken, extending the aircraft's service life by 30,000 flight hours. Additionally, the avionics subsystems developed for the C-5B have been incorporated into the C-5A fleet. One ANG and two AFRC squadrons are C-5A–equipped. The reliability and maintainability of the C-5A version have been the focus of numerous AMC studies.

C-5B. Generally similar to the C-5A but embodies all the improvements introduced since completion of C-5A production, including the strengthened wings, improved turbofans, and updated avionics, with color weather radar and triple INS. The first C-5B flew for the first time in September 1985 and was delivered to Altus AFB, Okla., in January 1986.

C-5C. Two C-5As assigned to Travis AFB, Calif., were modified to carry outsize space cargo for NASA by extending the cargo bay and modifying the aft doors.

All USAF Galaxys are undergoing a complete AMP that will install a state-of-the-art cockpit and ensure global access navigation safety compliance by the end of 2006; first upgraded aircraft flew December 2002. Additionally, the Air Force has contracted an SDD for a reliability enhancement and re-engining program for C-5A/B aircraft to take advantage of an estimated service life through 2040. Prototypes to be completed in 2006. To enhance force protection, a number of C-5s have been equipped with a missile defense system.

C-17 Globemaster III

Brief: A heavy-lift, air refuelable cargo transport for intertheater (strategic) and intratheater (tactical) direct delivery airlift of all classes of military cargo, including outsize items.

Function: Cargo and troop transport.
Operator: AETC, AFMC, AMC, AFRC.
First Flight: Sept. 15, 1991.
Delivered: June 1993–July 2008 (planned).
IOC: Jan. 17, 1995.
Production: 180 (planned).
Inventory: 92.
Unit Location: Altus AFB, Okla., Charleston AFB, S.C., McChord AFB, Wash., McGuire AFB, N.J. AFRC: Charleston AFB, S.C., McChord AFB, Wash., Allen C. Thompson Field, Miss. Planned: Dover AFB, Del., Travis AFB, Calif., AFRC: March ARB Calif., AFRC (Assoc.) Elmendorf AFB, Alaska; ANG (Assoc.) Hickam AFB, Hawaii.
Contractor: Boeing.
Power Plant: four Pratt & Whitney F117-PW-100 turbofans, each 40,440 lb thrust.
Accommodation: normal flight crew of three (two pilots plus loadmaster); additional pilot may be carried. Provisions for full range of military airlift missions, incl capacity for up to 102 passengers/paratroops or 36 litters; range of military cargo incl tanks and up to three AH-64A helicopters; three Bradley vehicles; one M1 main battle tank with other equipment; airdrop capability for single platforms weighing up to 60,000 lb.
Dimensions: span over winglet tips 169.8 ft, length 173.9 ft, height 55.1 ft.
Weight: empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.
Ceiling: 45,000 ft.
Performance: normal cruising speed 484 mph at 35,000 ft or 518 mph (Mach .77) at 28,000 ft, unrefueled range with 160,000-lb payload 2,760 miles, additional 690 miles with extended-range fuel containment system (ERFCS), unlimited with refueling.
COMMENTARY

Developed to meet US force projection requirements, the C-17 is able to operate routinely into small, austere airfields (3,000 ft x 90 ft) previously restricted to C-130s and provides the first capability to air-land or airdrop outsize cargo in the tactical environment.

C-17A is the first military transport to feature a full digital fly-by-wire control system and two-person cockpit, with two full-time, all-function HUDs and four multifunction electronic displays. Block 12 air-

C-17 Globemaster III (TSgt. Cary Humphries)

C-141 Starlifter (John Sidoriak)

craft, delivered from 2001, have the ERFCS upgrade, also to be retrofitted on earlier aircraft. Other C-17 improvements include a terrain awareness warning system (TAWS) and video integrated processor (VIP). A laser-jamming system to counter the IR–homing missile threat is planned from FY03, supplanting the current self-defense system, with the first 12 aircraft receiving an accelerated interim capability by March 2004. In October 2002, the C-17 assumed the special operations low level (SOLL) mission previously supported by the C-141. Enhancements include SOLL II communications suites and carry-on radio suites. C-17s have flown numerous operational and humanitarian missions since entering operational service, including peacekeeping operations in Bosnia, where the C-17 was the only aircraft capable of delivering outsize cargo.

C-135 Stratolifter

Brief: A version of the KC-135 tanker, without refueling equipment, produced for nontanker duties.

Function: Passenger and cargo airlifter.

Operator: PACAF.

First Flight: May 1961.

Delivered: 1961–62.

IOC: circa 1961.

Production: 48, plus five WC/TC-135s.

Inventory: three.

Unit Location: Hickam AFB, Hawaii.

Contractor: Boeing.

Power Plant: (C-135B) four Pratt & Whitney TF33-P-5 turbofans, each 18,000 lb thrust.

Accommodation (C-135B): 60 passengers.

Dimensions: span 130.8 ft, length 134.5 ft, height 38.3 ft.

Weights (C-135B): operating weight empty 102,300 lb, gross 275,500 lb.

Ceiling: 50,000 ft.

Performance (C-135B): max speed 600 mph, range with 54,000 lb payload 4,625 miles.

COMMENTARY

A few C-135 transports and variants, without the KC-135's refueling equipment, remain operational within USAF. They were ordered originally to serve as interim jet passenger or cargo transports, pending delivery of C-141s. Three converted KC-135s were followed by 45 production Stratolifters in two versions.

C-135A. The first 15 aircraft were equipped with J57-P-59W turbojets.

C-135B. The next version included upgraded Pratt & Whitney turbofans. USAF retrofitted 11 Bs with revised interior for VIP transportation.

C-135E. C-135As re-engined with Pratt & Whitney engines.

C-141 Starlifter

Brief: Workhorse of the US airlift force for many years, the Starlifter can project combat forces over long distances, inject those forces and their equipment either by air-land or airdrop, resupply these employed forces, and extract the sick and wounded from the hostile area to advanced medical facilities. Primary strategic special operations and airdrop platform.

Function: Long-range, air refuelable troop and cargo airlift.

Operator: ANG, AFRC.

First Flight: Dec. 17, 1963.

Delivered: October 1964–June 1982.

IOC: May 1965.

Production: 285.

Inventory: 76.

Unit Location: ANG: Allen C. Thompson Field, Miss., Memphis Arpt., Tenn. AFRC: Andrews AFB, Md., March ARB, Calif., McGuire AFB, N.J., Wright–Patterson AFB, Ohio.

Contractor: Lockheed Martin.

Power Plant: four Pratt & Whitney TF33-P-7 turbofans, each 21,000 lb thrust.

Accommodation: crew of five; cargo on 13 standard 463L pallets. Alternative freight or vehicle payloads, 200 fully equipped troops, 155 paratroops, or 103 litter patients plus attendants.

Dimensions: span 159.9 ft, length 168.3 ft, height 39.2 ft.

Weight: operating payload 38,000 lb; max payload 68,725 lb normal, 89,000 lb emergency war planning; gross 325,000 lb normal, 344,000 lb emergency war planning.

Ceiling: 45,000 ft.

Performance: max cruising speed 466 mph, range 5,290 miles without air refueling.

COMMENTARY

Longtime mainstay of USAF's airlift fleet, the C-141 was the first jet aircraft designed to meet military standards as a troop and cargo carrier. However, with the continuing deployment of C-17 aircraft, all C-141s in active units were to be retired by FY03. USAF also announced plans to retire older C-141s in reserve units earlier than scheduled. All were to retire by 2006.

C-141A entered service with MAC in April 1965; 285 were built, some of which were structurally modified to accommodate the Minuteman ICBM.

C-141B is a stretched C-141A with in-flight refueling capability. All C-141As (except four AFMC aircraft used for test purposes) were lengthened by 23 ft 4 in to expand lift capacity. First C-141B flew March 1977 and redeliveries took place between December 1979 and June 1982. The modification gave USAF the equivalent of 90 additional C-141A aircraft. Subsequent improvements include structural upgrades, a state-of-the-art autopilot and all-weather landing system, and improved airdrop systems. Modification of 13 C-141Bs is aimed at increasing their SOLL capability and survivability.

C-141C is a C-141B modified with computerized glass-cockpit instrumentation and digital flight-management system, with integrated GPS data for navigation and modern navigation safety equipment. The first version, which rolled out at Warner Robins ALC, Ga., Oct. 1, 1997, was assigned to AFRC's 452nd Air Mobility Wing, March ARB, Calif.

Theater and Special Use Transports

C-9 Nightingale

Brief: A twin-engine, medium-range, swept-wing jet aircraft used primarily for the aeromedical evacuation mission. A modified version of the DC-9, it is the only USAF aircraft specifically designed for the movement of litter and ambulatory patients.

Function: Aeromedical evacuation.

Operator: AMC, PACAF, USAFE, AFRC.

First Flight: August 1968.

Delivered: August 1968–February 1975.

IOC: circa 1968.

Production: 24.

Inventory: 23

Unit Location: Andrews AFB, Md., Chievres, Belgium, Ramstein AB, Germany, Scott AFB, Ill., Yokota AB, Japan.

Contractor: Boeing (McDonnell Douglas).

Power Plant: two Pratt & Whitney JT8D-9A turbofans, each 14,500 lb thrust.

Accommodation: crew of three; 40 litter patients or 40 ambulatory patients, or a combination of both, plus five medical staff.

Dimensions: span 93.2 ft, length 119.2 ft, height 27.4 ft.

Weight: gross 108,000 lb.

Ceiling: 35,000 ft.

Performance: max cruising speed at 25,000 ft 565 mph, range 2,500 miles.

COMMENTARY

C-9A transport is a derivative of the DC-9 Series 30 commercial airliner, modified to include a special-care compartment with separate atmospheric and ventilation controls. One C-9A also provides distinguished visitor (DV) airlift in Europe. Because of the critical nature of its mission, the aircraft carries a flight mechanic and a small supply of spares.

C-9C. Three specially configured C-9s were delivered to Andrews AFB, Md., in 1975 for the special air mission supporting the President and other US government officials. Upgrades include improvements to the passenger communications equipment, GATM, TAWS, and vertical separation equipment.

C-12 Huron

Brief: Aircraft to provide airlift support for attache and military advisory groups worldwide.

Function: Special airlift.

Operator: AETC, AFMC, PACAF.

First Flight: Oct. 27, 1972 (Super King Air 200).

Delivered: 1974–late 1980s.

IOC: circa 1974.

Production: 88.

Inventory: 27.

Unit Location: Elmendorf AFB, Alaska, Osan AB, South Korea, various overseas embassies.

Contractor: Beech.

Power Plant: (C-12J) two Pratt & Whitney Canada PT6A-65B turboprops, each 1,100 shp.

Accommodation: crew of two; C-12C: up to eight passengers; C-12J: up to 19 passengers.

Dimensions: (C-12J) span 54.5 ft, length 43.8 ft, height 15 ft.

Weight: (C-12J) empty 9,850 lb, gross 16,600 lb.

Ceiling: (C-12J) 25,000 ft.

Performance: (C-12J) max cruising speed at 16,000 ft 307 mph, range with 10 passengers 1,806 miles.

C-20 Gulfstream (SSgt. J.R. Ruark)

C-32A (Boeing)

COMMENTARY

C-12C. Re-engined C-12As, with PT6A-41 turboprops, deployed to overseas embassies.

C-12D. Similar to C model and also deployed to overseas embassies.

C-12F. With uprated PT6A-42 engines, can support medical airlift.

C-12J. A military version of the larger Beechcraft Model 1900, operated by PACAF.

C-20 Gulfstream

Brief: A twin-engine turbofan aircraft acquired to provide airlift for high-ranking government and DOD officials.

Function: Operational support airlift; special air missions.

Operator: AMC, USAFE.

First Flight: December 1979.

Delivered: September 1983–1989.

IOC: circa 1983.

Production: not available.

Inventory: 12.

Unit Location: Andrews AFB, Md., Ramstein AB, Germany.

Contractor: Gulfstream.

Power Plant: C-20A/B: two Rolls Royce–Spey MK511-8 turbofans, each 11,400 lb thrust; C-20H: two Rolls Royce–Tay MK611-8 turbofans, each 13,850 lb thrust.

Accommodation: crew of five; 12 passengers.

Dimensions: span 77.8 ft; length (C-20A/B) 83.1 ft, (C-20H) 88.3 ft; height 24.3 ft.

Weight: C-20A/B gross 69,700 lb; C-20H gross 74,600 lb.

Ceiling: 45,000 ft.

Performance: max cruising speed 576 mph, range 4,800 miles.

COMMENTARY

C-20A. Three Gulfstream III transports were acquired to replace aging C-140B aircraft. They provided USAFE's operational support airlift fleet with intercontinental range and ability to operate from short runways. Retired in September 2002.

C-20B. Seven C-20B versions, with advanced mission communications equipment and revised interior, were acquired in the late 1980s. Two C-20B aircraft have been retired.

C-20H. Two Gulfstream IV SP aircraft, with advanced-technology flight-management systems and upgraded Rolls Royce engines, were acquired by USAF to meet expanding special air mission requirements. The two C-20H aircraft were reassigned to USAFE to replace retired C-20As.

Upgrade for C-20A/B/H aircraft includes GPS, vertical separation equipment, GATM, and TCAS.

C-21

Brief: Aircraft designed to provide cargo and passenger airlift and transport litters during medical evacuations.

Function: Pilot seasoning, passenger and cargo airlift.

Operator: AETC, AMC, PACAF, USAFE, ANG.

First Flight: January 1973.

Delivered: April 1984–October 1985.

IOC: April 1984.

Production: 84.

Inventory: 78.

Unit Location: Andrews AFB, Md., Keesler AFB, Miss., Langley AFB, Va., Maxwell AFB, Ala., Offutt AFB, Neb., Peterson AFB, Colo., Ramstein AB, Germany, Randolph AFB, Tex., Scott AFB, Ill., Stuttgart, Germany, Wright–Patterson AFB, Ohio, Yokota AB, Japan.

Contractor: Gates Learjet.

Power Plant: two AlliedSignal TFE731-2 turbofans, each 3,500 lb thrust.

Accommodation: crew of two and up to eight passengers or 3,153 lb cargo. Convertible to aeromedical evacuation configuration.

Dimensions: span 39.5 ft, length 48.6 ft, height 12.2 ft.

Weight: empty, equipped 10,119 lb, gross 18,300 lb.

Ceiling: 51,000 ft.

Performance: max level speed at 25,000 ft 542 mph, range with max passenger load 2,306 miles, with max cargo load 1,653 miles.

COMMENTARY

C-21A aircraft provide operational support airlift for time-sensitive movement of people and cargo throughout the US and the Pacific and European Theaters, including aeromedical missions if required. Upgrades to include GATM and TCAS.

C-22

Brief: A Boeing 727-100 used by ANG as its primary medium-range aircraft for airlift of personnel.

Function: Passenger transportation.

Operator: ANG.

First Flight: February 1963 (commercial).

Delivered: 1984.

IOC: circa 1984.

Production: four.

Inventory: two.

Unit Location: Andrews AFB, Md.

Contractor: Boeing.

Power Plant: three JTD8D-7 turbofans, each 14,000 lb thrust.

Accommodation: flight crew of four, plus three or four cabin crew; up to 89 passengers.

Dimensions: span 108 ft, length 133.1 ft, height 34 ft.

Weight: gross 170,000 lb.

Ceiling: 37,400 ft.

Performance: max speed 630 mph, range 2,000 miles, 5.5 hr endurance.

COMMENTARY

C-22B. Boeing 727-100 commercial transports purchased and modified as C-22Bs for use by ANG on operational support airlift missions. Two were further modified to accommodate an additional 1,100 gallons of fuel and landing gear rated for 170,000 lb gross landing weight. The last C-22B retired at end of 2002. C-22Bs were replaced by the C-40C, a Boeing 737-700.

C-32

Brief: A modified Boeing 757-200 used to provide transportation for the vice president, Cabinet, Congressional members, and other high-ranking US and foreign officials.

Function: VIP air transport.

Operator: AMC.

First Flight: Feb. 19, 1982 (USAF Feb. 11, 1998).

Delivery: June–December 1998.

IOC: 1998.

Production: four.

Inventory: four.

Unit Location: Andrews AFB, Md.

Contractor: Boeing.

Power Plant: two Pratt & Whitney PW2040 turbofans, each 41,700 lb thrust.

Accommodation: 16 crew and 45 passengers.

Dimensions: span 124.8 ft, length 155.2 ft, height 44.5 ft.

Weight: empty 127,800 lb, gross 255,000 lb.

Ceiling: 41,000 ft.

Performance: cruise speed Mach 0.8–0.86 (530 mph), range 5,750 miles.

COMMENTARY

A military version of the commercial Boeing 757-200, four new C-32As were purchased as replacements for C-137B/C aircraft. The commercial DV interior includes a crew rest area, DV stateroom, conference area, and general passenger area. The passenger communications system provides worldwide clear and secure voice and data communications. Modern flight deck avionics allow operations to any suitable airfield in the world and provide an upgrade path as new capabilities become available. Upgrades include installation of a digital communications management system and broadband data transmit and receive, providing an office-in-the-sky capability.

C-37A

Brief: A modified Gulfstream V utilized as part of the executive fleet, providing transportation for the vice president, Cabinet, Congressional members, Secretary of Defense, Service Secretaries, and other prominent US and foreign officials.

Function: VIP air transport.

Operator: AMC.

First Flight: USAF October 1998.

Delivery: October 1998–present.

IOC: Dec. 9, 1998.

Production: 10.

Inventory: Nine.

Unit Location: Andrews AFB, Md.; Chievres, Belgium; Hickam AFB, Hawaii, MacDill AFB, Fla.

Contractor: Gulfstream.

Power Plant: two BMW–Rolls Royce BR710A1-10 turbofans, each 14,750 lb thrust.

Accommodation: five crew and 12 passengers.

Dimensions: span 93.5 ft, length 96.4 ft, height 25.8 ft.

Weight: empty 47,601 lb, gross 90,500 lb.

Ceiling: 51,000 ft.

Performance: cruise speed Mach 0.8 (530 mph), range 6,095 miles.

COMMENTARY

The C-37A is a military version of the Gulfstream V. Two C-37As, along with the C-32s, were purchased as replacements for the VC-137B/C aircraft. The interior includes separate DV and passenger areas and a communications system capable of worldwide clear and secure voice and data. Aircraft are capable of operations at any suitable civilian or military airfield worldwide. A third C-37A was purchased for combatant commander support airlift and was based at Chievres, Belgium. It has since been reassigned to Andrews AFB, Md. Two more C-37s were purchased for crisis response support. Five C-37As are being leased from Gulfstream Aerospace as combatant commander support aircraft; three are assigned to MacDill AFB, Fla.; one to Chievres; and one to Hickam AFB, Hawaii. Upgrades include GATM and continuing passenger communications system upgrades to the Andrews-based aircraft.

C-38A

Brief: A twin-engine transcontinental aircraft used to provide transportation for DVs, such as Congressional or high-ranking military members. It can also be configured for medevac and a wide range of special missions including C3 in time of war.

Function: VIP air transport and operational support.

Operator: ANG.

First Flight: 1998.

Delivered: April–May 1998.

IOC: 1998.

Production: two.

Inventory: two.

Unit Location: Andrews AFB, Md.

Contractor: Tracor (Israel Aircraft Industries Ltd).

Power Plant: two AlliedSignal TFE731-40R-200G, each 4,250 lb thrust.

Accommodation: typically two crew and eight passengers. In medevac role: two Spectrum 500 Life Support Units and two medical attendants. All seats removable for cargo.

Dimensions: span 54.6 ft, length 55.6 ft, height 18.2 ft.

Weight: gross 24,800 lb.

Ceiling: cruise, 33,000 ft.

Performance: cruise speed Mach 0.87.

COMMENTARY

The C-38A is a military version of the Astra SPX produced by IAI and supported worldwide by Galaxy Aerospace. Two aircraft are operated by ANG's 201st AS replacing Learjet C-21As. Equipment includes the most up-to-date navigation, communication, vertical separation, and safety equipment as well as state-of-the-art avionics. The contract includes an option for two additional aircraft.

C-40

Brief: A Boeing 727-700 used by ANG as its primary medium-range aircraft for airlift of personnel.

Function: Passenger transportation.

Operator: ANG.

First Flight: USN C-40A: April 14, 1999.

Delivered: 2002.

Production: seven planned.

Inventory: two.
Unit Location: Andrews AFB, Md., Hickam AFB, Hawaii.
Contractor: Boeing.
Power Plant: two General Electric CFM56-7 turbofans, each 24,000 lb thrust.
Accommodation: flight crew of four, plus three or four cabin crew; up to 89 passengers.
Dimensions: span 112 ft 7 in, length 110 ft 4 in, height 41 ft 2 in.
Weight: gross 171,000 lb.
Ceiling: 41,000 ft.
Performance: cruise speed 0.78–0.82 Mach, range 3,450 miles.
COMMENTARY
The C-40 is the military version of the commercial Boeing 737-700 increased gross weight aircraft. C-40s are used for SAM and support of combatant commanders.
C-40B. The B model is equipped with a DV suite, staff work area, conference area, and worldwide secure communications and data capability. USAF purchased two C-40Bs for delivery to Andrews AFB, Md., and Hickam AFB, Hawaii, in FY03 to support combatant commanders. One additional C-40B has been purchased for SAM and is assigned to Andrews. A further C-40B will be leased for the SAM mission, operating from Andrews, in 2004.
C-40C. The C model has a DV seating area, general passenger seating area, and secure communications capability. Two C-40Cs have been leased for ANG to replace recently retired C-22Bs at Andrews. Another aircraft will be leased for delivery in 2004 in support of airlift missions.

C-40 (MSgt. Terry L. Blevins)

C-130 Hercules
Brief: A rugged aircraft capable of operating from rough dirt strips to provide theater airlift and paradropping of troops and equipment into hostile areas.
Function: Inter- and intratheater airlift.
Operator: AETC, AFMC, AMC, PACAF, USAFE, ANG, AFRC.
First Flight: August 1954 (C-130A).
Delivered: December 1956–present (C-130J).
IOC: circa 1958.
Production: more than 2,200; (C/CC-130J) 168 planned.
Inventory: 522: 218 (E), 287 (H), 17 (J).
Unit Location: Active: Dyess AFB, Tex., Elmendorf AFB, Alaska, Little Rock AFB, Ark., Pope AFB, N.C., Ramstein AB, Germany, Yokota AB, Japan. ANG: 24 units. AFRC: nine units.
Contractor: Lockheed Martin.
Power Plant: (C-130H) four Rolls Royce–Allison T56-A-15 turboprops, each 4,300 shp. (C-130J) four Rolls Royce–Allison AE2100D3 turboprops, each 4,591 shp.
Accommodation: (C-130H) crew of five; up to 92 ground troops, 64 paratroops, 74 litter patients plus attendants, 54 passengers on palletized seating, or up to five 463L standard freight pallets, etc.; max load, 45,000 lb.
Dimensions: span 132.6 ft, length 97.8 ft, height 38.1 ft.
Weight: (C-130H) empty 81,000 lb, fuel/cargo max gross 155,000 lb.
Ceiling: 33,000 ft at 100,000 lb T-O weight.
Performance: (C-130H) max cruising speed 430 mph, T-O run 3,585 ft, landing run (at 130,000 lb) 1,700 ft, range with 40,000-lb payload 2,240 miles; range 3,450 miles.
COMMENTARY
First flown 48 years ago, the C-130 Hercules transport continues in production and has been delivered to more than 60 countries. Basic and specialized versions operate throughout USAF, performing diverse roles in both peace and war situations, including airlift support, Arctic ice cap resupply, aeromedical missions, aerial spray missions (AFRC), fire-fighting duties (AFRC and ANG) for the US Forest Service, and natural disaster and humanitarian relief missions.
C-130A, B, and D. Early versions, now retired. The initial production C-130A had four Allison T56-A-11 or -9 turboprop engines. USAF ordered a total of 219. The C-130B had improved range and higher weights and introduced Allison T56-A-7 turboprops; 134 were produced, with delivery from April 1959. Twelve were modified beginning 1961 as **JC-130Bs** for air-snatch satellite recovery together with three early H models. Twelve C-130Ds were modified As for Arctic operations.
C-130E is an extended-range development of the C-130B, with large under-wing fuel tanks; 389 were ordered, with deliveries beginning in April 1962. A wing modification to correct fatigue and corrosion extended the life of the aircraft well into this century. Other modifications include a self-contained navigation system, with an integrated communications/navigation management suite, GPS capability, and a state-of-the-art autopilot that incorporates a ground collision avoidance system.
C-130H is generally similar to the E model but has updated turboprops, a redesigned outer wing, and improved pneumatic systems; delivery began in July 1974. Subsequent improvements include updated avionics, improved low-power color radar, and other minor modifications. Night vision instrumentation system was introduced from 1993, TCAS II in new aircraft from 1994. ANG and AFRC **LC-130H/R** aircraft are modified with wheel-ski gear to support Arctic and Antarctic operations. Two **DC-130Hs** were modified for UAV control duties.
Boeing is undertaking a major AMP for the C-130E/H. Improvements include digital displays, flight-management systems, multifunction radar, new communication systems, and a single air data computer. Work is expected to begin in 2005, with planned completion 2014.
C-130J. This newest model features a three-crew flight operation system, 6,000 shp Rolls Royce–Allison AE2100D engines, all composite six-blade Dowty Aerospace R391 propeller system, digital avionics, and mission computers. Compared to earlier production C-130Es, its speed is up 21 percent, cruising altitude is 40 percent higher, and range 40 percent longer. The J also features improved reliability and maintainability. ANG and AFRC units began receiving J models in 1999.
CC-130J. USAF is acquiring a stretched version of the C-130J, with an additional 15 ft to the fuselage, capable of carrying up to 128 ground troops or 92 paratroops, to replace its oldest 1960s–vintage C-130Es. ANG received three in 2001 and two in 2002. Of five on contract for 2004 delivery, active duty will receive one; ANG, three; AFRC, one. USAF entered a 67-aircraft (43 USAF, 24 USMC) multiyear contract in 2002 with deliveries from 2005–09. Of the 43, active units will get 26; ANG, nine; AFRC, eight.

CV-22
Brief: A tilt-rotor, multimission transport aircraft designed to have the maneuverability and lift capability of a helicopter and the speed of a fixed-wing aircraft.
Function: Multimission airlift.
Operator: AFSOC.
First Flight: March 19, 1989 (V-22).
Delivery: 2006 (planned).
IOC: 2009 (planned).
Production: 50 (planned).
Inventory: 50 (planned).
Unit Location: Hurlburt Field, Fla., Kirtland AFB, N.M.
Contractor: Bell Boeing; Raytheon.
Power Plant: two Rolls Royce–Allison AE1107C turboshafts, each 6,200 shp.
Accommodation: four (two pilots, two flight engineers), up to 18 troops or 8,000 lb internal cargo.
Dimensions: proprotor diameter 38 ft, width, rotors turning 84.6 ft, fuselage length 57.3 ft, height 22 ft.
Weight: gross weight 34,900 lb, max VTO 52,870 lb; STO 57,000 lb, self-deploy T-O 60,500 lb.
Ceiling: 26,000 ft.
Performance: typically will carry troops or cargo over a 500-mile combat radius at 265 mph. Self-deployment range with one air refueling 2,417 miles.
COMMENTARY
CV-22 is the designation for the US Special Operations Command variant of the V-22 Osprey. Combined testing resumed at Edwards AFB, Calif. in September 2002 following a protracted grounding. It is a tilt-rotor, vertical/short takeoff and landing (V/STOL) aircraft capable of operations in austere environments from remote bases or air capable ships. The CV-22's mission is long-range clandestine penetration of denied areas in adverse weather and low visibility to infiltrate, exfiltrate, and resupply SOF. Capable of air-to-air refueling, its range is limited only by crew endurance.
CV-22 avionics include a fully integrated precision navigation suite, with GPS and INS; a digital cockpit management system oriented around four multifunction displays (MFDs); FLIR; an integrated NVG HUD; terrain-following/terrain-avoidance (TF/TA) radar; and digital map system. The CV-22 also incorporates an extensive defensive countermeasures suite. Components of this system include a RWR, missile warning system, laser detection system, radar missile jammer, IR missile jammer, and a countermeasures dispensing system. The communications suite will include secure UHF, VHF (AM and FM), and satellite communications (SATCOM) radios.
The first CV-22 is planned to begin initial operational test and evaluation in spring 2006. Initial training capability is scheduled for late 2003 at Kirtland AFB, N.M., and IOC for early 2009 at Hurlburt Field, Fla. USAF may place detachments of CV-22s in EUCOM and PACOM theaters.

***VC-25** Air Force One* (Boeing)

T-6 Texan II (MSgt. Greg Kobashigawa)

MC-130E/H Combat Talon

Brief: A modified C-130 able to provide global, day, night, and adverse weather capability to air-drop personnel and to deliver personnel and equipment to support US and allied SOF.

Function: SOF infiltration, exfiltration, and resupply.

Operator: AETC, AFSOC, AFRC.

First Flight: circa 1965 (E); January 1990 (H).

Delivered: initially 1966.

IOC: 1966 (E); June 1991 (H).

Production: 24 (new-build Hs).

Inventory: 14 (E); 22 (H).

Unit Location: Active (Assoc.) and AFRC MC-130Es at Duke Field, Fla. Active MC-130H at Hurlburt Field, Fla.; MC-130H at Kadena AB, Japan, Kirtland AFB, N.M., RAF Mildenhall, UK.

Contractor: Lockheed Martin (airframe); Boeing integrated weapons system support.

Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp.

Accommodation: E: crew of nine; 53 troops or 26 paratroops; H: crew of seven; 77 troops, 52 paratroops, or 57 litters.

Dimensions: span 132.6 ft, height 38.5 ft, length 100.8 ft (E), 99.8 ft (H).

Weight: empty 72,892 lb, gross 155,000 lb.

Ceiling: 30,000 ft.

Performance: max speed 289 mph, range 3,110 miles, unlimited with refueling.

COMMENTARY

MC-130 Combat Talon aircraft are equipped with in-flight refueling equipment, TF/TA radar, INS/GPS, ECM, and a high-speed aerial delivery system, enabling them to conduct infiltration, exfiltration, resupply, psychological operations, and aerial reconnaissance into hostile or denied territory. Combat Talons are able to deliver or air-drop personnel or equipment on austere, marked and unmarked landing zones/drop zones. They can conduct overt, clandestine, and low-visibility operations.

MC-130E Combat Talon I. Fourteen modified C-130E aircraft are equipped to air refuel helicopters. During Desert Storm, MC-130Es played a vital role performing psychological operations, with a secondary mission in CSAR.

MC-130H Combat Talon II. Twenty-four new-build MC-130Hs were acquired to supplement the Talon I. They include an integrated glass cockpit compatible with NVGs and improved IR and electronic defensive countermeasures. The 1st, 7th, and 15th SOSs employ the Combat Talon II, supporting unconventional warfare units from their bases in Japan, Europe, and CONUS, respectively. The 58th SOW at Kirtland AFB, N.M., is responsible for MC-130H mission qualification training.

VC-25 Air Force One

Brief: A specially configured Boeing 747-200B used for air transport of the President and his entourage. When the President is aboard, it has the radio call sign "Air Force One."

Function: Air transport of the President.

Operator: AMC.

First Flight: First flown as Air Force One Sept. 6, 1990.

Delivered: August–December 1990.

IOC: circa 1990.

Production: two.

Inventory: two.

Unit Location: Andrews AFB, Md.

Contractor: Boeing.

Power Plant: four General Electric CF6 turbofans, each 56,700 lb thrust.

Accommodation: crew of 26; up to 76 passengers.

Performance: max speed at 27,000 ft 538 mph, range 2,400 miles.

COMMENTARY

The T-1A Jayhawk is used to train pilots who will go on to fly transports such as the C-5 and C-17 or to tankers such as the KC-10 and KC-135.

T-1A. The swept-wing T-1A is a military version of the Beech 400A used for Joint Specialized Undergraduate Pilot Training (JSUPT). Special mission equipment includes an electronic flight instrument system (EFIS) avionics system, a single-point refueling system with increased capacity, and increased bird-strike protection in the windshield and leading edges for sustained low-level operation. A GPS retrofit program has been completed.

T-6A Texan II

Brief: A single-engine turboprop aircraft used for training student pilots, navigators, and naval flight officers in fundamentals of aircraft handling and instrument, formation, and night flying.

Function: Primary trainer.

Operator: AETC, AFRC (Assoc.), USN.

First Flight: July 15, 1998.

T-38 Talon (Guy Aceto)

Dimensions: span 195.7 ft, length 231.8 ft, height 63.4 ft.

Weight: long-range mission T-O weight 803,700 lb., gross 833,000 lb.

Ceiling: 45,000 ft.

Performance: speed 630 mph (Mach 0.92), normal cruising speed Mach 0.84, unrefueled range 7,820 miles.

COMMENTARY

Based on the Boeing 747-200B airframe, two VC-25As assigned to Andrews AFB, Md., support the President. Aircraft are equipped with staff work areas, a conference room, a general seating area, and an executive office. Communications capability includes worldwide secure and clear communications equipment. Upgrades include GATM and installation of a broadband data transmit and receive capability to provide video teleconferencing and office-in-the-sky capability.

Trainer Aircraft

T-1 Jayhawk

Brief: A medium-range, twin-engine jet trainer version of the Beechcraft 400A. It is used by the Air Force to train student pilots to fly airlift, tanker, and bomber aircraft.

Function: Advanced pilot training.

Operator: AETC, AFRC (Assoc.).

First Flight: Sept. 22, 1989 (Beechcraft 400A).

Delivered: Jan. 17, 1992–July 1997.

IOC: January 1993.

Production: 180.

Inventory: 180.

Unit Location: Columbus AFB, Miss., Laughlin and Randolph AFBs, Tex., Vance AFB, Okla.

Contractor: Raytheon.

Power Plant: two Pratt & Whitney Canada JT15D-5B turbofans, each 2,900 lb thrust.

Accommodation: two, side by side, and one to the rear; rails are fitted to accommodate an extra four seats to permit transport of maintenance teams.

Dimensions: span 43.5 ft, length 48.4 ft, height 13.9 ft.

Weight: empty 5,200 lb, gross 16,100 lb.

Ceiling: 41,000 ft.

Delivery: May 2000–present (operational aircraft).

IOC: November 2001.

Production: USAF 372 (ordered), USN 328 (planned).

Inventory: 81 (USAF).

Unit Location: planned: USAF: Columbus AFB, Miss., Laughlin, Randolph, and Sheppard AFBs, Tex., Moody AFB, Ga., Vance AFB, Okla. Navy: NAS Corpus Christi, Tex., NASs Pensacola and Whiting, Fla.

Contractor: Raytheon.

Power Plant: one Pratt & Whitney Canada PT6A-68 turboprop, 1,100 shp.

Accommodation: two, in tandem, on zero/zero ejection seats.

Dimensions: span 33.5 ft, length 33.4 ft, height 10.7 ft.

Weight: empty (approx) 4,707 lb; gross 6,500 lb.

Ceiling: 31,000 ft.

Performance: max speed 368 mph, range 920 miles.

COMMENTARY

The Joint Primary Aircraft Training System (JPATS) **T-6A** Texan II is based on the Swiss Pilatus PC-9 aircraft, modified to include a strengthened fuselage, zero/zero ejection seats, increased aircrew accommodation, upgraded engine, increased fuel capacity, pressurized cockpit, larger, bird-resistant canopy, and new digital avionics. The JPATS is replacing USAF's T-37Bs and USN's T-34Cs in primary pilot training, as well as supporting undergraduate naval flight officer and USAF navigator training. Pilot training began at Moody AFB, Ga., in October 2001.

T-37 Tweet

Brief: A twin-engine jet used for training undergraduate pilots and undergraduate navigator and tactical navigator students in fundamentals of aircraft handling and instrument, navigation, formation, and night flying.

Function: Primary trainer.

Operator: AETC, AFRC.

First Flight: September 1955.

Delivered: December 1956–1968.

IOC: 1957.

Production: 985.

Inventory: 404.

Unit Location: Columbus AFB, Miss., Laughlin, Randolph, and Sheppard AFBs, Tex., Vance AFB, Okla.

Contractor: Cessna.

Power Plant: two Continental J69-T-25 turbojets, each 1,025 lb thrust.
Accommodation: two, side by side, on ejection seats.
Dimensions: span 33.7 ft, length 29.2 ft, height 9.1 ft.
Weight: empty 3,870 lb, gross 6,625 lb.
Ceiling: 35,000 ft.
Performance: max speed at S/L 315 mph, range 460 miles.
COMMENTARY
USAF's first purpose-built jet trainer, the T-37 has been AETC's standard two-seat primary trainer. A distinctive blue-and-white finish is intended to help formation training and ease maintenance.
T-37A, with J69-T-9 turbojets; all have been modified to T-37B standards.
T-37B. The original T-37A was superseded in November 1959 by the T-37B, with improved radio navigational equipment, UHF radio, and upgraded instruments. All A models were later converted to B standard. Kits were subsequently produced to extend the capability of the T-37 by modifying or replacing critical structural components. AETC began replacing the T-37B with the T-6A Texan II in 2000.

T-38 Talon
Brief: A twin-engine, high-altitude, supersonic jet trainer used in a variety of roles, primarily for undergraduate pilot and pilot instructor training.
Function: Trainer.
Operator: ACC, AETC, AFMC, AFRC.
First Flight: April 1959.
Delivered: 1961–72.
IOC: March 1961.
Production: more than 1,100.
Inventory: 458.
Unit Location: Beale and Edwards AFBs, Calif., Columbus AFB, Miss., Holloman AFB, N.M., Laughlin, Randolph, and Sheppard AFBs, Tex., Moody AFB, Ga., Vance AFB, Okla., Whiteman AFB, Mo.
Contractor: Northrop Grumman.
Power Plant: two General Electric J85-GE-5A turbojets, each 2,680 lb thrust dry, 2,900 lb thrust with afterburning.
Accommodation: two, in tandem, on ejection seats.
Dimensions: span 25.3 ft, length 46.3 ft, height 12.8 ft.
Weight: empty 7,164 lb, gross 12,500 lb.
Ceiling: above 55,000 ft.
Performance: max level speed 812 mph, range 1,000 miles.
COMMENTARY
Most of the T-38s in service are used by AETC for advanced bomber–fighter training track in JSUPT. Capabilities are being enhanced through an ongoing program of modifications and structural renewal, including a full avionics upgrade with a HUD and integrated GPS/INS, and a propulsion modernization. As a result of the reduction in the T-38's workload through introduction of the T-1A and JSUPT, the service life of the T-38s should extend well beyond 2020.
T-38A. Close in structure to the F-5A export tactical fighter, the T-38A was the world's first supersonic trainer aircraft. It is used to teach supersonic techniques, aerobatics, formation, night and instrument flying, and cross-country and low-level navigation. Also used to train test pilots and flight engineers at Edwards AFB, Calif., by AFMC to test experimental equipment, and by ACC to maintain pilot proficiency.
AT-38B. A slightly different version, with a gunsight and practice bomb dispenser, used by AETC for Introduction to Fighter Fundamentals.
T-38C. All T-38A and AT-38B airframes will be redesignated as C models upon modification of the avionics systems, begun in 2000; first TC-38C was received late summer 2002; planned completion 2009.

T-43
Brief: A medium-range, swept-wing jet aircraft equipped with navigation and communications equipment to train navigators for strategic and tactical aircraft.
Function: Navigation trainer.
Operator: AETC.
First Flight: April 1973.
Delivered: September 1973–July 1974.
IOC: 1974.
Production: 19.
Inventory: 10.
Unit Location: Randolph AFB, Tex.
Contractor: Boeing.
Power Plant: two Pratt & Whitney JT8D-9 turbofans, each 14,500 lb thrust.
Accommodation: crew of two; 12 students and six instructors.
Dimensions: span 93 ft, length 100 ft, height 37 ft.
Weight: gross 115,500 lb.
Ceiling: 37,000 ft.
Performance: econ cruising speed 535 mph (Mach 0.7), operational range 2,995 miles.
COMMENTARY
T-43A. The T-43A was derived from the commercial Boeing Model 737-200 and was equipped with the same onboard avionics as most USAF operational aircraft, including mapping radar, VHF omnidirectional radio and Tacan radio systems, INS, radar altimeter, all required communications equipment, and celestial navigation capability.
A number of T-43s are configured for passengers and provide operational support to assigned commands.

T-41 Mescalero
Brief: Short-range, high-wing trainer used primarily for aerodynamic and navigation courses.
Function: Training, support.
Operator: USAFA.
Delivered: 1969.
Inventory: four.
Unit Location: USAFA, Colo.
Contractor: Cessna.
Power Plant: one Continental IO-360-DB piston engine, 210 hp thrust.
Accommodation: two, side by side.
Dimensions: span 36.1 ft, length 26.5 ft, height 8.9 ft.
Weight: gross 2,550 lb.
Ceiling: 16,000 ft.
Performance: speed 182 mph, range 690 miles.
COMMENTARY
The **T-41D,** a military version of the Cessna 172, is an all-metal, strut-braced high-wing monoplane. The aircraft is equipped with modern avionics, GPS, and other equipment appropriate to its mission. It is used for Aero 456 flight testing, USAFA flying team support, and orientation flights.

TG-3A
Brief: Single-seat, medium-performance sailplane used for cross-country and spin training.
Function: Cross-country and spin trainer.
Operator: USAFA.
Delivered: circa 1960.
IOC: circa 1960.
Production: not available.
Inventory: three.
Unit Location: USAFA, Colo.
Contractor: Schweizer Aircraft.
Accommodation: one pilot.
Dimensions: span 40 ft, length 21.6 ft, height 7.2 ft.
Weight: 700 lb.
Ceiling: Flight Level (FL) 250 ft.
Performance: speed 114 mph, glide ratio 23:1, range dependent on soaring conditions.
COMMENTARY
The **TG-3A** is a medium-performance sailplane that allows students to master basic flight maneuvers while solo before progressing to a more advanced sailplane. With the exception of the fabric covered horizontal stabilizer and control surfaces, the aircraft is all-metal construction. It is primarily used for cross-country training and high-altitude wave flight with up to six-hour flight duration.

TG-4A
Brief: Conventional two-place tandem basic training sailplane used to introduce all USAFA cadets to flight.
Function: Flight introduction.
Operator: USAFA.
Delivered: October 1984.
IOC: not available.
Production: not available.
Inventory: 14.
Unit Location: USAFA, Colo.
Contractor: Schweizer Aircraft.
Accommodation: two (student pilot and instructor).
Dimensions: span 51 ft, length 25.8 ft, height 9.3 ft.
Weight: gross 1,040 lb.
Ceiling: 14,000 ft.
Performance: speed 98 mph, glide ratio 23:1.
COMMENTARY
The **TG-4A** has an all-metal airframe with aluminum covering on wings and vertical tail and a one-piece canopy for increased visibility. USAFA introduces all cadets to flight through the Soar-for-All program using the TG-4A. It can perform aerotow, stall recovery, slow flight, steep turn, and rectangular traffic pattern maneuvers.

TG-7A
Brief: A conventional two-place, side-by-side, fixed-gear, low-wing motorized glider that is equipped with spoilers and used to simulate the flight characteristics of the TG-4A and reduce the number of sorties needed to solo.
Function: Trainer.
Operator: USAFA.
Delivered: 1984.
IOC: not available.
Production: not available.
Inventory: nine.
Unit Location: USAFA, Colo.
Contractor: Schweizer Aircraft.
Power Plant: one Lycoming O-235-L2C 4-cylinder engine, 112 hp.
Accommodation: two (student pilot and instructor).
Dimensions: span 59.5 ft, length 27.5 ft, height 7.7 ft.
Weight: gross 1,850 lb.
Ceiling: 14,000 ft.
Performance: speed 136 mph, range 230 miles.
COMMENTARY
The **TG-7A** motor glider is a single-engine, fixed-gear, conventional configuration, low-wing monoplane of all-metal construction with side-by-side seating. Students use it to practice multiple pattern, aerial maneuvers, and landing procedures, reducing by half the number of sorties needed to achieve a solo flight.

TG-9A
Brief: Medium-performance sailplane with tandem seating used for spins, aerobatics, and cross-country soaring.
Function: Trainer.
Operator: USAFA.
Delivered: October 1984.
IOC: not available.
Production: not available.
Inventory: four.
Unit Location: USAFA, Colo.
Contractor: Schleicher GmbH, Germany.
Accommodation: two, tandem.
Dimensions: span 55.8 ft, length 27.4 ft, height 5 ft.
Weight: gross 1,320 lb.
Ceiling: FL 250 ft.
Performance: speed 150 mph, glide ratio 34:1, range dependent on soaring conditions.
COMMENTARY
The **TG-9A** (ASK-21) sailplane has a midwing configuration with a T-tail and air brakes on the upper wing surface. It is used primarily for spin training and aerobatic demonstrations. It is used at the regional and national level for cross-country and aerobatic competition.

TG-10B
Brief: Two-seat medium-performance sailplane used for introductory glider training, instructor upgrade training, spin training, and basic cross-country soaring training.

TG-10C

Function: Trainer.
Operator: USAFA.
Delivered: spring 2002.
IOC: December 2002.
Production: 12.
Inventory: nine.
Unit Location: USAFA, Colo.
Contractor: Blanik.
Accommodation: two.
Dimensions: span 53.1 ft, length 27.9 ft, height 6.2 ft.
Weight: 1,124 lb.
Performance: speed 142.6 mph, glide ratio 28:1.
COMMENTARY
The **TG-10B** is an L-23 Super Blanik sailplane produced in the Czech Republic.

TG-10C
Brief: Two-seat medium-performance sailplane used for instructor spin upgrade, aerobatic demonstrations, and aerobatic competition.
Function: Trainer.
Operator: USAFA.
Delivered: spring 2002.
IOC: December 2002.

***MH-53J** Pave Low III* (TSgt. Scott Reed)

***HH-60G** Pave Hawk* (SSgt. Shane A. Cuomo)

Production: five.
Inventory: two.
Unit Location: USAFA, Colo.
Contractor: Blanik.
Accommodation: two.
Dimensions: span 46.3 ft, length 27.6 ft, height 6.8 ft.
Weight: 1,103 lb.
Performance: speed 146.1 mph, glide ratio 26:1.
COMMENTARY
The **TG-10C** is an L-13AC Blanik sailplane produced in the Czech Republic.

TG-10D
Brief: Single-seat medium-performance sailplane used for cross-country soaring training and competition.
Function: Trainer.
Operator: USAFA.
Delivered: spring 2002.
IOC: December 2002.
Production: four.
Inventory: four.
Unit Location: USAFA, Colo.
Contractor: Blanik.
Accommodation: single.
Dimensions: span 46.3 ft, length 21.7 ft, height 4.7 ft.
Weight: 750 lb.
Performance: speed 149.5 mph, glide ratio 33:1.
COMMENTARY
The **TG-10D** is an L-33 Solo Blanik sailplane produced in the Czech Republic.

TG-11A
Brief: Conventional two-place, side-by-side, self-launched high-performance sailplane used for cross-country training.
Function: Trainer.
Operator: USAFA.
Delivered: summer 1995.
IOC: not available.
Production: not available.
Inventory: two.
Unit Location: USAFA, Colo.
Contractor: Stemme GmbH, Germany.
Power Plant: one Limbach L-2400 EB1.AD four-cylinder engine, T-O 93 hp at 3,400 rpm, cruise 80 hp at 3,000 rpm (S/L).
Accommodation: two, side by side.
Dimensions: span 75.5 ft, length 27.6 ft, height 5.7 ft.
Weight: gross 1,874 lb.
Ceiling: 17,450 ft powered cruise, FL 250 ft.
Performance: speed 168 mph, 138 mph powered cruise, glide ratio 50:1, range 860 miles powered.
COMMENTARY
The **TG-11A** self-launched high-performance sailplane has a folding propeller that is stored behind a retractable propeller dome on the aircraft nose during soaring flight. It is used primarily for dual cross-country training, field selection, and advanced sailplane training.

TG-14
Brief: A two-place, side-by-side motorized glider for use by USAFA in its Introductory Flight Training Program (IFTP) flight screening/primary training program.
Function: Trainer.
Operator: USAFA.
Delivered: from June 2002.
IOC: December 2002.
Production: 14 (planned).
Inventory: five.
Unit Location: USAFA, Colo.
Contractor: Grupo Aeromot, Brazil.
Power Plant: one Rotax 912A, 81 hp engine.
Accommodation: two, side by side.
Dimensions: span 57.3 ft, length 26.4 ft, height 6.3 ft.
Weight: gross 1,874 lb.
Performance: cruise speed 110 mph, glide ratio 31:1, range 690 miles at high-speed cruise, max endurance seven hr.
COMMENTARY
A military version of the AMT-200S Sport Grupo Aeromot selected for use in USAFA's IFTP, replacing the Enhanced Flight Screening Program performed by civilian flying schools since the grounding of the T-3A Firefly in 1997. Cockpit and avionics are modified for military use.

UV-18 Twin Otter
Brief: Modified utility transport used for parachute jump training.
Function: Paradrop.
Operator: USAFA.
First Flight: May 1965 (commercial version).
Delivered: 1977.
IOC: 1977.
Production: three.
Inventory: three.
Unit Location: USAFA, Colo.
Contractor: de Havilland Aircraft of Canada.
Power Plant: two Pratt & Whitney Canada PT6A-27 turboprops, each 620 ehp.
Accommodation: crew of two and up to 20 passengers.
Dimensions: span 65 ft, length 51.8 ft, height 19.5 ft.
Weight: gross 12,500 lb.
Ceiling: 26,700 ft.
Performance: max cruising speed 210 mph, range with 2,500 lb payload 806 miles.
COMMENTARY
The UV-18B is a military version of the DHC-6 Twin Otter STOL utility transport used for parachute jump training at USAFA.

Helicopters

HH-60G Pave Hawk
Brief: Specially modified helicopters used for SAR and support missions.
Function: SOF heavy-lift helicopter.
Operator: ACC, AETC, AFMC, PACAF, ANG, AFRC.
First Flight: October 1974.
Delivered: 1982–present.
IOC: circa 1982.
Production: 105.
Inventory: 105.
Unit Location: Kadena AB, Japan, Kirtland AFB, N.M., Moody AFB, Ga., NAS Keflavik, Iceland, Nellis AFB, Nev., Robins AFB, Ga. ANG: Francis S. Gabreski Arpt., N.Y., Moffett Federal Airfield, Calif. AFRC: Davis–Monthan AFB, Ariz., Patrick AFB, Fla., Portland Arpt., Ore.
Contractor: Sikorsky.
Power Plant: two General Electric T700-GE-700/701C turboshafts, each 1,620 (continuous) shp.
Accommodation: crew of three or four; 11–14 troops, up to six litters, or internal or external cargo.
Dimensions: rotor diameter 53.6 ft, length of fuselage 64.7 ft, height 16.7 ft.
Weight: empty 12,330 lb, max gross 22,000 lb.
Ceiling: 14,200 ft.
Performance: max speed 173 mph, max range 373 miles (internal fuel), 500 miles (auxiliary tank).
Armament: two 7.62 mm miniguns, with provision for two .50 caliber machine guns in cabin doors.
COMMENTARY
One hundred five Black Hawk helicopters were modified to **HH-60G** Pave Hawk configuration for use by active duty, ANG, and AFRC air rescue units for CSAR and various mission-support activities worldwide. The Pave Hawk is a highly modified version of the Army Black Hawk helicopter, featuring an upgraded communications/navigation suite that includes INS/GPS/Doppler navigation systems, SATCOM, secure/antijam communications, and a PLS that provides range/steering data to compatible survivor radios.
Further modifications include an automatic flight-control system, NVG lighting, FLIR, color weather radar, engine/rotor blade anti-ice system, retractable in-flight refueling probe, internal auxiliary fuel tanks, and an integral rescue hoist. Combat enhancements include RWR, IR jammer, flare and chaff countermea-

***UH-1N** Iroquois* (Guy Aceto)

sures dispensing system, and two 7.62 mm or .50-caliber machine guns.

MH-53 Pave Low

Brief: Specially outfitted heavy-lift helicopters used by Air Force Special Operations Forces for infiltration/exfiltration as well as CSAR missions.

Function: SOF heavy-lift helicopter.

Operator: AETC, AFSOC.

First Flight: March 1967.

Delivered: from July 1987 (MH-53J).

IOC: 1988 (MH-53J).

Production: not available.

Inventory: 36.

Unit Location: AETC: Kirtland AFB, N.M. AFSOC: Hurlburt Field, Fla., Osan AB, South Korea, RAF Mildenhall, UK.

Contractor: Sikorsky; Texas Instruments.

Power Plant: two General Electric T64-GE-100 turboshafts, each 4,330 shp.

Accommodation: crew of six; up to 38 troops.

Dimensions: rotor diameter 72.2 ft, length of fuselage (without refueling probe) 67.2 ft, height 25 ft.

Weight: gross 50,000 lb.

Ceiling: 16,000 ft.

Performance: speed 164 mph, max range 630 miles, unlimited with air refueling.

Armament: mounts for any combination of three 7.62 miniguns and .50-caliber machine guns.

COMMENTARY

MH-53H. Older version of the helicopter, all of which, together with all HH/CH-53B/Cs, were upgraded to MH-53J Pave Low III "Enhanced" standard from 1986.

MH-53J. A long-range deep penetration helicopter, adverse weather capable and equipped for extended operations when air refueled. Equipped with a nose-mounted FLIR, an integrated digital avionics suite that includes TF/TA radar, Kalman filtered navigation suite (GPS, INS, Doppler), projected map display, secure UHF, VHF, FM, HF communications, PLS, SATCOM, hover coupler, rescue hoist, mission commander's C2 panel, armor plating, and an ECM suite with radar and IR missile jammers, flare/chaff dispensers, RWR, and missile launch detectors.

A service life extension program (SLEP) upgraded the aircraft's hydraulics, wiring, and basic airframe structure for increased gross weight, and an automated blade/pylon fold system optimized for shipboard compatibility. All aircraft modified to support aircrew eye/respiratory protection system.

MH-53M. MH-53J helicopters upgraded to Pave Low IV standard, delivered from 1999. Upgrades include the interactive defensive avionics suite/multimission advanced tactical terminal capability which integrates onboard EW systems with off-board, over-the-horizon, near-real-time intelligence, and mission software improvements. Cockpit modifications include three MFDs, integrated digital map, and mission commander situation awareness panel in the cabin area.

TH-53A. Six TH-53As (modified USMC CH-53As) are used by the 58th SOW, Kirtland AFB, N.M., as basic qualification trainers. Modifications include the installation of General Electric T64-GE-100 engines, air refueling probe, and standard USAF avionics and communications equipment.

UH-1 Iroquois

Brief: Modified Bell helicopter used to support Air Force ICBM facilities and for administrative airlift.

Function: Utility helicopter.

Operator: AETC, AFMC, AFSPC, AMC, PACAF.

First Flight: circa 1956.

Delivered: from September 1970.

IOC: circa 1970.

Production: 79.

Inventory: 62.

Unit Location: Fairchild AFB, Wash., F.E. Warren AFB, Wyo., Kirtland AFB, N.M., Malmstrom AFB, Mont., Minot AFB, N.D., Robins AFB, Ga., Vandenberg AFB, Calif., Yokota AB, Japan.

Contractor: Bell.

Power Plant: Pratt & Whitney Canada T400-CP-400 Turbo "Twin-Pac," 1,290 shp.

Accommodation: two pilots and 14 passengers or cargo, or external load of 4,000 lb.

Dimensions: rotor diameter (with tracking tips) 48.1 ft, fuselage length 42.3 ft, height 14.3 ft.

Weight: gross and mission weight 11,200 lb.

Ceiling: 13,000 ft.

Performance: max cruising speed at S/L 115 mph, max range, no reserves, 261 miles.

Armament: (optional) two General Electric 7.62 mm miniguns or two 40 mm grenade launchers; two seven-tube 2.75-in rocket launchers.

COMMENTARY

UH-1N is a twin-engine version of the UH-1 utility helicopter (Bell Model 212), most of which are allocated for AFSPC missile site support and for administrative/DV airlift. The UH-1N is also used by AETC's 58th SOW, Kirtland AFB, N.M., for training purposes and by the 336th TG, Fairchild AFB, Wash., for aircrew survival training. Two UH-1N helicopters are maintained by AFSOC for aviation advisory aircrew flight proficiency.

Strategic Missiles

AGM-86 Air Launched Cruise Missile

Brief: A small, subsonic, winged air vehicle, deployed on B-52H aircraft, which can be equipped with either a nuclear or conventional warhead and can be used to help dilute air defenses and complicate an enemy's air defense task.

Function: Strategic air-to-surface cruise missile.

Operator: ACC.

First Flight: June 1979 (full-scale development).

Delivered: from 1981.

IOC: December 1982, Griffiss AFB, N.Y.

Production: 1,700+.

Unit Location: Barksdale AFB, La., Minot AFB, N.D.

Contractor: Boeing.

Power Plant: Williams/Teledyne CAE F107-WR-10 turbofan, 600 lb thrust.

Guidance: AGM-86B: inertial plus Terrain Contour Matching (TERCOM); AGM-86C: inertial plus GPS.

Warhead: AGM-86B: W80-1 nuclear; AGM-86C: blast/fragmentation conventional; AGM-86D: hard target penetrating warhead.

Dimensions: length 20.8 ft, body diameter 2 ft, wingspan 12 ft.

Weight: 3,150 lb (B), 3,277 lb (C).

Performance (approx): speed 550 mph (Mach 0.6), range 1,500+ miles (AGM-86B).

COMMENTARY

AGM-86A. A prototype cruise missile, developed in the mid–1970s. Slightly smaller than the later versions, it never entered production.

AGM-86B. First production version, the B is programmed for strategic attack on surface targets. Small radar signature and low-level flight capability enhance the missile's effectiveness. The last of 1,715 production models was delivered in October 1986. Undergoing SLEP to extend life to FY30.

AGM-86C. A conventional warhead version, developed from June 1986, the Conventional Air Launched Cruise Missile (CALCM) was first used operationally during Gulf War I and has since been widely used in combat operations. CALCM provides the warfighter with an adverse weather, day/night, air-to-surface, accurate, standoff outside theater defenses strike capability, with a range greater than 500 miles and a 3,000-lb class warhead. CALCM is equally effective for stand-alone, clandestine/punitive strikes and fully integrated theater warfare. Since 1986, Boeing converted 622 Bs to the conventional configuration, the first of which was delivered in December 1987. Of the 322 most recent conversions, 132 feature new Block 1A enhancements with improved accuracy and increased immunity to electronic jamming.

AGM-86D. CALCM penetrator version with a Lockheed Martin AUP-3(M) warhead. The last 50 of the 322 CALCM conversions are to AGM-86D configuration. The CALCM penetrator provides the warfighter with a cost-effective, standoff outside theater defenses capability against a wide range of hardened, deeply buried targets.

AGM-129 Advanced Cruise Missile

Brief: A stealthy, long-range, winged air vehicle equipped with a nuclear warhead and designed to evade enemy air and ground-based defenses in order to strike hard, heavily defended targets at standoff distances.

Function: Strategic air-to-surface cruise missile.

Operator: ACC.

First Flight: July 1985.

Delivered: June 1990–August 1993.

IOC: circa 1991.

Production: 461.

Unit Location: Barksdale AFB, La., Minot AFB, N.D.

Contractor: General Dynamics; Boeing (McDonnell Douglas).

Power Plant: Williams International F112-WR-100 turbofan.

Guidance: inertial, with TERCOM update.

Warhead: W80-1 nuclear.

Dimensions: length 20.8 ft, body width 2.2 ft, wingspan 10.2 ft.

Weight: 3,700 lb.

***LGM-30G** Minuteman III in its silo* (Guy Aceto)

Performance (approx): range 2,300+ miles, speed 550 mph.

COMMENTARY

AGM-129A. Embodying stealth technology, the AGM-129A has improved range, accuracy, survivability, and targeting flexibility, compared with the AGM-86B. Developed by General Dynamics, McDonnell Douglas was certified as second source for this advanced system, which is deployed on B-52H aircraft.

LG-118 Peacekeeper

Brief: A solid-fuel ICBM capable of delivering a thermonuclear payload of 10 warheads with high accuracy over great distances.

Function: Strategic surface-to-surface ballistic missile.

Operator: AFSPC.

First Flight: June 17, 1983.

Delivered: June 1986–December 1988.

IOC: December 1986, F.E. Warren AFB, Wyo.

Production: 50.

Inventory: 49, as of Oct. 3, 2002.

Unit Location: F.E. Warren AFB, Wyo.

Contractor: Lockheed Martin.

Power Plant: first three stages: solid propellant; fourth stage: storable liquid; by Thiokol, Aerojet, Hercules, and Rocketdyne, respectively.

Guidance: inertial guidance system.

Warheads: 10 Avco Mk 21 MIRVs.

Dimensions: length 71 ft, diameter 7.7 ft.

Weight: approx 195,000 lb.

COMMENTARY

LG-118A. Developed initially in response to an increased Soviet strategic threat, deployment was capped at 50 in FY90 in response to the changing international political climate.

Housed in converted Minuteman III silos, Peacekeeper is a four-stage ICBM that carries up to 10 independently targetable re-entry vehicles. It is more accurate and has a greater payload and range than the Minuteman III. Its greater resistance to nuclear effects and its more capable guidance system provide a greatly improved ability to destroy very hard targets. These attributes, combined with its prompt response, provide a decisive deterrent.

USAF began its deactivation of Peacekeeper ICBMs, scheduled for retirement under nuclear force structure reductions, on Oct. 3, 2002. Dismantlement of all 50 missiles will take about three years.

LGM-30 Minuteman

Brief: A solid-fuel ICBM capable of being fired from silo launchers and delivering a thermonuclear payload of one to three warheads with high accuracy over great distances.

Function: Strategic surface-to-surface ballistic missile.

Operator: AFSPC.

First Flight: February 1961.

Delivered: 1962–December 1978.

IOC: December 1962, Malmstrom AFB, Mont.

Production: 1,800.

Inventory: 500.

Unit Location: F.E. Warren AFB, Wyo., Malmstrom AFB, Mont., Minot AFB, N.D.

Contractor: Boeing.

Power Plant: stage 1: Thiokol M-55 solid-propellant motor, 210,000 lb thrust; stage 2: Aerojet–General SR19-AJ-1 solid-propellant motor, 60,300 lb thrust; stage 3: Thiokol SR73-AJ-1 solid-propellant motor, 34,400 lb thrust.

Guidance: inertial guidance system.

Warheads: one–three Mk 12/12A MIRVs (downloaded to one).

Dimensions: length 59.8 ft, diameter of first stage 5.5 ft.

Weight: launch weight (approx) 78,000 lb.

Performance: speed at burnout more than 15,000 mph, highest point of trajectory approx 700 miles, range with max operational load more than 6,000 miles.

COMMENTARY

A key element in the US strategic deterrent posture, Minuteman is a three-stage, solid-propellant ICBM, housed in an underground silo.

LGM-30A/B. Minuteman I version deployed in the early 1960s. The last Minuteman I missile was removed from its silo at Malmstrom AFB, Mont., in February 1969. USAF had deployed 150 A and 650 B models in 16 squadrons.

LGM-30F. Minuteman II version incorporated a larger second stage, an improved guidance package, greater range and payload capability, and hardening against the effects of nuclear blast. IOC was reached in October 1965 at Grand Forks AFB, N.D. USAF deployed 450 in nine squadrons.

LGM-30G. The Minuteman III became operational in June 1970, providing improved range, rapid retargeting, and the capability to place three multiple independently targetable re-entry vehicles (MIRVs) on three targets with a high degree of accuracy. USAF initially deployed 550 in 11 squadrons.

***AIM-120** AMRAAM* (top), ***AIM-9** Sidewinder, **AGM-88** HARM* (bottom) (SrA. Stan Parker)

A single re-entry vehicle configuration has been demonstrated, planned for, and is being worked in accordance with strategic arms control negotiations. Currently a total of 500 Minuteman IIIs are based at Minot AFB, N.D.; F.E. Warren AFB, Wyo.; and Malmstrom.

An extensive life extension program is ensuring Minuteman's viability to 2020. Major upgrades include refurbishment of liquid propulsion post-boost rocket engine, remanufacture of the solid-propellant rocket motors, replacement of the environmental control system, repair of launch facilities, installation of updated, survivable communications equipment, and a C2 sustainment program.

Tactical Missiles and Weapons

AIM-7 Sparrow

Brief: A supersonic, medium-range, semiactive radar–guided air-to-air missile with all-weather, all-altitude, and all-aspect offensive capability and a high-explosive warhead, carried by fighter aircraft.

Function: Air-to-air guided missile.

First Flight: December 1983 (AIM-7M).

Delivered: from 1956.

IOC: April 1976 (AIM-7F).

Production: sustainment phase.

Inventory: classified.

Contractor: Raytheon (Hughes); General Dynamics.

Power Plant: Hercules Mk 58 Mod 0 4.5 sec boost–11 sec. sustain rocket motor.

Guidance: AIM-7M: monopulse semiactive radar.

Warhead: high-explosive, blast fragmentation, weighing 86 lb.

Dimensions: length 12 ft, body diameter 8 in, wingspan 3.3 ft.

Weight: launch weight 504 lb.

Performance (estimated): max speed more than 2,660 mph (Mach 3.5), range more than 34 miles.

COMMENTARY

Early versions. Production of Sparrow has been under way for more than 40 years. Approximately 34,000 early models (AIM-7A/B/C/D/E) were produced. Compared to the earlier versions, the advanced solid-state AIM-7F, introduced into USAF service in 1976, had a larger motor, Doppler guidance, improved ECM, and better capability over both medium and "dogfight" ranges. USAF produced approximately 5,000, but none are now in USAF service.

AIM-7M, a joint Navy–USAF project to produce a monopulse version of Sparrow aimed at reducing cost and improving performance in the ECM and look-down clutter regions. It began operational service in FY83. This version provides all-weather, all-altitude, all-aspect capability and equips USAF F-15s and F-16s (ADF) and Navy F-14s and F-18s.

AIM-7P. Block 1 retrofit to AIM-7M guidance and control sections (GCSs), providing low-altitude guidance and fuzing capability. Block 2 provides new-build for AIM-7P GCSs.

AIM-9 Sidewinder

Brief: A supersonic, short-range, IR–guided air-to-air missile carried by fighter aircraft, having a high-explosive warhead.

Function: Air-to-air missile.

First Flight: September 1953.

Delivered: 1983–present. First production AIM-9X delivered May 1, 2002.

IOC: circa 1983 (AIM-9M).

Production: sustainment phase (AIM-9M); LRIP from November 2000 (AIM-9X).

Inventory: classified.

Contractor: Raytheon; Loral.

Power Plant: Thiokol Mk 36 Mod 11 solid-propellant rocket motor.

Guidance: solid-state IR homing guidance.

Warhead: high-explosive, weighing 20.8 lb.

Dimensions: length 9.4 ft, body diameter 5 in, finspan 2.1 ft.

Weight: launch weight 190 lb.

Performance: max speed Mach 2+, range 10+ miles.

COMMENTARY

Early versions. AIM-9A was the prototype version. The AIM-9B, initial production version, entered the inventory in 1957 and was effective only at close range during day. These shortcomings were eliminated on subsequent AIM-9E/H/J/P versions. The third generation Sidewinder, AIM-9L, added a more powerful solid-propellant rocket motor as well as tracking maneuvering ability. Production and delivery began in 1976; production ended in 1981.

AIM-9M, a joint Navy–USAF project aimed at producing an improved version of AIM-9L with all-altitude, all-aspect, launch-and-leave intercept capability. Carriage options include: A-10, F-14, F-15, F-16, F-16 ADF, and F-18. This version has increased infrared counter-countermeasures (IRCCM) capability, improved background discrimination, and a reduced-smoke rocket motor. First flight of prototype was in February 1978. Full production began in FY81.

AIM-9M-9. A recently completed modification to improve IRCCM capability of early missiles.

AIM-9X is the result of a Navy–Air Force program, derived from a jointly funded demonstration and validation contract. Raytheon is the EMD contractor. The AIM-9X entered LRIP from November 2000. The flight-test program has completed 19 live guided-missile firings with 11 kills of QF-4 target drones. USAF plans to buy 5,097 missiles.

The AIM-9X incorporates advanced technologies such as a focal plane array imaging seeker, high off-boresight sensor (HOBS), and a highly maneuverable jet-vane control system. The missile utilizes the existing AIM-9M rocket motor, warhead, and fuze. It will be integrated with the JHMCS to maximize its HOBS capability. It will be employed on F-15, F-16, F-35, F/A-18, and F/A-22 aircraft.

AIM-120 AMRAAM

Brief: A new generation supersonic, medium-range, active radar–guided air-to-air missile with a high-explosive warhead.

Function: Air-to-air guided missile.

First Flight: December 1984.

Delivered: 1988–July 2010 (planned).

IOC: September 1991.

Production: 10,917+ planned for USAF/USN.

Inventory: classified.

Contractor: Raytheon.

Power Plant: Alliant boost-sustain solid-propellant rocket motor.

Guidance: inertial/command, inertial with active radar terminal homing.

Warhead: high-explosive directed fragmentation weighing 48 lb.

Dimensions: (A/B models) length 12 ft, body diameter 7 in, span of tail control fins 2.1 ft.

Weight: 335 lb.

Performance: cruising speed approx Mach 4, range more than 23 miles.

COMMENTARY

A joint project between the Navy and USAF, the

AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) is a replacement for the AIM-7 Sparrow. The AIM-120 equips F-15, F-16, F/A-18, and F/A-22 fighters. (The F/A-22 will only carry the C model.) Inertial and command inertial guidance and active radar terminal homing provide launch-and-maneuver capability. Significant improvements in operational effectiveness over the AIM-7 include increased average velocity, reduced miss distance, improved fuzing, increased warhead lethality, multiple target engagement capability, improved clutter rejection in low-altitude environments, enhanced electronic protection capability, increased maximum launch range, a reduced-smoke motor, and improved maintenance and handling.

AIM-120A was the first production version, delivered by Hughes in 1988 to the 33rd TFW at Eglin AFB, Fla.

AIM-120B/C are upgraded, reprogrammable variants of the AIM-120. The AIM-120C currently in production has smaller, clipped control surfaces to provide for internal carriage capability in the F/A-22, with HOBS launch capability.

AGM-65 Maverick

Brief: A tactical, TV– or imaging-infrared (IIR)–guided air-to-surface missile carried by fighters and designed for use in CAS, interdiction, and defense suppression missions, having standoff capability and high probability of strike against a wide range of targets.

Function: Air-to-surface guided missile.

First Flight: August 1969.

Delivered: from August 1972.

IOC: February 1973.

Production: sustainment phase.

Inventory: 7,300 AGM-65A/B/H/K (EO guidance); 15,000 AGM-65D/G (IR guidance).

Contractor: Raytheon.

Power Plant: Thiokol TX-481 solid-propellant rocket motor.

Guidance: self-homing, EO guidance system (IIR on D and G models).

Warhead: AGM-65A/B/D/H 125-lb high-explosive, shaped charge; AGM-65G/K 298-lb blast fragmentation.

Dimensions: length 8.2 ft, body diameter 1 ft, wingspan 2.3 ft.

Weight: launch weight (AGM-65A) 462 lb, (AGM-65G) 670 lb.

Performance: range about 9.2 miles.

COMMENTARY

Maverick missiles have a long and distinguished combat record. They were first employed by USAF in Vietnam and were used extensively during Gulf War I. They currently equip A-10, F-15E, and F-16 aircraft for use against tanks and columns of vehicles and in the SEAD role.

AGM-65A. The basic Maverick is a launch-and-leave, TV–guided air-to-surface missile that enables the pilot of the launch aircraft to seek other targets or leave the target area once the missile has been launched. Production was initiated in 1971, following successful test launches over distances ranging from a few thousand feet to many miles and from high altitudes to treetop level.

AGM-65B. A version with a "scene magnification" TV seeker that enables the pilot to identify and lock on to smaller or more distant targets.

AGM-65D. System developed to overcome limitations of the TV Maverick, which can be used only in daylight and clear-weather conditions. This version has an IIR seeker as well as a lower-smoke motor. IIR Maverick became operational on A-10s in February 1986.

AGM-65G. Uses the IIR seeker with an alternate 298-lb blast fragmentation warhead for use against hardened targets. Software has been modified to include options for targeting ships and large land targets as well as mobile armor. This version also has a digital autopilot and a pneumatic, rather than hydraulic, actuation system. USAF received its first G model in 1989.

AGM-65H. AGM-65B modified with an upgraded TV seeker providing significant reliability, maintainability, and performance improvements over the AGM-65B seeker and double the standoff range.

AGM-65K. AGM-65G modified with the same upgraded TV seeker as in the AGM-65H to provide a TV–guided version of the Maverick with the 298-lb blast fragmentation warhead.

AGM-84 Harpoon

Brief: An adverse weather capable, sea-skimming, active radar–guided, antiship cruise missile system capable of being fired from B-52H aircraft, ships, and submarines.

Function: Air-to-surface antiship missile.

First Flight: March 1974 (for USN).

Delivered: from 1977 (USN).

IOC: circa 1985 (USAF).

Production: sustainment phase.

Contractor: Boeing (McDonnell Douglas).

Power Plant: Teledyne CAE J402-CA-400 turbojet, 660 lb thrust.

F-15E releasing an ***AGM-130*** (SrA. Jeff Fitch)

Guidance: sea-skimming cruise monitored by radar altimeter, active radar terminal homing.

Warhead: penetration high-explosive blast type, weighing 500 lb.

Dimensions: length 12.6 ft, body diameter 1.1 ft, wingspan 3 ft.

Weight: 1,172 lb.

Performance: speed high subsonic, range more than 57 miles.

COMMENTARY

Harpoon and its launch control equipment provide USAF the capability to interdict ships at ranges well beyond those of other aircraft. Originally acquired to equip two squadrons of now-retired B-52G aircraft for maritime antisurface operations, the Harpoon all-weather antiship missile currently arms conventional-mission B-52Hs.

AGM-84D is a variant of the USN Harpoon that has been adapted for use on B-52 bombers, which can carry eight missiles.

AGM-88 HARM

Brief: An air-to-surface tactical missile designed to seek and destroy enemy radar-equipped air defense systems, using an advanced guidance system that senses and homes in on enemy radar emissions.

Function: Air-to-surface antiradiation missile.

First Flight: April 1979.

Delivered: 1982–98.

IOC: circa 1984.

Production: sustainment phase.

Contractor: Raytheon.

Power Plant: Thiokol smokeless, dual-thrust, solid-propellant rocket motor.

Guidance: passive homing guidance system, using seeker head that homes on enemy radar emissions.

Warhead: high-explosive fragmentation, weighing 145 lb.

Dimensions: length 13.7 ft, body diameter 10 in, wingspan 3.7 ft.

Weight: 795 lb.

Performance: cruising speed supersonic, altitude limits S/L to 40,000 ft, range more than 10 miles.

COMMENTARY

The High-speed Anti-Radiation Missile (HARM) exhibits great velocity along with an ability to cover a wide range of frequency spectrums through the use of programmable digital processors in both the carrier aircraft's avionics equipment and in the missile. The combination gives this second generation anti-radiation missile greatly improved capability over first-generation Shrikes and Standards. The AGM-88 proved highly effective against enemy ground radar during the 1991 Persian Gulf War and continues in use in current operations. HARMs equip F-16 Block 50/52s (F-16CJ) dedicated to the SEAD mission.

AGM-88A. A factory-programmed version used to equip the now-retired F-4G Wild Weasel to increase its lethality in electronic combat.

AGM-88B. Older versions of the AGM-88B are being upgraded with the enhanced capability guidance seeker currently equipping the C version.

AGM-88C. This current production version has a more lethal warhead, containing tungsten alloy cubes, rather than steel, and the enhanced-capability AGM-88C-1 guidance head.

Erasable electronically programmable read-only memory has been retrofitted on ACC, PACAF, and USAFE HARMs, permitting changes to missile memory in the field. Upgrade initiatives are aimed at increasing capability of both B and C versions against target shutdown, blanking, and blinking and at reducing potential damage to friendly radars in the target area; home-on jamming capability will be added to the C. Further planned upgrades include GPS precision navigation capability.

AGM-130

Brief: A powered TV– or IIR–guided air-to-surface missile, carried by the F-15E and designed for high- and low-altitude strikes at standoff ranges against heavily defended targets.

Function: Air-to-surface guided and powered bomb.

First Flight: 1984.

Delivered: November 1992–FY00.

IOC: 1994.

Production: sustainment phase.

Contractor: Boeing.

Guidance: TV or IIR seeker, or DME transponder.

Warhead: Mk 84 bomb (2,000-lb unitary) or BLU-109.

Dimensions: length 12.8 ft, body diameter 1.5 ft, wingspan 4.9 ft.

Weight: launch weight 2,917 lb.

Performance: cruising speed subsonic, ceiling in excess of 30,000 ft, range greater than 34.5 miles, circular error probable (CEP) about 10 ft.

COMMENTARY

AGM-130 is a product improvement to the GBU-15 glide bomb, with a guidance system designed to give pinpoint accuracy from low or medium altitudes. The AGM-130 adds a rocket motor, radar altimeter, and digital control system, providing it with double the standoff range of the GBU-15.

Upgrades include a new solid-state TV seeker, an improved IR seeker, and INS/GPS guidance that permit operation in adverse weather and improve target acquisition.

AGM-130s have been used extensively in recent operations.

AGM-130A, with the Mk 84 warhead.

AGM-130C, with the BLU-109/B penetrating warhead.

AGM-142 Have Nap

Brief: A medium-range standoff attack missile that is carried by USAF B-52Hs to provide this long-range aircraft with a conventional precision strike capability.

Function: Air-to-surface guided missile.

First Flight: 1990.

Delivered: 1992.

IOC: June 1992.

Production: 240.

Contractor: Rafael; Lockheed Martin.

Power Plant: solid-propellant rocket motor.

Guidance: inertial, with data link TV, or IIR homing.

Warhead: high-explosive, 750-lb blast/fragmentation or 800-lb penetrator.

Dimensions: length 15.9 ft, body diameter 1.8 ft, wingspan 5.8 ft.

Weight: 3,000 lb.

Performance: range greater than 57.5 miles.

COMMENTARY

The AGM-142 missile system provides a conventional, precision, standoff hard target penetrator weapon for the B-52H. The system consists of a standoff, air-to-ground precision guided missile, weapon data link pod, and associated support and training equipment. Initial operational test and evaluation launches were completed in May 1990. There are six variants of the AGM-142.

AGM-142A. TV seeker with 750-lb blast/frag warhead.

AGM-142B. IIR seeker with 750-lb blast/frag warhead.

AGM-142B-1. IIR-Z seeker with 750-lb blast/frag warhead.

AGM-142C. TV seeker with 800-lb penetrator warhead.

AGM-142D. IIR seeker with 800-lb penetrator warhead.

AGM-142D-1. IIR-Z improved seeker with 800-lb penetrator warhead.

AGM-154 Joint Standoff Weapon

Brief: First in a joint USAF and Navy family of low-cost, highly lethal glide weapons with a standoff capability, usable against heavily defended targets.

Function: Air-to-surface guided missile.

First Flight: December 1994.

Delivered: 2000–FY13 (planned).

IOC: 2000 (USAF).

Production: 6,114 (planned).

Inventory: 148.

Contractor: Raytheon.

Guidance: INS/GPS.

Dimensions: length 13.3 ft.

Weight: 1,065–1,500 lb.

Performance: range: low-altitude launch 17 miles, high-altitude launch 40+ miles.

COMMENTARY

A medium-range, INS/GPS–guided, standoff air-to-ground weapon designed to attack a variety of soft and armored area targets (fixed, relocatable, and mobile) during day/night/adverse weather conditions. JSOW enhances aircraft survivability, as compared to current interdiction weapon systems, by providing the capability for launch aircraft to stand off outside the range of enemy point defenses. JSOW accuracy and launch-and-leave capability will allow several target kills per aircraft sortie. Integration of JSOW is currently on F-16 Block 50 and B-2 aircraft, with follow-on capability on B-52 and F-15E in FY03, B-1B and F-16 Block 30/40.

AGM-154A. The baseline BLU-97 variant for use against area targets; in full-rate production.

AGM-154B. The BLU-108 variant providing anti-armor capability; began production in FY99. Now canceled.

AGM-154C. The third variant (used by Navy only), JSOW/Unitary integrates an IIR terminal seeker and a 500-lb unitary warhead.

AGM-158A Joint Air-to-Surface Standoff Missile

Brief: An advanced weapon designed to attack heavily defended targets with high precision at great standoff range.

Function: Air-to-surface guided weapon.

First Flight: April 8, 1999.

Delivered: first of 76 LRIP missiles due April 2003; through FY17 (planned).

IOC: FY03 (planned).

Production: 3,700 (USAF planned); 450 (Navy).

Inventory: TBD.

Contractor: Lockheed Martin; Raytheon; Honeywell.

Guidance: INS, GPS, and IIR terminal seeker.

Power Plant: Teledyne Continental Motors.

Dimensions: length 14 ft.

Weight: 2,250 lb.

Performance: 1,000-lb class penetrator and blast-fragmentation warheads; standoff range greater than 230 miles.

COMMENTARY

JASSM is a next generation missile that will enable Air Force and Navy fighters and bombers to destroy the enemy's war-sustaining capabilities from outside the ranges of enemy air defenses. JASSM has INS/GPS guidance with an IIR terminal seeker. It has an LO airframe and a rocket motor for survivability and stand-off beyond area defenses. This autonomous precision strike weapon will attack both fixed and relocatable targets, ranging from nonhardened above ground to moderately hardened buried targets. The system will also offer low operational support costs. Threshold aircraft are B-52H and F-16. Objective aircraft include B-1B, B-2, F-15E, F-117, F/A-18E/F, and P-3C. An extended-range version (JASSM-ER), with a range of more than 575 miles, starts development in FY03 and will begin production in FY07.

GBU-27 (SrA. Jeff Fitch)

GBU-31 *Joint Direct Attack Munition* (SSgt. Shane A. Cuomo)

CBU-87/103 Combined Effects Munition

Brief: The CBU-87 CEM is an area cluster munition effective against light armor, materiel, and personnel and used by USAF and Navy fighters and bombers for interdiction.

Function: Area cluster munition.

Production: sustainment phase.

Contractor: Aerojet General; Honeywell; Alliant Tech.

Guidance: none (CBU-87).

Dimensions: length 7.7 ft; diameter 1.3 ft.

Weight: 949 lb.

Performance: dispenses 202 BLU-97 combined effects bomblets over an area roughly 800 ft by 400 ft.

COMMENTARY

The CBU-87 Combined Effects Munition dispenses 202 BLU-97 shaped charge antipersonnel/antimateriel fragmentary/incendiary bomblets over the target in a rectangular pattern. It is currently delivered by USAF and Navy aircraft as an unguided gravity weapon. Density and size of the area covered depends on release parameters and spin rates.

CBU-103. USAF is retrofitting its inventory of CEMs with the WCMD tail kit. The WCMD will improve the munitions delivery accuracy when released from medium to high altitude. Tail kit purchases are based on available funding.

CBU-89/104 Gator

Brief: The CBU-89 Gator is an anti-armor/antipersonnel mine dispenser used by USAF and Navy fighters and bombers for interdiction.

Function: Scatterable mines.

Production: sustainment phase.

Inventory: classified (CBU-104).

Contractor: Honeywell; Aerojet General; Olan; Alliant Tech.

Guidance: none (CBU-89).

Dimensions: length 7.7 ft; diameter 1.3 ft.

Weight: 705 lb.

Performance: dispenses 72 BLU-91 anti-armor and 22 BLU-92 antipersonnel mines.

COMMENTARY

The CBU-89 Gator dispenser holds 94 mines, of which 72 are antitank and 22 are antipersonnel. The mines are dispersed over the target in a rectangular pattern. The antitank mines, which can be fuzed for up to a 72-hour delay, have a magnetic influence fuze to sense armor.

CBU-104. USAF is retrofitting its inventory of Gators with the WCMD tail kit, which will improve the munitions delivery accuracy when released from medium to high altitude. Tail kit purchases are based on available funding.

CBU-97/105 Sensor Fuzed Weapon

Brief: The CBU-97 SFW is an anti-armor cluster munition used by fighters and bombers for multiple kills per pass against moving and stationary land combat vehicles.

Function: Wide-area cluster munition.

First Flight: circa 1990.

Delivered: 1994–2007 (planned).

IOC: 1997.

Production: 3,937 (planned).

Inventory: classified.

Contractor: Textron Systems.

Guidance: IR sensors in each warhead search for targets, then detonate over them.

Dimensions: length 7.7 ft; diameter 1.3 ft.

Weight: 920 lb.

Performance: delivers 40 lethal projectiles over an area of about 500 ft by 1,200 ft.

COMMENTARY

The **CBU-97** Sensor Fuzed Weapon comprises an SUU-66/B tactical munitions dispenser with an FZU-39 fuze and a payload of 10 BLU-108/B submunitions. Each tactical munitions dispenser contains 10 BLU-108/B submunitions, and each submunition contains four "skeet" projectiles that, upon being thrown out, seek out their target and deliver an explosively formed penetrator. Each SFW can deliver a total of 40 lethal projectiles. The skeet IR sensors can detect a vehicle's IR signature; if no target is detected, the warhead detonates after a preset time. The SFW's primary targets are massed tanks, armored personnel carriers, and propelled targets. It also provides direct attack capability and interdiction against C2 centers.

The SFW is currently delivered as an unguided gravity weapon from the A-10, B-1, B-2, B-52H, F-15E, and F-16. A preplanned product improvement SFW variant is in full-scale production, incorporating improvements such as an active laser sensor, multimission warhead, and increased footprint.

CBU-105. Designation of a CBU-97 equipped with a WCMD tail kit. The CBU-105 can be accurately delivered from high altitude and in adverse weather from the B-1, B-2, B-52H, F-15E, and F-16.

GBU-10 Paveway II

Brief: An unpowered laser guided bomb (LGB) used to destroy high-value enemy targets from short stand-off distances.

Function: Air-to-surface guided munition.

First Flight: early 1970s.

Delivered: from 1976.

IOC: 1976

Production: 10,000; continuing.

Inventory: not available.

Contractor: Lockheed Martin; Raytheon.

Guidance: semiactive laser.

Warhead: GBU-10C/D/E/F: Mk 84 bomb (2,000-lb unitary); GBU-10G/H/J: BLU-109.

Dimensions: length GBU-10C/D/E/F: 14 ,1 ft; GBU-10G/H/J: 14 ft, body diameter GBU-10C/D/E/F: 1.5 ft; GBU-10G/H/J: 1.2 ft, wingspan 5.5 ft.
Weight: 1,985 lb.
Performance: CEP 29.7 ft; range 9.2 miles.
COMMENTARY
Folding-wing Paveway II weapons are improved versions of the earlier fixed-wing Paveway I. The GBU-10 is used primarily for precision bombing against nonhardened targets but is capable of greater penetration than previous version. It can operate in cloud ceilings down to 2,500 ft. GBU-10 platforms include A-10, B-52, F-15E, F-16, and F-117 aircraft.

GBU-12 Paveway II
Brief: An unpowered LGB used to destroy high-value enemy targets from short standoff distances.
Function: Air-to-surface guided munition.
First Flight: early 1970s.
IOC: 1976.
Production: about 30,000; continuing.
Inventory: not available.
Contractor: Lockheed Martin; Raytheon.
Guidance: semiactive laser.
Warhead: Mk 82 (500 lb) blast/fragmentation bomb.
Dimensions: length 10.9 ft, body diameter 10.7 in, wingspan 4.4 ft.
Weight: 603 lb.
Performance: CEP 29.7 ft; range about 6 miles.
COMMENTARY
Folding-wing Paveway II weapons are improved versions of the earlier fixed-wing Paveway I. The LGB is used primarily to strike fixed armor. It can operate in cloud ceilings down to 2,500 ft. GBU-12 platforms include A-10, B-52, F-15E, F-16, and F-117 aircraft.

GBU-15
Brief: An unpowered bomb carried by the F-15E and used to destroy high-value enemy targets from short standoff distances.
Function: Air-to-surface guided munition.
First Flight: 1975.
Delivered: 1983–complete.
IOC: 1983.
Production: more than 2,000.
Inventory: 1,650.
Contractor: Boeing; Raytheon.
Guidance: TV or IIR seeker.
Warhead: Mk 84 bomb (2,000-lb unitary) or BLU-109.
Dimensions: length 12.8 ft, body diameter 1.5 ft, wingspan 4.9 ft.
Weight: 2,500 lb.
Performance: cruising speed subsonic; range about 17 miles; CEP about 10 ft.
COMMENTARY
GBU-15 is an air-launched, cruciform-wing glide bomb fitted with a guidance system designed to give it pinpoint accuracy from low or medium altitudes. It also has a standoff capability. Development began in 1974, based on experience gained in Vietnam with the earlier Pave Strike GBU-8 modular weapon program. The GBU-15 is intended for tactical use to suppress enemy defenses and to destroy heavily defended targets. The target-detecting device is carried on the front of the warhead. The control module, with autopilot and data link module, attaches to the rear.
The weapon has two modes of attack. In direct attack, the weapon is locked on to the target before launch and flies a near line-of-sight profile to impact. In the indirect mode, the seeker can be locked on to the target after launch, or the operator can fly the weapon manually to impact, using guidance updates provided through the data link. A "buddy" system may be operated whereby the weapon is launched from one aircraft and controlled by another. The GBU-15 is deployed with the F-15E.
GBU-15(V)1/B. A TV–guided variant, qualified for operational service in 1983 (production complete).
GBU-15(V)2/B. IIR version entered service in 1987.
GBU-15-I. Combines accuracy of GBU-15 with the penetration capability of the improved 2,000-lb BLU-109/B penetrator bomb.
EGBU-15. GPS–guided variant, allowing pilot to select either TV, IR, or GPS guidance over the target, depending on weather and/or threat conditions. USAF had 100 initially produced for Allied Force, with field-level upgrade of over 1,200 existing GBU-15s.

GBU-16 Paveway II
Brief: An unpowered LGB used to destroy high-value enemy targets from short standoff distances.
Function: Air-to-surface glide munition.
First Flight: early 1970s.
IOC: 1976.
Production: not available.
Inventory: not available.
Contractor: Lockheed Martin; Raytheon.
Guidance: semiactive laser.
Warhead: Mk 83 (1,000 lb) bomb.
Dimensions: length 12.1 ft, body diameter 1.2 ft, wingspan 5.5 ft.
Weight: approx 1,000 lb.
Performance: CEP about 29 ft; range 9.2 miles.
COMMENTARY
Folding-wing Paveway II weapons are improved versions of the earlier fixed-wing Paveway I. The GBU-16 LGB is used primarily to strike fixed armor. Its platforms include A-10, F-15E, and F-16 aircraft.

GBU-24 Paveway III
Brief: A precise air-to-ground low-level LGB (LLLGB) equipped with an advanced guidance kit.
Function: Air-to-surface penetrating glide bomb.
First Flight: GBU-24A/B (USAF) in service May 1985; GBU-24B/B (Navy) June 1992.
Delivered: from 1986.
IOC: 1986.
Production: USAF 14,000; Navy 12,000.
Inventory: classified.
Contractor: Raytheon.
Guidance: semiactive laser.
Dimensions: length 14.2 ft.
Weight: 2,350 lb.
Performance: range more than 11.5 miles.
COMMENTARY
GBU-24A/B. An air-to-ground weapon equipped with the third generation Paveway III guidance kit, integrated with a BLU-109 penetrating warhead. The kit consists of an advanced guidance section and high-lift airframe. It is extremely precise and highly effective against a broad range of high-value hard targets. The system can be employed from low, medium, and high altitudes, providing operational flexibility through the use of an adaptive digital autopilot and large field-of-regard, highly sensitive scanning seeker. The GBU-24A/B was highly successful during Desert Storm.
The GBU-24 adapts to conditions of release, flies an appropriate midcourse, and provides trajectory shaping for enhanced warhead effectiveness. The weapon is deployed on USAF F-15E and F-16 and Navy F-14 and F/A-18.

GBU-27
Brief: A precise air-to-ground penetrating LGB equipped with an advanced guidance kit.
Function: Air-to-surface guided glide bomb.
First Flight: not available.
Delivered: from 1988.
IOC: 1988 (unconfirmed).
Production: approx 3,000.
Inventory: classified.
Contractor: Raytheon.
Guidance: semiactive laser.
Dimensions: span 5.5 ft, length 13.9 ft.
Weight: 2,170 lb.
Performance: range more than 11.5 miles.
COMMENTARY
To meet the unique requirements of the F-117A, the GBU-24A/B was adapted to GBU-27 standard, incorporating specific guidance features to accomplish this mission. The GBU-27 is extremely precise and was used to great effect in Desert Storm.
EGBU-27. Integrates GPS/INS guidance into the existing GBU-27 laser seeker to provide adverse weather capability and improved target location. Entered production in FY98. First operational use was in Gulf War II.

GBU-28
Brief: A large 5,000-lb class air-to-ground penetrating LGB equipped with an advanced laser guidance kit, used for striking and destroying hard underground targets.
Function: Air-to-surface guided glide bomb.
First Flight: February 1991.
Delivered: circa 1991.
IOC: 1991.
Production: approx. 500.
Inventory: classified.
Contractor: Raytheon.
Dimensions: length 19.2 ft, diameter 1.2 ft.
Weight: 4,676 lb.
Performance: range more than 5.75 miles.
COMMENTARY
Under USAF's rapid-response program, the GBU-28 bunker-busting LGB was developed for Desert Storm for use against deeply buried, hardened C2 facilities. Four of the GBU-28 weapons were used during the war: two for testing and two by F-111Fs against a bunker complex Feb. 27, 1991. Guidance is by a modified GBU-27 system.
EGBU-28. Integrates GPS/INS guidance into the existing GBU-28 guidance control unit to provide adverse weather capability and improved target location. Entered production in FY99.

GBU-31/32/38 Joint Direct Attack Munition
Brief: A joint USAF–Navy INS/GPS–guided weapon, carried by fighters and bombers, that provides highly accurate, autonomous, all-weather conventional bombing capability.
Function: Air-to-surface guided bomb.
First Flight: Oct. 22, 1996.
Delivered: 1998–FY08 (planned).
IOC: 1998.
Production: USAF 143,495; USN 72,246 (planned).
Inventory: 3,870.
Contractor: Boeing; Textron; Honeywell.
Dimensions: Mk 84 with JDAM 12.8 ft; BLU-109 with JDAM 12.4 ft; Mk 83 with JDAM 10 ft.
Weight: Mk 84 2,036/2,056 (USAF/USN); BLU-109 2,115/2,135; Mk 83 1,013/1,028.
Performance: range up to 17 miles, CEP with GPS 42.9 ft; CEP with INS only 99 ft.
COMMENTARY
JDAM upgrades the existing inventory of general-purpose bombs by integrating them with a GPS/INS guidance kit to provide accurate all-weather attack from medium/high altitudes. While still aboard the launch aircraft, JDAM is passed target information through the aircraft's avionics system. Once released, the inertial guidance kit takes over and, with periodic GPS updates to the INS, guides the weapon to its target. Threshold aircraft are B-1 and B-52; objective aircraft include AV-8B, B-2, F-14, F-15E, F-16, F-35, F-117A, F/A-18C/D/E/F, and F/A-22.
GBU-31. Variant that adds an INS/GPS guidance kit to the 2,000-lb general-purpose Mk 84 bomb or the 2,000-lb BLU-109 penetrator. First used in combat March 24, 1999.
GBU-32. Variant that adds an INS/GPS guidance kit to the 1,000-lb general-purpose Mk 83 bomb or the 1,000-lb BLU-110 penetrator.
GBU-38. Variant that adds an INS/GPS guidance kit to the 500-lb general-purpose Mk 82 bomb. First production deliveries, slated for the B-2, expected 2004.
Planned upgrades include an antispoofing GPS receiver and low-cost antijam antenna.

Massive Ordnance Air Blast (MOAB) Bomb
Brief: A massive precision guided munition designed to be dropped by B-1, B-2, or B-52 bombers.
Function: Massive bomb.
Guidance: GPS/INS.
Warhead: 18,000 lb, high explosive.
Dimensions: length 30 ft, diameter 3.3 ft.
Weight: 21,500 lb.
COMMENTARY
On March 11, 2003, USAF live-tested the largest PGM developed to date. Unlike the earlier "Daisy Cutter," the MOAB does not require a parachute.

Small Diameter Bomb
Brief: An air-to-surface miniaturized munition with accurate and precision standoff characteristics for both current and future fighter and bomber aircraft.
Function: Miniaturized bomb.
First Flight: TBD.
Delivered: TBD.
IOC: FY06.
Production: 24,000 (planned).
Inventory: TBD.
Contractor: TBD.
Guidance: GPS/INS.
Dimensions: TBD.
Weight: 250-lb class.
Performance: Near precision capability against fixed and relocatable targets in all weather.
COMMENTARY
The Small Diameter Bomb (SDB) is a 250-lb class weapon that increases loadout (number of weapons an aircraft can carry), thus maximizing the number of kills per sortie. It will use a common MIL-STD 1760 carriage system carrying four weapons. The SDB will provide fighter and bomber aircraft with an air-to-surface standoff capability from outside of point defenses against fixed targets. The SDB will use GPS/INS for guidance. Threshold aircraft for SDB is the F-15E. Objective aircraft include the A-10, B-1, B-2, F-16, F-35, F-117, F/A-22, and UCAV. The SDB weapons system will be interoperable with the information exchange requirements of the air operations theater C2 and intelligence, surveillance, and reconnaissance (ISR) architecture.
Two-year competitive design and development contracts were awarded to Boeing and Lockheed Martin. USAF plans to select the winner in September 2003.

Wind-Corrected Munitions Dispenser
Brief: A tail kit to be fitted to CBU 87/89/97 dispenser weapons. When dropped from high altitude, its inertial guidance system corrects for launch transients and wind effects to enhance accuracy.
Function: Guidance tail kit.
First Flight: February 1996.
Delivered: From 2000.
IOC: FY00.
Production: 31,165 (planned).
Inventory: 8,236 (tail kits delivered as of Sept. 30, 2002).
Contractor: Lockheed Martin.
Dimensions: length 1.4 ft, diameter 1.3 ft.

Weight: 100 lb.
Performance: range about eight miles.
COMMENTARY
USAF is to modify standard tactical munition dispensers with guidance kits to compensate for wind drift on downward flight from high altitudes. WCMD kits each have an INS guidance unit, movable tail fins that pop out in flight, and a signal processor. A WCMD tail kit is fitted on inventory cluster weapons: CEM (CBU-103), Gator (CBU-104), and SFW (CBU-105). Successful flight testing began in February 1996; WCMDs are now operational on F-16 and B-52 aircraft. Objective aircraft are B-1 (2003), F-15E, F-117, and F/A-22.

Satellite Systems

Defense Meteorological Satellite Program
Brief: Satellites that collect air, land, sea, and space environmental data to support worldwide strategic and tactical military operations.
Function: Environmental monitoring satellite.
Operator: National Polar-orbiting Operational Environmental Satellite System (NPOESS) program office.
First Launch: circa 1960s (classified until 1973).
IOC: classified but in use during Vietnam War.
Constellation/on-orbit: two.
Design Life: 48 months (Block 5D-2); 54 months (Block 5D-3).
Launch Vehicle: Titan II.
Unit Location: Suitland, Md.
Orbit Altitude: approx 500 miles.
Contractor: Lockheed Martin; Aerojet General; Northrop Grumman.
Power Plant: solar arrays generating 500–600 watts.
Dimensions: length 20.2 ft (with array deployed), width 4 ft.
Weight: 1,750 lb.
Performance: DMSP satellites orbit Earth at about 500 miles altitude and scan an area 1,800 miles wide. Each system covers the Earth in about 12 hr.
COMMENTARY
For the last 40 years, the DMSP constellation has provided high-quality, timely weather information to strategic and tactical warfighters worldwide. In addition, DMSP satellites provide critical land, sea, and space environment data required by US forces across the globe. The DMSP constellation will be replaced by the tri-agency NPOESS late in this decade.
Block 5D-2. Two operational DMSP Block 5D-2 satellites survey the entire Earth four times a day. The last of the Block 5D-2 satellites was launched in December 1999. The Block 5D-2 spacecraft "sees" visible and IR cloud-cover imagery to analyze cloud patterns with the operational linescan system. Secondary instruments include microwave imagers and sounders and a suite of space environment sensors.
Block 5D-3. DMSP F-16, the first Block 5D-3 satellite, is now scheduled for launch in May 2003. (DMSP F-15, with a 5D-3 satellite bus but 5D-2 sensors, was launched Dec. 12, 1999, and is credited as the first 5D-3 launch.) Block 5D-3 satellites have an improved spacecraft bus and sensors that provide for longer and more capable missions. Successful flyout of the DMSP Block 5D-3 satellites will help ensure a seamless transition to the NPOESS program for DOD.

Defense Satellite Communications System
Brief: A spacecraft traveling in geosynchronous orbit used to transmit SHF high-priority C2 communication.
Function: Communications satellite.
Operator: AFSPC.
First Launch: 1971 (DSCS II); 1982 (DSCS III); 2000 (DSCS III/SLEP).
IOC: Dec. 13, 1978 (DSCS II).
Constellation: five (III).
Design Life: 10 yr (III).
Launch Vehicle: Atlas II.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: 22,000+ miles in geosynchronous orbit.
Contractor: Lockheed Martin.
Power Plant: solar arrays generating 1,269 watts, decreasing to 980 watts after 10 yr; 1,500 watts (SLEP).
Dimensions: rectangular body 6 ft x 6 ft x 7 ft; 38-ft span with solar arrays deployed.
Weight: 2,580 lb; 2,716 lb (SLEP).
COMMENTARY
DSCS III. The Defense Satellite Communications System provides worldwide, high-bandwidth satellite communications supporting strategic and tactical C3I requirements. Users include national/defense leaders, Defense Information System Network (DISN), Diplomatic Telecommunications Service (DTS), White House Communications Agency, and ground mobile forces of all services. The constellation consists of five primary and five residual geosynchronous DSCS III satellites and supports communications services at SHF (X-band). DSCS satellites provide full Earth, narrow regional, and shaped coverage, are nuclear hardened, have an antijam capability, and host the AFSATCOM package (single channel transponder) for dissemination of protected emergency action messages. The modernization of satellite communications will continue with the deployment of the Wideband Gap-filler Satellites (WGS) and the Advanced Wideband System (AWS).
DSCS III/SLEP. The last four DSCS satellites underwent a SLEP. These provide approximately twice the bandwidth of the original DSCS III satellites. The first SLEP satellite was launched in FY00.

Defense Support Program
Brief: An early warning spacecraft that travels in geosynchronous orbit and provides alert of possible ballistic missile attack on US forces or homeland.
Function: Strategic and tactical launch detection system.
Operator: STRATCOM.
First Launch: November 1970.
IOC: circa 1972.
Constellation: classified.
Design Life: three yr.
Launch Vehicle: Titan IV IUS.
Unit Location: Peterson AFB, Colo.
Orbit Altitude: 22,000+ miles in geosynchronous orbit.
Contractor: TRW; Aerojet.
Power Plant: solar arrays generating 1,485 watts.
Dimensions: diameter 22 ft, height 32.8 ft, with solar paddles deployed.
Weight: 5,000 lb (approx).
Performance: orbits at approx 22,000 miles altitude in geosynchronous orbit; uses IR sensors to sense heat from missile and booster plumes against Earth's background.
COMMENTARY
The incredibly flexible Defense Support Program **(DSP)** satellite system was used extensively in Desert Storm to detect theater missile launches against coalition forces. Though not designed to spot and track smaller missiles, the system was highly successful in detecting launches enabling timely warnings of Iraqi Scud attacks. Using existing sensors and data collection sources, global data related to TMD is transmitted to the Attack and Launch Early Reporting to Theater (ALERT) and Shield systems centrally located at the National Test Facility (NTF). ALERT is a high-confidence operational system that provides assured theater missile warning to warfighters worldwide. Shield is a research and development effort that evaluates and demonstrates the potential benefits of using multiple data sources and novel techniques in support of TMD.
DSP satellites are a key part of the North American and theater early warning systems, capable of detecting missile launches and nuclear detonations. Warning data are fed to NORAD and US Strategic Command early warning centers at Cheyenne Mountain AFS, Colo. Since the first launch, DSP satellites have provided an uninterrupted early warning capability to the US, with 21 launched by 2002. America's early warning capability will be modernized with the introduction of the new Space Based Infrared System to be phased in beginning in FY07.

Global Positioning System
Brief: A constellation of orbiting space vehicles that provides highly precise and reliable navigation data, 24 hours a day, to military and civilian users around the world. Signals permit calculation of location within less than 100 ft.
Function: Worldwide navigation satellite.
Operator: AFSPC.
First Launch: Feb. 22, 1978.
IOC: Dec. 9, 1993.
Constellation: 28.
Design Life: six yr (II/IIA); 7.5 yr (IIR).
Launch Vehicle: Delta II.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: 12,636 miles (IIA); 12,532 miles (IIR).
Contractor: Boeing; Lockheed Martin.
Power Plant: solar arrays generating 700 watts (II/IIA); 1,136 watts (IIR).
Dimensions: II/IIA: body 8 ft x 8 ft x 12 ft, incl solar arrays 11 ft x 19 ft; IIR: body 8 ft x 6 ft x 10 ft, span incl solar arrays 37 ft.
Weight: 2,174 lb (IIA); 2,370 lb (IIR) on orbit.
Performance: GPS satellites orbit the Earth every 12 hr, emitting continuous navigation signals. The signals are so accurate that time can be figured to within one-millionth of a second, velocity within a fraction of a mile per hour, and location to within a few feet. Receivers are used in aircraft, ships, and land vehicles and can also be handheld.
COMMENTARY
Worldwide military operations, such as precision bombing, CSAR, mapping, and rendezvous are successful in part due to the 24-hour, worldwide navigation service provided by the Global Positioning System **(GPS)** navigation satellite constellation. Accurate three-dimensional (latitude, longitude, and altitude) position, velocity, and precise time are provided continuously in real time to support an unlimited number of users around the globe, both civilian and military. Concern over potential enemy denial of GPS is being addressed under GPS modernization efforts. Future GPS satellites will have two jam-resistant channels for military-only use plus a third civilian channel. Block IIF satellites are expected to enter service in early 2005.

Milstar Satellite Communications System
Brief: A satellite communications system that provides secure, jam-resistant worldwide C2 communications for tactical and strategic forces in all levels of conflict, linking command authorities to ground forces, ships, submarines, and aircraft.
Function: Communications satellite.
Operator: AFSPC.
First Launch: Feb. 7, 1994.
IOC: July 1997 (Milstar I).
Constellation: four (three spares).
Design Life: 10 yr.
Launch Vehicle: Titan IV/Centaur.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: 22,300 miles.
Contractor: Lockheed Martin; Boeing; TRW.
Power Plant: solar arrays generating almost 5,000 watts.
Dimensions: length 51 ft, width 116 ft (with full solar array extension).
Weight: 10,000 lb.
Performance: The constellation consists of three satellites in low-inclined geosynchronous orbit, providing worldwide coverage between 65° north and 65° south latitude.
COMMENTARY
The backbone of strategic–tactical communications, Milstar is a joint service communications system that provides secure, jam-resistant EHF communications. Worldwide operations are made possible by this 24-hour, all-weather capability, ready to support any deployment at a moment's notice. The Milstar inventory was to be fully deployed by the beginning of 2003, and modernization of satellite communications will continue with the Advanced EHF (AEHF) constellation deployments. The first AEHF launch is scheduled for 2007.

Polar MILSATCOM
Brief: Satellite that provides secure, survivable communications, supporting peacetime, contingency, and wartime operations in the North Pole region, above 65° north latitude.
Function: Communications satellite.
Operator: USN.
First Launch: late 1997.
IOC: 1997.
Constellation: three.
Design Life: host satellite dependent.
Launch Vehicle: not available.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: 25,300 miles.
Contractor: classified.
Power Plant: 410 watts consumed by payload (power from host solar array).
Dimensions: numerous items integrated throughout host.
Weight: 470 lb (payload).
COMMENTARY
Augmenting the Milstar constellation, the Polar MILSATCOM payload is a cost-effective means of providing secure communications for the northern polar region. Like Milstar, the system enables worldwide operations by linking strategic and tactical forces with secure, jam-resistant EHF communication links.

Space Based Infrared System High
Brief: Advanced surveillance system for missile warning, missile defense, battlespace characterization, and technical intelligence. System includes satellites in geosynchronous Earth orbit (GEO) and highly elliptical orbit.
Function: IR space surveillance.
Operator: AFSPC.
First Launch: (planned) High GEO: FY07.
IOC: TBD.
Constellation: High: four GEO sats, two highly elliptical orbit sensors.
Design Life: not available.
Launch Vehicle: Evolved Expendable Launch Vehicle (EELV) Heavy.
Unit Location: Buckley AFB, Colo.
Orbit Altitude: High at approx 22,300 miles.
Contractor: Lockheed Martin.

Power Plant: not available.
Dimensions: not available.
Weight: not available.
COMMENTARY
The follow-on to the DSP is the Space Based Infrared System **(SBIRS) High.** SBIRS High is an integrated "system of systems" including satellites in GEO, sensors hosted on satellites in highly elliptical orbits, and ground assets.
SBIRS is being fielded incrementally. Increment 1 consolidated all DSP ground processing in one CONUS master control station at Buckley AFB, Colo. IOC was declared Dec. 18, 2001. Increment 2 will field the space and ground assets. SBIRS High is in the EMD phase led by a Lockheed Martin team. The system will integrate the Space Tracking and Surveillance (STSS) capabilities as they become available.

Space Tracking and Surveillance System
Brief: Advanced surveillance system with IR and visible sensors for detecting and tracking ballistic missiles. STSS (formerly SBIRS Low) will have satellites in low Earth orbit (LEO) that work in concert with SBIRS High and other missile defense systems.
Function: Space surveillance.
Operator: AFSPC.
First Launch: TBD.
IOC: TBD.
Constellation: TBD (from nine up to 30 under consideration).
Design Life: not available.
Launch Vehicle: TBD.
Unit Location: TBD.
Orbit Altitude: 60–300 miles.
Contractor: Northrop Grumman (completion and launch of two R&D satellites).
Power Plant: not available.
Dimensions: not available.
Weight: not available.
COMMENTARY
The Missile Defense Agency manages the Space Tracking and Surveillance System **(STSS),** which, in December 2002, replaced the program known as SBIRS Low. In April 2002, MDA ended the SBIRS Low program definition and risk reduction competition and named TRW (purchased by Northrop Grumman) as prime contractor for a redefined space-based sensor R&D element of MDA's integrated Ballistic Missile Defense System (BMDS). The initial STSS contract calls for completion and launch of two LEO satellites in FY06–07 under Block 2006. New technologies will be inserted into subsequent R&D satellites under Block 2008 and beyond, leading to an operational system.

Wideband Gap-filler Satellite (WGS)
Brief: WGS will provide the wideband communications needed for information superiority to deployed tactical forces to include air and space expeditionary forces, Army Digital Corps, and Navy battle groups.
Function: Worldwide satellite communications.
Operator: AFSPC.
First Launch: January 2004 (planned).
IOC: October 2004 (planned).
Constellation: three satellites.
Design Life: 14 years.
Launch Vehicle: EELV.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: GEO.
Contractor: Boeing.
Dimensions: TBD.
Weight: 13,000 lb.
Performance: approx 12 times the capability of a DSCS satellite.
COMMENTARY
The WGS program is designed to fill the gap between current DSCS and Global Broadcast System (GBS) and an advanced wideband system. It will provide two-way services for national leaders, DTS, DISN, and all service ground mobile users. In addition it will provide direct broadcast of digital multimedia, high-bandwidth imagery, and video information directly from global and theater sites to deployed warfighters. The satellites will have X-band (DSCS III–like), Ka-band broadcast (GBS Phase 2–like), and two-way Ka-band services.

Aerial Targets

MQM-107 Streaker
Brief: A jet-powered, variable speed, recoverable target drone.
Function: Aerial target.
Operator: ACC.
First Flight: not available.
Delivered: from 1984 (B).
IOC: 1987.
Production: 70 (B); 221 (D); 78 (E).
Unit Location: Tyndall AFB, Fla.
Contractor: Raytheon (D model); Marconi (formerly Tracor) (E model).
Power Plant: initially on D model, one Teledyne CAE 373-8 engine, 950 lb thrust; MQM-107Ds delivered since 1989 have 950 lb thrust TRI 60-5 turbojets. Microturbo TRI 60-5 engine, 1,061 lb thrust or TCAE 373-8B (E model).
Guidance and Control: analog or digital, for both ground control and preprogrammed flight (D model); High–G autopilot provisions; digital autopilot and remote control by the Gulf Range Drone Control Upgrade System (GRDCUS), a multifunction C2 multilateration system (E model).
Dimensions: length 18.1 ft, body diameter 1.3 ft, span 9.8 ft.
Weight: max launch weight (excl booster) 1,460 lb.
Performance: operating speed 207–630 mph, operating height 50–40,000 ft, endurance 2 hr 15 min.
COMMENTARY
MQM-107D. A third generation version of the MQM-107 Streaker, it is a recoverable, variable-speed target drone used for research, development, test, and evaluation and the Weapon System Evaluation Program.
MQM-107E. Improved performance follow-on to the MQM-107D. In operational service, it replaces the MQM-107D and expands the flight envelope.

BQM-34 Firebee
Brief: A jet-powered, variable speed, recoverable target drone.
Function: Aerial target.
Operator: ACC.
First Flight: 1951; 1958 (BQM-34A).
Delivered: from 1951.
IOC: circa 1951.
Production: 1,800+.
Inventory: 33.
Unit Location: Tyndall AFB, Fla.
Contractor: Teledyne Ryan.
Power Plant: one General Electric J85-GE-100 turbojet, 2,850 lb thrust.
Guidance and Control: remote-control methods incl choice of radar, radio, active seeker, and automatic navigator developed by Teledyne Ryan; the current model of the BQM-34A is configured to accommodate the GRDCUS, which allows multiple targets to be flown simultaneously.
Dimensions: length 22.9 ft, body diameter 3.1 ft, span 12.9 ft.
Weight: launch weight 2,500 lb.
Performance: max level speed at 6,500 ft 690 mph, operating height range 10 ft to more than 60,000 ft, max range 796 miles, endurance (typical configuration) 30 min.
COMMENTARY
Current BQM-34As, with an upgraded General Electric J85-100 engine that provides a thrust-to-weight ratio of 1:1, offers higher climb rates and six–G maneuvering capability. A new microprocessor flight-control system provides a prelaunch and in-flight self-test capability. BQM-34s are used for research, development, test, and evaluation and the Weapon System Evaluation Program.

QF-4
Brief: A converted, remotely piloted F-4 Phantom fighter used for full-scale training or testing.
Function: Aerial target.
Operator: ACC.
First Flight: August 1993.
Inventory: 54.
IOC: not available.
Unit Location: Tyndall AFB, Fla. (detachment at Holloman AFB, N.M.)
Contractor: Marconi (formerly Tracor).
Power Plant: two General Electric J79-GE-17 turbojets, each with approx 17,000 lb thrust with afterburning.
Guidance and Control: remote-control methods incl the GRDCUS (Tyndall) and the Drone Formation and Control System (Holloman); will also accommodate the triservice Target Control System currently under development.
Dimensions: length 16 ft, height 6 ft, wingspan 38.4 ft.
Weight: mission operational weight 49,500 lb.
Performance: max speed Mach 2+, ceiling 55,000 ft, range (approx) 500 miles.
COMMENTARY
The QF-4 replaced the QF-106 Full-Scale Aerial Target (FSAT) in 1998 when the F-106 inventory was depleted. The QF-4 provides for a larger operational performance envelope (maneuvering) and greater payload capability compared with its predecessors.
More than 125 F-4 surplus aircraft have been converted to QF-4 FSATS since 1995. QF-4s are used for research, development, test and evaluation and the Weapon System Evaluation Program. ■

QF-4E (USAF photo)

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AFA/AEF National Report

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By Frances McKenney, Assistant Managing Editor

Gala for AFA

The 19th annual Air Force Association Gala in Orlando, Fla., honored the men and women who have developed American aerospace technology since the Wright brothers' first flight at Kitty Hawk nearly a century ago.

The black-tie event, held each February, is the culmination of several activities hosted by the **Central Florida Chapter** in conjunction with the AFA Air Warfare Symposium. The symposium and gala, said Chapter President John Timothy Brock, "continue to shine as two of the premier AFA events of the year."

During the evening gala, the chapter named five organizations as Ira Eaker Fellows of the Aerospace Education Foundation: NASA's Dryden Flight Research Center, represented by Richard Christiansen, associate director for planning; GE Aircraft Engines, represented by Tom Cooper, corporate vice president for Washington operations; Honeywell, represented by Scott Starret, VP and general manager for Defense and Space; Lockheed Martin's Skunk Works, represented by Frank Cappuccio, VP and general manager for advanced development programs; and Pratt & Whitney, represented by Walter Bylciw, executive VP for military engine programs.

Brock cited the drive and leadership of such organizations as epitomizing the spirit of American aviation.

In other highlights of the evening, AEF Board Chairman Richard B. Goetze Jr. and AEF President L. Boyd Anderson received a check for $45,000 from the chapter. Brock and Tommy G. Harrison, gala chairman, presented the donation, which brings the chapter's total contribution to AEF to more than $460,000.

The chapter also donated $10,000 to the Air Force Memorial Foundation, accepted by its president, Edward F. Grillo Jr.

Among the honored guests at the gala were Air Force Chief of Staff Gen. John P. Jumper, CMSAF Gerald R. Murray, and the dean of the Washington, D.C., air attache corps, Air Commodore Richard J. Newlands from New Zealand.

Photo by Dan Higgins

USAF Chief of Staff Gen. John Jumper (right) chats with AFA National President Stephen "Pat" Condon (left) and AEF Board Chairman Richard Goetze Jr. at the Air Warfare Symposium in Orlando, Fla. At the gala following the symposium, AEF received a $45,000 donation from the Central Florida Chapter.

On This Day

To help highlight the 100th anniversary of the Wright brothers' flight, Edith A. Magerkurth, vice president of the **Maj. Gen. Charles I. Bennett Jr. (Calif.) Chapter,** has produced a book listing aviation events by day. It is entitled *This Day in Aviation and Aerospace History: Celebrating 100 Years of Flight.*

Magerkurth, who is also state committee chairman for aerospace education and the 1997 recipient of AEF's George D. Hardy Memorial Award, began the project as a docent at the Castle Air Museum in Atwater, Calif. To prepare for her shift, she would bone up on that day's events in aviation history, then catch the attention of visitors by telling them about anniversaries for the day.

She then began keeping track of this information on her computer and in 2001 started working in earnest to shape it into a book. Magerkurth researched, edited, and typed the 186-page spiral-bound softback, which includes Web–site addresses. Several chapter members eventually lent a hand on the project. Treasurer Rick Chisholm, who is a historian, helped with fact-checking and editing. President Nelson E. Howlett helped on research. Stanley P. Thurston served as the resource on aircraft terminology. Edwin W. Lewis Jr., state secretary from the **Antelope Valley (Calif.) Chapter,** was among those who sent entries to include in the book.

Magerkurth paid for the printing, an initial run of 1,000 copies. She has distributed the book to the state's Civil Air Patrol squadrons, school libraries in Merced County, the Castle Air Museum, and the local Challenger Learning Center. She said that Samuel M. Gardner, Kansas state president, chipped in for copies to be distributec in his state, and the California state AFA wants copies for each state chapter.

Magerkurth has noticed that when people receive a copy of her book, they first check for what happened on the day they were born. The second thing they want to know is what

happened on the day they got their pilot's license.

Warbirds in Florida

The **Gold Coast (Fla.) Chapter** and the city of Pompano Beach, Fla., co-sponsored their most successful air fair yet at Pompano Beach Air Park in January: About 8,000 visitors attended the two-day gathering, according to Robert Clark, chapter communications VP.

The fifth annual air fair honored veterans from all wars and featured aircraft familiar to them. Among the nearly 20 warbirds on static display were a Fokker DR1, an AT-6 Texan trainer brought in by Air Education and Training Command, and an F-86 Sabre. A helicopter and biplane provided rides for the visitors.

The Military Collectors Association's display featured restored jeeps, a half-ton utility vehicle, and a World War II–era armored personnel carrier. Re-enactors in vintage military uniforms added to the realism, as did a collection of guns from all wars.

Retired Maj. Gen. Frederick C. Blesse—a Korean War ace, Vietnam War veteran, and member of the **Cape Canaveral Chapter**—spent several hours at the air fair, meeting visitors and signing copies of his 1987 book *Check Six*. Scott Carpenter, one of the original seven Mercury astronauts, also signed books—copies of his just-published *For Spacious Skies*. The chapter provided these books for purchase at an AFA tent and gave copies to AFJROTC cadets at the fair.

Other special guests included former Women's Airforce Service Pilots—WASPs—who chatted with the crowd. Leo R. Gray, a chapter member, manned a booth for the Tuskegee Airmen.

Chapter President Robert C. Tash and Irving Duboff headed the team of more than two dozen chapter members and other volunteers who organized and carried out the air fair.

Photos by Paul Kennedy

Air Force *Magazine's 23rd annual reception for foreign air attaches was held at Arlington, Va., in March. AFA Board Chairman John Politi greets Air Commodore Richard Newlands, dean of the Washington, D.C., air attache corps (top). Newlands is from New Zealand. Below, USAF Maj. Gen. Trudy Clark, deputy chief information officer, and Col. Franz Nolte, air attache from Germany, were among the guests from more than 40 countries at the reception.*

Korean War Vets Honored

In March, the **Alamo (Tex.) Chapter** participated in a regional joint service ceremony honoring Korean War veterans in the San Antonio area.

Some 1,000 people attended the event, including about 20 from the chapter, reported Karen S. Rankin, its past president. The ceremony was held near the city's historic Riverwalk. It featured the laying of a memorial wreath and the presentation of the Republic of Korea–Korean War Service Medal to several veterans representing all branches of service and POWs and MIAs.

A second part of the ceremony was the presentation, to about 500 guests, of bronze Freedom Medallions minted by the government of South Korea. The Military Order of the Purple Heart has sponsored these medallion presentations to Korean War veterans and the next of kin of those killed or missing in action.

Korean War vets had an opportunity to apply for the ROK–KoreanWar Service Medal at the ceremony: Air Force Personnel Center representatives from Randolph AFB, Tex., were on hand to process applications for the medal from those who brought discharge form DD-214 or its National Guard equivalent to the ceremony.

The event was one of many such ceremonies sponsored over the past three years by DOD s 50th Anniversary of the Korean War Commemoration Committee. The Alamo Chap-

ter is an official committee partner. It helped organize the ceremony, publicizing it among veterans organizations, volunteering a spokesman, even rounding up chairs for the event. Rankin served as a behind-the-scenes announcer. The chapter also arranged for a representative from the county veterans office to be present to answer questions.

Essays on Aviation

About 1,400 schoolchildren entered an essay contest co-sponsored by the **Chicagoland–O'Hare (Ill.) Chapter.**

The contest was held as a Black History Month activity and called for essays on African–American pioneers in aviation. It was open to schoolchildren in grades five through 12. They competed in four categories, with two grade levels in each.

Chapter President Joseph H. Pate said that the final round of judging and the award ceremony took place in a facility at O'Hare Airport. The city's Department of Aviation served as host, and Jim Tilmon, a former Army and airline pilot and now a weather anchor at a Chicago TV station, was guest speaker. At this event, three finalists from each category read their essays to a panel of judges, Pate among them.

Other sponsors of the contest included the local chapter of the Tuskegee Airmen, FAA, Chicago public schools, and several airlines that provided the first place prizes in each category: two round-trip tickets to a destination served by the carrier. The Chicagoland Chapter provided a $100 savings bond for each category's third-place winner.

Pate, who helped present awards to the students, said he was especially impressed by the essays of the fifth- and sixth-graders. "They're very enthusiastic at that age," he noted.

Hearts for Vets

The **Wright Memorial (Ohio) Chapter** joined the Dayton Veterans Affairs Medical Center's Voluntary Services in sponsoring a Valentine's Day party at the VA facility.

The chapter brought in the New Horizons Band from the University of Dayton to get the party going with marches and patriotic music. The two-year-old ensemble is made up of students 55 years or older and, according to the school, is one of only three such university-sponsored bands in the US. After the music program, center staff and chapter members served refreshments—paid for by the chapter—to the more than 50 veterans at the party. The staff also served refreshments to other patients who weren't able to attend the festivities.

George Simons, chapter VP for veterans affairs, organized the party. It was held in conjunction with the VA's annual National Salute to Hospitalized Veterans program, which honors hospitalized veterans during the week of Valentine's Day, increases awareness of VA medical centers, and encourages citizens to visit and volunteer at the facilities. Other chapter members who helped celebrate Valentine's Day at the center were Ronald E. Thompson, chapter president; Charles B. Spencer, treasurer; 2nd Lt. Christy Stravolo, communications VP; Walter D. Shellhorn, facilities VP; and Betty Moredock, assistant VP, membership.

Golf on the Dunes

No one made a hole in one at the **Frank Luke (Ariz.) Chapter's** fourth annual golf tournament in March, but even with that $10,000 prize going unclaimed, the event had many winners.

The chapter raised more than $600 to benefit the local Glendale Boys and Girls Club and more than $600 by selling mulligans (do-overs for bad shots). Proceeds from the mulligans help the chapter support programs for Luke Air Force Base airmen, AFJROTC units, and classrooms that particpate in the *USA Today*–AEF Visions of Exploration program.

Among the tournament's 143 players were 40 military members from the base, including the second place team headed by chapter member MSgt. Donald R. McKim. Daniel P. Bounds from the **Phoenix Sky Harbor (Ariz.) Chapter** led the first place team. No player left empty-handed. Each received a gift bag of golf items donated by Community Partner John H. Nix, and the numerous door prizes included bicycles, a resort stay, and restaurant certificates.

The tournament was played on the base's Falcon Dunes Golf Course, described by one Web site as "the flagship of Air Force golf courses."

More AFA/AEF News

■ Edward C. Aldridge Jr., undersecretary of defense for acquisition, technology, and logistics, received the Distinguished American Award from the **Nation's Capital (D.C.) Chapter.** Edward M. Bullard, chapter president, made the presentation at a black-tie event in January. The award recognized Aldridge's leadership in national affairs and contributions as a former Secretary of the Air Force (1986 to 1988). ■

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AF08

Unit Reunions

reunions@afa.org

4th AAA (SCARWAF) and **7th Air Division, 3910th BG,** RAFs Wyton, Mildenhall, Lakenheath, Upper Heyford, and Fairford, UK, and all satellite stations (1950–53). June 6–10 in Las Vegas. **Contact:** Bill Parkhurst, PO Box 2881, Tulsa, OK 74101 (918-446-6400).

5th Combat Communications Gp. May 23–25 in Warner Robins, GA. **Contact:** Richard Gillis (478-922-1377) (rtgillis@cox.net) (http://members.cox.net/5thccg2003reunion/5ccg.htm).

8th Air Force Historical Society, Pennsylvania Chapter. June 22–24 in State College, PA. **Contact:** Fielder Newton, 3301 Shellers Bend #914, State College, PA 16801-3068 (814-235-0889).

9th Air Vehicle Repair Sq, Kadena AB, Japan (1951–53). Sept. 18–21 at the Holiday Inn in Waterloo, NY. **Contact:** Richard Frarey (585-526-5143) (mjfromflint@webtv.net).

27th Air Transport Gp, including the 310th, 311th, 312th, and 325th Ferrying Sqs; 86th, 87th, 320th, and 321st Transport Sqs; and 519th and 520th Service Sqs. Sept. 11–13 in Spokane, WA. **Contact:** Fred Garcia, 6533 W. Altadena Ave., Glendale, AZ 85304 (623-878-7007).

27th FW, Kearney AFB, NE, and Bergstrom AFB, TX (Korean War). Sept. 18–31 at the Hilton North Hotel in Austin, TX. **Contact:** Jim Peek, 106 Kerry Ct., Lakeway, TX 78734-4543 (512-261-6219) (jcpeek@juno.com).

37th FS/FIS/FTS. Sept. 13–15 in Dayton, OH. **Contact:** L.E. Knapp, 9819 Gemini Dr., San Antonio, TX 78217 (210-655-0908) (lesknapp@juno.com).

46th FIS, Dover AFB, DE (1952–58). Sept. 11–14 at the Sheraton Dover Hotel in Dover, DE. **Contacts:** George Peckham, 8415 S. Pebble Creek Way, #101, Highlands Ranch, CO 80126 (303-721-0094) (geop10@juno.com) or Bob Eckley (850-668-9339 or 440-331-5141).

49th FIS. June 3–5 at The Beeches in Rome, NY. **Contact:** Tony Asterita, 1108 Villamay Blvd., Alexandria, VA 22307 (703-765-1085) (the49threunion@aol.com).

57th BW Assn of WWII, including all B-25 units in the Mediterranean Theater. Aug. 14–19 at the Adam's Mark Hotel Airport in Indianapolis. **Contact:** Bob Evans, 1950 Cunningham Rd., Indianapolis, IN 46224-5341 (317-247-7507).

305th BG Memorial Assn. Sept. 16–21 at the Gault House Hotel in Louisville, KY. **Contact:** John Butler, 858 Donna Dr., Orange, CT 06477 (203-795-3020).

319th FIS Assn. Sept. 18–21 at the Stone Mountain Inn in Atlanta. **Contact:** David Headen, PO Box 615, Mortons Gap, KY 42440-0615 (270-258-5633) (dwheaden@charter.net).

339th FS Assn. Oct. 2–5 in Coeur d'Alene, ID. **Contact:** A.R. Place, 10 Norge Rd., Delmar, NY 12054-3302 (518-439-9211).

450th BG. Oct. 9–12 at the Oklahoma City Marriott Hotel in Oklahoma City. **Contact:** Al Goodman, 2 Portside Ct., Grayslake, IL 60030 (847-543-8381) (gobaral@aol.com).

475th FG. Aug. 28–31 in Spokane, WA. **Contact:** Dale Thisted (509-458-3214) (twoflyers@attbi.com).

484th BG (WWII). Sept. 25–28 in Odessa, TX. **Contact:** Dick Olson (303-460-8316) (dolson@geographix.com).

3650th Basic Military Tng Wg, Sampson AFB, NY (1950–56), including all veterans, permanent party, basic trainees, special school trainees, and Womens Air Force. Sept. 4–7 at Sampson State Park in Romulus, NY. **Contact:** Ken Irish, 116 Lance Ln., Madison Heights, VA 24572-5351 (phone: 434-528-5313 or fax: 434-528-1978) (kencirish@aol.com).

Air Force Photomapping Assn. Oct. 1–5 in Nashville, TN. **Contacts:** Dwayne and Betty Flatt, PO Box 3536, Jackson, TN 38303-3536 (731-427-7783) (2flatts@bellsouth.net).

China–Burma–India Veterans Assn. Aug. 26–Sept. 2 at the Sheraton Park Ridge Hotel and Convention Center in King of Prussia, PA. **Contact:** Edgar Wolf Jr., 33 Clifford Ct., Mount Laurel, NJ 08054-6955 (856-235-5935) (bigbadwolf@bbwolf.com).

FB-111A, Omaha, NE. July 18–20 at the Holiday Inn Convention Center in Omaha, NE. **Contact:** Gerry Patterson, 503 W. Bailey Rd., Naperville, IL 60565 (630-961-9918) (gpatter455@aol.com).

Flight Checkers. Sept. 25–28 in Kansas City, MO. **Contact:** Marlin Legault, 16000 NW 135th St., Platte City, MO 64079 (816-858-2335) (magicmarlin@webtv.net).

Flying/Aviation Cadets, including NavCads and MarCads. Oct. 11–12 at the Aviation Cadet Museum in Eureka Springs, AR. **Contact:** Errol Severe, 542 CR 2073, Eureka Springs, AR 72632 (479-253-5008) (av1cadet@arkansas.net) (http://aviationcadet.com).

Kaiserslautern American High School Alumni Assn. Oct. 9–12 in Kaiserslautern, Germany. **Contact:** Don Newton, 2 Palace Pl., Freehold, NJ 07728 (732-308-3494) (donnewton@hotmail.com).

Mobile Aerial Port Sq, all MAP units. July 25–27 in Wheeling, WV. **Contacts:** Mark and Amy Bishop, 34 Rockledge Rd., Wheeling, WV 26003 (304-243-9572) (abishone@aol.com).

Pennsylvania AACS Alumni Assn. June 15–17 at the Hampton Inn in Du Bois, PA. **Contact:** Ed Rutkowski, 301 Blakley Ave., Du Bois, PA 15801 (814-371-7167).

Pilot Tng Class 57-R, all bases. Oct 6–8 at the Best Western Inn of the Ozarks in Eureka Springs, AR. **Contact:** Bill Doerler, 241 Cold Soil Rd., Princeton, NJ 08540 (609-896-0773) (psdwkd@aol.com).

Tactical Recon. Sept. 10–14 at the Marriott in Dayton, OH. **Contact:** Roger Wilkes, 1341 North 3175 East, Layton, UT 84040 (801-546-2258) (rogerwilco20@juno.com).

Seeking members of the **13th Communications Construction Sq,** Landstuhl–Ramstein AB, Germany (July 1955–June 1958) for a reunion. **Contact:** Bob Taylor, 47 Spring St., Carbondale, PA 18407-2024 (570-282-0103) (bobt3@mymailstation.com).

Seeking members of **Aviation Cadet Class 45-A,** Central Tng Command, for a reunion. **Contact:** Lewis Baker, PO Box 981, Spearfish, SD 57783 (605-644-8961) (lpvb@mato.com).

Seeking members of **Pilot Tng Class 55-J** for a reunion. **Contact:** George Bass, 923 Burton Mountain Rd., Clarkesville, GA 30523 (706-947-3346) (tsbass@alltell.net). ■

Mail unit reunion notices four months ahead of the event to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information. We reserve the right to condense notices.

AFA Conventions

May 2–3	South Carolina State Convention, Charleston, S.C.
May 2–4	New Jersey State Convention, Cape May, N.J.
May 10	Kansas State Convention, Topeka, Kan.
June 6–8	Arizona–New Mexico–Nevada State Convention, Albuquerque, N.M.
June 7	Alabama State Convention, Montgomery, Ala.
June 13–14	Arkansas State Convention, Hot Springs, Ark.
June 13–14	North Carolina State Convention, Asheville, N.C.
June 13–15	New York State Convention, Fredonia, N.Y.
June 20–21	Oklahoma State Convention, Oklahoma City
June 25–28	Alaska State Convention, Fairbanks and Anchorage, Alaska
June 25–29	California State Convention, March ARB, Calif.
July 12	Washington State Convention, McChord AFB, Wash.
July 18–20	Florida State Convention, Tyndall AFB, Fla.
July 18–20	Pennsylvania State Convention, Washington, Pa.
July 18–20	Texas State Convention, Austin, Tex.
July 25–27	Virginia State Convention, Hampton, Va.
July 26	Iowa State Convention, Sioux City, Iowa
Aug. 15–16	Utah State Convention, Ogden, Utah
Aug. 16	Georgia State Convention, Robins AFB, Ga.
Aug. 22	Missouri State Convention, Lake of the Ozarks, Mo.
Aug. 22–23	Colorado State Convention, Colorado Springs, Colo.
Sept. 15–17	AFA National Convention, Washington, D.C.
Sept. 28	New Hampshire State Convention, Manchester, N.H.
Oct. 24–25	Michigan State Convention, Alpena, Mich.

The Air Force Association's 44th Annual Outstanding Squadron Banquet will be held at the USAF Academy Officers' Club, on Thursday, May 22, to honor cadets of the United States Air Force Academy for the 2002–03 school year. Established in 1959, the Outstanding Squadron Trophy is one of the academy's most revered and coveted awards. It recognizes all elements of cadet life including drill, intramural athletics, military leadership, and academic standing.

For information on the USAFA Outstanding Squadron Banquet, contact Barbara Coffey, 800-727-3337 ext. 5805, e-mail: bcoffey@afa.org, or Ewa Rakowska, 719-622-2278, e-mail: Ewa.Rakowska@NorthropGrumman.com.

Symposium

The Lance P. Sijan Chapter of the Air Force Association is proud to announce *Space Ops 2003—Effects Based CONOPS: New Focus for Space*. This one-day symposium will take place on Wednesday, May 21, at the Sheraton Hotel in Colorado Springs. Invited speakers represent all services and OSD, including US Strategic Command and its component units.

For more information and to register online visit www.afasijan.com, or contact Judy Arnold at 719-622-2528, e-mail: judy.arnold@lmco.com.

Golf Tournament

The newly named Steve Foley Charity Golf Tournament, benefitting the Colorado Aerospace Education Foundation, will take place at the Ft. Carson Golf Club on Thursday, May 22. For more information, visit www.coaef.org, or contact Sherry Gardner at 719-637-2213, e-mail: sherry.l.gardner@lmco.com.

"The Department of Defense finds this event meets the minimum regulatory standards for attendance by DOD employees. This finding does not constitute a blanket approval or endorsement for attendance. Individual DOD component commands or organizations are responsible for approving attendance of their DOD employees based on mission requirements and DOD regulations."

Pieces of History

Photography by Paul Kennedy

BUFF

During the Vietnam War, a surface-to-air missile hit this B-52D, inflicting severe damage. After repairs that included replacement of two engines, it returned to carry out more missions over North Vietnam. Six years later, in 1978, the bomber became part of the US Air Force Museum's collection. Not all BUFFs are museum pieces, however. The B-52H—the only Stratofortress model now in use—has taken part in air attacks throughout Operation Iraqi Freedom. It has been more than 50 years since the first B-52 flew and more than 40 for the H model, but the vintage bomber still carries the widest array and heaviest load of ordnance among USAF's bombers.

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