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JOURNAL OF THE AIR FORCE ASSOCIATION

MAGAZINE

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**About the cover:** An eagle once again graces the cover and lead for *Air Force Magazine's* annual guide to the US Air Force. See 'USAF Almanac 2000,' p. 42. Photo © Tom and Pat Leeson.

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By John T. Correll, Editor in Chief

## The Information Time Bomb

**T**HE warnings keep on coming. In February, hackers launched a "distributed denial of service" attack against the nation's largest commercial Web sites, shutting off access to Amazon.com, eBay, Yahoo, E-Trade, and a number of others. For most of us, it was no more than a passing annoyance. Disruption of the Internet occurs often.

Even so, it is generally recognized that everything from the economy to continuity of the government depends increasingly on a starkly vulnerable electronic infrastructure.

The Department of Defense reports a rise in "cyber events" on its computer networks. It detects 80 to 100 attacks a day, of which about 10 are serious enough to get "detailed investigation."

Occasionally, an incident brings us up short. In January, the computers at the National Security Agency crashed suddenly and were down for three days. It was an internal glitch in the system, but at the time, NSA thought it might be under attack.

Call it another warning.

Contrary to the popular stereotype, not all hackers are teenagers or domestic malcontents. At least a dozen countries, perhaps twice that many, have information warfare programs directed at the United States.

Last year, angry about the NATO bombing of their embassy in Belgrade, the Chinese launched computer attacks on US government Web sites, including the White House site. In so doing, they blew the cover on clandestine "back doors" they had planted in US computer networks.

Nobody knows how deeply foreign powers have burrowed into critical US networks, siphoning off information or awaiting the time to strike. A nation with hostile intentions can do more than knock down Web sites.

It has been four years since Sen. Sam Nunn speculated about "an electronic Pearl Harbor." The phrase is repeated often, but we have not made much progress. A new kind of warfare is coming, and we are not prepared to meet it.

At an "anti-hacking summit" in Feb-

ruary, the White House said the federal government would become a role model for computer security. At the moment, it has a ways to go.

A survey by the General Accounting Office finds computer security lax at most federal agencies. GAO penetrated mission-critical systems at NASA and said that "we could have disrupted ongoing command and control operations and modified or de-

### **A new kind of warfare is coming. We are not prepared to meet it.**

stroyed system software and data." At the Defense Department, the survey said, "pervasive weaknesses" offer abundant chances to modify, steal, disclose, or destroy data.

The problem does not suffer from lack of discussion. The White House has issued a "National Plan for Information Systems Protection," complete with numbered "milestones" and target dates. Congressional committees are holding hearings and drafting legislation. Industry has set up all sorts of councils and centers to promote computer security.

For all of the talk, there is little real coordination. The FBI has the lead for the federal government—to the extent that anybody does—but a law enforcement approach is not well-suited to either corporate or military requirements.

Security consultant Mark Rasch told *The Washington Post* that a successful case for the FBI means catching the perpetrator and holding a public trial. For business, success is thwarting the attacker so that he goes away and no one ever hears about it. The corporate world shows no enthusiasm for any government solution.

The Department of Defense has assigned the computer network defense and attack missions to US Space Command, but the armed forces have no charter to protect any computer systems except their own.

The Pentagon general counsel says that international law is unclear about when a computer network attack might constitute an "armed attack" or aggression against our national sovereignty. Our concept of operation is still in the definition phase.

The White House plan, which leans toward optimism, predicts that "our best efforts to identify and fix vulnerabilities will slow, but not stop, malicious intrusions into information systems."

By 2003, the plan says, federal networks should be able to recognize when an attack is in progress, spread the alarm, isolate the nodes that are under attack, and divert operations to alternate emergency systems. Meanwhile, "law enforcement and other agencies would be attempting to locate the origin of the attacks and take appropriate measures to terminate them," whatever that means.

That approach is geared to an attack on the Internet by hackers and criminals. A military attack on the national infrastructure would call for stronger measures, including more weight on the offense.

Part of the requirement is the development of new capabilities that do not now exist, but that may be the easy part. With investment and determination, the technology will come. The more difficult parts are organization and strategy.

Our military, civil, and commercial infrastructures are too interdependent to treat separately. Defending them will require integration of effort by defense, law enforcement, intelligence, and private participants on a scale not previously attempted, or even contemplated.

We must reach a firm decision that we will regard an attack on our national information infrastructures as an act of war. It must be totally clear that we will respond as surely and swiftly as we would to an invasion of our borders or to an attack on our forces.

Ambiguity is inherent in this new form of war, but that must not suggest to our adversaries that they might get a free shot. ■



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## Shortfalls

Referring to articles [in the March issue]—"The State of Precision Engagement" [p. 24], "The View From the High Ground" [p. 32], and "The Shortfall in Science and Technology" [p. 48]—their juxtaposition is cause for both pride and concern.

The report of [the Air Force Association's] Science and Technology Committee is certainly correct, if perhaps understated out of deference to dignity and rectitude. How could it be that the branch of the service which is least labor intensive and most dependent on technology and the quality of its personnel should be lagging in the funding of the source of its global superiority?

In his statement that the Air Force has lost its "push-pull" relationship between operator and developer, [retired] Gen. [Lawrence A.] Sxantze is enunciating a really vital issue, because the continuous tensions in this relationship are essential for the fielding of a superior and evolving fighting force. A review of the weapons which were so effective in Desert Storm, and improved and augmented for Allied Force, shows that the developers have difficulty delivering advertised results on time and within cost, while the operators are loath to substitute unproven concepts for proven ones. But if the players are reasonable, the eventual outcomes are gratifying.

The [laser-guided bomb] overcame difficulties to succeed in Vietnam, and its descendants were magnificent in the Gulf and Kosovo. [The Airborne Warning and Control System] overcame early skepticism as did [Joint] STARS [radar aircraft]. Using [Global Positioning System] guidance on missiles was slow in coming, even as GPS itself had hard sledding over its many years of acquisition.

As dedicated people, we should not be dismayed or demoralized by our battles inside and outside the Air Force, but persevere.

Maj. Gen. J.C. Toomay,  
USAF (Ret.)  
Carlsbad, Calif.

The failure to match the great advances in precision weapons for targeting fixed targets with advances in weapons for targeting mobile targets is creating an increasingly serious problem.

During Operation Allied Force, as in all previous conflicts, the enemy's fielded forces were able to exploit adverse weather to move in relative safety from air attack. Only now enemy forces can move in even greater safety during adverse weather because prevailing attitudes on the loss of life are making it less likely [that] fixed- or rotary-wing aircraft will be allowed to make attacks under the weather.

To solve this problem and exploit the United States' growing and unprecedented ability to detect and track vehicles moving in adverse weather, there is an urgent need for weapons that make it possible to precisely attack these vehicles from medium altitude. It remains to be seen whether the low cost autonomous attack system will be a suitable solution.

Effectiveness in counterland operations requires a weapon that can be used against relatively inexpensive trucks, even when they are moving individually or in small convoys with large intervals between vehicles.

Lt. Col. Price T. Bingham,  
USAF (Ret.),  
Melbourne, Fla.

## The All-American Airmen

That was a great story on John Alison. [See "The All-American Airman," March, p. 52.]

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 served under both Alison and Phil Cochran, as we dated back to 1939 at Langley Field, Va., in the old 8th Pursuit Group. They were [second lieutenant] P-36 pilots and I was a private armorer in 1940.

Our paths crossed again in 1943 [when] Colonel Cochran and Colonel Alison headed up the 1st Air Commando Group, and I was flying as Lt. Col. Robert T. Smith's turret gunner in B-25Hs.

[Our crew] completed 48 combat missions together, flying *Barbie II* and *III*. "Round-trip" Smith, as [we] dubbed him, got the nickname as he always brought us back in fairly good shape.

R.T. also had a P-51 Mustang called *Barbie I*, which on a number of times he would fly a fighter sweep over the Japanese air bases in Burma, come back, and in the afternoon take us on a wild bombing and strafing mission.

Yes, they were rather exciting days, and when you have leaders like these men it [is] not too big of a problem to be anywhere, anytime, anyplace, and not bitch about it.

MSgt. Charles "Chuck" Baisden,  
USAF (Ret.)  
Savannah, Ga.

Your March issue came to me several weeks ago. I enjoyed all of it, but your article "The All-American Airman" was an absolute jewel.

In May 1995, I had the privilege of going along with Alison and 19 other [China-Burma-India Theater] veterans on a trip back through the Pacific to commemorate the 50th anniversary of the end of World War II there. On the afternoon of May 29, a group of us were having a cocktail in the lounge of the Shangri-la Hotel in Beijing when Alison told the story you related [on] p. 52—almost word for word.

He also gave us some insights into the air commando landing in spring 1944 at "Broadway" in central Burma. This was quite interesting to me since my squadron (1st Troop Carrier) operated in that part of CBI, off small dirt strips with cargo, ammo, medical supplies, etc., [using] the C-47.



There was one statement attributed to Alison which I suspect might bring some comment: If you can fly one aircraft, you can fly 'em all, [which] was true in his day, but I imagine some pilots of today might dispute this.

On the long ride home, I had a chance to sit and chat with the general for some time. Frankly, I came away in awe of his accomplishments. You named him right. He is truly the all-American airman.

Col. William H. Ramsey,  
USAF (Ret.)  
North Little Rock, Ark.

Your story was excellent. However, on p. 58 the photo and caption don't match. The photo caption says that the C-47 towed two gliders at one time, which is true, but your picture really shows a C-47 snatching a glider off the ground.

I took a series of pictures of this same procedure for the 11th Airborne Division while we were at Lipa, Luzon, in the Philippines. Also, this same procedure was used to snatch gliders out of "Shangri-la" in Dutch New Guinea. I was the aerial photographer for Fifth Air Force, 1943-45.

Paul S. Seaman  
Williamsport, Pa.

The article on Alison was very much on point in reference to a pilot can fly anything. Alison came to Fifth Air Force (of Far East Air Forces) as director of operations for Gen. [Ennis C.] Whitehead in April-May 1945.

[During that time as part of] the US Army's Luzon operations, it was necessary to fly an infantry colonel with Filipino guerrilla contacts to a behind-the-lines meeting.

I had just completed a P-47 combat tour with the 310th Fighter Squadron and, as a newly promoted captain, had chosen to stay in the theater with a Fifth AF [headquarters] tour in operations. Alison came into the [operations] office, pointed at me, said that this [infantry] colonel needed to be behind the lines for a liaison arrangement, and it was necessary that it be done today. Therefore [Alison said to] go to the strip, get checked out in the L-5, and get on with doing the necessary. So it was done.

Daylight on the treetops, into a fairly deep penetration, a cow pasture landing on the first try, a long wait for [the colonel's] business to be done, and in the dark of night over strange mountains and valleys, return to a blacked-out home field.

It reassured me (after the fact) that "you can do it." Alison was, and I am sure still is, a truly inspirational man

and a worthy leader of the Air Force Association.

Col. Jim Driscoll,  
USAF (Ret.)  
Indian Rocks Beach, Fla.

### GIs Don't Earn Enough

I received my first paycheck today with the new DoD pay raise. I am sure I will be able to put the extra \$160 per month to good use buying discount groceries. Of course, I am only a major with 14 years of service, so I am not yet raking in the big bucks like the overpaid 26-year colonel [Cindy Williams] cited. [See "Aerospace World: The Showdown at Military Pay Gap," March, p. 19.]

She didn't cite a percentage of Air Force personnel who actually receive this level of pay—interesting.

I found it interesting that she picked her apples to fit her argument rather nicely: An 18-year-old private making \$21,000? I have been in the homes of E-3s and E-4s, and they live in substandard homes. An Army private with a wife and child is eligible for food stamps, yet she claims he is in the top 75 percent of pay for all Americans. Do 75 percent of all Americans receive food stamps?

I also found it interesting that she used the example of a 20-year Marine and compared his pay to a fire chief. At 20 years the Marine is ready to retire and make about three times [his] military [pay] in the civilian sector. He would have left sooner, but he was devoted to his duty. Our enlisted force is so underpaid it is a wonder any of them stay in past their first enlistment. Don't compare the crew chief of my jet to the mechanic who fixes a car and tell me they should get the same wage—they don't do the same job.

Her point about four weeks of leave a year was humorous. The only time I have ever taken more than a week of leave in 14 years of service has been between duty assignments when I am uprooting my family from one house to the next. (I usually lose money on [the house] when I sell it after two or three years—with no help from my employer like most civilian companies [provide]).

Lastly, Williams insults us with her assertion that firemen and policemen put their lives on the line as we do—they don't. Policemen and firemen have never been prisoners of war. When they die, there is a funeral with a casket with a body in it. Not [always] so true for the military widow. Yes, policemen have been shot at and killed, but not by the army of another country.

I do agree with her assertion that beyond pay a decrease in operations tempo would help, but her relaxing of

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**To explain these needs to the American people.**

## Letters

antiquated rules looks a lot like a camel trying to get his nose under the tent.

It really annoys me to see numbers and statistics thrown around to make an argument that is false.

Williams's letter was at best a D effort by a research fellow. I only hope the American public isn't footing the bill for [her research].

Maj. Bob Colella  
Maxwell AFB, Ala.

### The New Clark

I enjoyed C.R. Anderegg's "Clark Digs Out of the Ashes" in the March issue [p. 40] but felt like he was writing to please the local Chamber of Commerce, not to tell the whole story. I was stationed at Clark from 1971 to 1974 with the 604th [Military Airlift Support Squadron] (Aerial Port), during the exciting times of the huge airlift into Vietnam before the signing of the Paris accords and the POW evacuation.

I had a chance to visit Clark again last July. While most of the article is accurate, Anderegg dismisses in one sentence the areas looted and reverting to jungle. Actually "the looted and abandoned" includes not only a large area of the base housing but the base hospital, base theater, and many other major buildings. I visited my old house in the MACV housing area and it looked like some bombed-out version of Angkor Wat, with the tropical foliage rapidly taking over the stripped shell of a house.

A positive note not mentioned in the article is the modern, divided highway toll road that connects Angeles City with Manila. That is a big improvement over the trip to Manila back in the early 70s.

Lt. Col. Thomas L. Gorham,  
AFRC (Ret.)  
Cincinnati

Thanks for the article on Clark AB. As victims of Mount Pinatubo, my family and I on occasion still discuss the nightmare. We were pleased to read about an update on the base. Most people don't realize that we experienced three natural disasters all at once—Mount Pinatubo, Typhoon Yunya, and the earthquakes—as a result of the volcano. It's refreshing to read about a recovery.

1st Lt. Freddie M. Goldwire,  
ANG  
Savannah, Ga.

### Pilot for a Day

I was very pleased to see the 560th Flying Training Squadron, Randolph

AFB, Texas, get some much deserved credit in this March issue. [See "Pilots for a Day," p. 70.]

I have been associated with this squadron since 1973, and the highly motivated officers have always been involved in very worthwhile extracurricular activities that have benefitted their community. Capt. Phillip Johnson is a fine example of the spirit demonstrated by all the members of the 560th that I have known.

Col. John E. Stavast,  
USAF (Ret.)  
Austin, Texas

### Disgruntled Troops

A year or so ago, I wrote a letter detailing the reasons I believe there is low morale and why people (especially enlisted people) are exiting the Air Force rather than staying until retirement. I don't think it was well-received by some, but the truth is still there.

I've been retired now for just over three years. Since I retired, I have often talked to many of the young people who worked for me in the Air Force. Some are still on active duty and others have gotten out, either retiring or just deciding to separate. Almost to the person, they have pretty much backed up what I said earlier. For the ones who separated, it was a matter of economics. The pay is definitely better with a lot less stress on the outside.

The study by the Center for Strategic and International Studies lasted over two years, [and] 12,000 members of the military were asked about morale, leadership, readiness, quality of life, and commitment to military values. [See "Aerospace World: CSIS Study Finds Disgruntled Troops," March, p. 14.]

All of the above are in desperate need of attention and soon. Not mentioned, but important to those young [people] who worked for me, is the fact that most young people in the service can actually qualify for food stamps and other forms of public assistance, don't get the same quality of health care as their civilian counterparts, etc.

During most of my career, and especially the last 10 years as a [non-commissioned officer], I listened to our leadership, especially the enlisted leadership, say the same things that this study found. The military leadership had been identifying these issues and bringing them before Congress long before this study was commissioned. For that matter, so has AFA, NCOA, and other organiza-





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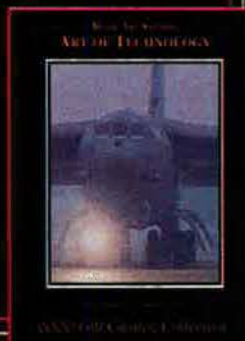
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tions that support people in uniform. But the big questions here are: Does spending millions of dollars on a study validate what's been [said] for years? If Congress reads this study and does something about the pay differential, eroding benefits, etc., what does that tell us about Congress "listening" to the leadership in the military services?

The Air Force (as well as our sister services) is filled with wonderfully talented and dedicated people whom I am proud to have served with. But, no matter how great a job is, people need to feel like they are appreciated and taken care of. People in the services today are seeing greener pastures on the outside and deciding to get out. That's a shame and something that can be reversed. The only way to reverse this trend is for everyone, in uniform and out, to write your Congressperson (if nothing else to ask them to read this aforementioned study) and vote.

Tell them to take part of that supposed surplus and fund a decent pay raise for those on active duty, fund quality-of-life issues, and restore the services as an honorable career choice.

MSgt. David Palmer,  
USAF (Ret.)  
Cary, N.C.

### The Memorial Issue Continues

I have long looked forward to an Air Force monument at our nation's capital. [See "Letters: The Memorial Issue," January, p. 7.] Such a fitting tribute to those past and present, who are responsible for our long and distinguished legacy, is sorely overdue.

I don't know what set of priorities led the proposed monument's design committee to the conclusion that a star-shaped building with a parasail on top would inspire visitors [to walk] through varying views to its lower deck. It might win kudos among aspiring Frank Lloyd Wright aficionados at an architect's convention, but it won't do a thing for those it is supposed to honor.

The design committee's assignment was tough, but it seems to me that they should realize up front that they are not going to be able to represent every single [Air Force specialty code] that ever existed, nor should they try to do so.

I would suggest that they draw a line in the historical time frame and build something that pays tribute to those who carved our proud legacy with their blood, sweat, and tears. Has the Iwo Jima Memorial down the street lost its appeal and luster since

it only depicts a single event of more than a half-century ago? Does anyone seriously think that Marine pilots feel slighted because it only shows infantry?

First of all, any monument purporting to honor Air Force achievements will never succeed in its stated purpose unless it includes some airplanes. People flock to air shows because they are fascinated by airplanes, and especially by military airplanes, and specifically those that have excelled in combat.

Why not construct a monument that will pay tribute to those who so proudly served and accomplished incredible feats in the face of extreme adversity? If it is done right, and heaven knows there is enough ammunition, it will inspire those yet to serve, the long and proud tradition will continue, and "the committee" will have accomplished the mission with which it was entrusted.

May I suggest something along the lines of a bronze B-17G sitting on its gear? Standing in front of it, place a bronze, composite statue of a pilot, gunner, crew chief, nonrated officer and a nurse, all attired in appropriate World War II uniforms. Position this display so that the group is looking upward at a displaced stainless steel, spiraling coil that would emulate the flight path of a geometrically symmetrical barrel roll that extends skyward at a 20-to-30-degree angle.

At the origin of the coil, attach a Spad in the wings-level attitude; at the next 90-degree point, attach a P-51D in a 90-degree left bank; at the 180-degree point, attach an F-86F in the inverted attitude; at the 270-degree point, attach an F-4D in a 90-degree right bank, and at the ending point of the coil, attach an F-15C Eagle in the wings-level attitude. Do all of the aircraft in bronze, and make them proportionally correct in size to one another and attach each at the outside extremity of the coil.

Finally, put Old Glory on a stainless steel pole overlooking the display and in its granite base carve the following: "Their mission was to fly and fight, and they didn't forget it."

Such a display would cover the World War I through Gulf War eras and arguably display some of our service's most recognizable and famous aircraft of each conflict. No, it would not have shown the great C-47 or the C-130, or the B-24 or the B-52, or the P-38 or the F-105, or the Titan missile or the X-15, or the F-22, or any of another thousand candidate vehicles. You're not going to please

everyone, but I'll guarantee you that such a display would not leave its visitors with any fuzzy impressions as to what we were all about.

We need to collectively step back and get a grip, here. This isn't a science fair project designed to explore the principles of flight. It is a one-time opportunity to capture the indomitable spirit of a remarkable team that continually persevered and succeeded in the face of terribly long odds.

I strongly urge a return to the drawing board. Failure to do so will forfeit a golden opportunity to honor a special breed of individuals who really believed that they were something special. They were and they deserve far better.

Col. Phil Handley,  
USAF (Ret.)  
Midland, Texas

As a retired Air Force officer, I enthusiastically support the concept of a memorial to honor those who have served our nation as members of our service. However, I am left completely uninspired by the proposed design.

A building, albeit in the shape of a five-pointed star often used as a symbol of the Air Force, completely fails to capture the essence of aerospace power. Unlike the Marine Corps memorial, which at a glance intuitively and clearly captures the essence of the sacrifice of Marines who served our nation, our proposed memorial will leave many wondering what it is, what it stands for, what it symbolizes, what it memorializes.

I can understand why the foundation "struggled" with the design. The results show it.

I have conveyed my concerns to the foundation. In response, the foundation stated, "The nature of our Air Force has produced a wide variety of highly specialized competencies that combine to provide America with unchallenged superiority in air and space operations. Representing the idea of the Air Force allows your memorial to embrace all those specialties in an inclusive and respectful way."

I can understand all the hard work that has gone into planning this memorial. However, while trying to evoke "the idea of the Air Force," the foundation and designers have quite simply, and in the opinion of many, failed.

Few believe that the memorial should be a way to recognize the "variety of highly specialized competencies" that comprise air- and space power. Rather, it should be a memorial to salute all who served and those



who will serve, and the best way to capture this is in a design that depicts what all of them collectively made happen—the exploitation of air and space in the defense of our nation.

In other words, the emphasis should not be on the singular competencies, but on the fruit of their effort—air vehicles that accomplish military missions—the most visible embodiment of the Air Force's *raison d'être*.

Moreover, even if intended to be a representation of various competencies, the design itself does a poor job of symbolizing them. It is so abstract as to be unidentifiable with any competency.

I am sure the foundation is proud of the design. But for many of us, and many potential donors, it fails to inspire us, fails to capture the essence of what we accomplished, fails to create a recognizable symbol of what the Air Force means to America. It does not capture the soul of our Air Force. It will not be meaningful to Air Force members, past, present, and future. And, it will not be easily recognizable to visitors and passersby, especially in comparison with other memorials.

I would propose something much more symbolic of that which the memorial seeks to depict. The memorial ought to take the form of a nondescript, but unmistakable, aerospace vehicle. This might be a sleek, metallic craft, pointed subtly upward, that captures the essence of aerospace power—that is, the exploitation of air and space to accomplish military and national objectives.

A building neither captures that critical essence, nor inspires the viewer, nor memorializes the sacrifices of the airmen who preceded us.

I, and many others, would be happy to contribute to the Air Force Memorial. Unfortunately, many of us are likely to withhold our support pending a reconsideration of the design. It would simply be a great waste of the time, effort, and money already invested to accept a less than fitting structure as our memorial.

I believe the foundation would be wise to pause and reconsider the finality of the design and would benefit from some input from those the memorial is intended to memorialize. We would be better off putting off construction until a more fitting design can be selected.

Col. Branford J. McAllister,  
USAF (Ret.)  
Niceville, Fla.

### Nothing Changes?

There is no need to reinvent the

wheel on [the] subject [of water discipline]. [See "Letters: Nothing Changes," *March*, p. 4.]

Based on extensive studies by the Israeli army and the US Navy Medical Corps gathered from treatment of Marines during the Vietnam War and the annual Marine Reserve combat training exercises at Twentynine Palms, Calif., [retired Col. C.D.] Hardison is incorrect in criticizing the policy of obligatory water intake during stressful exercises.

Whereas he is correct in stating that excess water intake can cause hemodilution and even water intoxication, these are comparatively rare phenomena. Dehydration is a real and practical risk during stressful exercise, particularly when the temperature is high and the humidity is low. A canteen of water every two hours is most likely less than actual water loss, depending on wind evaporation and level of physical exertion.

Capt. Larry O. Goldbeck,  
USNRM (Ret.)  
Suisun, Calif.

### New Focus—Use Resources Wisely

I continue to hear of the Air Force, Army, Navy, and Marine Corps' [shortage] of personnel, [which affects] mission capability and readiness. [See "Aerospace World: 2000 To See New Focus on Recruiting, Retention," *March*, p. 16.]

Being tasked "to do more with less" seems to be the common pitch. However, I think that part of the problem is the Department of Defense misuses military personnel for things which are not related to mission capability and readiness.

For example, each year DoD spends considerable time and effort and monies to train and subsequently have their military personnel prepare federal and state income taxes for the active duty, retired, reserve, and some DoD civilian personnel and dependents. Many of these individuals have small businesses, complex investments, rental property, sale of a home, itemized deductions, etc., as part of their tax return.

Our military personnel should be used in mission readiness capacities. This perk, if DoD feels that it is necessary, could be performed by temporary and/or permanent DoD civilians and/or contracted out to local tax return companies.

Moreover, many federal, state, and county governments offer this service free [to anyone, including] military personnel. Also perhaps arrangements could be made with such

governments to implement a special assistance program for the military. Let's use our resources wisely.

Robert Young  
Washington, D.C.

### No To the New Logo

The idea of changing the Hap Arnold logo—that isn't official—is beyond words. [See "Aerospace World: World Ready, or Not?" *March*, p. 11.] Why not make the Hap Arnold emblem official and retain the history of the Air Force?

The suggested [and] cheap looking logo takes away from our roots. To put out \$800,000 to [do a] survey and come up with a computer generated design is really throwing away money that could be used to help equip troops to be ready for combat.

Over my 27 years in USAF, I endured many changes that were very positive. Fortunately, I was retired before the change in the blue uniform that took away the look of being in the military and [made us look] more like bus/airline drivers. I was very proud to wear my uniform with epaulets, circle US insignias, and ribbons. We all felt proud.

MSGT. Wallace T. Moore,  
USAF (Ret.)  
Tucson, Ariz.

I find the new logo to be a serious mistake. It looks like something that would be worn on the chest of Wonder Woman or by some sort of cyber-battle warrior in a cheesy video game. The design also conjures up images of Nazi insignia for me.

This redesign seems to have been one of the Air Force's better kept secrets. Was any input solicited from the larger Air Force community? While a case can probably be made for an updated logo, this one should be thrown out and the design process started over with an eye for honoring, not discarding, our heritage.

Glenn Olsen  
Riverside, Calif.

Let's be responsible about this. Let's follow the direction that we began nearly a decade ago, of seriously instituting the quality improvement process, and let's let some of the people who will be using and wearing these items for the long term have a part to play in their existence.

Reading the words from the key people in charge of initiating this proposal—they themselves were proposing a "be patient" attitude. The top leadership truly seems to want to





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empower the middle, and little, man (and woman).

As one of those "little men," and a [technical sergeant], and [an] Air Force historian, I personally think that since we have not been using "officially" the Hap Arnold design, except on the buttons of our uniform and in other prominent places, why not just do the paperwork?

And for a catch phrase, how about: Air and Space—Set the Pace. This encompasses the "World Ready" premise.

I believe the planners in this endeavor are going down the right path, but they neglected to take with them what they had at the beginning of their journey—the answer. Make the Hap Arnold design the official emblem of the US Air Force.

TSgt. Randolph D. Brown Jr.,  
AFRC  
McConnell AFB, Kan.

It seems the Air Force is willing to pay a public relations firm \$800,000 to "update its image in an effort to spur recruiting and retention and more accurately reflect its new role as an Expeditionary Aerospace Force."

Now, I can see the importance of recruitment and retention, especially in these militarily downturned and economically upturned times, but to promote its role as an Expeditionary Aerospace Force? Wake up and smell the coffee, Air Force leaders! The EAF is the prime reason for the current retention problem! Don't even get me started on that one; this magazine isn't big enough for my opinions on the EAF.

Apparently, the problem with the Air Force's image is that it has no catchy slogan, nor does it have a symbol. According to the article, it never had either one. The Hap Arnold emblem is a famous Air Force symbol that has been around for more than 60 years, but it isn't an "official" symbol, so it should be changed. The proposed new symbol looks modern, more like an eagle landing than anything else, and I suppose it could pass as a new symbol, if we really needed one.

And the slogan "Aim High" is well-known to many as an Air Force catch phrase, but it, too, is not "official" and should be replaced. The proposed slogan, "World Ready," is pretty lame, in my opinion. Other slogans are being considered, and the taxpayers' \$800,000 is being spent, all in the name of creating a new look and a new tradition for today's Air Force. Is this the proper answer to recruitment

and retention, to magically create "tradition" out of a public relations firm's think tank? I hope not.

The Air Force has never had a "tradition" as a service. The US Air Force's glory days in World War I and World War II were as organizations within the Department of the Army, first as the US Army Air Service, then as the US Army Air Corps, and finally as the US Army Air Forces. Even after the Air Force became a separate service in 1947 its personnel wore former USAAF uniforms, complete with USAAF insignia, and followed the traditions of its former parent service.

There was one symbol on the Army uniform during World War II, however, that immediately identified its wearer as a member of the Air Force. It was the Hap Arnold emblem worn on the shoulder. The emblem is tradition itself: the star and meatball on a blue disc, which was the national insignia that appeared on all US military aircraft from 1917 until 1942, combined with the wings that identified the Air Force's mission, "To fly and fight." It not only appeared as a patch on Class As, it was also stenciled on flight jackets and utility uniforms and appeared in one form or another at USAAF bases all over the world. It even appeared on flight jackets during the Korean War, with US Air Force proudly stenciled under the emblem. Somehow, it has been officially forgotten since then.

The Hap Arnold emblem is not USAF's official emblem, but it should be. The Army has its emblem, the fighting eagle; the Navy has its emblem, the anchor; and the Marines have their emblem, the globe and anchor. All of these readily identify their respective military branches. I suppose if one had to identify the official emblem of the US Air Force it would have to be the eagle and shield on the Air Force seal.

If the present day Air Force leaders want to truly create a proud tradition for today's Air Force, and create a symbol that's already identifiable all over the world, they should continue a proud tradition by retaining the traditional Hap Arnold emblem and making it the official symbol, as well as including it on the official seal of the US Air Force.

As for a slogan, who can beat the Marine Corps' "Semper Paratus" (Always Faithful)? What Marine can resist greeting another Marine with "Semper Fi" and not know the pride of being a member of one of the most elite organizations in the world? The

Marine Corps is full of tradition, not the least of which is its slogan. The Air Force could use a similar slogan to enhance its image, not to mention its morale. I could suggest "Semper Alta" (Always High), but it's probably not appropriate for today's politically correct social environment. The Air Force recruiting slogan, Aim High, would be OK, though. In fact, I've always liked it.

When I was in Officers Training School during the Vietnam War, our upperclassmen would ask us what the Air Force mission was, to which we would shout, "To fly and to fight—and don't you forget it!" We thought that the Air Force's mission statement was its motto, but we were wrong. As a C-141 pilot for 19 years, I'd always heard that the "official" unofficial motto of Military Airlift Command was "You call, we haul; anytime, anywhere, anything—within reason." We never had an official slogan when I was in the Air Force. We never had an Aim High, but we had fun with our jokes, and they did help to build our morale, especially during the dark days after Vietnam. I think the adoption of an official slogan would certainly be beneficial for today's Air Force and its future.

Aim High has a nice ring to it. If it's good enough to inspire potential recruits to join up, why shouldn't it be good enough for the Air Force as a whole? What nobler aspiration could there be [than] for one to aim high in his thinking, to aim high in his career, to aim high in his life? All of these are the missions of today's Air Force, or should be, for if a recruit doesn't join the Air Force for these reasons, and the Air Force cannot improve his or her future, then why should he or she join in the first place? And if the Air Force cannot inspire its members to continue to aim high once they're in, what incentive would they then have to stay in? Aim High is the perfect slogan, in my opinion, for recruitment and retention in today's Air Force; if you aim high, success is always easier.

Consider this: "Aim High, Dude!" could be as familiar as "Semper Fi, Mac!" within our lifetime. My inner being revels at the very thought!

In the lower right-hand corner of the windshield of my Ford Explorer is a sticker I got from an Air Force recruiter a few years ago. It's a Hap Arnold emblem with the words "Aim High: Air Force" in block letters around it. I often get favorable comments about it from people around here, as well as from those I encounter on the



road. They instantly identify me as a proud member of the Air Force family because of the emblem, and I'm proud of the message it conveys to them. What better combination is there for an official symbol and slogan for today's Air Force?

Maj. Charles P. Gilmore,  
AFRC (Ret.)  
Bountiful, Utah

If it (the old Hap Arnold emblem) ain't broke, don't fix it. If it is not official, make it official. Please do not replace it with the trendy example of modern art. It looks like it is already broken.

CMSgt. Don Bradley,  
USAF (Ret.)  
Bellevue, Neb.

When I first read an article on the proposed new logo, I thought: "The Air Force spent \$800,000 for this absurd idea, thinking it would influence young people to rush to recruiting offices! They've gotta be kidding."

On Dec. 8, 1941, thousands of us were already well-acquainted with the wings and star logo of the USAAF when we converged on recruiting offices across the nation, anxious to serve under that noble emblem. And throughout my 32+ year career in the USAAF/USAF, I always assumed it was the official logo. I consider any thought of replacing the "old Hap Arnold wings and star" to be sacrilegious.

I certainly recognize [that] the Air Force must continually upgrade its equipment, tactics, training, etc. But do Air Force leaders actually believe the proposed new logo will make its airplanes more effective, its pilots more aggressive, and its ground personnel more proficient? Will the men and women confined behind security fences at Prince Sultan AB in the Saudi desert be less despondent due to long and frequent separations from their families? Will they become more anxious to re-enlist because the Air Force adopted a new logo? I am certain the answer to all those questions is a resounding No!

Pride of service and unity of purpose are the predominant ingredients necessary for the success of any organization. And permanence of its emblem is the banner under which members proudly serve, a fact recognized even before the days of the Roman Legions.

Millions of men and women have proudly served under the wings and staff logo, building on the triumphs of their forebears to create the most powerful military force in the history of the world. The logo has come to

represent to the world the one entity most capable of protecting free people from tyranny.

I'm certain the only beneficiaries of this waste of taxpayers' \$800,000 will be the consultants and the public relations firm [that] dreamed up the juvenile folded wings logo. It was a much greater waste than the well-publicized \$400 hammer. But, of course, the American taxpayers have become inured to such waste.

Finally, there is a more foreboding reason for my objection to the proposed folded wings logo. Each issue of the Air Forces Escape and Evasion Society newsletter has a section titled "Folded Wings" in which recently deceased members are listed.

Is the USAF about to fold its wings, too? It may as well do so if its leaders are so imprudent to believe the folded wings logo will improve USAF's image and boost enlistments.

Lt. Col. J.R. Cook,  
USAF (Ret.)  
Hunt, Texas

The efforts and money the Air Force is putting into buying an identity show a lack of understanding of what the Air Force's identity truly is. Identity cannot come from focus groups and computer manipulated graphics. It is a result of generations of tradition and history. Think of the simple anchor that has marked the US Navy for as long as anyone can remember, the Army's crossed rifles or crossed sabers. (The Army's armored badge still proudly sports the M4 Sherman, despite the impressive frontage of the modern M1 Abrams).

It is only fitting and proper that the Air Force should standardize on the Hap Arnold wings. It is disappointing that decades have passed with only "Hap-hazard" use of this classic symbol that is nearly universally recognized. The proposed logo is faddish. Even if declared official, in 50 years it will be long gone, while Hap's wings will soldier on in the hearts and minds of airmen everywhere, if not on the [signs] at our bases.

Andrew Wagner  
Plymouth, Mich.

It seems such a trivial thing to get steamed up over, but the thought that someone wants to mess with the beautiful emblem which you refer to as the Hap Arnold wings really does steam me up! If it isn't the official Air Force symbol, let's make it so.

That beautiful symbol has witnessed enough history, tradition, bloodshed, and heroism to last forever! Anyone who wouldn't be proud to wear it, doesn't deserve to wear it.

And the proposed new symbol? Surely not! It looks like a cult symbol with horns.

The slogan, Aim High, I can take or leave, although I've always felt it was a little weak. After all, if you are aiming at an object, you don't aim high unless your sights are not adjusted properly and you're having to estimate a correction factor. "On Target" would be a much better, and appropriate, slogan. However, with today's paranoia about guns, this slogan wouldn't have even the proverbial snowball's chance. World Ready? Ugh! Isn't there any imagination among the high-level thinkers out there?

But I do hope they are spending their time, and my tax money, on bigger and better things.

We must be the laughingstock of all the other services. We can't decide what we want to call our enlisted ranks or how we want to identify them. We've had two or three major makeovers of our uniform plus controversy over a design for our national memorial. Now we (not me, they) want to change our symbol and slogan. It's almost enough to make one bail out.

Lt. Col. George R. Partridge,  
USAF (Ret.)  
Prattville, Ala.

I have no serious objection to the design of the potential new Air Force logo. I do, however, have serious objections to it replacing the old, hallowed, and recognizable logo we have used for so many years. It may not have been the official symbol, as stated, but it was everything else to those of us who served with it. He also says you must have good eyes to identify an airman in battle dress. That is certainly not the fault of the logo.

Perhaps camouflage dictates have gone too far when the name strip and Air Force strip are so difficult to see or read. If they are that difficult, and the condition cannot be changed, why not eliminate them from the battle dress? Certainly the potential logo won't make the Air Force strip more readable unless it breaks the camouflage dictate, and if it can do that why can't the name and Air Force strips?

I regret Air Force leadership gradually removing most of our past. It's almost as though shame replaces honor and pride. Please mount the battle to retain the old logo to preserve a tie to history and accomplishment.

Jerome G. Peppers Jr.  
Fairborn, Ohio

I was shocked when I discovered that there is an ongoing attempt to



replace the Arnold wings as the emblem of the Air Force, with the explanation that the Air Force has never had an "official" symbol. Maybe the Arnold wings never received the designation as official, but they have certainly represented the Air Force well for generations.

I don't know when they were first used, but I certainly wore them proudly as a shoulder patch during World War II, and I notice that they are featured on my AFA membership card dated October 1946 and signed by Gen. [Jimmy] Doolittle.

Who developed this new design—the same people who came up with an Air Force Memorial that looks like a piece of rejected hardware from a "Star Wars" movie set? I suggest that for a monument that truly represents the heritage of the Air Force they should look at the airplane at the entrance to Maxwell AFB [Ala].

The Arnold wings have served us well as a symbol of the Air Force through three major wars and several minor ones. To replace it with something that looks like a stylized version of the old American Airlines logo is an insult to the millions of airmen [and -women] who have worn the Arnold wings symbol.

If the people in Washington need to fill a creativity square on their career progression chart let them create the paperwork to make the Arnold wings the official symbol of the Air Force. I urge the Air Force Association to take a position strongly objecting to the unnecessary destruction of another symbol of the greatness of our Air Force.

Col. Robert F. Myers,  
USAF (Ret.)  
Panama City, Fla.

You would not believe the wimpish, delicate little thing that the Air Force paid a corporate identity firm \$805,000 to design. If the Air Force brass really wants a unifying, morale-boosting logo, let them use the traditional symbol worn proudly on the shoulder of many a flying jacket—the gold wings above a white star with its centered, solid red circle all on a circular field of dark blue. Now that symbol has meaning!

And let them use the money they could have saved to help some airman on food stamps feed his family or spend more time with his kids. The last time the Air Force brass had time and money on their hands they chose to civilianize our uniform by creating a single-breasted jacket with a three-button front and a single breast pocket.

Oh, yes, they thought it would be nice to remove epaulets and rank from the shoulders, etc. This was announced by former Air Force Chief of Staff Gen. Merrill McPeak on Jan. 12, 1993, for implementation by 1996 with mandatory wear by late 1999.

Well, if you look like a civilian, you might as well be a civilian and get paid like a civilian. And they can't figure out why morale is low and no one wants to enlist!

Lt. Col. Herbert V. White,  
USAF (Ret.)  
San Antonio

I would like to add my voice to what I hope is a fast-growing crowd opposing the new logo. Aside from the fact that it looks cheap and inappropriate for the times, it doesn't begin to summon up the image and heritage the United States Air Force is so very proud of. I fought for my country under the old Hap Arnold logo and was proud to do so then and remain extremely proud of that symbol today.

Who, in their infinite wisdom, decided that the Air Force needed a face-lift? Is it because the world has moved into a new millennium and therefore all things are obsolete? I don't see the US Navy or the US Marines jumping to update their logos. They are extremely proud of their heritage. Are we less so? I should hope not.

Where are our priorities? Maybe the problem lies with upper management. Maybe their priorities have gotten off-kilter. I suspect that we did not learn our lesson from the McPeak uniform fiasco. The majority of the Air Force personnel did not welcome the change, and I bet that if an honest poll were taken, the logo change would not be a welcome one.

Lt. Col. James K. Beaty,  
USAF (Ret.)  
Alexandria, Va.

■ *We received other letters on this subject but none in favor of the new logo.—THE EDITORS*

### Jumping to Conclusions

I cannot believe my eyes! Without a doubt, the F-15 shown on p. 33 is the filthiest aircraft in the air. [See "Northern Watch," February, p. 32.] I was even more appalled to read that a general officer [Brig. Gen. David A. Deptula] was flying this garbage can.

I was a member of the original Eagle test squadron stationed at Edwards [AFB, Calif.]. We watched with great pride every time the robin's-

egg-blue proud bird went aloft. We were all saddened when the paint scheme changed to toned-down gray.

As a maintainer, I also know the problems keeping the bird clean. I also know the volumes it speaks to see a dirty aircraft: poor maintenance, lousy morale, less than combat ready troops. This picture is an embarrassment. Please use more discretion when printing a magazine likely to be seen by other military organizations and, God forbid, our taxpayers.

MSgt. John L. Clayborn,  
USAF (Ret.)  
Mesa, Ariz.

*Deptula replies:* Initially, Sergeant Clayborn's observation was the same that I had when this unit showed up for duty at Operation Northern Watch. As the commander of the Combined/Joint Task Force ONW, the general flying the aircraft has "operational control" of those aircraft but not "administrative control" of those aircraft.

These command relationship regulations mean that the ONW commander is responsible for employing the aircraft to achieve mission accomplishment, but does not "own" the aircraft, and therefore has no control over their maintenance, upkeep, appearance, etc. That is the prerogative and responsibility of the Air Force component commander to the [Combined Joint Task Force]—in this case the 39th Wing at Incirlik AB [Turkey].

Command relationship regulations are complicated further by the construct of "administrative control," since the Air Force component commander to the CJTF ONW (39th Wing commander) only exercises "administrative control" of these aircraft for a temporary period and is not responsible for long-term periodic maintenance since aircraft that fly at ONW rotate every 120 days from various units back in the States. It is the supplying unit that is responsible for periodic maintenance of these aircraft, and the originating units provide their own maintenance personnel during deployments.

Now, I believe that when I asked the question about the appearance of this particular aircraft on temporary deployment over a year ago (from the 60th Fighter Squadron, 33rd Fighter Wing, Eglin AFB, Fla.), the answer I received was that it was due some long-term, periodic maintenance and that it was scheduled to be repainted upon its return from its ONW deployment. The 60th FS was a great unit that performed very well





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during their time in the theater. While appearance is certainly one indicator of a unit's morale and performance, [you] shouldn't jump to conclusions that because the aircraft needed a paint job unit morale was poor. In fact, just the opposite was the case.

Additionally, you might consider that when an enemy is shooting at you to kill, there are elements far more important to success and morale than "looking good in the showers." I might also add that I have been flying the F-15 for 23 years—from second lieutenant to brigadier general—and I flew it while it was still in the "air superiority" blue paint scheme and miss it as well.

Brig. Gen. David A. Deptula  
Director, Air Force Quadrennial Defense Review  
Pentagon

### Lassie, Come Home

I enjoyed the "Flashback" on the B-32. [See "Forgotten Bomber," March, p. 76.] There are many who never heard of the machine. I had served my tour of duty with Eighth Air Force as a gunner on a B-24. Came home for 30 days. [Then] I was assigned to my first air base, which was Fort Worth, Texas, or Tarrant Field, as it was known in those days.

Due to my rank and ability to type, I was stuck in several office-type jobs, one being on the flight line and keeping track of the aircraft assigned there. The B-32 was a mainstay at that time, which was July 1945.

Consolidated being at the end of a long runway from Tarrant, it was no problem getting aircraft to our base. I was amazed at the size of the B-32, compared to what I had been to war in. The tail was a monster, and the engines were upgraded to be more like the "heavies" the English flew.

The scuttlebutt was, they were very prone to fire (engines) and were required to have one or two "fire watchers" on board during flights. I did witness one coming in with an engine smoking, but never really got to delve into it much further, as the Pentagon had further use for [us] returning Air Corps veterans and transferred many of us to the engineer fire fighting companies. This station was anywhere where there was forest, but all that is another story. Thanks for the memories.

William L. Case  
formerly a 612 on *Lassie Come Home*  
Bettendorf, Iowa

I was pleased to see the article

about the B-32. Our crew flew missions in B-24s from Clark Field in the Philippines until June of 1945 as members of the 403rd Squadron, 43rd Bomb Group. We then transferred to the 386th Squadron of the 312th Bomb Group at Floridablanca, which was a field south of Clark Field, to transition into B-32s.

We flew some missions from Floridablanca. While there, we amazed bystanders by backing into the hard stands. We then transferred to Yontan on Okinawa, Japan, for more missions prior to the end of the war. I don't recall having more than seven B-32s in the squadron.

Lt. Col. Richard Mackay,  
USAF (Ret.)  
Middleburg Heights, Ohio

### Another on Warbirds

In the [letter] "Warbirds of Heritage Flight" [April, p. 5], it was stated that the Skyblazers were from the 48th Fighter-Bomber Wing. The Skyblazers were from the 36th Fighter Wing, formed in 1949. I was there.

Jess Richey  
Olympia, Wash.

### Cotton Picker

I was an Electronic Warfare Officer in VMCJ-1 from April 1965 to May 1966 at Da Nang [South Vietnam] and spent four enjoyable weeks (two two-week stints) in Saigon with [now retired Maj.] Roger Boan. [See Boan's letter under "Route Pack 6, Several Views," January, p. 10.]

I said enjoyable for two reasons: 1) It got us out of a tent and into a bed, and 2) Roger took us in at the Majestic Hotel and was a great officer to work with. In the early phase of the air campaign VMCJ-1 was tasked to supply electronic warfare support for strikes in North Vietnam for both Air Force and Navy missions. To better coordinate our efforts, an EWO was sent to 2nd Air [Division] as liaison to work with the Air Force and Navy desks.

I do not believe that VMCJ-1 was [operational control] to the 2nd Air Division, but we did fly in support of both Air Force and Navy strikes going North. VMCJ-1 with its EF-10Bs did accompany the strike [aircraft] to target and suppress missile and fire-control radar. This was the humble beginning of the Wild Weasel and today's EA-6Bs.

The call sign Boan alluded to was not "Cottontail" but "Cotton Picker," a revered call sign in the VMCJ community. Vietnam was a shame, but the electronic warfare community

found that it proved to be a tactical proving ground. It was a pleasure to work with such professional and dedicated aircrews of the Air Force, Navy, and Marines that "worked" up North.

Capt. William H "Woody" Wood,  
USMC (Ret.)  
Havelock, N.C.

### The Other Jammer

The comments in the January issue concerning the RB/EB-66s were very gratifying, a clear indication of success from the work of individuals over many years, much accomplished in spite of opposition by Air Force leaders. [See letters from SMSgt. Frank Waddell and Boan, January, p. 10.]

"The Other Jammer" (March 1992) highlighted my work in modifying obsolescent airplanes to gain acceptance of tactical EW, now a normal part of air combat. But tactical EW only came about because a handful of people at Langley [AFB, Va.], Wright Field [Ohio], and the Pentagon, in spite of adverse opinions, provided the capability. We in Operations were able to convince our commanders to let us try new installations and tactics. I really hope someone involved in placing EW airplanes in Southeast Asia, and developing the tactics used there, will write a summary of the work. It would be enlightening to read of the trials and tribulations involved in actually employing the newer recon equipment, jammers, and escort systems. I'm sure there was opposition even then. There must be some extremely interesting stories there!

Maj. August R. Seefluth,  
USAF (Ret.)  
Lebanon, Ohio

### Corrections

In the March issue, in the photo display of "Department of Defense Senior Leadership," p. 61, the deputy undersecretary of defense for acquisition reform should be listed as Stan Z. Soloway. On p. 62, the deputy secretary of defense for drug enforcement policy and support should be Ana Maria Salazar.

In the January issue, a statement in "New Rules on Dual Compensation," p. 52, was incorrect. The Dual Compensation Act of 1964 did apply to retired regular officers in temporary civilian jobs. Only the first 30-day period of temporary employment was exempt from the act's provisions.



# Aerospace World

By Peter Grier

## JSF Contractors Seek All-or-Nothing Contest

Boeing and Lockheed Martin are urging the Pentagon to let them battle to the end, winner take all, for a Joint Strike Fighter contract valued at around \$200 billion for 3,000 aircraft.

Worried that the losing firm might exit the fighter aircraft field, some Pentagon officials want JSF work to be split between the two competitors. Competition in the nation's fighter industrial base might thus be preserved for the next round of design and purchase, decades hence.

A special Defense Department committee is weighing the consequences of splitting the contract. The Pentagon's top acquisition official, Undersecretary of Defense Jacques S. Gansler, was expected

*Continued on p. 22.*



USAF photo by A1C Jennie Ivey

*Secretary of Defense William Cohen is greeted by Brig. Gen. Robert Dierker, commander, 51st Fighter Wing, on arrival at Osan AB, South Korea. It was the last stop on Cohen's 10-day tour of several Asian nations in March.*

## Cohen Takes Historic Tour of Vietnam

Secretary of Defense William S. Cohen paid a three-day visit to Vietnam in mid-March in a bid to increase military-to-military interchange between the United States and its former Southeast Asian foe.

Cohen spoke at Vietnam's National Defense Academy in Hanoi. He visited a Vietnamese air base and toured an aviation museum. He checked on an excavation site near Dong Phu where some 250 Vietnamese laborers are methodically sifting soil, searching for traces of an F-4 Phantom that crashed there more than 30 years ago.

His basic message was that with time and patience on both sides, US-Vietnamese ties could be every bit as strong as those that now connect the US and the Philippines, Thailand, and many other Asian nations.

Cohen said upon his departure that he had not met anyone during his entire trip who had said anything about looking back into the past. He added that the Vietnamese were looking to the United States in a very positive way.

The substance of Cohen's meetings was modest. He called for cooperation in such areas as flood control, medicine, and research into the long-term effects of the defoliant Agent Orange.

Three principles will continue to guide the US in developing its security relationship with the Vietnamese, said Cohen. Security will develop in tandem with overall diplomatic and trade relations. Military relations will remain "transparent" so that neither country mistakes the other's intentions. And accounting for Americans still missing in action after all these years will remain the highest priority of US officials.

Joint recovery efforts have already had a beneficial effect on the relationship between the former bitter enemies, Cohen noted.

"By helping the families of the missing, we have helped to establish our working ties," he said.

His Dong Phu visit was a case in point. The crash site—a muddy rice paddy 20 miles southwest of Hanoi—was a beehive of joint US-Vietnamese activity at the time of Cohen's visit.

Weeks of effort had produced several bags of metal scraps and two fragments of bone that might be from Navy Cmdr. Richard Rich, who US authorities believe crashed in the area after his aircraft was struck by two surface-to-air missiles May 19, 1967.

Contemporary witnesses say a US aircraft came spiraling into the area from the south before it smashed into the paddy with a violent explosion that hurled chunks of metal for hundreds of yards. One villager was killed by a piece of engine—which was later turned into a sort of shrine where incense is burned.

To this day, Rich remains one of about 2,000 US servicemen from the Vietnam War still missing in action.

"We are making every conceivable effort to find the remains and bring them home," said Cohen.

Reporters asked Cohen whether he felt the timing of his visit was awkward, coming as it did at the beginning of a seven-week official celebration of Vietnam's victory in the war. The Defense Secretary said he preferred to dwell on another milestone: the upcoming five-year anniversary of the restoration of US-Vietnamese political relations.



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to make a decision on the issue this spring.

Neither Boeing nor Lockheed Martin want part of a settlement.

At least one contractor feels somewhat differently. Northrop Grumman, currently on board as a subcontractor for the Lockheed Martin JSF, wants the government to allot it 20 percent of JSF work, no matter who wins. Northrop is set to provide airframe parts, mission and avionics systems, and other services.

Such a move could be part of another option, in which a winning contractor would take the lead. The firm with the winning design would be in charge of a newly created team that would include the loser and other suppliers.

However, some members of Congress are worried that at this point any change in the JSF competition could endanger the entire program. Senate Armed Services Committee Chairman Sen. John W. Warner (R-Va.) has said that a major JSF readjustment would make him "concerned about its survival."

#### **CINCPAC: Invasion of Taiwan Would Be Bloody Failure**

China does not have enough military capability to successfully invade Taiwan, said Adm. Dennis C. Blair, the commander in chief of US Pacific Command. Still, he said, it could do "a lot of damage," primarily with ballistic missile attacks.

China has been steadily increas-

## **In China, an "Emerging Empire"**

*Following are excerpts from "Returning to a Principled Foreign Policy," a March 16 speech by Rep. Tom DeLay (R-Texas), House majority whip, at the Center for Strategic and International Studies in Washington, D.C.:*

"I believe how we handle the emerging empire ruled from Beijing is the leading national security issue of our time. ... I would recommend that a new approach to this growing conflict include the following three specific steps:

"First, we must rethink our view of 'engagement' and trade as tools for managing the US-Sino relationship. Once a process, engagement has been perverted into a comprehensive policy that is its own objective. ... Should the day arrive when our trade with the People's Republic of China serves more to fuel Communist expansion than nurture democracy, more to support oppression than to export American values, we will be compelled to subordinate our desire to access markets to the cold, hard realities of national defense. We should never be fooled into cheering higher profits, while Communist China harnesses that prosperity to construct an arsenal of tyranny.

"Second, we must enhance America's military posture in Asia and support our friends in the area. At this moment, the United States doesn't have the ability to deal decisively with a regional crisis. We must provide a short-term solution by moving additional assets to the theater. And we have to pursue a long-term answer by developing and deploying a missile defense system with our key allies, including, at their request, Taiwan. The Congress, I believe, has a clear vision. We know who shares our democratic value system and who is an enemy of democracy. ...

"Third and finally, we must discard old policies that no longer have credibility because they are no longer true. In my view, whatever utility the "One China" diplomatic fiction might have had 25 years ago has been erased by the new reality. There are, in fact, two Chinese states. One, the Republic of China on Taiwan, is free, democratic, and a welcome member of the family of nations. The other, the People's Republic of China, is not free, not democratic, and a threat to the security of us all.

"The people of China and the people of Taiwan will make their own decisions, and as they do, they will no doubt carefully account for the views of their friends and their foes. The United States cannot, however, under any circumstances allow the People's Republic of China to impose a Communist future on Taiwan. And, yes, this means America must make clear that threats to a free, democratic people will be met with the force required to deter and, if necessary, confront aggression."

AP photo/Srdjan Ilic



**An Iranian journalist and his family study the tail of an F-16 downed in Yugoslavia last May during Operation Allied Force. The aircraft part is on display at an aviation museum in Belgrade. Based at Aviano, the F-16 was one of two USAF aircraft downed during the conflict.**

ing its arsenal of short-range missiles opposite the Taiwanese coast, said Blair at a March 7 Pentagon briefing for reporters.

"The Chinese are adding about 50 missiles every year to their force that can target Taiwan," he said.

The Defense Intelligence Agency estimates that China has enough M-9 and M-11 missiles stockpiled to knock out all military bases on Taiwan with little or no warning, according to a report in *The Washington Times*. The DIA has stated that Beijing is building two new short-range missile bases, at Yongan and Xianyou, to supplement an existing installation at Leping, reported the *Times*.

China issued numerous blunt threats against Taiwan in the run-up to Taiwan's March 18 presidential election. Among other things, Chinese officials threatened invasion if Taiwan declares independence or even if it continues to spurn reunification talks.



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## "Overtaxing" the Air Guard and Reserve?

*Charles L. Cragin, principal deputy assistant secretary of defense for reserve affairs, raised the following concerns about USAF's Aerospace Expeditionary Forces in "Milestones on the Road to Integration," an article posted on the Department of Defense Web site:*

"The AEFs will take full advantage of the vital contributions being made by the Total Air Force—active, Guard, and Reserve—by integrating all the air components into cohesive and tightly bound and deployable force packages. ... These forces can be tailored to meet [commander in chief] requirements, and part of that tailoring involves the employment of associated Guard and Reserve units and personnel. ...

"We must ensure that new concepts like the AEF do not translate into a lower optempo for the active force at the expense of the [Guard and Reserve] components. In short, we cannot address readiness concerns by overtaking our reserve components. We need Total Force solutions. We need to closely monitor reserve component optempo and perstempo. ...

"This debate is about more than tempo. It's also about compatibility. If Air Force Reserve and Air National Guard units are going to be integrated into the AEFs—and they will be—then those units need to be fully compatible with their active duty counterparts. They need the latest equipment, airframes, avionics, sensors, and precision munitions."

If anything, the rhetoric backfired on Taiwanese voters. They elected Chen Shui-bian, whose Democratic Progressive Party has favored independence and who is one of China's least favorite Taiwanese politicians.

US Defense Secretary William S. Cohen, traveling in the region, told reporters at the Japan National Press Club on March 17, "We do not see any evidence of preparations for an imminent attack."

Cohen also reiterated that the US will not be intimidated by Chinese leaders. "The best way to resolve this is for both sides to back away from this confrontational pose and get back to the business of trying to peacefully reconcile the differences."

### USAF Scores Gains in Enlisted Retention

The Air Force announced March 15 that the most recent figures for retention indicate a positive trend in the enlisted force.

First- and second-term retention rates for January and February 2000 exceeded those at the same time in 1999, said Lt. Col. Jan Middleton, chief of retention policy, personnel.

- First-term rate: 59 percent, up from 46 percent.

- Second-term rate: 74 percent, up from 73 percent.

- Career: 91 percent, same as last year.

In Fiscal Years 1998 and 1999, Air Force re-enlistment rates in all three categories fell below their target levels.

The USAF goals are 55 percent of

first-termers, 75 percent of second-termers, and 95 percent of career airmen.

Officials said the upward trend may be credited to the pay and compensation initiatives passed this fiscal year as well as the service's continued emphasis on stabilizing operating tempo and improving quality of life for its people and their families.

### USAF to Congress: Let Us Close Bases

The Air Force "badly" needs another round of base closings, Chief of

Staff Gen. Michael E. Ryan told the Senate Armed Services Committee on March 1.

The need to free up funds for further modernization is only one reason why the service wants to trim its infrastructure. Officials also want to change an environment in which communities near Air Force installations are resisting all efforts to move or consolidate forces, because they fear that base closure will be next.

The Air Force is in "gridlock" because of this situation, said Ryan.

Secretary of Defense William S. Cohen echoed the Air Force plea, saying that the two rounds of base closings proposed in the Clinton defense budget—one in 2003, and another in 2005—could produce savings of \$3 billion a year.

Leaders of the other services, however, did not sound as enthusiastic. Marine Corps Commandant Gen. James L. Jones said he knew of no Marine installation he would recommend for closure. Chief of Naval Operations Adm. Jay L. Johnson said his view was "not far" from that of Jones. He added that the Navy does need to trim infrastructure, but he is concerned about permanently losing training ranges, airspace, and access to the sea. Army chief Gen. Eric K. Shinseki said he would support some closures but added a cautionary footnote that the Army needs to decide its future force level before it can judge base consolidation with certainty.



Air Force Undersecretary Carol DiBartiste welcomes one of the newest members of the Air Force into the ranks. As part of USAF's recruiting efforts, DiBartiste swore in 51 applicants from the 314th Recruiting Squadron at an enlistment ceremony in New York City on March 16.

USAF photo by SSgt. Angela Stafford



The Clinton Administration and Congress last agreed on a round of base closings in 1995.

### **USAF Expects Rise in B-2 Mission Capability**

The Air Force can expect to see a slight increase in the B-2 bomber's Mission Capable rate in coming months, Chief of Staff Gen. Michael E. Ryan told reporters during the Air Force Association annual Air Warfare Symposium in Orlando, Fla., in late February.

The reason: Maintainers will keep learning more about how to handle the Low Observable technologies on the bat-wing stealth aircraft.

The Air Force goal for the B-2 is a 60 percent MC rate. As of last July, the actual MC rate was 43 percent—and that included the push to keep the bombers ready for use in Operation Allied Force last year.

He emphasized that the MC rate is as low as it is because of the necessity to maintain the LO characteristics of the airplane. The slightest defect gets fixed. That artificially depresses the MC rate.

Other systems on the B-2 have been very reliable, said Ryan. Hydraulics, avionics, and the airframe are not a problem.

Use of new tools to determine whether an LO problem is simply a small glitch is one way the service should improve the B-2's mission record. Delivery of deployable aircraft shelters, which are scheduled to begin the first quarter of Fiscal 2001, should help the airplane meet its deployability requirements.



*At Grand Forks AFB, N.D., in April, a crew chief from the 319th Air Refueling Wing adjusts a communication cable on a KC-135 refueler. The wing was undergoing an operational readiness inspection at the time.*

This spring may see a turnaround for the MC rate for all Air Force aircraft, which has declined steadily over the last decade to about 71 percent. That is because a surge in spares funding that began in 1998 should finally be producing a surge in parts in the bins.

A turnaround in readiness or Mission Capable rates hasn't yet been seen, according to Ryan.

### **F-16 Pilot Killed During Air Show**

Maj. Brison Phillips, an F-16 pilot with the 78th Fighter Squadron, Shaw AFB, S.C., was killed March 19 when

his F-16 crashed in a field near Kingsville, Texas.

Phillips, who was a member of the F-16 East Coast Demonstration Team, was performing as part of an air show at Naval Air Station Kingsville. His aircraft went down about six miles north of the naval facility.

He was an instructor pilot and mission commander with more than 2,600 flying hours, including more than 2,300 in the F-16. He had been in the Air Force for 13 years.

A board of Air Force officers is investigating the accident.

### **Missile Defense Decision Still on Track**

President Clinton currently has no intention of handing off to his successor a decision about whether or not to deploy a National Missile Defense, according to a top Administration official.

"There is every reason why he should make this decision. ... There is enough time for [him] to have the kind of information he says he needs," Leon Fuerth, national security advisor to Vice President Al Gore, told defense reporters March 22.

Clinton will weigh the technical results of the third major NMD evaluation experiment, currently set for late June. It was originally scheduled for April. The test will involve the first demonstration flight of the developing NMD booster.

Clinton will also take into consideration the effects of a deployment on relations with other countries and on arms control in general—as well as the nature of the ballistic missile threat.



*TSgt. Willie Daniels, 307th RED HORSE Squadron—a construction and engineering unit from Barksdale, La.—works on equipment that cleans sand out of a well. USAF personnel from Barksdale and Kelly AFB, Texas, went to Belize from January through March for New Horizons 2000, an annual humanitarian mission.*

USAF photo by MSgt. Jessica D'Aurizio

USAF photo by SSgt. Paul Holcomb



Russia has remained adamant that a US NMD deployment would violate the 1972 Anti-Ballistic Missile Treaty. So far, the Russians have proved resistant to US entreaties for treaty modification.

"We have a fighting chance to persuade the Russians of this," insisted Fuerth.

Key lawmakers from both sides of the political spectrum have increasingly called on Clinton to delay an NMD decision and hand the issue off to the next President.

In early March, Sen. Joseph R. Biden Jr. (D-Del.), ranking minority member of the Senate Foreign Relations Committee, told an audience of scientists that he did not believe the North Korean missile threat is dire enough to justify deployment of an expensive, unproven NMD system.

"This has cost \$30 billion, and there has been no national debate," Biden told *The New York Times* after his speech.

#### **USAF Attacks Post-Kosovo Spares Problem**

A flurry of "bridge contracts" let to private firms and an infusion of money to bolster spares inventories are helping the Air Force overcome a parts problem that it faced after Operation Allied Force.

Last year, service maintainers were hit by a quick one-two punch: first the operational demands of war in the Balkans and then the scheduled clos-

## **F-22 Testing: Things Are Going OK, but Slow. Stay Tuned.**

*From a March 22 statement by Philip E. Coyle III, Pentagon director of operational test and evaluation, to the Senate Armed Services Committee's airland forces subcommittee:*

"The F-22 test results thus far are quite positive. The flight test envelope now extends above 50,000 feet, in excess of Mach 1.5, and with excursions from minus 40 degrees to greater than 60 degrees angle of attack and without any major impediments except for a thin buffeting in the vertical tails.

"Two key performance parameters, supercruise and internal missiles payload, have been demonstrated this year. Performance of the F119 engine has been outstanding throughout the allowable flight envelope. Several problems have been identified in testing to date, but they are being addressed and corrected.

"In support of last December's Defense Acquisition Executive review, the Air Force Operational Test and Evaluation Center conducted an early operational assessment. Although only limited flight data were available, aircraft component design problems, maintainability concerns, and programmatic issues were identified, and these are described in my complete statement. The F-22 program office is taking action to resolve these issues.

"The principal issue I have with the test program is that it is proceeding much more slowly than in previous aircraft development programs, and even these lagging schedules continue to slip over time. Continuing slips in flight test aircraft deliveries reduce the aircraft months available for testing. ...

"Over the past three years, we've lost 49 flight test months that could have been available for flight testing. To accommodate lost test time and reduce test costs, the total flight test hours have been reduced from 4,337 to 3,757 hours. This is a 13 percent reduction due mostly to the deferral of the requirement for external combat configuration testing and hoped-for avionics test efficiencies.

"To squeeze these hours into the available flight time will require test flying at an increased rate. Increasingly optimistic proposed development test schedules, schedules that have not been met to date, threaten the start of dedicated [initial operational test and evaluation] in August 2002.

"Nevertheless, flight test program progress should improve significantly this year with additional test aircraft. Four new flight test aircraft are to be delivered this year."



USAF photo by Yolanda Hunter



**CMSAF Jim Finch presents an Airman's Coin to basic military trainee Christopher Crosby at Lackland AFB, Texas, in October. Presentation of the coin, which has an eagle and the words "Aerospace Power" on one side and the traditional Hap Arnold wings on the other, marks the transition from trainee to airman.**

ing of Sacramento Air Logistics Center, Calif., and San Antonio ALC, Texas, and the transition of their work to remaining Air Force depots.

"The Kosovo crisis put heavy demands on our depots just as we made final preparations to move workload," Secretary of the Air Force F. Whitten Peters told a Senate Armed Services Committee subcommittee in March.

The result was an increase in airplanes that were not capable of fulfilling their missions due to supply shortages. By December, more than 90 F-16s were grounded due to lack of generators. A shortage of inlet fans led to a backup of 80 F100 engines on the repair line.

Problems with rudder actuators grounded more than 35 F-15s in the same time period.

Under law, the Air Force can only use 50 percent of depot funds for work in the private sector. That requirement can be waived for reasons of national security, however—an



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escape clause the Air Force invoked for Fiscal 2000. (See "Aerospace World: Depot Debate Rages," April, p. 16.) This provided officials with the fiscal flexibility to let bridge contracts to ramp up maintenance work while the remaining depots were adjusting to their new workload.

At the same time, an infusion of \$500 million into the Air Force spare parts working capital fund should boost Air Force Materiel Command's ability to support operational units.

USAF officials say they are not likely to waive the 50-50 private-public depot requirement for 2001. Public depots such as Ogden should have their new production lines up to full speed.

Still, members of Congress—many of whom are adamant about maintaining big in-service depots—say they will keep a close eye on the issue.

"There has been far too much animosity to the preservation of a core maintenance capability from this Administration for me to believe that there are not those in the department who would like to make a practice of issuing such waivers in order to circumvent the law," said Sen. James M. Inhofe (R-Okla.), chairman of the SASC readiness and management support subcommittee, in a statement.

## Officer Resigns Over Anthrax Vaccine

The Air Force announced March 22 that it had accepted the resignation of Maj. Sonnie Bates. He re-

ceived a discharge under honorable conditions, called a general discharge.

Bates was reportedly the highest-ranking US military officer to be punished for refusing to take the Pentagon's mandatory anthrax vaccinations. (See "Aerospace World: Major Faces Charges Over Anthrax Shots," March, p. 14.)

On Feb. 15, he withdrew his re-

## For Chairman Lewis, It's F-22 All Over Again

Rep. Jerry Lewis (R-Calif.), the chairman of the House Appropriations defense subcommittee, shocked USAF in 1999 with a near-fatal attack on the F-22, the service's top modernization priority. The fighter survived, and some thought Lewis may have softened his views somewhat. At a March 8 hearing with Air Force leaders, however, he gave fair warning of more trouble ahead:

"This year, the Air Force is requesting another \$4 billion for the F-22, which includes purchase of 10 aircraft. By anyone's standards, the F-22 is a very, very expensive program.

"To justify this kind of investment, we have to convince ourselves that our potential adversaries will be extraordinarily formidable. Unfortunately, this is difficult, given the economic conditions of most of our potential adversaries.

"In an age in which our NATO allies—representing some of the richest nations in the world—can't keep up with the US in military technology, it is difficult to see how Iraq, Iran, or North Korea will muster such a potent arsenal of advanced aircraft to justify the F-22.

"And while the Air Force would have us spend \$4 billion this year on the F-22, what opportunities are we missing elsewhere to exploit new force-multiplying capabilities or to alleviate pressing deficiencies?

"Shouldn't we be buying C-17s as fast as we can instead of cutting them? Shouldn't we be linking our sensors and shooters now rather than later? Shouldn't we be investing more in the 'low density' platforms that are in such high demand? Shouldn't we be doing more to protect ourselves from hackers? Shouldn't we be investing more in science and technology?"

quest for a court-martial and requested, instead, nonjudicial punishment consideration under Article 15 of the Uniform Code of Military Justice. In early March, the Air Force announced his punishment: a fine of \$3,200 and an official reprimand. The service then began discharge actions and Bates asked to resign.

Bates, a 13-year veteran who was serving with the 436th Airlift Wing, Dover AFB, Del., had been grounded since refusing the shots last year. He contends there are 60 cases of unexplained illness at Dover attributable to the vaccine.

A court-martial could have resulted in five years in prison and a dishonorable discharge.

## Not Enough E-3 AWACS To Go Around

US surveillance flights over the major coca-producing regions of Latin America have declined by two-thirds over the past year—threatening a key aspect of America's strategy for fighting illegal drugs.

Diplomatic problems, fights between the White House and Congress, and competing demands from other military operations are among the reasons behind the decline, according to a *Washington Post* report.

Marine Gen. Charles E. Wilhelm, commander in chief of US Southern Command, emphasized to Congress that the command needs intelligence,



SrA. Shane Redding, an air transportation specialist, 86th Air Mobility Squadron, Ramstein AB, Germany, checks his log as a 37th Airlift Squadron C-130, also from Ramstein, taxis into a Mozambique airfield in March, as part of Operation Atlas Response, a humanitarian mission to help flood victims.

USAF photo by SSgt. Ken Bergmann



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The Air Force's E-3 Airborne Warning and Control System aircraft are the assets that Wilhelm covets most. Yet since the air campaign over Kosovo last year, continued needs in the Balkans, Iraq, and North Korea have kept the crown jewels of Air Force surveillance busy elsewhere.

At the same time, the US has vacated its best forward base for counterdrug surveillance flights by AWACs and other eyes-in-the-sky. The US military turned Howard AFB, Panama, back to the Panamanian government last May. Early indications were that Panama would continue to allow the US to use Howard, but in the end the host nation asked US forces to leave entirely.

US officials want to use an airfield in Manta, Ecuador, in place of Howard AFB. But the field needs improvements before it can be used by sophisticated jets—and funding for those improvements has been withheld by GOP Congressional leaders, in part because they believe that the Clinton Administration mishandled Howard negotiations.

"From Manta and only from Manta can we reach down and cover the deep southern portion of the [coca] source zone," Wilhelm told Congress.

### **Newest Raptor Arrives at Edwards**

Raptor 4003, the newest addition to the F-22 test program, landed March 15 at Edwards AFB, Calif., completing a five-hour, cross-country flight from Dobbins ARB, Ga. It is the third F-22 test vehicle to enter the program.

"This plane will take us to the edge of a Raptor's flight envelope in max speed, max attitude, and max maneuverability," said Col. C.D. Moore, the F-22 Combined Test Force director. It "will carry a huge burden" for the next couple of years.

The F-22 CTF will be receiving more test aircraft this year, the Air Force reported. These will include Raptor 4004, the first F-22 equipped with advanced avionics.

The avionics capability with its sensor-fusion technology will allow a pilot to become "a tactician, rather than a housekeeper," stated Lt. Col. Steve Rainey, 411th Flight Test Squadron commander and an F-22 test pilot. "Fighter pilots become very busy in the F-15 or F-16 just trying to keep up with sensor management and interpretation of data ... transmitted between each other in flight," he said.

## **DoD Moves to Combat Anti-Gay Harassment**

Secretary of Defense William S. Cohen has appointed a working group of top defense leaders—chaired by Air Force Undersecretary Carol A. DiBattiste—to draw up plans to fight anti-gay harassment in the military.

Formation of the panel follows the Pentagon's March 24 release of Inspector General data detailing a high level of anti-homosexual activity.

Said Cohen: "The Inspector General's report convinces me that additional actions are necessary to address the problem of harassment of service members who are alleged or perceived to be homosexual."

According to the IG study, more than 80 percent of service members surveyed said they had heard offensive speech, derogatory names, or other verbal assaults regarding homosexuality within the past year. Eighty-five percent of those surveyed said they believed that other service personnel and leaders tolerated such remarks.

Some 37 percent of respondents said they had witnessed or experienced an actual event of harassment aimed at someone perceived to be homosexual.

"This behavior is not acceptable and can't be tolerated in the military," said Pentagon spokesman Kenneth H. Bacon at a briefing for reporters.

For the study, the IG's office canvassed 71,000 service members at 38 installations and on a total of 11 naval ships and submarines.

While not condoning acts of harassments, defense officials tried to place the study's results in a larger context. They pointed out that members of the military are recruited out of a civilian culture which itself is steeped in an anti-gay ethos.

"There is nothing out there that we have seen that says how often would you hear [anti-homosexual] jokes or names, or other types of offensive speech, in the broader civilian society," said Francis M. Rush Jr., then deputy undersecretary of defense for planning (personnel and readiness).

Most of the acts of harassment aimed at specific persons entailed verbal abuse or offensive or hostile gestures. About 15 percent of respondents said they had seen harassing graffiti. Nine percent said they had seen an anti-homosexual assault, and 8.9 percent said they had seen perceived homosexuals denied training or career opportunities.

People in the same unit were the guilty parties, in most cases.

However, 11 percent of respondents said they had seen immediate supervisors harass someone who stood below them in the military hierarchy.

There were some differences in attitude among the services. "You will find more offensive speech in the Marine Corps than you do in the Air Force," said Rush.

Some actions designed to combat anti-gay attitudes are already in motion. Last year, all services adopted new training programs designed to teach everyone in the military about the "don't ask, don't tell, don't harass" policy, said spokesman Bacon.

In addition, last December the chief and civilian secretary of each service issued statements that anti-homosexual harassment will not be tolerated.

The IG's research was already under way at that point, said Bacon. He added, "One of the jobs of the new committee that's being set up by Secretary Cohen will be to make sure that the new policies ... put out at the end of last year are fully implemented, [and] fully understood, and then to recommend any other actions that are necessary to deal with this issue."

Bacon, when asked a direct question, said it is his assumption that the panel "will focus on making the current policy work better," rather than suggesting a fundamental change in policy. "In particular," he said, "they will focus on ways to get the message across, from the top commanders down to the newest recruits, that harassment based on perceived sexual orientation is not appropriate and won't be tolerated in the military. And they'll be looking for new ways to drive that message home."



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"The F-22 does it all by itself. It has [an] intraflight data link that allows pilots to communicate without saying a word."

The Air Force wants to buy a total of 339 F-22s to replace its aging fleet of F-15s.

### **Pentagon Initially Denies Rise in Abuse of Gays**

Defense Department officials said in mid-March that they were skeptical of a new report that anti-homosexual abuse in the military more than doubled last year. The report, by the Servicemembers Legal Defense Network, cited 968 incidents of harassment of gays in the armed services in 1999, including a murder, assaults, and verbal gay bashing.

Officials vowed to investigate specific findings of the study. But Pentagon spokesman Rear Adm. Craig Quigley said that in the past the organization has "been somewhat anecdotal in [its] findings." He added, "If there are specifics, enough for us to actually do something with, we will."

He said that DoD discharged 10 percent fewer people in 1999 for being homosexual.

However, on March 24, the Pentagon released its own data showing a high level of homosexual harassment does occur. Immediately following the report's release, Defense Secretary William S. Cohen appointed a working group to address the situation. (See "DoD Moves to Combat Anti-Gay Harassment," p. 30.)

The worst act of anti-homosexual violence in the military last year was the July murder of Pfc. Barry Winchell at Ft. Campbell, Ky. Pvt. Calvin N.



**At the USAF Test Pilot School, Edwards AFB, Calif., Capt. Aaron George climbs out of a T-38 after testing a Swiss-made, liquid-filled, full-body anti-gravity suit. The new aircrew protection concept uses hydrostatic force to regulate suit pressure—a possible improvement over current compressed-air anti-g suits.**

Glover was sentenced to life in prison last December for bludgeoning Winchell to death in his bed.

The Servicemembers Legal Defense Network noted a particular increase in anti-gay graffiti, verbal harassment, and harassment of lesbians. Some 31 percent of those discharged from the military last year for being gay were women, even though women make up only 14 percent of service ranks.

### **Gulf State Gets Advanced F-16s**

The United Arab Emirates has contracted for 80 Lockheed Martin F-16s in the most advanced version, the Block 60. The contract is

valued at \$6.4 billion and calls for delivery between 2004 and 2007.

The UAE's new batch of F-16s will feature Northrop Grumman's new Agile Beam Radar, which tracks multiple targets, and an advanced electronic warfare package.

USAF is buying 10 Block 50 F-16s in Fiscal 2000 but deferred a planned buy of 20 more Block 50s until Fiscal 2002 and 2003. With the UAE now committed to underwrite a large portion of development costs on the Block 60, Lockheed Martin may be able to interest the Air Force in this latest version.

### **USAF Prepares New GPS Satellites**

Air Force officials have decided to forge ahead with a whole new generation of Global Positioning System satellites—Block III—that will include additional military and civilian signals and better anti-jamming capability. The move kills a 1997 Boeing deal to build 33 Block IIF satellites.

The Air Force decided not to exercise its existing option with Boeing but will allow the company to build up to 12 of the satellites. The service will compete the remainder.

Likely competitors include Lockheed Martin and Loral, as well as Boeing.

### **Navy Leader Reaches for NMD Role**

Chief of Naval Operations Adm. Jay L. Johnson is arguing that missile-laden cruisers could add an ex-

## **St. Louis Blues**

Sen. Christopher S. "Kit" Bond (R-Mo.) accused the Air Force of stalling on a deal to buy more F-15 fighters, endangering the St. Louis production line and a thousand jobs in Missouri.

According to the March 21 *St. Louis Post Dispatch*, Bond complained, "We are very much concerned there's foot-dragging. We intend to continue to push the Air Force to make sure they sign that contract."

He added, "The F-15 is too important to our national security, and the skilled jobs too important to St. Louis and our tactical aircraft manufacturing base, to wait around much longer."

USAF has not asked for the new fighters. The service would like to have them, were the budget larger, but they are viewed as unaffordable in light of higher priority needs.

Even so, Bond and Rep. Richard A. Gephardt (D-Mo.) last year succeeded in getting Congress to appropriate \$300 million to buy five F-15s in 2000 and start the purchase of materials for another five next year. It is that contract which has been held up by cost disputes between the Air Force and the contractor, Boeing.

Evidently, the F-15 line will close this summer unless the company receives new domestic or foreign orders.





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In a Feb. 18 memo to Secretary of Defense William S. Cohen, Johnson said the Navy should "be included in both the policy and architectural frameworks" of an NMD. (The memo was obtained by and initially reported on in *The Washington Post*.)

In the memo, Johnson emphasized that he was not talking so much about a near-term system as about a later NMD expansion. Sea-based assets should be "complementary" to an initial land-based defense, he wrote.

Supporters of Johnson's position say the Navy's fleet of Aegis cruisers and destroyers provide a ready-made foundation for NMD progress. Navy planners suggest that six to 12 cruisers, each with 15 to 20 interceptors, could go a long way toward protecting the continental US from an accidental or rogue nation missile attack.

Opponents point out that the Navy's development of a high-altitude interceptor has lagged behind the Army's work and that adding sea-based assets to NMD plans would make it that much harder to get the Russians to go along with NMD deployment.

Pentagon officials have said adding a sea-based component in the

## The Wonderful, but Outdated, \$60 Billion Procurement Goal

The Defense Department budget request for 2001 finally reaches a goal long sought by Pentagon officials: \$60 billion earmarked for procurement. But it already has been overtaken by events.

The goal is not high enough, Deputy Secretary of Defense John J. Hamre told a Senate Appropriations Committee defense subcommittee March 6.

"There's nothing magic about \$60 billion," said Hamre, who left the Pentagon to become head of the Center for Strategic and International Studies in March. He added that \$60 billion does not provide enough money to actually recapitalize the force.

The goal is not \$100 billion, but it is at least \$70 billion or \$75 billion, suggested Hamre.

Pentagon documents indicate that shipbuilding is the only aspect of military procurement that includes enough money to keep the force from shrinking. Tactical aircraft, armored vehicles, and helicopters are not funded at a replacement level.

National Missile Defense system would raise significant arms control complications.

### Starlight and the Attack Laser

Air Force specialists working on the Airborne Laser program are looking at the twinkling of starlight to help them make the prospective weapon more effective.

Flying a modified C-135E, specialists from the Air Force Research Labo-

ratory, Kirtland AFB, N.M., and the 452nd Flight Test Squadron, Edwards AFB, Calif., measured high-altitude atmospheric turbulence at overseas locations in February. They used a special instrument called a star scintillometer to lock on to specific stars while airborne and then gauge the amount of turbulence between them and the star.

Such distortion can be readily seen on Earth by watching stars twinkle, said Lt. Col. Richard Bagnell, chief of AFRL's Airborne Laser Technologies Branch, Directed Energy Directorate.

"Turbulence produces a variation in the refractive index, which affects how light behaves—bending it," he said.

The data are important because the beam of the ABL will encounter the same turbulence while traveling to its target. Uncorrected, the beam could be distorted and made less effective.

The measurement crew worked from air bases in South Korea and Qatar. Their findings were similar to those from a fall 1999 mission.

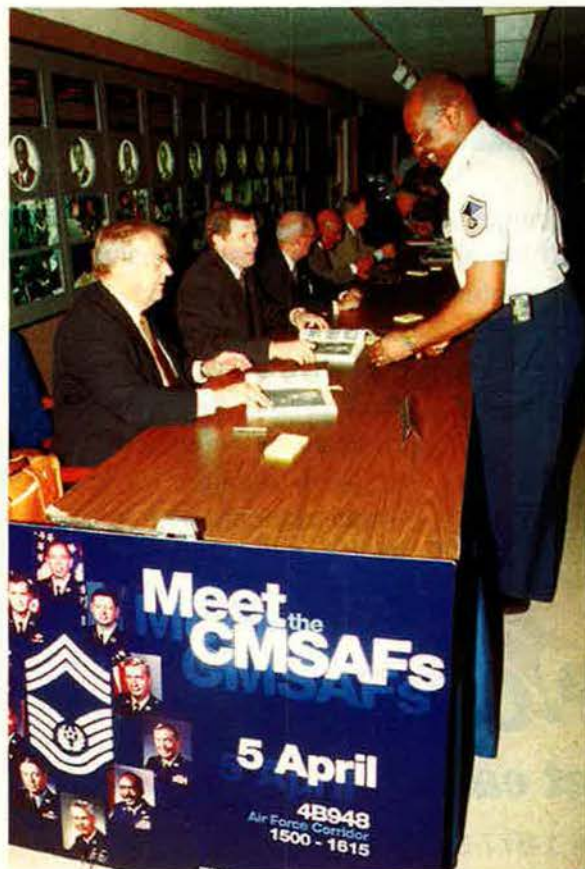
"The turbulence values we found ... support the contention that the airborne laser, as designed, can perform its mission very effectively," said Bagnell.

### News Notes

■ The seventh Joint Surveillance Target Attack Radar System aircraft has been delivered to the Air Force nearly a month ahead of schedule. The 93rd Air Control Wing at Robins AFB, Ga., received the aircraft from Northrop Grumman on March 6.

■ A B-1B Lancer bomber landed safely March 8 at Dyess AFB, Texas, after an engine failed on takeoff. The

USAF photo by SSgt. Angela Stafford



*Former Chief Master Sergeants of the Air Force attended a two-day conference in April at the Pentagon to receive updates on USAF's goals and current issues. At left, the service's former top enlisted men take time to talk with today's Air Force members at a special table set up outside the office of CMSAF Jim Finch.*





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**In a Cameroon village during a joint military medical exercise, Capt. Tammy R. St. Armond administers an injection to a local national. Medical teams turned villages into working health care centers during the exercise, providing immunizations and primary, optometric, and dental care.**

incident sparked grass fires near the base—one of which necessitated the evacuation of the nearby Dyess Elementary School.

■ The first production T-6A Texan II was delivered to Air Education and Training Command at Randolph AFB, Texas, in early March. Acquisition of the new primary training aircraft "truly is a milestone for the Air Force and our sister service, the Navy," said Col. Charles R. Davis, director, Flight Training System Program Office. The T-6A will eventually replace the Air Force's T-37B and the Navy's T-34C primary training aircraft, which are 38 and 23 years old, respectively.

■ An Air Force pilot in upgrade training lost his situational awareness and caused a midair collision between two F-16C aircraft near Springfield, Ill., on Nov. 17, 1999, according to an accident report released in February. One of the F-16s crashed 45 miles northwest of Springfield. The other landed safely at a nearby airport. Neither Maj. Ricky G. Yoder, 170th Fighter Squadron, who ejected, nor 1st Lt. Thomas J. Hildrebrand, also of the 170th FS and who landed his airplane, were seriously hurt.

■ An F-16D assigned to the 347th Wing's 69th Fighter Squadron, Moody AFB, Ga., crashed Feb. 16 near Donalsonville, Ga. Both pilots, Maj. Charles B. Kearney and 1st Lt. Christopher Hutchins, ejected safely. At

the time of the accident they were performing upgrade training using night vision goggles.

■ In another F-16 mishap, an F-16C from the 63rd Fighter Squadron at Luke AFB, Ariz., crashed Feb. 16 on the Barry M. Goldwater Range. The pilot, Maj. Anthony Barrell, who safely ejected, was flying on an air-to-air training mission with three other F-16s. He is an experienced F-16 pilot but was going through a transition course to requalify.

■ About 13,500 families of armed forces enlisted personnel received food stamps last year, and 8,290 received state child-care assistance, according to a new General Accounting Office report.

■ The National Defense University has established a new Center for the Study of Chinese Military Affairs at Ft. McNair, Washington, D.C. The center will provide a forum for multidisciplinary research and analytic exchanges on the national goals and strategic posture of China.

■ The Air Force and Navy are pro-

## USAF, Civil Air Patrol Move Toward Reconciliation



The Air Force and the Civil Air Patrol have essentially reconciled their dispute, which boiled over into a public controversy last year, over control of the CAP, a volunteer civilian auxiliary of the Air Force.

The main element in the agreement is the creation of a new 13-member governing body for CAP called the Board of Governors. Four members would be appointed by the Air Force, four by CAP, and two by Congress. The other three members would be from industry or other organizations with an interest in civil aviation.

Previously, CAP was governed by a 67-member national board, only one member of which was an Air Force representative.

Under the new arrangement, the chair of the Board of Governors would alternate every two years between a member appointed by the Air Force and one appointed by the CAP.


The rift grew out of a 1996 audit, which the Air Force said found significant problems in CAP financial management and accountability, flying safety, professionalism, and standards of conduct. CAP officials said that "only minor discrepancies" were involved and that the Air Force was trying to take over CAP, which was chartered as "a private, nonprofit corporation."

The Air Force asked the Senate to empower the Secretary of the Air Force to appoint a new national board of directors for CAP and establish the regulations under which it operates. CAP advocates in Congress shortstopped that attempt with a bill directing further study before any changes were made.

The CAP and the Air Force are working together on a legislative proposal to submit to Congress, which would codify the changes agreed upon.



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ducing combat pilots of "degraded skill and quality" due to aging aircraft and a shortage of flying hours, according to a new report compiled by a senior Senate defense staffer. Among the report's findings: Key training bases do not have enough aggressor aircraft to mimic enemy tactics.

■ Col. Rick Odegard, deputy commander of the 366th Operations Group, Mountain Home AFB, Idaho, has become the first Air Force fighter pilot to receive an unrestricted ejection-seat waiver for a bilateral hip replacement. An F-15C pilot, Odegard received the waiver Jan. 13, after more than three months of recovery from operations performed in the fall of 1999.

■ Civil Air Patrol pilots posted their safest flying record in five years in 1999. Their accident rate of 2.34 per 100,000 flying hours was substantially lower than the 4.76 rate posted in 1998.

■ The F-15 Project Team, Wright-Patterson AFB, Ohio, was recently awarded the Program Executive Office Team of the Year Award for 1999. The team won the honor for its efforts in managing and executing a highly aggressive \$350 million F-15 active



Olympic gold medalist Carl Lewis, wearing a flight suit, signs autographs for a track team from Judson High School, San Antonio, at the 149th Fighter Wing (ANG), Kelly AFB, Texas. Lewis received an F-16 orientation flight as part of the base's African-American Heritage Month celebration. Lewis earned nine gold medals in Olympic track and field competitions from 1984 to 1996.

USAF photo by SrA. Elaine Wilson-Burney

## Senior Staff Changes

**PROMOTIONS:** To **General:** John W. Handy. To **Lieutenant General:** Michael E. Zettler.

To **ANG Major General:** James Barnette, Gilbert Dardis, David Poythress, Joseph Simeone, Richard Spooner, Steven Thu, Bruce Tuxill. To **ANG Brigadier General:** Shelby Bryant, Kenneth Clark, Gregory Gardner, John Handy, Jon Jacobs, Clifton Leslie Jr., John Love, Douglas Moore, Eugene Sevi, David Strohm, Harry Wyatt III.

To **AFRC Major General:** Ralph Clem, John Danahy, Joseph Lynch, Jeffrey Musfeldt, Robert Siegfried. To **AFRC Brigadier General:** Gerald Black, Richard Ford, Jack Ihle, Keith Meurlin, Betty Mullis, Scott Nichols, David Robinson, Richard Roth, Randolph Ryder Jr., Joseph Shaefer, Charles Stenner Jr., Thomas Taverney, James Turlington.

**CHANGES:** Maj. Gen. Franklin J. Blaisdell, from Cmdt., AFSC, NDU, Norfolk, Va., to Dir., Nuclear & Counterproliferation, DCS, Air & Space Ops., USAF, Pentagon ... Maj. Gen. John H. Campbell, from Vice Dir., DISA, Arlington, Va., to Associate Dir., Central Intel. for Military Support, CIA, Langley, Va. ... Brig. Gen. Charles E. Croom Jr., from Dir., C<sup>3</sup> Sys., USEUCOM, Stuttgart-Vaihingen, Germany, to Vice Dir. and Dep. Dir., Defensewide C<sup>4</sup> Support, Jt. Staff, Pentagon ... Brig. Gen. Edward L. LaFontaine, from Dir., AEF Center Blue Team, ACC, Langley AFB, Va., to Cmct., AFSC, NDU, Norfolk, Va. ... Maj. Gen. (sel.) Timothy J. McMahon, from Dir., Nuclear & Counterproliferation, DCS, Air & Space Ops., USAF, Pentagon, to Cmdr., 20th AF, AFSPC, F.E. Warren AFB, Wyo. ... Brig. Gen. (sel.) John G. Pavlovich, from Cmc.,

341st SW, AFSPC, Malmstrom AFB, Mont., to Dep. Dir., Nuclear & Counterproliferation, DCS, Air & Space Ops., USAF, Pentagon ... Brig. Gen. (sel.) Jeffrey R. Riemer, from Dir., F-16 SPO, ASC, Wright-Patterson AFB, Ohio, to PEO, C<sup>2</sup> Prgms., AFPEO, Asst. SECAF for Acq., Pentagon ... Brig. Gen. (sel.) Marc E. Rogers, from Dir., C/S of the AF Ops. Group, USAF, Pentagon, to Cmdr., 49th FW, ACC, Holloman AFB, N.M. ... Brig. Gen. Gary L. Salisbury, from Dep. Dir., Engineering & Interoperability, DISA, Arlington, Va., to Dir., C<sup>3</sup> Sys., USEUCOM, Stuttgart-Vaihingen, Germany ... Brig. Gen. (sel.) Bernard K. Skoch, from Dir., Chief Info. Office Spt., AF Comm. & Info. Ctr., Pentagon, to Dep. Dir., Engineering & Interoperability, DISA, Arlington, Va. ... Maj. Gen. (sel.) Michael P. Wiedemer, from Cmdr., Sacramento ALC, AFMC, McClellan AFB, Calif., to Dir., Rqmts., AFMC, Wright-Patterson AFB, Ohio ... Brig. Gen. Craig P. Weston, from PEO, C<sup>2</sup> Prgms., AFPEO, Asst. SECAF for Acq., Pentagon, to Dir., Office of Architectures, Assessments, & Acq., NRO, Chantilly, Va. ... Lt. Gen. John L. Woodward Jr., from Dir., C<sup>4</sup> Sys., Jt. Staff, Pentagon, to Dir., Comm. & Info., USAF, Pentagon.

**SENIOR EXECUTIVE SERVICE RETIREMENTS:** James F. Bair, John A. Kline.

**SES CHANGES:** Robert S. Boyd, to Dir., Intel. Analysis, Natl. Air Intel. Ctr., Washington, D.C. ... William M. Brown, to Chief Scientist, Sensors, AFRL, Wright-Patterson AFB, Ohio ... James P. Czekanski, to Dir., Ops., AFRC, Robins AFB, Ga. ... James B. Engle, to Dep. Dir., Strategic Planning, DCS, P&P, USAF, Pentagon ... Paul F. McManamon, to Senior Scientist, Infrared Arrays & Sensors, AFRL, Wright-Patterson AFB, Ohio. ■



electronically scanned array radar upgrade program.

■ MSgt. Dave C. Anderson of the 369th Recruiting Squadron's Aiea, Hawaii, office reeled in 102 new Air Force members in Fiscal 1999. That made him the first Air Force recruiter in a decade to bring more than 100 applicants onto active duty and earned him the badge as the service's top recruiter for Fiscal 1999.

■ Israel declared its Arrow 2 missile battery operational March 14, according to *The Jerusalem Post*. That makes Israel the first country to stand up a missile defense capable of intercepting incoming ballistic missiles.

■ The 301st Fighter Wing of Air Force Reserve Command accepted delivery of the first four Litening II targeting pods in late February. The delivery of the precision strike pods makes the Fort Worth, Texas-based unit the first in the service to own this new state-of-the-art technology.

■ Sloppy communications may have alerted Serbs that some airstrikes were coming in the opening days of Operation Allied Force last year. Pentagon spokesman Kenneth H. Bacon admitted March 10 that some NATO officials believe a spy provided the foreknowledge, which enabled the Serbs to hide some assets. But after a change in communications procedures the problem largely went away, Bacon said.

■ On March 13, the former commander of the 18th Flight Test Squadron at Hurlburt Field, Fla., Col. James Sills, was found guilty of repeatedly molesting two girls, each under age 16, and was sentenced to eight years of confinement and dismissal from the service. In 1994, Sills won the

Mackay Trophy for the year's most meritorious Air Force flight, after leading a daring helicopter rescue of six seamen in stormy weather off the coast of Iceland.

■ The Pentagon announced March 2 the appointment of Deidre A. Lee as the new director of defense procurement, replacing Eleanor Spector, who retired in February. Lee had been the head of the Office of Federal Procurement Policy since July 1998.

## Obituaries

Retired Col. **Thomas W. Ferebee**, the B-29 *Enola Gay* bombardier who dropped the atomic bomb on Hiroshima in World War II, died March 16

in Florida. He was 81. Ferebee also participated in the first US bombing raid on Nazi-occupied France and was the lead bombardier for the Allies' first 100-airplane daylight raid in Europe. He flew aboard B-47s and, as an observer, on B-52s during the Vietnam War. He retired from the Air Force in 1970.

**Ed "Baldy" Baldwin**, a noted aircraft designer who worked on aircraft such as the F-117, SR-71, and U-2, died in early March from complications following a stroke. He joined Lockheed in 1940 and moved to the Skunk Works in 1944, initially to work on the YP-80. He retired from Lockheed in 1982. ■



SSgts. Ryan Jones (left) and Charles Yaws ensure proper placement of a Litening II targeting pod on an F-16 from the 301st Fighter Wing (AFRC). The precision attack targeting system allows F-16 pilots to identify targets at long range, night or day, and drop extremely accurate laser-guided weapons.

USAF photo by MSgt. Bill Gobert

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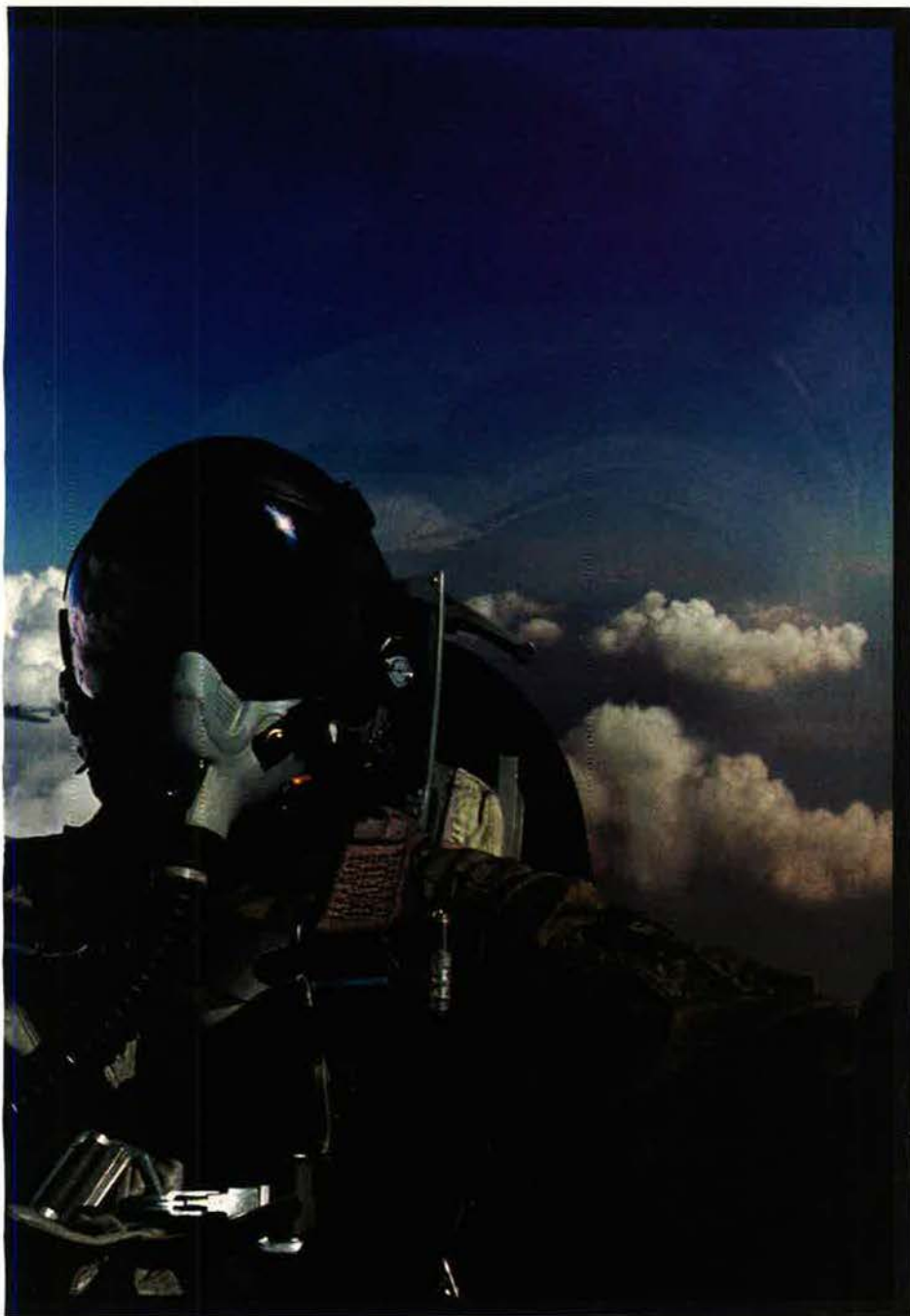


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Towed Decoys  
Airborne Jammers Series  
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RF-4: Navigation Attack Radar  
F-15 Eagle: Radars  
F-16 Falcon: Mission Computers  
F/A-18 Hornet: Radars  
and Radar Warning Receiver  
F-22 Raptor: Radar and Processor  
F-111: Terrain Following Radar  
F-117 Stealth: Targeting System  
Joint Strike Fighter: Avionics  
and Weapons  
B-2 Spirit: Radar  
C-130 Hercules: Talon-1 Navigation  
Attack Radar  
AC-130 Spectre Gunship: FLIR and  
Fire Control Radar  
CV-22 Osprey: Radar and  
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# USAF Alman





# ac

# 2000

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

## 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 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



# USAF Almanac

■ The Air Force in Facts and Figures

## 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 the typical organization chain.

The **Department of Defense (DoD)** is a Cabinet agency headed by the Secretary of Defense. It was created in 1947 to consolidate pre-existing 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. Until recently, most wings were headed by colonels but now are usually under the command of a general officer. An objective wing typically contains an **operations group**, which includes aircrews, intelligence units, and others; a **logistics group**, which can include maintenance and supply squadrons; a **support group**, which can include such functions as security forces and civil engineers; 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, there are numerous others, including centers, field operating agencies, and direct reporting units.

*These F-15s, F-15Es, F-16s, a B-1B, and a KC-135 were part of a composite 366th Wing from Mountain Home AFB, Idaho, that was a forebear of the Air Force's Expeditionary Aerospace Force concept.*



USAF photo by S/A Greg L. Davis





Capt. Joseph C. McConnell Jr.

### USAF Aces of the Korean War

McConnell, Capt. Joseph C. Jr.	16
Jabara, Maj. James	15 <sup>a</sup>
Fernandez, Capt. Manuel J.	14.50
Davis, Maj. George A. Jr.	14 <sup>a</sup>
Baker, Col. Royal N.	13 <sup>a</sup>
Blesse, Maj. Frederick C.	10
Fischer, 1st Lt. Harold E.	10
Garrison, Lt. Col. Vermont	10 <sup>a</sup>
Johnson, Col. James K.	10 <sup>a</sup>
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 <sup>a</sup>
Risner, Capt. Robinson	8
Ruddell, Lt. Col. George I.	8 <sup>a</sup>
Buttleman, 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 <sup>a</sup>
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 <sup>a</sup>
Baldwin, Col. Robert P.	5
Becker, Capt. Richard S.	5
Bettinger, Maj. Stephen L.	5
Creighton, Maj. Richard D.	5 <sup>a</sup>
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 <sup>a</sup>
Wescott, Maj. William H.	5

<sup>a</sup>In addition to World War II victories.



Cpts. Charles B. DeBellevue and Richard S. Ritchie

### USAF Aces of the Vietnam War

DeBellevue, Capt. Charles B.	6
Feinstein, Capt. Jeffrey S.	5
Ritchie, Capt. Richard S.	5



Capt. Jeffrey S. Feinstein



Maj. George A. Davis (left), the first ace in two wars, was the leading ace in Korea with 14 aircraft destroyed when he was shot down on a mission for which he would receive a posthumous Medal of Honor. With him are Col. Ben Preston (center), 4th Fighter-Interceptor Group commander, and Maj. Winton W. Marshall, also an ace. Davis would eventually be surpassed by only three pilots, including Capt. Joseph C. McConnell Jr., USAF's leading ace in Korea.



## 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 <sup>a</sup>	16
Mitchell, Col. John W.	11	4	15
Bruehl, 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 J. Jr.	6	1	7
Bettinger, Maj. Stephen L.	1	5	6
Visser, 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

<sup>a</sup>Olds' four additional victories came during the Vietnam War.



Col. John C. Meyer



Maj. James Jabara

Col. Robin Olds



Col. Francis S. Gabreski



Capt. Robert S. Johnson

## 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 <sup>b</sup>	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

<sup>b</sup>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.



# USAF Recipients of the Medal of Honor

Names, Alphabetically  
by Wars, and Rank  
at Time of Action

\*Living Medal of Honor recipient.

Hometown

Date of Action

Place of Action

## World War I

Bleckley, 2nd Lt. Erwin R.	Wichita, Kan.	Oct. 6, 1918	Binarville, France
Goettler, 2nd Lt. Harold E.	Chicago	Oct. 6, 1918	Binarville, France
Luke, 2nd Lt. Frank Jr.	Phoenix	Sept. 29, 1918	Murvaux, France
Rickenbacker, Capt. 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.	Poplar, Wis.	Oct. 10–Nov. 15, 1944	Southwest Pacific
Carswell, Maj. Horace S. Jr.	Fort Worth, Texas	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. <sup>a</sup>	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, Texas	Aug. 1, 1943	Ploesti, Romania
Kearby, Col. Neel E.	Wichita Falls, Texas	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, SSgt. Archibald	Scotland	Feb. 20, 1944	Leipzig, Germany
Mathis, 1st Lt. Jack W.	San Angelo, Texas	March 18, 1943	Vege sack, 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, Texas	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. <sup>a</sup>	Carlisle, Pa.	June 16, 1943	Buka, Solomon Islands

## Korea

Davis, Maj. George A. Jr.	Dublin, Texas	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, Texas	June 29, 1972	Quang Tri, S. Vietnam
Day, Col. George E. <sup>a</sup>	Sioux City, Iowa	Conspicuous gallantry while POW	
Dethlefsen, Maj. Merlyn H.	Greenville, Iowa	March 10, 1967	Thai Nguyen, N. Vietnam
Fisher, Maj. Bernard F. <sup>a</sup>	San Bernardino, Calif.	March 10, 1966	A Shau Valley, S. Vietnam
Fleming, 1st Lt. James P. <sup>a</sup>	Sedalia, Mo.	Nov. 26, 1968	Duc Co, S. Vietnam
Jackson, Lt. Col. Joe M. <sup>a</sup>	Newnan, Ga.	May 12, 1968	Kham Duc, S. Vietnam
Jones, Col. William A. III	Warsaw, Va.	Sept. 1, 1968	Dong Hoi, N. Vietnam
Levitow, A1C John L. <sup>a</sup>	South Windsor, Conn.	Feb. 24, 1969	Long Binh, S. Vietnam
Sijan, Capt. Lance P.	Milwaukee	Conspicuous gallantry while POW	
Thorsness, Lt. Col. Leo K. <sup>a</sup>	Seattle	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	Da Nang area, 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



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# 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: operational and support.

## Air Combat Command

**Headquarters** Langley AFB, Va.

**Established** June 1, 1992

**Commander** Gen. John P. Jumper

### 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

**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, Joint Forces, 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

Four numbered air forces: **1st** (ANG), Tyndall AFB, Fla.; **8th**, Barksdale AFB, La.; **9th**, Shaw AFB, S.C.; **12th**, Davis-Monthan AFB, Ariz.

One direct reporting unit: Air Warfare Center, Nellis AFB, Nev.  
23 wings

### OPERATIONAL ACTIVITY

Flying hours: 29,275 per month

### Major operations

Allied Force (Yugoslavia), Southern/Northern Watch (Iraq)

### Major training exercises

Air Warrior, Green Flag, Red Flag

(Nellis AFB, Nev.); Air Warrior II (Barksdale AFB, La.); Amalgam Warrior (NORAD); Baltops, TFW (EUCOM); Blue Advance, Fuertas Defensas, New Horizons (SOUTHCOM); Blue Flag (Hurlburt Field, Fla.); Bright Star, Initial Link, Internal Look (CENTCOM); Cooperative Zenith, JTFEX, Linked Seas, Northern Viking, Roving Sands, Strong Resolve (JFCOM); Global Guardian (STRATCOM); Maple Flag (Canada); Rugged Arch (CENTAF)

### PERSONNEL

(as of Sept. 30, 1999)

Active duty	85,906
Officers	12,271
Enlisted	73,635
Reserve components	58,234
ANG	47,432
AFRC	10,802
Civilian	10,817
<b>Total</b>	<b>154,957</b>



*Aircrew and support personnel signal a warrior's goodbye for an Air Combat Command F-16 taking off on deployment from Shaw AFB, S.C., to Operation Allied Force. On this morning in June 1999, 12 Fighting Falcons from the 20th Fighter Wing headed for the conflict in Kosovo.*

USAF photo by 2nd Lt. Paula Kurtz



# AIR COMBAT COMMAND, LANGLEY AFB, VA.



## EQUIPMENT

(Primary Aircraft Inventory as of Sept. 30, 1999)

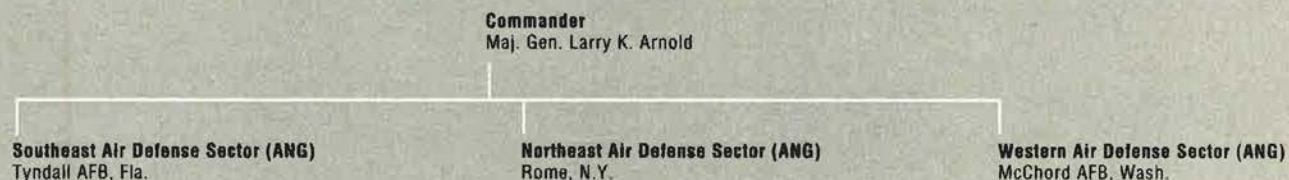
Bombers (B-1B, B-2, B-52H)	116	Fighter/Attack (A/OA-10, F-15, F-16, F-117)	724	E-8, E-9, EC-130, OC-135, RC-135, RQ-1, U-2)	106
		Helicopter (HH-60)	29	Tanker (HC-130, KC-135R)	15
		Recon/BM/C <sup>3</sup> I (E-3, E-4,		Trainer (T-38, TC-135, TU-2)	39

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, Texas	B-1B
9th Reconnaissance Wing	Beale AFB, Calif.	T-38, U-2R/S
20th Fighter Wing	Shaw AFB, S.C.	F-16C/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-1B
33rd Fighter Wing	Eglin AFB, Fla.	F-15C
49th Fighter Wing	Holloman AFB, N.M.	AT-38B, F-4, F-117A, German F-4F
53rd Wing	Eglin AFB, Fla.	A-10, F-15A/C/E, F-16C/D, F-117, HH-60
55th Wing	Offutt AFB, Neb.	E-4B, OC-135B, RC-135S/U/V/W, TC-135S/W, WC-135W
57th Wing	Nellis AFB, Nev.	A-10, F-15C/D/E, F-16, HH-60, RQ-1A
65th Air Base Wing	Lajes Field, the Azores (support)	—
85th Group	NAS Keflavik, Iceland	HH-60
93rd Air Control Wing	Robins AFB, Ga.	E-8C
99th Air Base Wing	Nellis AFB, Nev. (support)	—
347th Wing	Moody AFB, Ga.	A/OA-10, F-16C/D, HC-130, HH-60
355th Wing	Davis-Monthan AFB, Ariz.	A/OA-10, EC-130E/H
366th Wing	Mountain Home AFB, Idaho	B-1B, F-15C/D/E, F-16C/D, KC-135R
388th Fighter Wing	Hill AFB, Utah	F-16C/D
475th Weapons Evaluation Group*	Tyndall AFB, Fla.	E-9, BQM-34, MQM-107, QF-4, QF-106
509th Bomb Wing	Whiteman AFB, Mo.	B-2, T-38
552nd Air Control Wing	Tinker AFB, Okla.	E-3B/C

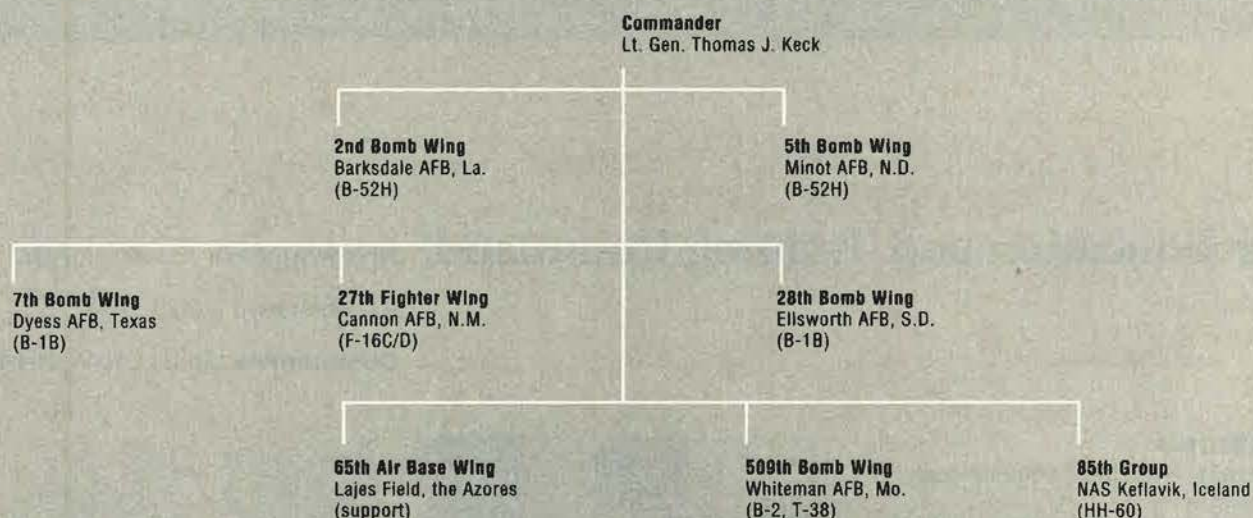
\*Part of 53rd Wing.



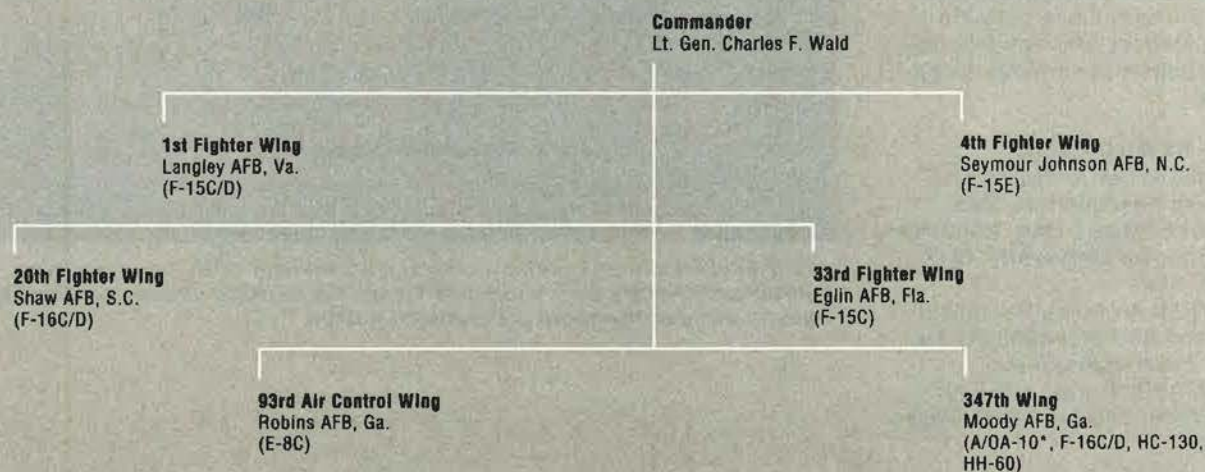
## 1st AIR FORCE (ANG), TYNDALL AFB, FLA.



## 8th AIR FORCE (ACC), BARKSDALE AFB, LA.



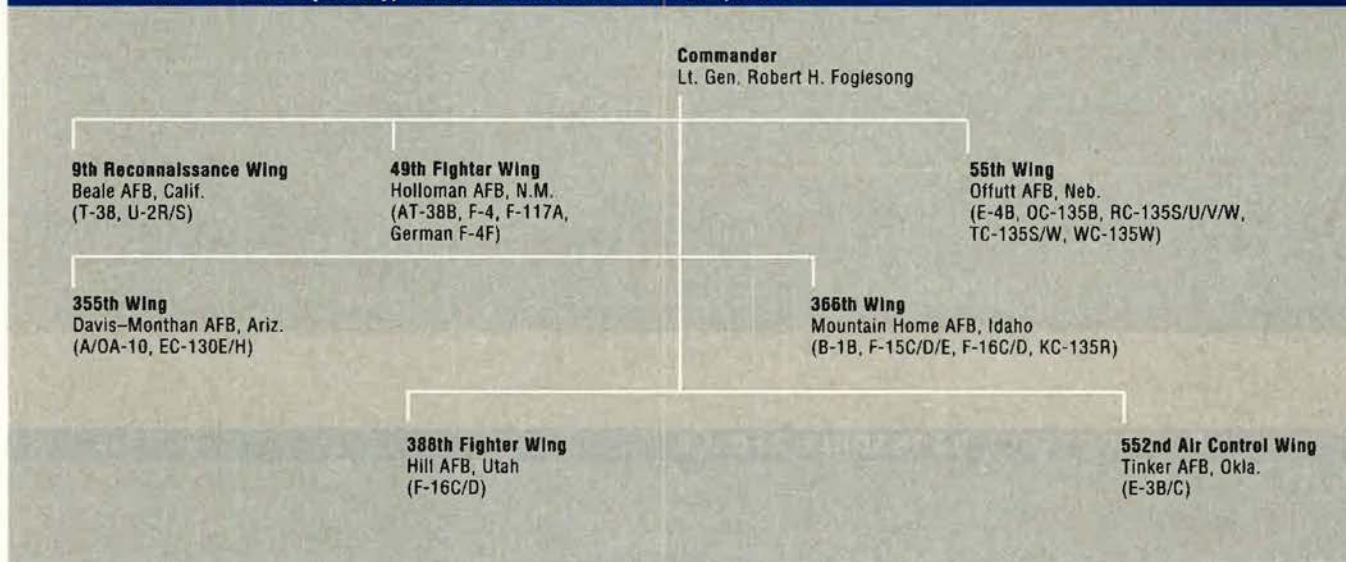
## 9th AIR FORCE (ACC), SHAW AFB, S.C.



\*A/OA-10 unit deactivates June 2000.



## 12th AIR FORCE (ACC), DAVIS-MONTHAN AFB, ARIZ.



# AETC

## Air Education and Training Command

**Headquarters** Randolph AFB, Texas

**Established** July 1, 1993

**Commander** Gen. Lloyd W. Newton

### 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, Texas; **Air University**, Maxwell AFB, Ala.

Three DRUs: Air Force Recruiting Service and Air Force Security Assistance Training Squadron, Randolph AFB, Texas, and 59th Medical Wing, Lackland AFB, Texas  
16 wings

### OPERATIONAL ACTIVITY

Flying hours: 46,229 per month



*At Air Education and Training Command's Lackland AFB, Texas, training instructors have six weeks to guide young raw recruits through basic military training, turning them into professional airmen.*

Staff photo by Guy Aceto



**PERSONNEL**

(as of Sept. 30, 1999)

Active duty		65,400
Officers	14,656	
Enlisted	50,744	
Reserve components		5,888
ANG	4,353	
AFRC	1,535	
Civilian		13,936
<b>Total</b>		<b>85,224</b>

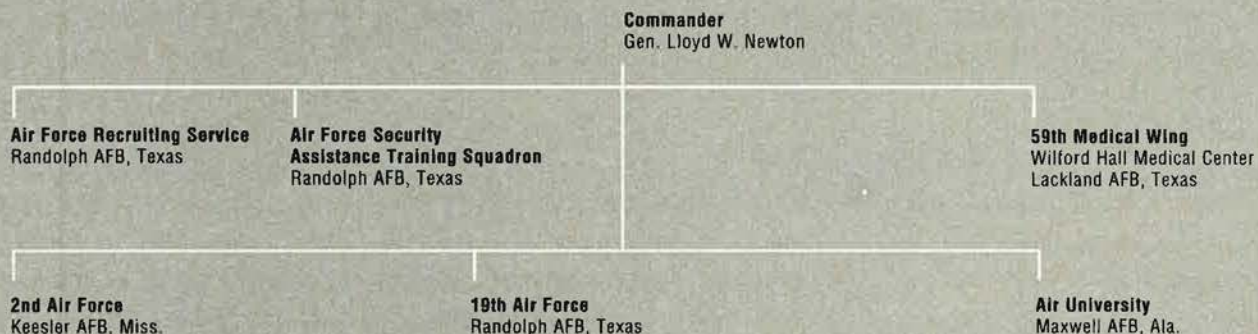
**EQUIPMENT**

(PAI as of Sept. 30, 1999)

Fighter/Attack (F-15, F-16)	227
Helicopter (HH-60, TH-53, UH-1)	20
Special Operations Forces (MC-130, MH-53)	12
Tanker (KC-135)	24
Trainer (AT/T-38, T-1, T-3*, T-6, T-37, T-43)	883
Transport (C-5, C-12, C-17, C-21, C-130, C-141)	64

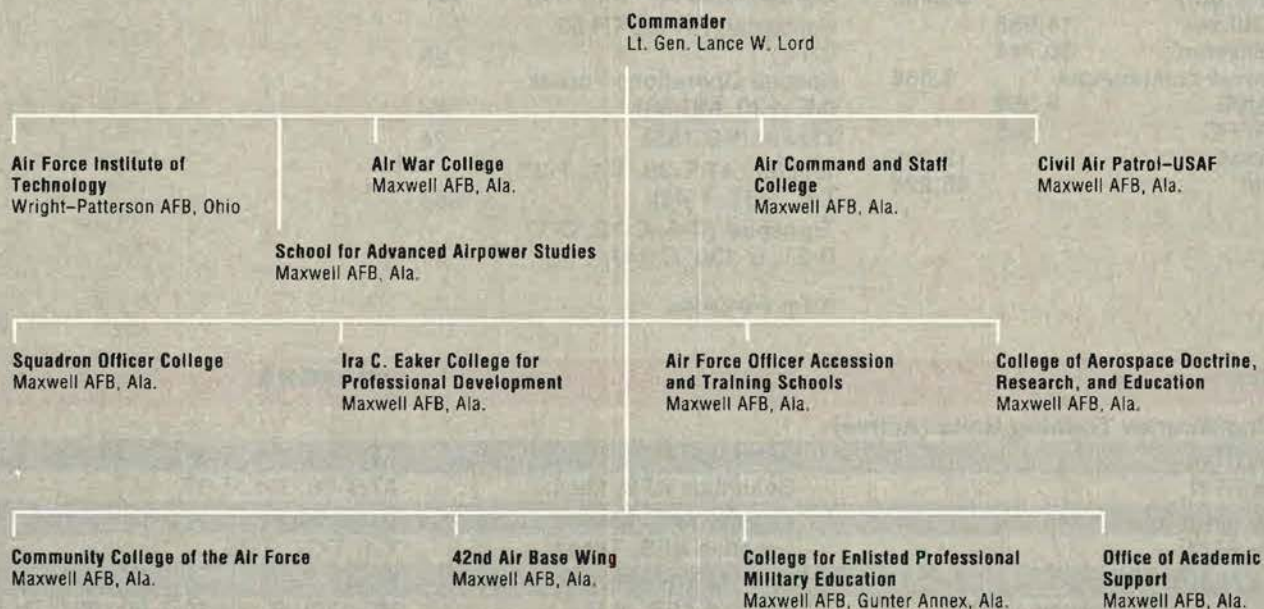
\*T-3 no longer in use.

UNIT	BASE	WEAPONS
<b>Flying/Aircrew Training Units (Active)</b>		
12th FTW	Randolph AFB, Texas	AT/T-38, T-1, T-6, T-37, T-43
14th FTW	Columbus AFB, Miss.	AT/T-38, T-1, T-37
45th Airlift Squadron	Keesler AFB, Miss.	C-12, C-21
47th FTW	Laughlin AFB, Texas	T-1, T-37, T-38
56th Fighter Wing	Luke AFB, Ariz.	F-16
58th Special Operations Wing	Kirtland AFB, N.M.	MC-130H/P, HH-60G, MH-53J, TH-53A, UH-1
71st FTW	Vance AFB, Okla.	T-1, T-37, T-38
80th FTW	Sheppard AFB, Texas	AT/T-38, T-37
97th Air Mobility Wing	Altus AFB, Okla.	C-5, C-17, C-141, KC-135
314th Airlift Wing	Little Rock AFB, Ark.	C-130
325th Fighter Wing	Tyndall AFB, Fla.	F-15
336th Training Group	Fairchild AFB, Wash.	UH-1
<b>Technical Training Units</b>		
17th Training Wing	Goodfellow AFB, Texas	
37th Training Wing	Lackland AFB, Texas	
81st Training Wing	Keesler AFB, Miss.	
82nd Training Wing	Sheppard AFB, Texas	
381st Training Group	Vandenberg AFB, Calif.	
<b>Other Major Units</b>		
Air University	Maxwell AFB, Ala.	
Air Force Recruiting Service	Randolph AFB, Texas	
42nd Air Base Wing	Maxwell AFB, Ala.	
59th Medical Wing	Lackland AFB, Texas	

**AIR EDUCATION AND TRAINING COMMAND, RANDOLPH AFB, TEXAS**



## AIR UNIVERSITY (AETC), MAXWELL AFB, ALA.

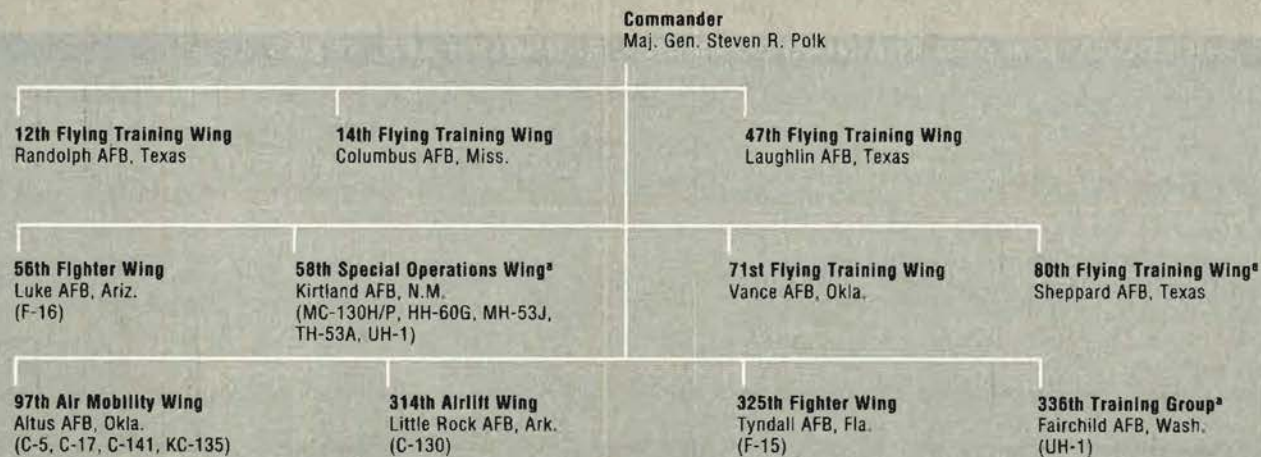


## 2nd AIR FORCE (AETC), KEESLER AFB, MISS.



\*Tenant unit.

## 19th AIR FORCE (AETC), RANDOLPH AFB, TEXAS



\*Tenant unit.



# Air Force Materiel Command

**Headquarters** Wright-Patterson AFB, Ohio

**Established** July 1, 1992

**Commander** Gen. Lester L. Lyles

## MISSIONS

**Manage** the integrated research, development, test, acquisition, and sustainment of weapon systems

**Produce** and acquire advanced systems

**Operate** major product centers, logistics centers, test centers, and the Air Force Research Laboratory

## FORCE STRUCTURE

Four major product centers  
Two test centers  
Five air logistics centers  
Two specialized centers  
One laboratory

## OPERATIONAL ACTIVITY

Flying hours: 2,400 per month

## PERSONNEL

(as of Sept. 30, 1999)

Active duty		28,647
Officers	7,959	
Enlisted	20,688	
Reserve components		5,738
ANG	2,299	
AFRC	3,439	
Civilian		61,473
<b>Total</b>		<b>95,858</b>

## EQUIPMENT

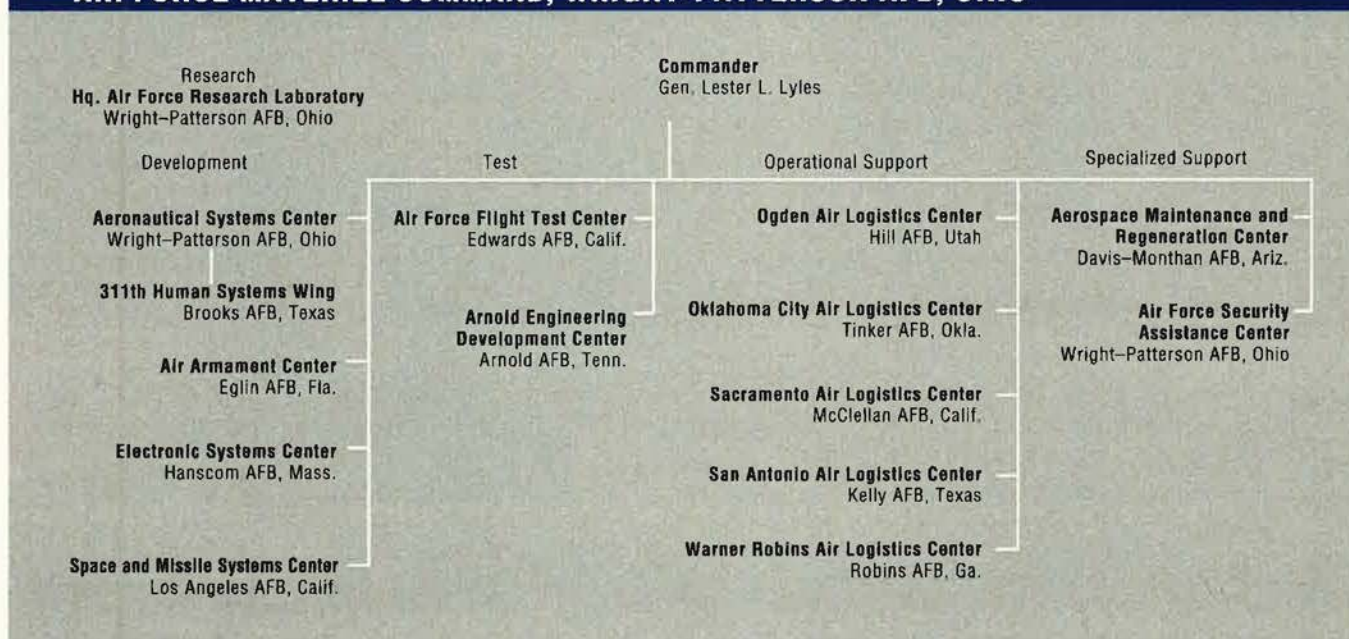
(PAI as of Sept. 30, 1999)		Recon/BM/C <sup>3</sup> I (EC-18, EC-135)	4
Bomber (B-1B, B-52)	3	SOF (MH-60)	3
Fighter/Attack (A-10, F-15, F-16, F-22, F-117)	66	Tanker (NKC/KC-135)	4
Helicopter (UH-1)	2	Trainer (AT/T-38, T-39)	17
		Transport (C-12, C-17, C-130, C-135)	37

## UNIT

## BASE

Aeronautical Systems Center	Wright-Patterson AFB, Ohio
Air Armament Center	Eglin AFB, Fla.
Electronic Systems Center	Hanscom AFB, Mass.
Space and Missile Systems Center	Los Angeles AFB, Calif.
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.
Sacramento Air Logistics Center	McClellan AFB, Calif.
San Antonio Air Logistics Center	Kelly AFB, Texas
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 AFB, Texas
Hq. Air Force Research Laboratory	Wright-Patterson AFB, Ohio

## AIR FORCE MATERIEL COMMAND, WRIGHT-PATTERSON AFB, OHIO







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THE PRICE OF VICTORY.



maximum affordability. Based on real-time costs and advanced commercial production processes. A guarantee only Boeing can deliver.





# Air Force Space Command

**Headquarters** Peterson AFB, Colo.  
**Established** Sept. 1, 1982  
**Commander** Gen. Ralph E. Eberhart

## 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 USSPACECOM; space weather support to entire DoD

## 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 direct reporting unit: Space Warfare Center  
 Seven space wings  
 One space group

## PERSONNEL

(as of Sept. 30, 1999)

Active duty		18,210
Officers	3,706	
Enlisted	14,504	
Reserve components		837
ANG	252	
AFRC	585	
Civilian		4,139
<b>Total</b>		<b>23,186</b>

## EQUIPMENT

(as of Sept. 30, 1999)

**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

**Helicopters:** 22

**ICBMs:**

Peacekeeper: 50  
 Minuteman III: 500

**NATO III** communications satellites

**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, 2000):

GPS: Block II/IIA/IIR: 28  
 DSCS III: 10  
 Milstar: 2  
 UHF Follow-on: 8  
 DMSP: 5

## Space surveillance systems:

Electro-Optical Deep Space Surveillance System, phased-array radars, mechanical tracking radars, passive surveillance radars



USAF photo by TSgt. Scott Wagers

*Air Force Space Command's responsibilities include command and control for DoD satellites—a mission handled by personnel at Schriever AFB, Colo.*

## AIR FORCE SPACE COMMAND, PETERSON AFB, COLO.

**Commander**  
 Gen. Ralph E. Eberhart

**14th Air Force**  
 Vandenberg AFB, Calif.

**Space Warfare Center**  
 Schriever AFB, Colo.

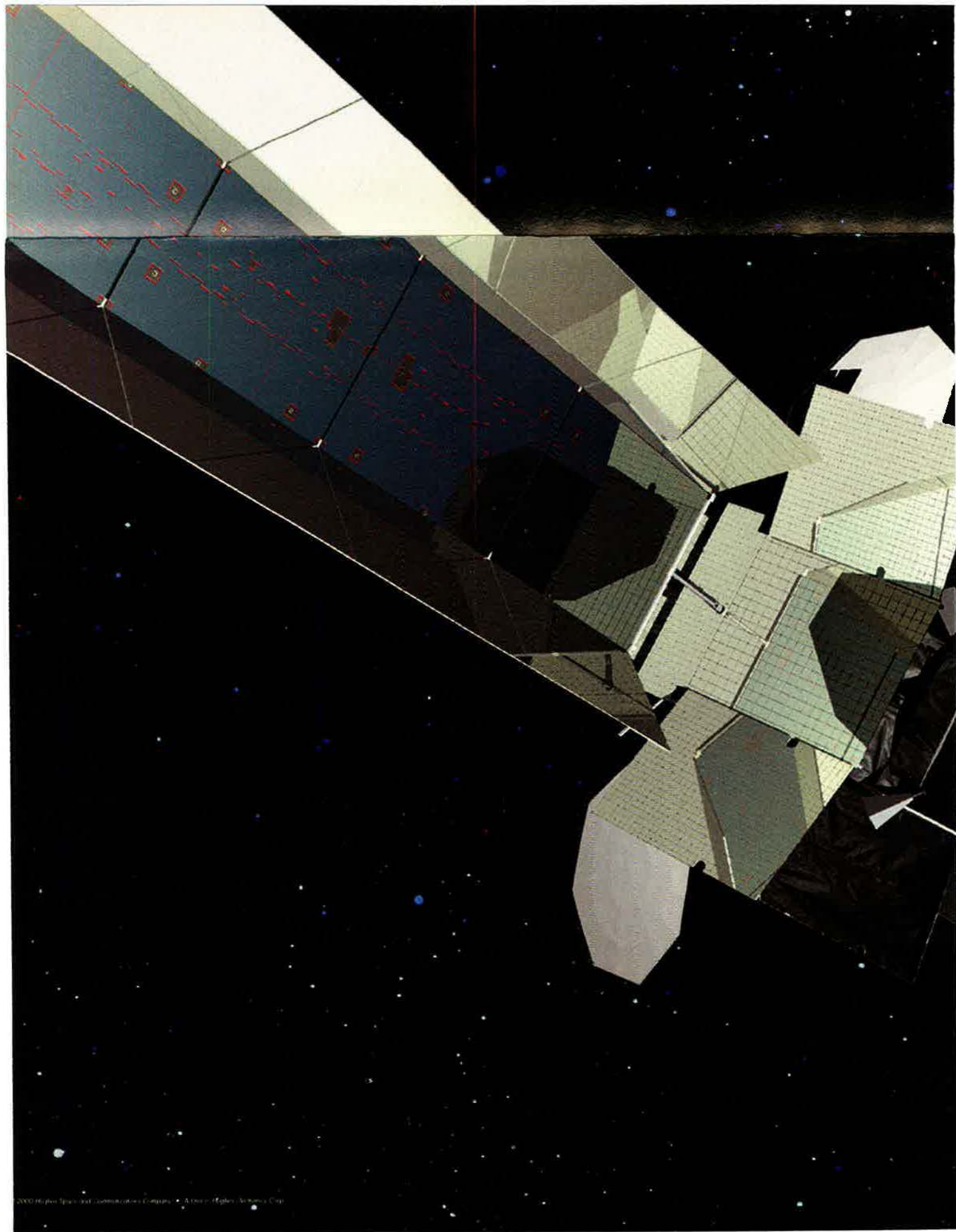
**20th Air Force**  
 F.E. Warren AFB, Wyo.



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Hughes 702

The world's  
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communications  
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Launched  
December 21, 1999

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## 14th AIR FORCE (AFSPC), VANDENBERG AFB, CALIF.

**Commander**  
Maj. Gen. Robert C. Hinson

**21st Space Wing**  
Peterson AFB, Colo.

**30th Space Wing**  
Vandenberg AFB, Calif.  
(UH-1N)

**45th Space Wing**  
Patrick AFB, Fla.

**50th Space Wing**  
Schriever AFB, Colo.

**821st Space Group**  
Buckley ANGB, Colo.

## 20th AIR FORCE (AFSPC), F.E. WARREN AFB, WYO.

**Commander**  
Maj. Gen. Thomas H. Neary

**90th Space Wing**  
F.E. Warren AFB, Wyo.  
(Peacekeeper, Minuteman III, 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
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
821st Space Group	Buckley ANGB, Colo.	Missile warning and space communications

# AFSOC

## Air Force Special Operations Command

**Headquarters** Hurlburt Field, Fla.

**Established** May 22, 1990

**Commander** Lt. Gen. Maxwell C. Bailey

### 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)

Two squadrons (one flight test and one support operations)

USAF Special Operations School



*An Air Force Special Operations Command MH-53M Pave Low from the 21st Special Operations Squadron, RAF Mildenhall, UK, prepares to take on fuel from a 67th SOS MC-130P also from Mildenhall. Both aircraft were participating in a humanitarian mission to flood-damaged Mozambique in March.*



USAF photo by TSgt. Chuck Roberts

## OPERATIONAL ACTIVITY

Flying hours: 4,700 per month

## PERSONNEL

(as of Sept. 30, 1999)

Active duty	9,131
Officers	1,473
Enlisted	7,658
Reserve components	2,473
ANG	1,226
AFRC	1,247
Civilian	571
<b>Total</b>	<b>12,175</b>

## EQUIPMENT

(PAI as of Sept. 30, 1999)

Helicopter (UH-1)	2
Recon/BM/C <sup>3</sup> I (EC-137)	1
SOF (AC-130, MC-130, MH-53, MH-60)	92

UNIT	BASE	WEAPONS
16th Special Operations Wing	Hurlburt Field, Fla.	AC-130H/U, EC-137, MC-130E/H, MC-130P (Eglin AFB, Fla.), MH-53J/M, UH-1
18th Flight Test Squadron	Hurlburt Field, Fla.	—
352nd Special Operations Group	RAF Mildenhall, UK	MC-130H, MC-130P, MH-53J/M
353rd Special Operations Group	Kadena AB, Japan	MC-130H/P, MH-53J (Osan AB, South Korea)
720th Special Tactics Group	Hurlburt Field, Fla.	—
USAF Special Operations School	Hurlburt Field, Fla.	—

## AIR FORCE SPECIAL OPERATIONS COMMAND, HURLBURT FIELD, FLA.

**Commander**  
Lt. Gen. Maxwell C. Bailey

**16th Special Operations Wing**  
Hurlburt Field, Fla.  
(AC-130H/U, EC-137, MC-130E/H, MC-130P<sup>a</sup>, MH-53J/M, UH-1)

**352nd Special Ops Group**  
RAF Mildenhall, UK  
(MC-130H, MC-130P, MH-53J/M)

**353rd Special Ops Group**  
Kadena AB, Japan  
(MC-130H/P, MH-53J<sup>b</sup>)

**720th Special Tactics Group**  
Hurlburt Field, Fla.

**18th Flight Test Squadron**  
Hurlburt Field, Fla.

**USAF Special Ops School**  
Hurlburt Field, Fla.

**AFSOC Air Support Ops Squadron**  
Ft. Bragg, N.C.

<sup>a</sup>MC-130Ps are at Eglin AFB, Fla.

<sup>b</sup>MH-53Js are at Osan AB, South Korea.



# AMC

**Air Mobility Command** Headquarters Scott AFB, Ill.

**Established** June 1, 1992

**Commander** Gen. Charles T. Robertson Jr.

## 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 direct reporting units: 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, two air mobility, four air refueling)

Three groups (two airlift, one air refueling)

## OPERATIONAL ACTIVITY

Flying hours: 30,000+ per month

## Major operations

Able Sentry, Sabre (Macedonia); Allied Force, Joint Guardian, Shining Hope (Yugoslavia); Avid Response (earthquake relief, Turkey); Deep Freeze (Arctic/Antarctic); Deliberate/Joint Forge (Bosnia); Hurricane Mitch (Honduras and Nicaragua); Laser Strike (Latin

America); Northern/Southern Watch (Iraq); Phoenix Banner (Europe, New Zealand, Mediterranean); Safe Border (Ecuador and Peru); Stabilise (East Timor); Taiwan earthquake support

## Major training exercises

African Crisis Response Initiative; Amalgam Warrior (NORAD); Atlas Drop, Bright Star, Eastern Castle (CENTCOM); Cobra Gold, Tandem Thrust, Team Spirit, Purple Dragon (PACOM); New Horizons (Dominican Republic, Haiti, St. Lucia)

## PERSONNEL

(as of Sept. 30, 1999)

Active duty	51,580
Officers	8,917
Enlisted	42,663
Reserve components	82,787
ANG	37,982
AFRC	44,805
Civilian	7,991
<b>Total</b>	<b>142,358</b>



USAF photo by SSgt. Efrain Gonzalez

USAF photo by MSgt. Raymond T. Conway



*Air Mobility Command operations include airlifting supplies, equipment, and people, including non-DcD personnel such as the US Federal Protection Service member above. Loadmasters from the 62nd Airlift Wing, McChord AFB, Wash. (at left), braved the Antarctic cold to deliver medical and other supplies to a National Science Foundation station at the South Pole.*

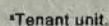
## EQUIPMENT

(PAI as of Sept. 30, 1999)

Helicopter (UH-1)	15
Recon/BM/C <sup>3</sup> I (EC-135)	1
Tanker (KC-10, KC-135)	222
Trainer (CT-43)	1
Transport (C-5, C-9, C-17, C-20, C-21, C-32, C-37, C-130, C-137, C-141, VC-25)	350



**AIR MOBILITY COMMAND, SCOTT AFB, ILL.**





# PACAF

## Pacific Air Forces

**Headquarters** Hickam AFB, Hawaii

**Established** July 1, 1957

**Commander** Gen. Patrick K. Gamble

### MISSIONS

**Plan**, conduct, and coordinate offensive and defensive air operations in the Asian and Pacific theaters

**Organize**, train, equip, and maintain resources to conduct air operations

### 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: 10,543 per month

### Major training exercises

Cobra Gold (Thailand), Commando Sling (Singapore), Cope North (Japan), Cope Thunder (Alaska), Cope Tiger (Thailand), Foal Eagle (South Korea), Positive Force (Pacific), Reception Staging Onward Movement and Integration (South Korea), Tandem Thrust (Guam, No. Marianas), Ulchi Focus Lens (South Korea)



*An A-10 and F-16 from the 51st Fighter Wing, Osan AB, fly over the farm fields of South Korea, training for offensive and defensive air operations.*

### PERSONNEL

(as of Sept. 30, 1999)

Active duty	32,289
Officers	4,032
Enlisted	28,257

Reserve components	4,409
ANG	4,094
AFRC	315
Civilian	8,468
<b>Total</b>	<b>45,166</b>

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	C-135E
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, UH-1N

### PACIFIC AIR FORCES, HICKAM AFB, HAWAII

**Commander**  
Gen. Patrick K. Gamble

**5th Air Force**  
Yokota AB, Japan

**7th Air Force**  
Osan AB, South Korea

**11th Air Force**  
Elmendorf AFB, Alaska

**15th Air Base Wing**  
Hickam AFB, Hawaii  
(C-135E)

**13th Air Force**  
Andersen AFB, Guam



## 5th AIR FORCE (PACAF), YOKOTA AB, JAPAN

**Commander**  
Lt. Gen. Paul V. Hester

**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, UH-1N)

## 7th AIR FORCE (PACAF), OSAN AB, SOUTH KOREA

**Commander**  
Lt. Gen. Charles R. Heflebower

**8th Fighter Wing**  
Kunsan AB, South Korea  
(F-16C/D)

**51st Fighter Wing**  
Osan AB, South Korea  
(A/OA-10A, C-12J, F-16C/D)

## 11th AIR FORCE (PACAF), ELMENDORF AFB, ALASKA

**Commander**  
Lt. Gen. Thomas R. Case

**3rd Wing**  
Elmendorf AFB, Alaska  
(C-12J/F, 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, 1999)

Fighter/Attack (A/OA-10, F-15, F-16)	270
Helicopter (UH-1, HH-60)	11
Recon/BM/C <sup>3</sup> I (E-3)	4
Tanker (KC-135)	15
Transport (C-9, C-12, C-21, C-130, C-135)	41

*Personnel from the 374th Security Forces Squadron, Yokota AB, Japan, were among 30,000 US military forces from all services taking part in Foal Eagle '99, a Joint Chiefs of Staff exercise in South Korea testing rear-area protection and command, control, and communications systems.*



USAF photo by MSgt. Val Gampis

## 13th AIR FORCE (PACAF), ANDERSEN AFB, GUAM

**Commander**  
Maj. Gen. Daniel M. Dick

**36th Air Base Wing**  
Andersen AFB, Guam

**497th Fighter Training Squadron**  
Paya Lebar Airfield, Singapore\*

\*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  
Six wings (one multimission, one air refueling, one airlift, and three fighter)

### OPERATIONAL ACTIVITY

Flying hours: 8,544 per month

### Major operations

Allied Force, Joint Guardian, Shining Hope (Yugoslavia); Joint Forge (Bosnia); Northern Watch (Iraq)



USAF photo by S/A Jeffrey Allen

*An F-16 flies over the Adriatic Sea, returning from an Operation Joint Guardian mission over Kosovo. US Air Forces in Europe air bases were beehives of activity for Allied Force, with Aviano AB, Italy, as a major hub.*

### US AIR FORCES IN EUROPE, RAMSTEIN AB, GERMANY

**Commander**  
Gen. Gregory S. Martin

**3rd Air Force**  
RAF Mildenhall, UK  
Maj. Gen. Joseph H. Wehrle Jr.

**16th Air Force**  
Aviano AB, Italy  
Lt. Gen. Ronald E. Keys\*

The USAFE organizational chart above shows peacetime lines of command. The chart below shows the NATO wartime command lines of authority.

### Allied Command Europe (ACE)

**Allied Forces Southern Europe (AFSOUTH)**  
Naples, Italy

**Allied Forces Central Europe (AFCENT)**  
Brunssum, Netherlands

**Allied Forces Northwest Europe (AFNORTHWEST)**  
High Wycombe, UK

**Allied Air Forces Southern Europe (AIRSOUTH)**  
Naples, Italy

**Allied Air Forces Central Europe (AIRCENT)**  
Ramstein AB, Germany

**Allied Air Forces Northwest Europe (AIRNORTHWEST)**  
High Wycombe, UK

**5th Allied Tactical Air Force**  
Vicenza, Italy

**6th Allied Tactical Air Force**  
Izmir, Turkey

\*Confirmed.



## Major training exercises

African Eagle, Atlas Drop, Baltops, Clean Hunter, Combined Endeavor, Cooperative Banner/Chance/Key, Cornerstone, Dynamic Mix, Humro, Juniper Stallion, Matador, Medceur, Medflag, Tactical Fighter Weaponry, Trailblazer, Union Flash

## PERSONNEL

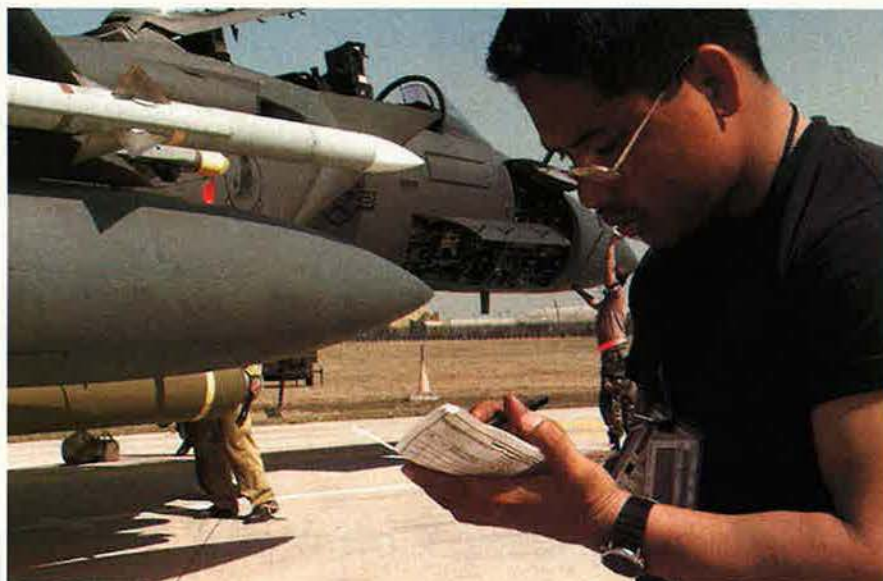
(as of Sept. 30, 1999)

Active duty	26,020
Officers	3,398
Enlisted	22,622
Reserve components	230
ANG	60
AFRC	170
Civilian	5,064
<b>Total</b>	<b>31,314</b>

## EQUIPMENT

(PAI as of Sept. 30, 1999)

Fighter/Attack (A/OA-10, F-15, F-16)	174
Tanker (KC-135)	15
Transport (C-9, C-20, C-21, C-130)	37



At Aviano AB, F-15 crew chief SSgt. Daniel Ventura—based at RAF Lakenheath, UK—logs information on a jet that has just returned from an Allied Force strike mission.

USAF photo by MSGt. Keith Reed

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
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. Joseph H. Wehrle Jr.

**48th Fighter Wing**  
RAF Lakenheath, UK  
(F-15C/D, F-15E)

**52nd Fighter Wing**  
Spangdahlem AB, Germany  
(A/OA-10, F-16C/D)

**86th Airlift Wing**  
Ramstein AB, Germany  
(C-9, C-20, C-21, C-130E)

**100th Air Refueling Wing**  
RAF Mildenhall, UK  
(KC-135R)

## 16th AIR FORCE (USAFE), AVIANO AB, ITALY

**Commander**  
Lt. Gen. Ronald E. Keys\*

**31st Fighter Wing**  
Aviano AB, Italy  
(F-16C/D)

**39th Wing**  
Incirlik AB, Turkey  
(Tactical range and contingency support, rotational aircraft)

\*Confirmed.



## 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.

# AFRC

**Headquarters** Robins AFB, Ga.

**Established** Feb. 17, 1997

**Commander** Maj. Gen. James E. Sherrard III

### MISSIONS

**Support** the active duty force  
**Serve** in such missions as fighter, bomber, airlift, aerial refueling, rescue, special operations, aero-medical 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 (Carswell Field), Texas; **22nd**, Dobbins ARB, Ga.

35 flying wings

Eight groups (one air refueling, one air control, one flying training, one rescue, one space, and three regional support)

### OPERATIONAL ACTIVITY

Allied Force, Shining Hope (Yugoslavia); airlift, air refueling, and fighter support (Bosnia); Coronet Oak (Central and South America); Northern/Southern Watch (Iraq)

### PERSONNEL

(as of Sept. 30, 1999)

Total AFRC (paid)*	71,722
Officers	16,215
Enlisted	55,557
Civilians (non-ART)	5,057
<b>Total</b>	<b>76,829</b>

\*Numbers for AFRC personnel assigned to Majcoms, FOAs, and DRUs are included here.



DoD photo by Dave Davenport

*The Total Force effort for Allied Force meant Air Force Reserve Command personnel worked alongside active duty service members. Here SrA. Benny Ambs (left), 43rd Airlift Wing, Pope AFB, N.C., discusses maintenance status and fuel load with SSgt. Steve Keller from the 315th Airlift Wing (AFRC), Charleston AFB, S.C.*

### EQUIPMENT

(PAI as of Sept. 30, 1999)		Recon/BM/C <sup>3</sup> I (WC-130)	10
Bomber (B-52)	8	SOF (MC-130)	12
Fighter/Attack (A/OA-10, F-16)	105	Tanker (HC-130, KC-135)	72
Helicopter (HH-60)	21	Transport (C-5, C-130, C-141)	165



## AIR FORCE RESERVE COMMAND, ROBINS AFB, GA.

**Commander**  
Maj. Gen. James E. Sherrard III

**4th Air Force**  
March ARB, Calif.

**10th Air Force<sup>c</sup>**  
NAS Fort Worth JRB  
(Carswell Field), Texas

**22nd Air Force**  
Dobbins ARB, Ga.

**Air Reserve Personnel Center**  
Col. Margie L. Humphrey  
Denver, Colo.

## 4th AIR FORCE (AMC), MARCH ARB, CALIF.

**Commander**  
Maj. Gen. Wallace W. Whaley

**349th Air Mobility Wing**  
Travis AFB, Calif.  
(C-5A/B, KC-10<sup>a</sup>)

**433rd Airlift Wing**  
Kelly AFB, Texas  
(C-5A)

**434th Air Refueling Wing**  
Grissom ARB, Ind.  
(KC-135R)

**445th Airlift Wing**  
Wright-Patterson AFB, Ohio  
(C-141C)

**446th Airlift Wing**  
McChord AFB, Wash.  
(C-17, C-141B)<sup>a</sup>

**452nd Air Mobility Wing**  
March ARB, Calif.  
(C-141C, KC-135R)

**507th Air Refueling Wing**  
Tinker AFB, Okla.  
(C-29<sup>a</sup>, KC-135R)

**916th Air Refueling Wing**  
Seymour Johnson AFB, S.C.  
(KC-135R)

**927th Air Refueling Wing**  
Selfridge ANGB, Mich.  
(KC-135E)

**932nd Airlift Wing**  
Scott AFB, Ill.  
(C-9<sup>a</sup>)

**940th Air Refueling Wing**  
Beale AFB, Calif.  
(KC-135E)

**931st Air Refueling Group**  
McConnell AFB, Kan.  
(KC-135R<sup>a</sup>)

## 10th AIR FORCE (ACC), NAS FORT WORTH JRB (CARSWELL FIELD), TEXAS

**Commander**  
Maj. Gen. John A. Bradley

**301st Fighter Wing<sup>c</sup>**  
NAS Fort Worth JRB  
(Carswell Field), Texas  
(F-16C/D)

**419th Fighter Wing**  
Hill AFB, Utah  
(F-16C/D)

**442nd Fighter Wing**  
Whiteman AFB, Mo.  
(OA-10A)

**482nd Fighter Wing**  
Homestead ARB, Fla.  
(F-16C)

**917th Wing**  
Barksdale AFB, La.  
(B-52H, OA-10A)

**919th Special Ops Wing**  
Duke Field, Fla.  
(MC-130E/P)<sup>b</sup>

**926th Fighter Wing<sup>c</sup>**  
NAS JRB New Orleans, La.  
(OA-10A)

**939th Rescue Wing**  
Patrick AFB, Fla., Portland IAP,  
Ore., Davis-Monthan AFB, Ariz.,  
(HC-130N/P, HH-60G)

**944th Fighter Wing**  
Luke AFB, Ariz.  
(F-16C/D)<sup>b</sup>

**310th Space Group**  
Schriever AFB, Colo.

**340th Flying Training Group**  
Randolph AFB, Texas  
(AT/T-38, T-1, T-37)<sup>a</sup>

**513th Air Control Group**  
Tinker AFB, Okla.  
(E-3<sup>a</sup>)

**Det. 1**  
Shaw AFB, S.C.  
(F-16C/D<sup>a</sup>)

## 22nd AIR FORCE (AMC), DOBBINS ARB, GA.

**Commander**  
Maj. Gen. John J. Batbie Jr.

**94th Airlift Wing**  
Dobbins ARB, Ga.  
(C-130H)

**302nd Airlift Wing**  
Peterson AFB, Colo.  
(C-130H)

**315th Airlift Wing**  
Charleston AFB, S.C.  
(C-17A, C-141B)<sup>a</sup>

**403rd Wing**  
Keesler AFB, Miss.  
(C-130E, WC-130H/J)

**439th Airlift Wing**  
Westover ARB, Mass.  
(C-5A)

**440th Airlift Wing**  
General Mitchell IAP/ARS, Wis.  
(C-130H)

**459th Airlift Wing**  
Andrews AFB, Md.  
(C-141B/C)

**512th Airlift Wing**  
Dover AFB, Del.  
(C-5A/B<sup>a</sup>)

**514th Air Mobility Wing**  
McGuire AFB, N.J.  
(C-141B, KC-10A)<sup>a</sup>

**908th Airlift Wing**  
Maxwell AFB, Ala.  
(C-130H)

**910th Airlift Wing**  
Youngstown-Warren  
Regional Airport/ARS, Ohio  
(C-130H)

**911th Airlift Wing**  
Pittsburgh IAP/ARS, Pa.  
(C-130H)

**913th Airlift Wing**  
Willow Grove ARS, Pa.  
(C-130E)

**914th Airlift Wing**  
Niagara Falls IAP/ARS, N.Y.  
(C-130H)

**934th Airlift Wing**  
Minneapolis-St. Paul IAP/  
ARS, Minn.  
(C-130E)

<sup>a</sup>Associate aircraft.

<sup>b</sup>AFRC-owned and associate aircraft.

<sup>c</sup>Tenant unit on naval base.

**ANGB**  
**ARB**  
**ARS**

Air National Guard Base  
Air Reserve Base  
Air Reserve Station

**IAP**  
**JRB**  
**NAS**

International Airport  
Joint Reserve Base  
Naval Air Station



# ANG

## Air National Guard

**Headquarters** Washington

**Established** Sept. 18, 1947

**Director** Maj. Gen. Paul A. Weaver Jr.

### 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

Flying units: 88 wings

### OPERATIONAL ACTIVITY

Allied Force (Yugoslavia); Coronet Nighthawk (Central America); Coronet Oak (South America); Joint Guard (Bosnia); Northern/Southern Watch (Iraq); relief missions for victims of several major hurricanes; partnership programs with nations of the former Soviet Union



USAF photo by SSgt. Marvin R. Preston

USAF photo by S/A James N. Faso II



*The Total Force includes Air National Guard participation in Aerospace Expeditionary Forces. Here, Maj. Jeff Smith and John Busch, both from the 169th Fighter Wing, McEntire ANGB, S.C., prepare for AEF 4 to Incirlik AB, Turkey.*

*At left, a KC-135R from the 168th Air Refueling Wing (ANG), Eielson AFB, Alaska, accompanies F-15s out of the 3rd Wing at Elmendorf AFB, Alaska, to refuel the fighters en route to Allied Force.*

### PERSONNEL

(as of Sept. 30, 1999)

Total ANG military*	105,715
Officers	13,291
Enlisted	92,424
Civilian	1,485
<b>Total</b>	<b>107,200</b>

\*Includes ANG personnel assigned to Majcoms, FOAs, and DRUs.

### EQUIPMENT

(PAI as of Sept. 30, 1999)

Bomber (B-1)	18
Fighter/Attack (A/OA-10, F-15, F-16)	655
Helicopter (HH-60)	15
Recon/BM/C <sup>3</sup> I (EC-130)	5
Tanker (HC-130, KC-135)	214
Transport (C-5, C-21, C-22, C-26, C-38, C-130, C-141)	263



## The Air National Guard by Major Command Assignment

(As of April 1, 2000)

### Air Combat Command

#### A-10A

103rd Fighter Wing	Bradley IAP, Conn.
104th Fighter Wing	Barnes MAP, Mass.
110th Fighter Wing	W.K. Kellogg Airport, Mich.
124th Wing <sup>a</sup>	Boise Air Terminal, Idaho
175th Wing <sup>a</sup>	Baltimore

#### B-1B

116th Bomb Wing	Robins AFB, Ga.
184th Bomb Wing	McConnell AFB, Kan.

#### F-15

131st Fighter Wing	Lambert-St. Louis IAP, Mo.
159th Fighter Wing	NAS JRB New Orleans, La. <sup>b</sup>

#### F-15—air defense

102nd Fighter Wing	Otis ANGB, Mass.
125th Fighter Wing	Jacksonville IAP, Fla.
142nd Fighter Wing	Portland IAP, 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 IAP, N.D.
120th Fighter Wing	Great Falls IAP, Mont.
122nd Fighter Wing	Fort Wayne IAP, Ind.
127th Wing <sup>a</sup>	Selfridge ANGB, Mich.
132nd Fighter Wing	Des Moines IAP, Iowa
138th Fighter Wing	Tulsa IAP, Okla.
140th Wing	Buckley ANGB, Colo.
147th Fighter Wing	Ellington Field, Texas
148th Fighter Wing	Duluth IAP, Minn.
150th Fighter Wing	Kirtland AFB, N.M.
158th Fighter Wing	Burlington IAP, Vt.
169th Fighter Wing	McEntire ANGB, S.C.
174th Fighter Wing	Syracuse Hancock IAP, N.Y.
177th Fighter Wing	Atlantic City IAP, N.J.
180th Fighter Wing	Toledo Express Airport, Ohio
181st Fighter Wing	Hulman Regional Airport, Ind.
183rd Fighter Wing	Capital MAP, Ill.
185th Fighter Wing	Sioux Gateway Airport, Iowa
187th Fighter Wing	Dannelly Field, Ala.
188th Fighter Wing	Fort Smith MAP, Ark.
192nd Fighter Wing	Richmond IAP, Va.

#### F-16—air defense

144th Fighter Wing	Fresno Air Terminal, Calif.
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#### HC-130/HH-60

106th Rescue Wing	Francis S. Gabreski IAP, N.Y.
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#### MC-130/HH-60

129th Rescue Wing	Moffett Federal Airfield, Calif. <sup>c</sup>
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#### A/OA-10A

111th Fighter Wing	Willow Grove ARS, Pa.
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### Air Education and Training Command

#### F-15

173rd Fighter Wing	Klamath Falls IAP, Ore.
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#### F-16

149th Fighter Wing	Kelly AFB, Texas
162nd Fighter Wing	Tucson IAP, Ariz.
178th Fighter Wing	Springfield-Beckley MAP, Ohio

#### C-130 (training)

189th Airlift Wing	Little Rock AFB, Ark.
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### Air Force Special Operations Command

#### EC-130E

193rd Special Ops Wing	Harrisburg IAP, Pa.
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### Air Mobility Command

#### C-5A

105th Airlift Wing	Stewart IAP, N.Y.
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#### C-130

109th Airlift Wing	Schenectady County Airport, N.Y.
118th Airlift Wing	Nashville Metropolitan Airport, Tenn.
123rd Airlift Wing	Louisville IAP AGS, Ky.
130th Airlift Wing	Yeager Airport, W.Va.
133rd Airlift Wing	Minneapolis-St. Paul IAP/ARS, Minn.

136th Airlift Wing	NAS Fort Worth JRB, Texas <sup>b</sup>
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137th Airlift Wing	Will Rogers World Airport, Okla.
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139th Airlift Wing	Rosecrans Memorial Airport, Mo.
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143rd Airlift Wing	Quonset State Airport, R.I.
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145th Airlift Wing	Charlotte/Douglas IAP, N.C.
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146th Airlift Wing	Channel Islands ANGB, Calif.
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152nd Airlift Wing	Reno/Tahoe IAP, Nev.
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153rd Airlift Wing	Cheyenne MAP, Wyo.
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156th Airlift Wing	Luis Munoz Marin IAP, Puerto Rico
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165th Airlift Wing	Savannah IAP, Ga.
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166th Airlift Wing	New Castle County Airport, Del.
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167th Airlift Wing	Eastern West Virginia Regional Airport/Shepherd Field, W.Va.
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179th Airlift Wing	Mansfield Lahm Airport, Ohio
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182nd Airlift Wing	Greater Peoria Airport, Ill.
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#### C-141C

164th Airlift Wing	Memphis IAP, Tenn.
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172nd Airlift Wing	Jackson IAP, Miss.
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#### KC-135

101st Air Refueling Wing	Bangor IAP, Maine
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107th Air Refueling Wing	Niagara Falls IAP/ARS, N.Y.
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108th Air Refueling Wing	McGuire AFB, N.J.
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117th Air Refueling Wing	Birmingham Airport, Ala.
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121st Air Refueling Wing	Rickenbacker IAP, Ohio
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126th Air Refueling Wing	Scott AFB, Ill.
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128th Air Refueling Wing	General Mitchell IAP/ARS, Wis.
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134th Air Refueling Wing	McGhee Tyson Airport, Tenn.
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141st Air Refueling Wing	Fairchild AFB, Wash.
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151st Air Refueling Wing	Salt Lake City IAP, Utah
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155th Air Refueling Wing	Lincoln MAP, Neb.
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157th Air Refueling Wing	Pease ANGB, N.H.
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161st Air Refueling Wing	Phoenix-Sky Harbor IAP, Ariz.
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163rd Air Refueling Wing	March ARB, Calif.
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171st Air Refueling Wing	Pittsburgh IAP/ARS, Pa.
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186th Air Refueling Wing	Key Field, Miss.
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190th Air Refueling Wing	Forbes Field, Kan.
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### Pacific Air Forces

#### C-130

154th Wing (204th Airlift Sq.)	Hickam AFB, Hawaii
176th Wing <sup>d</sup>	Kulis ANGB, Alaska

#### F-15

154th Wing <sup>e</sup> (199th FS)	Hickam AFB, Hawaii
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#### HC-130/HH-60

176th Wing (210th RQS)	Kulis ANGB, Alaska
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#### KC-135

154th Wing (203d ARS)	Hickam AFB, Hawaii
168th Air Refueling Wing	Eielson AFB, Alaska

<sup>a</sup>Also flies C-130s.

<sup>b</sup>Naval base.

<sup>c</sup>NASA installation.

<sup>d</sup>Includes 210th Rescue Squadron with HC-130 and HH-60G aircraft.

<sup>e</sup>Includes 203rd Air Refueling Squadron with KC-135 aircraft.



# USAF Almanac

## 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. Ricky R. Ales

#### MISSION, PURPOSE, OPERATIONS

**Support** development and use of the Joint Synthetic Battlespace for training, analysis, acquisition, test and evaluation, and operations; corporate USAF modeling and simulation operations

**Implement** USAF, joint, and DoD modeling and simulation policies and standards

**Manage**, coordinate, and integrate major USAF/joint modeling and simulation programs and initiatives

**Promote** and support technology improvements

#### STRUCTURE

Two divisions

#### PERSONNEL

Active duty	18
Officers	16
Enlisted	2
Reserve components	0
Civilians	12
<b>Total</b>	<b>30</b>

### Air Force Audit Agency

Hq.: Washington  
 Estab.: July 1, 1948  
 Dir.: Jackie R. Crawford

#### 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

Three directorates at Arlington, Va., March ARB, Calif., and Wright-Patterson AFB, Ohio

Three regional offices  
 20 field offices

#### PERSONNEL

Active duty	2
Officers	1
Enlisted	1
Reserve components	0
Civilians	882
<b>Total</b>	<b>884</b>

The director of AFAA is the auditor general of the Air Force.

### Air Force Base Conversion Agency

Hq.: Arlington, Va.  
 Estab.: Nov. 15, 1991  
 Dir.: Albert F. Lowas Jr.

#### MISSION, PURPOSE, OPERATIONS

**Execute** environmental programs and real and personal property disposal for major Air Force bases in the US 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 quickly and efficiently as possible

#### STRUCTURE

Regional divisions  
 Base-level operating locations

#### PERSONNEL

Civilians	262
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#### STRUCTURE

Four directorates  
 Three regional environmental offices

#### PERSONNEL

Active duty	39
Officers	37
Enlisted	2
Reserve components	9
ANG	0
AFRC	9
Civilians	370
<b>Total</b>	<b>418</b>

### 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	86
Officers	18
Enlisted	68
Reserve components	25
ANG	1
AFRC	24
Civilians	129
<b>Total</b>	<b>240</b>

### Air Force Center for Environmental Excellence

Hq.: Brooks AFB, Texas  
 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



## 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	20
Officers	18
Enlisted	2
Reserve components	0
Civilians	34
<b>Total</b>	<b>54</b>

## Air Force Flight Standards Agency

Hq.: Andrews AFB, Md.  
Estab.: Oct. 1, 1991  
Cmdr.: Col. Richard P. Packard

### 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, and airspace management

### STRUCTURE

Two detachments at Oklahoma City and Washington  
Three directorates

### PERSONNEL

Active duty	127
Officers	58
Enlisted	69
Reserve components	5
ANG	0
AFRC	5
Civilians	27
<b>Total</b>	<b>159</b>

## Air Force Historical Research Agency

Hq.: Maxwell AFB, Ala.  
Estab.: May 25, 1979  
Cmdr.: Col. William E. Mathis

### 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	8
Officers	3
Enlisted	5
Reserve components	21
ANG	0
AFRC	21
Civilians	59
<b>Total</b>	<b>88</b>

## Air Force History Support Office

Hq.: Washington  
Estab.: Sept. 30, 1994  
Cmdr.: Col. Leonard J. Maggio

### 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; scholars with research and teaching materials

**Record** and disseminate USAF history to enable decision makers and planners to formulate strategy, plans, and doctrine to conduct operations; educate USAF students at professional military schools; inform the public about the role of USAF and airpower in national security

### STRUCTURE

Two divisions

### PERSONNEL

Active duty	4
Officers	1
Enlisted	3
Reserve components	2
ANG	0
AFRC	2
Civilians	29
<b>Total</b>	<b>35</b>

## Air Force Inspection Agency

Hq.: Kirtland AFB, N.M.  
Estab.: Aug. 1, 1991  
Cmdr.: Col. Fred K. Wall

### MISSION, PURPOSE, OPERATIONS

**Provide** USAF leadership with objective and 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** USAF Inspector General School; special reviews and inquiries

**Publish** *TIG Brief* magazine

### STRUCTURE

Four directorates

### PERSONNEL

Active duty	113
Officers	88
Enlisted	25
Reserve components	3
ANG	1
AFRC	2
Civilians	21
<b>Total</b>	<b>137</b>

## Air Force Legal Services Agency

Hq.: Bolling AFB, D.C.  
Estab.: Sept. 1, 1991  
Cmdr.: Col. James R. Van Orsdol (acting)

### 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	401
Officers	275
Enlisted	126
Reserve components	0
Civilians	127
<b>Total</b>	<b>528</b>



## Air Force Logistics Management Agency

Hq.: Maxwell AFB, Gunter Annex, Ala.  
Estab.: Sept. 30, 1975  
Cmdr.: Col. Richard M. Bereit

### 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		53
Officers	35	
Enlisted	18	
Reserve components		0
Civilians		17
<b>Total</b>		<b>70</b>

## Air Force Manpower Innovation Agency

Hq.: Randolph AFB, Texas  
Estab.: Dec. 19, 1996  
Cmdr.: Col. John C. Vrba

### 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/quality training architecture

### STRUCTURE

Four divisions

### PERSONNEL

Active duty		113
Officers	35	
Enlisted	78	
Reserve components		0
Civilians		81
<b>Total</b>		<b>194</b>

## Air Force Medical Operations Agency

Hq.: Bolling AFB, D.C.  
Estab.: July 1, 1992  
Cmdr.: Brig. Gen. Gary H. Murray

### MISSION, PURPOSE, OPERATIONS

**Develop** 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  
Two offices

### PERSONNEL

Active duty		69
Officers	56	
Enlisted	13	
Reserve components		0
Civilians		69
<b>Total</b>		<b>138</b>

## Air Force Medical Support Agency

Hq.: Brooks AFB, Texas  
Estab.: July 1, 1992  
Cmdr.: Col. Martin L. Harper

### 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		51
Officers	43	
Enlisted	8	
Reserve components		0
Civilians		26
<b>Total</b>		<b>77</b>

## Air Force News Agency

Hq.: Kelly AFB, Texas  
Estab.: June 1, 1978  
Cmdr.: Col. Harold J. Smarkola Jr.

### MISSION, PURPOSE, OPERATIONS

**Support** the Secretary of the Air Force Office of Public Affairs by creating and delivering timely and credible products and services

**Communicate** and broadcast news, information, and entertainment through print and electronic means

**Operate** all USAF-managed Armed Forces Radio and Television Service outlets

**Produce** news and feature stories on soldiers and airmen for release to civilian broadcast and print media

### STRUCTURE

Air Force Broadcasting Service  
Army and Air Force Hometown News Service

Air Force News Service

### PERSONNEL

Active duty		343
Officers	18	
Enlisted	325	
Reserve components		36
ANG	0	
AFRC	36	
Civilians		100
<b>Total</b>		<b>479</b>

## Air Force Office of Special Investigations

Hq.: Andrews AFB, Md.  
Estab.: Aug. 1, 1948  
Cmdr.: Brig. Gen. Francis X. Taylor

### MISSION, PURPOSE, OPERATIONS

**Provide** criminal investigative, counter-intelligence information, and force-protection services to commanders

**Identify** and prevent criminal activity, including homicide, drug abuse, espionage, terrorism, and sabotage, and economic (major defense contractor fraud and local fraud), environmental, and other crimes that threaten Air Force and DoD resources

**Provide** force-protection assistance to deployed wings and units

**Serve** as DoD's executive agent for the Defense Computer Forensics Laboratory and the Defense Computer Investigations Training Program

### STRUCTURE

USAF Special Investigations Academy  
Eight regional offices  
Six overseas squadrons  
160 detachments and operating locations

### PERSONNEL

Active duty		1,434
Officers	365	
Enlisted	1,069	
Reserve components		441
ANG	0	
AFRC	441	
Civilians		421
<b>Total</b>		<b>2,296</b>



## Air Force Operations Group

Hq.: Washington  
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 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

Six divisions

### PERSONNEL

Active duty		212
Officers	141	
Enlisted	71	
Reserve components		4
ANG	0	
AFRC	4	
Civilians		7
Total		223

## Air Force Personnel Center

Hq.: Randolph AFB, Texas  
Estab.: Oct. 1, 1995  
Cmdr.: Maj. Gen. Richard E. Brown III

### MISSION, PURPOSE, OPERATIONS

**Provide** personnel operations service

### STRUCTURE

Eight divisions

### PERSONNEL

Active duty		987
Officers	312	
Enlisted	675	
Reserve components		21
ANG	1	
AFRC	20	
Civilians		1,005
Total		2,013

AFPC was formerly the Air Force Military Personnel Center and the Air Force Civilian Personnel Management Center.

## Air Force Personnel Operations Agency

Hq.: Washington  
Estab.: Aug. 15, 1993  
Dir.: Maj. Gen. John F. Regni

### MISSION, PURPOSE, OPERATIONS

**Execute** personnel programs and pro-

vide personnel support to Hq. USAF personnel in the Washington area  
**Develop** and operate officer, enlisted, and civilian models and databases for management information  
**Support** DCS, Personnel, computer operations

### STRUCTURE

Two divisions

### PERSONNEL

Active duty		42
Officers	25	
Enlisted	17	
Reserve components		0
Civilians		20
Total		62

## Air Force Program Executive Office

Hq.: Washington  
Estab.: November 1990  
Exec.: Lawrence J. Delaney

### MISSION, PURPOSE, OPERATIONS

**Manage** and account for the execution of major and selected Air Force acquisition programs

### STRUCTURE

**Program Executive Officers:**

Brig. Gen. Craig P. Weston, Command & Control Programs

Joseph G. Diamond, Weapons Programs

Brent R. Collins, Space Programs

Oscar A. Goldfarb, Logistics Information Systems

Brig. Gen. R.W. Chedister, Airlift, Trainers, & Modeling Simulation

Maj. Gen. Claude M. Bolton Jr., Fighter & Bomber Programs

### PERSONNEL

Active duty		32
Officers	30	
Enlisted	2	
Reserve components		0
Civilians		12
Total		44

## Air Force Real Estate Agency

Hq.: Bolling AFB, D.C.  
Estab.: Aug. 1, 1991  
Dir.: William E. Edwards

### MISSION, PURPOSE, OPERATIONS

**Acquire**, manage, and dispose of real property worldwide for the Air Force

**Maintain** a complete land and facilities inventory

**Plan** and execute the Real Property Management program

**Provide** policy to assist USAF in complying with public laws and federal and DoD guidance

### PERSONNEL

Civilians	12
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## 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

### STRUCTURE

Air Force Board for Correction of Military Records

Air Force Civilian Appellate Review Office

Air Force Personnel Council

### PERSONNEL

Active duty		11
Officers	5	
Enlisted	6	
Reserve components		4
ANG	1	
AFRC	3	
Civilians		35
Total		50

## Air Force Safety Center

Hq.: Kirtland AFB, N.M.  
Estab.: Jan. 1, 1996  
Cmdr.: Maj. Gen. Timothy A. Peppe

### 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

Nine divisions

### PERSONNEL

Active duty		69
Officers	49	
Enlisted	20	
Reserve components		2
ANG	1	
AFRC	1	
Civilians		53
Total		124

The commander also holds the title of Air Force chief of safety. AFSC publishes *Flying Safety*, *Road and Rec*, and *Weapons Journal* and produces safety videos.



## Air Force Security Forces Center

Hq.: Lackland AFB, Texas  
 Estab.: March 17, 1997  
 Cmdr.: Brig. Gen. James M. Shamess

### 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

Three divisions  
 Force Protection Battlelab  
 One group  
 Three detachments at Ft. Leavenworth, Kan., NAS Miramar, Calif., and Charleston NWC, S.C.

### PERSONNEL

Active duty		253
Officers	53	
Enlisted	200	
Reserve components		11
ANG	1	
AFRC	10	
Civilians		13
<b>Total</b>		<b>277</b>

Air Force Security Police Agency was redesignated Air Force Security Forces Center, a DRU, March 17, 1997; it was redesignated an FOA Oct. 1, 1998.

## Air Force Services Agency

Hq.: San Antonio  
 Estab.: Feb. 5, 1991  
 Cmdr.: Col. Horace L. Larry

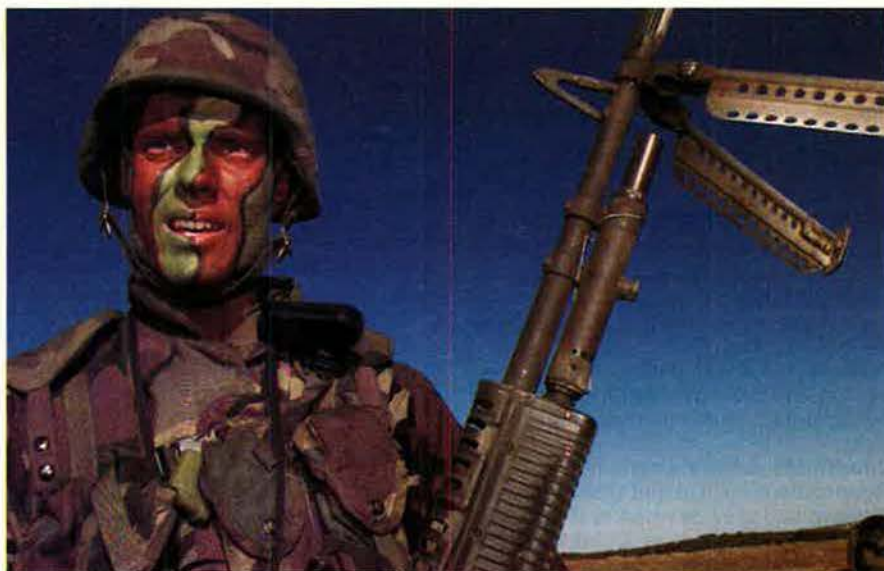
### MISSION, PURPOSE, OPERATIONS

**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 agency programs

**Manage** Air Force nonappropriated central funds and operate central systems, such as banking, investments, purchasing, data flow, insurance, and benefit programs

### STRUCTURE

Base-level services managers



USAF photo by SrA. Patty Zimmerman

*The annual Defender Challenge Security Forces competition for USAF major commands and allied nations takes place at Lackland AFB, Texas, headquarters for Air Force Security Forces Center. This Air Mobility Command airman competed in the combat weapons portion.*

### PERSONNEL

Active duty		100
Officers	41	
Enlisted	59	
Reserve components		11
ANG	0	
AFRC	11	
Civilians		186
<b>Total</b>		<b>297</b>

## Air Force Studies and Analysis Agency

Hq.: Washington  
 Estab.: February 1991  
 Cmdr.: Col. Donald P. Higgins Jr.

### MISSION, PURPOSE, OPERATIONS

**Provide** timely, objective, and operationally relevant analyses to support senior Air Force decision makers and foster excellence in the military modeling, simulation, and analysis communities

**Advise** DoD and Air Force leadership on issues of force sizing and shaping, weapon system employment, resource allocation, and aerospace strategy, operational art, and tactics

### STRUCTURE

Senior Analysis Review Group  
 Three divisions

### PERSONNEL

Active duty		73
Officers	63	
Enlisted	10	
Reserve components		0
Civilians		20
<b>Total</b>		<b>93</b>

## Air Force Technical Applications Center

Hq.: Patrick AFB, Fla.  
 Estab.: July 7, 1959  
 Cmdr.: Col. Harold J. Beatty

### MISSION, PURPOSE, OPERATIONS

**Monitor** compliance with several international nuclear treaties

**Operate** and maintain a global network of subsurface, surface, airborne, and space-based sensors and analytical laboratories that provide national authorities with technical measurements with which to monitor foreign nuclear tests

**Conduct** research and development of proliferation-detection technologies for all weapons of mass destruction

**Expand** current monitoring capability to include the Comprehensive Test Ban Treaty upon its entry into force

### STRUCTURE

Analysis Center, Patrick AFB, Fla.  
 Laboratory and technical operations division, McClellan AFB, Calif.  
 Operational sites/detachments in 18 countries

### PERSONNEL

Active duty		539
Officers	141	
Enlisted	398	
Reserve components		0
Civilians		0
<b>Total</b>		<b>539</b>



## EQUIPMENT

24 seismic arrays and 15 single-instrument locations consisting of seismometers and associated data acquisition systems and workstations

Seven hydroacoustic recording locations  
More than 140 sensors on 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 W. French

## MISSION, PURPOSE, OPERATIONS

Enhance the nation's combat capability by arming US forces with quality weather and space products, training, equipment, and communications

## STRUCTURE

Air Force Combat Climatology Center, Asheville, N.C.

Air Force Combat Weather Center, Hurlburt Field, Fla.

Space Weather Squadron, Schriever AFB, Colo.

One detachment at Tinker AFB, Okla.

## PERSONNEL

Active duty		604
Officers	116	
Enlisted	488	
Reserve components		7
ANG	0	
AFRC	7	
Civilians		183
Total		794

Formerly Air Weather Service, established July 1, 1937.

## Air Intelligence Agency

Hq.: Kelly AFB, Texas

Estab.: Oct. 1, 1993

Cmdr.: Maj. Gen. Bruce A. Wright

## MISSION, PURPOSE, OPERATIONS

Gain, exploit, defend, and attack information to ensure superiority in the air, space, and information domains

Provide expertise in information warfare and information-in-warfare, specializing in intelligence collection, force protection, acquisition, foreign weapon systems and technology, and treaty monitoring

Bring information operations capabilities and training to USAF numbered air forces and, with ACC, to air operations centers worldwide

## STRUCTURE

Air Force Information Warfare Center, Kelly AFB, Texas

National Air Intelligence Center, Wright-Patterson AFB, Ohio

67th Intelligence Wing, Kelly AFB, Texas  
Eight groups in the US and one in Germany

## PERSONNEL

Active duty		10,735
Officers	1,239	
Enlisted	9,496	
Reserve components		2,118
ANG	186	
AFRC	1,932	
Civilians		2,012
Total		14,865

## EQUIPMENT

Worldwide communications equipment  
Two AN/FLR-9 antennas located in Alaska and Japan

## OPERATIONAL ACTIVITY

Allied Force (Kosovo), Joint Forge (Bosnia), Southern/Northern Watch (Iraq)

AIA was formed by integrating personnel and missions of the former Air Force Intelligence Command and Air Force Intelligence Support Agency and elements of Air Combat Command. The AIA commander also serves as commander of the Joint Command and Control Warfare Center.

## ANG Readiness Center

Hq.: Andrews AFB, Md.

Estab.: August 1997

Cmdr.: Brig. Gen. Craig R. McKinley

## MISSION, PURPOSE, OPERATIONS

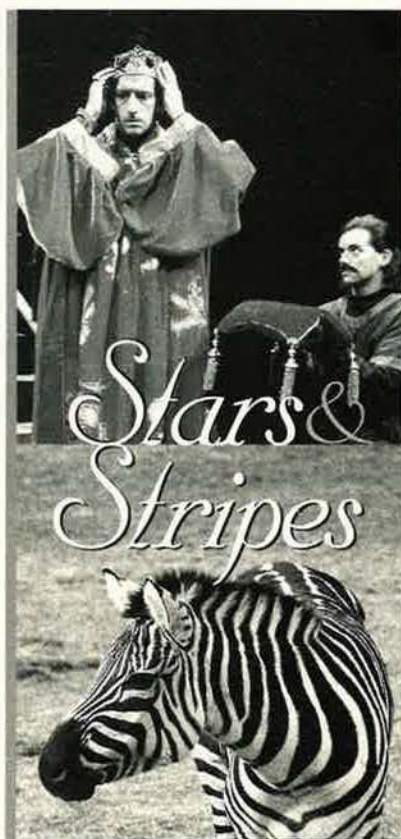
Provide guidance and resources to prepare men and women for combat and serve as a channel of communication for contingencies and national policies

## STRUCTURE

201st Mission Support Squadron  
13 directorates

## PERSONNEL

Active duty		118
Officers	75	
Enlisted	43	
Reserve Components		527
ANG	525	
AFRC	2	
Civilians		428
Total		1,073



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# USAF Almanac

## Direct Reporting Units

A Direct Reporting Unit is a subdivision of the Air Force, directly subordinate to Hq. USAF, separate from any major command or field operating agency because of a unique mission, legal requirements, or other factors. DRUs have the same administrative and organizational responsibilities as major commands.

### Air Force Communications and Information Center

Hq.: Washington  
 Estab.: April 1, 1997  
 Cmdr.: Lt. Gen. William J. Donahue

#### MISSION, PURPOSE, OPERATIONS

**Apply** information technology to USAF processes

**Lead** USAF efforts to develop, implement, and enforce policy and system architectures for C&I systems

**Manage** C&I resources

**Provide** C&I services to the Air Staff, Secretariat, and selected JCS elements and OSD

**Ensure** that information technology systems are integrated and interoperable and that technical standards and solutions meet customers' needs

#### STRUCTURE

Air Force Pentagon Communications Agency, Washington

Air Force Communications Agency, Scott AFB, Ill.

Air Force Frequency Management Agency, Arlington, Va.

#### PERSONNEL

Active duty		811
Officers	272	
Enlisted	539	
Reserve components		20
ANG	1	
AFRC	19	
Civilians		665
<b>Total</b>		<b>1,496</b>

joint campaign models and exercise scenarios

**Collect** inputs from exercises and operations for lessons learned

**Participate** in development and investigation of future operational concepts, technologies, and strategies

**Present** USAF doctrine to Army officers at various combat arms branch schools

#### STRUCTURE

Det. 1, Langley AFB, Va.

Six operating locations

Air Force Liaison, Pentagon

#### PERSONNEL

Active duty		76
Officers	67	
Enlisted	9	
Reserve components		1
ANG	0	
AFRC	1	
Civilians		12
<b>Total</b>		<b>89</b>

### Air Force Operational Test and Evaluation Center

Hq.: Kirtland AFB, N.M.  
 Estab.: Jan. 1, 1974  
 Cmdr.: Maj. Gen. William A. Peck Jr.

#### MISSION, PURPOSE, OPERATIONS

**Plan**, execute, and report independent OT&Es

**Determine** operational capabilities and limitations of USAF and joint systems to meet warfighter mission needs

**Provide** operational effectiveness, suitability, and evaluation expertise from concept development to system employment to support USAF, DoD, and other government agencies

#### STRUCTURE

Three geographically separate units: Edwards AFB, Calif., Eglin AFB, Fla., and Peterson AFB, Colo.

### Air Force Doctrine Center

Hq.: Maxwell AFB, Ala.  
 Estab.: Feb. 24, 1997  
 Cmdr.: Maj. Gen. Lance L. Smith

#### MISSION, PURPOSE, OPERATIONS

**Provide** a focal point for aerospace doctrine

**Develop** basic and operational doctrine for USAF Total Force

**Advocate** doctrinally correct representation of aerospace power in service and



*Cadets check out satellite analysis software at the US Air Force Academy where education, military training, physical conditioning, and character development prepare them to become USAF officers.*

Photo by Analytical Graphics, Inc.



## PERSONNEL

Active duty	517
Officers	359
Enlisted	158
Reserve components	0
Civilians	206
<b>Total</b>	<b>723</b>

## US Air Force Academy

Hq.: Colorado Springs, Colo.  
Estab.: April 1, 1954  
Supt.: Lt. Gen. Tad J. Oelstrom

### 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	2,761
Officers	1,257
Enlisted	1,504
Reserve components	15
Civilians	1,933
<b>Total</b>	<b>4,709</b>

## EQUIPMENT

31 aircraft (ASK-21 sailplanes; Cessna 150s; TG-3 and TG-4 gliders; and TG-7A and TG-11A motorized gliders; UV-18 jump airplanes)

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 air-manship programs, and military training.

## 11th Wing

Hq.: Bolling AFB, D.C.  
Estab.: July 15, 1994  
Cmdr.: Col. James P. Hunt

## 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 AFB

**Manage** physical, personal, electronic, and information security within the Pentagon

## STRUCTURE

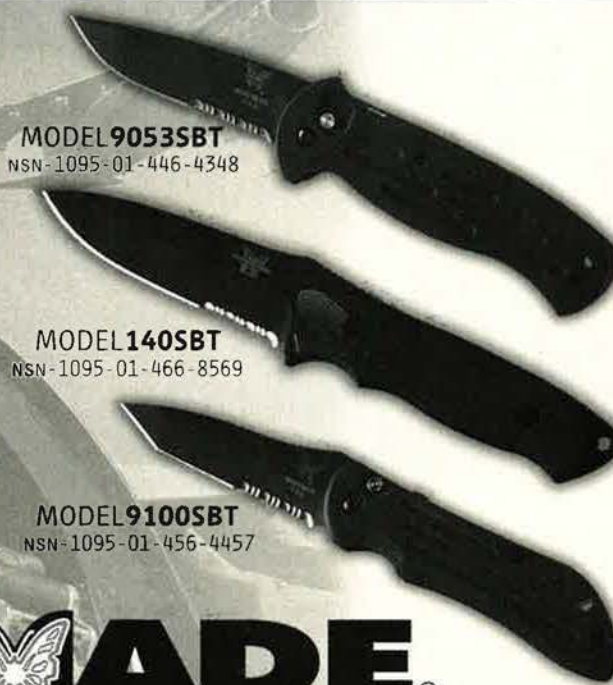
Objective wing

## PERSONNEL

Active duty	1,639
Officers	181
Enlisted	1,458
Reserve components	18
ANG	0
AFRC	18
Civilians	887
<b>Total</b>	<b>2,544</b>

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# Flashback


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Although they were built to bomb, a few Boeing B-17s were converted for use as air rescue airplanes and, from their former bomb bay locations, dropped lifeboats in situations where a water landing wasn't possible. The lifeboats—like this one attached to a 10th Rescue Squadron SB-17 flying over Alaska—were suspended on three parachutes. They were self-righting and came with

self-bailing equipment and emergency provisions. Some of the converted bombers had a search-radar dome in place of the chin turret. Others retained some defensive armament. For the Korean War, these aircraft were refitted with cheek, waist, and tail machine guns.





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# USAF Almanac

## Guide to Air Force Installations Worldwide

### Major Installations

**Altus AFB**, Okla. 73523-5000; within Altus city limits, 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, C-141, and KC-135 aircraft by operating AETC's strategic airlift and aerial refueling flying training schools. **History:** activated January 1943; inactivated May 1945; reactivated January 1953. **Area:** 6,981 acres. **Runways:** 13,440 ft., 9,000-ft. parallel runway, and 3,500-ft. assault strip. **Altitude:** 1,381 ft. **Personnel:** permanent party military, 2,030; DoD civilians, 1,288; contract employees, 817. **Housing:** single family, officer, 251, enlisted, 751; unaccompanied, UAQ/UEQ, 394; visiting, VOQ, 320, VAQ/VEQ, 345, TLF, 20. **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); 634th Air Mobility Sq. (AMC); Helicopter Combat Support Sq. 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 between Kwajalein and Hawaii in February 1945. **Area:** 20,270 acres. **Runways:** (N) 10,555 ft. and (S) 11,182 ft. **Altitude:** 612 ft. **Personnel:** permanent party military, 2,481; DoD civilians, 1,241. **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. **Phone:** 301-981-1110; DSN 858-1110. **Majcom:** AMC. **Host:** 89th Airlift Wing. **Mission:** gateway to the nation's capital and home of Air Force One. Provides safe, reliable, and comfortable 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 (D.C. ANG); 459th Airlift Wing (AFRC); 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, 5,855; DoD civilians, 1,128; contract employees, 584. **Housing:** single family, officer, 384, enlisted, 1,694; leased units, 414 off base; unaccompanied, UAQ/UEQ, 974; visiting, VOQ, 111, VAQ/VEQ, 65, TLF, 68. **Hospital.**

**Arnold AFB**, Tenn. 37389; approx. 7 mi. SE of Manchester. **Phone:** 931-454-3300; DSN 340-5011. **Majcom:** AFMC. **Host:** Arnold Engineering Development Center. **Mission:** supports the 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, 101; DoD civilians, 178; contract employees, 2,365. **Housing:** single family, officer, 14, enlisted, 26; visiting, 45. **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) 011-39-434-667111; DSN 632-1110. **Majcom:** USAFE. **Host:** 31st Fighter Wing. **Mission:** maintains two LANTIRN-equipped F-16 fighter squadrons, the 510th and the 555th, capable of conducting offensive and defensive air combat operations and flying night vision goggles missions. **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-Herzegovina; 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-Herzegovina; 406th Ex. ABG, Taszar AB, Hungary; 496th Air Base Sq., Morón AB, Spain;

620th Ex. ABG, Camp Able Sentry, Macedonia; 731st Munitions Support Sq., Araxos AB, Greece; 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, 241; local nationals, 550. **Housing:** single family, officer, 22, enlisted, 508; unaccompanied, UAQ/UEQ, 680; visiting, VOQ, 17, VAQ/VEQ, 12, DV suites, 5. **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. **Major tenants:** 8th Air Force (ACC); 917th Wing (AFRC), B-52H and A-10 operations; 8th Air Force Museum. **History:** activated Feb. 2, 1933. Named for Lt. Eugene H. Barksdale, WWI airman killed in an August 1926 crash near Wright Field, Ohio. **Area:** 22,000 acres (18,000 acres reserved for recreation). **Runway:** 11,756 ft. **Altitude:** 166 ft. **Personnel:** permanent party military, 6,895; DoD civilians, 1,119. **Housing:** single family, officer, 135, enlisted, 594; unaccompanied, LAQ/UEQ, 780; visiting, VOQ, 139, VAQ/VEQ, 102, TLF, 24. **Superclinic.**

**Beale AFB**, Calif. 95903-5000; 13 mi. E of Marysville. **Phone:** 530-634-3000; DSN 368-1110. **Majcom:** ACC. **Host:** 9th Reconnaissance Wing. **Mission:** RC-135, U-2 operations. **Major tenants:** 940th ARW, 7th SWS (Pave Paws), 13th IS, 48th IS. **History:** originally US Army's Camp Beale; transferred to Air Force April 1948; became AFB 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, 3,047; DoD civilians, 834; contract employees, 66. **Housing:** single family, officer, 187, enlisted, 1,519; unaccompanied, UOQ, 30, UAQ/UEQ, 523; visiting, VOQ, 53, VAQ/VEQ, 125, TLF, 23. **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 Real Estate Agency; Air



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Force Medical Operations Agency; Defense Intelligence Agency; Air Force Legal Services Agency; 497th Intelligence Gp. **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, 1,480; DoD civilians, 1,350. **Housing:** single family, officer, 284, enlisted, 971; unaccompanied, UOQ, 4, UAQ/UEQ, 564 dorm spaces; visiting, VOQ, 62, DV, 18, VAQ/VEQ, 66, TLF, 100. **Clinic.**

**Brooks AFB, Texas 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; products enhance human performance; assesses and manages health, safety, and environmental risks for USAF and DoD; trains 7,000+ 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; 311th Human Systems Program Office; 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. **Area:** 1,310 acres. **Runway:** none. **Altitude:** 600 ft. **Personnel:** permanent party military, 1,943; DoD civilians, 1,538; contract employees, 558. **Housing:** single family, officer, 70, enlisted, 100; unaccompanied, none; visiting, VOQ, 151, VAQ/VEQ, 44, TLF, 8. **Clinic.**

**Cannon AFB, N.M. 88103-5000;** 8 mi. W of Clovis. **Phone:** 505-784-3311; DSN 681-1110. **Majcom:** ACC. **Host:** 27th Fighter Wing. **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:** 3,782 acres. **Runways:** 10,000 ft. and 8,200 ft. **Altitude:** 4,295 ft. **Personnel:** permanent party military, 3,205; DoD civilians, 692. **Housing:** single family, officer, 224, enlisted, 1,486; unaccompanied, UAQ/UEQ, 835 dorm spaces; visiting, VOQ, 6, TLF, 45. **Ambulatory care clinic.**

**Charleston AFB, S.C. 29404-5000;** in North Charleston, 10 mi. from downtown Charleston. **Phone:** 843-963-6000; DSN 673-1110. **Majcom:** AMC. **Host:** 437th Airlift Wing. **Mission:** C-17, C-141 operations. **Major tenant:** 315th AW (AFRC Assoc.). **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, 4,500; DoD civilians, 1,500. **Housing:** single family, officer, 152, enlisted, 1,313; unaccompanied, UAQ/UEQ, 655 dorm spaces; visiting, VOQ, 64, VAQ/VEQ, 40, DV suites, 13, TLF, 29. **Clinic.**

**Columbus AFB, Miss. 39710-1000;** 10 mi. NW of Columbus. **Phone:** 662-434-7322; DSN 742-1110. **Majcom:** AETC. **Host:** 14th Flying Training Wing. **Mission:** Specialized Undergraduate Pilot Training and Introduction to Fighter Fundamentals. **History:** activated 1941 for pilot training. **Area:** 6,017 acres. **Runways:** 12,000 ft., 8,000 ft., and 6,300 ft. **Altitude:** 214 ft. **Personnel:** permanent party military, 949; DoD civilians, 1,443. **Housing:** single family, officer, 232, enlisted, 577; unaccompanied,

UOQ, 205, UAQ/UEQ, 377; visiting, VOQ, 61, VAQ/VEQ, 30, TLF, 26. **Clinic.**

**Davis-Monthan AFB, Ariz. 85707-5000;** within Tucson city limits. **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; 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. (AFRC), day/night combat rescue capability. **History:** activated 1927. Named for two local early aviators: 2nd Lt. Samuel H. Davis, killed Dec. 28, 1921, and 2nd Lt. Oscar Monthan, killed March 27, 1924. **Area:** 11,000 acres. **Runway:** 13,845 ft. **Altitude:** 2,620 ft. **Personnel:** permanent party military, 8,235; DoD civilians, 1,386. **Housing:** single family, officer, 133, enlisted, 1,106; visiting, VOQ, 188, VAQ/VEQ, 132, TLF, 16. **Clinic.**

**Dover AFB, Del. 19902-7219;** 3 mi. SE of Dover. **Phone:** 302-677-3000; DSN 445-3000. **Majcom:** AMC. **Host:** 436th Airlift Wing. **Mission:** provides 25 percent of nation's inter-theater 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 joint services 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, 5,671; DoD civilians, 1,031; contract employees, 610. **Housing:** single family, officer, 108, enlisted, 1,441; unaccompanied, UAQ/UEQ, 726 dorm spaces; visiting, VOQ, 68, VAQ/VEQ, 185, TLF, 24. **Clinic.**

**Dyess AFB, Texas 79607-1980;** WSW border of Abilene. **Phone:** 915-696-0212; DSN 461-1110. **Majcom:** ACC. **Host:** 7th Bomb Wing. **Mission:** conducts all B-1 combat crew training for the Air Force. **Major tenant:** 317th Airlift Gp. (AMC), C-130 operations. **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 at Burbank, Calif., in December 1943. **Area:** 6,437 acres (including off-base sites). **Runway:** 13,500 ft. **Altitude:** 1,789 ft. **Personnel:** permanent party military, 4,622; DoD civilians, 336. **Housing:** single family, officer, 150, enlisted, 985; visiting, VOQ, 74, VAQ/VEQ, 92, TLF, 39. **Clinic.**

**Edwards AFB, Calif. 93524;** adjacent to Rosamond. **Phone:** 661-277-1110; DSN 527-1110. **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, 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 and launch site for the X-33 RLV. **Major tenants:** AFRL's Propulsion Dir. (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, 3,450; DoD civilians, 3,809; contract employees, 3,075. **Housing:** single family, officer, 399, enlisted, 1,296; unaccompanied,

UOQ, 62, UAQ/UEQ, 762; visiting, VOQ, 72, VAQ/VEQ, 105, 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 Fighter Wing (ACC); 53rd Wing (ACC); 919th Special Operations Wing (AFRC); Air Force Armament Museum. **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, 7,445; DoD civilians, 3,704 (excluding Hurlburt Field); contract employees, 2,931. **Housing:** single family, officer, 235, enlisted, 2,099; unaccompanied, UOQ, UAQ/UEQ, 1,048; visiting, VOQ, 188, VAQ/VEQ, 153, TLF, 88. **Hospital.**

**Eielson AFB, Alaska 99702-5000;** 26 mi. SE of Fairbanks. **Phone:** 907-377-1110; DSN 317-377-1110. **Majcom:** PACAF. **Host:** 354th Fighter Wing. **Mission:** F-16C/D, A-10, and OA-10 operations. **Major tenants:** Arctic Survival School (AETC); 168th Air Refueling Wing (ANG). **History:** activated October 1944. Named for Carl Ben Eielson, Arctic aviation pioneer who died in an Arctic rescue mission November 1929. **Area:** 19,790 acres (including 16 remote sites, 63,195 acres). **Runway:** 14,500 ft. **Altitude:** 534 ft. **Personnel:** permanent party military, 2,713; DoD civilians, 1,007. **Housing:** single family, officer, 181, enlisted, 1,310; unaccompanied, UOQ, 13, UNCOQ, 6, UAQ/VEQ, 402 dorm spaces; visiting, VOQ, 206, VAQ/VEQ, 260, DV suites, 12. **Outpatient clinic.**

**Ellsworth AFB, S.D. 57706-5000;** 10 mi. E of Rapid City. **Phone:** 605-385-1000; DSN 675-1000. **Majcom:** ACC. **Host:** 28th Bomb Wing, two B-1B squadrons. **Mission:** B-1B operations. **Major tenants:** Det. 2, 79th Test and Evaluation Sq.; Det. 4, 57th Wing; Det. 8, 372nd Training Sq.; South Dakota Air and Space Museum. **History:** activated July 1942 as Rapid City AAB; renamed June 13, 1953, for Brig. Gen. Richard E. Ellsworth, killed March 18, 1953, in RB-36 crash in Newfoundland, Canada. **Area:** 10,632 acres. **Runway:** 13,497 ft. **Altitude:** 3,286 ft. **Personnel:** permanent party military, 2,995; DoD civilians, 969. **Housing:** single family, officer, 198, enlisted, 1,882; visiting, VOQ, 127, VAQ/VEQ, 57, 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 and F-15E fighter and C-130 and C-12 airlift operations, E-3 Airborne Warning and Control System operations. Hub for air traffic to and from the Far East. **Major tenants:** Alaskan Command; 11th Air Force (PACAF); Alaskan NORAD Region; 11th Rescue Coordination Center (ANG). **History:** activated July 1940. Named for Capt. Hugh Elmendorf, killed Jan. 13, 1933, at Wright Field, Ohio, while flight-testing a new pursuit airplane. **Area:** 13,100 acres. **Runways:** 10,000 ft. and 7,500 ft. **Altitude:** 213 ft. **Personnel:** permanent party military, 6,752; DoD civilians, 1,130. **Housing:** single family, officer, 174, enlisted, 1,408; unaccompanied, UAQ/UEQ, 786; visiting, VOQ, 90, VAQ/VEQ, 170, TLF, 108. **Hospital.**

**Fairchild AFB, Wash. 99011-5000;** 12 mi. WSW



of Spokane. **Phone:** 509-247-1212; DSN 657-1212. **Majcom:** AMC. **Host:** 92nd Air Refueling Wing. **Mission:** KC-135R, KC-135T operations. **Major tenants:** 336th Training Gp. (USAF Survival School, AETC); 141st Air Refueling Wing (Washington 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, 4,675; DoD civilians, 1,021. **Housing:** single family, officer, 142, enlisted, 1,281; unaccompanied, UAQ/UEQ, 756; visiting, VOQ, 143, VAQ/VEQ, 152, TLF, 18. **Clinic.**

**F.E. Warren AFB, Wyo.** 82005-5000; adjacent to Cheyenne. **Phone:** 307-993-1110; DSN 481-1110. **Majcom:** AFSPC. **Host:** 90th Space Wing. **Mission:** control, maintain, and operate 50 Peacekeeper and 150 Minuteman III ICBMs, seven UH-1N helicopters. **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, 3,500; DoD civilians, 690. **Housing:** single family, officer, 156, enlisted, 675; unaccompanied, UAQ/UEQ, 1,310; visiting, VOQ, 33, VAQ/VEQ, 37, TLF, 50. **Clinic.**

**Goodfellow AFB, Texas** 76908-4410; SE of San Angelo. **Phone:** 915-654-3231; DSN 477-3231. **Majcom:** AETC. **Host:** 17th Training Wing. **Mission:** train intelligence, fire protection, and special instruments personnel—officer and enlisted in all military branches and international and DoD personnel. **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, 1,432; DoD civilians, 776. **Housing:** single family, officer, 2, enlisted, 299; unaccompanied, UOQ, 144, UAQ/UEQ, 132; visiting, VOQ, 95, VAQ/VEQ, 730, TLF, 29. **Clinic.**

**Grand Forks AFB, N.D.** 58205-5000; 16 mi. W of Grand Forks. **Phone:** 701-747-3000; DSN 362-1110. **Majcom:** AMC. **Host:** 319th Air Refueling Wing. **Mission:** KC-135R operations. **History:** home of the first of AMC's core air refueling wings. 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, 2,737; DoD civilians, 330. **Housing:** single family, officer/enlisted, 1,516; unaccompanied, UOQ, 40, UAQ/UEQ, 475; visiting, VOQ/VAQ/VEQ, 21, TLF, 200. **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 Sensors 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.

## Air Force Installations

Major Installations	FY96	FY97	FY98	FY99	FY00	FY01
US and possessions	77	75	74	74	74	74
Foreign	13	13	13	13	13	12
Worldwide	90	88	87	87	87	86
Minor Installations						
US and possessions	80	81	80	81	80	80
Foreign	4	4	3	3	3	2
Worldwide	84	85	83	84	83	82

Includes Air National Guard and Air Force Reserve Command.

**Altitude:** 133 ft. **Personnel:** permanent party military, 1,413; DoD civilians, 1,590; contract employees, 980. **Housing:** single family, officer, 388, enlisted, 472; unaccompanied, UOQ, 40; visiting, VOQ and VAQ/VEQ, 131, TLF, 35. **Clinic.**

**Hickam AFB, Hawaii** 96853-5000; 9 mi. W of Honolulu. **Phone:** 808-449-7110 (Oahu military operator); DSN 471-7110. **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 in chief, 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); Central Identification Lab (Army). **History:** activated September 1938. Named for Lt. Col. Horace M. Hickam, aviation pioneer killed in crash Nov. 5, 1934, at Ft. Crockett, Texas. **Area:** 2,761 acres. **Runway:** Four joint-use runways shared with Honolulu IAP: 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, 4,592; DoD civilians, 1,285; contract employees, 300. **Housing:** single family, officer, 1,395, enlisted, 4,775; unaccompanied, UOQ, 180, UAQ/UEQ, 1,031; visiting, VOQ, 202, VAQ/VEQ, 183. **Clinic.**

**Hill AFB, Utah** 84056-5990; 25 mi. N. of Salt Lake City. **Phone:** 801-777-7221; DSN 777-1110. **Majcom:** AFMC. **Host:** Ogden Air Logistics Center. **Mission:** provides worldwide engineering and logistics management for F-16 fighters; maintains A-10s, C-130s, and F-16s; handles logistics management and maintenance for Minuteman and Peacekeeper ICBMs; provides sustainment and logistics support for space and C<sup>3</sup>I 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 Fighter Wing (ACC); 419th FW (AFRC); Area Command Ogden; Hill Aerospace Museum. **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, 5,634; DoD civilians, 9,760; contract employees, 5,063. **Housing:** single family, officer, 179, enlisted, 966; visiting, VOQ, 106, VAQ/VEQ, 154, TLF, 40. **Clinic.**

**Holloman AFB, N.M.** 88330-5000; 8 mi. SW of Alamogordo. **Phone:** 505-572-6511; DSN 572-1110. **Majcom:** ACC. **Host:** 49th Fighter Wing. **Mission:** F-117 operations; QF-4 drone operations. High Speed Test Track; German air force F-4F and Tornado aircrew training. **Major tenants:** 46th Test Gp. (AFMC); Det. 1, 82nd Aerial Target Sq. (AFMC); 4th Space Surveillance Sq. (AFSPC); German Air Force Flying Training Center. **History:** activated 1942. Named for Col. George Holloman, guided-missile pioneer. **Area:** 59,639 acres. **Runways:** 12,133 ft., with 1,000-ft. overrun; 10,577 ft., with 1,000-ft. overrun; and 8,055 ft., with 7,044-ft. overrun. **Altitude:** 4,093 ft. **Personnel:** permanent party military, 3,781; DoD civilians, 904; German air force, 580. **Housing:** single family, officer, 190, enlisted, 1,331, unaccompanied, UAQ/UEQ, 975; visiting, VOQ, 136, VAQ/VEQ, 149, DV suites, 6, TLF, 50. **Clinic.**

**Hurlburt Field, Fla.** 32544-5000; 5 mi. W of Fort Walton Beach. **Phone:** 850-884-1110; DSN 579-1110. **Majcom:** AFSOC. **Host:** 16th Special Operations Wing. **Mission:** equipped with MC-130E/H Combat Talons, AC-130H/U Spectre gunships, MH-53J/M Pave Low III/IV helicopters, MC-130P Combat Shadows (located at Eglin AFB), and UH-1N Huey helicopters. USAF Special Operations School. **Major tenants:** Air Force Special Operations Command; USAF Command and Control Training and Innovation Gp.; C<sup>2</sup> Battlelab; USAF Combat Weather Center. **History:** activated 1943. Named for Lt. Donald W. Hurlburt, WWII pilot killed Oct. 1, 1943, in a crash at nearby Eglin Field Military Reservation. **Area:** 6,600 acres. **Runway:** 6,900 ft. **Altitude:** 38 ft. **Personnel:** permanent party military, 7,191; DoD civilians, 573. **Housing:** single family, officer, 52, enlisted, 628 (300 leased); visiting, VAQ/VEQ, 232, TLF, 24. **Clinic.**

**Incirlık AB, Turkey, APO AE 09824;** 10 mi. E of Adana. **Phone:** (cmcl, from CONUS) 011-90-322-316-1110; DSN (from CONUS) 314-676-1110. **Majcom:** USAF. **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 F-4Es, F-16s, and KC-135s, British Jaguars and VC-10s, and USAF, USN, and USMC air assets, including C-12s, C-130s, E-3s, EA-6Bs, EP-3s, F-15s, F-16s, KC-135s, HH-60s, and MH-60s. **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, 1,494; DoD civilians, 276; local nationals, 671. **Housing:** single family, officer, 225, enlisted, 675; unaccompanied,



The map displays the following Air Force Bases (AFB) and Air Force Commands (AFC) across the United States:

- Alaska:** Eielson AFB (PACAF), Elmendorf AFB (PACAF)
- Hawaii:** Hickam AFB (PACAF), Oahu
- California:** McClellan AFB (AFMC), Travis AFB (AMC), Vandenberg AFB (AFSPC), Edwards AFB (AFMC), Los Angeles AFB (AFMC), March ARB (AFRC), Luke AFB (AETC), Davis-Monthan AFB (ACC)
- Idaho:** Mountain Home AFB (ACC)
- Montana:** Malmstrom AFB (AFSPC)
- Wyoming:** Hill AFB (AFMC)
- Utah:** Schriever AFB (AFSPC), Buckley ANGB (ANG), USAF Academy, Peterson AFB (AFSPC)
- Colorado:** Peterson AFB (AFSPC)
- Nebraska:** Offutt AFB (ACC)
- Kansas:** McConnell AFB (AMC)
- Missouri:** Whiteman AFB (ACC)
- Illinois:** Grissom ARB (AFRC)
- Indiana:** Scott AFB (AMC)
- Ohio:** Selfridge ANGB (ANG)
- Michigan:** Minot AFB (ACC), Grand Forks AFB (AMC)
- Wisconsin:** Ellsworth AFB (ACC)
- North Dakota:** Minot AFB (ACC)
- South Dakota:** Ellsworth AFB (ACC)
- Minnesota:** Ellsworth AFB (ACC)
- North Carolina:** Langley AFB (ACC), Seymour Johnson AFB (ACC), Pope AFB (AMC)
- South Carolina:** Shaw AFB (ACC)
- Georgia:** Columbus AFB (AETC), Maxwell AFB (AETC), Moody AFB (ACC)
- Alabama:** Moody AFB (ACC)
- Mississippi:** Keesler AFB (AETC)
- Arkansas:** Little Rock AFB (AETC)
- Oklahoma:** Vance AFB (AETC)
- Texas:** Tinker AFB (AFMC), Altus AFB (AETC), Barksdale AFB (ACC), Goodfellow AFB (AETC), Dyess AFB (ACC), Sheppard AFB (AETC), Laughlin AFB (AETC)
- New Mexico:** Kirtland AFB (AFMC), Cannon AFB (ACC), Holloman AFB (ACC)
- Nevada:** Nellis AFB (ACC)
- Arizona:** Luke AFB (AETC)
- Florida:** Patrick AFB (AFSPC), MacDill AFB (AMC)
- Virginia:** Langley AFB (ACC), Arnold AFB (AFMC), Seymour Johnson AFB (ACC), Pope AFB (AMC)
- West Virginia:** Wright-Patterson AFB (AFMC)
- Delaware:** Dover AFB (AMC)
- Maryland:** Bolling AFB
- District of Columbia:** Hq. USAF
- Washington:** Tyndall AFB (AETC), Eglin AFB (AFMC), Hurlburt Field (AFSOC)
- Michigan:** Selfridge ANGB (ANG)
- Ohio:** Wright-Patterson AFB (AFMC)
- Indiana:** Scott AFB (AMC)
- Illinois:** Grissom ARB (AFRC)
- Missouri:** Whiteman AFB (ACC)
- Kansas:** McConnell AFB (AMC)
- Nebraska:** Offutt AFB (ACC)
- Wyoming:** Hill AFB (AFMC)
- Utah:** Schriever AFB (AFSPC), Buckley ANGB (ANG), USAF Academy, Peterson AFB (AFSPC)
- Colorado:** Peterson AFB (AFSPC)
- Montana:** Malmstrom AFB (AFSPC)
- Idaho:** Mountain Home AFB (ACC)
- California:** McClellan AFB (AFMC), Travis AFB (AMC), Vandenberg AFB (AFSPC), Edwards AFB (AFMC), Los Angeles AFB (AFMC), March ARB (AFRC), Luke AFB (AETC), Davis-Monthan AFB (ACC)
- Alaska:** Eielson AFB (PACAF), Elmendorf AFB (PACAF)
- Hawaii:** Hickam AFB (PACAF), Oahu
- Washington, D.C. Area:** Hq. USAF, Bolling AFB, Andrews AFB (AMC)
- Other:** Hanscom AFB (AFMC), Otis ANGB (ANG), Westover ARB (AFRC)





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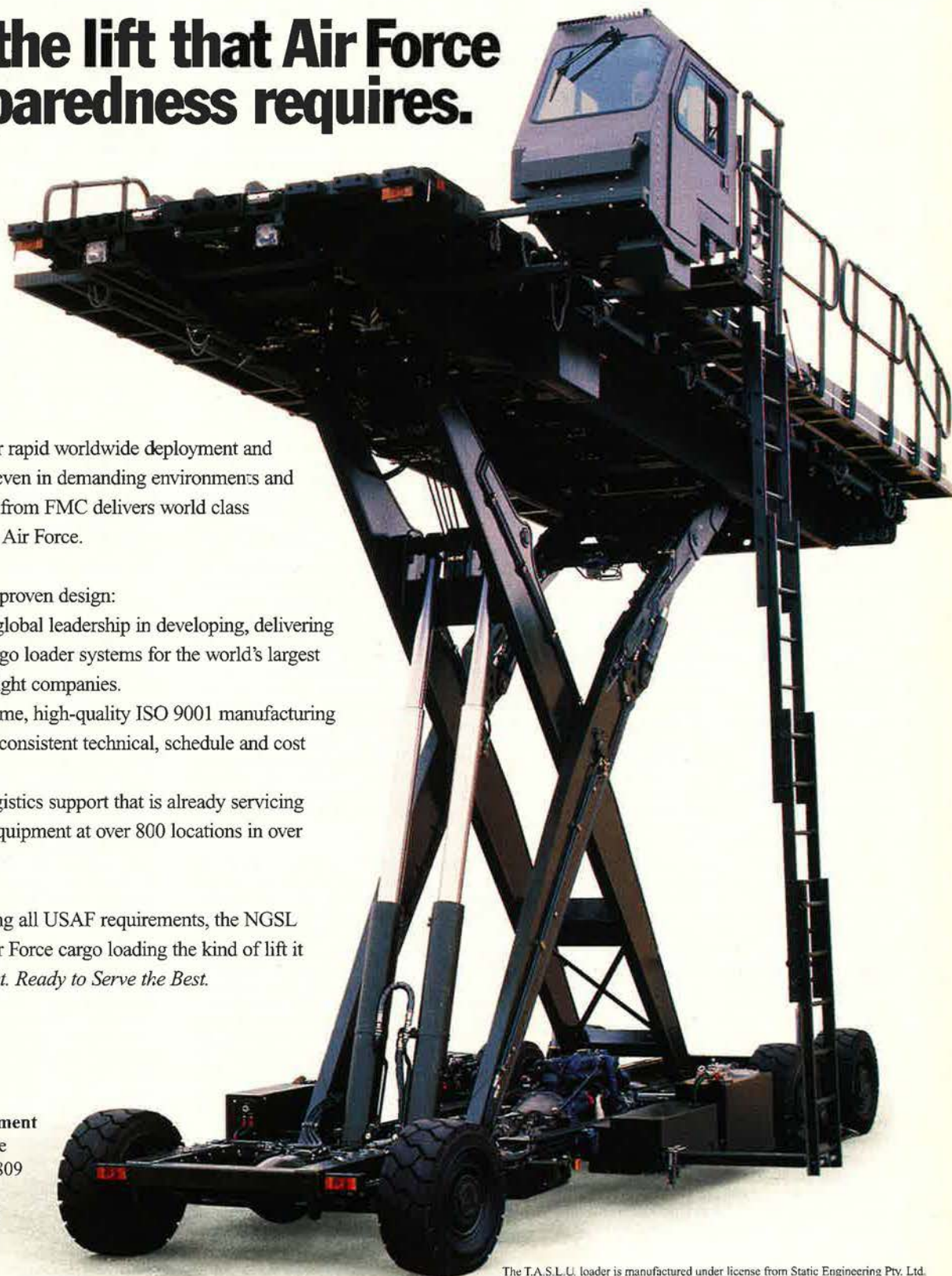
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UOQ, 20 dorm rooms, 50 (town house share), UAQ/UEQ, 622 dorm rooms; visiting, 344, TLF, 80. **Hospital.**

**Kadena AB, Japan, APO AP 96368-5000; 15 mi. N of Naha. Phone:** (cmcl, from CONUS) 011-81-98938-1111; DSN 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:** length 12,100 ft. **Altitude:** 146 ft. **Personnel:** permanent party military, 6,879; DoD civilians, 531; local nationals, 3,379. **Housing:** single family, officer, 981, enlisted, 4,360; unaccompanied, UOQ, 274, UAQ/UEQ, 2,582; visiting, VOQ, 301, VAQ/VEQ, 276, 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 training for avionics, communications, electronics, radar systems, computer and command-and-control systems, weather and precision equipment, physician residencies, specialized nursing, and medical technicians. **Major tenants:** 2nd Air Force (AETC); 403rd Wing (AFRC). **History:** activated June 12, 1941. Named for 2nd Lt. Samuel R. Keesler Jr., a native Mississippian and WWI aerial observer killed in action Oct. 9, 1918, near Verdun, France. **Area:** 3,554 acres. **Runway:** 5,630 ft. **Altitude:** 26 ft. **Personnel:** permanent party military, 10,205; DoD civilians, 2,125. **Housing:** single family, officer, 287, enlisted, 1,562; visiting, VOQ, 512, VAQ/VEQ, 1,070, TLF, 77. **Keesler Medical Center.**

**Kelly AFB, Texas 78241-5000; 5 mi. SW of San Antonio. Phone:** 210-925-1110; DSN 945-1110. **Majcom:** AFMC. **Host:** San Antonio Air Logistics Center. **Mission:** provides logistics management, procurement, and systems support for such DoD aircraft as the C-17, T-37, and T-38 and for such foreign-operated aircraft as the A-37, C-47, F-5, and OV-10. **Major tenants:** Information Warfare Battlelab; Air Intelligence Agency; Air Force Information Warfare Center; Joint Command and Control Warfare Center; Air Force News Agency; Defense Commissary Agency; 433rd Airlift Wing (AFRC); 149th Fighter Wing (ANG); Defense Reutilization and Marketing Office; Air Force Audit Agency; Defense Distribution Depot. **History:** dating from Nov. 21, 1916, Kelly is the oldest continuously active air base in the US. Named for Lt. George E.M. Kelly, first Army pilot to lose his life flying a military aircraft, killed May 10, 1911. **Status:** San Antonio ALC is slated to close July 13, 2001. At that time, the other major units on Kelly will be supported by nearby Lackland AFB, and SA-ALC will deactivate. **Area:** 4,660 acres. **Runway:** 11,550 ft. **Altitude:** 689 ft. **Personnel:** permanent party military, 4,806; DoD civilians, 7,425; contract employees, 1,154; commercial employees, 4,432. **Housing:** single family, officer, 57, enlisted, 374; unaccompanied, UAQ/UEQ, 605. **Clinic.**

**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 Special Operations Wing (AETC); Air Force Operational Test and Evaluation Center; Air Force Research Laboratories (AFMC); 150th Fighter Wing (ANG); 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 and commandant of Langley Field, Va., in 1930s, who died May 2, 1941. **Area:** 51,558 acres. **Runway:** 19,375 ft. **Altitude:** 5,352 ft. **Personnel:** permanent party military, 5,468; DoD civilians, 3,810; contract employees, 11,870. **Housing:** single family, officer, 294, enlisted, 1,490; visiting, VOQ, 130, VAQ/VEQ, 180. **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) 011-82-654-470-1110; DSN 782-1110. **Majcom:** PACAF. **Host:** 8th Fighter Wing. **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; local nationals, 478. **Housing:** unaccompanied, UOQ, 247, UAQ/UEQ, 1,733; visiting, VOQ, 28, VAQ/VEQ, 108. **Clinic.**

**Lackland AFB, Texas 78236-5000; 8 mi. SW of downtown San Antonio. Phone:** 210-671-1110; DSN 473-1110. **Majcom:** AETC. **Host:** 37th Training Wing. **Mission:** largest training wing in the Air Force. Its four primary training functions graduate more than 75,000 students annually. Provides basic military training for civilian recruits entering Air Force, ANG, and Air Force Reserve; 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. The 59th Medical Wing (Wilford Hall Medical Center) is a major referral medical center. **Major tenants:** 59th Medical Wing; Air Force Security Forces Center; Force Protection Battlelab. **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, 8,532; DoD civilians, 4,677; students, 9,358 (avg. daily student load). **Housing:** single family, officer, 109, enlisted (NCO), 611; visiting, VOQ, 388, VAQ/VEQ, 1,280, TLF, 157, student, 748. **Wilford Hall Medical Center.**

**Lajes Field, Azores, Portugal, APO AE 09720-5000; Terceira Island, 900 mi. W of Portugal. Phone:** (cmcl, from CONUS) 011-351-95-295-540100; DSN from US 535-1110, from Europe 245-1110. **Majcom:** ACC. **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; 952nd Transportation Co. (US Army). **History:** US operations began at Lajes Field 1946. **Area:** 1,148 acres. **Runway:** 10,865 ft. **Altitude:** 180 ft. **Personnel:** permanent party military, 950; DoD civilians, 894. **Housing:** single family, officer, 80, enlisted, 403; visiting, VOQ, 128, VAQ/VEQ, 346, TLF, 30. **Clinic.**

**Langley AFB, Va. 23665-5000; 3 mi. N of Hampton. Phone:** 757-764-1110; DSN 574-1110. **Majcom:** ACC. **Host:** 1st Fighter Wing. **Mission:** F-15 operations. **Major tenants:** Air Combat Command; Air Force Rescue Coordi-

nation Center; Aerospace C<sup>2</sup>ISR Center; ACC Heritage of America Band; 12th Airlift Flight; US Army TRADOC flight det. **History:** activated Dec. 30, 1916. Langley is among the oldest continuously active air bases in the US. Named for aviation pioneer and scientist Samuel Pierpont Langley, who died in 1906. **Area:** 3,167 acres. **Runway:** 10,000 ft. **Altitude:** 11 ft. **Personnel:** permanent party military, 8,275; DoD civilians, 2,065. **Housing:** single family, officer, 384, enlisted, 1,222; visiting, VOQ, 101, VAQ/VEQ, 195, TLF, 100. **Hospital.**

**Laughlin AFB, Texas 78843-5000; 6 mi. E of Del Rio. Phone:** 830-298-3511; DSN 732-1110. **Majcom:** AETC. **Host:** 47th Flying Training Wing. **Mission:** Specialized UPT. **History:** activated July 1942. Named for 1st Lt. Jack Thomas Laughlin, Del Rio native, B-17 pilot killed over Java Jan. 29, 1942. **Area:** 5,357 acres. **Runways:** 8,858 ft., 8,310 ft., and 6,246 ft. **Altitude:** 1,082 ft. **Personnel:** permanent party military, 1,367; DoD civilians, 1,034; contract employees, 853. **Housing:** single family, officer, 303, enlisted, 248; unaccompanied, UOQ, 246, UAQ/UEQ, 264; visiting, VOQ, 30, VAQ/VEQ, 14, DV, 8, 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 Airlift Wing. **Mission:** largest C-130 training base in DoD; trains crew members from all branches of military service and 27 foreign countries. **Major tenants:** 463rd Airlift Gp. (AMC), C-130s; 189th Airlift Wing (ANG), C-130s; Air Mobility Warfare Center Combat Aerial Delivery School (AMC); Hq. Arkansas ANG. **History:** activated Oct. 9, 1955. **Area:** 6,130 acres. **Runway:** 12,000 ft. **Altitude:** 310 ft. **Personnel:** permanent party military, 4,670; DoD civilians, 504. **Housing:** single family, officer, 185, enlisted, 1,350; unaccompanied, UAQ/UEQ, 11 single-occupancy dorms housing 764; visiting, VOQ, 197, VAQ/VEQ, 207. **Clinic.**

**Los Angeles AFB, Calif. 90245-4657; in El Segundo, 3 mi. SE of Los Angeles IAP; base housing and support facilities 18 mi. S of the main base, in San Pedro. Phone:** 310-363-1110; DSN 833-1110. **Majcom:** AFMC. **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, 1,535; DoD civilians, 989. **Housing:** single family, at Ft. MacArthur Annex, 574 town houses, officer, 299, enlisted, 275; unaccompanied, UAQ/UEQ, 56; visiting, VOQ, 27, 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 Fighter Wing. **Mission:** F-16 operations; conducts USAF and allied F-16 aircrew training. **Major tenant:** 944th Fighter Wing (AFRC), F-16 operations. **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, near Murvaux, France. Luke is the largest fighter training base in the world. **Area:** 4,200 acres, plus 2,679,090-acre Barry M. Goldwater Range. **Runways:** 10,000 ft. and 9,910 ft. **Altitude:** 1,090 ft. **Personnel:** permanent party military, 5,600; DoD civilians, 1,200; contract employees, 500. **Housing:** single fam-



# Major Air Force Installations Overseas

## Europe

Note: All bases on this map are USAFE bases.



## Pacific

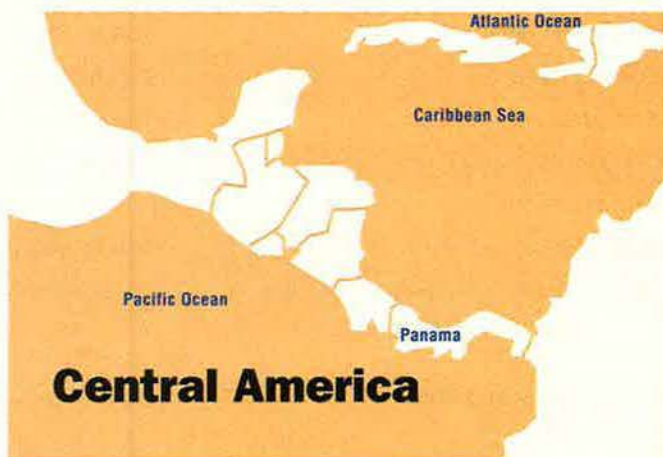
Note: All bases on this map are PACAF bases.



## Atlantic



## Central America





ily, officer, 95, enlisted, 779; unaccompanied, UAQ/UEQ, 996; visiting, VOQ, 184, VAQ/VEQ, 87, TLF, 40. **Hospital.**

**MacDill AFB, Fla.** 33621-5000; located on the Interbay Peninsula in southern Tampa. **Phone:** 813-828-1110; DSN 968-1110. **Majcom:** AMC. **Host:** 6th Air Refueling Wing. **Mission:** KC-135 operations; provides worldwide air refueling and responsive CINC 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, near Washington. **Area:** 5,600 acres. **Runways:** 11,480 ft. and 7,167 ft. **Altitude:** 6 ft. **Personnel:** permanent party military, 5,810; DoD civilians, 1,057. **Housing:** single family, officer, 103, enlisted, 514; unaccompanied, UAQ/UEQ, 654; visiting, VOQ, 136, VAQ/VEQ, 77, TLF, 24. **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 ICBMs, UH-1N helicopters. **Major tenant:** 819th RED HORSE Sq. **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, 3,577; DoD civilians, 672. **Housing:** single family, officer, 258, enlisted, 1,148; unaccompanied, UAQ/UEQ, 956 units (12 dormitories); visiting, VOQ, 34, VAQ/VEQ, 34, TLF, 195. **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; Air Force Officer Accession and Training Schools; Ira C. Eaker College for Professional Development; Community College of the Air Force; Civil Air Patrol; Squadron Officer School; 908th Airlift Wing (AFRC); Air Force Historical Research Agency; Air Force Doctrine Center. **History:** activated 1918. Named for 2nd Lt. William C. Maxwell, killed in air accident Aug. 12, 1920, in the Philippines. **Area:** 3,903 acres (includes Gunter Annex). **Runway:** 8,006 ft. **Altitude:** 172 ft. **Personnel:** permanent party military, 4,247; DoD civilians, 2,889. **Housing:** single family, officer, 370, enlisted, 533; unaccompanied, UOQ, 2, UAQ/UEQ, 420; visiting, VOQ, 1,324, VAQ/VEQ, 565, TLF, 33. **Clinic.**

**McChord AFB, Wash.** 98438-5000; 10 mi. S of Tacoma. **Phone:** 253-984-1910; DSN 984-1110. **Majcom:** AMC. **Host:** 62nd Airlift Wing. **Mission:** C-17s, C-141s. Base is adjacent to Ft. Lewis, its primary customer for strategic airlift worldwide. **Major tenants:** 446th Airlift Wing (AFRC); Western Air Defense Sector (ANG); 22nd Special Tactics Sq. **History:** activated May 5, 1938. Named for Col. William C. McChord, killed Aug. 18, 1937, while attempting a forced landing at Maidens, Va. **Area:** 4,616 acres. **Runway:** 10,100 ft. **Altitude:** 323 ft. **Personnel:** permanent party military, 3,507; DoD civilians, 2,123. **Housing:** single family, officer, 88, enlisted, 895; unaccompanied, UAQ/UEQ, 900 dorm rooms; visiting, VOQ, 70, VAQ/

VEQ, 287, TLF, 12. **Dispensary.** Madigan Army Medical Center is located 4 mi. SE.

**McClellan AFB, Calif.** 95652-5000; 9 mi. NE of Sacramento. **Phone:** 916-643-2111; DSN 633-1110. **Majcom:** AFMC. **Host:** Sacramento Air Logistics Center. **Mission:** transitions workforce, manages and transitions sustainment and other customer responsibilities, and will close McClellan on July 13, 2001. Responsibilities include depot maintenance for KC-135 aircraft; involved in space and communications-electronics. Technology center for very high-speed integrated circuits, fiber optics, and advanced composites; has the only Casting Emissions Research Program with the only fully instrumental foundry in US. The McClellan Nuclear Radiation Center is being designed for use as a brain-scan facility, partnering with the University of California Davis Medical Center. **Major tenants:** Defense Commissary Agency Western Pacific Region; US Coast Guard Air Station, Sacramento (DoT). **History:** activated April 9, 1939. Named for Maj. Hezekiah McClellan, pioneer in Arctic aeronautical experiments, killed in a crash May 25, 1936. **Area:** 3,763 acres. **Runway:** 10,600 ft. **Altitude:** 75 ft. **Personnel:** permanent party military, 1,359; DoD civilians, 3,657; contract employees, 266. **Housing:** single family, officer, 100, enlisted, 564; visiting, VOQ, 72, VAQ/VEQ, 24, TLF, 19. **Clinic** for active duty and Tricare Prime members only.

**McConnell AFB, Kan.** 67221-5000; SE corner of Wichita. **Phone:** 316-652-6100; DSN 743-1110. **Majcom:** AMC. **Host:** 22nd Air Refueling Wing. **Mission:** KC-135 operations. **Major tenants:** 931st Air Refueling Gp. (AFRC Assoc.); 184th Bomb Wing (ANG). **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, during an attack on Bougainville, Papua New Guinea). **Area:** 3,113 acres. **Runways:** two, 12,000 ft. each. **Altitude:** 1,371 ft. **Personnel:** permanent party military, 2,615; DoD civilians, 388. **Housing:** single family, officer, 69, enlisted, 501; visiting, VOQ, 45, VAQ/VEQ, 42, TLF, 45 units off base. **Clinic.**

**McGuire AFB, N.J.** 08641-5000; 18 mi. SE of

Trenton. **Phone:** 609-724-1100; DSN 440-1100. **Majcom:** AMC. **Host:** 305th Air Mobility Wing. **Mission:** C-141 and KC-10 operations. **Major tenants:** 21st Air Force (AMC); Air Mobility Warfare Center, Ft. Dix, N.J.; N.J. ANG; N.J. Civil Air Patrol; 108th Air Refueling Wing (ANG), KC-135s; 514th Air Mobility Wing (AFRC Assoc.). **History:** adjoins Army's Ft. Dix. Formerly Ft. Dix AAB; activated as AFB 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, in the Philippines. **Area:** 3,598 acres. **Runways:** 10,001 ft. and 7,124 ft. **Altitude:** 133 ft. **Personnel:** permanent party military, 4,750; DoD civilians, 1,509. **Housing:** single family, officer, 215, enlisted, 1,676; visiting, VOQ, 33, VAQ/VEQ, 274, TLF, 30. **Clinic.**

**Minot AFB, N.D.** 58705-5000; 13 mi. N of Minot. **Phone:** 701-723-1110; DSN 453-1110. **Majcom:** ACC. **Host:** 5th Bomb Wing. **Mission:** B-52H operations. **Major tenant:** 91st Space Wing (AFSPC), Minuteman III ICBMs, UH-1N helicopters. **History:** activated January 1957. Named after the city of Minot, whose citizens donated \$50,000 toward purchase of the land for the Air Force. **Area:** 5,049 acres, plus additional 8,500 acres for missile sites. **Runway:** 13,200 ft. **Altitude:** 1,668 ft. **Personnel:** permanent party military, 4,482; DoD civilians, 536. **Housing:** single family, officer, 352, enlisted, 1,967; unaccompanied, UOQ, 59, UAQ/UEQ, 1,401 dorm spaces; visiting, VOQ, 34, VAQ/VEQ, 28, TLF, 38. **Clinic.**

**Misawa AB, Japan,** APO AP 96319-5000; within Misawa city limits. **Phone:** (cmcl, from CON-US) Direct: 011-81-3117-66-1111. Switchboard: 011-81-176-53-5181; DSN 94-315-226-1110. **Majcom:** PACAF. **Host:** 35th Fighter Wing. **Mission:** F-16C/D operations. **Major tenants:** 3rd Space Surveillance Sq. (AFSPC); 301st Intelligence Sq.; 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, 4,013; DoD civilians, 335; local nationals, 1,884. **Housing:** single family, officer, 355, enlisted, 1,884; unaccompanied, UOQ, 120, UAQ/UEQ, 823; visiting, VOQ, 82,

## Minor Installations

In addition to the installations listed above, the Air Force has a number of minor installations. These air stations perform various missions, including air defense 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. 02561-9314 (AFSPC)	DSN 557-2277
Cavalier AFS, N.D. 58220-5000 (AFSPC)	DSN 330-3292
Cheyenne Mountain AFS, Colo. 80914-5515 (AFSPC)	DSN 268-1211
Clear AFS, Alaska, APO AP 99704 (AFSPC)	DSN 317-585-6110
Onizuka AFS, Calif. 94088-3430 (AFSPC)	DSN 561-3000
Prince Sultan AB, Saudi Arabia (363rd Air Expeditionary Wing), Unit 70404, Box 4, APO AE 09882	DSN 318-434-7252
RAF Croughton (UK), APO AE 09494 (USAFE)	DSN 314-236-1110
Thule AB (Greenland), APO AE 09704-5000 (AFSPC) (ask for Thule operator)	DSN 268-1211



VAQ/VEQ, 44; Navy CBH, 823; TLF, 40. **Hospital.**

**Moody AFB, Ga.** 31699-5000; 10 mi. NNE of Valdosta. **Phone:** 912-257-4211; DSN 460-1110. **Majcom:** ACC. **Host:** 347th Wing. **Mission:** F-16C/D (LANTIRN-equipped), A/OA-10; HC-130, HH-60 operations. **History:** activated June 1941. Named for Maj. George P. Moody, killed May 5, 1941, while test-flying a Beech AT-10. **Area:** 11,840 acres. **Runway:** 8,000 ft. **Altitude:** 233 ft. **Personnel:** permanent party military, 4,648; DoD civilians, 800. **Housing:** single family, officer, 30, enlisted, 271; visiting, VOQ, 36, VAQ/VEQ, 19, TLF, 32. **Clinic.**

**Mountain Home AFB, Idaho** 83648-5000; 45 mi. SE of Boise. **Phone:** 208-828-2111; DSN 728-2111. **Majcom:** ACC. **Host:** 366th Wing. **Mission:** USAF's Air Expeditionary Wing, ready to deploy rapidly worldwide with B-1Bs, F-15C/Ds, F-15Es, F-16Cs, and KC-135Rs. **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, 4,200; DoD civilians, 830. **Housing:** single family, officer, 196, enlisted, 1,325; visiting, VOQ, 48, VAQ/VEQ, 47, 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; oversees Tonopah Test Range, three 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 and Green Flag exercises (414th Combat Training Sq.); graduate-level pilot training (USAF Weapons School); support for US Army exercises as part of Air Warrior I and II (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; also responsible for operational testing and evaluation of new equipment and systems proposed for use by these forces. **Major tenants:** Aerospace Integration Center, OSD Joint Suppression of Enemy Air Defenses, Triservice Reserve Center, 67th Intelligence Gp., 820th RED HORSE Sq.; 896th Munitions Sq. **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, in Europe. **Area:** Main base is 11,000 acres. NRC occupies 3.1 million acres of restricted air-land use and an additional 5-million-acre military operating area shared with civilian aircraft. **Runways:** 10,119 ft. and 10,051 ft. **Altitude:** 1,868 ft. **Personnel:** permanent party military, 6,500; DoD civilians, 2,700. **Housing:** single family, officer, 72, enlisted, 1,254; visiting, VOQ, 335, VAQ/VEQ, 323, DV suites, 8, 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, command and control, and combat support to warfighting commanders and national leadership. **Major tenants:** US Strategic Command; Joint Intelligence Cen-

ter (USSTRATCOM); Air Force Weather Agency; National Airborne Operations Center (JCS); ACC 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, from injuries received at Valheureux, France. **Area:** 4,041 acres. **Runway:** 11,700 ft. **Altitude:** 1,048 ft. **Personnel:** permanent party military, 8,241; DoD civilians, 1,543. **Housing:** single family, officer, 337, enlisted, 2,211; visiting, VOQ/VAQ/VEQ, 78, DV suites, 51, TLF, 60. **Hospital.**

**Osan AB, Republic of Korea,** APO AP 96278-5000; 38 mi. S of Seoul. **Phone:** (cmcl, from CONUS) 011-82-333-661-1110; DSN 784-4110. **Majcom:** PACAF. **Host:** 51st Fighter Wing. **Mission:** A-10, C-12J, F-16C/D, and OA-10A operations. **Major tenant:** 7th Air Force (PACAF); 5th Reconnaissance Sq. (ACC); 31st Special Ops Sq. (AFSOC); 33rd Rescue Sq. (PACAF); 303rd Intelligence Sq. (AIA). **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, 6,529; DoD civilians, 223; local nationals, 1,034. **Housing:** single family, 252; unaccompanied, UOQ, 396, VAQ/UEQ, 3,380; visiting, VOQ, 60, VAQ/VEQ, 182, TLF, 16. **Hospital.**

**Patrick AFB, Fla.** 32925-3237; 2 mi. S of Cocoa Beach. **Phone:** 407-494-1110; 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. Besides host responsibilities for Patrick AFB and Cape Canaveral AFS, 45th SW also oversees operations at tracking stations on Antigua and Ascension islands. **Major tenants:** Defense Equal Opportunity Management Institute; Air Force Technical Applications Center; 920th Rescue Gp.; 301st Rescue Sq. (AFRC); 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, 2,500; DoD civilians, 2,000; contract employees, 5,500. **Housing:** single family, officer, 185, enlisted, 1,364; unaccompanied, UOQ/UEQ, 274; visiting, VOQ, 109, VAQ/VEQ, 105, TLF, 51. **Clinic.**

**Peterson AFB, Colo.** 80914-5000; at eastern edge of Colorado Springs. **Phone:** 719-556-7321; DSN 834-7011. **Majcom:** AFSPC. **Host:** 21st Space Wing. **Major tenants:** NORAD; US Space Command; Air Force Space Command; Army Space Command; 302nd Airlift Wing (AFRC); Edward J. Peterson Air and Space Museum. **History:** activated 1942. Named for 1st Lt. Edward J. Peterson, killed Aug. 8, 1942, in an aircraft crash at the base. **Area:** 1,277 acres. **Runway:** shared with city. **Altitude:** 6,200 ft. **Personnel:** permanent party military, 3,175; DoD civilians, 1,593; contract employees, 1,472. **Housing:** single family, officer, 107 enlisted, 384; visiting, VOQ, 72, VAQ/VEQ, 98, TLF, 40. **Clinic.**

**Pope AFB, N.C.** 28308-2391; 12 mi. NNW of Fayetteville. **Phone:** 910-394-1110; DSN 424-1110. **Majcom:** AMC. **Host:** 43rd Airlift Wing. **Mission:** C-130 operations. Base 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); 18th Air Support Operations Gp. (ACC); 21st and 24th Special Tactics Sqs. (AFSOC); USAF Combat Control School. **History:** activated 1919. Named after 1st Lt. Harley H. Pope, WWI pilot, killed Jan. 7, 1919, when his JN-4 "Jenny" crashed into the Cape Fear River near Fayetteville. **Area:** 2,198 acres. **Runway:** 7,500 ft. **Altitude:** 218 ft. **Personnel:** permanent party military, 4,844; DoD civilians, 515. **Housing:** single family, officer, 90, enlisted, 547; unaccompanied, UOQ/UEQ, 752 dorm spaces; visiting, VOQ, 153, VAQ/VEQ, 111, TLF, 8. **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:** Royal Air Force base. **Host:** 48th Fighter Wing (USAFE). **Mission:** flies the F-15C/D and the F-15E and trains for and conducts air operations in support of NATO. **Major tenant:** 5th Space Surveillance Sq. (AFSPC) at RAF Feltwell. **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, 5,000; DoD civilians, 1,300; local nationals, 600. **Housing:** single family, officer, 294, enlisted, 1,994 (plus 1,065 govt.-leased); unaccompanied, UOQ/UEQ, 864; visiting, VOQ, 84, VAQ/VEQ, 95 bed spaces, DV suites, 11, TLF, 32. **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:** USAF. **Host:** 100th Air Refueling Wing. **Mission:** KC-135R Stratotankers conduct air refueling, force reception, force deployment, and support operations for US and NATO in the European Theater. **Major Partner Units:** 3rd Air Force (USAFE); 352nd Special Operations Gp. (AFSOC), MC-130H, MC-130H/P, and MH-53J aircraft; 95th Reconnaissance Sq. (ACC); 488th Intelligence Sq. (AIA); Naval Air Facility, C-12 aircraft. **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, 4,620; DoD US civilians, 1,061; local nationals, 600. **Housing:** single family, officer, 40, enlisted, 79; visiting, VOQ, 210, VAQ/VEQ, 152.

**Ramstein AB, Germany,** APO AE 09094-0385; adjacent to the city of Ramstein, 10 mi. W of Kaiserslautern. **Phone:** (cmcl, from CONUS) 011-49-6371-47-113; DSN 480-1110. **Majcom:** USAF. **Host:** 86th Airlift Wing. **Mission:** C-9, C-20, C-21, and C-130E operations; provides inter- and intratheater operational airlift, intratheater aeromedical evacuation, and CONUS staging and aeromedical evacuation. Wing commander also serves as commander of the Kaiserslautern Military Community, the largest concentration of US citizens (35,000) outside the US. **History:** activated and US presence began 1953. **Area:** 10,261 acres. **Runway:** 8,015 ft. **Altitude:** 782 ft. **Personnel:** permanent party military, 12,630; DoD US civilians, 3,280; local nationals, 5,380; contract US employees, 1,599. **Housing:** single family, officer, 465, enlisted, 4,674; unaccompanied, UOQ, 60 (includes NATO), dormitory rooms, 1,724 (Air Force only); visiting, VOQ, 582, VAQ/VEQ, 1,459, TLF, 182. **Clinic.**

**Randolph AFB, Texas** 78150-5000; 17 mi. ENE of San Antonio. **Phone:** 210-652-1110; DSN 487-1110. **Majcom:** AETC. **Host:** 12th Flying Training Wing. **Mission:** conducts AT-38, T-1A, T-37, and T-38 instructor pilot train-



ing; 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, when his AT-4 crashed on takeoff at Gorman, Texas. **Area:** 5,044 acres. **Runways:** two parallel, (W) 9,350 ft. and (E) 8,350 ft. **Altitude:** 761 ft. **Personnel:** permanent party military, 5,010; DoD civilians, 4,222; contract employees, 1,511. **Housing:** single family, officer, 218, enlisted, 801; unaccompanied, UOQ, 202, UAQ/UEQ, 275; visiting, VOQ, 348, VAQ/VEQ, 171, TLF, 30. **Clinic.**

**Robins AFB, Ga.** 31098; 15 mi. SSE of Macon at Warner Robins. **Phone:** 912-926-1110; DSN 468-1110. **Majcom:** AFMC. **Host:** Warner Robins Air Logistics Center. **Mission:** provides worldwide logistics management for C-5s, C-130s, C-141s, and F-15s, helicopters, missiles, and remotely piloted vehicles. Other management responsibilities include the 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:** 93rd Air Control Wing (ACC); Air Force Reserve Command; 116th Bomb Wing (ANG), B-1B; 19th Air Refueling Gp. (AMC); 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, 5,272; DoD civilians, 11,210; contract employees, 5,306. **Housing:** single family, officer, 244, enlisted, 1,225; visiting, VOQ, 134, VAQ/VEQ, 82, 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. **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, 2,075; DoD civilians, 309; contract employees, 1,781. **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 Airlift Wing. **Mission:** C-9 and C-21 operations; ANG KC-135s. **Major tenants:** US Transportation Command; Air Mobility Command; Air Force Communications Agency; Defense Information Technology Contracting Office; 126th Air Refueling Wing (ANG); 932nd Airlift Wing (AFRC). **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, in a Wright B Flyer at College Park, Md. **Area:** 3,230 acres. **Runways:** 10,000 ft. and 8,000 ft. (joint-use airfield). **Altitude:** 453 ft. **Personnel:** permanent party military, 7,500; DoD civilians, 3,000; contract employees, 1,300. **Housing:** single family, officer, 304, enlisted, 1,476; unaccompanied, UAQ/UEQ, 558 bed spaces; visiting, VOQ, 220 bed spaces, VAQ/VEQ, 169 bed spaces, TLF, 36 units. **Hospital.**

**Seymour Johnson AFB, N.C.** 27531; within city limits of Goldsboro. **Phone:** 919-722-5400; DSN 722-1110. **Majcom:** ACC. **Host:** 4th Fighter Wing. **Mission:** F-15E operations. **Major tenant:** 916th Air Refueling Wing (AFRC), KC-135R operations. **History:** activated June 12, 1942. Named for Navy Lt. Seymour A. Johnson, Goldsboro native, killed March 5, 1941, in an aircraft accident in Maryland. **Area:** 3,233 acres. **Runway:** 11,758 ft. **Altitude:** 110 ft. **Personnel:** permanent party military, 4,400; DoD civilians, 1,200. **Housing:** single family, officer, 152, enlisted, 1,544; unaccompanied, UOQ, 20; UAQ/UEQ, 631 rooms; visiting, VOQ, 32, VAQ/VEQ, 37, DV, 10, TLF, 29. **Clinic.**

**Shaw AFB, S.C.** 29152-5000; 10 mi. WNW of Sumter. **Phone:** 803-895-1110; DSN 965-1110. **Majcom:** ACC. **Host:** 20th Fighter Wing. **Mission:** F-16 operations. **Major tenant:** 9th Air Force (ACC). **History:** activated Aug. 30, 1941. Named for 2nd Lt. Ervin D. Shaw, one of the first Americans to see air action in WWI, killed in France July 9, 1918, when his Bristol fighter was shot down during a reconnaissance mission. **Area:** 3,363 acres; supports another 13,000 acres. **Runways:** 10,000 ft. and 8,000 ft. **Altitude:** 244 ft. **Personnel:** permanent party military, 5,800; DoD civilians, 800. **Housing:** single family, officer, 162, enlisted, 1,542; unaccompanied, UAQ/UEQ, 988; visiting, VOQ, 74, VAQ/VEQ, 66, TLF, 40. **Hospital** (no emergency room).

**Sheppard AFB, Texas** 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 Flying Training Wing (AETC), conducts T-37 and T-38 UPT; instructor pilot training in the Euro-NATO Joint Jet Pilot Training program; Introduction to Fighter Fundamentals course with AT-38 aircraft. **History:** activated June 14, 1941. Named for US Sen. Morris E. Sheppard of Texas, 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, 3,864; DoD civilians, 1,498. **Housing:** single family, officer, 190, enlisted, 1,036; unaccompanied, UOQ, 196, UAQ/UEQ (permanent party, not pipeline), 696; visiting, VOQ, 426, VAQ/VEQ, 2,126, NPS, 5,160, TLF, 80. **Hospital.**

**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 Fighter Wing. **Mission:** two F-16 squadrons with the only HARM targeting capability in Europe; USAFE's only A/OA-10 squadron. The wing also includes the only air control squadron in central Europe, and its logistics responsibilities extend to more than 90 GSUs. **History:** built 1953 by the French and given to US. Named after nearby town. **Area:** 1,282 acres. **Runway:** 10,000 ft. **Altitude:** 1,196 ft. **Personnel:** permanent party military, 4,800; DoD US civilians, 300; local nationals, 600; NAF and DODDS, 1,100. **Housing:** single family, officer, 121, enlisted, 2,074; visiting, 116 rooms, TLF, 39. **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 main-

tenance 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); 507th Air Refueling Wing (AFRC); Navy Strategic Communications Wing One; Defense Logistics Agency's Defense Distribution Depot Oklahoma City; 3rd Combat Communications Gp.; 38th Engineering Installation Wing (AFMC); Defense Megacenters Oklahoma City. **History:** activated March 1942. Named for Maj. Gen. Clarence L. Tinker, whose LB-30 (an early model B-24) went down at sea southwest of Midway Island June 7, 1942. **Area:** 5,000 acres. **Runways:** 11,100 ft. and 10,000 ft. **Altitude:** 1,291 ft. **Personnel:** permanent party military, 7,300; DoD civilians, 14,794. **Housing:** single family, officer, 108, enlisted, 622. **Hospital.**

**Travis AFB, Calif.** 94535-5000; 50 mi. NE of San Francisco at Fairfield. **Phone:** 707-424-1110; DSN 837-1110. **Majcom:** AMC. **Host:** 60th Air Mobility Wing. **Mission:** C-5 and KC-10 operations. **Major tenants:** 15th Air Force (AMC); 349th Air Mobility Wing (AFRC Assoc.); David Grant Medical Center; America's Band of the Golden West; Air Museum. **History:** activated May 17, 1943. Named for Brig. Gen. Robert F. Travis, killed Aug. 5, 1950, in a B-29 accident. **Area:** 6,383 acres. **Runways:** two, each approx. 11,000 ft. **Altitude:** 62 ft. **Personnel:** permanent party military, 6,807; DoD civilians, 1,009; contract employees, 51; NAF employees, 456. **Housing:** single family, officer, 279, enlisted, 2,167; unaccompanied, UAQ/UEQ, 1,080 spaces; visiting, VOQ, 138, VAQ/VEQ, 242, TLF, 84. **Hospital.**

**Tyndall AFB, Fla.** 32403-5000; 12 mi. E of Panama City. **Phone:** 850-283-1113; DSN 523-1113. **Majcom:** AETC. **Host:** 325th Fighter Wing. **Mission:** F-15 operations; provides training for 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, 4,191; DoD civilians, 647; contract employees, 1,134. **Housing:** single family, officer, 123, enlisted, 904; unaccompanied, UAQ/UEQ, 7 dorms/435 beds; visiting, VOQ, 6 dorms/219 beds, VAQ/VEQ, 7 dorms/263 beds, TLF, 5 units/40 suites. **Clinic.**

**US Air Force Academy, Colo.** 80840-5025; N of Colorado Springs. **Phone:** 719-333-1818; DSN 333-1110. **Host:** USAFA is direct reporting unit. **Mission:** inspires and develops outstanding young men and women to become Air Force officers with knowledge, character, and discipline, motivated to lead the world's greatest aerospace force in service to the nation. **Major tenant:** 557th Flying Training Sq. (AETC). **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, 2,369; cadets, 4,020; DoD civilians, 1,875; contract employees, 702. **Housing:** single family, officer, 619, enlisted, 609; unaccompanied, UAQ/UEQ, 164; visiting, VOQ, 76, TLF, 25. **Hospital.**

**Vance AFB, Okla.** 73705-5000; 3 mi. SSW of Enid. **Phone:** 580-213-7111; DSN 448-7110. **Majcom:** AETC. **Host:** 71st Flying Training Wing. **Mission:** provides Joint Specialized UPT 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, when air-evac airplane returning to the US went down in the Atlantic near Iceland. **Area:** 4,555 acres. **Runway:** 5,038 ft. **Altitude:** 1,007 ft. **Personnel:** permanent party military, 984; DoD civilians, 181; contract employees, 1,200. **Housing:** single family, officer, 118, enlisted, 112; unaccompanied, UOQ, 210, UAQ/UEQ, 108; visiting, VOQ, 48, TLF, 10, DV suites, 6. **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, 3,631; DoD civilians, 1,088; contract employees, 3,074. **Housing:** single family, officer, 447, enlisted, 1,367. **Clinic.**

**Whiteman AFB, Mo.** 65305-5000; 2 mi. S of Knob Noster. **Phone:** 660-687-1110; DSN 975-1110. **Majcom:** ACC. **Host:** 509th Bomb Wing. **Mission:** B-2 operations. **Major tenants:** 442nd Fighter Wing (AFRC); 1st Battalion, 135th Aviation (ARNG). **History:** activated 1942. Named for Sedalia resident 2nd Lt. George A. Whiteman, first pilot to die in aerial combat during the attack on Pearl Harbor. **Area:** 4,627 acres. **Runway:** 12,400 ft. **Altitude:** 871 ft. **Personnel:** permanent party military, 3,149; DoD civilians, 1,659. **Housing:** single family, officer, 96, enlisted, 893; visiting, VOQ, 61 (plus 3 houses), VAQ/VEQ, 77, TLF, 31. **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 Airlift Wing (AFRC); 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, in the crash of a DH-4. 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 and open to the public. Site of the US Air Force Marathon, held annually on the Saturday nearest Sept. 18. **Area:** 8,145 acres. **Runway:** 19,600 ft. **Altitude:** 824 ft. **Personnel:** permanent party military, 6,000; DoD civilians, 11,700; contract employees, 3,600. **Housing:** single family, officer, 742, enlisted, 1,550; unaccompanied, UAQ/UEQ, 350; visiting, VOQ, 488, VAQ/VEQ, 75, TLF, 40. **Hospital:** second largest medical center in the Air Force.

**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 Airlift Wing. **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 Air Mobility Support Sq. (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, 3,671; DoD civilians, 1,415; local nationals, 2,271. **Housing:** single family, officer, 715, enlisted, 1,924; unaccompanied, UOQ, 220, UAQ/UEQ, 860; visiting, VOQ, 196, VAQ/VEQ, 64, TLF, 94. **Hospital.**

## ANG and AFRC Bases

Notes: This section of the guide consolidates major Air National Guard and Air Force Reserve Command bases into a single listing. Most ANG locations are listed according to the airports whose facilities they share. AFRC units are listed by the names of their bases and are designated as AFRC facilities. There are, in addition, some ANG and AFRC units located on USAF bases. These may be found in the "Major Installations" section.

ANG personnel are organized into two categories. Part-time personnel are traditional Guardsmen who work in the private sector during the week, serve in ANG one weekend each month, and go on active duty for two weeks during the summer. If called up by the President, they go on active military status.

ANG's second category, full-time support personnel, are Active Guard Reserve, Title 32, and Title 5 personnel. Active Guard Reserves are assigned to the state. They do not serve at the national level, but they receive the same benefits as regular active military. Title 32 personnel are civilians employed full-time in ANG, but they wear two hats: They can go on active military service if their unit gets called up. They also participate in ANG weekend training exercises once a month and for two weeks in the summer. Title 5 personnel are federal civilian employees who hold administrative positions in ANG.

**Atlantic City IAP, N.J.** 08232-9500; 10 mi. W of Atlantic City. **Phone:** 609-645-6000; DSN 455-6000. **Unit:** 177th Fighter Wing (ANG). **Area:** 286

acres. **Runway:** 10,000 ft. **Altitude:** 76 ft. **Full-time personnel:** 304.

**Baltimore, Md. (Martin State Airport)** 21220-2899; 8 mi. E of Baltimore. **Phone:** 410-780-8270; DSN 243-6210. **Unit:** 175th Wing (ANG). **Area:** 175 acres. **Runway:** 7,000 ft. **Altitude:** 24 ft. **Full-time personnel:** 422.

**Bangor IAP, Maine** 04401-3099; 4 mi. NW of Bangor. **Phone:** 207-990-7700; DSN 698-7700. **Units:** 101st Air Refueling Wing (ANG); 776th Radar Sq. (ACC). **Area:** 457 acres. **Runway:** 11,400 ft. **Altitude:** 192 ft. **Full-time personnel:** 311. Small BX.

**Barnes MAP, Mass.** 01085; 3 mi. N of Westfield. **Phone:** 413-568-9151; DSN 636-9210. **Unit:** 104th Fighter Wing (ANG). **Area:** 186 acres. **Runway:** 9,000 ft. **Altitude:** 270 ft. **Full-time personnel:** 289.

**Birmingham Airport, Ala.** 35217. **Phone:** 205-841-9200; DSN 778-2210. **Unit:** 117th Air Refueling Wing (ANG). **Area:** 118 acres. **Runway:** 10,000 ft. **Altitude:** 650 ft. **Full-time personnel:** 278.

**Boise Air Terminal (Gowen Field), Idaho** 83707; 6 mi. S of Boise. **Phone:** 208-422-5011; DSN 941-5011. **Units:** 124th Wing (ANG). Also host to ARNG (Army field training site) and Marine Corps Reserve. **History:** named for Lt. Paul R. Gowen, killed in B-10 crash July 11, 1938. **Area:** 1,994 acres. **Runway:** 9,800 ft. **Altitude:** 2,858 ft. **Full-time personnel:** 390. Limited transient facilities available during ARNG camps.

**Bradley IAP, Windsor Locks, Conn.** 06026-5000; 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:** 126 acres. **Runway:** 9,500 ft. **Altitude:** 173 ft. **Full-time personnel:** 275.

**Buckley ANGB, Colo.** 80011; 8 mi. E of Denver.

**Phone:** 303-340-9555; DSN 877-9011. **Units:** 140th Wing (ANG); Hq. Colorado ANG; 227th Air Traffic Control Flt. (ANG); 240th Civil Engineering Flt. (ANG); Navy Reserve, Marine Corps Reserve, ARNG, and Air Force units. **History:** activated April 1, 1942, as a gunnery training facility. ANG assumed control from US Navy in 1959. Named for Lt. John H. Buckley, National Guardsman, killed Sept. 27, 1918. **Area:** 3,832 acres. **Runway:** 11,000 ft. **Altitude:** 5,663 ft. **Full-time personnel:** 302.

**Burlington IAP, Vt.** 05401; 3 mi. E of Burlington. **Phone:** 802-660-5215; DSN 220-5210. **Unit:** 158th Fighter Wing (ANG). **Area:** 241 acres. **Runway:** 7,800 ft. **Altitude:** 334 ft. **Full-time personnel:** 297.

**Capital MAP, Ill.** 63707-5000; 2 mi. NW of Springfield. **Phone:** 217-753-8850; DSN 892-8210. **Unit:** 183rd Fighter Wing (ANG). **Area:** 91 acres. **Runway:** 8,000 ft. **Altitude:** 592 ft. **Full-time personnel:** 296.

**Channel Islands ANGB, Point Mugu, Calif.** 93041-4001. **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:** 265.

**Charlotte/Douglas IAP, Charlotte, N.C.** 28208. **Phone:** 704-391-4100; DSN 583-9210. **Unit:** 145th Airlift Wing (ANG). **Area:** 79 acres. **Runway:** 10,000 ft. **Altitude:** 749 ft. **Full-time personnel:** 287.

**Cheyenne MAP, Cheyenne, Wyo.** 82001. **Phone:** 307-772-6201; DSN 943-6201. **Unit:** 153rd Airlift Wing (ANG). **Area:** 70 acres. **Runway:** 8,600 ft. **Altitude:** 6,156 ft. **Full-time personnel:** 271.

**Dannelly Field, Ala.** 36196; 7 mi. SW of Montgomery. **Phone:** 205-284-7100; DSN 385-7200. **Units:** 187th Fighter Wing (ANG); 232nd Combat Communications Sq. **History:** named for Ens. Clarence Dannelly, Navy pilot killed during WWII. **Area:** 51 acres. **Runway:** 9,000 ft. **Altitude:** 221 ft. **Full-time personnel:** 289.

ANGB	Air National Guard Base
ARB	Air Reserve Base
ARS	Air Reserve Station
IAP	International Airport
JRB	Joint Reserve Base
MAP	Municipal Airport
NAS	Naval Air Station
RAP	Regional Airport



**Des Moines IAP**, Iowa 50321; within city of Des Moines. **Phone:** 515-256-8502; DSN 939-8210. **Unit:** 132nd Fighter Wing (ANG). **Area:** 113 acres. **Runway:** 9,000 ft. **Altitude:** 957 ft. **Full-time personnel:** 298.

**Dobbins ARB**, Ga. (Marietta) 30069-5010; 16 mi. NW of Atlanta. **Phone:** 770-919-5000; DSN 925-5000. **Majcom:** AFRC. **Units:** Hq. 22nd Air Force (AFRC); 94th Airlift Wing (AFRC); Hq. Georgia ANG; Army Aviation Group (Georgia ARNG); US Army Reserve Center; Naval 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:** 1,068 ft. **Full-time personnel:** 200 ARTs; 300 civilians.

**Duluth IAP**, Minn. 55811-5000; 5 mi. NW of Duluth. **Phone:** 218-727-6886; DSN 825-7210. **Unit:** 148th Fighter Wing (ANG). **Area:** 329 acres. **Runway:** 10,200 ft. **Altitude:** 1,429 ft. **Full-time personnel:** 284.

**Eastern West Virginia RAP** (Shepherd Field), W. Va. 25401; 4 mi. S of Martinsburg. **Phone:** 304-267-5100; DSN 242-9210. **Unit:** 167th Airlift Wing (ANG). **Area:** 420 acres. **Runway:** 7,000 ft. **Altitude:** 556 ft. **Full-time personnel:** 271.

**Ellington Field**, Texas 77034-5586; a city of Houston airport 17 mi. SE of downtown Houston. **Phone:** 713-929-2110; DSN 954-2110. **Units:** 147th Fighter Wing (ANG); NASA Flight Operations; US Coast Guard; ARNG; FAA. **History:** named for Lt. Eric L. Ellington, pilot killed November 1913. **Area:** 216 acres. **Runway:** 9,000 ft. **Altitude:** 40 ft. **Full-time personnel:** 314.

**Forbes Field**, Kan. 66619-5000; 2 mi. S of Topeka. **Phone:** 913-231-4210; DSN 720-4210. **Unit:** 190th Air Refueling Wing (ANG). **Area:** 193 acres. **Runway:** 12,800 ft. **Altitude:** 1,079 ft. **Full-time personnel:** 279.

**Fort Smith MAP**, Ark. 72906. **Phone:** 501-648-5210; DSN 962-8210. **Unit:** 188th Fighter Wing (ANG). **Area:** 113 acres. **Runway:** 8,000 ft. **Altitude:** 468 ft. **Full-time personnel:** 295.

**Fort Wayne IAP**, Ind. 46809-5000; 5 mi. SSW of Fort Wayne. **Phone:** 219-478-3210; DSN 786-1210. **Unit:** 122nd Fighter Wing (ANG). **Area:** 138 acres. **Runway:** 12,000 ft. **Altitude:** 800 ft. **Full-time personnel:** 287.

**Francis S. Gabreski IAP**, Westhampton Beach, N.Y. 11978-1294. **Phone:** 516-288-7300; DSN 456-7300. **Unit:** 106th Rescue Wing (ANG). **History:** named for Col. Francis S. Gabreski. **Area:** 71 acres. **Runway:** 9,000 ft. **Altitude:** 67 ft. **Full-time personnel:** 250.

**Fresno Air Terminal**, Calif. 93727-2199; 5 mi. NE of Fresno. **Phone:** 209-454-5100; DSN 949-5100. **Unit:** 144th Fighter Wing (ANG). **Area:** 126 acres. **Runway:** 9,200 ft. **Altitude:** 332 ft. **Full-time personnel:** 313.

**General Mitchell IAP/ARS**, Wis. 53207-6299; 7 mi. S of Milwaukee. **AFRC phone:** 414-482-5000; DSN 950-5000. **ANG phone:** 414-747-4410; DSN 580-8410. **Majcom:** AFRC. **Units:** 440th Airlift Wing (AFRC); 128th Air Refueling Wing (ANG). **Area:** AFRC, 103 acres; ANG, 111 acres. **Full-time personnel:** AFRC, 436; ANG, 263.

**Greater Peoria Airport**, Ill. 61607-1498; 7 mi. SW of Peoria. **Phone:** 309-791-2282; DSN 724-2282. **Unit:** 182nd Airlift Wing (ANG). **Area:** 381 acres. **Runway:** 9,500 ft. **Altitude:** 660 ft. **Full-time personnel:** 273.

**Great Falls IAP**, Mont. 59401-5000; 5 mi. SW of Great Falls. **Phone:** 406-791-2282; DSN 279-

2282. **Unit:** 120th Fighter Wing (ANG). **Area:** 139 acres. **Runway:** 10,500 ft. **Altitude:** 3,674 ft. **Full-time personnel:** 304.

**Grissom ARB**, Ind. 46971-5000; 15 mi. N of Kokomo. **Phone:** 765-688-5211; DSN 928-1110. **Majcom:** AFRC. **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:** 1,126.5 acres. **Runway:** 12,500 ft. **Altitude:** 800 ft. **Housing:** 485 transient. Small BX. **Full-time personnel:** ARTs, 300; civilians, 400.

**Gulfport-Biloxi RAP**, Miss. 39501; in city of Gulfport. **Phone:** 601-868-6200; DSN 363-8200. **Units:** Combat Readiness Training Center; 255th Tactical Control Sq. (ANG); 1108th Aviation Repair Depot (ARNG); 173rd Civil Engineering Flt. An air-to-ground gunnery range is located 70 mi. N of site. **Area:** 269 acres. **Runway:** 9,000 ft. **Altitude:** 28 ft. **Full-time personnel:** 125.

**Harrisburg IAP**, Pa. 17057; 10 mi. E of Harrisburg. **Phone:** 717-948-2200; DSN 430-9200. **Unit:** 193rd Special Operations Wing (ANG). **Area:** ANG, 39 acres. **Runway:** 9,500 ft. **Altitude:** 310 ft. **Full-time personnel:** 303.

**Hector IAP**, Fargo, N.D. 58105-5536. **Phone:** 701-237-6030; DSN 362-811C. **Unit:** 119th Fighter Wing (ANG). **Area:** 209 acres. **Runway:** 9,500 ft. **Altitude:** 900 ft. **Full-time personnel:** 300.

**Homestead ARB**, Fla. 33039-1299; 5 mi. NE of Homestead. **Phone:** 305-224-7303; DSN 791-7303; Fax (DSN) 791-7302. **Majcom:** AFRC. **Units:** 482nd Fighter Wing (AFRC); Det. 1, 125th Fighter Wing (Fla. ANG, NORAD); US Customs Miami Aviation Branch; Fla. Army National Guard 50th ASG; Defense Logistics Agency; Civil Air Patrol Sq. 279; AFOSI; Naval Intelligence. **Area:** approx. 1,000 acres. **Runway:** 11,200 ft. **Altitude:** 11 ft. **Full-time personnel:** 800. **Billeting** available.

**Hulman RAP**, Ind. 47803-5000; 5 mi. E of Terre Haute. **Phone:** 812-877-5210; DSN 724-1210. **Unit:** 181st Fighter Wing (ANG). **Area:** 279 acres. **Runway:** 9,000 ft. **Altitude:** 585 ft. **Full-time personnel:** 277.

**Jackson IAP**, Miss. 39208-0810; 7 mi. E of Jackson. **Phone:** 601-939-3633; DSN 731-9210. **Unit:** 172nd Airlift Wing (ANG). **Area:** ANG, 116 acres. **Runway:** 8,500 ft. **Altitude:** 346 ft. **Full-time personnel:** 298.

**Jacksonville IAP**, Fla. 32229; 15 mi. NW of Jacksonville. **Phone:** 904-741-7100; DSN 460-7100. **Unit:** 125th Fighter Wing (ANG). **Area:** 332 acres. **Runway:** 10,000 ft. **Altitude:** 26 ft. **Full-time personnel:** 353.

**Joe Foss Field**, Sioux Falls, S.D. 57104; N side of Sioux Falls. **Phone:** 605-988-5700; DSN 939-7700. **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:** 166 acres. **Runway:** 9,000 ft. **Altitude:** 1,428 ft. **Full-time personnel:** 286.

**Key Field**, Meridian, Miss. 39302-1825; at municipal airport near Hwy. 20 and 59. **Phone:** 601-484-9000; DSN 778-9210. **Units:** 186th Air Refueling Wing (ANG); 238th Combat Communications Sq. (ANG). **Area:** 117 acres. **Runway:** 8,000 ft. **Altitude:** 297 ft. **Full-time personnel:** 310.

**Klamath Falls IAP** (Kingsley Field), Ore. 97603-0400; 5 mi. SE of Klamath Falls. **Phone:** 503-883-6350; DSN 830-6350. **Units:** 173rd Fighter Wing (ANG); 142nd OLAD (ANG). **Area:** 1,072 acres. **Runway:** 10,300 ft. **Altitude:** 4,092 ft. **Full-time personnel:** 334.

**Kulis ANGB**, Alaska 99502; at Anchorage IAP. **Phone:** 907-249-1444; DSN 317-626-1659. **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:** 10,900 ft. **Altitude:** 124 ft. **Full-time personnel:** 412.

**Lambert-St. Louis IAP**, Bridgeton, Mo. 63145; 3 mi. W of St. Louis. **Phone:** 314-263-6200; DSN 693-6200. **Unit:** 131st Fighter Wing (ANG). **Area:** 49 acres. **Runway:** 10,600 ft. **Altitude:** 605 ft. **Full-time personnel:** 371.

**Lincoln MAP**, Neb. 68524-1888; 1 mi. NW of Lincoln. **Phone:** 402-458-1234; DSN 946-1234. **Units:** 155th Air Refueling Wing (ANG); ARNG unit. **Area:** 179 acres. **Runway:** 12,900 ft. **Altitude:** 1,207 ft. **Full-time personnel:** 270.

**Louisville IAP/AGS** (Standiford Field), Ky. 40213. **Phone:** 502-364-9400; DSN 989-4400. **Units:** 123rd Airlift Wing (ANG); 223rd Communications Sq. (ANG). **Area:** 69 acres. **Runway:** 10,000 ft. **Altitude:** 497 ft. **Full-time personnel:** 289.

**Luis Munoz Marin IAP**, Puerto Rico 00914; E of San Juan. **Phone:** 787-253-5100; DSN 860-9210. **Unit:** 156th Airlift Wing (ANG). **Area:** 84 acres. **Runway:** 10,000 ft. **Altitude:** 9 ft. **Full-time personnel:** 265.

**Mansfield Lahm Airport**, Ohio 44901-5000; 3 mi. N of Mansfield. **Phone:** 419-521-0100; DSN 696-6210. **Unit:** 179th Airlift Wing (ANG). **History:** named for nearby city and aviation pioneer Brig. Gen. Frank P. Lahm. **Area:** 224 acres. **Runway:** 9,000 ft. **Altitude:** 1,296 ft. **Full-time personnel:** 231. **Coast Guard exchange.**

**March ARB**, Calif. 92518-5000; 9 mi. SE of Riverside. **Phone:** 909-655-1110; DSN 947-1110. **Majcom:** AFRC. **Unit:** 452nd Air Mobility Wing (AFRC). **Phone:** 909-655-4520; DSN 947-4520. **4th Air Force** (AFRC); 163rd Air Refueling Wing (Calif. ANG); 119th Fighter Gp. (N.D. ANG); 4th Combat Camera Sq.; Armed Forces Radio and Television Broadcast Center; Defense Visual Information Center; Air Force Audit Agency Financial and Support Audit 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, 697; DoD civilians, 1,465; ANG, 278. **Housing:** VOQ, 101 beds, VAQ, 150 beds.

**McEntire ANGB**, S.C. 29044; 12 mi. E of Columbia. **Phone:** 803-695-6300; DSN 583-8201. **Units:** 169th Fighter Wing (ANG); 240th Combat Communications Sq. (ANG); 1/151st Aviation Battalion (ARNG). **History:** named for ANG Brig. Gen. B.B. McEntire Jr., killed in 1961 F-104 accident. **Area:** 2,473 acres. **Runway:** 9,000 ft. **Altitude:** 250 ft. **Full-time personnel:** 343.

**McGhee Tyson Airport**, Tenn. 37901; 10 mi. SW of Knoxville. **Phone:** 615-985-3200; DSN 266-8200. **Units:** 134th Air Refueling Wing (ANG); 228th Combat Communications Sq.; ANG's I.G. Brown Professional Military Education Center. **Area:** 271 acres. **Runway:** 9,000 ft. **Altitude:** 980 ft. **Full-time personnel:** 319.

**Memphis IAP**, Tenn. 38181-0026; within Memphis city limits. **Phone:** 901-541-7111; DSN 966-8210. **Unit:** 164th Airlift Wing (ANG). **Area:** ANG, 103 acres. **Runway:** 9,300 ft. **Altitude:** 332 ft. **Full-time personnel:** 273.

**Minneapolis-St. Paul IAP/ARS**, Minn. 55450-2000; in Minneapolis, near confluence of the Mississippi and Minnesota rivers. **AFRC phone:** 612-713-1110; DSN 783-1000. **ANG phone:** 612-713-2450; DSN 783-2450. **Majcom:** AFRC. **Units:** 934th Airlift Wing (AFRC), C-130s; 133rd Airlift Wing (ANG), C-130s; 210th Engineering Installation Sq. (ANG); Naval Reserve Readiness Com-



mand, Region 16; Civil Air Patrol, NCLR, and MNLO; Rothe Development Inc. (AFRC). **Area:** AFRC, 300 acres; ANG, 130.5 acres. **Runway:** 10,000 ft. **Altitude:** 840 ft. **Full-time personnel:** AFRC, 153; ANG, 254. Lodging, clubs, fitness center, and exchange available.

**NAS Fort Worth JRB** (Carswell Field), Texas. 76127-6200. **AFRC Phone:** 817-782-5000; DSN 739-5000. **ANG Phone:** 817-852-3202; DSN 874-3202. **Units:** 301st Fighter Wing (AFRC); 136th Airlift Wing (ANG). **Area:** AFRC, 1,805 acres; ANG, 81 acres. **Runway:** 12,002 ft. **Altitude:** 650 ft. **Full-time personnel:** AFRC, 250 ARTs, 200 civilians; ANG, 244.

**Nashville Metropolitan Airport**, Tenn. 37217-2538; 6 mi. SE of Nashville. **Phone:** 615-399-5410; DSN 788-6210. **Unit:** 118th Airlift Wing (ANG). **Area:** 85 acres. **Runway:** 10,200 ft. **Altitude:** 597 ft. **Full-time personnel:** 288.

**New Castle County Airport**, Del. 19720; 5 mi. S of Wilmington. **Phone:** 302-323-3500; DSN 445-7500. **Units:** 166th Airlift Wing (ANG); ARNG aviation company. **Area:** 57 acres. **Runway:** 7,200 ft. **Altitude:** 80 ft. **Full-time personnel:** 239.

**Niagara Falls IAP/ARS**, N.Y. 14304-5001; 6 mi. E of Niagara Falls. **Phone:** 716-236-2000; DSN 238-2000. **Majcom:** AFRC. **Units:** 914th Airlift Wing, C-130Hs; 107th Air Refueling Wing (ANG), KC-135s. **History:** activated January 1952. **Area:** 979 acres; ANG area, 104 acres. **Runway:** 9,130 ft. **Altitude:** 590 ft. **Full-time personnel:** 414. Lodging, exchange, and consolidated club available.

**Otis ANGB**, Mass. 02542-5001; 7 mi. NNE of Falmouth. **Phone:** 508-968-4667; DSN 557-4667. **Units:** 102nd Fighter Wing (ANG), F-15A/Bs; 567th USAF Band (ANG); 101st and 202nd Weather Flts. (ANG). **History:** named for 1st Lt. Frank J. Otis, ANG flight surgeon and pilot killed in 1937 crash. **Area:** 3,883 acres. **Runway:** 9,500 ft. **Altitude:** 132 ft. **Full-time personnel:** 376.

**Pease ANGB**, Portsmouth, N.H. 03803-6505. **Phone:** 603-430-2453; DSN 852-2453. **Unit:** 157th Air Refueling Wing (ANG). **Area:** 229 acres. **Runway:** 11,300 ft. **Altitude:** 101 ft. **Full-time personnel:** 311.

**Pittsburgh IAP/ARS**, Pa. 15108-4403; 15 mi. NW of Pittsburgh. **AFRC phone:** 412-474-8000; DSN 277-8000. **ANG phone:** 412-474-7359; DSN 277-7359. **Majcom:** AFRC. **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, 369; ANG, 386. **Housing:** VOQ, 24, VEQ, 230. No on-base housing. Limited exchange.

**Portland IAP**, Portland, Ore. 97218-2797. **Phone:** 503-335-4020; DSN 638-4020. **Units:** 142nd Fighter Wing (ANG); 244th Combat Communications Sq. (ANG); 272nd Combat Communications Sq. (ANG); Oregon Wing, CAP; 939th Rescue Wing (AFRC). **Area:** 246 acres. **Runway:** 11,000 ft. **Altitude:** 26 ft. **Full-time personnel:** 416.

**Quonset State Airport**, R.I. 02852; 20 mi. S of Providence. **Phone:** 401-886-1200; DSN 476-3210. **Unit:** 143rd Airlift Wing (ANG). **Area:** 79 acres. **Runway:** 8,000 ft. **Altitude:** 19 ft. **Full-time personnel:** 248.

**Reno/Tahoe IAP** (May Field), Nev. 89502; 5 mi. SE of Reno at 1776 ANG Way. **Phone:** 702-788-4500; DSN 830-4500. **Unit:** 152nd Airlift Wing (ANG). **History:** named for Maj. Gen. James A. May, Nevada adjutant general, 1947-67. **Area:** 123 acres. **Runway:** 10,000 ft. **Altitude:** 4,411 ft. **Full-time personnel:** 272.

**Richmond IAP** (Byrd Field), Va. 23150; 4 mi. SE of downtown Richmond. **Phone:** 804-236-6429; DSN 864-6129. **Unit:** 192nd Fighter Wing (ANG).

**History:** named for Adm. Richard E. Byrd, Arctic and Antarctic explorer. **Area:** 143 acres. **Runway:** 9,000 ft. **Altitude:** 167 ft. **Full-time personnel:** 291.

**Rickenbacker IAP**, Ohio 43217-5887; 13 mi. SSW of Columbus. **Phone:** 614-492-4223; DSN 950-8211. **Units:** 121st Air Refueling Wing (ANG); Naval Air Reserve and Naval Construction. **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:** 2,016 acres. **Runway:** 12,100 ft. **Altitude:** 744 ft. **Full-time personnel:** 392.

**Rosecrans Memorial Airport**, Mo. 64503; 4 mi. W of St. Joseph. **Phone:** 816-236-3300; DSN 956-3300. **Unit:** 139th Airlift Wing (ANG). **Area:** 302 acres. **Runway:** 8,100 ft. **Altitude:** 826 ft. **Full-time personnel:** 291.

**Salt Lake City IAP**, Utah 84116; 3 mi. W of Salt Lake City. **Phone:** 801-595-2200; DSN 924-9200. **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:** 12,000 ft. **Altitude:** 4,220 ft. **Full-time personnel:** 409.

**Savannah IAP**, Ga. 31408; 4 mi. NW of Savannah. **Phone:** 912-966-8210; DSN 860-8210. **Units:** 165th Airlift Wing (ANG); field training site. **Area:** 20 acres. **Runway:** 9,400 ft. **Altitude:** 50 ft. **Full-time personnel:** 316. **Housing:** officer, 156, enlisted, 736.

**Schenectady County Airport**, Scotia, N.Y. 12302-9752; 2 mi. N of Schenectady. **Phone:** 518-786-4502; DSN 974-9210. **Unit:** 109th Airlift Wing (ANG). **Area:** 106 acres. **Runway:** 7,000 ft. **Altitude:** 378 ft. **Full-time personnel:** 440.

**Selfridge ANGB**, Mich. 48045-5046; 3 mi. NE of Mount Clemens. **Phone:** 810-307-5553; DSN 273-5553. **Units:** 127th Wing (ANG); 927th Air Refueling Wing (AFRC); Air Force, Army, Navy Reserve, Marine Corps Reserve, Army Reserve units; US Coast Guard Air Station for Detroit. **History:** activated July 1917; transferred to Michigan 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:** 3,700 acres. **Runway:** 9,000 ft. **Altitude:** 583 ft. **Full-time personnel:** ANG, 457; AFRC, 242.

**Sioux Gateway Airport**, Iowa 51110; 7 mi. S of Sioux City. **Phone:** 712-279-7500; DSN 939-6500. **Unit:** 185th Fighter Wing (ANG). **Area:** 118 acres. **Runway:** 9,000 ft. **Altitude:** 1,098 ft. **Full-time personnel:** 298.

**Sky Harbor IAP**, Phoenix, Ariz. 85034. **Phone:** 602-231-8200; DSN 853-9000. **Unit:** 161st Air Refueling Wing (ANG). **Area:** 58 acres. **Runway:** 11,000 ft. **Altitude:** 1,230 ft. **Full-time personnel:** 287.

**Springfield-Beckley MAP**, Ohio 45501-1780; 5 mi. S of Springfield. **Phone:** 513-327-2100; DSN 346-2100. **Units:** 178th Fighter Wing (ANG); 251st Combat Communications Gp. (ANG); 269th Combat Communications Sq. (ANG). **Area:** 114 acres. **Runway:** 9,000 ft. **Altitude:** 1,052 ft. **Full-time personnel:** 327.

**Stewart IAP**, Newburgh, N.Y. 12550-0031; 15 mi. N of US Military Academy (West Point). **Phone:** 914-563-2001; DSN 636-2001. **Units:** Hq. N.Y. ANG; 105th Airlift Wing (ANG); USMA subpost airport. **History:** Stewart AFB until 1969; acquired by state of New York in 1970. **Area:** ANG, 276 acres. **Runway:** 9,800 ft. **Altitude:** 491 ft. **Full-time personnel:** 616. Most military services available through West Point or subpost.

**Syracuse Hancock IAP**, N.Y. 13211-7099; 5 mi. NE of Syracuse. **Phone:** 315-454-6100; DSN 489-9100. **Units:** 174th Fighter Wing (ANG); operations for Hancock ANGB; 152nd Tactical Con-

trol Gp.; 108th and 113th Tactical Control Sqs. (ANG). **Area:** 371 acres. **Runway:** 9,000 ft. **Altitude:** 421 ft. **Full-time personnel:** 313.

**Toledo Express Airport**, Swanton, Ohio 43558; 14 mi. W of Toledo. **Phone:** 419-866-4078; DSN 580-4078. **Unit:** 180th Fighter Wing (ANG). **Area:** 114 acres. **Runway:** 10,600 ft. **Altitude:** 684 ft. **Full-time personnel:** 284.

**Truax Field** (Dane County RAP), Wis. 53704-2591; 2 mi. N of Madison. **Phone:** 608-242-4200; DSN 724-8210. **Unit:** 115th Fighter Wing (ANG). **History:** activated June 1942 as AAF base; taken over by Wisconsin ANG April 1968. Named for Lt. T.L. Truax, killed in P-40 training accident in 1941. **Area:** 154 acres. **Runway:** 8,600 ft. **Altitude:** 862 ft. **Full-time personnel:** 288. **Housing:** transient, 7.

**Tucson IAP**, Ariz. 85734; within Tucson city limits. **Phone:** 602-295-6210; DSN 924-6210. **Unit:** 162nd Fighter Wing (ANG). **Area:** 84 acres. **Runway:** 11,000 ft. **Altitude:** 2,650 ft. **Full-time personnel:** 979.

**Tulsa IAP**, Okla. 74115. **Phone:** 918-832-8300; DSN 956-5210. **Units:** 138th Fighter Wing (ANG); 219th Electronic Installation Sq. **Area:** 82 acres. **Runway:** 10,000 ft. **Altitude:** 676 ft. **Full-time personnel:** 314.

**Volk Field**, Wis. 54618-5001; 90 mi. NW of Madison. **Phone:** 608-427-1210; DSN 798-3210. **Unit:** ANG field training site featuring air-to-air and air-to-ground gunnery ranges. **History:** named for Lt. Jerome A. Volk, first Wisconsin ANG pilot killed in the Korean War. **Area:** 2,336 acres. **Runway:** 9,000 ft. **Altitude:** 910 ft. **Full-time personnel:** 119.

**W.K. Kellogg Airport**, Battle Creek, Mich. 49015-1291. **Phone:** 616-963-1596; DSN 580-3210. **Unit:** 110th Fighter Wing (ANG). **Area:** 315 acres. **Runway:** 10,000 ft. **Altitude:** 941 ft. **Full-time personnel:** 262.

**Westover ARB**, Mass. 01022-5000; 10 mi. NE of Springfield. **Phone:** 413-557-1110; DSN 589-1110. **Majcom:** AFRC. **Units:** 439th Airlift Wing; home of 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:** ART, 472; DoD civilians, 441. **Housing:** VOQ, 41, VAQ, 142 beds.

**Willow Grove ARS**, Pa. 19090-5203; 14 mi. N of Philadelphia. **AFRC phone:** 215-443-1050; DSN 991-1050. **ANG phone:** 215-443-1501; DSN 991-1501. **Majcom:** AFRC. **Units:** 913th Airlift Wing; 111th Fighter Wing (ANG). **History:** activated August 1958. **Area:** AFRC, 162 acres; ANG, 39 acres. **Altitude:** 356 ft. **Runway:** share use of NAS/JRB Willow Grove runway (8,000 ft.). **Full-time personnel:** 271.

**Will Rogers World Airport**, Okla. 73169-5000; 7 mi. SW of Oklahoma City. **Phone:** 405-686-5210; DSN 940-8210. **Unit:** 137th Airlift Wing (ANG). **Area:** 133 acres. **Runway:** 9,800 ft. **Altitude:** 1,290 ft. **Full-time personnel:** 256.

**Yeager Airport**, W.Va. 25311-5000; 4 mi. NE of Charleston. **Phone:** 304-341-6126; DSN 366-6210. **Unit:** 130th Airlift Wing (ANG). **History:** named for Brig. Gen. Charles E. "Chuck" Yeager. **Area:** 269 acres. **Runway:** 6,300 ft. **Altitude:** 981 ft. **Full-time personnel:** 232.

**Youngstown-Warren RAP/ARS**, Ohio 44473-5910; 14 mi. N of Youngstown. **Phone:** 330-609-1000; DSN 346-1000. **Majcom:** AFRC. **Units:** 910th Airlift Wing (AFRC), Army Corps of Engineers, Army Reserve, Navy Reserve, Marine Corps Reserve, FAA. **History:** activated 1953. **Area:** 403 acres. **Runways:** three, primary length 9,000 ft. **Altitude:** 1,196 ft. **Full-time personnel:** 553. **Housing:** 112. Limited exchange. ■



# USAF Almanac

## Records and Trophies

### 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, Germany, the US, Great Britain, France, Spain, Italy, and Switzerland met in Paris to form the Fédération Aéronautique Internationale, the world body of national aeronautic sporting interests. The FAI today comprises the national aero clubs of 77 nations and certifies*

**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.

*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.*

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 Maj. Adolphus H. Bledsoe Jr. (pilot) and John T. Fuller (RSO) in Lockheed SR-71A Blackbird at Beale AFB, Calif., July 27, 1976.

### 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 Loering.** 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.
- 1958 **USAF/Lockheed/GE F-104 team.** F-104. **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.



# 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.  | 1959 | US Air Force Thunderbirds.  |
| 1913    | 2nd Lts. Joseph E. Carberry and Fred Seydel.  | 1960 | 6593rd Test Sq., Hickam AFB, Hawaii.  |
| 1914    | Capt. Townsend F. Dodd and Lt. S.W. Fitzgerald  | 1961 | Lt. Col. William R. Payne and Maj. William L. Polthemus and Raymond R. Wagener, 43rd Bomb Wing, SAC.  |
| 1915    | Lt. B.Q. Jones.   | 1962 | Maj. Robert G. Sowers and Capt. Robert MacDonald and John T. Walton.  |
| 1916-17 | No award.   | 1963 | Capt. Donald R. Mack, John R. Ordemann, and Warren P. Tomsett; TSgt. Edsol P. Inlow; SSgts. Frank C. Barrett and Jack E. Morgan.  |
| 1918    | Capt. Edward V. Rickenbacker.   | 1964 | 464th Troop Carrier Wing, TAC.  |
| 1919    | Lt. Col. Harold E. Hartney; Capt. 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.                                       | 1965 | YF-12A Test Force (Col. Robert L. Stephens; Lt. Col. Daniel Andre; Maj. Walter F. Daniel and Noel T. Warner; Capt. James P. Cooney).  |
| 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.   | 1966 | Lt. Col. Albert R. Howarth.   |
| 1921    | Lt. John A. Macready.   | 1967 | Maj. John H. Casteel; Capt. Dean L. Hoar and Richard L. Trail; MSgt. Nathan C. Campbell.  |
| 1922    | Lts. John A. Macready and C.G. Kelly.   | 1968 | Lt. Col. Daryl D. Cole.   |
| 1923    | Lts. John A. Macready and C.G. Kelly.   | 1969 | 49th Tactical Fighter Wing, TAC.  |
| 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.   | 1970 | Capt. Alan D. Milacek and AC-119K crew (Capt. 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). |
| 1925    | Lts. Cyrus K. Bettis and Jimmy Doolittle.   | 1971 | Lt. Col. Thomas B. Estes and Maj. Dewain C. Vick.   |
| 1926    | Pan American Goodwill Fliers; Maj. H.A. Dargue; Capt. 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.         | 1972 | Capt. Charles B. DeBellevue, Jeffrey S. Feinstein, and Richard S. "Steve" Ritchie.  |
| 1927    | Lts. Albert F. Hegenberger and Lester J. Maitland.  | 1973 | MAC aircrews.   |
| 1928    | 1st Lt. Harry A. Sutton.  | 1974 | Maj. Willard R. MacFarlane, David W. Peterson, and Roger J. Smith.  |
| 1929    | Capt. A.W. Stevens.   | 1975 | Maj. Robert W. Undorf.  |
| 1930    | Maj. Ralph Royce.   | 1976 | Capt. James A. Yule.  |
| 1931    | Brig. Gen. Benjamin D. Foulois.   | 1977 | C-5 aircrew (Capt. David M. Sprinkel and crew).   |
| 1932    | 11th Bombardment Sq., March Field, Calif., 1st Lt. Charles H. Howard.   | 1978 | C-5 aircrews (Lt. Col. Robert F. Schultz and crew and Capt. Todd H. Hohberger and crew, 436th Military Airlift Wing).   |
| 1933    | Capt. Westside T. Larson.   | 1979 | Maj. James E. McArdle Jr.   |
| 1934    | Brig. Gen. Henry H. Arnold.   | 1980 | Crews S-21 and S-31, 644th Bombardment Sq.  |
| 1935    | Capt. O.A. Anderson and A.W. Stevens.   | 1981 | Capt. John J. Walters.  |
| 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. | 1982 | B-52 Crew E-21, 19th Bombardment Wing.  |
| 1937    | Capt. Carl J. Crane and George V. Holloman.   | 1983 | Capt. Robert J. Goodman and his crew, 42nd Bombardment Wing, SAC.   |
| 1938    | 2nd Bombardment Group, Lt. Col. Robert Olds.  | 1984 | Lt. Col. James L. Hobson Jr.  |
| 1939    | Maj. 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.   | 1985 | Lt. Col. David E. Faught.   |
| 1940-46 | No award.   | 1986 | KC-10 crew (Capt. M.D. Felman and T.M. Ferguson; MSgts. C. Bridges Jr., P.S. Kennedy, and G.G. Treadwell; TSgts. L.G. Boulter and G.M. Lewis; SSgts. S.S. Flores, S.A. Helms, and G.L. Smith), 68th Air Refueling Group, SAC.                 |
| 1947    | Capt. Charles E. Yeager.  | 1987 | Det. 15, USAF Plant Representative Office, and B-1B SPO.  |
| 1948    | Lt. Col. Emil Beaudry.  | 1988 | C-5 crew, 436th Military Airlift Wing.  |
| 1949    | Capt. James G. Gallagher and crew of <i>Lucky Lady II</i> .   | 1989 | B-1B crew, 96th Bomb Wing.  |
| 1950    | 27th Fighter Wing.  | 1990 | AC-130 crew, 16th Special Operations Sq.  |
| 1951    | Col. Fred J. Ascani.  | 1991 | MH-53 crew, 20th Special Operations Sq.   |
| 1952    | Maj. Louis H. Carrington Jr. and Frederick W. Shook; Capt. Wallace D. Yancey.   | 1992 | C-130 crew, 310th Airlift Sq., ACC, Howard AFB, Panama.   |
| 1953    | 40th Air Division, SAC.   | 1993 | B-52 crew, 668th Bomb Sq., ACC.   |
| 1954    | 308th Bombardment Wing (M) and 38th Air Div., SAC.  | 1994 | HH-60G crew of Air Force Rescue 206 and 208, 56th Rescue Sq., ACC, NAS Keflavik, Iceland.   |
| 1955    | Col. Horace A. Hanes.   | 1995 | Aircrew BAT-01, Dyess AFB, Texas.   |
| 1956    | Capt. Iven C. Kincheloe Jr., Air Research and Development Command.  | 1996 | Aircrew Duke 01, 2nd Bomb Wing, Barksdale AFB, La.  |
| 1957    | 93rd Bombardment Wing, SAC.   | 1997 | Crew of Whiskey-05, 7th Special Operations Sq., RAF Mildenhall, UK.   |
| 1958    | TAC Air Strike Force, X-Ray Tango.  | 1998 | Crew of Air Force Rescue 470, 210th Rescue Sq., Kulis ANGB, Alaska.   |



## The Gen. Thomas D. White USAF Space Trophy

The Gen. Thomas D. White USAF Space Trophy 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.

## The Hughes Achievement Award

The Hughes Achievement Award (formerly the Hughes Trophy) is presented annually to the top Air Force squadron with an

air defense/air superiority mission. Raytheon now sponsors the award.

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 IAP, 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

Year	Unit, Base	Aircraft
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 IAP, 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 IAP, 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



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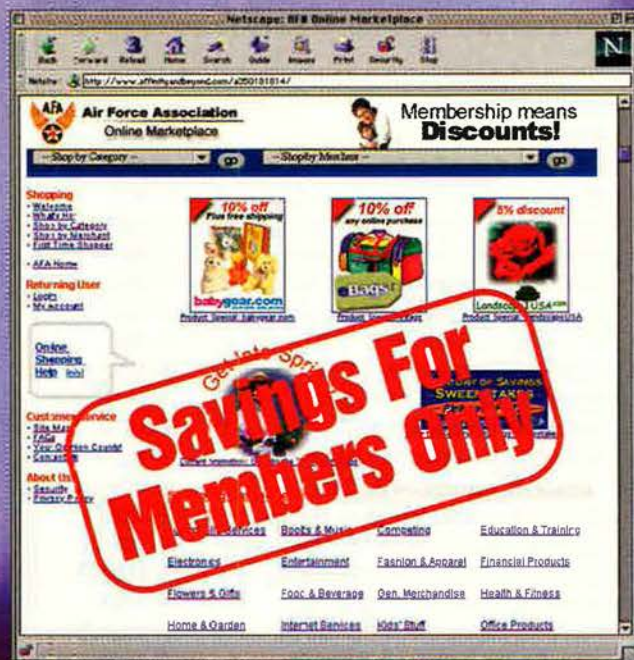
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—S. Sibley, Lorton, VA



# Verbatim

By Robert S. Dudley, Executive Editor

## Bombing Innocent Civilians

"The most obscene chapter in recent American history is the conduct of the Kosovo conflict, when the President of the United States refused to prepare for ground operations, refused to have airpower used effectively. ... He had them flying at 15,000 feet, where they killed innocent civilians because they were dropping bombs from such ... high altitude."—**Sen. John McCain (R-Ariz.), former Presidential aspirant, in Feb. 15 South Carolina Republican debate.**

## The Life of a Lone Pilot

"None of this is to argue that commanders should be cavalier about risks to their troops. But risk reduction should not be permitted to torpedo mission accomplishment. Was the life of any lone American pilot—and a volunteer professional at that—really more valuable than the fate of more than 1,600,000 Kosovar Albanians?"—**Jeffrey Record, a member of the faculty of the Air War College, in the article "Gutless Giant?" published in the March 2000 issue of Proceedings.**

## Don't Listen, Don't Hear

"There is a serious question in the findings of the [Pentagon] survey on gays in the military. How is it that 20 percent of the military respondents said they had not heard offensive remarks or jokes about gays? Either they are lying or, even more troubling, completely oblivious to their fellow service members. It would even be hard to believe that one in five civilians has not heard a derogatory remark about homosexuals."—**Charles Moskos, noted military sociologist at Northwestern University, in March 28 letter to The New York Times.**

## The Warless War

"[L]ook at the history of casualties, ... almost half a million killed in World War II, over 35,000 killed in Korea, and more than 50,000 killed in Vietnam, and zero combat deaths in Kosovo. In my judgment, this country will never again permit the armed

forces to be engaged in conflicts which inflict the level of casualties we have seen historically. So what do you do? You move toward the unmanned type of military vehicle to carry out missions which are high risk in nature. ... The driving force is the culture in our country today, which says, 'Hey! If our soldiers want to go to war, so be it, but don't let any of them get hurt.'"—**Sen. John W. Warner (R-Va.), chairman of Senate Armed Services Committee, quoted in National Journal, March 4, 2000.**

## So Listen Up, Youse Guys

"Let me advise all these people in Taiwan: Do not just act on impulse at this juncture which will decide the future course that China and Taiwan will follow. Otherwise, I'm afraid you won't get another opportunity to regret."—**Chinese Premier Zhu Rongji, in March 15 news conference in Beijing on the eve of the Taiwanese presidential election.**

## Duking Out the JSF

"My real fear, though, is the Joint Strike Fighter. ... When those airplanes get jumped by enemy aircraft, you need a number of airplanes that will be able to fight that classification of airplanes, like the Su-27, Su-35, and Su-37. ... If you don't have the numbers of aircraft, you're going to have a problem. The JSF [is] limited to \$28 million apiece. If you have an airplane up there where you can't go neutral with the enemy, you're going to need more airplanes that can, like the F-22."—**Rep. Randy "Duke" Cunningham (R-Calif.), in interview with reporter Frank Wolfe of Defense Daily.**

## French Cooking

"The European Union [plan to create] a 60,000-person rapid reaction force is, to me, deeply troubling. ... If this is truly a rhetorical army or force, is that going to do any good? [If it is] in fact going to be a 60,000[-person] force not subject to the command of the NATO commander or the Atlantic Council but subject to

the will or the whims of the European parliament, ... I look upon it as being literally an abrogation of European responsibility to NATO.

"None of them [European nations] have announced any plan to increase the military budget for their defense budgets. Some have announced that they're going to decrease them. ...

"[The] NATO Alliance ... operates by consensus. I don't know how in the name of heaven the European parliament operates, and who'll be making the decisions, ... especially when you have the French to deal with. And let me say that this American is very, very aggravated when the president of France goes to Beijing and says he's seeking a strategic partnership with China to counteract American hegemony. I'm not sure that's an ally that I'm totally willing to depend upon."—**Rep. Herbert H. Bateman (R-Va.), chairman of military readiness panel of the House Armed Services Committee, in Feb. 17 hearing remarks.**

## We Provoked Them

"Senator Robert C. Byrd of West Virginia writes that 'a year ago, American and NATO warplanes began 78 days of air assaults that halted the murderous assault of Slobodan Milosevic on the Kosovar Albanians.' Mr. Byrd would have done better to substitute the word 'initiated' for 'halted.' By the best figures available to me, the Serbs pushed 25,000 Kosovars across adjacent borders in the two years before the bombing began and expelled approximately 750,000 more after the air assaults commenced. These figures come to fewer than 40 people a day before March 24, 1999, and to approximately 9,600 a day after that date. In effect, the United States and NATO stepped into the trap that Mr. Milosevic had set. Kosovo is horrible enough to contemplate without congratulating ourselves for what we 'halted.'"—**Norman Mailer, novelist, nonfiction writer, essayist, screenwriter, ex-political candidate, and public persona, in March 20 letter to The New York Times.**



# USAF Almanac

## Gallery of USAF Weapons

By Susan H.H. Young

Note: Inventory numbers are Total Active Inventory figures as of Sept. 30, 1999.



**B-1B Lancer** (Ted Carlson)

## Bombers

### B-1 Lancer

**Brief:** A long-range multirole bomber capable of flying missions over intercontinental range without refueling, then penetrating enemy defenses with a heavy load of ordnance.

**Function:** Long-range conventional bomber.

**Operator:** ACC, ANG.

**First Flight:** Dec. 22, 1974 (B-1A); Oct. 18, 1984 (B-1B).

**Delivered:** June 1985–May 1988.

**IOC:** Oct. 1, 1986, Dyess AFB, Texas (B-1B).

**Production:** 104.

**Inventory:** 93 (B-1B).

**Unit Location:** Active: Dyess AFB, Texas, Ellsworth AFB, S.D., Mountain Home AFB, Idaho. ANG: McConnell AFB, Kan., Robins AFB, Ga.

**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 78 ft, length 147 ft, height 34 ft.

**Weights:** empty equipped 192,000 lb, max operating weight 477,000 lb.

**Ceiling:** over 30,000 ft.

**Performance:** max speed at low level high subsonic; Mach 1.2 at altitude; range intercontinental.

**Armament:** three internal weapons bays capable of accommodating in a conventional role up to 84 Mk 82 (500-lb) bombs or Mk 62 naval mines and 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, and up to 24 2,000-lb GBU-31 Joint Direct Attack Munitions (JDAMs).

### 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 setting permits takeoff from shorter runways and fast base-escape capability for airfields under attack. The fully swept position is used in supersonic flight and for high-subsonic, low-altitude penetration.



**B-2 Spirit** (Ted Carlson)

The bomber's offensive avionics include forward-looking radar, Moving Target Indicator (MTI), and Terrain-Following Radar (TFR), an extremely accurate Global Positioning System/Inertial Navigation System (GPS/INS), computer-driven avionics, strategic Doppler radar, and a radar altimeter, enabling aircrews to navigate, update mission profiles and 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-homing and heat-seeking missiles. Aircraft structure and radar-absorption materials reduce the aircraft's radar signature to approximately 1 percent that of a B-52. The ALE-50 provides greater protection against RF threats.

**B-1A.** This model of the new long-range strategic bomber never went into production. USAF acquired four prototype flight test models in the 1970s, but the program was canceled in 1977. Flight test of the four B-1A models continued through 1981.

**B-1B** is the improved variant initiated by the Reagan Administration in 1981. First production model flew October 1984 and 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. B-1B's speed, super- or handling qualities, and large payload make it a key element of any joint/composite strike force, with a flexibility to deliver a wide range of weapons or to carry additional fuel, as required. The JDAM GPS-guided weapon is currently being added to the

B-1B's list of weapons, with fleet completion in FY02.

The B-1B's capability is being significantly enhanced by the ongoing Conventional Mission Upgrade Program (CMUP). This gives the B-1B greater 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 radios, and improved computers to support precision weapons, initially the JDAM, followed by the Joint Standoff Weapon (JSOW) and the Joint Air-to-Surface Standoff Missile (JASSM). The Defensive System Upgrade Program will improve aircrew situational awareness and jamming capability.

### 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. 17, 1993–present.

**IOC:** April 1997, Whiteman AFB, Mo.

**Production:** 21.

**Inventory:** 21.

**Unit Location:** Whiteman AFB, Mo.

**Contractor:** Northrop Grumman, with Boeing, LTV, and General Electric as principal subcontractors.

**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 50,000–160,000 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) JDAM or a penetration version of a BLU-109, or 16 Mk 84 2,000-lb bombs; up to 16 2,000-lb GBU-36/B (GPS-Aided Munition); or up to eight 4,700-lb GBU-37 (GAM-113) near-precision guided weapons. Various other conventional weapons, incl the Mk 82 500-lb bomb, M117 750-lb bomb, Mk 62 500-lb naval mine, and up to 32 CBU-87/89/97 cluster bombs. JASSM and JSOW are presently 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 weapon bays side by side in the lower center-body. These bays contain rotary launchers or bomb rack assemblies capable of carrying a total weapons load of 40,000 lb.

Mounted in pairs within the wing structure are four non-afterburning turbofans, with scalloped over-wing 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 GAMs, the GBU-37 and GBU-38B, on two rotary launcher assemblies, providing an interim, near-precision strike capability. All Block 10 and 20 aircraft have now been upgraded to Block 30.

Block 30 configuration delivers full PGM capability, including up to 16 JDAMs on the rotary launcher assemblies, and carriage of the Mk 82 500-lb bomb, cluster munitions, including SFWS, JSOW, JASSM, the GAM-113 hard target penetration munition, the M117 750-lb bomb, and the Mk 62 air-delivered sea mine on a bomb rack assembly. Other Block 30 enhancements include fully operational defensive and offensive avionics, a more sophisticated mission planning system, and additional operating modes for the Synthetic Aperture Radar (SAR).

Extensions of the B-2's conventional capabilities beyond Block 30 configuration are under consideration. The first test B-2 is being refurbished as an operational bomber and will enter operational service in September 2002.

The first combat mission took place March 24, 1999, against Serb targets in Allied Force. Two B-2s made a 30-hour-plus round-trip from Whiteman AFB to attack a variety of hard and soft targets. Each aircraft dropped 16 2,000-lb JDAMs.

#### B-52 Stratofortress

**Brief:** A long-range, heavy multirole bomber that can perform a variety of missions, carrying nuclear or conventional ordnance or air launched cruise missiles, 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:** 94.

**Unit Location:** Barksdale AFB, La., Minot AFB, N.D.

**Contractor:** Boeing.

**Power Plant:** eight Pratt & Whitney TF33-P-3 turbo-

fans, each 17,000 lb thrust.

**Accommodation:** two pilots, side by side, plus naviga-

tor, radar navigator, and electronic warfare officer.

**Dimensions:** span 185 ft, length 160 ft 11 in, height

40 ft 8 in.

**Weight:** empty approx 188,000 lb, max T-O weight

488,000 lb.

**Ceiling:** 55,000 ft.

**Performance (approx):** max level speed 650 mph,

range more than 10,000 miles.

**Armament:** 12 AGM-86B ALCMs or AGM-129A ACMs

externally, with provision for eight more ALCMs or

gravity weapons internally. Conventional weapons incl

AGM-86C CALCMs, bombs up to 2,000 lb, CBU 87/89/

97 cluster munitions, and on some aircraft, three to four

AGM-142A Have Nap missiles or eight AGM-84 Har-

poons in under-wing clusters.

#### COMMENTARY

A key element of USAF's manned strategic bomber force for well over 40 years, the B-52's still-expanding weapons capability reflects its continuing ability to perform a wide range of missions, including show of force, maritime interdiction, precision strikes, and defense suppression.

The bomber is equipped with an electro-optical 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 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



B-52H Stratofortress (SrA. Greg L. Davis)

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 of the Stratofortress 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–October 1962.

Deployment of the B-1 and B-2 led to a change in the primary role of the B-52 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-threat environments supplemented by a standoff attack capability. Upgrades include the installation of GPS terminals, secure radios, and MIL-STD-1760 interfaces; weapons capability to include naval mines, precision guided weapons, such as Harpoon, AGM-142 Have Nap, and AGM-86C CALCM (a conventional variant of the ALCM); and advanced weapons, such as JASSM, JDAM, JSOW, and WCMD. Installation of a heavy stores adapter beam will standardize aircraft to carry all B-52-certified munitions.

Current plans encompass a force of around 76 aircraft.

## Fighter and Attack Aircraft

#### A-10 Thunderbolt II

**Brief:** A simple, effective, and survivable twin-engine aircraft specifically designed for close air support of ground forces and which can be used against all ground targets, including tanks and other armored vehicles.

**Function:** Attack aircraft.

**Operator:** ACC, PACAF, USAF, ANG, AFRC.

**First Flight:** Feb. 15, 1975 (preproduction).

**Delivered:** November 1975–March 1984.

**IOC:** October 1977.

**Production:** 713.

**Inventory:** 368.

**Unit Location:** Active: Davis–Monthan AFB, Ariz., Eglin AFB, Fla., Eielson AFB, Alaska, Moody AFB, Ga., Nellis AFB, Nev., Osan AB, South Korea, Pope AFB, N.C., Spangdahlem AB, Germany, ANG: Baltimore, Md., Barnes MAP, Mass., Boise Air Terminal, Idaho, Bradley IAP, Conn., W.K. Kellogg Airport, Mich., Willow Grove ARS, Pa. AFRC: Barksdale AFB, La., NAS JRB New Orleans, La., Whiteman AFB, Mo.

**Contractor:** Fairchild Republic.

**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 ft 6 in, length 53 ft 4 in, height 14 ft 8 in.

**Weight:** empty 28,000 lb, max gross 51,000 lb.

**Ceiling:** 45,000 ft.

**Performance:** speed 420 mph, range with 9,500 lb of weapons and 1.7 hr loiter, 20 min reserve, 288 miles.

**Armament:** one 30 mm GAU-8/A gun; 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)



A-10A Thunderbolt II (Guy Aceto)



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 infrared-directed threats. The centerline pylon and the two flanking fuselage pylons cannot be occupied simultaneously.

#### COMMENTARY

Supporting the demands of the Close Air Support (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/A 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. Used extensively during the Persian Gulf War, the A-10 is projected to serve well into the 2020s. An A-10 structural enhancement is in the works.

**A-10A** equipment includes an Inertial Navigation System (INS), 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.

**OA-10A.** Redesignated A-10s, used for Forward Air Control (FAC) 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 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).



AC-130H (Guy Aceto)



F-15B Eagle (Guy Aceto)



F-15C Eagle (Guy Aceto)



F-15E Strike Eagle (Guy Aceto)

**Production:** 39.  
**Inventory:** 21.  
**Unit Location:** Hurlburt Field, Fla.  
**Contractor:** Lockheed Martin, 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 ft 7 in, length 97 ft 9 in, height 38 ft 6 in.

**Weight:** H model; gross 155,000 lb.

**Ceiling:** 25,000 ft.

**Performance:** H model; speed 300 mph, range 1,500 miles, with air refueling unlimited.

**Armament:** two 20 mm Vulcan cannons with 3,000 rd, one 40 mm Bofors cannon with 256 rd, and one Howitzer with 100 rd.

#### COMMENTARY

AC-130 gunships perform special operations and conventional missions, including CAS, air interdiction, armed reconnaissance, escort, surveillance, and air base defense. Equipment includes a HUD, combined

INS/GPS, and Spectra ceramic armor protection. Self-protection measures for the low-to-medium threat environment include ECM, chaff and flares, and infrared and radar warning receivers.

**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 Electro-Optical (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.

**AC-130U Spooky**s 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.

#### F-15 Eagle

**Brief:** A supersonic, all-weather, extremely maneuverable tactical fighter designed to permit USAF to swiftly gain and maintain air superiority in aerial combat.

**Function:** Fighter.

**Operator:** ACC, AETC, AFMC, PACAF, USAF, ANG.

**First Flight:** July 27, 1972.

**Delivered:** from November 1974.

**IOC:** September 1975.

**Production:** 874.

**Inventory:** 527.

**Unit Location:** Active: Edwards AFB, Calif., Eglin AFB, Fla., Elmendorf AFB, Alaska, Kadena AB, Japan, Langley AFB, Va., Nellis AFB, Nev., RAF Lakenheath, UK, Tyndall AFB, Fla. ANG: Hickam AFB, Hawaii, Jacksonville IAP, Fla., Klamath Falls IAP, Ore., Lambert-St. Louis IAP, Mo., Mountain Home AFB, Idaho, NAS JRB New Orleans, La., Otis ANGB, Mass., Portland IAP, Ore.

**Contractor:** Boeing.

**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 ft 10 in, length 63 ft 9 in, height 18 ft 8 in.

**Weight:** empty 28,600 lb, gross 68,000 lb.

**Ceiling:** 65,000 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-9 Sidewinder and up to four AIM-7 Sparrow air-to-air missiles, or up to eight AIM-120 AMRAAMs, carried externally.

#### COMMENTARY

The F-15's superior maneuverability and acceleration, range, weapons, and avionics enable it to penetrate hostile defenses and establish air superiority over enemy systems. F-15 fighters deployed to the Persian Gulf for Desert Storm accounted for 29 of the 37 USAF air-to-air victories.

**F-15A** (single-seat) and **F-15B** (two-seat) fighters immediately became USAF's front-line fighter upon introduction in the mid-1970s. Basic equipment 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 the 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. Tactical capabilities have been extensively enhanced since 1983 through an ongoing program of installation or modification of new or 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 more than 162 C/Ds are scheduled to receive an APG-63 upgrade, with at least one squadron receiving a later version featuring an advanced active electronic scanned array.

#### F-15E Strike Eagle

**Brief:** A heavily modified, two-seat, dual-role variant of the original F-15, with weapon systems totally integrated for all-weather deep interdiction missions as well as air-to-air combat.

**Function:** Dual-role fighter.

**Operator:** ACC, AFMC, PACAF, USAF.

**First Flight:** Dec. 11, 1986.

**Delivered:** December 1988-present.

**IOC:** May 1989.

**Production:** 226.

**Inventory:** 204.

**Unit Location:** Edwards AFB, Calif., Eglin AFB, Fla., Elmendorf AFB, Alaska, Mountain Home AFB, Idaho, Nellis AFB, Nev., RAF Lakenheath, UK, Seymour Johnson AFB, N.C.

**Contractor:** Boeing.

**Power Plant:** two Pratt & Whitney F100-PW-220, each 23,770 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 ft 9 in, length 63 ft 9 in, height 18 ft 5 in.

**Weight:** empty 32,000 lb, gross 81,000 lb.

**Ceiling:** 65,000 ft.

**Performance:** max level speed at altitude Mach 2.5, ferry range with CFTs 3,000 miles.





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**communications**





**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; EO, IR, and standard bombs; CBU 87/89/97 cluster munitions; and nuclear weapons. Future options include JASSM, JDAM, JSOW, and WCMD.

#### COMMENTARY

**F-15E** has a strengthened airframe for increased gross weight at takeoff and maneuver at 9gs throughout the flight envelope. Cockpit controls and displays are improved and a wide-field-of-view 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 radar and LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) pods, with wide-field FLIR. The digital, triple-redundant flight-control system permits automatic terrain following. Other improvements include a ring-laser gyro INS, with GPS capability from 1997. CFTs fitted, adapted to carry ordnance tangentially, to reduce drag.

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 aircraft.

#### 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, USAF, ANG, AFRC.

**First Flight:** Dec. 8, 1976 (full-scale development).

**Delivered:** August 1978-present.

**IOC:** October 1980, Hill AFB, Utah.

**Production:** 2,206.

**Inventory:** 1,431.

**Unit Location:** 14 active wings, 28 ANG, and four AFRC units.

**Contractor:** Lockheed Martin.

**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. 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 ft 8 in, length overall 49 ft 5 in, height 16 ft.

**Weight:** empty (F100-PW-220) 18,238 lb, (F110-GE-100) 19,020 lb; gross, with external load (Block 40/42) 42,300 lb.

**Ceiling:** above 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.

**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 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, and were again used extensively during Allied Force.

F-16s are deployed to patrol the no-fly zones in northern and southern Iraq and to Bosnia.

**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 ever built. Equipment includes a multi-mode radar with a clutter-free look-down capability, advanced radar warning receiver, 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.



**F-16B Fighting Falcon** (Guy Aceto)



**Block 30 F-16D Fighting Falcon** (Guy Aceto)



**Block 40 F-16CG Fighting Falcon** (Guy Aceto)



**Block 50 F-16CJ Fighting Falcon** (Guy Aceto)

The Multinational Staged Improvement Program (MSIP), 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. 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 radar warning receiver (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 Increased Performance Engines (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-hr airframe, and expanded envelope 9g capability.

Block 50/52 F-16C/Ds have MSIP Stage III improvements, which also show up in selected retrofits of Block 25s. These aircraft incorporate the latest cockpit control and display technology, including a wide-angle HUD. Weapons improvements include multishot AMRAAM compatibility.

F-16C/Ds had earlier acquired interim HARM capability for Suppression of Enemy Air Defenses (SEAD) missions in conjunction with the now-retired F-4G Wild Weasels. When carrying the AN/ASQ 213 HARM Targeting System (HTS), the Block 50/52 F-16 has the ability to autonomously locate enemy threat radars and launch HARM missiles at them in the range known mode. An updated version of the HTS is being worked on.

In another program, Block 40/42/50/52 USAF F-16C/Ds are to be retrofitted with a new modular mission computer being developed under an F-16 midlife update codevelopment and coproduction effort with the European participating government of the F-16 Multinational Fighter Program. Other improvements to be incorporated include Joint Helmet Mounted Cueing System, AIM-9X, Link 16 Data Link, and improved weapons capabilities.

F-16CG designated aircraft are equipped with LANTIRN for night attack.

F-16CJ designated aircraft are equipped with HARM for SEAD. Thirty additional F-16CJs were requested in the FY00 budget.

#### F-22 Raptor

**Brief:** High-technology follow-on for the F-15C. An all-weather fighter that combines a highly maneuverable airframe at both sub- and supersonic speeds with stealth technologies and highly integrated avionics to help it penetrate enemy airspace and achieve air superiority in aerial combat.

**Function:** Fighter.

**Operator:** ACC.

**First Flight:** Sept. 7, 1997.

**Delivery:** 2001 (anticipated first production representative test aircraft).

**IOC:** December 2005.

**Production:** 339 (planned).

**Inventory:** two test aircraft.

**Unit Location:** Langley AFB, Va. (preferred option).

**Contractor:** Lockheed Martin, with Boeing and Pratt & Whitney as principal subcontractors.

**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 ft 6 in, length 62 ft 1 in, height 16 ft 7 in.

**Weight:** empty 40,000-lb class, gross approx 60,000 lb.

**Ceiling:** above 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 sides of the fuselage; six AIM-120 AMRAAMs in the main weapons bay; for ground attack, two 1,000-lb JDAMs will replace four AMRAAMs internally.

#### COMMENTARY

This ultrasophisticated multimission air superiority fighter aircraft is designed to penetrate high-threat enemy airspace and achieve air superiority with a first-look, first-kill capability against multiple targets. It will cruise at supersonic speed without using its afterburners (supercruise). Its fully integrated avionics and



weapon systems will permit simultaneous engagement of multiple targets. Extreme maneuverability is achieved through the combination of the avionics system, structural strength, and thrust vectoring nozzles. A Raytheon Common Integrated Processor (CIP) will tie together various avionics functions.

Two prototypes were built for competitive evaluation with Northrop/McDonnell Douglas YF-23 prototypes. First flight was Sept. 29, 1990. YF-22 selected as winner in April 1991.

**F-22A.** Production-configured version entered Engineering and Manufacturing Development (EMD) phase in August 1991. USAF is receiving nine single-seat F-22As, three without avionics to explore flight characteristics, flutter, loads, propulsion, and envelope expansion, and six as avionics test beds. It will also receive one static test and one fatigue test airframe.

A decision taken toward the end of 1999 to keep the F-22 in development means the next six F-22s will be production representative test aircraft for use in follow-on testing of avionics, stealthiness, and weapons delivery systems. The third test Raptor flew March 6, and the fourth, the first to be equipped with the full integrated avionics suite, is expected to be flying in summer 2000. A production decision will depend on critical avionics flight testing milestones being achieved by the end of 2000.

#### 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.

**First Flight:** June 18, 1981.

**Delivered:** 1982–summer 1990.

**IOC:** October 1983.

**Production:** 59.

**Inventory:** 56.

**Unit Location:** Holloman AFB, N.M.

**Contractor:** Lockheed Martin.

**Power Plant:** two General Electric F404-GE-F1D2 non-afterburning turbojets, each 10,800 lb thrust.

**Accommodation:** pilot only, on zero/zero ejection seat.

**Dimensions:** span 43 ft 4 in, length 65 ft 11 in, height 12 ft 5 in.

**Weight:** empty (estimated) 29,500 lb, max gross 52,500 lb.

**Ceiling:** 35,000 ft.

**Performance:** high subsonic, mission radius, unrefueled (5,000-lb weapon load) 656 miles.

**Armament:** full internal carriage of what is described as a wide variety of tactical weapons, incl laser-guided 2,000-lb munitions.

#### COMMENTARY

Acknowledged publicly in November 1988, the F-117's first operational deployment was to Panama in 1989 for First Cause. During the Persian Gulf War in 1991, a fleet of more than 40 F-117As undertook 1,270 missions. No aircraft were lost or damaged by hostile fire. An F-117 was lost March 27, 1999, while participating in Allied Force in Yugoslavia.

**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 initially with the 4450th Tactical Group (redesignated 37th TFW in 1989) at Tonopah Test Range Airfield, Nev., where operations were restricted mainly to night flying to maintain secrecy, although three aircraft were lost in much-publicized accidents.

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 non-afterburning 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. High-precision INS is installed, with recently upgraded FLIR and DLIR (Downward-Looking Infrared), each with a boresight laser designator and an autotracker, to ensure precision attack.

Improvements since 1989 have included upgraded cockpit display and instrumentation, GPS capability, and ring-laser gyro INS. Currently undergoing modification to provide a single, optimal LO configuration, adverse weather capability via advanced weapons, and to maintain the fleet through its service life.



F-22 Raptor (F-22 Team Photo)



F-117A Nighthawk (Guy Aceto)

#### Joint Strike Fighter

**Brief:** An affordable, highly common family of next-generation strike aircraft.

**Operator:** ACC for USAF.

**First Flight:** TBD

**Delivery:** 2005 (anticipated first production).

**IOC:** 2010 (USAF).

**Production:** planned: 1,763 (USAF), 480 (USN), 609 (USMC), 150 (UK).

**Inventory:** TBD

**Unit Location:** TBD

**Contractor:** Lockheed Martin and Boeing are competing contractors; Pratt & Whitney is primary propulsion contractor; General Electric is alternate engine contractor.

**Power Plant:** one Pratt & Whitney F119 derivative turbofan, 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 630 knots calibrated airspeed for Navy and Short Takeoff and Vertical Landing (STOVL) variants, Mach 1 for USAF variant, combat radius more than 678.5 miles for USAF variant, 690 miles for Navy variant, and 517.5 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 concept demonstration phase of the program commenced in November 1996 with competitive contract awards to Lockheed Martin and Boeing. This phase will feature flying concept demonstrators and concept-unique ground and flight demonstrations. Both Lockheed Martin and Boeing will demonstrate commonality and modularity, STOVL hover and transition, and low-speed handling qualities. Pratt & Whitney received a contract to provide propulsion hardware and engineering support for the weapons system concept demonstration efforts. General Electric is continuing technical efforts related to development of an alternate engine source for production.

#### YAL-1A Attack 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 be used to kill Theater Ballistic Missiles in their boost, or very earliest, phase of flight, when the TBMs display

bright plumes and are under tremendous dynamic stresses, making them vulnerable to laser weapons. The airborne laser can target TBMs hundreds of miles away and thus can fly over friendly territory to kill TBMs as they are launched.

**Function:** Attack laser.

**Operator:** ACC.

**First Flight:** 2003.

**Delivered:** to be completed by 2009 (planned).

**IOC:** FY07 (planned).

**Production:** seven (planned).

**Inventory:** TBD

**Unit Location:** TBD

**Contractor:** Boeing (ABL platform; battle management 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 ft 5 in, length 228 ft 9 in, height 63 ft 8 in.

**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 kms, unrefueled endurance at 40,000 ft with operational laser weapon load approx 6 hr.

#### COMMENTARY

Air Combat Command will base the Attack Laser in CONUS, but it has the ability to deploy 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. Typical deployment would include five aircraft to establish two, near continuous combat air patrols as directed by the joint force commander. The aircraft will fly above the clouds and typically operate at an altitude of approx 40,000 ft, initially located some 57.5 miles from the enemy but able to be moved forward as US forces gain air superiority. Information on the hostile launch location can also be determined by the ABL and passed on to attack airplanes.

The attack laser's main armament is a lightweight, megawatt-class Chemical Oxygen-Iodine Laser (COIL). The laser weapon contains 14 COIL modules and sufficient chemical fuel for 20–40 TBM kills. An optical system transports the laser beam up to the aircraft nose, where a 4.9-ft-diameter mirror in a ball turret points the beam at the target. The optical system contains low-power lasers, sensors, steering mirrors, and adaptive optics (deformable mirrors) to precisely track targets and correct atmospheric distortions, thereby increasing the high-energy laser beam's intensity on target and the system's lethal range.

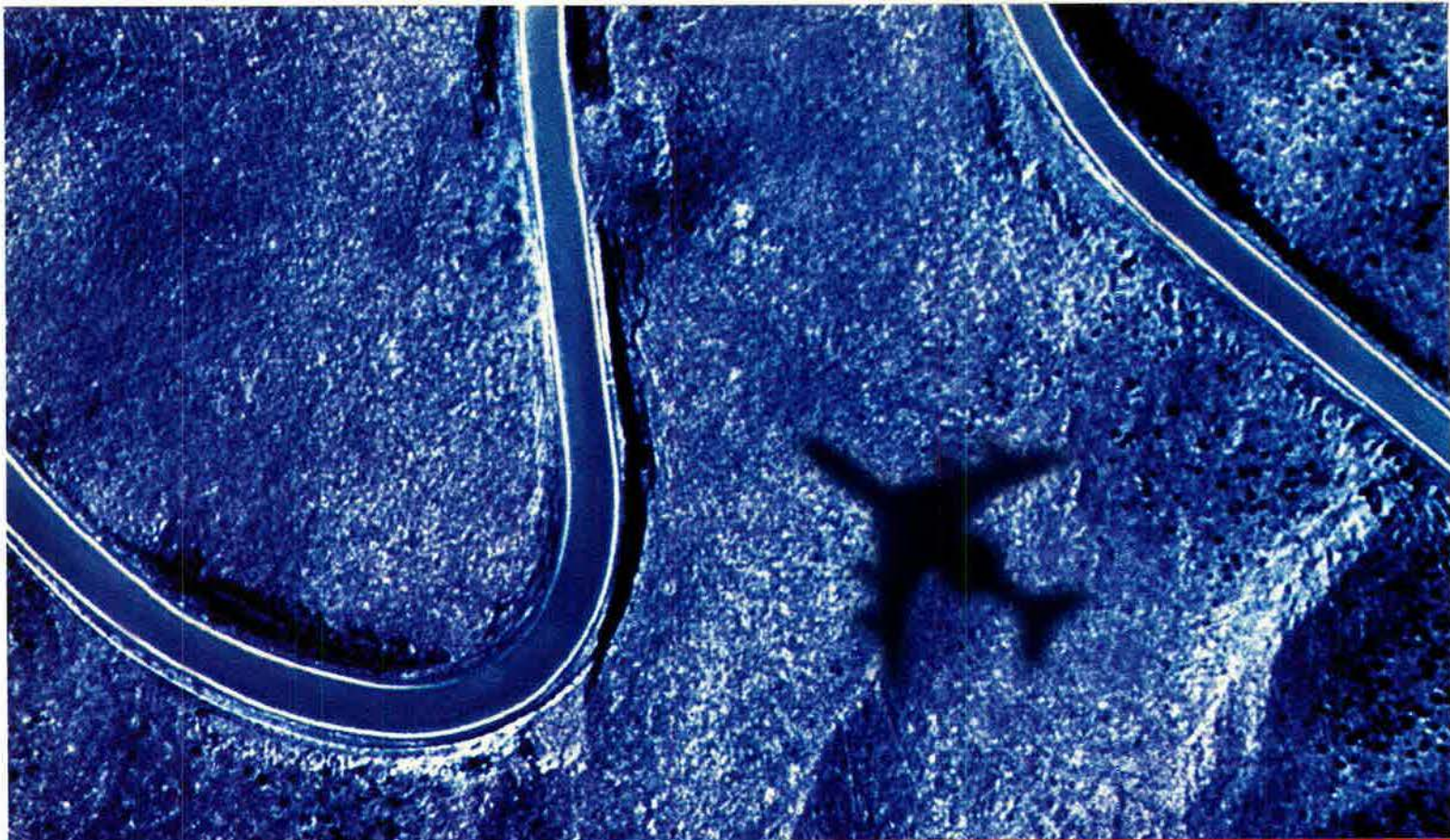
The test aircraft will offer limited operational capability; this aircraft will eventually be converted to a fully operational model.

## Reconnaissance and Surveillance Aircraft

#### E-3 Sentry

**Brief:** Modified Boeing 707 fitted with a rotating radar dome, 30 feet wide and 6 feet thick, which provides all-weather air surveillance and C<sup>3</sup> for tactical and air defense forces. Capable of surveillance from





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Earth's surface up to the stratosphere, over land or water, at more than 200 miles.

**Function:** Airborne early warning, Battle Management (BM), C<sup>2</sup>.

**Operator:** ACC, PACAF, AFRC (associate).

**First Flight:** Oct. 31, 1975 (full avionics).

**Delivered:** March 1977-84.

**IOC:** 1977.

**Production:** 34.

**Inventory:** 32.

**Unit Location:** Elmendorf AFB, Alaska, Kadena AB, Japan, Tinker AFB, Okla.

**Contractor:** Boeing.

**Power Plant:** four Pratt & Whitney TF33-PW-100/100A turbofans, each 21,000 lb thrust.

**Accommodation:** basic operational crew of 17-23, incl 13-19 AWACS mission specialists and four flight crew members.

**Dimensions:** span 145 ft 9 in, length 152 ft 11 in, height 41 ft 9 in.

**Weight:** gross 335,000 lb; max T-O 347,000 lb.

**Ceiling:** above 38,000 ft.

**Performance:** optimum cruise Mach 0.78, endurance eight hr unrefueled.

#### COMMENTARY

In high operational demand, the E-3 Airborne Warning and Control System (AWACS) aircraft is a militarized version of the Boeing 707-320B, equipped with an extensive complement of mission avionics, including computer, radar, IFF, communications, display, and navigation systems. Its capability is provided by its look-down radar, which makes possible all-altitude surveillance over land or water, with an ability to track both air and sea targets simultaneously.

**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.

USAF E-3s are undergoing major sustainability, reliability, and availability upgrades. 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 will permit AWACS aircraft operating in the pulse-Doppler mode to detect smaller, stealthier targets. IOC for these improvements scheduled for this year.

#### 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, C<sup>2</sup>.

**Operator:** ACC.

**First Flight:** December 1988.

**Delivered:** May 1996-present.

**IOC:** Dec. 18, 1997.

**Production:** 14 (planned).

**Inventory:** five.

**Unit Location:** Robins AFB, Ga.

**Contractor:** Northrop Grumman.

**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 ft 9 in, length 152 ft 11 in, height 42 ft 6 in.

**Weight:** empty 171,000 lb, 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 is an all-weather, round-the-clock system comprising an airborne E-8C aircraft (equipped with a multimode radar) and US Army mobile ground stations. The radar subsystem features a multimode, side-looking, phased-array radar with MTI as the primary mode. The radar can interleave MTI with Synthetic Aperture Radar (SAR) and Fixed Target Indicator (FTI) imagery. Joint STARS directs attack on targets,



**E-3C Sentry** (Guy Aceto)



**E-8C Joint STARS** (Guy Aceto)



**RC-135W Rivet Joint** (Ted Carlson)

in real time, via a secure, jam-resistant digital data link to broadcast data to ground forces.

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 testbed E-8C). As a result of their success, the system's original role was expanded to include bomb-damage assessment, SEAD, and the detection of mobile missile launchers and their decoys.

**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 four production Joint STARS will have more advanced computer systems, which will be retrofitted on the 10 earlier aircraft.

#### 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.

**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 version of the WC-135, modified for specialized reconnaissance with an infrared linescanner, Synthetic Aperture Radar, and forward- and vertical-looking video cameras, to monitor the 1992 Open Skies Treaty.

**OC-135B** modifications center around four cameras installed in the rear of the aircraft. Cameras installed include one vertical and two oblique KS-87 framing

cameras, used for low-altitude photography approximately 3,000 feet 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 feet. 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 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:** 22.

**Unit Location:** Offutt AFB, Neb.

**Contractor:** Raytheon.

**Power Plant:** four Pratt & Whitney TF33-P-5/9 turbofans, each 18,000 lb thrust. (Replaced with CFM International F108-CF-100s in one W version; re-engining of further aircraft anticipated.)

**Accommodation:** flight crew of four; 25-35 mission crew.

**Dimensions:** span 145 ft 9 in, length 164 ft, height 42 ft 6 in.

**Weight:** max gross 336,000 lb.

**Ceiling:** 45,000 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.

**RC-135S Cobra Ball** is used for missile tracking. Equipment includes wide-area IR sensors, long-range optical telescopes, and an advanced communications suite that can locate a missile more than 250 miles away and calculate its trajectory and impact point.

**RC-135U Combat Sent.** Two aircraft with larger tailcone and fin fairing, used for measuring and analyzing foreign electronic and IR equipment. IOC: 1967.

**RC-135 V/W Rivet Joint.** Used for electronic surveillance, RC-135 Rivet Joints loiter near battlefields providing near-real-time data updates via the Tactical Information Broadcast System (TIBS) and JTIDS on enemy air defense systems to crews of F-16 HTS aircraft. The aircraft's recon systems are continuously upgraded to keep pace with new threats.

#### RC-1A Predator

**Brief:** A medium-altitude, long-endurance Unmanned Aerial Vehicle, flown remotely by a rated



officer. Joint force commander asset with multiple imagery sensors.

**Function:** Unmanned reconnaissance aircraft.

**Operator:** ACC.

**First Flight:** July 1994.

**Delivered:** November 1996–present.

**IOC:** TBD

**Production:** 12 systems planned (system typically consists of four air vehicles, one ground control station, and one Trojan Spirit II satellite communications suite). Sixty vehicles total ordered.

**Inventory:** Six air vehicles.

**Unit Location:** Indian Springs AFAP, Nev.

**Contractor:** General Atomics.

**Power Plant:** one Rotax 914 engine.

**Accommodation:** unmanned system.

**Dimensions:** length 27 ft, height 6 ft 9 in, span 48 ft 8 in.

**Weight:** empty 950 lb, gross 2,250 lb.

**Ceiling:** 25,000 ft.

**Performance:** cruise speed up to 80 mph, continuous coverage on station with multiple air vehicles and relief on station, 460 miles from base at altitude of 25,000 ft, endurance 40 hr.

#### COMMENTARY

USAF has two Predator squadrons, the 11th and 15th RS. Both squadrons support operational deployment commitments, and the 11th conducts mission qualification training. The system has already demonstrated its capability during surveillance missions over Bosnia and Iraq. Navigation is by GPS/INS. Equipped with EO/IR and SAR sensors with C-band line of sight and Ku-band satellite data link allowing real-time transmissions of video images to the ground control station. System upgrades are under way to expand capability.

#### RQ-4A Global Hawk

**Brief:** A high-altitude, long-range, long-endurance Unmanned Aerial Vehicle.

**Function:** Unmanned reconnaissance aircraft.

**Operator:** ACC.

**First Flight:** Feb. 28, 1998.

**Delivered:** TBD

**IOC:** TBD

**Production:** decision in FY01.

**Inventory:** TBD

**Unit Location:** TBD

**Contractor:** Northrop Grumman.

**Power Plant:** one Rolls Royce–Allison AE 3007H turbofan, 7,600 lb thrust.

**Accommodation:** unmanned system.

**Dimensions:** length 44 ft 5 in, height 15 ft 2 in, span 116 ft 2 in.

**Weight:** empty 9,200 lb, gross 25,600 lb.

**Ceiling:** 67,300 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 3,450 miles from base for 24 hr.

#### COMMENTARY

A high-altitude endurance UAV carrying a 2,000-lb payload, incorporating EO/IR and SAR sensors that will permit ground commanders to switch among radar, IR, and visible wavelengths as required. Navigation is by GPS/INS. It 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 No. 2 crashed March 29, 1999. Vehicle No. 3 was damaged Dec. 6, 1999, after a test flight. Vehicle No. 1 resumed test flights March 11 after a precautionary shutdown.

#### 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.

**First Flight:** August 1955 (U-2); 1967 (U-2R); October 1994 (U-2S).

**Delivered:** 1955–October 1989.

**IOC:** circa 1956.

**Production:** 35 (U-2S).

**Inventory:** 35.

**Unit Location:** Beale AFB, Calif.

**Contractor:** Lockheed.

**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:** max cruising speed ceiling, more than 430 mph; range more than 4,500 miles; max endurance 14+ hr.

#### COMMENTARY

The U-2 is capable of collecting multisensor photo,



RQ-1A Predator (Guy Aceto)



RQ-4A Global Hawk (Ted Carlson)



U-2 Dragon Lady (Guy Aceto)



WC-130H Hercules (Ted Carlson)

electro-optic, infrared, and radar imagery, as well as performing other types of intelligence functions. Current upgrades to its sensors, airframe, and cockpit will extend the U-2's usefulness well into this century.

**U-2R** (single-seat) and **U-2RT** (two-seat) aircraft are single-engine, high-altitude reconnaissance aircraft, derived from the original version that had a key role in the Cuban Missile Crisis of 1962. This model is 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 designations for U-2Rs that were re-engined with the General Electric F118-101, a derivative of the engine used in the B-2 bomber, providing improved performance and supportability. The Air Force accepted the first U-2S in October 1994, and conversion of the entire fleet of 31 single-seat U-2s and four two-seat trainers was completed in 1999.

#### WC-130 Hercules

**Brief:** A high-wing, medium-range aircraft flown by Air Force Reserve Command 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:** C-130J: October 1999–present.

**IOC:** 1959 (B model), 1962 (E), 1964 (H).

**Production:** (no new-build WC-130H).

**Inventory:** 10 (WC-130H).

**Unit Location:** Keesler AFB, Miss.

**Contractor:** Lockheed.

**Power Plant:** four Allison T56-A-15 turboprops, each 4,910 shp.

**Accommodation:** six.

**Dimensions:** span 132 ft 6 in, length 99 ft 4 in, height 38 ft 6 in.

**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, Fla.

**WC-130J.** Ten weather-capable versions of the latest C-130 model ordered, powered by four Allison AE2100D3 turboprops. First delivered Oct. 12, 1999. First test and evaluation sortie made Nov. 18, 1999.

## 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, C<sup>3</sup> center allowing the National Command Authority 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.

**Power Plant:** four General Electric CF6-50E2 turbofans, each 52,500 lb thrust.

**Accommodation:** up to 114.

**Dimensions:** span 195 ft 8 in, length 231 ft 4 in, height 63 ft 5 in.

**Weight:** gross 800,000 lb.

**Ceiling:** above 30,000 ft.

**Performance:** unrefueled endurance in excess of 12 hr; with aerial refueling up to 72 hr.

#### COMMENTARY

E-4 aircraft were developed as the National Emergency Airborne Command Post (NEACP), now the National Airborne Operations Center (NAOC). The E-4B fleet provides a survivable C<sup>3</sup> platform capable of supporting the National Command Authority throughout the full threat spectrum, including sustained operations in a nuclear environment.

The first B model was delivered to the Air Force in January 1980. Four were produced, of which three were converted E-4As. The first operational mission was flown in March 1980. They are hardened against the effects of nuclear explosions, including electromagnetic pulse. A 1,200-kVA electrical system supports advanced system electronics as well as state-of-the-art communications and data processing equipment such as Extremely High Frequency (EHF) Milstar satellite terminals and six-channel International Maritime Satellite (INMARSAT). Triband radomes also house 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 tying into 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.

#### E-9

**Brief:** Airplane used for low-altitude, over-the-horizon data gathering during missile tests and for sea



surveillance in order to keep boats out of the Gulf Test Range during tests.

**Function:** Electronic surveillance.

**Operator:** ACC.

**First Flight:** (Prototype Dash 8) June 20, 1983.

**Delivered:** 1988.

**IOC:** circa 1988.

**Production:** two.

**Inventory:** zero (two, Primary Aircraft Inventory).

**Unit Location:** Tyndall AFB, Fla.

**Contractor:** de Havilland of Canada.

**Power Plant:** two Pratt & Whitney Canada PW120A turboprops, each 2,000 shp. (No military designation on these engines).

**Accommodation:** three: pilot, copilot, and systems operator.

**Dimensions:** span 85 ft, length 73 ft, height 24 ft 7 in.

**Weight:** gross 34,500 lb fully fueled.

**Ceiling:** 25,000 ft.

**Performance:** max speed at 25,000 ft 245 mph, loiter time 5 hr.

#### COMMENTARY

**E-9A** is a highly modified Boeing Canada (de Havilland) DHC-8 Dash 8M-100 aircraft. Two are operated by the 475th Weapons Evaluation Group as airborne platform telemetry relay aircraft. Each is equipped with a sensor suite that includes an AN/APS-128D sea surveillance radar in a ventral radome and a five-beam, electronically steerable, 75-square-foot, phased-array telemetry antenna in a starboard-side fuselage fairing, capable of automatically detecting, tracking, and relaying data simultaneously from five pairs of distinct targets traveling at speeds of Mach 5 or more.

#### EC-18

**Brief:** A heavily modified Boeing 707 used to gather telemetry and other data 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:** three.

**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 ft 9 in, length 152 ft 11 in, height 42 ft 5 in.

**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)** are modified former commercial Boeing 707-320 transports. Replacing some of the EC-135A/E ARIA aircraft, the EC-18B is similarly equipped, with the world's largest airborne steerable antenna housed in a bulbous nose. Range, cabin space, and fuel efficiency are all increased to provide greater support for the expanding ARIA mission, including DoD and NASA space and missile programs.

**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.

#### EC-130E/J

**Brief:** A heavily modified C-130 which, in its several variants, is used to carry out battlefield command, electronic warfare, and electronic combat.

**Function:** Electronic warfare.

**Operator:** ACC, ANG.

**First Flight:** January 1990.

**Delivered:** March 1990.

**IOC:** December 1990.

**Production:** (no USAF new-build EC-130Es).

**Inventory:** 15.

**Unit Location:** Active: Davis–Monthan AFB, Ariz. ANG: Harrisburg IAP, Pa.

**Contractor:** Lockheed Martin.

**Power Plant:** four Allison T56-A-15 turboprops, each 4,910 shp.

**Accommodation:** four flight crew, 15 mission personnel.

**Dimensions:** span 132 ft 7 in, length 100 ft 6 in, height 38 ft 3 in.

**Weight:** gross 155,000 lb.

**Ceiling:** 20,000 ft.

**Performance:** speed 299 mph, range in excess of 2,100 miles.

#### COMMENTARY

**EC-130E ABCCC** is an Airborne Battlefield Com-

mand and Control Center. Seven aircraft were updated by Unisys to ABCCC III standard. The advanced JTIDS receives data transmitted by AWACS aircraft and other systems, enabling the crew to see a real-time picture of air operations over a combat area. EC-130s have been deployed in support of NATO operations.

**EC-130E Commando Solo.** ANG uses this version 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.



**EC-9** (Ted Carlson)



**EC-18** (USAF photo)



**EC-130E ABCCC** (TSgt. Lance Cheung)



**EC-130E Commando Solo** (Ted Carlson)



**EC-130H Compass Call** (Ted Carlson)

Secondary mission is electronic attack in the military frequency spectrum.

**EC-130J Commando Solo.** Four specialist versions of the latest C-130 aircraft ordered. First expected to enter operational 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.

**Production:** (converted).

**Inventory:** 15.

**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 ft 7 in, length 100 ft 6 in, height 38 ft 3 in.

**Weight:** 155,000 lb.

**Ceiling:** 20,000 ft.

**Performance:** speed 374 mph at 20,000 ft.

#### COMMENTARY

A variant used as an airborne communications jamming platform. It played a vital role in disrupting Iraqi military communications at strategic and tactical levels during the Persian Gulf War and has since been deployed to the Balkans.

#### EC-135

**Brief:** Modified KC-135 tanker aircraft extensively equipped with sophisticated communications equipment was used to provide continuous airborne alert in support of national command and control; other aircraft used for telemetry and voice relay.

**Function:** ARIA aircraft.

**Operator:** AFMC.

**First Flight:** not available

**Delivered:** not available

**IOC:** Feb. 3, 1961.

**Production:** (converted).

**Inventory:** three.

**Unit Location:** Edwards AFB, Calif.

**Contractor:** Boeing.

**Power Plant:** (EC-135C) four Pratt & Whitney TF33-P-9 turbofans, each 18,000 lb thrust.

**Accommodation:** flight crew of four, plus various specialists.

**Dimensions:** span 130 ft 10 in, length 136 ft 3 in, height 38 ft 4 in.

**Weight:** (ARIA) gross 300,500 lb.

**Ceiling:** (ARIA) 33,000 ft.

**Performance:** (ARIA) max cruise speed 490 mph, operational radius 2,675 miles.

#### COMMENTARY

Several KC-135A tankers were modified for use as airborne command posts during the 1960s.

**EC-135A/G/L** were operated by SAC; **EC-135H** by USAF; **EC-135J/P** by PACAF; and **EC-135K** by TAC. **EC-135Ns** had specialized nose radar and tracking equipment to support the Apollo program. Other EC-135 aircraft included J and Y versions. Virtually all retired.

**EC-135C** aircraft, known as Looking Glass, supported USSTRATCOM's Airborne National Command Post mission, as well as other command-and-control missions. Delivered as KC-135Bs, they were redesignated in 1964 to reflect their role. Continuous airborne alert status ended July 24, 1990, and all retired by September 1998 as the USN's E-6B aircraft took over the NCP mission.

**EC-135E ARIA.** Only one E-model now functions as telemetry data recording and relay station to supplement land and marine telemetry stations that support DoD and NASA space and missile programs. Specialist equipment includes an airborne steerable antenna housed in a bulbous nose, a probe antenna on each wingtip, and a trailing wire antenna on the bottom of the fuselage. The cargo compartment is modified to include all of the instrumentation subsystems installed as a 30,000-lb modular package.

## Tanker Aircraft

#### 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 (associate).

**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; max 27 pallets; max cargo payload 169,409 lb.  
**Dimensions:** span 165 ft 4.5 in, length 181 ft 7 in, height 58 ft 1 in.  
**Weight:** gross 590,000 lb.  
**Ceiling:** 42,000 ft.



**KC-10A Extender** (Ted Carlson)



**KC-135E Stratotanker** (Ted Carlson)

**Performance:** cruising speed Mach 0.825, range with max cargo 4,370 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. Later modification included wing-mounted air refueling pods to increase capability.

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 US Navy, Marine Corps, and allied aircraft.

**Function:** Aerial refueling/airlift.

**Operator:** ACC, AETC, AMC, PACAF, USAF, ANG, AFRC.

**First Flight:** August 1956.

**Delivered:** January 1957-66.

**IOC:** June 1957, Castle AFB, Calif.

**Production:** 732.

**Inventory:** 547.

**Unit Location:** Altus AFB, Okla., Fairchild AFB, Wash., Grand Forks AFB, N.D., Kadena AB, Japan, MacDill AFB, Fla., McConnell AFB, Kan., Mountain Home AFB, Idaho, RAF Mildenhall, UK, Robins AFB, Ga. ANG: 19 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 TF33-PW-102 turbofans, each 18,000 lb thrust.

**Accommodation:** crew of four; up to 57 passengers.  
**Dimensions:** span 130 ft 10 in, length 136 ft 3 in, height 38 ft 4 in.

**Weight:** empty 119,231 lb, gross 322,000 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

Backbone of the USAF tanker fleet, the long-serving KC-135 is similar in size and appearance to com-



**KC-135R Stratotanker** (SSgt. Randy Mallard)



**HC-130P** (TSgt. Cary Humphries)

mercial 707 aircraft but was designed to military specifications, incorporating different structural details and materials. The KC-135 fuel tankage is 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 163 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 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 are capable of refueling SR-71s. The program continues.

Ongoing modernization programs are extending KC-

135 capability and operational utility well into this century. The lower wing skin was renewed, adding 27,000 flying hours to the aircraft. The Pacer CRAG avionics modernization program permits operation by a three-person flight crew. Several avionics upgrades are under way that will significantly improve systems reliability and maintainability. Under the Pacer CRAG program, the entire fleet will be fitted with improved cockpit and navigation suites, including color weather radar, reduced vertical separation minimums equipment, and integrated INS/GPS. Some KC-135Rs have been fitted with wing-mounted hose-and-drogue refueling pods to enhance interoperability and support to the US Navy, US Marines, NATO, and other allied receiver aircraft.

#### MC-130P Combat Shadow/HC-130

**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 airdrop 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:** MC-130P: 28; HC-130N/P: 29.

**Unit Location:** Active: Eglin AFB, Fla., Kadena AB, Japan, Kirtland AFB, N.M., Moody AFB, Ga., Patrick AFB, Fla., RAF Mildenhall, UK. ANG: Anchorage, Alaska, Francis S. Gabreski IAP, N.Y., Moffett Federal Airfield, Calif. AFRC: Eglin and Patrick AFBs, Fla., Portland IAP, Ore.

**Contractor:** Lockheed.

**Power Plant:** four Allison T56-A-15 turboprops, each 4,910 shp.

**Accommodation:** four flight crew, plus four mission crew.

**Dimensions:** span 132 ft 7 in, length 98 ft 9 in, height 38 ft 6 in.

**Weight:** gross 155,000 lb.

**Ceiling:** 33,000 ft.

**Performance:** speed 289 mph, range more than 4,000 miles.

#### COMMENTARY

Since initial introduction, Combat Shadow aircraft have served a wide range of roles and missions. They are currently dedicated to special operations missions, conducting single-ship or formation in-flight refueling of SOF helicopters in a low-threat to selected medium-threat environment. During Desert Storm, they provided air refueling of SOF helicopters over friendly and hostile territory as well as psychological operations and leaflet drops.

**MC-130P.** (Formerly KC-130N/P.) Modified with new secure communications, self-contained inertial navigation and countermeasures systems, and NVG-compatible lighting. NVG low-level flights use minimal lighting and communications-out procedures. Additional modifications include 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. Fifteen have been fitted with an in-flight refueling receptacle to extend their range indefinitely.

**HC-130.** Tankers serving with active, ANG, and AFRC search-and-rescue units retain the HC-130 designation.

## Strategic Transports

#### C-5 Galaxy

**Brief:** A heavy-lift, air refuelable cargo transport for massive strategic airlift over long ranges, including outside cargo. Supports special operations missions.

**Function:** Cargo and troop transport.

**Operator:** AETC, 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., Kelly AFB, Texas, Travis AFB, Calif. ANG: Stewart IAP, N.Y. AFRC: Dover AFB, Del., Kelly AFB, Texas, 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



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engineers, and two loadmasters), plus rest area for 15 (relief crew, etc.) and seating for 75. 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 ft 9 in, length 247 ft 10 in, height 65 ft 1 in.

**Weight:** empty 374,000 lb, gross 769,000 (wartime 840,000) lb.

**Ceiling:** 34,000 ft with a 605,000-lb load.

**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 6,469 miles. Normal cruising speed at altitude 518 mph (Mach 0.77), unlimited range with in-flight air refueling.

#### COMMENTARY

One of the world's biggest 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. 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, and the C-5A fleet has incorporated the avionics subsystems developed for the C-5B.

**C-5B** is 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 Galaxy's are on contract to undergo a complete avionics modernization program that will install a state-of-the-art cockpit and ensure global access navigation safety compliance by the end of 2005. To baseline this modification, all C-5s have had their flight-management systems modernized and GPS receivers installed. A number of C-5s have been equipped with a prototype missile defense system. Additionally, the Air Force is planning a comprehensive modernization effort including a re-engineering effort to take advantage of an estimated service life through 2040.

#### 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, AMC, AFRC.

**First Flight:** Sept. 15, 1991.

**Delivered:** June 1993-present.

**IOC:** Jan. 17, 1995.

**Production:** 134 minimum planned.

**Inventory:** 55.

**Unit Location:** Altus AFB, Okla., Charleston AFB, S.C., McChord AFB, Wash. AFRC: Charleston AFB, S.C., McChord AFB, Wash.

**Contractor:** Boeing.

**Power Plant:** four Pratt & Whitney F117-PW-100 turbofans, each 40,400 lb thrust.

**Accommodation:** normal flight crew of three (two pilots plus loadmaster). 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, jeeps, 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 ft 8 in, length 173 ft 11 in, height 55 ft 1 in.

**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 .74) at 28,000 ft, unrefueled range with 160,000-lb payload 2,760 miles, 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 air-drop outsize cargo in the tactical environment.

**C-17A** completed its full flight test program in June



**C-5B Galaxy** (TSgt. Brad Fallin)



**C-17 Globemaster III** (Ted Carlson)



**C-141B (SOLL) Starlifter** (SrA. Greg L. Davis)

1995. It 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 multi-function electronic displays. For operational deployments to Bosnia, the C-17 was the only aircraft capable of carrying outsize cargo into Tuzla AB.

#### C-135 Stratolifter

**Brief:** A version of the KC-135 tanker, without refueling equipment, produced for non-tanker duties.

**Function:** Passenger and cargo airlifter.

**Operator:** ACC, AFMC, AMC, PACAF, ANG.

**First Flight:** May 1961.

**Delivered:** 1961-62.

**IOC:** circa 1961.

**Production:** 48, plus five WC/TC-135s.

**Inventory:** five.

**Unit Location:** Andrews AFB, Md., Edwards AFB, Calif., Hickam AFB, Hawaii, Offutt AFB, Neb.

**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 ft 10 in, length 134 ft 6 in, height 38 ft 4 in.

**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

Several 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-141 Starlifter

**Brief:** The workhorse of US airlift force, 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:** AETC, AMC, ANG, AFRC.

**First Flight:** Dec. 17, 1963.

**Delivered:** October 1964-June 1982.

**IOC:** May 1965.

**Production:** 285.

**Inventory:** 155.

**Unit Location:** Active: Altus AFB, Okla., Charleston AFB, S.C., Edwards AFB, Calif., McChord AFB, Wash., McGuire AFB, N.J. ANG: Jackson IAP, Miss., Memphis IAP, Tenn. AFRC: Andrews AFB, Md., Charleston AFB S.C. (associate), March AFB, Calif., McChord AFB, Wash., McGuire AFB, N.J., Wright-Patterson AFB, Ohio.

**Contractor:** Lockheed.

**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 ft 11 in, length 168 ft 4 in, height 39 ft 3 in.

**Weight:** operating 150,000 lb; max payload 68,725 lb normal, 89,000 lb emergency war planning; gross 325,000 lb normal, 344,900 lb emergency war planning.

**Ceiling:** 41,600 ft.

**Performance:** max cruising speed 566 mph, range with max payload 2,170 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.

**C-141A** entered service with MAC in April 1965, and 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 realize the aircraft's full payload potential. 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 (Special Operations Low Level) 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, is assigned to AFRC's 452nd Air Mobility Wing, March AFB, Calif. ANG and AFRC are slated to get 63 of these glass-cockpit transports.

## 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, USAF, AFRC.

**First Flight:** August 1968.

**Delivered:** August 1968–February 1975.

**IOC:** circa 1968.

**Production:** 24.

**Inventory:** 23.

**Unit Location:** Andrews AFB, Md., Chievres AB, Belgium, Ramstein AB, Germany, Scott AFB, Ill., Yokota AB, Japan.

**Contractor:** McDonnell Douglas (now Boeing).

**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 ft 5 in, length 119 ft 3 in, height 27 ft 5 in.

**Weight:** gross 121,000 lb.

**Ceiling:** 35,000 ft.

**Performance:** max cruising speed at 25,000 ft 565 mph, range more than 2,000 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. Two C-9As also provide 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 Presidential and other US governmental duties.

### C-12 Huron

**Brief:** Aircraft to provide airlift support for attaché and military advisory groups worldwide.

**Function:** Special airlift.

**Operator:** AETC, PACAF.

**First Flight:** Oct. 27, 1972 (Super King Air 200).

**Delivered:** 1974–late 1980s.

**IOC:** circa 1974.

**Production:** 88.

**Inventory:** 32.

**Unit Location:** Elmendorf AFB, Alaska, Keesler AFB, Miss., 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 ft 6 in, length 43 ft 9 in, 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.

### 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 turboprop aircraft acquired to provide airlift for high-ranking government and DoD officials.

**Function:** Operational support airlift; special air missions.



C-9 Nightingale (Ted Carlson)



C-12 Huron (Ted Carlson)



C-20 Gulfstream III (MSgt. Joe Cupido)



C-21 (Ted Carlson)



C-22 (Ted Carlson)

**Operator:** AMC, USAF.

**First Flight:** December 1979.

**Delivered:** from September 1983.

**IOC:** circa 1983.

**Production:** not available

**Inventory:** 13.

**Unit Location:** Andrews AFB, Md., Ramstein AB, Germany.

**Contractor:** Gulfstream.

**Power Plant:** C-20A/B: two Rolls Royce-Spey MK511-8 turboprops, each 11,400 lb thrust; C-20H: two Rolls Royce-Tay MK611-8 turboprops, each 13,850 lb thrust.

**Accommodation:** crew of five; 12 passengers.  
**Dimensions:** span 77 ft 10 in, length 83 ft 1 in, height 24 ft 4 in.

**Weight:** C-20A/B gross 68,200 lb; C-20H gross 74,600 lb.

**Ceiling:** 45,000 ft.

**Performance:** max cruising speed 561 mph, range 4,050 miles.

### COMMENTARY

**C-20A.** Three Gulfstream III transports were acquired to replace aging C-140B aircraft. They provide USAF's Special Air Mission fleet with intercontinental range and ability to operate from short runways.

**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-20C.** Three special missions aircraft, with hardened strategic communications equipment.

**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.

### 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, USAF, 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, Texas, Scott AFB, Ill., Stuttgart, Germany, Wright-Patterson AFB, Ohio, Yokota AB, Japan.

**Contractor:** Raytheon.

**Power Plant:** two AlliedSignal TFE731-2 turboprops, 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 ft 6 in, length 48 ft 7 in, height 12 ft 3 in.

**Weight:** empty, equipped 10,119 lb, gross 18,300 lb.

**Ceiling:** 45,000 ft.

**Performance:** max level speed at 25,000 ft 542 mph, range with max passenger load 2,420 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.

### C-22

**Brief:** A Boeing 727-100 used by the Air National Guard 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:** three.

**Unit Location:** Andrews AFB, Md.

**Contractor:** Boeing.

**Power Plant:** three JTD8D-1 turboprops, 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 ft 2 in, 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 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.

### C-26

**Brief:** A modified commuter transport aircraft.

**Function:** Transport, medevac, and counterdrug.

**Operator:** ANG.

**First Flight:** not available

**Delivered:** March 1989–present.

**IOC:** March 1989.

**Production:** not available

**Inventory:** 12 (C-26B, UC-26C).



**Unit Location:** various ANG units.  
**Contractor:** Fairchild.  
**Power Plant:** two AlliedSignal TPE331-11U-612G turboprops, each 1,100 shp, or TPE331-12UAR, each 1,119 shp.

**Accommodation:** crew of two; 19–20 passengers.  
**Dimensions:** span 57 ft, length 59 ft 4 in, height 16 ft 8 in.

**Weight:** empty 9,494 lb, gross 16,000 lb.  
**Ceiling:** 26,700 ft.

**Performance:** max cruising speed at midcruise weight of 12,500 lb 321 mph, range with 19 passengers 1,224 miles.

#### COMMENTARY

**C-26A.** USAF acquired 13 Fairchild Metro III commuter transport aircraft, under the designation C-26A, to replace ANG C-131s. C-26As serving in the ANG Operational Support Transport Aircraft (ANGOSTA) role have a quick-change interior, enabling passenger seats to be replaced by a medevac or cargo-carrying configuration.

**C-26B.** C-26Bs, modified Fairchild Metro 23s, have TCAS II, GPS, and microwave landing systems.

**UC-26C.** A modified Fairchild Merlin IVC, used for counterdrug operations.

#### 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 ft 10 in, length 155 ft 3 in, height 44 ft 6 in.

**Weight:** empty 127,800 lb, gross 255,000 lb.

**Performance:** cruise speed Mach 0.8–0.86, cruise altitude 41,000 ft.

#### COMMENTARY

New Boeing 757-200s, known as C-32As, are replacing C-137B/Cs. 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.

#### 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–January 1999.

**IOC:** Dec. 9, 1998.

**Production:** two.

**Inventory:** two.

**Unit Location:** Andrews AFB, Md.  
**Contractor:** Gulfstream.  
**Power Plant:** two BMW-Rolls Royce BR710A1-10 turbofans, each 14,900 lb thrust.



C-26 (Ted Carlson)



C-32 (Robert F. Dorr)



C-37A (Robert F. Dorr)



C-38A (Robert F. Dorr)

**Accommodation:** five crew and 12 passengers.  
**Dimensions:** span 93 ft 6 in, length 96 ft 5 in, height 25 ft 10 in.

**Weight:** empty 47,601 lb, gross 90,500 lb.

**Performance:** cruise speed Mach 0.8, cruise altitude up to 51,000 ft.

#### COMMENTARY

The C-37A, along with the C-32, is a replacement for the VC-137B/C aircraft. It can conduct simultaneous diplomatic missions with secure communications. Capable of operations at any suitable civilian or military airfield in the world.

#### 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 cargo use.

**Function:** VIP air transport and operational support.

**Operator:** ANG.

**First Flight:** 1998.

**Delivered:** May 1998.

**IOC:** 1998.

**Production:** two.

**Inventory:** two.

**Unit Location:** Andrews AFB, Md.

**Contractor:** Tracor (Israel Aircraft Industries Ltd.).

**Power Plant:** two AlliedSignal Garrett TFE731-40R-200G, each 4,250 lb thrust.

**Accommodation:** three 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 ft 7 in, length 55 ft 7 in, height 18 ft 2 in.

**Weight:** gross 24,800 lb.

**Performance:** cruise speed Mach 0.87, cruise altitude 33,000 ft.

#### COMMENTARY

The C-38A is a military version of the Astra SPX produced by IAI and supported worldwide by Galaxy Aerospace. The first two aircraft are operated by ANG's 201st AS. It replaced existing Learjet C-21As. The contract includes an option for two additional aircraft.

#### C-130 Hercules

**Brief:** A rugged aircraft capable of operating from rough dirt strips to provide theater airlift and para-dropping of troops and equipment into hostile areas.

**Function:** Inter- and intra-theater airlift.

**Operator:** ACC, AETC, AFSOC, AMC, PACAF, USAF, ANG, AFRC.

**First Flight:** August 1954 (C-130A).

**Delivered:** December 1956–present.

**IOC:** circa 1958.

**Production:** more than 2,200.

**Inventory:** 530.

**Unit Location:** Active: Dyess AFB, Texas, Eglin AFB, Fla., Elmendorf AFB, Alaska, Hurlburt Field, Fla., Kirtland AFB, N.M., Little Rock AFB, Ark., Moody AFB, Ga., Pope AFB, N.C., Ramstein AB, Germany, Yokota AB, Japan. ANG: 25 units, AFRC: 10 units.

**Contractor:** Lockheed Martin.

**Power Plant:** (C-130H) four Rolls Royce–Allison T56-A-15 turboprops, each 4,500 shp.

**Accommodation:** (C-130H) crew of five; up to 92 troops, 64 paratroops, 74 litter patients plus attendants, 54 passengers on palletized seating, or up to five 463L standard freight pallets, etc.

**Dimensions:** span 132 ft 7 in, length 97 ft 9 in, height 38 ft 1 in.

**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 385 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.

#### COMMENTARY

Continuing in production, the C-130 Hercules transport aircraft first flew 45 years ago 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, fire-fighting duties 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. Six were modified in 1961 as **JC-130Bs** for air-snatch satellite recovery. 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 has extended the life of the aircraft well into the next century.



C-130H Hercules (Guy Aceto)



Other modifications include a Self-Contained Navigation System (SCNS), 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, updated avionics, and other, minor, improvements; delivery began in July 1974. More than 350 C-130Hs and derivatives were ordered for active and reserve units of the US services. Night Vision Instrumentation System was introduced from 1993, TCAS II in new aircraft from 1994. ANG and AFRC C-130Hs are used in fire-fighting missions. Specifically modified aircraft are used by AFRC's 757th AS for aerial spraying, typically to suppress mosquito-spread epidemics. Seven LC-130Hs, modified with wheel-ski gear, are operated by ANG's 109th AW, Schenectady County Airport, N.Y., in support of Arctic and Antarctic operations. Two former USN LC-130Rs are being modified to LC-130H standard for delivery to the 109th AW later this year. Two DC-130Hs were modified for UAV control duties.

**C-130J.** This newest model features a three-crew flight operation system, 6,000 shp Rolls Royce-Allison AE 2100D engines, digital avionics and mission computers, enhanced performance, and improved reliability and maintainability.

#### C-137 Stratoliner

**Brief:** A modified Boeing 707 providing transportation for the vice president, cabinet and Congressional members, and other high-ranking US and foreign officials. It also serves as a backup for Air Force One, the Presidential aircraft.

**Function:** VIP air transport.

**Operator:** AMC.

**First Flight:** April 1959.

**Delivered:** from 1959.

**IOC:** 1962.

**Production:** seven.

**Inventory:** two.

**Unit Location:** Andrews AFB, Md.

**Contractor:** Boeing.

**Power Plant:** four Pratt & Whitney JT3D-3B turbofans, each 18,000 lb thrust.

**Accommodation:** varies with mission.

**Dimensions:** span 145 ft 9 in, length 152 ft 11 in, height 42 ft 5 in (VC-137C).

**Weight:** gross 322,000 lb (VC-137C).

**Ceiling:** 42,000 ft.

**Performance:** max speed 627 mph, range 6,000 miles (VC-137C).

#### COMMENTARY

One specially modified Boeing 707 transport is operated by AMC's 89th Airlift Wing for VIP duties. Other aircraft have been replaced by new Boeing 757-200s, designated C-32A, and two Gulfstream-5s, designated C-37A.

**VC-137A.** Three specially configured 707-120 aircraft, acquired by USAF for VIP duties. All modified to B standard.

**C-137B.** VC-137A aircraft modified with turbofan engines. All retired.

**C-137C.** Four VIP-configured 707-320Bs, two of which have been Air Force One aircraft. Aircraft tail #26000, the first VC-137C in service (Oct. 12, 1962) and the first specifically purchased for use as Air Force One, retired in May 1998. It is perhaps most well-known as the aircraft that was used to return President John F. Kennedy's body to Washington and to host the swearing in of President Lyndon B. Johnson in 1963. The remaining Air Force One, tail #27000, entered service Aug. 4, 1972.

#### CV-22 Osprey

**Brief:** A tiltrotor, 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:** 2003 (planned).

**IOC:** 2004 (planned).

**Production:** 50 (planned).

**Inventory:** 50 (planned).

**Unit Location:** TBD

**Contractor:** Bell/Boeing.

**Power Plant:** two Allison T406-AD-400 turboshafts, each 6,150 shp.

**Accommodation:** four flight crew, 18 troops or 8,000 lb internal cargo.

**Dimensions:** proprotor diameter 38 ft, width, rotors turning 84 ft 7 in, fuselage length 57 ft 4 in, height over tail fins 17 ft 8 in.

**Weight:** normal mission weight, VTO 47,500 lb; gross, STO 60,500 lb.

**Ceiling:** 26,000 ft.

**Performance:** max cruising speed in helicopter mode 115 mph, in airplane mode 316 mph.

#### COMMENTARY



LC-130H Hercules (Guy Aceto)



C-130J Hercules (Guy Aceto)



C-137C Stratoliner (Ted Carlson)

Development of this variant of the Marine Corps MV-22 is continuing. It is expected to fulfill the Air Force special operations requirement for high-speed, long-range Vertical/Short Takeoff and Landing (V/STOL) aircraft capable of low-visibility, clandestine penetration/extraction of denied areas in adverse weather.

CV-22 is based on Bell's XV-15. It is designed typically to carry troops or cargo over a 575-mile combat radius at 265 mph. Self-deployment range will be 2,860 miles with one air refueling.

The CV-22 will be shipboard compatible and air refueling capable. Equipment will include a fully integrated precision navigation suite, with GPS and INS; FLIR; terrain-following/terrain-avoidance radar; digital map display; and NVG-compatible cockpit displays. The electronic warfare suite will include radar and missile warning receivers, radar and infrared missile jammers, and flare/chaff dispensers. The communica-

tions suite will include secure UHF, VHF (AM and FM), and SATCOM radios.

Four Full-Scale Development (FSD) aircraft had flown by the end of 1991. Flight testing resumed in April 1993, following the incorporation of numerous design changes. The first CV-22 is expected to begin initial operational test and evaluation at Kirtland AFB, N.M., in spring 2002.

#### MC-130E/H Combat Talon

**Brief:** A modified C-130 able to provide global, day, night, and adverse weather capability to air-drop personnel, to deliver personnel and equipment in support of SOF, and to refuel helicopters.

**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); 24 (H).

**Unit Location:** Active (associate) and AFRC MC-130Es at Duke Field, Fla. Active MC-130H at Hurlburt Field, Fla., Kadena AB, Japan, Kirtland AFB, N.M., RAF Mildenhall, UK.

**Contractor:** Lockheed Martin.

**Power Plant:** four Allison T56-A-15 turboprops, each 4,508 shp.

**Accommodation:** E: crew of nine; 53 troops or 26 paratroops; H: crew of seven; 75 troops or 52 paratroops.

**Dimensions:** span 132 ft 7 in, height 38 ft 6 in, length 100 ft 10 in (E), 99 ft 9 in (H).

**Weight:** empty 72,892 lb, gross 155,000 lb.

**Ceiling:** 33,000 ft.

**Performance:** max speed 366 mph, range 3,110 miles, unlimited with refueling.

#### COMMENTARY

Specially modified C-130 transports, these aircraft are equipped with in-flight refueling equipment, terrain following/terrain avoidance radar, INS/GPS, and a high-speed aerial delivery system. These systems are used to locate small drop zones and deliver people or equipment with greater accuracy and at higher speeds than is possible with a standard C-130. The aircraft can penetrate hostile airspace at low altitudes, at night, and in adverse weather.

**MC-130E (Combat Talon I).** Fourteen modified C-130E aircraft, nine of which are equipped with a surface-to-air Fulton air recovery system. During Operation Desert Storm, MC-130Es played a vital role performing psychological operations, with a secondary mission in combat search and rescue.

**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 infrared 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.



MC-130H Combat Talon II (MSgt. Val Gempis)



**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.  
**Dimensions:** span 195 ft 8 in, length 231 ft 10 in, height 63 ft 5 in.  
**Weight:** long-range mission T-O weight 803,700 lb., gross 833,000 lb.  
**Ceiling:** 45,000 ft.  
**Performance:** high-speed cruise Mach 0.88–0.91, normal cruising speed Mach 0.84, unrefueled range 7,140 miles.

#### COMMENTARY

Based on the Boeing 747-200B airframe, two VC-25A Presidential transports replaced the former primary and backup Air Force One C-137Cs. Equipment aboard the aircraft makes them practically self-sufficient, and despite their long range they are air refuelable.

## 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 (associate).  
**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, Texas, 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 ft 6 in, length 48 ft 5 in, height 13 ft 11 in.

**Weight:** empty 5,200 lb, gross 16,300 lb.

**Ceiling:** 41,000 ft.

**Performance:** max speed at 27,000 ft 538 mph, range 2,222 miles.

#### COMMENTARY

Pilots trained in the T-1 progress to transports, such as the C-5 and C-17, tankers, such as the KC-10 and KC-135, and the B-52 (through FY00).

**T-1A.** The swept-wing T-1A is a version of the Beech 400A, with military avionics, used for Specialized Undergraduate Pilot Training (SUPT). Structural enhancements provide for a large number of landings per flight hour, increased bird strike resistance, and an additional fuselage fuel tank. GPS is being retrofitted.

### T-3 Firefly

**Brief:** A propeller-driven aircraft that was used by the Air Force to screen pilot candidates.

**Function:** Primary screener.

**Operator:** AETC.  
**First Flight:** July 4, 1993.  
**Delivered:** Feb. 25, 1994–January 1996.

**IOC:** March 1994.

**Production:** 113.

**Inventory:** 110.

**Unit Location:** not applicable

**Contractor:** Slingsby; Northrop.

**Power Plant:** Textron Lycoming AEIO-540-D4A5 engine, 260 hp.

**Accommodation:** two, side by side.

**Dimensions:** span 34 ft 9 in, length 24 ft 9 in, height 7 ft 9 in.

**Weight:** empty 1,780 lb, gross 2,550 lb.

**Ceiling:** 19,000 ft.

**Performance:** max level speed 155 mph, range with max fuel, 65 percent power at 8,000 ft 469 miles.

#### COMMENTARY

**T-3A.** Selected in April 1992 to replace the T-41



T-1 Jayhawk (Ted Carlson)



T-6A Texan II (Ted Carlson)



T-37 Tweet (Guy Aceto)



T-38 Talon (Guy Aceto)

Mescalero, the fully aerobatic T-3A was used from March 1994 by AETC at Hondo Airport, Texas, and from January 1995 by the US Air Force Academy to screen prospective pilots prior to SUPT. However, USAF suspended operations in the T-3 in July 1997 to determine the cause of several unplanned engine stoppages that led to the deaths of three students and three instructors over a three-year period. On Oct. 9, 1999, the Air Force announced that it was permanently grounding its T-3As. Divestiture options are under consideration.

### T-6A Texan II

**Brief:** A single-engine turboprop aircraft that will be 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 (USAF), USN.

**First Flight:** July 15, 1998.

**Delivery:** from FY00 (planned).

**IOC:** FY01 (planned).

**Production:** USAF 372, USN 339 (planned).

**Inventory:** one.

**Unit Location:** USAF: Columbus AFB, Miss., Laughlin, Randolph, and Sheppard AFBs, Texas, Moody AFB, Ga., Vance AFB, Okla. Navy: NAS Corpus Christi, Texas, NAS Whiting and Pensacola, 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 ft 4 in, length 33 ft 3 in, height 10 ft 6 in.

**Weight:** empty (approx) 4,900 lb; gross 6,500 lb.

**Ceiling:** 31,000 ft.

**Performance:** max speed 368 mph.

#### COMMENTARY

Winner of the Joint Primary Aircraft Training System (JPATS) competition, Raytheon's Beech/Pilatus PC-9 Mk II is based on the Swiss Pilatus PC-9 aircraft, modified to include a strengthened fuselage, upgraded engine, more fuel, pressurized cockpit, larger, bird-resistant canopy, and new digital avionics. The JPATS will replace USAF's T-37Bs and USN's T-34Cs and their associated ground-based training systems.

### 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:** from December 1956.

**IOC:** 1957.

**Production:** 985.

**Inventory:** 417.

**Unit Location:** Columbus AFB, Miss., Laughlin, Randolph, and Sheppard AFBs, Texas, 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 ft 8 in, length 29 ft 3 in, height 9 ft 2 in.

**Weight:** empty 3,870 lb, gross 6,625 lb.

**Ceiling:** 35,000 ft.

**Performance:** max speed at 25,000 ft 426 mph, range at 360 mph with standard tankage 870 miles.

#### COMMENTARY

USAF's first purpose-built jet trainer, the T-37 currently is 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 will replace the T-37B with the new T-6A Texan II.

### 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:** 509.

**Unit Location:** Beale and Edwards AFBs, Calif., Columbus AFB, Miss., Eglin AFB, Fla., Holloman AFB, N.M., Laughlin, Randolph, and Sheppard AFBs, Texas, Moody AFB, Ga., Vance AFB, Okla., Whiteman AFB, Mo.

**Contractor:** Northrop.

**Power Plant:** two General Electric J85-GE-5A turbojets, each 2,680 lb thrust dry, 3,850 lb thrust with afterburning.

**Accommodation:** two, in tandem, on ejection seats.

**Dimensions:** span 25 ft 3 in, length 46 ft 4 in, height 12 ft 10 in.

**Weight:** empty 7,164 lb, gross 12,093 lb.

**Ceiling:** above 55,000 ft.

**Performance:** max level speed at 36,000 ft more than Mach 1.23 (812 mph), range, with reserves, 1,093 miles.

#### COMMENTARY

Most of the T-38s in service are used by AETC for advanced student training. Capabilities are being enhanced through an ongoing program of modifications and structural renewal, including a full avionics upgrade and integrated GPS/INS. As a result, coupled with the reduction in the T-38's workload through introduction of the T-1A, the service life of the T-38s should extend to 2020.

**T-38A.** Almost identical 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 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 (IFF).

**T-38C.** All T-38A and AT-38B airframes will be redesignated as C models upon modification of the avionics systems.

#### T-43

**Brief:** A medium-range, swept-wing jet aircraft equipped with modern 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:** 11.

**Unit Location:** Randolph AFB, Texas.

**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 at 35,000 ft 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 the most advanced USAF operational aircraft of that time, including celestial, radar, and inertial navigation systems, a Long-Range Aid to Navigation (LORAN) system, and other radio systems. All remaining aircraft are in the AETC inventory.

#### UV-18 Twin Otter

**Brief:** Modified utility transport used for parachute jump training.

**Function:** Paratroop.

**Operator:** AETC.

**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 ft 9 in, height 19 ft 6 in.

**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 the US Air Force Academy.



T-43 (Guy Aceto)



UV-18 Twin Otter (Ted Carlson)

## Helicopters

#### HH/MH-60G Pave Hawk

**Brief:** Specially outfitted heavy-lift helicopters used by Air Force Special Operations Forces for infiltration and exfiltrations as well as combat search-and-rescue missions.

**Function:** SOF heavy-lift helicopter.

**Operator:** ACC, AETC, PACAF, ANG, AFRC.

**First Flight:** October 1974.

**Delivered:** 1982–present.

**IOC:** circa 1982.

**Production:** 102.

**Inventory:** 99.

**Unit Location:** HH-60G at Eglin AFB, Fla., Holloman AFB, N.M., Kadena AB, Japan, Kirtland AFB, N.M., Moody AFB, Ga., NAS Keflavik, Iceland, Nellis AFB, Nev. ANG: Francis S. Gabreski IAP, N.Y., Kulis ANGB, Alaska, Moffett Federal Airfield, Calif. AFRC: Davis-



HH-60G Pave Hawk (Ted Carlson)



MH-53M Pave Low IV (TSgt. Cary Humphries)

Monahan AFB, Ariz., Patrick AFB, Fla., Portland IAP, 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 ft 7 in, length of fuselage 64 ft 8 in, height 16 ft 8 in.

**Weight:** empty 12,330 lb, max gross 22,500 lb.

**Ceiling:** 14,200 ft.

**Performance:** max speed 222 mph, max range, with reserves, 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

Ninety-eight Black Hawk helicopters were modified to HH-60G Pave Hawk configuration, with aerial refueling capability and internal auxiliary fuel. Configuration varies between aircraft, but both versions are equipped with an integrated navigation system using GPS, INS, and Doppler, with input to a flight path–vectored FLIR. Both have unsecure VHF and secure FM, HF, UHF, and satellite communications.

Further modifications include an integral rescue hoist and an External Stores Support System (ESSS) for weapons and additional fuel. Pave Hawk capabilities permit rapid-response, long-range/loiter mission profiles requiring a broad scale of payload possibilities.

**HH-60G.** Used by active duty, ANG, and AFRC air rescue units for combat search-and-rescue and various mission-support activities worldwide. Planned upgrades include a revised communications, navigation, and integrated EW combat search-and-rescue capability.

**MH-60G.** Until recently operated by AFSOC's 16th SOW, these aircraft were transferred to ACC units.

#### MH-53 Pave Low

**Brief:** Specially outfitted heavy-lift helicopters used by Air Force Special Operations Forces for infiltration as well as combat search-and-rescue 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:** 44.

**Unit Location:** AETC: Kirtland AFB, N.M. AFSOC: Osan AB, South Korea, RAF Mildenhall, UK.

**Contractor:** Sikorsky.

**Power Plant:** two General Electric T64-GE-100 turboshafts, each 4,330 shp.

**Accommodation:** crew of six; 38 troops.

**Dimensions:** rotor diameter 72 ft 3 in, length of fuselage (without refueling probe) 67 ft 2 in, 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.** Enhanced version equipped with a nose-mounted FLIR, an integrated digital avionics suite that includes terrain-following and terrain-avoidance radar, GPS, INS, Doppler, secure communications,





**UH-1N Iroquois** (Guy Aceto)

armor plating, and an ECM suite with radar and IR missile jammers, flare/chaff dispensers, radar warning receivers, and missile launch detectors.

**MH-53M.** MH-53J helicopters upgraded to Pave Low IV standard, delivered from 1999. Modifications include the capacity to integrate on-board EW systems with off-board, over-the-horizon intelligence, and an upgraded weapons systems computer. A Service Life Extension Program (SLEP) upgraded the aircraft's hydraulics, wiring, and basic airframe structure for increased gross weight, and a shipboard fold/compatibility modification has been undertaken.

**TH-53A.** Six TH-53As (modified USMC CH-53As) are used by the 58th SOW as basic qualification trainers. Modifications include the installation of General Electric T64-GE-100 engines, air refueling probe, and some standard USAF equipment.

#### **UH-1 Iroquois**

**Brief:** Modified Bell helicopter used to support Air Force ICBM facilities and for administrative airlift.

**Function:** Utility helicopter.

**Operator:** AETC, AFSOC, AFSPC, AMC, PACAF.

**First Flight:** circa 1956.

**Delivered:** from September 1970.

**IOC:** circa 1970.

**Production:** 79.

**Inventory:** 63.

**Unit Location:** Andrews AFB, Md., Fairchild AFB, Wash., F.E. Warren AFB, Wyo., Hurlburt Field, Fla., Kirtland AFB, N.M., Malmstrom AFB, Mont., Minot AFB, N.D., 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 ft 2 in, fuselage length 42 ft 4 in, height 14 ft 4 in.

**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 remain in the inventory for missile site support duties with AFSPC and for administrative 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.

## **Strategic Missiles**

#### **AGM-86 Air Launched Cruise Missile**

**Brief:** A small, subsonic, unmanned, winged air vehicle, currently 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 (FSD).

**Delivered:** from 1981.

**IOC:** December 1982, Griffiss AFB, N.Y.

**Production:** 1,700+.

**Inventory:** 1,600.

**Unit Location:** Barksdale AFB, La., Minot AFB, N.D.



**AGM-129** (Guy Aceto)

**Contractor:** Boeing.

**Power Plant:** Williams/Teledyne CAE F107-WR-10 turbofan, 600 lb thrust.

**Guidance:** AGM-86B: inertial plus 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 ft 9 in, body diameter 2 ft, wingspan 12 ft.

**Weight:** 3,200 lb.

**Performance (approx):** speed Mach 0.6, range 1,555 miles.

#### **COMMENTARY**

**AGM-86A.** A prototype cruise missile, developed in the mid-1970s. Slightly smaller than the later versions, it never entered production.

**AGM-B.** First production version, the B is programmed for precision attack on surface targets. When launched in large numbers, its ability to dilute enemy defenses improves the capability of manned aircraft to penetrate to major 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.

**AGM-86C.** A non-nuclear version, developed from 1986, the Conventional Air Launched Cruise Missile (CALCM) was first used operationally during the Persian Gulf War and has since been widely used in combat. Boeing is currently under contract to convert 322 Bs to conventional configuration, the first of which was delivered November 1999.

**AGM-86D.** The last 50 of the 322 CALCM conversions will be to AGM-86D standard, with a Lockheed Martin AUP-3(M) hard target penetrating warhead. Final delivery expected mid-2001.

#### **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.

**Inventory:** not available

**Unit Location:** Barksdale AFB, La., Minot AFB, N.D.

**Contractor:** General Dynamics/McDonnell Douglas (now Boeing).

**Power Plant:** Williams International F112-WR-100 turbofan.

**Guidance:** inertial, with TERCOM update.

**Warhead:** W80-1 nuclear.

**Dimensions:** length 20 ft 10 in, body width 2 ft 3 in, wingspan 10 ft 2 in.

**Weight:** 3,709 lb.

**Performance (approx):** range 1,865 miles.

#### **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 awarded a contract in 1987 for technology transfer leading to second-source capability for this advanced system, which is deployed on B-52H aircraft.

#### **LGM-30 Minuteman**

**Brief:** A solid-fuel, intercontinental-range ballistic missile 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 ft 10 in, diameter of first stage 5 ft 6 in.

**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 7,000 miles.



**AGM-86C** (SSgt. Jim Howard)



## COMMENTARY

Minuteman continues to play a key role in the US strategic deterrent posture. It is a three-stage, solid-propellant ICBM, housed in underground silos for which an upgrade program was completed in 1980 to provide increased launch-facility protection.

**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 current version, 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 deployed 550 in 10 squadrons.

A single re-entry vehicle configuration has been demonstrated, and planned for, in accordance with strategic arms control negotiations. A total of 500 Minuteman IIIs will be based at Minot AFB, N.D.; F.E. Warren AFB, Wyo.; and Malmstrom AFB, when START II is ratified.

All 150 missiles that were at Grand Forks AFB have been transferred to Malmstrom AFB and emplaced in converted MM II silos.

An extensive life extension program is ensuring Minuteman's continuing viability. Major upgrades include refurbishment of liquid propulsion post-boost rocket engine, remanufacture of the solid-propellant rocket motors, replacement of standby power systems, repair of launch facilities, and installation of updated, survivable communications equipment and new command-and-control consoles to enhance immediate communications. USAF also plans to modify Minuteman IIIs to accept the warheads taken from deactivated Peacekeeper missiles following implementation of the START II treaty.

### LGM-118 Peacekeeper

**Brief:** A solid-fuel intercontinental-range ballistic missile 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:** 50.

**Unit Location:** F.E. Warren AFB, Wyo.

**Contractor:** Martin Marietta.

**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 ft 8 in.

**Weight:** approx 195,000 lb.

### COMMENTARY

**LGM-118A.** Developed initially in response to an increased Soviet strategic threat, the ending of the Cold War caused the US to cap deployment at only 50 Peacekeeper missiles in the FY90 budget and to cease development of a rail-garrison mode of deployment.

Housed in former Minuteman III silos, Peacekeeper is a four-stage ICBM that carries up to 10 independently targetable re-entry vehicles. It is more accurate, carries more warheads, and has greater 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. Peacekeeper will be scheduled for retirement under the provisions of the START II treaty; however no retirement action will occur until its terms come into force.



LGM-30G



LGM-118A

**Delivered:** from 1956.

**IOC:** April 1976 (AIM-7F).

**Production:** not available

**Inventory:** classified.

**Contractor:** Raytheon/Hughes; General Dynamics.

**Power Plant:** Hercules Mk 58 Mod 0 boost–sustain rocket motor.

**Guidance:** AIM-7M: monopulse semi-active radar.

**Warhead:** high-explosive, blast fragmentation, weighing 86 lb.

**Dimensions:** length 12 ft, body diameter 8 in, wing-span 3 ft 4 in.

**Weight:** launch weight 504 lb.

**Performance (estimated):** max speed more than Mach 3.5, range more than 30 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 in 1975, 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 service.

**AIM-7M** is a monopulse version of Sparrow, aimed at reducing cost and improving performance in the ECM and look-down clutter regions. It began opera-

tional service in FY83. This version equips USAF F-15s and remaining F-16s (ADF).

**AIM-7R** is designed to improve missile performance against sophisticated ECM by means of a new infrared (IR) seeker added to the guidance and control section, incorporated in a multimode seeker.

AIM-7s and AIM-9s (see below) equipped with telemetry packages in place of warheads are used in a program initiated by the USAF Air Warfare Center and linked with industry, to develop passive missile-warning systems for USAF tactical aircraft.

### AIM-9 Sidewinder

**Brief:** A supersonic, short-range, heat-seeking air-to-air missile carried by fighter aircraft, having a high-explosive warhead and a passive infrared guidance system.

**Function:** Air-to-air missile.

**First Flight:** September 1953.

**Delivered:** 1983–98 (AIM-9M current operational variant).

**IOC:** circa 1983 (AIM-9M).

**Production:** not available

**Inventory:** not available

**Contractor:** Raytheon/Loral.

**Power Plant:** Thiokol Mk 36 Mod 11 solid-propellant rocket motor.

**Guidance:** solid-state passive IR homing guidance.

**Warhead:** high-explosive, weighing 20.8 lb.

**Dimensions:** length 9 ft 5 in, body diameter 5 in, fin-span 2 ft 1 in.

**Weight:** launch weight 190 lb.

**Performance:** max speed above 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** is an improved version of AIM-9L with all-aspect intercept capability. 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 with an order for approximately 1,280 missiles.

**AIM-9M-9.** A modification to improve IRCCM capability of early missiles.

**AIM-9X** provides the next step in the continuing evolution of the AIM-9 infrared family of short-range air-to-air missiles. This joint Navy and Air Force program was derived from a jointly funded demonstration and validation contract. The current 60-month EMD contract was awarded to Hughes (now Raytheon) in December 1996. AIM-9X is in developmental flight test phase of EMD and successfully completed its fourth guided firing, directly hitting a target drone March 31.

The AIM-9X incorporates new technologies such as a focal plane array imaging seeker, high off-boresight sensor, 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 Joint Helmet Mounted Cueing System to maximize its high off-boresight capability. It will be employed on F-15, F-16, F-22, and potentially JSF aircraft.

### AIM-120 AMRAAM

**Brief:** A new-generation radar-guided, all-weather,

## Tactical Missiles and Weapons

### AIM-7 Sparrow

**Brief:** A 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).



AIM-7 Sparrow (Guy Aceto)





**AIM-9 Sidewinder (top), AIM-120 AMRAAM (bottom)** (Guy Aceto)

beyond-visual-range air-to-air missile carried by fighters, with high capability to attack low-altitude targets. Pilot may aim and fire several Advanced Medium-Range Air-to-Air Missiles simultaneously at multiple targets and perform evasive maneuvers.

**Function:** Air-to-air guided missile.

**First Flight:** December 1984.

**Delivered:** 1988–present.

**IOC:** September 1991.

**Production:** more than 12,000 planned for USAF/USN.

**Inventory:** classified.

**Contractor:** Raytheon.

**Power Plant:** Alliant boost-sustain solid-propellant rocket motor.

**Guidance:** inertial and 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 ft 1 in.

**Weight:** 335 lb.

**Performance:** cruising speed approx Mach 4, range more than 20 miles.

#### COMMENTARY

A replacement for the AIM-7 Sparrow, the AIM-120 AMRAAM equips USAF's F-15, F-16, and F-22 fighters. (The F-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 (EP) capability, increased maximum launch range, a reduced-smoke motor, and improved maintenance and handling.

**AIM-120A.** First production AIM-120A, delivered by Hughes in 1988 to the 33rd TFW at Eglin AFB, Fla.

**AIM-120B/C** are upgraded variants of the AIM-120 and are reprogrammable. The AIM-120C currently in production has smaller, clipped control surfaces to provide for internal carriage capability in the F-22.

#### AGM-65 Maverick

**Brief:** A tactical, TV- or IIR-guided air-to-surface missile carried by fighters and designed for use in close air support, 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:** not available

**Inventory:** classified.

**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 ft 2 in, body diameter 1 ft, wingspan 2 ft 4 in.

**Weight:** launch weight (AGM-65A) 462 lb, (AGM-65G) 677 lb.

**Performance:** range 0.6 to 14 miles.

#### COMMENTARY

Maverick missiles were first employed by USAF in Vietnam and were used extensively during the Per-



**AGM-88 HARM** (Guy Aceto)



**AGM-65 Maverick** (Guy Aceto)

sian Gulf War. 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 TV Maverick, which can be used only in daylight and clear-weather conditions. This version has an Imaging-Infrared (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 with significant reliability, maintainability, and performance improvements over the AGM-65B seeker.

**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 all-weather, over-the-horizon, anti-ship

missile system, carried by bombers, with a low-level, sea-skimming cruise trajectory, active radar guidance, and high-explosive warhead. Used for attack on warships.

**Function:** Air-to-surface anti-ship missile.

**First Flight:** March 1974 (for USN).

**Delivered:** from 1977 (USN).

**IOC:** circa 1985 (USAF).

**Production:** USAF none.

**Inventory:** classified.

**Contractor:** McDonnell Douglas (now Boeing).

**Power Plant:** Teledyne CAE J402-CA-400 turbojet, 660 lb thrust.

**Guidance:** sea-skimming cruise monitored by radar altimeter, active radar terminal homing.

**Warhead:** penetration high-explosive blast type, weighing 488 lb.

**Dimensions:** length 12 ft 7 in, body diameter 1 ft 1 in, wingspan 3 ft.

**Weight:** 1,145 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 anti-surface operations, the Harpoon all-weather anti-ship missile now 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 anti-radiation missile.

**First Flight:** April 1979.

**Delivered:** 1982–98.

**IOC:** circa 1984.

**Production:** not available

**Inventory:** classified.

**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 ft 8.5 in, body diameter 10 in, wingspan 3 ft 8.5 in.

**Weight:** 807 lb.

**Performance:** cruising speed supersonic, altitude limits S/L to 40,000 ft, range more than 10 miles.

#### COMMENTARY

This 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 Persian Gulf War and continues to be used in current operations. HARMs now equip F-16 Block 50/52s 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.** USAF is updating older AGM-88Bs with the new, 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 USAF, PACAF, and ACC HARMs, permitting changes to missile memory in the field. Current 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 upgrades under development will introduce 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–present.

**IOC:** 1994.



**Production:** approx 600.  
**Inventory:** classified.  
**Contractor:** Boeing.  
**Guidance:** TV or IIR seeker, or DME transponder.  
**Warhead:** Mk 84 bomb (2,000-lb unitary), BLU-109.  
**Dimensions:** length 12 ft 10 in, body diameter 1 ft 6 in, wingspan 4 ft 11 in.  
**Weight:** launch weight 2,917 lb.  
**Performance:** cruising speed subsonic, ceiling in excess of 30,000 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 Iraq and the Balkans.

**AGM-130A.** Currently in production with a Mk 84 warhead.

**AGM-130C.** Currently in production with a 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 a conventional precision strike capability.

**Function:** Air-to-surface guided missile.

**First Flight:** 1990.

**Delivered:** 1992.

**IOC:** June 1992.

**Production:** approx 250.

**Inventory:** classified.

**Contractor:** Rafael (Israel).

**Power Plant:** solid-propellant rocket motor.

**Guidance:** inertial, with data link, TV, or IIR homing.

**Warhead:** high-explosive, 750-lb-class blast/fragmentation or penetrator.

**Dimensions:** length 15 ft 11 in, body diameter 1 ft 9 in, wingspan 5 ft 9 in.

**Weight:** 2,998 lb.

**Performance:** range approx 50 miles.

#### COMMENTARY

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:** from 2000.

**IOC:** 2000 (USAF).

**Production:** 6,000.

**Inventory:** TBD

**Contractor:** Raytheon.

**Guidance:** INS/GPS.

**Dimensions:** length 13 ft 4 in.

**Weight:** 1,065 lb.

**Performance:** range: low-altitude launch 17 miles, high-altitude launch 40+ miles.

#### COMMENTARY

Long-range, INS/GPS-guided, standoff air-to-ground weapon designed to attack a variety of soft and armored area targets 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 standoff 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 threshold on F-16 Block 50 aircraft and objective on B-1B, F-15E, and F-16 Block 30/40.

**AGM-154A.** The baseline BLU-97 variant for use against area targets; now in full-rate production.

**AGM-154B.** The BLU-108 variant providing anti-armor capability; began production in FY99.

**AGM-154C.** The third variant (used by Navy only), JSOW/Unitary integrates an IIR terminal seeker and a 500-lb unitary warhead.

#### CBU-97 Sensor Fuzed Weapon

**Brief:** The CBU-97 SFW is an anti-armor cluster munition to be used by fighters and bombers for multiple kills per pass.

**Function:** Wide-area cluster munition.

**First Flight:** circa 1990.

**Delivered:** from 1994.

**IOC:** 1997.

**Production:** 5,000.

**Inventory:** TBD

**Contractor:** Textron Systems.

**Guidance:** IR sensors in each warhead search for

targets, then detonate over them.

**Dimensions:** length 92 in; diameter 16 in.

**Weight:** 927 lb.

**Performance:** delivers 40 lethal projectiles.

#### COMMENTARY

The CBU-97 Sensor Fuzed Weapon comprises an SUU-66/B tactical munitions dispenser with an FZU-39 fuze. Each tactical munitions dispenser contains 10 BLU-108/B submunitions, and each submunition contains four projectiles that, upon being thrown out, seek out their target and deliver a warhead. Each SFW can deliver a total of 40 lethal projectiles. The projectiles' IR sensors can detect a vehicle's infrared signature; if no target is detected, the warhead detonates after a preset time.

The SFW is currently delivered as an unguided gravity weapon from the B-1, B-2, B-52H, F-15E, and F-16. The Air Force is completing development of an improved version, leading to reduced cost and increased capability. Among ongoing changes, the service is adding a laser range finder to enable the SFW to detect targets based on height as well as IR signature, a multimission warhead for softer targets, and is increasing the footprint.

**CBU-105.** USAF plans to retrofit its inventory of SFWs with the Wind-Corrected Munitions Dispenser tail kit. The WCMD will improve the munitions delivery accuracy when released from medium to high altitude.



AGM-130 (TSgt. Mike Amons)



AGM-142 Have Nap (TSgt. Mike Amons)



AGM-154 JSOW (Guy Aceto)



CBU-97 (SrA. Jeff Fitch)



GBU-15 (Guy Aceto)

#### GBU-24

**Brief:** A precise air-to-ground penetrating glide bomb equipped with an advanced guidance kit.

**Function:** Air-to-surface guided 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:** semi-active laser.

**Dimensions:** length 14 ft 2 in.

**Weight:** 2,350 lb.

#### COMMENTARY

GBU-24A/B. This is an air-to-ground weapon equipped



with a third-generation Laser-Guided Bomb guidance kit, called Paveway III, 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 adapts to conditions of release, flies an appropriate midcourse, and provides trajectory shaping for enhanced warhead effectiveness. The weapon is deployed on the F-15E and F-16. The GBU-24A/B was highly successful in the Persian Gulf War and is in production for foreign military sales.

#### GBU-27

**Brief:** A precise air-to-ground penetrating glide bomb equipped with an advanced guidance kit.

**Function:** Air-to-surface guided bomb.

**First Flight:** not available

**Delivered:** from 1988.

**IOC:** 1988 (unconfirmed).

**Production:** not available

**Inventory:** classified.

**Contractor:** Lockheed Martin.

**Guidance:** semi-active laser.

**Dimensions:** span 5 ft 6 in, length 13 ft 11 in.

**Weight:** 2,170 lb.



GBU-24 (Guy Aceto)



GBU-27 (SSgt. Michael Rivera)



GBU-28 (SrA. Jeffrey Allen)

#### 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 the Persian Gulf War.

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 FY99.

#### GBU-28

**Brief:** A large 5,000-lb-class air-to-ground penetrating glide bomb equipped with an advanced laser guidance kit, used for striking and destroying hard underground targets.

**Function:** Air-to-surface guided bomb.

**First Flight:** February 1991.

**Delivered:** circa 1991.

**IOC:** 1991.

**Production:** not available

**Inventory:** classified.

**Contractor:** Raytheon.

**Dimensions:** length 19 ft 2 in, diameter 1 ft 2 in.

**Weight:** 4,676 lb.

**Performance:** classified.

#### COMMENTARY

Under USAF's rapid-response program, a new bunker-busting weapon was developed for Desert Storm for use against deeply buried, hardened command-and-control facilities. Four of the laser-guided GBU-28 weapons were used in 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.



GBU-31 JDAM (Guy Aceto)



Joint Air-to-Surface Standoff Missile  
(TSgt. Mike Ammons)

EGBU-28. Integrates GPS/INS guidance into the existing GBU-28 laser seeker to provide adverse weather capability and improved target location. Entered production in FY98.

#### GBU-31/32 Joint Direct Attack Munition

**Brief:** A joint USAF/Navy INS/GPS-guided 1,000- or 2,000-lb 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:** 1997-present.

**IOC:** 1998.

**Production:** USAF 62,000; USN 25,496 (planned).

**Inventory:** not available

**Contractor:** Boeing.

**Dimensions:** Mk 84 with JDAM 152.7 in; BLU-109 with JDAM 148.6 in; Mk 83 with JDAM 119.5 in.

**Weight:** Mk 84 2,036/2,056 (USAF/USN); BLU-109 2,115/2,135; Mk 83 1,013/1,028.

**Performance:** 42.9 ft CEP with GPS; 99 ft CEP with INS only.

#### COMMENTARY

JDAM is designed to provide USAF and USN with highly accurate, autonomous, all-weather, conventional bombing capability. While still aboard the launch aircraft, JDAM can be continually updated with target information through the aircraft's avionics system. Once released, the inertial guidance kit will take over and, with periodic GPS updates to the INS, will guide the weapon to its target. JDAM is intended for use on a variety of aircraft, including the B-1, B-2, B-52, F-15E, F-16, F-22, F-117A, F/A-18, and AV-8B.

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. Under development.

#### Joint Air-to-Surface Standoff Missile

**Brief:** An advanced weapon designed to be able to attack heavily defended targets with high precision at great standoff range.

**Function:** Air-to-surface guided weapon.

**First Flight:** April 8, 1999

**Delivered:** TBD

**IOC:** FY03 (planned).

**Production:** 2,400 (USAF planned); TBD (Navy).

**Inventory:** TBD

**Contractor:** Lockheed Martin.

**Power Plant:** Teledyne Continental Motors.

**Dimensions:** 14 ft.

**Weight:** 2,250 lb.

**Performance:** 1,000-lb class warhead (both versions).

#### COMMENTARY

JASSM is intended to be a precision, long-range weapon to hold high-value targets at risk. The missile will use an IR seeker for terminal guidance, with GPS/INS for midcourse and back-up terminal guidance. Engineering and Manufacturing Development program commenced November 1998. DoD plans to use JASSM on threshold aircraft B-52H and F-16. Objective aircraft include B-1B, B-2, F/A-18E/F, F-15E, F-117, and P-3C.

#### 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:** FY00 (planned).

**IOC:** FY00 (planned).

**Production:** 40,000 (planned).

**Inventory:** TBD

**Contractor:** Lockheed Martin.

**Dimensions:** length 17 in, diameter 15 in.

**Weight:** 100 lb.

**Performance:** range, about eight miles.

#### COMMENTARY

USAF plans to modify 40,000 standard tactical munition dispensers with guidance kits to compensate for wind drift on downward flight from high altitudes. WCMD kits will each have an INS guidance unit, movable tail fins that pop out in flight, and a signal processor. A WCMD tail kit will be fitted on dispensers that will carry mines, cluster bomblets, or anti-armor submunitions. Successful flight testing began in February 1996. DoD plans to integrate WCMD on threshold aircraft B-52 and F-16. Objective aircraft: B-1, F-15E, F-22, and F-117.

#### FIM-92 Stinger

**Brief:** A man-portable Surface-to-Air Missile designed to defend airfields against low-flying attacking aircraft.

**Function:** Surface-to-air missile.



**First Flight:** August 1973.  
**Delivered:** from 1980.  
**IOC:** 1984 (USAF).  
**Production:** not available  
**Inventory:** not available  
**Contractor:** Raytheon (Hughes).  
**Power Plant:** solid-propellant rocket motor.  
**Guidance:** IR homing guidance.  
**Warhead:** high-explosive blast fragmentation, weighing 6.6 lb.

**Dimensions:** length 5 ft, body diameter 2.7 in, wing-span 5.5 in.

**Weight:** launch weight 35.2 lb.

**Performance:** range 1.86 miles.

#### COMMENTARY

First developed as a man-portable, tube-launched SAM for the US Army, Stinger has been employed since 1984 by air personnel in South Korea to provide base defense against high-speed, low-level ground-attack aircraft.

#### Rapier

**Brief:** A 24-hour, highly mobile SAM unit designed to defend airfields against high-speed, low-level air threats.  
**Function:** Surface-to-air missile.

**First Flight:** 1986.

**Delivered:** 1986.

**IOC:** circa 1986.

**Production:** 32.

**Inventory:** 32.

**Contractor:** British Aerospace (now Mahr BAe Dynamics).

**Power Plant:** IMI two-stage solid-propellant rocket motor.

**Guidance:** surveillance radar and command to line-of-sight guidance. Optional Blindfire radar or optical target tracking, depending on conditions.

**Warhead:** semi-armor-piercing, with impact fuze.

**Dimensions:** length 7 ft 4 in, body diameter 5 in, wingspan 1 ft 3 in.

**Weight:** approx 94 lb.

**Performance:** max speed more than Mach 2, range 4 miles.

#### COMMENTARY

British-built Rapier missile systems, deployed previously to protect USAF bases in the UK and Turkey, have mostly been returned to the US and redeployed to the services. Under a similar agreement, the government of Turkey operates 14 US-owned fire units for the defense of US air bases in that country.

## Launch Vehicles

#### Atlas

**Brief:** An expendable, medium-lift launch vehicle whose primary mission is the launch into space of the Defense Satellite Communications System (DSCS) satellite and other national missions.

**Function:** Medium expendable spacelift vehicle.

**Operator:** commercial (AFSPC oversight).

**First Launch:** December 1957; Feb. 10, 1992 (Atlas IIA); December 1993 (Atlas IIA); FY00 (Atlas III).

**IOC:** September 1959.

**Launches Scheduled:** two (FY00); three (FY01).

**Unit Location:** Cape Canaveral AFS, Fla., Vandenberg AFB, Calif.

**Contractor:** Lockheed Martin.

**Power Plant:** Atlas II: uprated Rocketdyne MA-5 propulsion system in Atlas stage, comprising central sustainer motor and two boosters; total thrust 490,000 lb. Atlas IIA version adds four Thiokol Castor IVA solid rocket motors, providing an average thrust of 112,000 lb. Atlas III: two-chamber RD-180 built by NPO Energomash of Russia. The RD-180 is a throttleable engine fed by liquid oxygen and kerosene propellants, providing a total sea-level rated thrust of 860,200 lb. Atlas IIA uses a Centaur upper stage in the single-engine (RL10A-4-1) configuration; Atlas IIB uses a stretched Centaur stage powered by either one or two RL10A-4-2 engines.

**Dimensions:** Atlas IIA/IIAS: length 81 ft 7 in, max body diameter 10 ft. Atlas IIIA: length 170 ft. 2 in., diameter 10 ft., with standard 14-ft-diameter payload fairing; Atlas IIB: length 174 ft 2 in with large payload fairing.

**Launch Weight:** 408,800 lb (Atlas IIA); 486,500 lb (Atlas IIIA).

**Performance:** Atlas IIA capable of putting 19,050 lb into a Low Earth Orbit (LEO) from Cape Canaveral AFS, Fla. Range of payloads Atlas II through Atlas IIA can lift into Geosynchronous Transfer Orbit (GTO) from Cape Canaveral is 4,900–8,150 lb and 13,650–15,900 lb to LEO from Vandenberg AFB. Atlas IIIA will be able to lift up to 9,920 lb into GTO from Cape Canaveral.

#### COMMENTARY

Early Atlas launchers were refurbished Atlas ICBMs

used from December 1957 to launch military payloads into space. Versions include Atlas D/E/F and SLV-3A and 3D with longer tanks and increased engine thrust, compatible, respectively, with the Agena and Centaur upper stages.

**Atlas II.** Upgraded version of the Atlas Centaur vehicle developed to meet USAF's continuing Medium-Launch Vehicle (MLV II) requirement. The familiar stage-and-a-half configuration of the original ICBM is retained. Changes include lower-cost advanced avionics, an improved flight computer, booster engines with greater thrust, and longer propellant tanks. The engine and tank changes were made to both the Atlas and Centaur stages.

The Atlas IIAS is essentially the same booster as the IIA but adds four Thiokol Castor IVA solid rocket motors.

The first Atlas II DSCS launch took place from Cape Canaveral AFS, Fla., in February 1992; first Atlas II Centaur configuration was launched in January 1995.

**Atlas III.** Version which includes a new Russian-designed and built single-stage Atlas RD-180 engine, additional lengthening of the Atlas booster, a single-engine Centaur upper stage for the Atlas IIA, and a dual engine, stretched Centaur for the upcoming IIB. The first Atlas IIIA flight is scheduled for mid-2000.

**Atlas V.** See EELV below.

#### Centaur

**Brief:** A high-energy upper stage with multiburn and extended coast capability.

**Function:** High-energy upper stage.

**Operator:** commercial (AFSPC oversight).

**First Launch:** November 1963; earlier flight in May 1962 unsuccessful.

**IOC:** 1968.

**Launches Scheduled:** one (FY00); one (FY01).

**Unit Location:** Cape Canaveral AFS, Fla., Vandenberg AFB, Calif.

**Contractor:** Lockheed Martin.

**Power Plant:** for Atlas IIA/AS configuration, two Pratt & Whitney RL10A-4-1 liquid oxygen/liquid hydrogen rocket engines, each 22,300 lb thrust; for Atlas IIIA, one RL10A-4-1 engine; for Atlas IIB, one or two RL10A-4-2 engines, each 22,300 lb thrust; G-prime: two RL10A-3-3A engines, each with 16,500 lb thrust.

**Dimensions:** for Atlas IIA/AS/IIIA, length 33 ft, diameter 10 ft; for Atlas IIB, length 38 ft 6 in; G-prime: length 29 ft, diameter 14 ft 2 in.

**Launch Weight:** D-2A (approx) 45,000 lb; G-prime-mod (approx) 53,000 lb.

#### COMMENTARY

Centaur was the first US high-energy upper stage and the first to use liquid hydrogen as a propellant. Its multiburn and extended coast capability were first used

operationally during the 1977 Mariner Jupiter/Saturn missions.

**D-1A.** The D-1A version used with the Atlas demonstrated wide-ranging applications and capabilities. The nose section of Atlas was modified to a constant 10-ft diameter to accommodate the Centaur, which, in turn, provided most of the electronic command-and-control systems for the launch vehicle. A 10-ft-diameter fairing protected payloads for Centaur D-1A.

**D-2A.** The D-2A, used with the current Atlas II, has been stretched 3 ft to include more propellant and thus has increased thrust. Payload fairings of either 11-ft or 14-ft diameter can be used. Centaur upper stages used in the Atlas IIIA will have a single RL10A-4-1 engine; a dual engine, stretched version is applicable to the Atlas IIB. The Centaur stage for Atlas V is virtually identical to that used on Atlas IIB.

**Centaur G-prime** modified upper stage, with high-energy cryogenic propellants and multiple restart capability, is used with the Titan IVB, creating the greatest weight-to-altitude capability of any US launch vehicle by placing a 10,200-lb payload into Geosynchronous Earth Orbit.

#### Delta

**Brief:** An expendable, medium-lift launch vehicle now used to launch Navstar Global Positioning System satellites into orbit, providing navigational data to military and civilian users, and to launch civil and commercial payloads into low Earth, polar, geo transfer, and geosynchronous orbits.

**Function:** Medium expendable spacelift vehicle.

**Operator:** commercial (AFSPC oversight).

**First Launch:** May 13, 1960; Feb. 14, 1989 (Delta II); Aug. 26, 1998 (Delta III).

**IOC:** 1989 (Delta II).

**Launches Scheduled:** three (FY00); five (FY01).

**Unit Location:** Cape Canaveral AFS, Fla., Vandenberg AFB, Calif.

**Contractor:** Boeing.

**Power Plant:** stage 1: Boeing RS-27A liquid-propellant engine, 237,000 lb thrust; stage 2: Aerojet AJ10-118K engine, 9,750 lb thrust; stage 3: Thiokol STAR-48B solid-propellant motor, 14,920 lb thrust; nine strap-on solid rocket motors, 100,270 lb thrust (sea level). Delta III stage 1: Boeing RS-27A liquid-propellant engine, 237,000 lb thrust; stage 2: Pratt & Whitney RL10B-2 engine, 20,500 lb thrust; stage 3: Thiokol Star 48B (modified).

**Dimensions:** Delta II: length 130 ft, diameter 8 ft; bulbous payload fairing, max diameter 10 ft. Delta III: length 130 ft, diameter 10 ft; payload fairing, diameter 13 ft.

**Launch Weight:** 511,190 lb.

**Performance:** Delta II: up to 11,100 lb to near Earth orbit, up to 4,010 lb to Geosynchronous Transfer Orbit (GTO), up to 2,000 lb to Geosynchronous Earth Orbit (GEO). Delta III: up to 8,930 lb to GTO; up to 18,280 lb to Low Earth Orbit (LEO).

#### COMMENTARY

**Delta I.** Delta launch vehicle family began in 1959 with a contract to Douglas Aircraft Co. (now Boeing) for the production and integration of 12 space-launch vehicles. The Delta used components from USAF's Thor intermediate-range ballistic missile as its first stage and the Navy's Vanguard launch vehicle program as its second. The first Delta was launched from Cape Canaveral and had the ability to deliver a 100-lb spacecraft into GTO.

**Delta II.** Selected by the Air Force in 1987 to launch the Navstar GPS satellites, the Delta II is slightly larger than the earlier Delta rocket, to satisfy USAF's medium-payload requirement. The first launch took place in February 1989, and 25 operational GPS satellites have been launched.

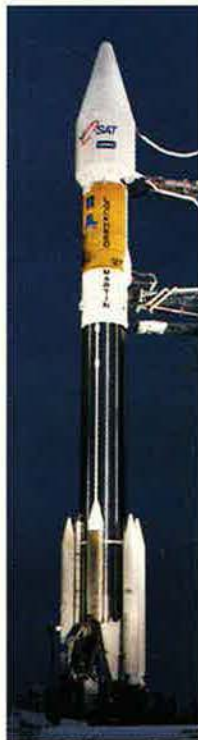
Delta II is a three-stage booster surrounded by nine solid-propellant Graphite Epoxy Motors. For LEO missions, stage 3 is typically not used. In December 1995, a newly assigned vehicle, complete with new avionics, an increased expansion ratio on three of the GEMs, and a new launch control system, successfully placed a NASA payload into orbit. Delta II will continue to support GPS into the next century by replenishing aging satellites as they fail and is supporting other DoD payloads.

**Delta III.** Developed to address the needs of the commercial market, Delta III will increase GTO capacity to 8,930 lb. Notable features include a cryogenically propelled single-engine upper stage, bigger and more powerful strap-on solid rocket motors than Delta II, and a larger composite fairing to house bigger payloads.

#### Evolved Expendable Launch Vehicle

**Brief:** EELV is USAF's spacelift modernization program to field two new families of expendable launch vehicles with an objective to reduce the cost of launch by 25 to 50 percent over current systems. Replaces current Delta II, Atlas II, Titan II, and Titan IV launch vehicles.

**Function:** Medium/heavy expendable launch vehicle.



Atlas IIAS



Atlas IIA



**Operator:** commercial (oversight AFSPC).  
**IOC:** 2003 (planned).  
**Launches Scheduled:** first government FY02.  
**Unit Location:** Cape Canaveral AFS, Fla., Vandenberg AFB, Calif.  
**Contractor:** Boeing (Delta IV) and Lockheed Martin (Atlas V).

**Power Plant:** Delta IV: Rocketdyne RS-68 (Heavy, two additional core engines), 650,000 lb thrust; stage 2 (Medium): Pratt & Whitney RL10B-2, 9,750 lb thrust. Atlas V: RD AMROSS LLC RD-180 (Heavy, two additional engines), 860,200 lb thrust; up to five strap-on solid rocket boosters; stage 2 (both) Centaur: one or two Pratt & Whitney RL10A-4s, each 22,300 lb thrust.

**Dimensions:** Delta IV: length 235 ft, diameter (Medium) 13 ft, (Heavy) 16 ft 8 in. Atlas V: length 106 ft 2 in, diameter 12 ft 6 in.

**Launch Weight:** Delta IV: 565,000–1.6 million lb. Atlas V: 734,850–1.2 million lb.

**Performance:** Delta IV: (Medium) 9,200 lb to GTO; (Heavy) 29,000 lb to GTO. Atlas V: (Medium) 18,900 lb to LEO; (Heavy) 42,000 lb to LEO.

#### COMMENTARY

Engineering and Manufacturing Development (EMD) and Initial Launch Services (ILS) contracts were awarded Oct. 16, 1998, to Boeing and Lockheed Martin. The ILS contracts cover the first 28 government EELV launches between FY02–06. Boeing has 19 of the launches and Lockheed Martin nine. The first commercial launch is scheduled for FY01. The first government medium launch is set for FY02, and the first government heavy launch is scheduled for FY03.

#### Inertial Upper Stage

**Brief:** An upper stage for use with DoD's Titan IV launcher as well as with NASA's shuttle.

**Function:** Upper stage for space launchers.

**Operator:** commercial (AFSPC oversight).

**First Launch:** October 1982.

**IOC:** circa 1982.

**Launches Scheduled:** one (FY00); one (FY01).

**Unit Location:** Cape Canaveral AFS, Fla., Vandenberg AFB, Calif.

**Contractor:** Boeing.

**Power Plant:** aft-stage solid rocket motor 41,700 lb thrust; forward-stage solid rocket motor 17,200 lb thrust.

**Guidance:** inertial.

**Dimensions:** length 17 ft, diameter 9 ft 6 in.

**Launch Weight:** 32,600 lb.

**Performance:** 5,350 lb into GEO when used on Titan IVB.

#### COMMENTARY

Serving as an upper stage for the Titan IV for DoD, as well as with the shuttle for NASA, the highly reliable IUS consists of an aft skirt, an aft-stage solid rocket motor, an interstage, a forward-stage solid rocket motor, and an equipment support structure.

#### Pegasus

**Brief:** A small winged launcher tasked to carry small payloads to LEO.

**Function:** Expendable launch vehicle.

**Operator:** commercial (AFSPC oversight for DoD payloads).

**First Launch:** April 5, 1990.

**IOC:** circa 1996 (DoD).

**Launches Scheduled:** none for DoD.

**Contractor:** Orbital Sciences/Alliant.

**Power Plant:** three solid-propellant motors developing 109,400 lb, 27,600 lb, and 7,800 lb thrust, respectively.

**Guidance:** inertial guidance.

**Dimensions:** length 49 ft, wingspan 22 ft, diameter 4 ft 2 in.

**Launch Weight:** 42,000 lb.

**Performance:** 850–1,050-lb payloads to LEO.

#### COMMENTARY

This three-stage winged vehicle was air-launched originally from a B-52. Orbital Sciences currently uses an L-1011 aircraft. Developed jointly as a private venture by Orbital and Hercules, the vehicle was under contract to the Defense Advanced Research Projects Agency (DARPA) for its initial two flights. In July 1991, it successfully placed seven minisatellites in orbit. The Air Force now manages DoD launches for the USAF space test program and the Ballistic Missile Defense Organization. The enhanced-performance Pegasus XL successfully launched a DoD payload into polar orbit March 8, 1996, following two earlier, unsuccessful launch attempts.

#### Taurus

**Brief:** A small ground-based launch vehicle for use in testing a quick-readiness, mobile launch facility.

**Function:** Expendable launch vehicle.

**Operator:** commercial (AFSPC oversight for DoD payloads).

**First Launch:** March 13, 1994.

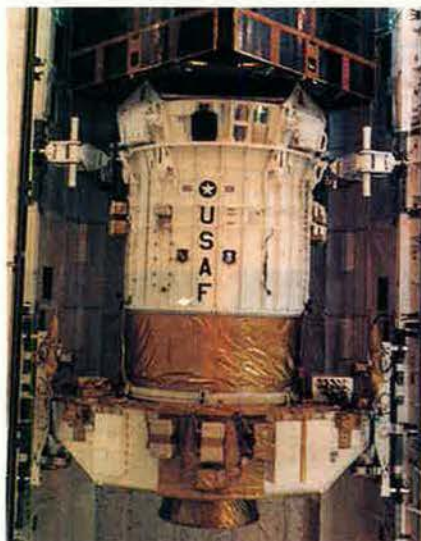
**IOC:** March 13, 1994.



Delta II



Titan IV



Inertial Upper Stage

**Launches Scheduled:** one (FY00); none (FY01).  
**Contractor:** Orbital Sciences.

**Power Plant:** four solid-propellant motors generating 495,400 lb, 109,140 lb, 26,900 lb, and 7,200 lb thrust, respectively.

**Dimensions:** length 89 ft, max body diameter 50–92 in.  
**Weight:** gross 50,000 lb.

**Performance:** capable of lifting 3,000 lb to LEO and 900 lb to GTO using a Star 37 perigee kick motor.

#### COMMENTARY

A more powerful version of the Pegasus space launch vehicle, using an LGM-118 Peacekeeper missile first-stage addition and with the Pegasus wings removed. Taurus is ground-launched from regular launch complexes. The first launch, March 13, 1994, put two USAF and DARPA satellites into a 340-mile polar orbit.

#### Titan II

**Brief:** Modified ICBM used to launch military, classified, and NASA payloads into space.

**Function:** Expendable launch vehicle.

**Operator:** commercial (AFSPC oversight).

**First Launch:** April 1964 (NASA's Titan II-Gemini).

**IOC:** Sept. 5, 1988 (USAF).

**Launches Scheduled:** one (FY00); one (FY01).

**Unit Location:** Vandenberg AFB, Calif.

**Contractor:** Lockheed Martin.

**Power Plant:** stage 1 and 2: Aerojet liquid hypergolic propellant rocket engines; stage 1: 430,000 lb thrust; stage 2: 100,000 lb thrust.

**Guidance:** inertial guidance system.

**Dimensions:** stage 1 and 2: height 110 ft, diameter 10 ft; payload fairing heights 20, 25, and 30 ft, diameter 10 ft.

**Launch Weight:** 408,000 lb.

**Performance:** more than 4,200 lb to polar LEO.

#### COMMENTARY

**Titan I.** The Titan family was established in October 1955 when the Air Force awarded the then Martin Co. (now Lockheed Martin) a contract to build a heavy-duty space system. It became known as the Titan I, the nation's first two-stage and first silo-based ICBM.

**Titan II.** Titan I provided many structural and propulsion techniques that were later incorporated into the Titan II. The launcher was used in the 1960s for the manned Gemini flights.

Fourteen Titan II ICBMs were subsequently refurbished and modified to provide expendable space launch capability. Seven successful launches have included the launch of the space probe Clementine I toward the Moon in January 1994, marking the first US lunar mission since Apollo 17 in December 1972. Remaining refurbished Titan IIs are assigned to place Defense Meteorological Satellite Program (DMSF), National Oceanic and Atmospheric Administration (NOAA) satellites, and other government agencies' satellites into polar orbit into this century.

#### Titan IV

**Brief:** A heavy-lift space launch vehicle used to carry DoD payloads such as Defense Support Program (DSP) and Milstar satellites into space. It is the largest unmanned space booster used by the Air Force.

**Function:** Heavy expendable spacelift vehicle.

**Operator:** commercial (AFSPC oversight).

**First Launch:** June 14, 1989 (Titan IVA); Feb. 23, 1997 (Titan IVB).

**IOC:** June 14, 1989.

**Launches Scheduled:** three (FY00); three (FY01).

**Unit Location:** Cape Canaveral AFS, Fla., Vandenberg AFB, Calif.

**Contractor:** Lockheed Martin.

**Power Plant:** Aerojet liquid hypergolic propellant rocket engines; stage 1: two engines 551,200 lb thrust each; stage 2: 106,150 lb thrust; two Alliant Techsystems solid rocket motors, each 1.8 million lb peak thrust.

**Guidance:** digital avionics system on Titan IVB.  
**Dimensions:** stage 1 and 2: height 119 ft 2 in, diameter 10 ft.

**Launch Weight:** 1.9 million lb.

**Performance:** 12,700 lb to GEO; 47,800 lb to LEO.

#### COMMENTARY

USAF's primary heavy-lift launcher, Titan IV was selected in 1985 to augment the space shuttle and is used to launch critical military payloads, including DSP and Milstar satellites. It is a growth version of the earlier Titan 34D, with stretched first and second stages, three-segment solid boosters, and a 16-ft-8.5-in-diameter payload fairing, with various heights of payload fairings available.

**Titan IVA.** The last Titan IVA was launched Aug. 12, 1998. This version was capable of placing a 32,000-lb payload into polar LEO and 39,000 lb into LEO. With a modified Centaur G-prime upper stage, it could place 10,200 lb into GEO, or with an alternative IUS, 5,200 lb into GEO.

**Titan IVB.** The latest Titan IVB version has mission-unique kits, providing a standard interface for payloads to permit launch-site processing, a new electrical system on the booster core, a new ground system, and upgraded solid rocket motors with 25 percent improved performance. First Titan IVB launch from Cape Canaveral was made successfully Feb. 23, 1997.

## Satellite Systems

#### Defense Support Program System

**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:** AFSPC.

**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 ft 8 in, 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

Defense Support Program (DSP) satellites are a key part of North America's early warning system, capable of detecting missile launches, space launches, and nuclear detonations. Warning data is fed to NORAD and US Space Command early warning centers at Cheyenne Mountain AFS, Colo.

Since their first launch DSP satellites have provided an uninterrupted early warning capability to the US. Though not designed to spot and track smaller missiles, the system's capability was demonstrated during the Persian Gulf War, when the satellites provided warnings of Iraqi Scud attacks. A total of 19 DSP satellites have been launched by USAF. Procurement will end with No. 23, and the last DSP satellite will be launched in FY03.

#### Space Based Infrared System

The follow-on to the DSP is the **Space Based Infrared System (SBIRS)**, an advanced program with four primary missions: missile warning, missile defense, technical intelligence, and battlespace characterization. SBIRS is an integrated "system of systems" including a High Component (satellites in GEO and sensors hosted on satellites in Highly Elliptical Orbit) and a Low Component (satellites in LEO), as well as ground assets. It is being fielded in three increments. Increment 1 was expected to consolidate all DSP ground processing in one CONUS Mission Processing Station at Buckley ANGB, Colo., by the end of FY00. Increment 2 fields the High Component starting in FY04, and Increment 3 fields the Low Component starting in FY06. The High Component is in the EMD phase of development, through a Lockheed Martin team, including Aerojet, Honeywell, and Northrop Grumman. The Low Component should complete the program definition phase in early FY02. Two SBIRS Low program definition and risk reduction contracts were awarded to TRW and Spectrum Astro in August 1999.

#### 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.

**Power Plant:** solar arrays generating 500-600 watts.

**Dimensions:** height 12 ft, 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

Defense Meteorological Satellite Program (DMSP) space vehicles have been collecting weather data for US military operations for more than 30 years. In addition to atmospheric data, DMSP satellites provide critical land, sea, and space environmental data for the military.

Circa 2008-09, DMSP will be replaced by the follow-on NPOESS. NPOESS will consolidate today's separate civil and military polar orbiting meteorological satellite systems into a single national program.

**Block 5D-2.** Two operational DMSP Block 5D-2 satellites survey the entire Earth four times a day, using their primary sensor, the Operational Linescan System, to take visual and IR imagery of cloud cover. Military weather forecasters use this imagery to support military operations and to detect developing weather patterns anywhere in the world, helping to identify, locate, and characterize emerging and evolving weather systems.

**Block 5D-3.** Providing increased capabilities, including improved sensors and a longer life span, the first Block 5D-3 launch is expected this year.



**Defense Support Program satellite**  
 (Artist's concept)



**Global Positioning System satellite**



**Milstar Satellite Communications System** (Artist's concept)

#### Defense Satellite Communications System

**Brief:** A spacecraft traveling in geosynchronous orbit used to transmit SHF high-priority command-and-control 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:** 2,550 lb; 2,716 lb (SLEP).

#### COMMENTARY

Defense Satellite Communications System (DSCS) satellites provide worldwide secure voice high-data-rate transmission, operating in Superhigh Frequency. The system is used for high-priority communications, such as the exchange of wartime information between deployed units, battlefield commanders, and defense officials. The military also uses the DSCS to transmit data on space operations and early warning to various systems and users.

**DSCS II.** No longer on orbit.

**DSCS III.** The first launch of the more advanced Phase III satellites was in 1982. Ten are currently in orbit, with launches continuing until 2002. These satellites are nuclear hardened, can resist jamming, and are equipped with antennas capable of providing low-gain, Earth-field-of-view coverage and steerable, high-gain area coverage.

**DSCS III/SLEP.** First SLEP-modified DSCS III scheduled for launch in FY00.

#### 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 300 feet.

**Function:** Worldwide navigation satellite.

**Operator:** AFSPC.

**First Launch:** Feb. 22, 1978.

**IOC:** Dec. 9, 1993.

**Constellation:** 24.

**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 and Lockheed Martin.

**Power Plant:** solar arrays generating 700 watts (II/IIA); 1,136 watts (IIR).

**Dimensions:** body 8 ft x 8 ft x 12 ft, incl solar arrays 11 ft x 19 ft (II/IIA); body 8 ft x 6 ft x 10 ft, span incl solar arrays 37 ft (IIR).

**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

The 24 satellites of the Navstar Global Positioning System (GPS) provide 24-hour navigation services, including accurate, three-dimensional (altitude, longitude, and altitude) velocity and precise time; passive, all-weather operation; continuous real-time information; support to an unlimited number of users and areas; and support to civilian users currently at a slightly less accurate level. Concern over potential enemy use of GPS is being addressed under the Navstar and GPS modernization efforts; new GPS satellites will have two jam-resistant channels for military-only use, as well as two new civilian-only channels. There are currently 28 satellites on orbit: nine Block II, 17 IIA, and two IIR.

Mapping, aerial refueling and rendezvous, geodetic surveys, and search-and-rescue operations are examples of the many GPS applications.

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**Function:** Communications satellite.

**Operator:** AFSPC.

**First Launch:** Feb. 7, 1994.

**IOC:** July 1997 (Milstar I).

**Constellation:** three (three spares).

**Design Life:** 10 yr.

**Launch Vehicle:** Titan IV/Centaur.

**Unit Location:** Schriever AFB, Colo.

**Orbit Altitude:** 22,300 miles.

**Contractor:** Lockheed Martin.

**Power Plant:** solar arrays generating 5,000 watts.

**Dimensions:** 51 ft x 116 ft (with full solar array extension).

**Weight:** 10,000 lb.

**Performance:** The constellation will consist of three satellites in low-inclined geosynchronous orbit, providing worldwide coverage between 65° north and 65° south latitude.

#### COMMENTARY

Milstar is a joint-service communications system that provides secure, jam-resistant EHF communications. Operated by the 50th Space Wing, the constellation will link command authorities with a wide variety of resources, including ships, submarines, aircraft, and ground stations.

Currently serving tactical as well as strategic forces, the last three Milstars (to be launched between 2000 and 2002) will include low-data-rate and medium-data-rate payloads able to transmit higher data rates to highly mobile forces.

#### MILSATCOM Polar System

**Brief:** Satellite that provides secure, survivable communications, supporting peacetime, contingency, and wartime operations in the North Pole region.

**Function:** Communications satellite.

**Operator:** AFSPC.

**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

USAF deployed a modified EHF payload on a host polar-orbiting satellite, providing an interim cheaper alternative to Milstar to ensure protected polar communications capability. Two further satellites are under development, with launches scheduled for 2003 and 2004.

#### UHF Follow-On Satellite Systems

**Brief:** New-generation communications satellites replaced Fleet Satellite Communications System (FLTSATCOM).

**Function:** Communications satellite.

**Operator:** US Navy, AFSPC.

**First Launch:** March 25, 1993.

**IOC:** Sept. 3, 1993.

**Constellation:** four primary, four redundant.

**Design Life:** 14 yr.

**Launch Vehicle:** Atlas II.

**Unit Location:** Schriever AFB, Colo., worldwide Navy locations.

**Orbit Altitude:** 22,300 miles.

**Contractor:** Hughes.

**Power Plant:** two deployed three-panel solar arrays generating 2,500–3,800 watts.

**Dimensions:** deployed length 60 ft 6 in (F-2–F-7); 86 ft (F-8–F-10); diameter 9 ft 6 in.

**Weight:** 2,600–3,400 lb.

#### COMMENTARY

New generation of satellites with 39 channels, providing UHF communications. Compatible with the terminals used by the earlier systems. UFO-4 was the first in the series to include an EHF communications package, constituting 20 channels of Milstar-compatible protected connectivity. UFO-8, -9, and -10 will host GBS phase 2 payloads, providing direct broadcast of digital multimedia information to small tactical terminals. A Gapfiller UFO II is planned.

**First Flight:** not available

**Delivered:** from 1984 (B).

**IOC:** 1987.

**Production:** 70 (B); 221 (D); 78 (E).

**Inventory:** not available

**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 command-and-control multilateration system (E model).

**Dimensions:** length 18 ft 1 in, body diameter 1 ft 3 in, span 9 ft 10 in.

**Weight:** max launch weight (excl booster) 1,46C 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 (RDT&E) and the Weapon System Evaluation Program.

**MQM-107E.** Improved performance follow-on to the MQM-107D. In operational service.

#### BQM-34 Firebee

**Brief:** A jet-powered, variable speed, recoverable target drone.



MQM-107 Streaker (Guy Aceto)



BQM-34 Firebee (Guy Aceto)

**Function:** Aerial target.

**Operator:** ACC.

**First Flight:** 1951; 1958 (BQM-34A).

**Delivered:** from 1951.

**IOC:** circa 1951.

**Production:** 1,800+.

**Inventory:** not available

**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 ft 11 in, body diameter 3 ft 1 in, span 12 ft 11 in.

**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

More than 1,800 of these jet target vehicles have been delivered to USAF since initial development of the BQM-34A in the 1950s.

Current BQM-34As with uprated General Electric J85-100 engine provide a thrust-to-weight ratio of 1-to-1, enabling this version to offer higher climb rates and 6g maneuvering capability. A new microprocessor flight-control system provides a prelaunch and in-flight self-test capability. Used for weapon system evaluation.

#### 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.

**IOC:** not available

**Inventory:** 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) and will also accommodate the triservice Target Control System currently under development.

**Dimensions:** length 63 ft, height 16 ft 5.5 in, wing-span 38 ft 5 in.

**Weight:** mission operational weight 49,500 lb.

**Performance:** max speed Mach 2+, ceiling 55,000 ft, range (approx) 500 miles.

#### COMMENTARY

The F-4 was selected as the source aircraft for the replacement of the QF-106 Full-Scale Aerial Target (FSAT) 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. A complement of 331 F-4E, F-4G, and RF-4C aircraft have been allotted for the FSAT conversion program.



QF-4 (SrA. Matthew C. Simpson)

## Aerial Targets

#### MQM-107 Streaker

**Brief:** A jet-powered, variable speed, recoverable target drone.

**Function:** Aerial target.

**Operator:** ACC.



# Industrial Associates



Listed below are the Industrial Associates of the Air Force Association. Through this affiliation, these companies support the objectives of AFA as they relate to the responsible use of aerospace technology for the betterment of society and the maintenance of adequate aerospace power as a requisite of national security and international amity.

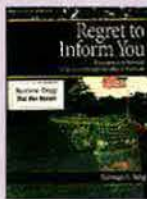
3M/Federal Systems Dept.	ECC International Corp.	Litton Applied Technology	Rockwell Collins
AAI Corp.	EDO Corp., Government	Litton Data Systems	Avionics & Communi-
Advanced Technical	Systems Div.	Litton Guidance & Control	cations Div.
Products	EDS	Systems	Rolls-Royce Inc.
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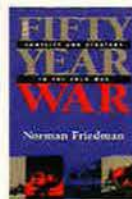
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Compiled by Chanel Sartor, Editorial Associate

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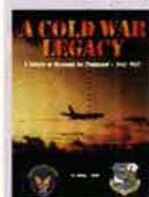
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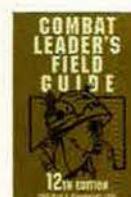
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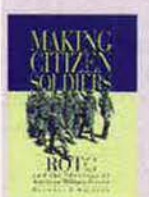
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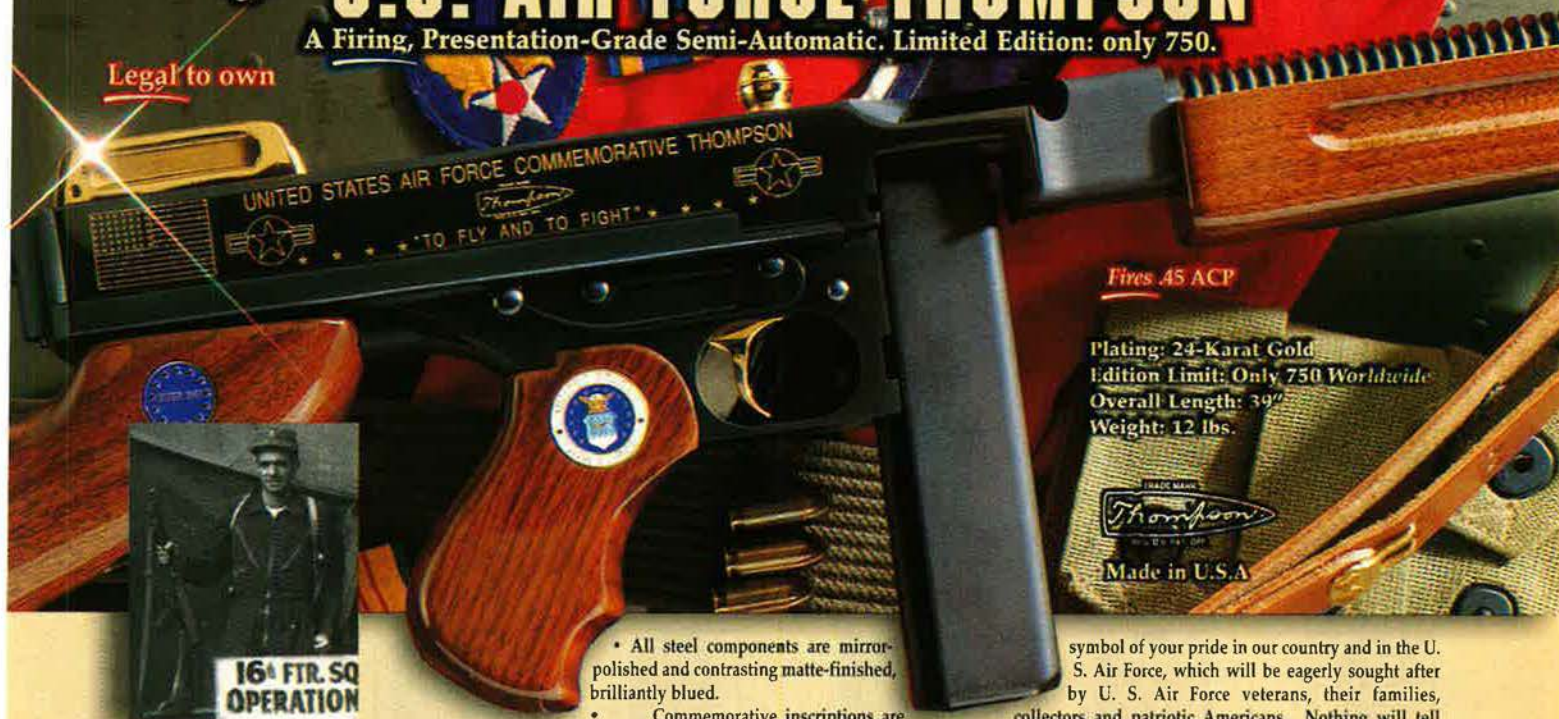


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**16<sup>th</sup> FTR. SQ  
OPERATION**

## A RARE AND IMPORTANT SYMBOL OF YOUR PRIDE IN THE U.S. AIR FORCE

To honor and commemorate military service, what more appropriate symbol than America's most famous military firearm, the Thompson—used by all of America's armed forces and having seen combat in World War II, Korea and Vietnam.

The Thompson can tell many stories, ranging from its post-World War I aircraft-mounted tests, downward firing (anti-personnel) in fighter bi-planes, to the report from Col. Bill Williams, USAF (Ret.)—shown in photo, above—who recalls: "When I was an F.O. in Korea, not flying F-80 Shooting Stars, that Thompson was mighty comforting."

Now, active-duty, retired, and prior-service U. S. Air Force personnel and their families can own the world's first limited edition Thompson ever issued in honor of the U. S. Air Force. Each is specially built with the deluxe features of the more-expensive, early models, including: the finned barrel, adjustable rear sight and Cutts Compensator. But, because this is a tribute to those who serve or have served in the United States Air Force, each is custom gunsmithed to museum quality, especially for this limited edition—and each can be engraved with your name and military information (call for details).

### 24-KARAT GOLD PLATING

Sight across the 24-Karat Gold plated rear sight, through the slot in the gold-plated actuator knob and over the 35 deep cooling fins of the highly polished and blued barrel. A beast of a weapon, it weighs twelve pounds unloaded. It takes two hands to hold it. And, like the originals, each fires .45 ACP so it could be used to defend your family, home or nation. And because it fires in semi-automatic only (not full auto), it can be legally owned in most states by anyone who can own a standard hunting rifle. A legal, 20-round magazine is included.

### CUSTOM GUNSMITHING

Unlike most modern firearms, all the major components are actually machined from massive blocks of solid steel. The fit and finish are presentation grade. In addition to the quality expected from a Thompson, this limited edition is custom gunsmithed with the following special features:

- All steel components are mirror-polished and contrasting matte-finished, brilliantly blued.
- Commemorative inscriptions are deeply etched across the receiver in bas relief and gold-gilt infilled, including the American flag and the famous Thompson "Bullet" official trademark.
- All the 24-Karat Gold surfaces are plated to Jewelers Grade-Heavy thickness for lasting beauty and value: rear sight, actuator knob, trigger, front sight, Cutts Compensator, and sling swivel assemblies/screws.
- The stocks are crafted of genuine American Walnut, custom-finished to high gloss.
- Portraying the U. S. Air Force founding date, custom fired-enamel cloisonnés are inlaid in both sides of the buttstock and a third, with the U.S. Air Force symbol, is inlaid in the presentation side of the pistol grip.
- Following final inspection, your Thompson is fitted with an adjustable brown leather military sling.

### ONLY 750, WORLDWIDE

The U. S. Air Force Commemorative Thompson is custom gunsmithed in a strictly limited edition of only 750 in the world. Each is specially engraved with its limited edition Registry Number from USAF001 through USAF750. A Certificate of Authenticity attesting to the Registry Number, edition limit and purity of the 24-Karat Gold plating accompanies your Thompson.

### SATISFACTION GUARANTEED

The U. S. Air Force Commemorative Thompson is available exclusively through The American Historical Foundation. A small deposit is all that is needed to reserve, and a convenient monthly payment plan is available. To reserve, call our Member Relations Staff, toll free, at 1-800-368-8080 or mail the Reservation Request to "Columbia," circa 1817, our National Historic Landmark Museums and Headquarters in Richmond, Virginia. Satisfaction is guaranteed or you may return your Thompson within 30 days for a full refund.

If you do not have a Federal Firearms License, our Member Relations Staff will help coordinate delivery with you through your local firearms dealer, after your reservation is received here. This is a rare and important

symbol of your pride in our country and in the U. S. Air Force, which will be eagerly sought after by U. S. Air Force veterans, their families, collectors and patriotic Americans. Nothing will tell your friends and family this as dramatically as the U. S. Air Force Commemorative Thompson. Please call today or tonight to avoid disappointment.



To protect your investment from dust and unauthorized handling, an optional, wall-mounting American Walnut Display Case is available. Lined in Air Force Blue, the 44" x 14" x 4" case features a locking acrylic-glass lid.

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**Satisfaction guaranteed or return within 30 days for a full refund.**

Yes, I wish to reserve the U.S. Air Force Commemorative Thompson. I understand that only 750 U.S. Air Force Thompsons will be crafted worldwide. I will also receive a Certificate of Authenticity attesting to the edition limit, serial number and the purity of the 24-Karat Gold plating.

☐ My deposit (or credit card authorization) of \$195 per Thompson is enclosed. Please ☐ charge or ☐ invoice the balance due prior to delivery . . .

☐ in ten monthly payments of \$230, or  
☐ in full.

☐ My full payment of \$2,495 is enclosed.

☐ Also, please add the optional Walnut Display Case, adding \$249 to my final payment.

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# AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

## Air Force Magazine Hosts 20th Air Attaché

New Zealand's Air Commodore James S. Barclay, dean of the foreign air attaché corps, described the Air Force Association's symposiums, convention, and publications as being of "exceptional standard and value." He spoke on behalf of military officers from 51 countries who attended *Air Force Magazine's* foreign air attaché reception in March.

To emphasize the scope of AFA's activities, Barclay listed the events he and his colleagues had been invited to over the past year, including the Eaker Institute's colloquy in August on Operation Allied Force, the Aerospace Technology Exposition in September, the Aerospace Symposium in Los Angeles in December, and the Air Warfare Symposium in Florida in February.

"AFA is achieving the goals of its mission statement admirably," Barclay said.

AFA National President Thomas J. McKee and the association's national officers welcomed the attachés to this 20th annual reception, in Arlington, Va.

Chief of Staff Gen. Michael E. Ryan headed the list of US Air Force senior leaders at the gathering. It also included officials from more than 30 defense industry companies.

### Salute to Special Operations

About 1,000 guests attended the 16th annual Air Force Gala, sponsored by the **Central Florida Chapter** and the Aerospace Education Foundation.

Held in Orlando, Fla., in conjunction with the Air Warfare Symposium, the gala paid tribute to USAF Special Operations, highlighting a history going back to the Carpetbaggers of World War II—who delivered supplies to patriot forces behind enemy lines—and including covert air operations in the Korean War; notable missions during the Vietnam War, such as the raid on the Son Tay prisoner of war camp; special tactics teams that conducted rescue and reconnaissance in Desert Storm; and today's operations in the Balkans.



Staff photo by Guy Aceto

**AFA National President Thomas McKee and Air Commodore James Barclay, dean of the foreign air attaché corps, enjoy the camaraderie at Air Force Magazine's annual reception for foreign air attachés.**

Gala Chairman Martin H. Harris opened the evening's festivities, followed by a presentation of the colors by a color guard from AFROTC Det. 159, University of Central Florida. John T. Brock, Central Florida Chapter executive vice president, introduced special guests such as the Air Force's top civilian leaders F. Whitten Peters and Carol A. DiBattiste and top military leader Gen. Michael E. Ryan.

Timothy R. Brock, chapter president, introduced the evening's program, including presentation of Jimmy Doolittle Educational Fellows, in whose names \$1,000 donations were made to AEF from the chapter.

New fellows from the **Eglin (Fla.) Chapter** were Harry C. Aderholt and MSgt. Timothy A. Wilkinson. Aderholt, who began his military career in World War II and retired as a USAF brigadier general in 1976, was involved in special warfare from the Korean War on. During the Vietnam War, he helped develop the special warfare operations airfields called Lima sites and commanded two air commando wings and US Military Assistance Command, Thailand.

Wilkinson earned an Air Force Cross for extraordinary heroism in October 1993, when, as a para-rescuer, he helped rescue US Army Rangers injured in the downing of a helicopter in the streets of Mogadishu, Somalia.

Also named as Doolittle Fellows were five surviving members of the C-130 crew Republic 4 that participated in the April 1980 Desert One attempt to rescue JS citizens held hostage in Iran: Col. Jeff Harrison, retired MSgt. Wesley Witherspoon, retired TSgt. Kenneth Bancroft, retired SSgt. J.J. Beyers, and Jim McLain.

Two Operation Allied Force rescue teams named as Doolittle Fellows were Vega 31, which picked up a downed F-117 pilot near Batajnica, Serbia, in March and Hammer 34, which rescued a downed F-16 pilot near Novi Sad, Serbia, in May. Representing Vega 31 mission members were rescue helicopter crew members Capt. Chad P. Franks, MSgt. Donald J. Cantwell, and SSgts. Eric D. Giacchino and Gunther J. Kirsch. Hammer 34 mission members were represented by rescue helicopter crew members Capt. William F. Denehan





# Reception

and SSgts. Jeremy S. Hardy and Richard D. Kelley.

AEF established the Doolittle Educational Fellow program in 1974 to honor those who promote public understanding and support for aerospace power.

The Air Force Gala is the Central Florida Chapter's biggest single event for fund-raising to support its many aerospace education initiatives. According to Harris, this year the chapter donated \$45,000 to AEF and \$10,000 to the Air Force Memorial Foundation.

## Air Force Memorial Gala

At a gala in Washington in March, the Air Force Memorial Foundation paid tribute to Frank C. Carlucci, former Secretary of Defense, and William A. Anders, an Apollo 8 astronaut and member of the **Greater Seattle (Wash.) Chapter**, who together have raised \$20 million for the memorial project.

Joseph Coors Jr., chairman of the foundation's board of trustees, presented them with lithographs of an artist's rendition of the memorial.

The gala also featured the debut of the video "Soaring to Glory" that gives a virtual tour of the memorial and explains the symbolism in the building's design elements.

A host of VIPs turned out for the event, including Congressmen James A. Gibbons (R-Nevada), Sam Johnson (R-Texas), and Howard "Buck" McKeon (R-Calif.). Also on hand were former Secretaries of the Air Force Edward C. Aldridge Jr., John L. McLucas, Robert C. Seamans Jr., and Sheila E. Widnall, as well as four former Chiefs of Staff—retired Gens. Michael J. Dugan, Ronald R. Fogleman, Charles A. Gabriel, and David C. Jones—and retired CMSAFs Thomas N. Barnes and James M. McCoy. USAF leaders who attended included Chief of Staff Gen. Michael E. Ryan and CMSAF Frederick J. "Jim" Finch.

In his remarks to the audience, Ryan said the memorial would be a tribute not only to past sacrifice but also to the Air Force's current success stories.



*The Central Florida Chapter raised \$45,000 for AEF this year, an achievement celebrated at its annual gala by (l-r) Martin Harris, event chairman; Jack Price, AEF president; Michael Dugan, AEF chairman of the board; and Timothy Brock, chapter president.*

## Young Astronauts

With AEF President Jack C. Price as special guest, the **Carl Vinson Memorial (Ga.) Chapter** helped sponsor the 11th annual Young Astronauts Day on March 11 at the Museum of Aviation Flight and Technology Center in Warner Robins, Ga.

More than 400 kindergarten through ninth-grade students from across the state attended workshops throughout the day—workshops that were hands-on and space and math related, said Victoria W. Hunnicutt, an AEF trustee and an organizer of the event. She said they ranged from building rockets and model airplanes to playing constellation bingo and testing reaction time.

Price spoke at the opening ceremony and visited workshops. That evening, Georgia state AFA hosted a dinner in his honor at the Robins AFB NCO Club. AFA officials participating in Young Astronauts Day were Zack E. Osborne, region president (Southeast Region); Dan Callahan and Jack H. Steed, national directors; Robert E. Largent, state president; and Martin Jubelt, chapter president.

The chapter picked up all expenses for the day, sponsored with the Museum of Aviation at Robins AFB and the Georgia College and State University.

## Aerospace Tribute

Aerospace Tribute Night in Melbourne, Fla., sponsored by the **Cape Canaveral (Fla.) Chapter**, honored Secretary of the Air Force F. Whitten Peters in February.

More than 200 guests attended the black-tie event, where, according to Chapter President Chris G. Bailey, Peters presented "A Year in the Life of the SECAF," a slide show documenting his travels to air bases in 1999.

Peters also was designated an Ira C. Eaker Historical Fellow. A \$1,000 contribution was made in his name from the chapter to AEF.

Other honored guests at this 16th annual banquet were Rep. Dave Weldon (R-Fla.) and Brig. Gen. Donald P. Pettit, commander of 45th Space Wing at Patrick AFB, Fla.

The chapter made note of two former Eaker Fellows attending the



USAF photo by Jim Laviska



**Air Force Secretary F. Whitten Peters (second from right) visits the Khobar Towers Memorial at Patrick AFB, Fla., accompanied by CMSgt. Patrick Zima, Brig. Gen. Donald Pettit, and Chris Bailey, Cape Canaveral Chapter president.**

dinner: Forrest S. McCartney, who was named a fellow in 1992, and Jimmey R. Morrell, named last year.

AEF's Eaker Fellow program, established in 1981, recognizes leadership that inspires an appreciation of aerospace history, achievements, and its role in national security.

Earlier that day, Peters visited the Khobar Towers Memorial at Patrick AFB. The chapter led the fund-raising effort to build this memorial to honor five USAF personnel from the base who died in the terrorist bombing of the Khobar Towers housing complex in Dhahran, Saudi Arabia, in June 1996.

#### **CMSAF Finch in Nevada**

CMSAF Frederick J. "Jim" Finch attended a Pearl Harbor Memorial Luncheon hosted by the **Thunderbird (Nev.) Chapter**.

He pointed out the need for continued investment in national defense, underscoring the importance of the F-22 and airborne laser and quality-of-life initiatives to help retain a trained, experienced force.

"The new defense budget had a lot of [issues] telling the people we understand what you do, but this is like pushing a rock up hill: You can't let go," a Nellis AFB newspaper quoted Finch as saying.

The luncheon also recognized four members in the audience who had survived the attack on Pearl Harbor.

#### **Commander's Recognition**

The **Langley (Va.) Chapter** joined Air Combat Command senior staff in

sponsoring Commander's Recognition Day on Feb. 4, a special occasion to salute the role of Strategic Air Command and Tactical Air Command in USAF and ACC history.

In a highlight of the day, Gen. Ralph E. Eberhart, who was then ACC commander, unveiled portraits of former SAC and TAC commanders. Symbolic of how the two commands are the roots of today's ACC, the new portraits are now incorporated into current displays of ACC commanders' portraits. There are two complete sets of portraits; one hangs outside the commander's conference room at ACC headquarters and the

other in the Commanders Room at the Langley AFB Officers Club.

Former SAC commanders at the ceremony were retired Gens. Russell E. Dougherty (1974-77) and Larry D. Welch (1985-86). Retired Gens. John Michael Loh, the last TAC commander (1991-92) and first ACC commander (1992-95), and Richard E. Hawley, former ACC commander (1996-99), also participated in the ceremony.

Events held earlier during Commander's Recognition Day included briefings on ACC operations and the Aerospace Command and Control Intelligence, Surveillance, and Reconnaissance Center at Langley; implementation of the Expeditionary Aerospace Force concept; and the F-22, Joint Strike Fighter, and other modernization and readiness programs.

That evening, the Langley Chapter named Eberhart a Doolittle Educational Fellow.

#### **Gilman on Gas Prices**

In a March speech to the **Gen. Carl A. "Tooey" Spaatz (N.Y.) Chapter**, Rep. Benjamin A. Gilman (R-N.Y.) said he had introduced the Oil Price Reduction Act of 2000 in response to "numerous calls and letters" from constituents complaining about price hikes for gasoline.

"This legislation would require the President to cut off assistance and arms sales to those members of OPEC and other major net oil exporting countries which are determined to be engaged in oil price fixing to the detriment of the US economy," he said.

Gilman, who is chairman of the House International Relations Com-



**Rifle team members from the USAF Academy and University of Alaska Fairbanks share pizza at a reception hosted by the Fairbanks Midnight Sun Chapter.**



mittee, also brought the audience up to date on events between Israelis and the Syrians and Palestinians that have taken place since peace negotiations earlier this year in Shepherdstown, W.Va.

"US military aid is critical not only to Israel's security but to defending American interests in the Middle East as well," he said.

The chapter is also arranging a full weekend of activities in conjunction with the US Air Force Academy vs. US Military Academy football game at West Point, N.Y., on Nov. 4. According to Karl Miller, chapter president, activities include a breakfast, attendance at the parade of cadets, a "victory reception," and a champagne brunch especially for AFROTC, AFJROTC, and Civil Air Patrol cadets. The chapter is selling tickets that are for seats in a good location in a reserved block, so AFA ticket holders can sit together.

### Pizza and Pop

The Fairbanks Midnight Sun (Alaska) Chapter hosted a "Pizza and Pop" reception in February for rifle teams from the US Air Force Academy and the University of Alaska Fairbanks.

The teams had been at the university for two days, qualifying for collegiate sectional matches of the National Athletic Association and the National Rifle Association.

Nine chapter members, including Steven R. Lundgren, Alaska state president, Bart LeBon, chapter president, and James V. Drew, chapter secretary, joined the rifle teams and their coaches for the reception.

Drew said the chapter had hosted a highly successful reception for the visiting Academy hockey team a few years ago. The event brought the chapter good visibility in the community, he explained, because hockey is a popular sport in Alaska, and local children brought their hockey sticks to the reception to get them autographed by the players.

This latest reception focused on a school sport that doesn't often receive attention, Drew said. As a result, he said, "The teams seemed to be very pleased with the recognition they received."

### Also in Alaska

The Anchorage Chapter welcomed Lt. Gen. Thomas R. Case as guest speaker for its January meeting at Elmendorf AFB, Alaska.

Case, who is commander of 11th Air Force at Elmendorf, gave an overview of USAF plans and objectives, according to Victor R. Davis, chapter vice president for membership.

## AFA Conventions

May 5-7  
May 5-7  
June 1-4  
June 3-4  
June 9-10  
June 9-11  
June 9-11  
June 10-11  
June 16-17  
June 16-18  
June 30-July 1  
July 21-23  
July 21-23  
July 28-29  
July 28-30  
Aug. 11-13  
Aug. 11-13  
Aug. 18-19  
Aug. 18-19  
Aug. 25-26  
Sept. 10-13  
Sept. 29-Oct. 1

New Jersey State Convention, Cape May, N.J.  
South Carolina State Convention, Myrtle Beach, S.C.  
California State Convention, Palm Springs, Calif.  
Mississippi State Convention, Biloxi, Miss.  
Arkansas State Convention, Fort Smith, Ark.  
Arizona-Nevada-New Mexico State Convention, Albuquerque, N.M.  
New York State Convention, Lockport, N.Y.  
Ohio State Convention, Cincinnati  
Washington-Oregon State Convention, McCord AFB, Wash.  
Missouri State Convention, Whiteman AFB, Mo.  
Oklahoma State Convention, Altus, Okla.  
Pennsylvania State Convention, Pittsburgh  
Texas State Convention, Dallas  
Alabama State Convention, Birmingham, Ala.  
Florida State Convention, Homestead AFB, Fla.  
Georgia State Convention, Robins AFB, Ga.  
Indiana State Convention, Indianapolis  
Colorado State Convention, Aurora, Colo.  
Virginia State Convention, Roanoke, Va.  
Illinois State Convention, Springfield, Ill.  
Air Force Association National Convention, Washington  
New Hampshire State Convention, Portsmouth, N.H.

During the meeting, chapter members Carl W. Bradford, Floyd E. Gori, and Gary A. Hoff received their 1999 AFA Medals of Merit.

### Blockbuster Lineup

Starting the year off right, the Lexington (Ky.) Chapter lined up well-attended chapter events, beginning with its fifth annual mixer for chapter

members and cadets of the University of Kentucky Lexington's Det. 290.

Forty-five junior- and senior-year cadets and 15 chapter members attended the mixer, held on the UK campus in January. Retired Brig. Gen. Jesse S. Hocker, former commander of 14th Air Division at Beale AFB, Calif., served as guest speaker. A UK graduate who earned his com-

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**F8 Victorinox Pocket Knives.** Blue enamel or silver metallic. Contains blade, nail file, scissors. Blue enamel also includes toothpick and tweezers. AFA name and logo. **\$16**

**F9 Music Key Ring.** Plastic key ring with AFA logo. Plays the tune "Off We Go". **\$6**

**F10 Windproof Lighter.** By Zippo. Brushed stainless steel. **\$13**

**F11 Golfer's Money Clip.** By Zippo. Brushed stainless steel with ballmarkers and greenskeeper. **\$13**

**F12 AFA Umbrella.** 60" in white and dark blue with AFA logo and fiberglass shaft. **\$25**

**F13 3" Decal.** Member or Life Member. Specify inside or outside window. **\$.15**

**F14 AFA Golf Balls.** Titanium Top Flight by Wilson with full color AFA logo. Sleeve of 3. **\$8.50**

**F15 Pewter Medal.** AFA logo. Suitable for plaques and decorative placement. 1.75" diameter. **\$5**



mission through ROTC, Hocker had "instant credibility" with the cadets, reported Chapter President Col. James S. "Steve" Parker. Hocker—a member of the **Dallas Chapter**—spoke about his 30-year USAF career, especially the challenges of being a wing and division commander in Strategic Air Command.

Parker, who commands Det. 290, said his cadets were most impressed with Hocker's 227 combat missions and experience flying 25 kinds of aircraft, including the SR-71.

As a traditional part of the mixer, chapter members who were in the Air Force each gave a brief overview of their careers. Parker said this part of the program is "always a hit with the cadets. They hear about airplanes they didn't know existed!"

Wrapping up a first quarter of events, the chapter held its March meeting at the Aviation Museum of Kentucky with two members of the 123rd Special Tactics Flight, Louisville IAP AGS, Ky., as speakers.

ANG Maj. Jeremy Shoop, flight commander, and ANG TSgt. John G. Rosa, of the **Gen. Russell E. Dougherty (Ky.) Chapter**, described their unit's combat control and pararescue functions. They covered the exten-



Photo by Ken Goetz

**AFA Chairman of the Board Doyle Larson presents Gen. Lloyd Newton, Air Education and Training Command commander, with an AFA coin during a visit in March. Larson traveled to several USAF bases to receive information briefings.**

sive training combat controllers and pararescue jumpers receive and some of the highlights of important special tactics operations from Vietnam to Bosnia. Parker reported that some of the unit's 15 members are on temporary duty more than 100 days a year.

After the presentation, the two speakers explained the 15 items of specialized equipment that they had brought along, such as global positioning system satellite receivers and "do-it-yourself runway lights."

#### Scholarship Presentations

Twenty cadets from AFROTC Det. 159, University of Central Florida at Orlando, Fla., received scholarships from the **Central Florida Chapter** in a March ceremony at the school's student union building.

John T. Brock, chapter executive vice president, spoke about the career of the late Gen. Bruce K. Holloway, a former Flying Tiger, USAF vice chief of staff, and commander of Strategic Air Command.

Brock then joined Lt. Col. Carol L. Judge, Det 159 commander and also a chapter member, in presenting a \$1,000 scholarship named for Holloway to cadet Brian Belau. Cadet Edwin Rodriguez received a \$1,000 scholarship named for the late Carlos Arriaga, a former Det. 159 cadet. Eighteen other cadets received scholarships, ranging from \$150 to \$400.

#### Publicizing USAF Issues

Central West Florida Vice President Robert F. Cutler, from the **Gen. Nathan F. Twining (Fla.) Chapter**, and South West Florida Vice President Kenneth R. Beers, from the **Florida Highlands Chapter**, worked with the Greater Tampa Chamber of Commerce and the Avon Park Air Force Range in Avon Park, Fla., to carry out a bombing range orienta-

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tion for a diverse group of civilians in February.

Beers also helped present a briefing to the visitors on the history and purpose of the range.

The orientation received good coverage in the *Tampa Tribune*. The newspaper's article covered several Air Force topics, including the Expeditionary Aerospace Force concept, the challenges of having fewer air bases in Europe, training for the Guard and Reserve, the need for safe areas to develop skills in using laser-guided bombs, and even the problem of bird strikes.

#### More AFA/AEF News

■ **The Nation's Capital (D.C.) Chapter** presented Deputy Secretary of Defense John J. Hamre with its Distinguished Award for International Achievement at a chapter banquet in March. The award—which has been given only six times in the chapter's history—recognized Hamre's leadership in "pioneering cooperative security measures" during his tenure as deputy secretary, from July 1997 to March, and his years of government service in DoD and on Capitol Hill. Tofie M. Owen, chapter president, made the presentation.

■ **Altoona (Pa.) Chapter** members joined AFROTC cadets from Penn-

sylvania State University's Det. 720 in University Park, Pa., for a February ceremony honoring 10 former Penn State AFROTC cadets who were killed or listed as missing in action in the Vietnam War. The ceremony included alumni and some family members of the 10 and capped eight months of research by six current cadets—including AFA cadet members Philip Z. Atkinson, Kelly Buckels, Nathaniel M. Evans, Andrew C. Miller, and Anne V. Zlotorzynski. In their research, they matched names of AFROTC alumni against records from the Korean War and against names listed on a Vietnam Veterans Memorial Website.

■ **The Fort Wayne (Ind.) Chapter** honored the 122nd Civil Engineering Squadron (ANG) with its 1999 Military Unit Achievement Award at the chapter's annual awards banquet. The award recognized the unit's role in helping to build a tent city for Hondurans displaced by Hurricane Mitch in October 1998. ANG Maj. Ron Blanchard, squadron commander and also a chapter member, accepted the award from Theodore Huff Jr., chapter president.

■ **Richard E. Jonas from the Barry Goldwater (Ariz.) Chapter** presented an AFA award to AFJROTC cadet Vanessa Lansing at a February awards

ceremony at Mohave High School in Bullhead City, Ariz. Jonas is the senior aerospace science instructor at the school.

■ Prominent in his AFA jacket, Fred Di Fabio, president of the **Nassau Mitchel (N.Y.) Chapter**, helped unveil a poster of the Vietnam Veterans Memorial postage stamp on Jan. 13 for Nassau County. The US Postal Service had officially unveiled the stamp two days before in a ceremony on the National Mall. The stamp is one in a series of 15 that commemorate events of the 1980s.

■ A group of 27 from the **Phoenix Sky Harbor (Ariz.) Chapter** visited the Arizona State Capitol and Museum in February, taking in a section of artifacts from USS *Arizona* and viewing a statue of Phoenix native 2nd Lt. Frank Luke Jr., World War I Medal of Honor recipient. The chapter was recognized from the floor of the state senate, which was in session.

■ Robert W. Gregory, a former AFA national vice president (Northeast Region) and New Jersey state president, died Jan. 16 in Sterling, Va. He had retired from USAF as a colonel in 1963 after a 23-year career and was a government logistics officer until retiring a second time in 1988. He was a member of the **Thomas B. McGuire Jr. (N.J.) Chapter**. ■

## Unit Reunions

reunions@afa.org

**1st AACs Mobile.** Sept. 14–17, 2000, at the Hope Hotel in Dayton, OH. **Contact:** James Mumaw, 5748 Mallard Dr., Dayton, OH 45424-4148 (937-236-5323) (bigmawmu@aol.com).

**2nd Chemical Mortar Battalion** and 461st Infantry Battalion, Korea (1950–53). Sept. 13–17, 2000, at the Four Points Hotel by Sheraton Aberdeen in Aberdeen, MD. **Contact:** William Thomas, 7418 Overdale Dr., Dallas, TX 75240 (972-387-1247).

**28th BW/28th Strategic Recon Wg.** Ellsworth AFB, SD, and all subordinate/associated units. Aug. 31–Sept. 4, 2000, at the Best Western Ramkota Hotel in Rapid City, SD. **Contact:** Jim Savage, PO Box 3092, Rapid City, SD 57709 (phone: 605-342-3996 or fax: 605-343-4036) (ells28bw@aol.com).

**44th BG.** Eighth AF (WWII), all 44th units formed after WWII, and 3rd Strategic Air Depot Assn members. Aug. 31–Sept. 3, 2000, at the Westin Horton Plaza in San Diego. **Contact:** Mike Yuspeh, 7214 Sardonix St., New Orleans, LA 70124-3509 (phone: 504-283-3424 or fax: 504-283-3425) (mikeyuspeh@juno.com).

**51st Fighter Interceptor Wing.** Korean War. Sept. 7–10, 2000, in Frankenmuth, MI. **Contact:** Charles E. Goshman, 3865 Old King Rd., Saginaw, MI 48601 (517-777-5523).

**52nd Air Rescue Sq.** Flt. B, 6th ARS; and Ernest Harmon AB, Canada, personnel. Sept. 7–9, 2000, at Wright-Patterson AFB, OH. **Contact:** Roger A. Coelho, 44 Sinnott St., West Bridgewater, MA 02379-1132 (508-587-9741) (ehafb53@aol.com).

**58th BW.** Sept. 11–17, 2000, at the Hilton Wichita Airport & Executive Conference Center in Wichita, KS. **Contact:** Sunflower Travel Corp., PO Box 780448, Wichita, KS 67277 (800-445-0563).

**64th TCG.** September 2000 in Washington, DC. **Contact:** Vern Montgomery, 6744 Carlsen Ave., Indianapolis, IN 46214-2328 (317-241-5264).

**86th Fighter–Bomber Wg.** Neubiberg/Landstuhl, Germany (1951–55). Sept. 13–16, 2000, at the Honeysuckle Inn & Conference Center in Branson, MO. **Contact:** Harvey Merritt, 3009 Meadow Forest Dr., Jackson, MS 39212-4034 (phone: 601-372-1720 or fax: 601-352-1124) (rustynail999@aol.com).

**98th BG/BW Veterans Assn.** Sept. 5–9, 2000, at the Hilton Cherry Hill Inn in Cherry Hill, NJ. **Contact:** Stan Flentje, 310 Sunnywood Ln., San Marcos, TX 78666-8914 (512-396-2509).

**107th Tactical Recon Sq.** Sept. 10–13, 2000, in Denver. **Contact:** William O'Keefe, 606 Jack Pine Pl., Loveland, CO 80538 (970-663-2961).

**111th TRS** (WWII). Sept. 13–17, 2000, at the Clarion Hotel in Richardson, TX. **Contacts:** Sue Davis, Travel All Seasons International (800-880-0484), or Garland Hendricks, 7201 Claybrook Dr., Dallas, TX 75231-4801 (214-348-2779).

**199th FIS/TFS.** Hawaii ANG Fighter Pilots Assn (September 1946–present). Feb. 24, 2001, at the Hickam AFB, HI, Officers Club. **Contact:** Jim Haruguchi, 1503 Hoaina St., Honolulu, HI 96821 (808-373-4088).

**303rd ARS.** Sept. 12–15, 2000, at the Hanalei Hotel in San Diego. **Contact:** Charlie Jensen, 2425 Locust St., San Diego, CA 92106 (phone or fax: 619-224-8347) (thecapt@gateway.net).

**306th BW.** Sept. 12–18, 2000, in Colorado Springs, CO. **Contact:** Joe Demes, PO Box 542066, Merritt Island, FL 32954 (phone: 321-452-4417 or fax: 321-452-0603) (www.306thbw.org).

**354th FG.** Ninth Air Force (WWII). Sept. 10–13, 2000, at the Silver Legacy Resort Casino in Reno, NV. **Contact:** Clayton Gross, 2306 SE Spyglass Dr., Vancouver, WA 98683 (parprob@aol.com).

**387th BG.** 556th, 557th, 558th, and 559th BSs. Sept. 13–17, 2000, at the Grosvenor Resort in Walt Disney World in Lake Buena Vista, FL. **Contact:** David J. Miller, 559th Bomb Squadron (561-770-2195) (dj.miller1@juno.com).

**417th BG (L)** (WWII). Sept. 7–9, 2000, at the Holiday Inn Oklahoma City Airport in Oklahoma City. **Contacts:** Charles or Betty Troutman, 4325 NW 26th St., Oklahoma City, OK 73107-1014 (405-942-1256).

**481st TFS** and **Cannon AFB, NM**, veterans. June 9–10, 2000, in Clovis, NM. **Contact:** Bob Finley, 6618 E. Valle Di Cadore, Tucson, AZ 85750 (520-577-1006) (rfinley65@aol.com).

**483rd BG (H)** (WWII) and 566th Air Engineers. Sept. 11–16, 2000, in Covington, KY. **Contact:** Hank Burlew, 2348 Petersburg Rd., #224, Hebron, KY 41048-0224 (606-689-4347).



## Unit Reunions

**487th BG (H) Assn**, Eighth AF (WWII). Aug. 30–Sept. 3, 2000, in Alexandria, VA. **Contact:** Barney Nolan, 2121 Jamieson Ave., #1003, Alexandria, VA 22314 (703-567-1882) (btolan@aol.com).

**509th BW**. Sept. 20–24, 2000, in San Antonio. **Contact:** Bob Buck, 9218 Spellman Rd., Houston, TX 77031 (713-771-2322).

**567th Strategic Missile Sq (SAC)**, Atlas E, Fairchild AFB, WA, including all military and civilians from activation until deactivation. Sept. 7–10, 2000, at Cavanaugh's Best Western Templin's Resort in Post Falls, ID. **Contact:** Dick Mellor, 6331 N. Elmhurst St., Spokane, WA (509-327-2879) (elm1929@aol.com).

**601st TCW**, Germany (1945–95), and all subordinate units. Oct. 18–21, 2000, in Oklahoma City. **Contact:** Harry E. Ambrose, 18720 Dallas Ln., Little Rock, AR 72223-9219 (501-821-3509) (heambrose@aol.com).

**613th, 847th, 848th AC&W Sq, 39th AD (ADCC), and 511th AC&W Gp.** Sept. 15–18, 2000, in Arlington, VA. **Contact:** Donald D. Simmons, 704 S. Grove Rd., Richardson, TX 75081 (972-231-6518) (dona7112@iadfw.net).

**623rd AC&W Sq**, including 624th and 851st AC&W Sqs, 529th AC&W Gp, and 2152nd Communications Sq, Okinawa air defense, September 1945–present. Sept. 8–10, 2000, in Dayton, OH. **Contact:** Ray Walker, 9149 Millertown Pike, Mascot, TN 37806-1703 (865-932-3111) (orangee123@aol.com).

**636th AC&W Radar Sq (SAGE)** Condon AFS, OR (1951–70). Aug. 17–20, 2000. **Contact:** Dave

Klein, 2140 SW Umatilla Ave., Redmond, OR 97756 (541-504-8934) (dvan636@bendnet.com).

**1045th Operations, Evaluation, & Training Gp**, Det. 1 and 2. Sept. 14–17, 2000, at the Casino Magic Biloxi in Biloxi, MS. **Contact:** Chuck Bowen, 11612 S. Sheridan Ave., Tacoma, WA 98444 (253-531-4263).

**3083rd ADG/3096th ADS**, Travis AFB (formerly Fairfield AFS), CA. July 20–23, 2000, in Seattle. **Contact:** William B. Oaks, 2218 177th Pl. NE, Redmond, WA 98052-6071 (425-957-1797) (wmbyoaks@aol.com).

**3389th Pilot Training Sq (MAP)**, all instructors and students. Oct. 19–22, 2000, at the Four Points Hotel by Sheraton Riverwalk in San Antonio. **Contact:** Chuck Davies, 4435 Monaco Dr., San Antonio, TX 78218 (210-653-1475).

**American Fighter Aces Assn.** Sept. 14–17, 2000, at the Hilton Reno Resort & Casino in Reno, NV. **Contact:** Clayton Gross, 2306 SE Spyglass Dr., Vancouver, WA 98683 (parprob@aol.com).

**Bainbridge AAF, GA/Southern Airways School** alumni, former employees, students, and permanent party military personnel. Sept. 1–3, 2000. **Contact:** Max E. Horn, 2114 High Rd., Tallahassee, FL 32303 (850-385-4419).

**Det. 2, 4000th Support Gp.** Sept. 7–10, 2000, in Colorado Springs, CO. **Contact:** Jim Sever, 67 Alsobrooks Rd., Picaune, MS 39466 (601-749-2061) (sever@datasync.com) (jsever@ssc.nasa.gov).

**Grand Forks Red River High School**, Grand Forks AFB, ND, class of 1970. Aug. 4–5, 2000. **Contact:** Joanne Evans Kobetsky, 3737 Belmont Ct., Grand Forks, ND 58201 (kobet@gherald.infi.net).

**Navy and Air Force brats**, Guam, in the mid-1960s. July 1, 2000, at the Embassy Suites (Airport) in Phoenix. **Contacts:** Rhea and Becky Cooke, 5405 Fairway Dr., San Angelo, TX 76904 (915-944-7783) (bcooke1@gte.net).

**Pilot Training Class 50-E.** Sept. 13–15, 2000, in Washington, DC. **Contact:** F.A. Humphreys (703-455-4202).

**RED HORSE** unit members, former and present. Sept. 12–14, 2000, at the Ramada Plaza Beach Resort in Fort Walton Beach, FL. **Contact:** Chief Master Sergeant Floyd (850-881-2189 or DSN: 641-2189) (susan.floyd@823rhs.hurlburt.af.mil).

**Roswell AAF/Walker AFB Veterans Assn** (1941–67). Sept. 15–17, 2000, at the Best Western Sally Port Inn & Suites in Roswell, NM. **Contact:** Alfred H. Wilbur, PO Box 2744, Roswell, NM 88202 (505-622-5413).

Seeking **Altus Aces**, WWII graduates, Altus AAF, OK, for a September 2000 reunion in Colorado Springs, CO. **Contact:** Lester K. Glaze, PO Box 309, Broken Bow, NE 68822-0309 (308-872-2896) or (308-872-2842).

Seeking former members of **808C Mobile Training Det.**, GAM-77, for a reunion in Virginia in the fall of 2000. **Contact:** William R. Gardiner, 314 Chilton Rd., Zacata, VA 22581 (804-493-0291).

## Bulletin Board

bulletin@afa.org

Seeking contact with anyone assigned to the **B-52/KC-135 Mobile Flight Simulator Section**, Castle AFB, CA, 1960–73. **Contact:** O. Roy Camp, 311 Great Falls Rd., Rockville, MD 20850 (day: 301-320-3000 or evening: 301-279-2930).

Seeking contact with, photos of, or information on **2nd Lts. Joseph M. Altas, Thomas J. McDonald, Milton M. Ward, and Walton E. Wiggins; SSgts. George A. Boyce, John J. Chuck, Joseph Garbush, Martin A. Smith, and Sam H. Young; and Pvt. Royce Heath**, members of 728th BS, 452nd BG, Eighth AF, whose B-17 landed in German-occupied France on May 27, 1944. Also interested in information on the 728th BS and 452nd BG. **Contact:** Philippe Guilleray, Pharmacia, Avoudrey, France 25690 (phone: 03-81-43-24-04 or fax: 03-81-43-28-99) (252011440@resopharma.fr).

For display, seeking colored B-47 wing insignia of the **68th, 79th, 93rd, 303rd, 308th, 320th, 321st, 379th, 380th, and 384th Wgs.** Color pictures or **patches** are acceptable. **Contact:** Sigmund Alexander, 12110 Los Cerdos Dr., San Antonio, TX 78233-5953 (phone: 210-653-5361 or fax: 210-653-1001) (sigmundalexander@worldnet.att.net).

For 35th anniversary, seeking photos and memorabilia for the **823rd RED HORSE** "Walls of History." **Contact:** Chief Master Sergeant Floyd (850-881-2189) (susan.floyd@823rhs.hurlburt.af.mil).

Seeking graduates of **Pilot Training Class 51-G** (Craig AFB, AL; Reese AFB, TX; Williams AFB, AZ; and Vance AFB, OK). **Contact:** Alex Pisciotto Jr., 720 Old Oak Ridge, San Marcos, CA 92069 (760-744-3005) (amfalex@inetworld.com).

Seeking contact with **AAC Sgt. Clifford Leroy**

**Christiansen (Christian?)**, who was born in December 1917 and was stationed at RAF Bovingdon, UK, 1942–45 and may have been a teacher. **Contact:** R.W. Keil, 10503 Georgetown Dr., Rancho Cordova, CA 95670 (yoji@juno.com).

Seeking serial numbers, names, and photos of **B-29s** from the 58th 73rd, 313th, 314th, and 315th BW and their groups. **Contact:** Tom Britton, 9209 Cynthia St., Manassas Park, VA 20111 (703-393-9875) (usaafhistorian@yahoo.com).

Seeking original bomber/fighter squadron, group, and wing **patches** from WWII and the Korean War. **Contact:** Daniel S. Miller, 5800 Sonoma Rd., Bethesda, MD 20817 (202-841-3062) (dmiller88@aol.com).

For collection, seeking **military currency (military payment certificates)** used overseas between 1946–73. Will trade duplicates. **Contact:** Nick Schrier, PO Box 60104, Sacramento, CA 95860 (phone: 800-546-8720 or fax: 916-488-2301).

Seeking contact with pilots who flew in fighter, bomber, and light-bombardment squadrons during the **Korean War**. **Contact:** Vincent Castano, Dept. of History, Western Carolina University, Cullowhee, NC 28723 (828-227-7243) (vc17916@wcu.edu).

Seeking **Robert F. Davidson**, who was stationed at RAF Alconbury, UK, around 1967 and lived in Baker, FL, in 1968. **Contact:** Gary Tilbrook, 14 Wellhouse Rd., Roundhay, Leeds, W. Yorkshire, UK LS8 4BS.

Seeking **Robert R. Murney**, a USAF photographer, stationed in the IG Farben Building, Frankfurt, Germany, 1958–60, and who lived in Colorado Springs, CO, 1960–61. **Contact:** Tony

Petrello, 40332 Via Siena, Murrieta, CA 92562 (siena@iinet.com).

Seeking **Gordon C. Anderson**, co-pilot of a glider flown by **2nd Lt. Delmar E. Switzer** that crashed northeast of Wesel, Germany. **Contact:** Nancy Switzer Bartlett, 214 Fulton St., Keokuk, IA 52632 (319-524-7180).

Seeking members of the **5055th Range Sq**, Eielson AFB, AK. **Contact:** Randy Bell (randallbrentbell@hotmail.com).

For a dedication ceremony, seeking contact with the families of **2nd Lts. James L. Dyar** of Carnesville, GA, and **Alvis D. Noble** of Brashear, TX, both of the 388th FS, 365th FG, who were killed in the crash of a P-47, July 18, 1944, in Normandy, France. **Contact:** Stephane David, Les Olseaux, Rabodanges, France 61210 (stephane.david8@wanadoo.fr).

If you need information on an individual, unit, or aircraft, or want to collect, donate, or trade USAF-related items, write to "Bulletin Board," *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. Items submitted by AFA members have first priority; others will run on a space-available basis. If an item has not run within six months, the sender should resubmit an updated version. Letters must be signed. Items or services for sale, or otherwise intended to bring in money, and photographs will not be used or returned.



# Outstanding Squadron Dinner

AFA Colorado Springs/Lance Sijan Chapter

## Thursday, May 25

**Featured speaker:** Lt. Gen. Michael C. Short, allied air forces commander during Operation Allied Force in Kosovo.

AFA's 41st Annual Outstanding Squadron Dinner will be held at The Broadmoor Hotel on Thursday, May 25 to honor cadets of the United States Air Force Academy for the 1999-2000 school year. The price is \$85 per person and \$850 per table.

## Annual Reception

### Wednesday, May 24

The Annual AFA Reception will take place from 5:30-7 p.m. in the West Ballroom. The fee for the reception is \$45.

**For reservations at The Broadmoor Hotel,** call (800) 634-7711 and identify yourself as an attendee of the Air Force Association symposium or dinner.

If you have any questions regarding the USAFA Outstanding Squadron Dinner, please contact **Barbara Coffey**, (800) 727-3337, ext. 5805, e-mail: [bc Coffey@afa.org](mailto:bc Coffey@afa.org) or **Ms. Jeri Andrews** (719) 574-1590, e-mail: [jaandrew@rmi.net](mailto:jaandrew@rmi.net).

A classified (secret) information warfare symposium will also be held May 25. The cost is \$250 for AFA civilian individual or Industrial Associate members. Government prices available. (The symposium registration fee includes a continental breakfast, coffee breaks, lunch, and the Wednesday evening reception.) Contact **Judy Arnold**, (719) 277-4028, fax: (719) 277-4372, e-mail: [judy.arnold@lmco.com](mailto:judy.arnold@lmco.com).

The Department of Defense finds that this event meets 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 its DoD employees based on mission requirements and DoD regulations.



# Pieces of History

Photography by Paul Kennedy

## Coming Into Their Own



Less than three years after becoming an independent service in the US military, the Air Force went to war in Korea. The H-19 Chickasaw—its cockpit shown here—was brand-new, too, having entered service in 1951. It was used extensively for special operations, air-sea rescue, and transport duties during the war. Draped across the helicopter's seat is one of the first Air Force fatigue

shirts. 'Unti' the war, development of distinctive utility uniforms for the new service branch had not received as much attention as the design for service coats such as the popular Ike jacket, shown next to it. The flight helmet, navigation chart of Korea—marked with locations of UN bases—and the jacket locally made for 17th Bomb Wing members also recall the early 1950s,

when the fledgling service met the challenge of its first war.

Memorabilia courtesy Museum of Aviation, Warner Robins, Ga.



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