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1999 USAF Almanac

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May 1999, Vol. 82, No. 5

AIR FORCE MAGAZINE

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About the cover: This year's eagle is the fourth to be used on the cover of the May Almanac. See p. 40. Photo © Tom and Pat Leeson.

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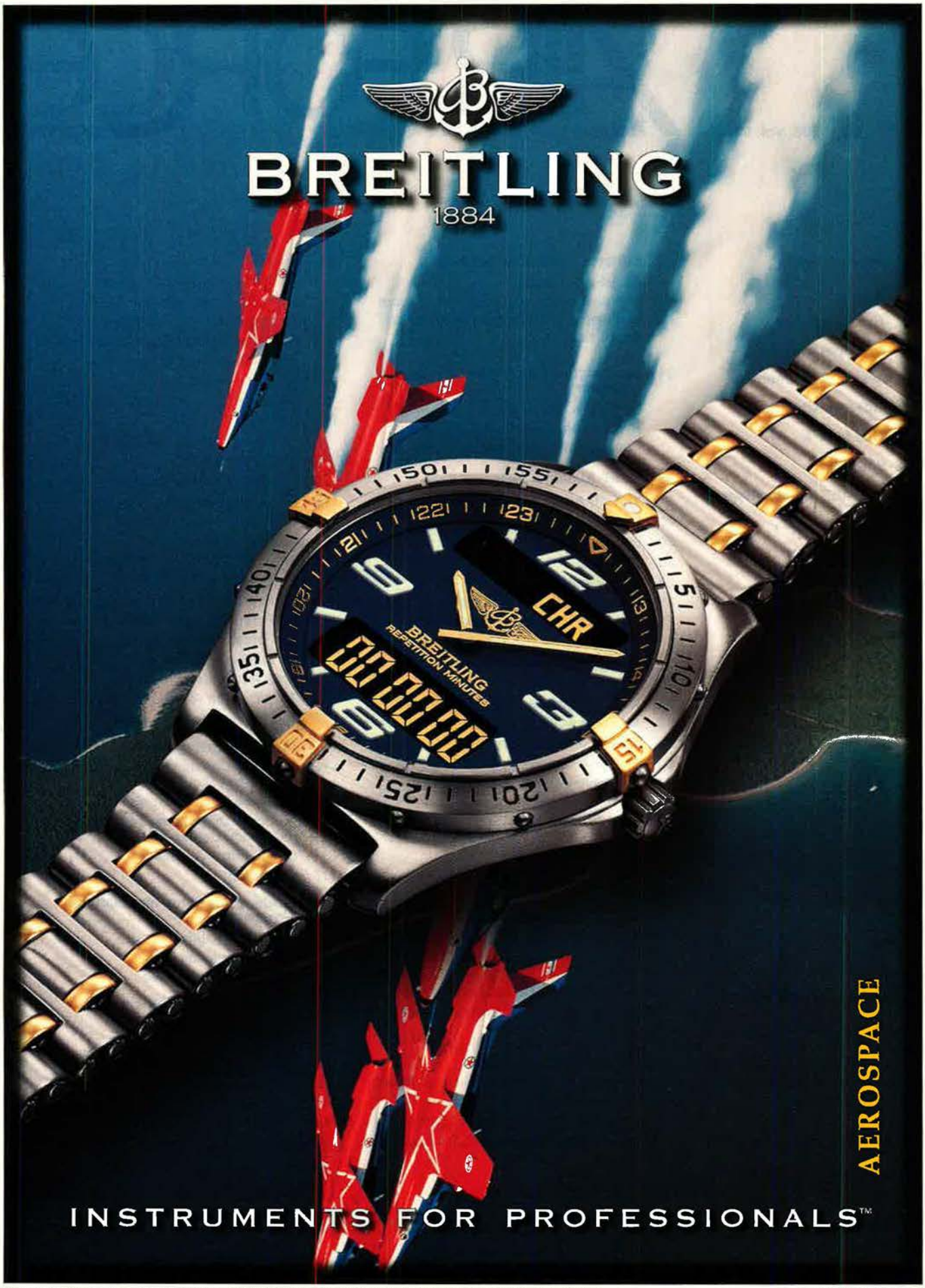

Editorial

By John T. Correll, Editor in Chief

The Faith Not Kept

In late February, the Senate voted, 91–8, to restore the military retirement system that had been in effect before the devastating "Redux" legislation of 1986. Redux, along with several smaller changes that were adopted previously, cut the lifetime value of the 20-year retirement program by about 25 percent for people who entered service after the measure was enacted.

This year, with retention problems on the rise, the Joint Chiefs of Staff made restoration of the retirement system the top priority in their budget request.

There is opposition, though. The Congressional Budget Office, the *Washington Post,* and various others say that repeal of Redux would be a mistake. It would cost a great deal of money and it might not cure the retention problems. They say that Redux would not even be an issue had the service chiefs not made it one by pumping up the expectations of the force.

Indeed, abolishing Redux probably won't cure the problem in a single stroke. The problem is bigger than that. It encompasses such things as frequent family separations, pay inequities, and the perception that the government no longer understands or cares much about the hardships, privations, and stresses of life in the armed forces.

One short-notice deployment follows another to distant operations in which the nation's interest is marginal. The sacrifice that this demands from service members and their families seems to be expended almost casually.

The relationship of faith and trust that military people once had—or thought they had—with the nation they served is all but gone. If the CBO and its colleagues do not believe that Redux was one of the main rocks in the landslide, they are wrong.

Redux was largely the handiwork of Les Aspin, then chairman of the House Armed Services Committee and later Secretary of Defense. He regarded the military retirement system as a "boondoggle," especially the benefits for those who retired after 20 years of service.

It is popular now to claim that the goal of Redux was to retain people for more than 20 years, but the explanations in 1986 were about saving money. The services had no real difficulty in keeping people beyond 20 years. The more frequent problem in those days was an excess of older veterans blocking mobility for those below them in the ranks.

The problem is bigger than Redux, but that was one of the main rocks in the landslide.

The purpose of Redux was to save money, and the justification given for doing it at the expense of military members was that their retirement program was "too generous."

Too generous compared to what? The comparison most readily at hand for military people was with the benefits of Civil Service personnel who worked alongside them. Job for job, the civil servants—who hardly ranked among the privileged classes themselves—made more money, had more regular hours, and were not subject to being sent to faraway places with strange sounding names. Comparison with private sector employment in general produced even starker differences.

The standard explanation had always been that the civilians did not have the great deferred benefits of the military member, such as the superb retirement program and free medical care for life.

Redux took the heart out of the retirement system. Then the government announced that it was unable to keep the promise on health care for life. The best it can offer retirees (and many active duty families) is Tricare and the troubles by which it is still besieged. The medical program that civil servants and members of Congress have—the Federal Employees Health Benefits Program—is not open to military people. Among other reasons, it is said to be too expensive.

At present, the spotlight is on Redux. The leading objection to repealing it is the cost—some $6 billion over the next six years. But if that is too great an expense for the entire United States with its population of 272.1 million, consider the proportional impact on the 1.4 million members of the armed services of the same $6 billion levied as a Redux penalty.

The *National Journal* recently interviewed Bob Emmerichs, who as Aspin's top aide in 1986, was largely responsible for the crafting of Redux. Emmerichs thinks the reduced benefit now in effect is still too generous. As for going back to the old system, he says that would be "throwing money down the rat hole."

CBO also found the Senate's proposal for a 4.8 percent military pay raise next year objectionable. CBO doubted that any pay gap with the private sector really exists, adding that "the whole notion of relying on a pay-gap estimate to set pay raises is inappropriate." The attitude shines through like a beacon.

Not that anybody planned it that way, but in effect what the government did in Redux and similar actions was to substitute accounting and sharp practice for leadership and good faith.

The decision that Congress will make this year is not just about the restoration of what was once the No. 1 military retention benefit. It is also about restoring a relationship between the military people and the nation. It is the first step—and a big one—in the process, and it is important that this time we get it right. ■

Letters

letters@afa.org

Blood in the Scuppers

If it was Rebecca Grant's intention to douse the flames of interservice rivalry in her March article, "The Carrier Myth" *[p. 26]*, it seems she succeeded only in adding another log to the fire.

The myth that she "uncovers" goes something like this: Aircraft carriers unfairly dominate action-hungry TV broadcasts during crises; the Navy promotes flattops whenever possible and this somehow constitutes an explicit attack against the Air Force and its F-22 fighter, B-2 bomber, and F-117 attack jet crown jewels.

Her argument goes one air-refueling tanker bridge too far.

If self-love among the services was really a crime—the Navy's sole offense, here—there are more than enough press releases, speeches, and Congressional testimonials generated daily in Washington to convict the Air Force, the Marine Corps, and the Army several times over.

Gathering this evidence as proof of a pernicious myth is about as useful as herding clouds. The fact is that not only are aircraft carriers no replacement for land-based airpower—*when present*—but no reasonable naval officer would or should claim otherwise. Land-based airpower—*when present*—always trumps Navy and Marine Corps air for sustained sortie generation and, for the foreseeable future, with all-aspect stealthy strike aircraft.

Conversely, the Navy will always trump the Air Force when it comes to access—with two exceptions. Not all future conflicts will lie within a carrier's reach. And Navy carriers may one day find themselves vulnerable to increasingly fast, accurate, and lethal anti-ship cruise missiles now being sold worldwide like grain.

Contrary to the author's underlying contention, the Pentagon does not exist in a zero-sum universe in which one service builds only upon another's ruins. Proof of this comes in the collective gains made by the Joint Chiefs of Staff when they finally united in 1998 on the topic of overused personnel and equipment. Consequently, talk now centers on not whether to boost defense spending, but by how much.

On the eve of a new century, there are enough real targets for all to engage, overseas and in Washington. For example, Navy and Air Force backers ought to join together in explaining why the F-22 and F/A-18E/F are both needed to replace aging inventories. Military experts like Grant ought to lock-in on real targets like this instead of the chaff found inside the Pentagon.

Ernest Blazer
Arlington, Va.

■ *Blazer is a senior fellow at the Lexington Institute, a nonprofit, public-policy think tank in Arlington, Va.*—THE EDITORS

I am struck by the assertion that the Navy claims to be able to act alone in future wars. The Navy does not claim to be capable of winning a major theater air war by itself, much the same as the Marine Corps does not claim to be a heavy land force. Rather, the synergy the two forces provide is a significant enabler of joint and allied force projection.

Grant takes issue with the requirement for 12 aircraft carriers and the resultant "gap" in theater coverage. Unfortunately, even the Secretary of Defense recognizes the need for more carriers to avoid "gaps" in presence. To maintain carriers forward deployed in three theaters at all times, the Navy would need 15 carriers. However, 12 allows two theaters to be covered at all times while limiting deployments to six months and supporting depot-level maintenance of the carrier.

The numbers arguments made of sorties generated during Operations Desert Storm, Deliberate Force, and Desert Fox refer to operations generated from existing land bases where a fixed logistics infrastructure was established and the force was allowed to build up over a significant period of time. The ability of the Air Force to generate the same number of sorties from an expeditionary field, where it must carry all of its logistics with it, remains to be tested. On the other hand, carriers operate daily in all of the world's oceans with their own logistics, fuel, and ordnance ready at a moment's notice. This "infrastructure" is not dependent on foreign basing rights or overflight rights. The carrier can rearm and refuel at sea while conducting strikes. Additionally, in Bosnia, the Navy flew the assigned missions, which is not necessarily reflective of the total capacity for missions.

Grant also takes issue with the fact that the number of carrier-launched sorties diminishes as a function of distance to the target. Certainly the time–distance problem comes into play. I am not sure, however, that land-based air without adjacent nation basing support can generate more sorties (El Dorado Canyon strike in Libya, for example). The turnaround time for a carrier 50–100 nautical miles from the coast is still significantly less than for an intercontinental B-52, B-2, B-1, or F-117 flying at subsonic speed.

An additional quality of carrier-based air is numbers. The Air Force only plans to buy 21 B-2s and has 54 F-117s. If all are operational on a given day, it is only slightly more strike aircraft than one carrier air wing and ignores the obvious need for phase and depot maintenance. Moreover, stealth is a significant force multiplier but it has its limitations. Once detected, the F-117 and B-2 are vulnerable to optically guided systems, resulting in an operational employment scheme that requires nighttime operations. To compensate for a shortfall in stealth, the Navy employs Toma-

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Editorial afmag@afa.org

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Executive Editor
Robert S. Dudney

Senior Editor
John A. Tirpak

Associate Editor
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Juliette Kelsey

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Advertising Director
Patricia Teevan
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Telefax: 703/247-5855

Industry Relations Manager
Nicola C. Whitlock • 703/247-5800

US and European Sales Manager
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Letters

hawk cruise missiles to neutralize air defenses.

The article also makes numerous assertions without supporting them. It states that all of *Nimitz's* targets were within 200 nautical miles of the carrier during SURGEX '97. It then assumes that the majority of the targets in a conflict would not be within that radius, when in fact 70 percent of the world's population lives within 200 miles of the coast. The corresponding infrastructure and command-and-control nodes form the basis of the target set. By virtue of its continued command of the seas, the Navy has been able to focus its attention on land where future target sets are located and to directly assist our sister services.

In summary, the Navy is pursuing stealth technology, but to meet the demands of today and the majority of the projected threats, numbers also matter. The ability to generate sorties depends on both the number of aircraft available and the proximity of the operating base to the target. Freedom of the seas guarantees access, and combined arms can somewhat compensate for stealth. The Navy is an enabler for CONUS power projection but it cannot win a major theater war by itself; but neither can the Air Force. Therefore, future wars are planned as joint operations in recognition of this fact.

Cmdr. Kevin P. Newmeyer,
Strategy and Policy Division,
Chief of Naval Operations
Pentagon

As former naval aviators, we were both entertained and irritated by "The Carrier Myth." This is a classic case of an engineer/analyst operating independent of the real warfighter, spouting assorted opinions based on an "interesting" interpretation or manipulation of the data. Her ideas miss the target by a country mile, and perhaps rightfully so, as the data used [are] not all-inclusive or indicative of actual service performance. The article is a feeble attempt at giving naval airpower a black eye and is useless as a tool from which to build future US tactics and doctrine.

Where's the "myth"? [Grant] states that "carrier effectiveness, though significant, has been inflated to mythic proportions." She cites as her only evidence, the TV coverage of the Navy's portion of the December Iraqi strikes and Rear Adm. [John B.] Nathman's comments crediting the Navy's presence with the cessation of Iraqi no-fly zone violations. As Grant states in her own article, because of persistent diplomatic problems with neighboring states, the Navy was the primary player for the strikes, which, by the way, were deemed by the Pentagon as highly successful. There's no myth here, just the facts.

Randy "Burger" King and Ken
"Duke" Weddington
Albuquerque, N.M.

The Navy most certainly did have an aircraft capable of autonomous delivery of [Laser-Guided Bombs] during Desert Storm. The A-6E dropped a majority of the LGBs delivered during the Gulf War by the USN and USMC. The Navy can hardly be tarred and feathered for being the only one behind the power curve on the value of LGBs back then. Only the 48th TFW and the 37th TFW really understood the value of LGBs when the war started. (As I understand it, the F-15E leadership was forced into using LGBs, which they hadn't trained with.)

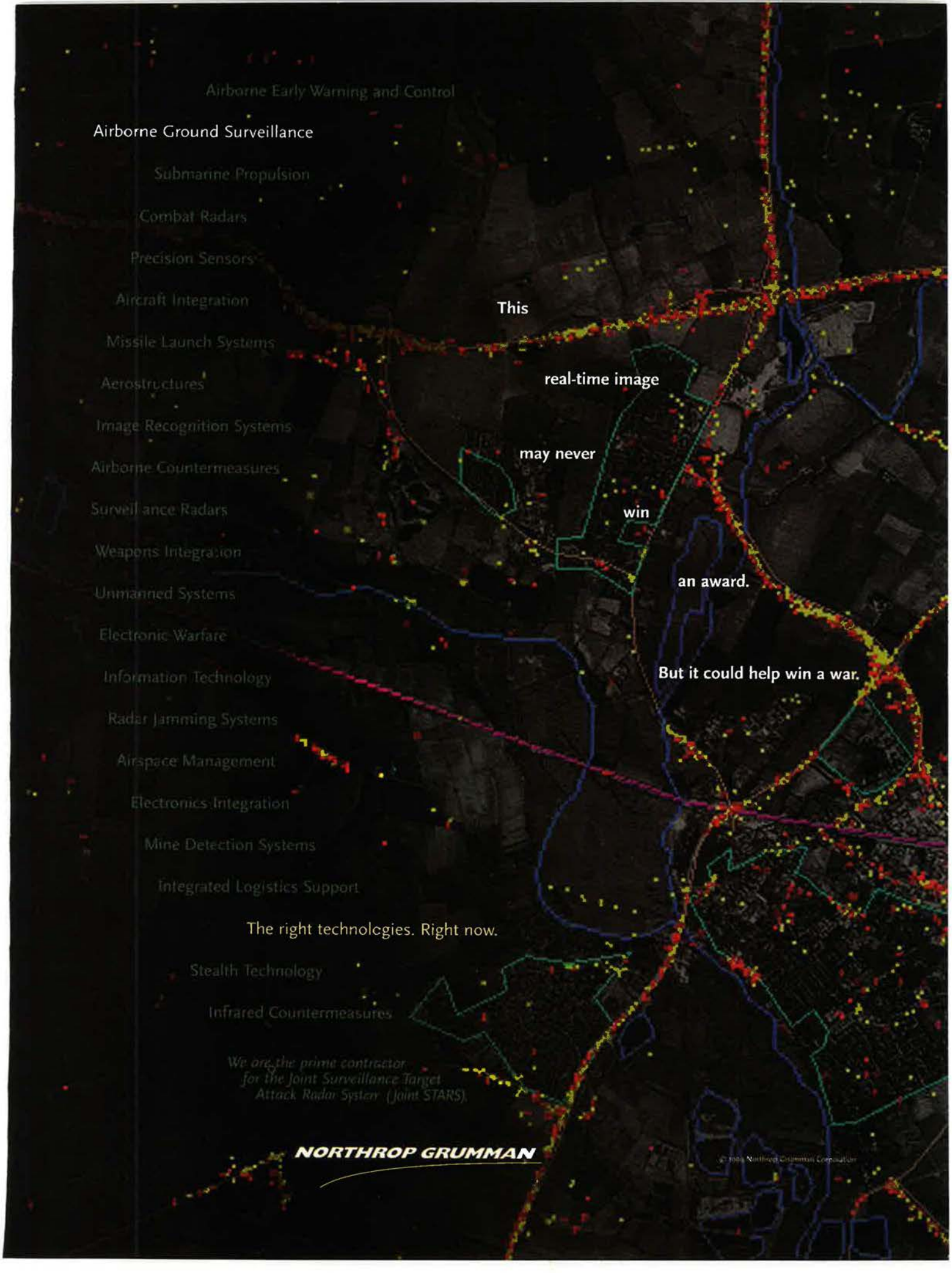
In addition, LANTIRN targeting pods were in short supply during Desert Storm. Likewise, almost none of the F/A-18's AAS-38 targeting pods were fitted with lasers. Now LANTIRN targeting pods are plentiful and the AAS-38 pods have lasers. Also, the F-14 has become a very capable strike fighter.

As any operator past or present realizes, everyone (USAF included) conducts operationally irrelevant exercises focused on generating sortie count. Having led more dusk-to-dawn mission planning cells than I care to remember, I can assure your readers that the Air Force uses those, too, allowing less-experienced crews to fly more sorties without wasting crew rest time with planning chores. When push comes to shove, I don't care about the "sortie" count, only about the "targets killed per sortie" count. As near as I've been able to tell, everyone does about the same with LGBs, about 80–85 percent per bomb.

Stealth is a nice thing, and I'm glad we have it. However, drawing the conclusion that the Navy "will be unable to perform many critical wartime missions" is a reach. Stealth has some crucial applications, but many nonstealthy aircraft continue to perform quite adequately without it, including the F-15 and F-16. There are other ways to accomplish some of those high-threat missions, including cruise missiles and other standoff weapons.

Maj. Jim Rotramel,
USAF (Ret.)
Lexington Park, Md.

"The Carrier Myth" was right on the mark and a perfect example of the type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of information that needs to be uncovered and published concerning the often inflated capabilities of the aircraft carrier. I have participated in a number of joint exercises and recently had the opportunity to spend a month aboard an aircraft carrier during [one]. I witnessed firsthand the limited amount of sorties the carrier could launch, devoted to striking targets on land, and the limited range those aircraft had. It amazes me that naval airpower proponents continue to make ridiculous claims of not only being able to provide the large number of aircraft to conduct a full-fledged air campaign, but to also provide command and control for a campaign by being the [Joint Force Air Component Commander], where their ability is limited as well, due to differences in doctrine and procedure from a land-based JFACC.

The aircraft carrier is definitely an impressive and outstanding force, but its abilities are very limited and specialized. Navy claims are usually followed by the argument that their forward presence allows them to project airpower quicker and with greater ease than the Air Force since they do not need to contend with overflight restrictions or basing agreements with foreign nations. Nothing could be further from the truth. While basing rights could pose a problem for the Air Force, USAF has proved time and time again that it can hold virtually any target in the world at risk with its larger numbers of aircraft and ordnance stationed in CONUS. The concept of the new AEF further emphasizes this point. In my opinion, the crown jewel of the carrier battle group is not the carrier but the multitude of ships which surround it with their capability to launch the Tomahawk Land Attack Missiles. Battle groups are an excellent weapon for presence operations or limited (small) air campaigns.

1st Lt. Gregory Subero,
Barksdale AFB, La.

I must agree with my former skipper, Rear Adm. John B. Nathman, when he speaks on the no-fly zone violations. Nathman has been there as commander of the F/A-18 squadron VFA-132 in USS *Coral Sea* during the Libyan fracas. (By the way, it was the USN who triumphed here, as they were on scene, whereas the Air Force had to fly all the way in from bases in England.) The point is, carriers can be there immediately capable of action, being self contained. Air Force planes are required to rely on maintenance and logistics support which is not immediately available. In the final analysis, both Air Force and [USN] aviation are indispensable over the long haul. The denigration of one service by the other serves no one and can be harmful to national interests.

Dr. William R. Gardiner (Ph.D)
Zacata, Va.

Those UCAVs

I read with great interest John Tirpak's article, "UCAVs Move Toward Feasibility," *[p. 32]* in the March issue. The author responsibly captured the pitfalls and promises of robotic air vehicles. What the article does not capture is twofold: First, the biggest obstacle facing the military is that integration of robotic airborne systems requires cultural and philosophical acceptance of the pilotless concept in a field where the bulk of the expertise resides among the pilot cadre. I found it interesting and frustrating that the UAV development teams consisted almost entirely of non-aviators. One need only look at the evolution of flying safety, and all the attention placed in the area of pilot responsibility, to realize that flying large machines is not something to be taken lightly.

Second, these prototype UAV programs have enormous budgets. The article does not capture the fact that in today's scaled down DoD fiscal environment, money spent on new-start programs usually comes from an existing program, often leaving current systems underfunded. What the article might have suggested is that there could be alternative and less costly, albeit less flashy, systems concepts that could outperform any UAV concept at lesser cost.

Maj. Greg Lamb
Vance AFB, Okla.

I was dumbfounded by the name "uninhabited" in place of what I had always heard as "unmanned." What a cumbersome and obtrusive way to bring political correctness to the Air Force! The word "uninhabited" implies that a place or thing that is capable of being lived in is not currently being lived in. As UCAVs are not capable of being occupied by humans, the descriptors "uninhabited" or "unoccupied" would seem inappropriate. "Unmanned," on the other hand, does not mean that the place or object is not occupied by a male human being but that no one (male or female) has been assigned a place.

So how did this corruption come about? Somebody somewhere with a [politically correct] mentality incorrectly assigned a masculine gender to the gender-neutral adjective "unmanned."

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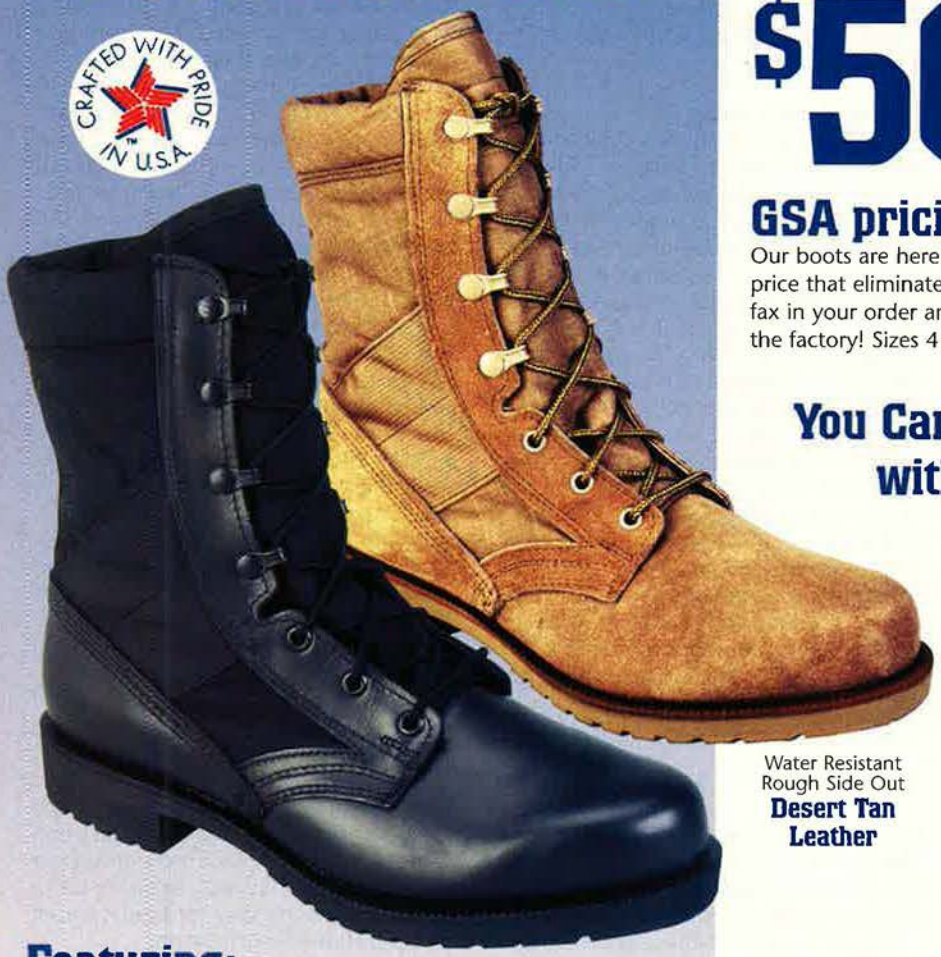

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Letters

Somebody else of unimpeachably high rank, general officer or civilian bureaucrat, within the Defense Department signed off on it with the best of intentions, however ill-informed.

Lt. Col. Gary L. Peppers
Columbus, Miss.

■ *Quoting from USAF's* New World Vistas, *"We use the term 'uninhabited' rather than 'unpiloted' or 'unmanned' to distinguish the aircraft enabled by the new technologies from those now in operation or planned. The 'unmanned' aircraft of the present have particular advantages, such as cost or endurance, but they are either cruise missiles or reconnaissance vehicles. The 'uninhabited' combat aircraft (UCAV) are new, high performance aircraft that are more effective for particular missions than are their inhabited counterparts."*—THE EDITORS

History on Canvas

Reference the [Charles J.] Kuderna painting *["History on Canvas," March, p. 48]* of the Nagoya [Japan] typhoon: The year is wrong, the weather is wrong, and the floodplain depiction is wrong. I was a member of a small Air Force team at the time (September 1959), assisting the [Japanese Air Self Defense Force] 3d Wing in upgrading to the F-86D at Komaki AB near Nagoya. As I recall, there was no "rush ... racing to Nagoya." No US rescue forces arrived at the scene until at least two days after the storm, by which time the skies were crystal clear. The US Navy, in the form of the [anti-submarine warfare support] carrier USS *Kearsarge* anchored in Nagoya Harbor, provided the preponderance of relief, along with small USAF and Marine units. The flooded areas, while extensive, did not penetrate near the castle.

Lt. Col. Thomas O. Gamble Jr., USAF (Ret.)
Santa Rosa, Calif.

■ *You are correct on the year. The* World Almanac *lists the date as 1959, not 1960 as stated in the USAF caption. We also erred in using the term "racing" to depict the action in this painting. However, "racing" was the image evoked in the artist's depiction of events. The original caption stated that USAF helicopter rescue forces "swarmed into the disaster area to pluck survivors out of the water, off rooftops, and from the dikes."*—THE EDITORS

El Dorado

Regarding Walter Boyne's article, "El Dorado Canyon" *[March, p. 56]*, may I offer some Navy input for the record? Instead of just one EA-6B flying in support of the operation, multiple Prowlers jammed for both the Air Force and Navy attackers. I write this from the perspective of having been in one of those EA-6Bs and to suggest that the operation was even more joint in execution than stated in the article.

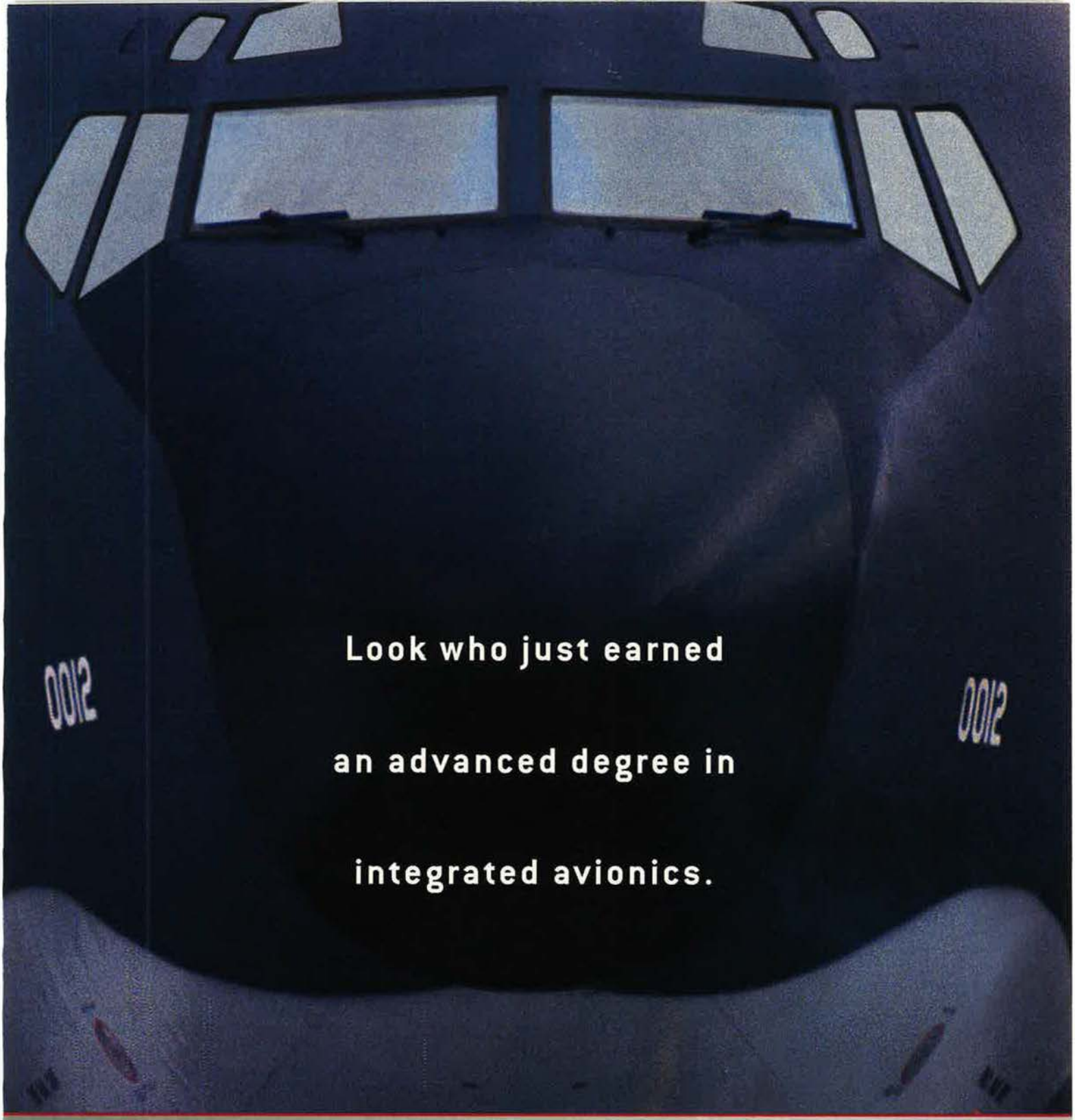
The Benina/Benghazi strike had three EA-6Bs for support (two USN aircraft from USS *Coral Sea,* and one USMC aircraft from USS *America*). I believe two Marine Prowlers from the *America* supported the Air Force attack on Tripoli. Prowlers did not fire HARM missiles as the aircraft had not yet received that capability. Navy and Marine F/A-18s from the *Coral Sea* fired HARMs and then transitioned to combat air patrol duty. The *Coral Sea* air wing had two E-2s providing airborne early warning and an EA-3B providing signals intelligence support. Additionally, there was an Air Force Rivet Joint aircraft airborne. I do not recall if *America's* E-2s participated.

As for the question on whether the Navy could have conducted the entire operation on its own, I suppose that the answer will always be colored by what uniform you're wearing. Between the two carriers there were over 30 A-6Es present; the weapons loadout and capabilities of the Intruder and the F-111F were very similar. (The F-111s did have a speed advantage over the A-6s.) Perhaps, though, we are focusing on old, unnecessary arguments. The point is that US Air Force and Navy aircraft conducted successful simultaneous strikes, with joint support, made all the more impressive given the long round-trip flight that the "Varks" had to conduct.

On a personal note, I had the good fortune a few years later to serve with many of the Air Force officers who participated in El Dorado Canyon when I was on an exchange tour at Mountain Home AFB, Idaho. Boyne certainly has it correct that we, Air Force and Navy both, used our Libyan experience in helping pave the way for later combat in Operation Desert Storm.

Cmdr. Fred Drummond
Lexington, Mass.

Boyne's article on the Libya airstrikes is excellent. His reference to "collateral damage, with one bomb landing near the French Embassy" seems in error. At the time, the French press actively reported this event and broadcast video of the bomb wreckage on the embassy grounds. I recall Penta-



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gon press reports stating that American pilots had not damaged the French Embassy, as American aircraft did not overfly the embassy. A year later, as an intelligence applications officer at [the Defense Intelligence Agency], I met several intelligence analysts who had examined the French video. They contacted their French counterparts and asked two questions, "Why are the markings on the bomb wreckage in Cyrillic, not English?" and "Why does the bomb wreckage look an awful lot like a Russian–manufactured SA-2 surface-to-air missile?" French intelligence purportedly confirmed the fact that the French Embassy was "bombed" by a jammed Libyan surface-to-air missile. Correspondingly, the French press suddenly dropped the story.

Paul Nanko
Burke, Va.

I felt compelled to mention a little-known action that was, I believe, the precursor to the main strike. I am referring to Operation Ghost Rider, which took place in October 1985.

This operation consisted of several squadrons of F-111E aircraft, fully loaded with live munitions, departing RAF Upper Heyford, UK, in the early morning hours and flying nonstop to an undisclosed site in Canada, delivering their load, and returning to England. This was to test the endurance of pilot and plane, since the F-111A/E/F models were tactical in nature and flying a sortie of such duration had not been done in the past. This also allowed support activities, such as tanker support, to be tested. It is also interesting to note the distance flown on this operation closely matches that of Operation El Dorado Canyon. Coincidence? I don't think so.

Ray O. Lindsley Jr.
Spokane, Wash.

The proud unit that won the David C. Schilling Award for tanker support on the El Dorado Canyon mission was the 306th Strategic Wing; there was no 300th Strategic Wing. I was the deputy commander for operations of the Strat Wing at the time. Tankers not only saved time and eased navigation but—because none of our "allies" along the route would allow use of their territories to launch tankers—it was the only possible way the EF- and F-111s could get to the targets and back. Tankers were and continue to be key in the success of long strike missions and along with the F/EF-111s did their job—praise, citations, or not.

Col. Joseph A. Price III,
USAF (Ret.)
Altus, Okla.

■ *We failed to catch the error.*—THE EDITORS

Lucky Lady II

I enjoyed "Lucky Lady II" *[March, p. 72]* by Bruce Callander and vividly recall the historic landing on March 2, 1949, after the round-the-world flight. It seemed as if everyone stationed at Carswell [AFB, Texas] was on the flight line that morning as word had gotten around that something really big was brewing. This was confirmed when we saw all the generals appear, followed by buses loaded with people from the news media. I must differ with Callander on one statement, however. He wrote [that] the long-range B-36 bomber was in development. That is not altogether correct as the first B-36 was delivered in the summer of 1948 to the 436th Bomb Squadron, 7th Bomb Group, the unit to which I was assigned.

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

As one who proposed the first nonstop aerial refueled flight around the world some two years before the Air Force awakened to its potential, I read with interest "Lucky Lady II." However, I must take umbrage with his statement that it was not a breakthrough in technology. This one flight shook up military aviation like no other. LeMay, albeit belatedly, became aerial refueling's No. 1 proponent. The Soviet Union was no longer out of the range of American airpower. Too bad the Air Force was unable to recognize the potential for this technology during the Pacific War, when B-24 pilots literally begged for the opportunity to strike Japan from Midway Island, 2,200 miles from Tokyo. This would have required single-airplane nighttime bombing that was so successful after formation bombing failed so miserably.

Aerial refueling was an American first, thanks to Lt. Godfrey Cabot of the US Navy who skimmed down the Potomac in 1920 and grabbed a can of gasoline off a sea sled. It was the Army's Lts. [John] Richter and [Lowell] Smith who flew [a] nonstop flight from Canada to Mexico in 1923 that should have alerted everyone to the potential of this technology, especially their commanding officer, one Maj. H.H. "Hap" Arnold. The Air Force tried several attempts at in-flight refueling during World War II, mainly with the British system, but technical difficulties with the in-air hookups ended in failure. The B-24 system would have had the tanker and receiver take off and fly, joined by a loose cable so the difficult in-air hookups would be eliminated. Giving credit where it is due, we owe the Brits a great deal for conducting aerial refueled flights after [the war] using B-24s. It was this British technology that came to our rescue when Gen. [Joseph T.] McNarney wrote in 1948 that it was absolutely imperative that we obtain in-flight refueling capability. Lucky for him the Brits had given up on aerial refueling and had some rusty old equipment available at bargain prices.

William J. Spelliscy
Orange, Calif.

I noticed that in the article you intimated that Spaatz had set a record for flight duration for more than 150 hours. I would like to draw your attention to the fact that Col. Al Key and his brother, Fred, stayed aloft for 653 hours, 34 minutes, for over 27 days in the Curtiss–Robbins monoplane *Ole Miss* in 1935. This aircraft is on display at the Smithsonian's Air and Space Museum.

TSgt. Richard E. Kotynia,
186th ARW (ANG)
Meridian, Miss.

I have no doubt the mission started

and ended at Carswell AFB; however the photo on p. 73 clearly shows the Santa Catalina Mountains in the background. This view could only have been taken at Davis–Monthan AFB, Ariz. As for the air refueling, I was used to seeing the flying boom operations at Castle AFB, Calif. I was transferred to Davis–Monthan when the 303d Bomb Wing was reactivated in October 1951. I was somewhat surprised by the older hose operations used there.

TSgt. John A. LeGault,
USAF (Ret.)
Montrose, Colo.

More Pieces

In the March issue you published my letter *[p. 10]* about tests of the P-75A. When I saw it in print I realized I had misspelled the name of Maj. Harry Bolster—not Bolton as I wrote it. In respect to his memory, I wish to correct this mistake.

Lt. Col. Allen S. Webb,
USAF (Ret.)
Lynn Haven, Fla.

"A Class by Itself" *["Pieces," March, p. 88]* stated that Maj. Jerome F. O'Malley and Maj. Edward D. Payne flew the SR-71 on its first operational sortie in March 1968. I question the 1968 date as I was in the 305th Bomb Wing, equipped with the B-58 Hustler, and in 1965 and 1966 the wing was shipping pilots and navigators to the SR-71 wing in California. My navigator, at the time, Maj. Tom Schmittou, was one of the initial crew members to go. I do believe that Jerry O'Malley flew the SR-71 on the first operational sortie at a much earlier date.

John S. Williams
Fort Worth, Texas

■ *Several historical references on the SR-71, including the Air Force Museum which is home to this particular Blackbird, refer to the first operational sortie in March 1968. The sources vary on the exact day, but the month and year seem firm. The mission was flown out of Okinawa, Japan, over North Vietnam.*—THE EDITORS

The Chart Page

By Tamar A. Mehuron, Associate Editor

Of Honored Memory

World War II Casualties

	Battle Deaths	Non-Battle Deaths	Wounds Not Mortal	Number Who Served	Ratio of Battle Deaths to Number Who Served (%)
Army Air Forces	52,173	37,856	17,359	2,244,000	2.33
Army	182,701	45,544	548,502	9,016,000	2.03
Navy	36,950	25,664	37,778	4,183,466	0.88
Marine Corps	19,733	4,778	68,207	669,100	2.95
AAF Percentage of Total	17.89	33.25	2.58	13.93	

The Heavy Toll of Two Battles

		Number Involved	Combat Deaths/ Aircraft Lost	Attrition Rate
Ploesti, Romania, Aug. 1, 1943	**Personnel**	1,770	532	30.10%
	Aircraft	177	54	30.50%
Schweinfurt, Germany, Oct. 14, 1943	**Personnel**	2,290	599	26.20%
	Aircraft	229	67	29.30%

Source: Air Force Memorial Foundation

Aerospace World

By Peter Grier

USAF Grapples With F-22 Costs

Air Force officials say that they have been hit with nearly $1 billion worth of F-22 fighter cost increases.

They hasten to add that they believe they can still complete the Raptor program without busting a Congressionally mandated cost cap, due to budget flexibility.

The price rises are reflected in a $312 million increase in the Air Force's 2000 budget request for the F-22 and a projected $667 million in further increases noted in a recent preliminary General Accounting Office report.

Lt. Gen. Gregory S. Martin, principal deputy assistant secretary of the Air Force for acquisition, noted these figures at a March House hearing—though he added that the $667 million in outyear hikes was only an estimate.

Air Force planners are aiming to bring the F-22 research and development program to a close under an $18.6 billion cap.

The flight test program might be one area of savings, said Martin, since the airplane is performing so well. If further penny-pinching is necessary, service leaders have already decided to delay the F-22's certification of external weapons carriage.

Avionics delays are one factor driving Raptor costs up, according to the GAO. Past problems in manufacturing the titanium castings which connect wings and other body parts have also contributed.

The F-22 is not the only tactical aircraft program currently under the budget microscope.

The GAO also reports that it does not accept the Navy's assertion that the F/A-18E/F program is on schedule and within cost. The Navy's conclusion "reflects the projected aircraft performance, not the actual performance being demonstrated in flight tests," Louis J. Rodrigues, GAO director of defense acquisition issues, told Congress in March.

Boeing Joint Strike Fighter Passes Review

On Feb. 24, Boeing announced that its entry in the Joint Strike Fighter competition passed its third formal Defense Department review with flying colors.

"The program is on schedule, on budget, and has the ability and will to fly two demonstrators," said Richard D. Hearney, Boeing's vice president of military aircraft and missile systems group.

The program is 56 percent finished, on a cost basis, with only a 5 percent cost overrun, said Boeing officials.

Recently, Boeing changed its X-32 JSF design, adding horizontal tails, a modified wing trailing edge, and an aft-swept inlet. The changes should not mean that the program cannot meet military specifications, said Boeing.

The Pentagon is expected to select either Boeing's X-32 or Lockheed Martin's X-35 for its JSF in March 2001. The winner will land a huge prize: a program that could be worth $300 billion if all 6,000 projected aircraft are eventually built.

Air Force Defends Airborne Laser

Air Force officials are defending the Airborne Laser program against charges the program faces too much technological risk. The system is also known as the YAL-1 Attack Laser.

A restructuring that stretches the program by a year and adds more risk reduction testing should take care of the problem, according to service and contractor officials.

Continued on p. 18

Boeing Offers More C-17s, Lower Price

Boeing offered to sell the Air Force a new batch of 60 C-17 transports at a cost 15 percent below current contract prices.

The offer, if accepted in full, would increase the ultimate size of the C-17 fleet from 120 to 180 aircraft. At present, the service has 120 of the advanced airlifters either on the ramp, in construction, or under contract for future delivery.

In addition, USAF has previously stated its requirement for 15 C-17s beyond the 120 and has included funding for all but one of them in the Fiscal 2000–05 defense plan.

The Air Force currently is buying the advanced airlifter under a multiyear contract. The 60 new airplanes would carry more fuel, which would increase their range and payload.

The offer was made to give the Air Force "real numbers" to work with in the preparation of several ongoing mobility studies, such as Mobility Requirements Study–05, set to be completed late this spring, according to Boeing's Stuart Thomson, vice president for business development.

The Air Force is reassessing the lift requirement in light of the true pace of operations since the end of the Cold War. It is planning a major rehabilitation of the C-5 Galaxy fleet, to include re-engining.

Thomson said production of long-lead items for the C-17 begins shutting down in 18 months. By considering the cost data now, he said, the Air Force can make an informed choice about putting more airplanes into "the normal process of the [program objective memorandum] development" rather than as a "crisis action" when the production line starts to close.

Under the proposal, the average flyaway price of each additional C-17 would be $149 million, a figure that includes the cost of government-furnished engines. Under the existing C-17 contract, the best single-airplane price is $198 million.

Both figures are in current dollars.

In addition, the airplanes would have additional fuel tankage of 10,000 gallons, or 67,000 pounds. The baseline C-17 carries 182,000 pounds of fuel.

The price quoted to the Air Force assumes maintaining production at 15 airplanes per year through 2006 and finishing out the buy with five in 2007, rather than in 2003, as is now planned. It also assumes that Boeing will be able to achieve further materials and process savings. The company is investing $275 million in manufacturing improvements, which Thomson said are expected to yield a 3-to-1 return in savings.

—John A. Tirpak, Senior Editor

To War in the Balkans

April 12, 1999

Relying on a formidable air armada, the US–led NATO Alliance on March 24 launched Operation Allied Force against Serb forces in Yugoslavia. The Allies mounted the air operation to end the crisis in Kosovo, a province where Serbs were committing atrocities against ethnic Albanians in a spasm of "ethnic cleansing."

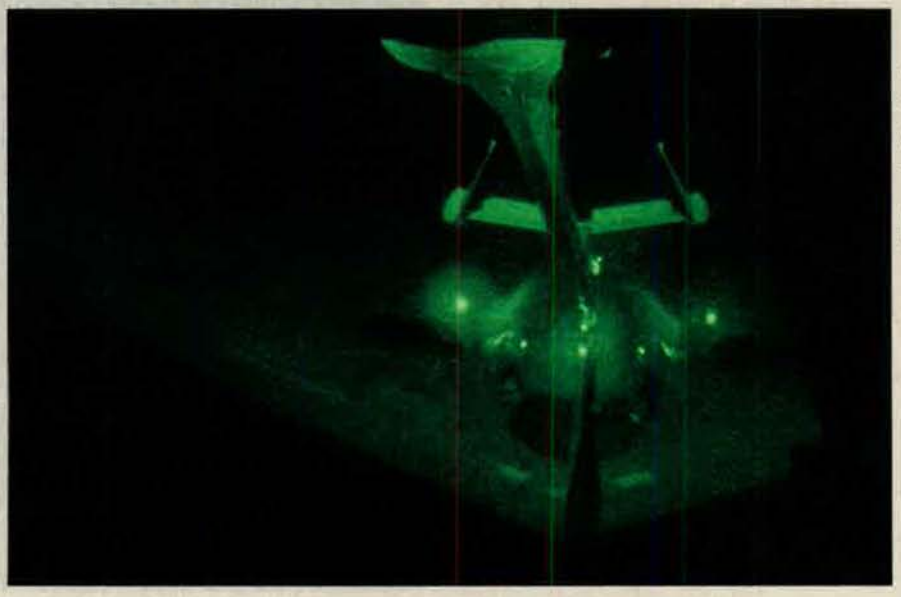
This marked the first time in NATO's 50-year history that the Alliance had conducted armed operations against a sovereign nation.

USAF photo by SrA. Jeffrey Allen

***Send-off.** A member of the 510th Fighter Squadron, Aviano AB, Italy, salutes an F-16 pilot about to launch a mission into Yugoslavia.*

USAF photo by SSgt. Efrain Gonzalez

***The Bone and the BUFF.** At RAF Fairford, UK, a B-52H sits on the ramp as a B-1B bomber lands. The two USAF heavy bombers played a major role in Operation Allied Force. B-52s forward deployed to Britain carried out precision cruise missile attacks on Yugoslav targets, firing the opening shots of the war. The B-1B, with a 42,000-pound payload, dropped cluster munitions on Serb forces in Kosovo. Allied Force marked the first time USAF has used all three types of bombers in a single conflict. NATO at the outset of the war publicly ruled out use of ground forces, and by the third week of the war, NATO's air fleet had swelled to some 600 fighter, bomber, transport, and special-purpose aircraft, the bulk of them belonging to the US Air Force.*



USAF photo by SSgt. Ken Bergmann

***B-2 at the rendezvous.** USAF's newest combat aircraft, the B-2 bomber, went to war for the first time. On opening night of the war, two of the long-range stealth aircraft flew from Whiteman AFB, Mo., dropped 32 precision weapons on Yugoslav targets, and returned to base, completing a 30-hour trip. Here, a B-2 refuels from a KC-10 Extender after completing an Allied Force mission. KC-135R Stratotankers also played a key role in refueling operations.*

USAF photo by Kristina P. Cilia

Bound for the Balkans. Members of the 60th Aerial Port Sq., Travis AFB, Calif., throw a cargo net over palletized crates of tents. The shelters were used by ethnic Albanian refugees forced from their Kosovo homes. USAF mounted a major airlift of food, water, shelter, medicine, and other items needed to establish temporary camps for homeless thousands. This humanitarian mission, called Operation Sustain Hope, featured C-5s, C-17s, C-130s, and contract 747s. Overall AMC missions for Allied Force also included C-141s, KC-10s, and KC-135s.

US Army photo by Spc. Tracy Trotter

Requiem for a MiG. A NATO team surveys what's left of a Yugoslav MiG-29, one of two shot down by USAF F-15C fighters on March 26. The Fulcrums crossed into Bosnian airspace, possibly to attack NATO peacekeepers. The shootdowns brought to five the number of MiG-29s destroyed. USAF itself lost an aircraft—an F-117 stealth fighter, which was brought down on March 27. US forces rescued the pilot and returned him to Italy.

USAF photo by SrA. Jeffrey Allen

Eagle to the fight. For weeks on end, NATO warplanes streaked out of Aviano AB, Italy, headed for operations over Yugoslavia. F-15E Strike Eagles, such as this one, were sent against some of the toughest Yugoslav targets in the early going. Ground attacks were also carried out by F-16, A-10, and special operations aircraft, while E-3 AWACS, E-8 Joint STARS, Rivet Joint, and USAF spacecraft provided critical support.

A report by Gen. Robert T. Marsh, USAF (Ret.), sent to Congress March 18 concluded that ABL officials had outlined too little testing in such areas as atmospheric measurement. It endorsed the proposed program restructure, however, and spoke enthusiastically of the potential of the system.

If achieved, the ability to deliver lethal doses of electromagnetic energy from an aircraft onto distant targets at the speed of light will represent a truly revolutionary weapon in the nation's arsenal, said the Marsh study.

Peters Announces Humanitarian Mini-AEFs

On March 5, acting Secretary of the Air Force F. Whitten Peters announced the creation of five mobility Aerospace Expeditionary Force lead wings designed to carry out such humanitarian missions as delivery of relief supplies. The five will complement the 10 combat Aerospace Expeditionary Force lead wings and two on-call Aerospace Expeditionary Wings whose fighters and bombers will remain committed to national security missions.

The mobility AEF wings will draw many of their forces from the other AEFs.

It was the experience of helping out after Hurricane Mitch that caused service leaders to realize they needed humanitarian AEWs, said Peters. Such airlift efforts require a different set of skills than patrolling over Iraq or Bosnia.

EAF Wings in Three Flavors

USAF on March 5 announced changes in force structure affecting operating locations, people, and aircraft in the US and Britain. Included were identities of 10 Aerospace Expeditionary Force combat lead wings, five mobility lead wings, and two permanent on-call AEFs.

Lead wings are the heart of the Expeditionary Aerospace Force concept, scheduled to become operational by Jan. 1, 2000. The goal is to reduce the stress and strain of high optempo.

Aerospace Expeditionary Force Lead Wings (Combat)

No.	Wing	Base	Command
1	388th Fighter Wing	Hill AFB, Utah	ACC
2	7th Bomb Wing	Dyess AFB, Texas	ACC
3	3d Wing	Elmendorf AFB, Alaska	PACAF
4	48th FW	RAF Lakenheath, UK	USAFE
5	355th Wing	Davis-Monthan AFB, Ariz.	ACC
6	20th FW	Shaw AFB, S.C.	ACC
7	2d BW	Barksdale AFB, La.	ACC
8	28th BW	Ellsworth AFB, S.D.	ACC
9	27th FW	Cannon AFB, N.M.	ACC
10	1st FW	Langley AFB, Va.	ACC

AEF Lead Wings (Mobility)

1/2	43d Airlift Wing	Pope AFB, N.C.	AMC
3/4	60th Air Mobility Wing	Travis AFB, Calif.	AMC
5/6	22d Air Refueling Wing	McConnell AFB, Kan.	AMC
7/8	319th ARW	Grand Forks AFB, N.D.	AMC
9/10	92d ARW	Fairchild AFB, Wash.	AMC

On-Call Aerospace Expeditionary Wings

1	366th Wing	Mountain Home AFB, Idaho	ACC
2	4th FW	Seymour Johnson AFB, N.C.	ACC

USAF photo by SrA. Stan Parker

A1C Scott Richard (foreground) and SSgt. Gene Sukup, both of the 52d Civil Engineer Sq., Spangdahlem AB, Germany, secure the foundation for additional tents at Aviano AB, Italy, primary staging point for troops supporting Operation Allied Force.

National Missile Defense Legislation Advances

Both chambers of Congress in early March passed bills mandating deployment of a National Missile Defense system for the United States. Neither piece of legislation mentions a specific deployment date, but the Senate version does call for construction of such an NMD system "as soon as technologically possible."

The votes—97–3 in the Senate and 317–105 in the House—put more pressure on an administration that has proceeded down the NMD road in a more leisurely manner than many lawmakers would like.

The White House had to abandon a veto threat levied against the NMD bills after Democratic senators said such a veto would be hard to sustain—and after passage of amendments that link American NMD policy to continued arms talks with Russia.

The Clinton Administration has long

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planned to make an NMD decision in June 2000. If the decision is "go," a system could be ready by 2005, according to Pentagon estimates. First-generation NMD equipment would be intended to protect the US against limited missile launches and not an all-out attack.

NMD has been gradually gaining support in Congress as the potential threat of rogue nation ballistic missiles grows more apparent. North Korea's test of a Taepo Dong 1 missile over Japan, and intelligence reports that it will soon test a multistage missile capable of hitting some parts of the US, may have changed the minds of many missile defense opponents.

Sea-based NMD?

It is far from a forgone conclusion that any American National Missile Defense system will depend on land-based interceptor rockets. In recent months some Navy officers and outside experts have become increasingly outspoken about the virtues of sea-based NMD.

USAF photo by MSgt. Val Gempis

SrA. Christopher L. Bryer, an aircrew egress specialist, 35th Maintenance Sq., Misawa AB, Japan, performs cleaning and polishing on an F-16D canopy during its 36-month maintenance inspection. Bryer and about 150 other Misawa support personnel, along with eight F-16CJ Wild Weasel suppression-of-enemy air-defenses aircraft, deployed to Saudi Arabia recently to help enforce the southern no-fly zone in Iraq. The tour marks the fourth into the region for the 35th Fighter Wing.

The $90 Billion Minimum

"CBO estimates that DoD would need to spend about $90 billion a year to maintain steady-state procurement funding for today's force structure. ... DoD plans to spend much ess than $90 billion a year. Average annual spending in the Administration's six-year plan equals $62 billion, which is DoD's goal. Planned purchases do not equal steady-state procurement since they do not halt fleet aging. And planned funding is only two-thirds of the funding DoD would need to maintain its forces.

"The cost of steady-state procurement for DoD s sensitive to a number of assumptions, changes in which could raise or lower that cost. The estimate of $90 billion assumes that DoD will keep its major weapons longer than it has in the past. If DoD was unable to extend service lives as long as it plans, the estimate would be much higher."

From "Aging Military Equipment," a Feb. 24, 1999, report to Congress by Lane Pierrot, Congressional Budget Office senior national security affairs analyst.

Average Ages of Selected Equipment (In Years)

Type	Weapon Systems	Service	Midpoint of Planned Service Life	Average Age in 1999	Average Age in 2007
Missions Without Replacement Plans					
Tanks	M1 Abrams	Army	15	12	20
Shore-Based Maritime Patrol Aircraft	P-3C	Navy	15–20	23	31
Support Aircraft	E-2, EA-6B, S-3B	Navy	10–18	18	24
Bombers	B-52, B-1, B-2	Air Force	25–35	23	30
Tankers	KC-135, KC-10	Air Force	25–33	39	47
Missions With Replacement Plans					
Light Attack and Scout Helicopters	OH-58 Kiowa (Replacement: Comanche)	Army	10–18	21	28
Surface Combatants	DDG-51, DD-21 (Replacement: CG-47, others)	Navy	15–20	12	15
Multirole Fighters, Close Air Support	F-14, F/A-18, AV-8B (Replacement: Joint Strike Fighter)	Navy	10–15	13	16
Multirole Fighters, Close Air Support	F-16, A-10 (Replacement: JSF)	Air Force	10–15	12	19
Air Superiority Fighters	F-15A-D (Replacement: F-22)	Air Force	10–15	18	23

Source: Congressional Budget Office based on data from the Department of Defense.

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The $2.6 Billion Hole

When the latest Pentagon budget drill ended early this year, USAF wound up short of money for many validated requirements.

The Fiscal 2000 shortfall was $2.6 billion, by official count.

Cumulative Data	(in millions) FY 2000
Modernization items	$759.9
Readiness items	901.2
Infrastructure items	926.0
Total unfunded	**$2,587.1**

Modernization Item	FY 2000
ALCM to CALCM conversion	$69.1
B-52 radar upgrades	15.4
F-16 HARM targeting system pods	6.4
LANTIRN midlife upgrade equipment	10.6
F-16 Goldstrike program	14.4
Accelerate JPATS buy	85.4
Wind-corrected munitions dispenser	10.1
Communications	88.0
Space range modernization	60.5
60K loader acceleration	12.5
Special purpose vehicles	52.8
C-17 modifications	35.9
MILSATCOM terminals	23.8
B-2 Link 16	36.0
E-8 and E-3 computer/display upgrades	17.1
Global air traffic management	59.1
E-8 #14 procurement line shutdown	48.2
Classified program 2	2.0
Classified program 3	18.0
Science and technology	94.6
Unfunded	**$759.9**

In a Feb. 22 letter to Congress, Gen. Michael E. Ryan, USAF Chief of Staff, provided a list showing gaps of $760 million in modernization, $901 million in readiness, and $926 million in infrastructure. The list follows:

Readiness Item	(in millions) FY 2000
Spares inventory	$195.2
Initial spares	43.6
Engine modifications	16.5
Training munitions	146.8
AC2ISR Center programs	42.9
EFX/Joint Experimentation	60.4
Civil Air Patrol	7.5
NBC high-leverage funds	18.8
Rivet Joint #15–16/Cobra Ball 3	32.4
C-130J logistics and training	24.2
Depot maintenance to 90%	87.0
Mobility CLS contract	72.4
Sustaining engineering	95.4
ICBM prime contract	16.3
C-17 sustainability	41.8
Unfunded	**$901.2**

Infrastructure Item	FY 2000
Military family housing O&M	$205.0
Base operating support	169.9
Real property maintenance	360.0
Environmental clean-up funds	54.5
Communications infrastructure	74.0
ACALS sustainment	13.6
Real property support	49.0
Unfunded	**$926.0**

Such a system would expand on the current tracking and fire-control capabilities of Aegis cruisers and destroyers. Building on existing equipment could provide a near-term technical advantage, proponents say.

It might also make defensive sites more survivable, as the stealthiness and mobility of Trident missile subs make them harder to attack than land-based ICBM silos.

But cost is an issue. A recent Pentagon study asserted that a sea-based NMD system would cost $19 billion—almost twice as much as the $10.5 billion DoD has currently allotted for a first-generation land-based NMD.

A recent Heritage Foundation report claimed the $19 billion figure was excessive and put the cost of a sea option at $8 billion. Unlike DoD, Heritage assumed that existing Aegis ships would make up the backbone of the system, as opposed to new NMD–only craft.

One big stumbling block could be the Anti-Ballistic Missile Treaty struck with the Soviets in 1972. The ABM pact specifically prohibits sea-based defense missiles.

Army, Navy Open Recruit Door Wider

In recent months both the Army and the Navy have relaxed their educational requirements for enlistees. But the Air Force won't be following their lead—despite today's tough recruiting environment.

The policy remains that 99 percent of young people coming into the Air Force must either have a high school diploma or a General Equivalency Degree and at least 15 hours of college.

Without such an education, it is hard to master the high-tech skills needed to keep today's aircraft flying, say service officials.

The Air Force is maintaining this standard despite indications that it may not meet its annual recruiting goal for the first time since 1979. At the end of February, the service was 7.7 percent short of its month-to-month recruiting goals.

Things are even tougher for the Army and Navy. That is why both now allow up to 10 percent of their recruits to be high school dropouts who have an equivalency degree only.

A booming civilian economy is one reason recruitment is tough. But youngsters today are also less likely to accept the discipline and uniformity that a tour in the military requires.

Pay and pension increases now moving through Congress could help. Sen. John W. Warner (R–Va.), chairman of the Senate Armed Services Committee, has another idea: shorten enlistments, despite the fact that such a move would raise training costs considerably.

In a March letter to service chiefs, Warner urged them to consider reducing enlistment time from four years or more to 18 months.

The Army already allows two-year enlistments in a number of combat arms specialties. The Navy has a handful of two-year slots available. The Air Force, and the Marines, have continued to insist on a four-year minimum.

F-16 Crash Rate Rising

F-16 crash rates are rising again after years of decline, and worried Air Force officials can see no obvious cause for the spike.

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For the Record

"The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defense recognized by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic area."

—Article 5 of the Washington Treaty, basis of NATO, signed April 4, 1949.

Albanian Population in Southern Balkans

Albania	Pop: 3,400,000	Ethnic Albanians: 99%
Kosovo	Pop: 1,600,000	Ethnic Albanians: 81%
Macedonia	Pop: 441,000	Ethnic Albanians: 23%
Montenegro	Pop: 41,000	Ethnic Albanians: 7%

Source: National census of Yugoslavia, Albania, as reported in the *Washington Post*, March 24, 1999.

In 1996, the Class A accident rate for the lightweight fighter jet was a record-low 2.14 per 100,000 flying hours. In 1997, it climbed to 3.0 and in 1998 to 3.89. As of mid-February, the Fiscal 1999 F-16 crash rate was 5.83 per 100,000 flying hours.

Engine trouble may be one reason. Of the nine 1999 crashes, six were caused by engine failure. Five of 1997's 11 Class A accidents were engine-related.

But officials caution that "engine failure" is a broad term that can cover everything from design problems to poor maintenance. And engines have not been failing in the same manner—each has been a unique and isolated problem.

Still, Air Force officials had an informal meeting at Luke AFB, Ariz., this winter to discuss the possibility of acute F-16 engine problems.

Over time, about 52 percent of the F-16's Class A accidents have been caused by pilot failure, according to manufacturer Lockheed Martin. Some 36 percent have been engine related.

USAF Wants F-16 Engine Fixes Accelerated

The Air Force has asked Pratt & Whitney and General Electric, the contractors who manufacture the engines used in the F-16, to accelerate planned power plant improvements, officials told a House appropriations panel March 10.

The high number of F-16 crashes attributable to engines has caused the service to allocate funds in its Fiscal 2000 budget to redesign some engine parts as a precautionary measure. The current time frame to field the new components is 18 to 24 months, and the Air Force leadership has decided it wants things to move faster than that.

Officials told the House panel that they have conducted thorough inspections and do not think additional crashes will result if the parts are delayed.

Optempo a Factor in Pave Hawk Collision

High operations tempo, and the crew burnout it causes, may have been a contributing factor to the September midair collision of two HH-60G helicopters at Nellis AFB, Nev.

An accident investigation report released March 15 said that the accident, which killed all 12 crew members from the two 66th Rescue Squadron aircraft, was directly caused by operator error and possible breakdown in crew coordination during evasive maneuver or close formation flying.

A number of things may have lain behind these human mistakes, said Col. Denver L. Pletcher, head of the board and commander of the Joint Combat Rescue Agency at Langley, AFB, Va.

"They include operation tempo, training shortfalls, leadership dynamics, broken squadron processes, and human factors," said Pletcher.

The Pave Hawk pilots just weren't as sharp as they could be, said officials. The squadron had been home only 10 months out of the previous 36. A clinical psychologist assigned to the board concluded that the 66th was severely overtasked at the time and under immense operational stress.

In addition, the squadron was faced with what Pletcher described as a virtually unmanageable imbalance in copilot manning and experience levels. This was due to the addition of four Pave Hawks to the unit, the replacement of several experienced commanders, and a lack of seasoned instructors to break in the new pilots.

"Put all these together and you make an accident more probable," said Pletcher.

USAF photo by MSgt. Val Gempis

SSgt. Nathaniel L. Raney, an orthotic laboratory technician, 374th Medical Operations Sq., Yokota AB, Japan, uses a sewing machine to fabricate leather cuffs for custom-made leg braces. The lab, which makes wrist splints, cervical collars, ankle supports, and other braces for people with compression-type problems, is the only one of its kind in the Pacific theater.

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Photo by Ted Carlson

The Joint STARS Imperative

Congress wants the Pentagon to buy more E-8 Joint STARS surveillance aircraft—lots more.

Members of the Senate and House, in separate but identical March 11 letters to Secretary of Defense William S. Cohen, urged the Defense Department to ramp up production of the USAF system.

"We believe that it is imperative that the acquisition of Joint STARS continue in the most cost effective and timely manner so that we meet the clearly stated and existing operational requirement for at least 19 aircraft as soon as feasible."

The letters were signed by majorities in both bodies—56 senators (31 Republicans, 25 Democrats) and 238 representatives (147 Republicans and 91 Democrats).

The Air Force is planning to spend $483.0 million next year for one more E-8C, the 14th. Cohen in 1997 cut the planned buy from 19 to 13 but has had second thoughts and shifted course, adding one in Fiscal 2000.

Air Force officials said they do not know whether the service will be permitted to buy any more. The last five E-8s—numbers 15 through 19—are not included in long-range budget plans.

The Air Force is already moving to prevent similar accidents in the future, said officials. Air Combat Command now formally requires a post-deployment training plan for squadrons that takes it easy upon returning home—what officials described as a crawl, walk, and run philosophy.

In January, the Air Force approved funding for four more Pave Hawks, to help ease the deployment burden. "And we are re-evaluating all initial qualification training, mission qualification training, contingency training, and continuation training to ensure that they meet the [66th's] combat mission needs," said Maj. Gen. David F. MacGhee Jr., ACC director of air and space operations.

Cold War Certificates

Beginning April 5, military personnel and Department of Defense civilians who took part in the long twilight struggle against the Soviet Union could apply for certificates honoring them for their role in winning the Cold War.

Those eligible must have served with the War, Navy, or Defense departments some time during the period Sept. 2, 1945, through Dec. 26, 1991. Among the documents that will be accepted as proof of service are copies of active duty discharges (DD Form 214) for the military and Standard Form 50 for civilians.

Applicants can mail requests to: Cold War Recognition, 4035 Ridge Top Rd., Suite 400, Fairfax, VA 22030.

Individuals may also apply via the Internet at http://coldwar.army.mil; by e-mail at cwrs@Fairfax-emh1.army.mil; or fax at (703) 275-6749.

New Bomber a Long Way Off

A new USAF white paper predicts that the service will not see a new long-range bomber enter operational service until 2037. That means, among other things, that the B-52 will likely still be flying until at least that date—when some models will be over 80 years old.

The white paper was produced in response to a 1998 Congressional request. It says that a mission area assessment of the next bomber program will begin in 2013, with the acquisition program starting in 2019 and production in 2034.

"Long-range bombers are integral to [the] Air Force Global Engagement vision," said the report.

Currently there are 190 bombers in the fleet: 93 B-1s, 76 B-52s, and 21 B-2s. The Air Force study does not

A T-39B ejects a flare during recent testing by the 418th Flight Test Sq., Edwards AFB, Calif. The T-39 can now serve as a low-cost chaff and flare dispenser to support various users, including the Army in testing its ground-based radar systems.

27,000 pounds of thrust is a small part of the force it takes to propel an F-16. From the launchers to the refuelers to the air traffic controllers, weapons loaders and end of runway personnel, it takes a team. We give airmen the technological edge they need to rise to the challenge. We are as dedicated to the success of the United States Air Force as they are to the security of our country. And we know that it's about more than our technologies: it's about the people who use them.

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envision growth in those numbers. Where the Cold War put a premium on the ability to stealthily deliver nuclear weapons on heavily defended targets, today's world demands large platforms that can deliver large loads of standoff conventional weapons from a distance.

"Preserve what we have" is the theme for bombers, said acting Air Force Secretary F. Whitten Peters at a briefing on the white paper.

Pay OK, Despite Y2K

The Year 2000 computer problem will not stand in the way of the Defense Department paying all civilian employees, military members, and retirees, according to a Defense Finance and Accounting Service official.

DFAS has been working on the problem for three years, and all its payroll systems are now Y2K compliant, said DFAS Director Gary W. Amlin in March. "I feel confident we'll do extremely well," he said.

The agency continues to work on its computer interfaces with various outside financial institutions. Federal Reserve Banks are all compliant from a system standpoint, said Amlin. The Fed is supporting testing of Y2K solutions with selected stateside financial institutions and overseas credit unions and NationsBank, the defense contractor that provides banking services to all DoD personnel overseas.

Contingency plans include provision for backup computer tapes on standby at the Fed in case there are data transmission problems. DFAS will have an extra stockpile of checks on hand, in case individual banks cannot post deposits.

"If an institution does not electronically receive a transaction, we can mail a check," said Amlin.

Stockpiling banknotes isn't necessary, said the DFAS chief. "I'm not going to go out and store cash," he said. But he recommends that all who use DFAS services ask their individual financial institutions what they are doing to make sure their data systems work when "2000" clicks over for the first time.

AMC Chief Cancels Charleston Inspection

On a March 4–5 visit to Charleston AFB, S.C., Air Mobility Command chief Gen. Charles T. "Tony" Robertson announced that he was canceling the base's upcoming operational readiness inspection.

More on the "Space Force"

Sen. Bob Smith (R–N.H.) used a March 22 public hearing in Colorado to promote the idea of creating a separate "Space Force" from the structure of today's Air Force.

He said he meant this as no criticism of the Air Force and thought it might even be helpful to the service.

"It may be unrealistic and unfair to expect the Air Force to be the pre-eminent airpower and also fully exploit space," said Smith, chairman of the Senate Armed Services Committee's Strategic Forces subcommittee.

Smith spoke at a Congressional field hearing held at Peterson AFB, Colo. According to Smith, relieving USAF of space missions could not only strengthen the nation's military space capabilities but also let USAF concentrate on air warfare.

"I don't see any advantage to that, right now," responded Gen. Richard B. Myers, commander in chief of US Space Command and commander of Air Force Space Command.

Myers, echoing Gen. Michael E. Ryan, Air Force Chief of Staff, said creating a separate branch would duplicate costs and increase bureaucracy, leading to less real emphasis on space. The proper route, said these generals, is to seek a full integration of air and space capabilities.

Smith first broached the subject in a Nov. 18 address at Cambridge, Mass. He warned that the Air Force needed to "truly step up to the space power mission" or run the risk that Congress would create a new military service for space.

Smith recognized that "the Air Force has played the dominant role in military space matters for decades" and that "a significant portion of its budget has gone toward developing and operating the nation's military space systems."

However, he made his opinion clear that the Department of Defense and the Air Force are shortchanging space power and that "America's future security and prosperity depend on our constant supremacy in space."

Photo by Ted Carlson

Global Hawk Crashes

The Air Force announced that Global Hawk Unmanned Aerial Vehicle No. 2 was destroyed in a March 29 crash during testing at Naval Air Weapons Station China Lake's south range in California.

There were no injuries or property damage. The crash came after a flight of about 20 minutes, the Air Force said. The Air Force has appointed an investigation team to determine the cause of the crash.

The in-development aircraft is to provide battlefield imagery while flying at high altitude and over a long period. When it becomes operational, Global Hawk will be able to fly higher than 60,000 feet and remain on station for more than 24 hours.

Global Hawk is the Air Force's most prominent remaining UAV. The service canceled its stealthy DarkStar UAV earlier this year.

Charleston had canceled two mobility exercises so it could respond to Operations Northern and Southern Watch, among others, Robertson noted. The base also took the lead in providing airlift to deliver humanitarian supplies to Puerto Rico and Honduras in the wake of this winter's severe hurricanes.

"I am recognizing your contributions to our nation's defense by awarding Team Charleston full operational readiness inspection credit," Robertson told a crowd of nearly 700 in the base theater. He received a standing ovation in response.

The AMC head also authorized an extra $132,000 for base Year of the Family initiatives. The money will be used to improve several base areas, including the athletic field, jogging trail, picnic area, and playground.

Congress Weighs Future of "Troops to Teachers"

Congress is considering legislation that would reauthorize and strengthen the expiring "Troops to Teachers" program, which provides incentives for retiring military personnel to enter the education field.

If it passes, the Troops to Teachers Improvement Act would extend the program through 2004, while taking its $25 million budget out of the hands of the Defense Department and giving it to the Department of Education.

"Troops to Teachers is an ingenious idea," said Sen. Joseph I. Lieberman (D) of Connecticut, one of 13 co-sponsors of the legislation. "It harnesses a unique natural resource to meet a pressing national need."

Congress first created the program in 1993, partly to assist military personnel being shuffled out of the service by reductions in force. As envisioned by the reauthorization bill, it will provide a stipend of $5,000 to assist with certification and relocation costs for military personnel who agree to go into teaching for at least four years. A further $10,000 bonus would go to those who agree to four years in schools with a large population of low-achieving at-risk students.

Eligibility is limited to retired military personnel with 20 years of service, disabled veterans, or those who served six years and were then affected by military downsizing.

"Since its inception, Troops to Teachers has been a resounding success with over 3,000 highly qualified men and women having filled school vacancies in 48 states," said

USAF photo by MSgt. Val Gempis

TSgt. Mario V. Bandalan Jr., SSgt. Tapu Sitagata, and A1C Kevin R. Tuten, all aerospace propulsion technicians from the 374th Maintenance Sq., Yokota AB, Japan, ensure the paperwork for a propeller assembly is in order before shipment. Yokota handles all C-130 engine repair for Pacific Air Forces.

Sen. John McCain (R) of Arizona, chief sponsor of the new bill.

Global Hawk Down Under

If all goes according to plan, in the spring of 2001, the Global Hawk Unmanned Aerial Vehicle will take off from its Edwards AFB, Calif., base and fly 12,000 miles down under, all the way to Australia.

The exercise will be part of a $20 million cost-sharing exercise between the United States and Australia.

"This is a historic moment for the [High Altitude Endurance] Global Hawk UAV program," said Col. Craig McPherson, director of the Joint HAE UAV Division at the Aeronautical Systems Center Reconnaissance Systems Program Office. "The agreement affords us the unique opportunity to demonstrate, in an overseas deployment, the reconnaissance capabilities of the HAE UAV system and its interoperability with the Australian JP 129 Project."

As part of JP 129, Australia plans to buy an airborne wide-area surveillance system soon after the turn of the century.

Air Sovereignty Operations Center Online

Air Sovereignty Operations Centers are now up and running in Hungary, Poland, Czech Republic, and Romania.

Run by Electronic Systems Center at Hanscom AFB, Mass., the centers are intended to produce a real-time military air-situation display. Except for the ASOC in Romania, they are connected to NATO air surveillance systems, and to each other, as part of their mission in each nation.

"The ASOC brings a new degree of command and control to these countries by creating a comprehensive military air picture and by promoting cooperation and cross-border data sharing," said Col. Bruce Hevey, ESC's director of Combat Air Forces Command and Control Systems.

Similar facilities are planned for Slovakia and Slovenia. A regional Air Surveillance Coordination Center, serving the Baltic nations of Latvia, Lithuania, and Estonia, is under construction in Lithuania.

Promotions to Master Sergeant Hit Five-Year High

On March 8, the Air Force announced that it has reached a five-year high in its selection rate for promotion to senior master sergeant. The service picked 1,506 of 18,862 eligibles for promotion, a 7.98 percent selection rate.

The rate has gone up each year since 1994, when it was 4.62 percent. With the drawdown of Air Force personnel largely over, officials are hopeful this percentage will keep heading up. They are optimistic that senior master sergeant promotions will at least remain above the objective of 6 percent per year.

Ellsworth Fraud Case Settled

The nation's largest builder of military family housing has agreed to pay the US government $8 million over a five-year period to settle a fraud claim brought by the Justice Department.

Hunt Building Corp. also agreed to make repairs to an allegedly faultily designed and constructed 828-unit family housing project at Ellsworth AFB, S.D.

"This settlement will ensure that our servicemen and -women will be able to live in habitable housing on Ellsworth AFB and that the United States recovers rents that were paid in the past for uninhabitable housing

Senior Staff Changes

NOMINATION: To be **Lieutenant General:** Maj. Gen. Donald G. **Cook.**

CHANGES: Maj. Gen. (sel.) Scott C. **Bergren,** from Cmdr., 82d Trng. Wg., AETC, Sheppard AFB, Texas, to Dir., Maintenance, DCS, Instl. & Log., USAF, Pentagon ... Brig. Gen. Randall K. **Bigum,** from Cmdr., 4th FW, ACC, Seymour Johnson AFB, N.C., to Dir., Rqmts., ACC, Langley AFB, Va. ... Maj. Gen. Paul K. **Carlton Jr.,** from Cmdr., 59th Medical Wg., AETC, Lackland AFB, Texas, to Cmdr., AF Medical Ops. Agency, Bolling AFB, D.C. ... Brig. Gen. (sel.) Kenneth M. **Decuir,** from Dep. Dir., Jt. Matters, DCS, Air & Space Ops., USAF, Pentagon, to Cmdr., 354th FW, PACAF, Eielson AFB, Alaska ... Brig. Gen. Paul R. **Dordal,** from Vice Cmdr., 7th AF, PACAF, Osan AB, South Korea, to Dep. Dir., Ops. & Tng., DCS, Air & Space Ops., USAF, Pentagon ... Brig. Gen. (sel.) William M. **Fraser III,** from C/S, USSTRATCOM, Offutt AFB, Neb., to Cmdr., 2d BW, ACC, Barksdale AFB, La. ... Brig. Gen. Michael G. **Lee,** from Dir., Inspections, IG, USAF, Pentagon, to Dep. Dir., Ops., Natl. Mil. Cmd. Center, Pentagon ... Maj. Gen. Earl W. **Mabry II,** from Cmdr., AF Medical Ops. Agency, Bolling AFB, D.C., to Cmdr., 59th Medical Wg., AETC, Lackland AFB, Texas ... Brig. Gen. David L. **Moody,** from Dep. Dir., Ops. & Tng., DCS, Air & Space Ops., USAF, Pentagon, to Cmdr., 57th Wg., ACC, Nellis AFB, Nev. ... Maj. Gen. William A. **Peck Jr.,** from Dir., Rqmts., ACC, Langley AFB, Va., to Vice Cmdr., 7th AF, PACAF, Osan AB, South Korea ... Brig. Gen. Neal T. **Robinson,** from Assoc. Dir., Ops., C^{3}I, Langley AFB, Va., to Dir., Intel., USEUCOM, Stuttgart–Vaihingen, Germany ... Brig. Gen. (sel.) Norman R. **Seip,** from Exec., C/S, USAF, Pentagon, to Cmdr., 4th FW, ACC, Seymour Johnson AFB, N.C. ... Brig. Gen. Andrew W. **Smoak,** from Cmdr., 2d BW, ACC, Barksdale AFB, La., to Dir., Customer Spt. Office, NIMA, ASD, C^{3}I, Reston, Va.

For THAAD, That's Six in a Row

The Pentagon announced March 29 that the Theater High Altitude Area Defense interceptor once again failed to intercept a missile target in a flight test above the White Sands Missile Range, N.M.

It was THAAD's sixth straight miss with no hits. The Army program, which is to produce a weapon capable of shooting down an incoming missile, is in deep trouble in Congress.

The Ballistic Missile Defense Organization and the Army announced the test occurred at high altitude over the central portion of the White Sands National Missile Range. The Hera target, which simulated a Scud ballistic missile, was launched seven minutes before the intercept test.

The test was the ninth in a planned series of THAAD program definition and risk reduction flight tests to verify the THAAD prototype design and performance of the system components.

units," said US Attorney Karen E. Schreier of Sioux Falls, S.D.

The project, known as Centennial Estates, was built between 1989 and 1991. Alleged structural and design defects included violations of fire-safety requirements, flaws that caused the units to twist and break apart in the fierce winds of the high plains, and pipes simply inserted into the ground to make it appear as if they were mandatory sewer clean-outs.

The Air Force had declared 500 of these units uninhabitable.

News Notes

■ US airlift and sealift capacity in the Pacific region is not adequate to respond to crises that may be developing there, Army Gen. John H. Tilelli Jr., commander in chief of US Forces Korea, told a Congressional committee March 3. The C-17 and roll-on, roll-off sealift are critical to quick response time to North Korea and other aggressors, said Tilelli.

■ The Air Force won the 1999 Armed Forces Cross-Country Championship, held at NAS Mayport, Fla., Feb. 19. The contest consisted of a 12K and 5K race for men and a 5K race for women. The composite Air Force team time was 3 hours, 27 minutes, 58 seconds. The Army came in second, with a composite time of 3:35:46.

■ On March 5, the US Air Force Academy filed charges against 13 cadets as the result of an investigation into mail theft from the cadet post office. If found guilty, those charged could face up to five years in jail, as well as dismissal from the service.

■ The November crash of an Air National Guard F-16C on the Jefferson Proving Ground Range near Madison, Ind., was caused by engine failure, according to an accident investigation report released March 9. According to the investigating officer, the crash occurred because of a defective compressor discharge pressure rotating air seal in the engine.

■ A film by the 375th Communication Squadron's Visual Information Flight, depicting 50 years of air mobility, won first place in the historical film category at the fourth annual International Military Film Festival in Bucharest, Romania. It was the first time the US

USAF photo by SrA. Jeffrey Bishop

Army jumpmasters watch as members of the 820th Security Forces Group, Lackland AFB, Texas, practice parachute landing falls during Basic Airborne Refresher Training at Ft. Sam Houston, Texas. The airborne training is necessary for the 820th's role as USAF's rapidly deployable, first-in force protection unit.

had taken such top honors.

■ On March 8, the 37th Airlift Squadron, Ramstein AB, Germany, delivered a C-130 loaded with almost 3,500 pounds of clothes, toys, toiletries, and blankets to Tuzla, Bosnia. The supplies are intended for orphans and widows at a facility near Eagle Base in that recovering corner of the Balkans.

■ Boeing and the Air Force commemorated the 10th anniversary of the first launch of a Block II Global Positioning System satellite March 11. The first Block II lifted off aboard a Delta II rocket in 1989 and has since orbited the Earth over 7,300 times.

■ On March 7, Lockheed Martin Astronautics delivered the first of its new Atlas III rockets to Cape Canaveral AS, Fla. Designated AC-201, the rocket is being readied for launch in mid-June. It will carry aloft the Telstar 7 satellite for Loral Skynet.

■ In the first Air Force court-martial for computer hacking, Air Force Academy cadet Christopher D. Weist was found guilty March 14 of breaking into the systems of Interlink Communications of North Carolina and causing $6,300 in damage. A military jury of eight academy officers dismissed Weist from the service.

■ SrA. Chris Bloomfield, 20th Special Operations Squadron, Hurlburt Field, Fla., rescued a woman from a burning car on Interstate 75 near Tampa, Fla., Feb. 15. The MH-53J Pave Low gunner came upon the crumpled car when returning from the Daytona 500 auto race. He smashed a window with a hammer and pulled the victim from the auto after several tries.

■ Two firefighters from the 45th Civil Engineer Squadron at Patrick AFB, Fla., saved the life of a man injured in a beach accident March 7. A1C Mark Huetter and Amn. Archie Clemons stabilized the condition of the victim who had been injured after diving off a shallow pier. They did chest compressions and helped push air into the victim's lungs. Although no pulse was detectable at the scene, the man revived at the hospital and survived, despite spinal injuries.

■ The Air Force has changed the name of its Social Actions offices to Military Equal Opportunity to better reflect the human resource program's current mission. The new tag correctly defines the office's mission to prevent discrimination, said officials March 12, when announcing the shift. Prevention of substance abuse, a former mission, has now been moved to the Air Force Surgeon General's purview.

■ The LeMay Foundation wants to remind the Air Force family that its services are available to assist widows of former service members who need help to remain in their homes after their spouses pass away. Named for Gen. and Mrs. Curtis E. LeMay, the foundation has lately seen a surge in requests. Since last September it

has approved 57 grants—32 one-time payments and 25 continuing monthly payments.

■ A Congressionally appointed commission voted against separating men and women during basic training. By a 6–2 margin the panel declared March 17 that each service should be allowed "to continue basic training in accordance with its current policies. This includes the manner in which basic trainees are housed and organized into units." Last year, another study group had urged that men and women be split up at this crucial time in their military careers.

■ Launch vehicles based on Lockheed Martin's new Common Core Booster will carry the name "Atlas V," company officials announced in February.

■ The Air Force Continuing Care Retirement Communities—Air Force Villages I and II in San Antonio; Air Force Village West in Riverside, Calif.; and the Air Force Retired Officers Community in Sterling, Va.—have formed an association to promote their common interests. Neither the new AFCCRC Association nor the individual communities are directly related to the US Air Force. ■

Index to Advertisers

Washington Watch

By John A. Tirpak, Senior Editor

The Leverage of Airpower

Ryan emphasizes the role of the Air Force in the "enabling" of joint operations.

GEN. Michael E. Ryan, Air Force Chief of Staff, doesn't count himself an apostle of the "religion" of aerospace power as potentially the sole engine of US victory in future wars. While he firmly believes in the utter necessity of aerospace dominance by the US, as well as in concepts such as Rapid Halt, he does not agree with the notion that aerospace power may be the only force needed to corral the bad actors of the world.

Discussing with *Air Force* Magazine the concept of Strategic Control, which suggests that conventional aerospace power exclusively may be able to completely subdue an enemy or deter adventurism *[see "Strategic Control," February, p. 20],* the Chief of Staff said he does not see the construct as a blueprint for a reorganized US military.

"I'm a 'joint' kind of person," Ryan said. "There's application, I think, for all our forces, and a good rationale for [those] we have on the books today." If there wasn't, he believes, those without a legitimate mission would have been eliminated during the long defense drawdown since 1985.

"Not that I don't believe that airpower doesn't have huge effects—huge—and not that airpower alone, in some very particular instances, can't bring about Strategic Control," he added.

However, he's reluctant to argue that airpower can do the job alone, in all circumstances, universally. For him, it's not "a religious tenet. I've been on too many of these operations to ... become a monk, I guess."

Ryan also discussed the idea of a new "Space Force" that could be split off from USAF to put greater focus on the space mission, as well as the effects on the Air Force's budget if the decline in defense spending had not been slowed with the Fiscal 2000 budget.

Huge Clashes No More

"I'm on record," Ryan asserted, "saying that I think the days of great armies clashing with great armies in huge land battles is over." If US ground troops are to engage an enemy, it likely will be an enemy that has been "demoralized, defeated, and denuded" by air forces first, he said. If aerospace power doesn't achieve Strategic Control by itself, "it certainly leverages, hugely, the use of other forces."

The Air Force, he said, contributes to Strategic Control "through our Core Competencies," which he summarizes as providing freedom from attack, freedom to maneuver, and freedom to attack—to carry the fight directly to the enemy.

This is a crucial enabling mission, and "airpower," Ryan said, "brings a lot to this Strategic Control." However, he added, "It doesn't bring everything."

The Air Force's 1999 Posture Statement—which carries the byline of Ryan and acting Secretary of the Air Force F. Whitten Peters—takes up the enabling theme in almost every section. According to the statement, "From beginning to end, aerospace power enables joint operations." It begins by providing reconnaissance and intelligence, then moves equipment into position, protects US forces from attack, conducts precision strikes against key targets, and prepares the battlespace for surface forces.

The posture statement refrains from mention of Strategic Control but does stick up for USAF in describing the Halt Phase.

The national strategy, it says, calls for "fast-responding US capabilities to defeat aggression in distant theaters, quickly and decisively. This strategy allows warfighting commanders to seize the initiative, minimize territory that must be won back, and maintain coalition integrity."

Ryan said that aerospace power offers speed, range, flexibility as well as "global reach and perspective," combined with stealth and precision, which make "aerospace power the force of choice to execute the halt." It does not discuss USAF's potential role in going beyond the halt on its own.

For Ryan, having a credible land force is a constant in the deterrence equation. And even if that land force is not used, its intimidating existence has a significant role to play in Strategic Control, he asserted.

"I believe we need all the forces that we have in our military ... because I think you need the threat of all the forces that we have to bring about a solution—a strategic solution. ... In some cases, you need to bring all the forces to bear. In some cases, in order not to use force, you have to threaten its use."

And, while Strategic Control represents for him "an interesting concept" that can illuminate the development of future joint strategy, "you have to overlay it with the realities of a particular scenario."

Ryan spoke before Operation Allied Force had been set in motion. He allowed, though, that in the previous two large-scale military operations in which the US was the key player—Desert Storm in Iraq and Deliberate Force in Bosnia—airpower did indeed afford a measure of Strategic Control.

"In Desert Storm, we had ... over six months of freedom from attack. We had about five months of freedom to maneuver, ... to move forces around the Gulf as we wanted to, move forces around the continent, ... position them in the right place, and, in effect, use ... airpower to set the conditions for a relatively easy victory," Ryan said. In Deliberate Force—which Ryan himself ran as the commander of NATO's Allied Air Forces Southern Europe—judicious application of airpower brought the Serbs back to the bargaining table and set the stage for the Dayton Accords.

He also acknowledged that a humanitarian operation—such as air-

lifting relief to victims of Hurricane Mitch—is a measure of Strategic Control, which was "wrested back ... from the fury of Mother Nature."

Ryan is uncomfortable with the idea of any of the services promoting itself as the single indispensable force in guaranteeing national security and is even more opposed to the idea of promoting USAF as that one force.

On the one hand, "I don't think any of the other services would claim" single-handed ability to win wars, Ryan said. On the other, he added, USAF is "not bashful about telling" the national leadership what airpower "is good for."

The Posture Statement, in fact, concludes by asserting that "aerospace power has become the preeminent tool of the National Command Authority."

He dismisses the notion that the Air Force's contribution to the nation's ability to win wars gets short shrift in the Joint Staff organization, despite the glacial pace at which Pentagon modeling and simulation programs are being upgraded to accurately reflect the true contributions of airpower.

No outsider should feel compelled to step in and make the Air Force's case, because "I don't see any underappreciation for the capabilities of aerospace power" within the Joint Staff, he asserted. He feels impatient with enthusiasts who "want to get these [interservice] fights going. ... I just don't get into that."

Having served in key positions in the Joint Staff, as well as a component commander in the field, Ryan said that, while he has seen some "wild ideas" brought into the debate, "I've never seen a truly innovative solution that had acceptable risk ... turned down" for consideration either by the Joint Staff or regional commanders in chief, who are the ultimate developers of war plans.

"I don't see where ... initiative is stifled at all," he asserted.

"When it comes down to the business we do, and when it's on the line to actually execute, reasonable men come together with the best solutions," he asserted.

Controversy in Space

Ryan admits to frustration, though, with partisans who believe space capabilities are not being developed aggressively enough and who see USAF as dragging its feet in exploiting the medium.

"We indeed have been and will be good stewards of space," Ryan asserted. To either spin off a wholly new space service or to assign responsibility for space to another branch of the military—as has been suggested by Sen. Bob Smith (R–N.H.), among others—would be, in Ryan's opinion, a mistake.

Ryan pointed out the multitude of missions performed by satellites—weather, communications, navigation, intelligence, reconnaissance, surveillance—and asserted, "I don't know how you could separate air forces from space forces."

Air and space integration is "conceptually" a reality and is becoming a practical reality more and more each day, he said.

He noted that the Air Force is pursuing a Moving Target Indicator capability in space—the Discoverer II program—to expand the capabilities now chiefly resident within the fleet of E-8 Joint STARS aircraft.

"It's not a question of where you do this," he said. "You want to know whether there are moving targets out there," and it doesn't matter whether the information is obtained from space or an airborne platform.

When the space MTI system is in place, it will work together with the airborne systems, he explained.

"When you start separating those things from each other, you have a hard time integrating them." In addition, "you have advocates that may

not be advocating across the spectrum for aerospace superiority."

It takes careful analysis to determine what mix of space and air systems are best to accomplish a mission, Ryan asserted, and he dismissed the "criticism without analysis" that argues for a space-based vs. an air-based system in any given role.

The Air Force carefully "makes the trade-offs" about which functions are best carried out in space or air, "from a fiscal standpoint and a physical standpoint," he said. It then makes "the best investment for the defense of the nation, not the best investment for the medium. And I think we do that very well," Ryan claimed.

Criticisms of USAF's handling of space accounts come from "a very few who are not charged with the day-to-day, life-and-death situations that we are," he said.

He further noted that, despite the defensewide drawdown since 1985, "the only constant, growing aspect of the United States Air Force budget during all those drawdown years was investments in space." As a result, he said, "I dismiss the person who says we don't care" enough about the space mission.

There are always choices to be made with regard to the budget, Ryan said, and, naturally, USAF's desire is always to do more.

"If the argument is, we don't have enough money to do all the things we'd like to do in space, in the Air Force and other places, I absolutely agree," Ryan said. "I wish we could do it all."

To spin off a Space Force, creating a separate bureaucracy and all that goes with it "sucks up dollars, time, and energy" and would only exacerbate the space research and infrastructure funding situation, not improve it, he said.

"If there's more money" for a separate service, Ryan said, "give it to us and we will invest it where we think it's most wise. ... I don't see where creating a whole new bureaucracy gets you any more money for investment in space."

Ryan emphasized that USAF does not pursue space systems for exploration or science, and he asserted that it is the wrong apparatus to conduct such missions.

Rather, USAF pursues space systems, he said, "for the defense of this nation, and we do the trade-offs within [that] context ... not new technologies for new technologies' sake, nor space for space's sake."

Space, Ryan said, is a medium that "gets the recognition it deserves. ... You cannot do space in isolation of the other things you must do. And to isolate it, I think would be militarily ... incorrect."

Tyranny of the Thirds

Still, USAF must juggle airpower necessities—like the F-22 and replacements for the F-16 fleet—with space requirements that it must underwrite for the benefit of all services, and sometimes for the world, such as the Global Positioning System. Given that, Ryan allows that defense spending priorities perhaps should not be "one-third, one-third, one-third" for the Army, Navy/Marines, and Air Force.

"Even with the $2.5 billion, we haven't done all the readiness, modernization, and people things we wanted," Ryan added.

The defense budget now before Congress, Ryan thinks, is a watershed event: a recognition that more than a decade of decline has imperiled the capability of the services to carry out their missions and that a reconstruction period is in order.

The Air Force was allowed to keep the windfall savings from record low fuel prices and lower-than-expected inflation. Those, plus topline additions, led to an Air Force budget in Fiscal 2000 that is $2.5 billion larger than originally planned. Normally such savings go back to the Treasury. If that had happened this year, said Ryan, there would have been drastic and painful additional cuts to USAF.

"If we had not got the $2.5 billion, ... we would have had to take down some force structure, delay modernization, and we would not have stopped the readiness decline," he explained.

Readiness, which has fallen steeply, mostly in stateside units, is only arrested at low levels, and it would take further infusions of money to even start working it back up to the levels seen during the Gulf War and shortly thereafter.

In a letter to the chairman of the House Armed Services Committee, Rep. Floyd D. Spence (R–S.C.), Ryan noted that the $2.5 billion in funding was exactly half the amount he testified last fall would be needed over and above planned spending to meet all USAF priorities.

"Even with the $2.5 billion, we haven't done all the readiness, modernization, and people things we wanted," Ryan added.

Postscript: Allied Force

In March 18 testimony on Capitol Hill, a few days before bombs began to fall, Ryan made clear his view that the incipient NATO air attacks on Yugoslavia would prove to be difficult and dangerous work.

The Air Force Chief told members of the Senate Armed Services Committee that Belgrade's extensive network of Soviet–made air defense radars and mobile surface-to-air missile launchers posed risks to aircraft carrying out Operation Allied Force, which began on March 24.

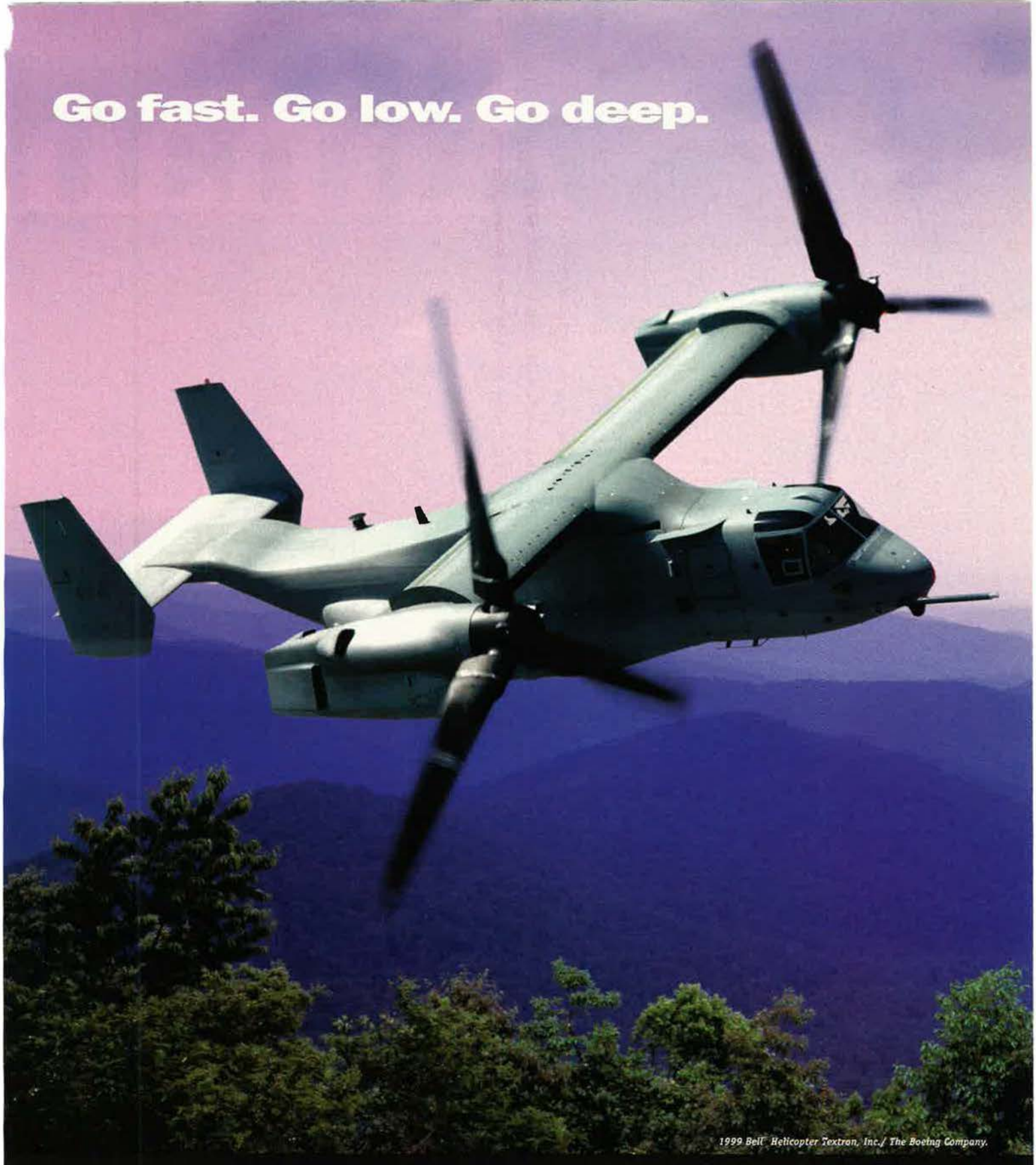
Ryan, who in 1995 commanded Operation Deliberate Force against Serbian targets in Bosnia, said Yugoslavia was a much tougher nut to crack.

Its air defenses, said Ryan, shaped up as "two to three times" more muscular than those in Bosnia.

"This is a very substantive air defense capability," reported Ryan, "not just within Kosovo but within the whole Yugoslav land mass. It is an integrated, redundant system consisting of SA-2s, SA-3s, SA-6s, many radar-guided capable surface-to-air missiles. It is also heavily defended with [anti-aircraft artillery] in strategic locations. ...

"It is deep and redundant. And the VJ, the Yugoslav army, is a very professional army and air defense corps. ... They [the Bosnian Serbs] were good, but these guys are very good. So taking on these defenses with airpower, which was one of your initial questions, will not be easy. It will take a very serious campaign against those systems."

Ryan added, "There's no assurance that we won't lose aircraft in trying to take on those air defenses. ... There is a distinct possibility we will lose aircraft in trying to penetrate those defenses." ■



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USAF Almanac

ac 1999

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 in its role as liaison with Air Staff agencies 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** (see p. 79). Major commands are headed by general officers and have broad functional or geographic responsibility. 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.

May 1992

May 1997

May 1998

The May 1992 Almanac detailed a far-reaching transformation in USAF's major commands. To help illustrate changes in the force, we turned to wildlife photographers Tom and Pat Leeson, who provided photographs of a bald eagle and its young eaglets. The symbol proved popular with readers, and in 1997 we again turned to the Leesons for the eagle in our Air Force 50th anniversary Almanac. The only eagle unique to North America, this national symbol is also becoming as closely identified with Air Force Magazine's Almanac.

Legendary leaders of USAF's predecessor organizations included (left) Gen. Henry H. Arnold, commanding general of the Army Air Forces, and Gen. Carl A. Spaatz (center), who succeeded him as commanding general, AAF. Maj. Gen. Hoyt S. Vandenberg (right) was Ninth Air Force commander when this photo was taken at a ceremony in Luxembourg in April 1945. Vandenberg went on to succeed Spaatz as USAF Chief of Staff.

The Nation's Air Arm and Its Early Leaders

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

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

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

USAF Leaders Through the Years

Secretaries of the Air Force

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

USAF Chiefs of Staff

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

Chief Master Sergeants of the Air Force

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

Air Combat Command

Gen. John Michael Loh	June 1, 1992	June 22, 1995
Gen. Joseph W. Ralston	June 23, 1995	Feb. 27, 1996
Lt. Gen. Brett M. Dula (acting)	Feb. 28, 1996	April 4, 1996
Gen. Richard E. Hawley	April 5, 1996	

Air (Aerospace) Defense Command

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

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

Air Education and Training Command

Gen. Henry Viccellio Jr.	July 1, 1993	June 19, 1995
Gen. Billy J. Boles	June 20, 1995	March 17, 1997
Gen. Lloyd W. Newton	March 17, 1997	

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Air Force Communications Command

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

Formerly Air Force Communications Service. Redesignated Air Force Communications Command Nov. 15, 1979. Redesignated Air Force Command, Control, Communications, and Computer Agency, an FOA. Redesignated Air Force Communications Agency June 13, 1996.

Air Force Intelligence Command

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

Now Air Intelligence Agency, an FOA. See Electronic Security Command.

Air Force Logistics Command

Lt. Gen. Nathan F. Twining	March 9, 1946	Oct. 13, 1947
Gen. Joseph T. McNarney	Oct. 14, 1947	Aug. 31, 1949
Lt. Gen. Benjamin W. Chidlaw	Sept. 1, 1949	Aug. 20, 1951
Gen. Edwin W. Rawlings	Aug. 21, 1951	Feb. 28, 1959
Lt. Gen. William F. McKee (acting)	March 1, 1959	March 14, 1959
Gen. Samuel E. Anderson	March 15, 1959	July 31, 1961
Gen. William F. McKee	Aug. 1, 1961	June 30, 1962
Gen. Mark E. Bradley Jr.	July 1, 1962	July 31, 1965
Gen. Kenneth B. Hobson	Aug. 1, 1965	July 31, 1967
Gen. Thomas P. Gerrity	Aug. 1, 1967	Feb. 24, 1968
Lt. Gen. Lewis L. Mundell (acting)	Feb. 24, 1968	March 28, 1968
Gen. Jack G. Merrell	March 29, 1968	Sept. 11, 1972
Gen. Jack J. Catton	Sept. 12, 1972	Aug. 31, 1974
Gen. William V. McBride	Sept. 1, 1974	Aug. 31, 1975
Gen. F. Michael Rogers	Sept. 1, 1975	Jan. 27, 1978
Gen. Bryce Poe II	Jan. 28, 1978	July 31, 1981
Gen. James P. Mullins	Aug. 1, 1981	Nov. 1, 1984
Gen. Earl T. O'Loughlin	Nov. 1, 1984	July 31, 1987
Gen. Alfred G. Hansen	July 31, 1987	Oct. 31, 1989
Gen. Charles C. McDonald	Oct. 31, 1989	July 1, 1992

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

Air Force Materiel Command

Gen. Ronald W. Yates	July 1, 1992	June 30, 1995
Gen. Henry Viccellio Jr.	June 30, 1995	May 9, 1997
Lt. Gen. Kenneth E. Eickmann (interim)	May 9, 1997	May 29, 1997
Gen. George T. Babbitt Jr.	May 29, 1997	

Air Force Reserve Command

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

Air Force Space Command

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

Air Force Special Operations Command

Maj. Gen. Thomas E. Eggers	May 22, 1990	June 30, 1991
Maj. Gen. Bruce L. Fister	June 30, 1991	July 22, 1994
Maj. Gen. James L. Hobson Jr.	July 22, 1994	July 9, 1997
Maj. Gen. Charles R. Holland	July 9, 1997	

Air Force Systems Command

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

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

Air Mobility Command

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

Air National Guard

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

Air Proving Ground Command

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

Now Air Force Development Test Center, Eglin AFB, Fla.

Air Training Command

Lt. Gen. John K. Cannon	April 13, 1946	Oct. 13, 1948
Lt. Gen. Robert W. Harper	Oct. 14, 1948	June 30, 1954
Maj. Gen. Glenn O. Barcus	July 1, 1954	July 25, 1954
Lt. Gen. Charles T. Myers	July 26, 1954	July 31, 1958
Lt. Gen. Frederic H. Smith Jr.	Aug. 1, 1958	July 31, 1959
Lt. Gen. James E. Briggs	Aug. 1, 1959	July 31, 1963
Lt. Gen. Robert W. Burns	Aug. 1, 1963	Aug. 10, 1964
Lt. Gen. William W. Momyer	Aug. 11, 1964	June 30, 1966
Lt. Gen. Sam Maddux Jr.	July 1, 1966	Aug. 30, 1970
Lt. Gen. George B. Simler	Sept. 1, 1970	Sept. 9, 1972
Lt. Gen. William V. McBride	Sept. 9, 1972	Aug. 31, 1974
Lt. Gen. George H. McKee	Sept. 1, 1974	Aug. 28, 1975
Gen. John W. Roberts	Aug. 29, 1975	April 1, 1979
Gen. Bennie L. Davis	April 1, 1979	July 28, 1981
Gen. Thomas M. Ryan Jr.	July 29, 1981	June 22, 1983
Gen. Andrew P. Iosue	June 23, 1983	Aug. 27, 1986
Lt. Gen. John A. Shaud	Aug. 28, 1986	June 5, 1988
Lt. Gen. Robert C. Oaks	June 6, 1988	June 24, 1990
Lt. Gen. Joseph W. Ashy	June 25, 1990	Dec. 9, 1992
Gen. Henry Viccellio Jr.	Dec. 10, 1992	June 30, 1993

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

Air University

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

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

Alaskan Air Command

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

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

Continental Air Command

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

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

Electronic Security Command

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

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

Headquarters Command

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

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

Military Airlift Command

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

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

Northeast Air Command

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

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

Pacific Air Command/Seventh Air Force

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

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

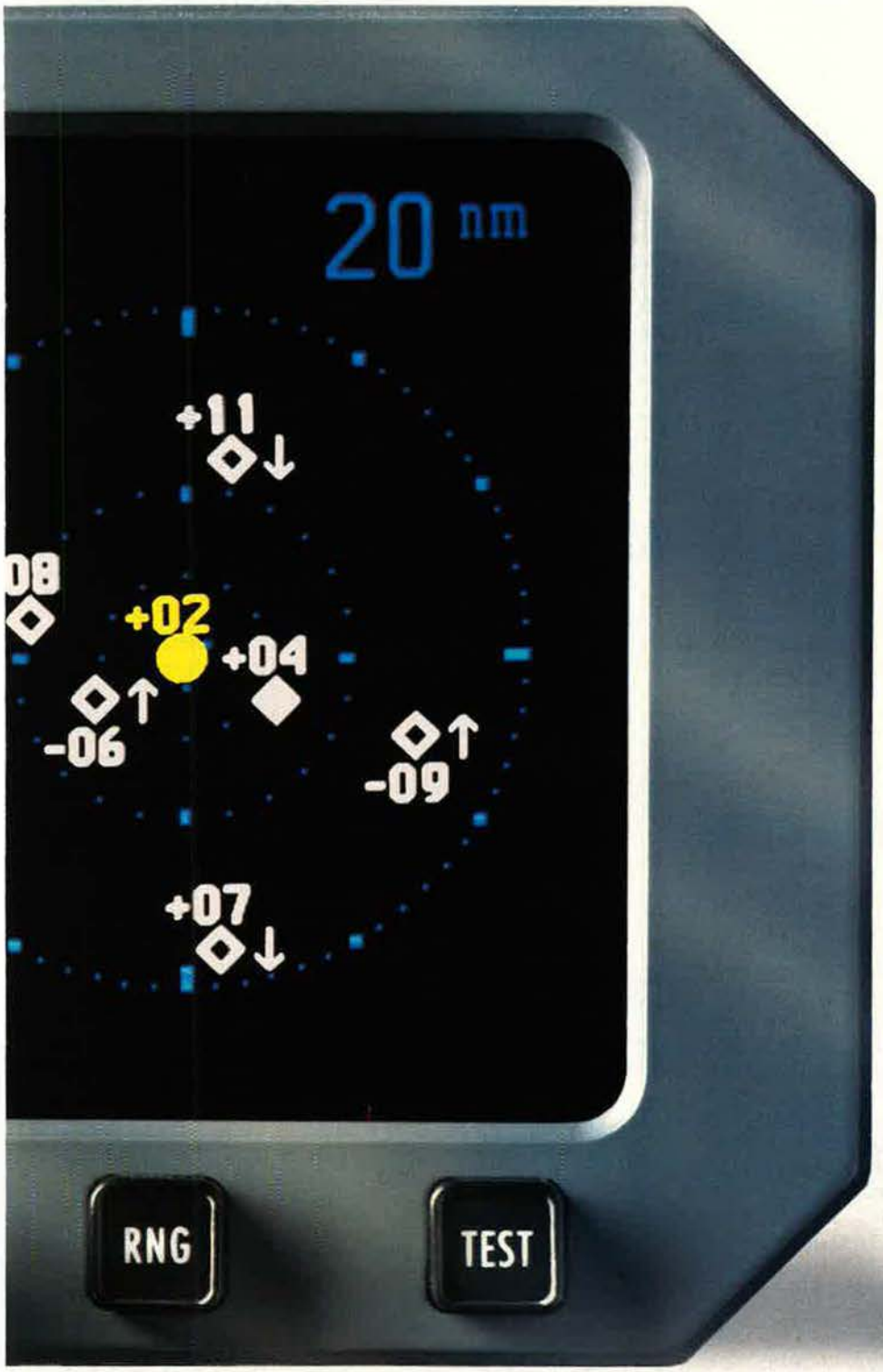
Pacific Air Forces

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

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

Strategic Air Command

Gen. George C. Kenney	March 21, 1946	Oct. 18, 1948
Gen. Curtis E. LeMay	Oct. 19, 1948	June 30, 1957
Gen. Thomas S. Power	July 1, 1957	Nov. 30, 1964
Gen. John D. Ryan	Dec. 1, 1964	Jan. 31, 1967
Gen. Joseph J. Nazzaro	Feb. 1, 1967	July 28, 1968



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Gen. Bruce K. Holloway	July 29, 1968	April 30, 1972
Gen. John C. Meyer	May 1, 1972	July 31, 1974
Gen. Russell E. Dougherty	Aug. 1, 1974	July 31, 1977
Gen. Richard H. Ellis	Aug. 1, 1977	July 31, 1981
Gen. Bennie L. Davis	Aug. 1, 1981	July 31, 1985
Gen. Larry D. Welch	Aug. 1, 1985	June 30, 1986
Gen. John T. Chain	July 1, 1986	Jan. 31, 1991
Gen. George L. Butler	Feb. 1, 1991	June 1, 1992

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

Tactical Air Command

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

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

US Air Forces in Europe

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

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

US Air Forces Southern Command/Caribbean

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

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

USAF Academy Superintendents

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

Note: Various USAF leaders have also served as JCS chairman and vice chairman, as shown in the following lists.

Chairman of the Joint Chiefs of Staff

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

Vice Chairman of the Joint Chiefs of Staff

Gen. Robert T. Herres, USAF	Feb. 6, 1987	Feb. 28, 1990
Adm. David E. Jeremiah, USN	March 1, 1990	Feb. 28, 1994
Adm. William A. Owens, USN	March 1, 1994	Feb. 27, 1996
Gen. Joseph W. Ralston, USAF	March 1, 1996	

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People

USAF Total Force

(As of Sept. 30, 1998)

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Air Force active duty							
Officers	84,073	81,003	78,444	76,388	73,983	71,892	72,616
Enlisted	356,126	341,317	317,938	308,608	299,373	291,590	294,266
Cadets	4,152	4,007	4,027	4,005	4,029	3,988	4,000
Total Air Force active duty	**444,351**	**426,327**	**400,409**	**389,001**	**377,385**	**367,470**	**370,882**
Career re-enlistments (second term)	38,300	41,000	37,200	37,200	34,900	31,300	31,200
Rate	90%	89%	88%	87%	86%	85%	85%
First-term re-enlistments	17,600	13,100	13,500	12,900	12,300	10,400	11,900
Rate	61%	60%	65%	59%	56%	54%	55%
Civilian personnel							
Direct hire (excluding technicians)	158,631	155,385	146,180	143,662	139,517	133,332	125,934
ANG	24,958	24,063	24,174	23,931	23,404	23,388	22,750
Technicians: AFRC	9,827	9,398	9,432	9,436	9,422	9,376	9,761
Indirect hire—foreign nationals	8,246	7,643	6,643	6,695	6,841	6,749	6,489
Total civilian personnel	**201,662**	**196,489**	**186,429**	**183,724**	**179,184**	**172,845**	**164,934**
Guard and Reserve							
Air National Guard, Selected Reserve	117,162	113,587	109,826	110,471	110,023	108,098	106,991
AFRC, paid	80,562	79,621	78,706	76,138	73,311	71,970	74,242
AFRC, nonpaid	111,509	98,848	99,000	71,910	66,827	56,459	56,840
Total Ready Reserve	**309,233**	**292,056**	**287,532**	**258,519**	**250,161**	**236,527**	**238,073**
Standby	13,042	9,926	14,435	14,437	14,500	16,042	15,400
Total Guard and Reserve	**322,275**	**301,982**	**301,967**	**272,956**	**264,661**	**252,569**	**253,473**

Numbers are rounded and may not sum to totals. FYs 1993–98 are actual figures; FY 1999 is an estimate.

Armed Forces Manpower Trends, End Strength in Thousands

(As of Sept. 30, 1998)

	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00[a]
Active duty military								
Air Force	444	426	400	389	377	367	366	361
Army	572	541	509	491	492	484	480	480
Marine Corps	178	174	175	175	174	173	172	172
Navy	510	469	435	417	396	382	372	372
Total	**1,705**	**1,611**	**1,519**	**1,472**	**1,439**	**1,407**	**1,390**	**1,385**
Selected Guard and Reserve								
Air National Guard	117	114	110	110	110	108	107	107
AFRC	81	80	78	74	72	72	74	74
Army National Guard	410	397	375	370	370	362	357	350
Army Reserve	276	260	241	226	213	205	208	205
Marine Corps Reserve	42	41	41	42	42	41	40	40
Naval Reserve	132	108	101	98	95	93	91	90
Total	**1,058**	**998**	**946**	**920**	**902**	**881**	**877**	**866**
Direct-hire civilian[b]								
Air Force[c]	295.7	262.7	249.1	238.1	236.6	174.4	168.7	162.6
Army[c]	284.6	266.1	248.8	229.4	214.2	237.3	225.9	219.9
Navy/Marine Corps	200.3	188.2	182.0	176.0	174.6	210.5	206.9	199.5
Defense agencies	150.8	151.3	141.9	135.4	134.7	125.5	122.8	118.3
Total[c]	**931.4**	**868.3**	**821.7**	**778.9**	**760.0**	**747.7**	**724.4**	**700.2**

Numbers are rounded and may not sum to totals.

[a] Programmed manpower as of FY 2000 Clinton Administration DoD budget.

[b] Full-time equivalents.

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

USAF Educational Levels

(As of Sept. 30, 1998)

Enlisted

Level	Number	Percent
Below high school	39	0.01
High school	26,764	9.18
Some college (< 2 years)	157,800	54.12
AA/AS degree	41,060	14.08
2–3 years college	50,825	17.43
Baccalaureate degree	13,249	4.54
Master's degree or higher	1,853	0.64
Total	**291,590**	**100.00**

Officers

Level	Number	Percent
Below baccalaureate/ unknown	917	1.28
Baccalaureate degree	30,492	42.41
Master's degree	33,344	46.38
Doctoral and professional degrees	7,139	9.93
Total	**71,892**	**100.00**

Numbers are rounded and may not sum to totals. Total does not include 3,988 cadets.

Air Force Personnel Strength

(As of Sept. 30, 1998)

Year	Strength	Year	Strength	Year	Strength
1907	3	1938	21,089	1969	862,062
1908	13	1939	23,455	1970	791,078
1909	27	1940	51,165	1971	755,107
1910	11	1941	152,125	1972	725,635
1911	23	1942	764,415	1973	690,999
1912	51	1943	2,197,114	1974	643,795
1913	114	1944	2,372,292	1975	612,551
1914	122	1945	2,282,259	1976	585,207
1915	208	1946	455,515	1977	570,479
1916	311	1947	305,827	1978	569,491
1917	1,218	1948	387,730	1979	559,450
1918	195,023	1949	419,347	1980	557,969
1919	25,603	1950	411,277	1981	570,302
1920	9,050	1951	788,381	1982	582,845
1921	11,649	1952	973,474	1983	592,044
1922	9,642	1953	977,593	1984	597,125
1923	9,441	1954	947,918	1985	601,515
1924	10,547	1955	959,946	1986	608,199
1925	9,670	1956	909,958	1987	607,035
1926	9,674	1957	919,835	1988	576,446
1927	10,078	1958	871,156	1989	570,880
1928	10,549	1959	840,028	1990	535,233
1929	12,131	1960	814,213	1991	510,432
1930	13,531	1961	820,490	1992	470,315
1931	14,780	1962	883,330	1993	444,351
1932	15,028	1963	868,644	1994	426,327
1933	15,099	1964	855,802	1995	400,409
1934	15,861	1965	823,633	1996	389,001
1935	16,247	1966	886,350	1997	377,385
1936	17,233	1967	897,426	1998	367,470
1937	19,147	1968	904,759	1999	370,882

1999 number is programmed.

Active Duty Force Demographics

(As of Sept. 30, 1998)

Grade	Total	Blacks	Women	Other Minorities
Officers				
General	274	8	7	8
Colonel	3,815	144	270	185
Lieutenant Colonel	10,418	717	1,304	184
Major	15,612	899	2,279	188
Captain	27,523	1,642	5,091	50
First Lieutenant	7,414	526	1,595	16
Second Lieutenant	6,836	475	1,425	6
Total	**71,892**	**4,411**	**11,971**	**637**
Enlisted				
Chief Master Sergeant of the Air Force	1			
Chief Master Sergeant	2,946	570	284	56
Senior Master Sergeant	5,896	1,066	682	168
Master Sergeant	29,606	6,044	3,281	1,241
Technical Sergeant	38,280	7,735	4,481	1,774
Staff Sergeant	73,461	13,402	10,720	4,066
Sergeant/Senior Airman	67,709	10,487	15,190	4,892
Airman First Class	44,600	7,660	11,633	5,150
Airman	17,698	3,222	4,551	1,901
Airman Basic	11,393	1,946	2,720	1,219
Total	**291,590**	**52,132**	**53,542**	**20,467**
Total personnel	**363,482**	**56,543**	**65,513**	**21,104**

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

Total does not include 3,988 cadets.

The Civilian Force

(As of Sept. 30, 1998)

General Schedule/ Other

Grade	Force
1	1
2	48
3	664
4	3,870
5	10,382
6	6,633
7	8,845
8	1,209
9	12,497
10	792
11	16,156
12	18,937
13	10,997
14	3,244
15	1,237
16	0
17	0
18	0
ST[a]	39
SES[b]	159
Other	250
Total	**95,960**

Wage Grade

Grade	Force
1	4
2	228
3	277
4	164
5	1,225
6	1,086
7	1,654
8	3,565
9	3,466
10	13,782
11	3,791
12	1,589
13	207
14	60
15	2
16	0
17	0
18	0
Total	**31,100**

Wage Grade Leader

Grade	Force
1	0
2	5
3	4
4	0
5	18
6	34
7	44
8	102
9	260
10	730
11	111
12	43
13	0
14	0
15	0
16	0
17	0
18	0
Total	**1,351**

Wage Grade Supervisory

Grade	Force
1	9
2	23
3	29
4	50
5	69
6	138
7	210
8	253
9	912
10	1,194
11	448
12	262
13	148
14	180
15	115
16	65
17	36
18	17
Total	**4,158**

Air Force Civilian Personnel: Average Age and Length of Service

Average length of service (overall)	**18 years**
General schedule	**17 years**
Federal wage system	**18 years**
Average age	**47 years**

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

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

[a]Scientific and Technical.

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

USAF Personnel Strength by Commands, FOAs, and DRUs

(As of Sept. 30, 1998)

	Military	Civilian	Total
Major commands			
Air Combat Command (ACC)	87,327	11,315	98,642
Air Education and Training Command (AETC)	65,777	14,363	80,140
Air Force Materiel Command (AFMC)	30,577	66,409	96,986
Air Force Reserve Command (AFRC)	450	14,798	15,248
Air Force Space Command (AFSPC)	19,207	4,352	23,559
Air Force Special Operations Command (AFSOC)	9,227	546	9,773
Air Mobility Command (AMC)	52,458	8,403	60,861
Pacific Air Forces (PACAF)	32,621	8,495	41,116
United States Air Forces in Europe (USAFE)	26,769	5,204	31,973
Total major commands	**324,413**	**133,885**	**458,298**
Field Operating Agencies (FOAs)			
Air Force Agency for Modeling and Simulation	17	11	28
Air Force Audit Agency	2	886	888
Air Force Base Conversion Agency	0	284	284
Air Force Center for Environmental Excellence	42	372	414
Air Force Center for Quality & Mgmt. Innovation	117	88	205
Air Force Civil Engineer Support Agency	95	126	221
Air Force Cost Analysis Agency	25	37	62
Air Force Flight Standards Agency	138	30	168
Air Force Historical Research Agency	8	62	70
Air Force History Support Office	4	31	35
Air Force Inspection Agency	121	26	147
Air Force Legal Services Agency	390	121	511
Air Force Logistics Management Agency	58	11	69
Air Force Medical Operations Agency	62	73	135
Air Force Medical Support Agency	51	28	79
Air Force News Agency	360	106	466
Air Force Office of Special Investigations	1,418	410	1,828
Air Force Operations Group	229	11	240
Air Force Personnel Center	963	932	1,895
Air Force Personnel Operations Agency	45	19	64
Air Force Program Executive Office	34	11	45
Air Force Real Estate Agency	0	13	13
Air Force Review Boards Agency	10	34	44
Air Force Safety Center	69	57	126
Air Force Security Forces Center	252	13	265
Air Force Services Agency	80	190	270
Air Force Studies and Analyses Agency	77	23	100
Air Force Technical Applications Center	701	0	701
Air Force Weather Agency	683	163	846
Air Intelligence Agency	10,540	2,053	12,593
Air National Guard Readiness Center	117	464	581
Joint Combat Rescue Agency	12	2	14
Joint Services Survival, Evasion, Resistance, and Escape Agency	31	75	106
Total FOAs	**16,751**	**6,762**	**23,513**
Direct Reporting Units (DRUs)			
Air Force Communications & Information Center	864	676	1,540
Air Force Doctrine Center	76	9	85
Air Force Operational Test and Evaluation Center	536	231	767
United States Air Force Academy	2,301	1,839	4,140
11th Wing	1,609	848	2,457
Total DRUs	**5,386**	**3,603**	**8,989**
Other			
Other active duty	16,932	28,595	45,527
USAFA cadets	3,988	0	3,988
Total for all categories	**367,470**	**172,845**	**540,315**

USAF Personnel by Geographic Area

(As of Sept. 30, 1998)

Total military personnel	**367,470**
US territory and special locations	**305,617**
Total in foreign countries	**61,853**
Western and southern Europe	**31,201**
Germany	13,473
UK	8,423
Turkey	2,033
Italy	4,248
Spain	246
All other countries	2,778
East Asia and Pacific	**24,731**
Japan/Okinawa	13,755
South Korea	8,580
Guam	2,033
All other countries	363
Africa, Near East, South Asia	**467**
Saudi Arabia	268
Egypt	65
All other countries	134
Western hemisphere	**2,036**
Panama	1,712
Canada	82
All other countries	242
Other areas	**3,418**

Active Duty Force by Grade

(As of Sept. 30, 1998)

Grade	Number
Officers	
General	10
Lieutenant General	39
Major General	86
Brigadier General	139
Colonel	3,815
Lieutenant Colonel	10,418
Major	15,612
Captain	27,523
First Lieutenant	7,414
Second Lieutenant	6,836
Total	**71,892**
Cadets	3,988
Enlisted	
Chief Master Sergeant of the Air Force	1
Chief Master Sergeant	2,946
Senior Master Sergeant	5,896
Master Sergeant	29,606
Technical Sergeant	38,280
Staff Sergeant	73,461
Sergeant/Senior Airman	67,709
Airman First Class	44,600
Airman	17,698
Airman Basic	11,393
Total	**291,590**
Total strength	**367,470**

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Specialties in the Enlisted Force

(As of Sept. 30, 1998)

Code	Career Field	Assigned	Percent
1A	Aircrew Operations	6,802	2.3
1C	Command Control Systems Operations	11,789	4.0
1N	Intelligence	11,580	4.0
1S	Safety	385	0.1
1T	Aircrew Protection	2,584	0.9
1W	Weather	2,549	0.9
2A	Manned Aerospace Maintenance	61,504	21.1
2E	Communications–Electronics Systems	15,467	5.3
2F	Fuels	3,769	1.3
2G	Logistics Plans	740	0.3
2M	Missile & Space Systems Maintenance	2,726	0.9
2P	Precision Measurement	1,388	0.5
2R	Maintenance Management Systems	1,767	0.6
2S	Supply	13,320	4.6
2T	Transportation & Vehicle Maintenance	12,413	4.3
2W	Munitions & Weapons	14,966	5.1
3A	Information Management	12,343	4.2
3C	Communications–Computer Systems	13,868	4.8
3E	Civil Engineering	18,371	6.3
3H	Historian	103	<0.1
3M	Morale, Welfare, Recreation, & Services	4,605	1.6
3N	Public Affairs	1,610	0.6
3P	Security Forces	20,506	7.0
3R	Printing Management	5	<0.1
3S	Mission Support	10,199	3.5
3U	Manpower	785	0.3
3V	Visual Information	1,670	0.6
4X	Medical	22,390	7.7
4Y	Dental	2,733	0.9
5J	Paralegal	1,030	0.4
5R	Chapel Service Support	470	0.2
6C	Contracting	1,283	0.4
6F	Financial	4,099	1.4
7S	Special Investigation	710	0.2
8	Special Duty Identifiers	6,153	2.1
9	Reporting Identifiers	4,902	1.7
	Unassigned	6	<0.1
	Total	**291,590**	**100**

Percentages have been rounded.

Specialties in the Officer Force

(As of Sept. 30, 1998)

Code	Utilization Field Title	Assigned	Percent
X0	Commander & Director	873	1.2
11	Pilot	12,766	17.8
12	Navigator	4,533	6.3
13	Space, Missile, Command & Control	4,631	6.4
14	Intelligence	2,778	3.9
15	Weather	705	1.0
16	Operations Support	1,549	2.2
21	Aircraft Maintenance & Munitions	4,009	5.6
31	Security Forces	746	1.0
32	Civil Engineering	1,487	2.1
33	Communications–Computer Systems	4,375	6.1
34	MWR & Services	357	0.5
35	Public Affairs	416	0.6
36	Personnel	1,661	2.3
38	Manpower	333	0.5
4X	Medical	13,527	18.8
51	Law	1,310	1.8
52	Chaplain	604	0.8
61	Scientific/Research	1,009	1.4
62	Developmental Engineering	2,657	3.7
63	Acquisition	2,355	3.3
64	Contracting	1,019	1.4
65	Financial	905	1.3
71	Special Investigations	373	0.5
8X	Special Duty Identifiers	1,867	2.6
9X	Reporting Identifiers	5,044	7.0
	Other	3	<0.1
	Total	**71,892**	**100**

Total does not include 3,988 cadets. Percentages have been rounded.

USAF photo by MSgt. Val Gempis

Col. Dayle Hartgerink (left) and SrA. Darryl Jordan, of the 374th Dental Squadron at Yokota AB, Japan, treat Kimberly Geofroy during an orthodontic checkup. There are more USAF officers in the medical field than in any other specialty. In the enlisted force, personnel in the medical field are outnumbered only by those in manned aerospace maintenance.

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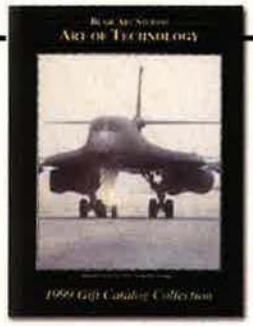

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Budgets

Terms Explained

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

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

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

Air Force Budget—A 10-Year Perspective

(Budget authority in current and constant $ millions)

Current dollars	**FY90**	**FY91**	**FY92**	**FY93**	**FY94**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**
Military personnel	$21,777	$22,755	$21,381	$20,141	$18,168	$19,602	$19,309	$19,186	$19,111	$19,451
Operations and maintenance	25,160	29,061	22,816	22,179	24,525	24,561	23,519	22,728	25,174	24,227
Procurement	30,276	24,041	23,249	21,803	17,716	16,529	15,558	14,247	15,258	17,494
RDT&E	13,507	12,207	12,867	12,979	12,021	11,787	12,427	14,017	14,265	13,683
Military construction	1,453	1,117	1,200	1,053	1,554	816	1,285	1,567	1,537	1,372
Family housing	870	888	1,112	1,212	923	1,106	1,124	1,135	1,114	1,086
Rev. and mgmt. funds	121	1,672	n/a	n/a	n/a	n/a	n/a	790	234	31
Trust and receipts	-274	-485	-286	-221	-332	-470	-231	-453	-409	-439
Total	**92,890**	**91,257**	**82,340**	**79,146**	**74,575**	**73,933**	**72,992**	**73,218**	**76,284**	**76,905**
Constant FY00 dollars										
Military personnel	29,829	29,754	27,153	24,498	21,567	22,719	21,875	21,142	20,447	20,193
Operations and maintenance	31,603	32,813	26,778	25,308	27,397	27,181	25,450	24,000	25,815	24,455
Procurement	36,058	27,819	26,276	24,147	19,264	17,662	16,380	14,824	15,710	17,775
RDT&E	16,399	14,269	14,663	14,468	13,153	12,664	13,105	14,561	14,679	13,906
Military construction	1,724	1,289	1,354	1,166	1,688	871	1,354	1,634	1,585	1,394
Family housing	1,050	1,025	1,259	1,342	1,001	1,180	1,177	1,173	1,139	1,100
Rev. and mgmt. funds	148	1,961	n/a	n/a	n/a	n/a	n/a	814	240	31
Trust and receipts	-335	-569	-326	-246	-362	-503	-242	-467	-419	-446
Total	**116,476**	**108,361**	**97,155**	**90,683**	**83,707**	**81,773**	**79,100**	**77,680**	**79,196**	**74,408**
Percentage real growth										
Military personnel	-2.0	-0.3	-8.7	-9.8	-12.0	5.3	-3.7	-3.4	-3.3	-1.2
Operations and maintenance	-1.9	4.1	-18.4	-5.5	8.3	-0.8	-6.4	-5.7	7.6	-5.3
Procurement	-5.6	-22.9	-5.5	-8.1	-20.2	-8.3	-7.3	-9.5	6.0	13.1
RDT&E	-11.6	-12.9	2.8	-1.3	-9.1	-3.7	3.5	11.1	0.8	-5.3
Military construction	-2.9	-25.2	5.0	-13.9	44.8	-48.4	55.5	20.7	-3.0	-12.1
Family housing	-8.9	-2.3	22.8	6.6	-25.4	17.9	-0.3	-0.3	-2.9	-3.4
Total	**-4.6**	**-7.0**	**-10.3**	**-6.7**	**-7.7**	**-2.3**	**-3.3**	**-1.8**	**2.0**	**-1.0**

Air Force Major Force Programs

(Total Obligation Authority in FY00 constant $ billions)

	FY90	**FY91**	**FY92**	**FY93**	**FY94**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**
Forces										
Strategic Forces	$15.6	$14.6	$12.2	$9.7	$6.2	$5.1	$5.1	$3.9	$4.4	$4.1
General-Purpose Forces	25.6	24.4	20.4	18.4	17.6	16.9	16.9	16.6	16.8	16.5
Airlift Forces	6.8	5.9	7.0	8.1	8.7	9.1	8.7	8.6	9.0	9.8
Guard and Reserve Forces	7.4	6.5	6.9	7.2	7.3	7.5	7.2	7.1	7.4	7.5
Special Operations Forces	1.4	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.4
Total	**56.8**	**51.7**	**46.8**	**43.8**	**40.2**	**39.0**	**38.4**	**36.6**	**38.0**	**38.3**
Support										
Intelligence & Communications	$21.6	$20.1	$21.5	$21.2	$20.6	$18.0	$18.4	$18.2	$19.0	$19.0
Research & Development	10.9	9.4	9.0	8.4	7.5	8.4	8.5	8.1	8.1	7.2
Central Supply & Maintenance	12.2	10.6	7.2	6.5	4.5	4.5	4.2	4.0	4.0	4.2
Training, Medical, & General Personnel	12.2	13.9	9.6	9.4	8.7	9.0	8.9	8.4	8.4	8.5
Administration & Other	1.6	1.6	1.5	1.5	1.5	1.4	1.5	1.5	1.5	1.4
Total	**58.5**	**55.6**	**48.8**	**47.0**	**42.8**	**41.3**	**41.5**	**40.2**	**41.0**	**40.3**

Defense Department Budget Topline

($ billions)

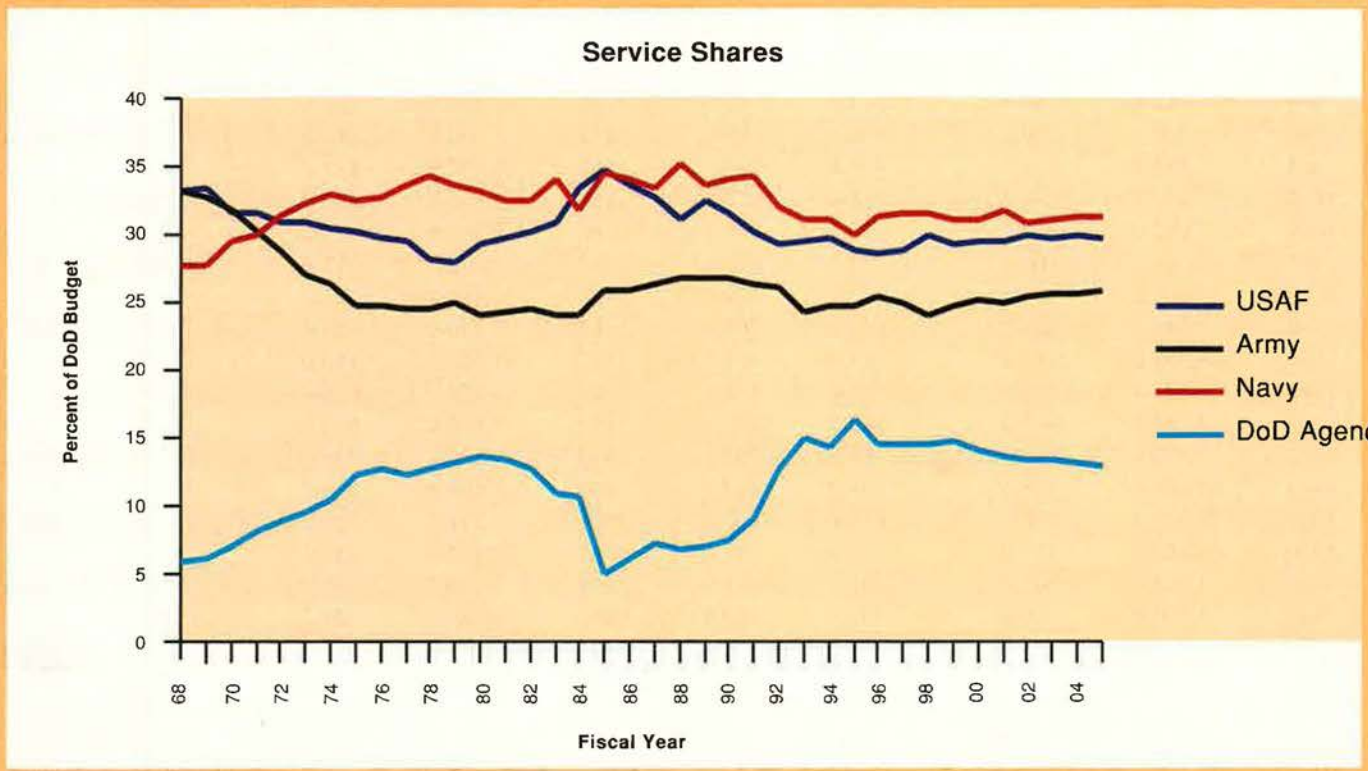
	FY99	FY00	FY01	FY02	FY03	FY04	FY05
Budget authority (current $)	262.6	267.2	286.4	288.3	298.7	307.6	318.9
Budget authority (constant FY00 $)	268.6	267.2	279.3	274.3	277.1	277.8	280.4
Outlays (current $)	263.6	260.8	268.6	278.3	290.2	300.0	317.6
Outlays (constant FY00 $)	269.5	260.8	261.9	264.9	269.8	271.4	280.0

Service Shares

(Budget authority, current $ billions)

	FY99	FY00	FY01	FY02	FY03	FY04	FY05
Air Force	76.9	79.1	84.8	86.7	89.2	92.3	95.1
Army	65.3	67.2	71.3	73.6	76.4	78.9	82.3
Navy	81.9	83.3	91.4	89.2	93.1	96.2	100.3
Defense agencies, DoD–wide	38.5	37.6	38.9	38.8	40.0	40.3	41.2
Total	**262.6**	**267.2**	**286.4**	**288.3**	**298.7**	**307.6**	**318.9**
Percent of budget authority							
Air Force	29.3	29.6	29.6	30.1	29.9	30.0	29.8
Army	24.9	25.2	24.9	25.6	25.6	25.7	25.8
Navy	31.2	31.2	31.9	30.9	31.2	31.3	31.5
Defense agencies, DoD–wide	14.7	14.1	13.6	13.5	13.4	13.1	12.9

Fiscal 2000 figures are those contained in the Clinton Administration's budget request. Numbers have been rounded.



Explanatory Note

Data for 1962–98 are historical. Data for 1999–2000 are projections. These four tables are based on "The Economic and Budget Outlook: Fiscal Years 2000–09," published by the Congressional Budget Office, January 1999. (Constant dollar figures are derived.)

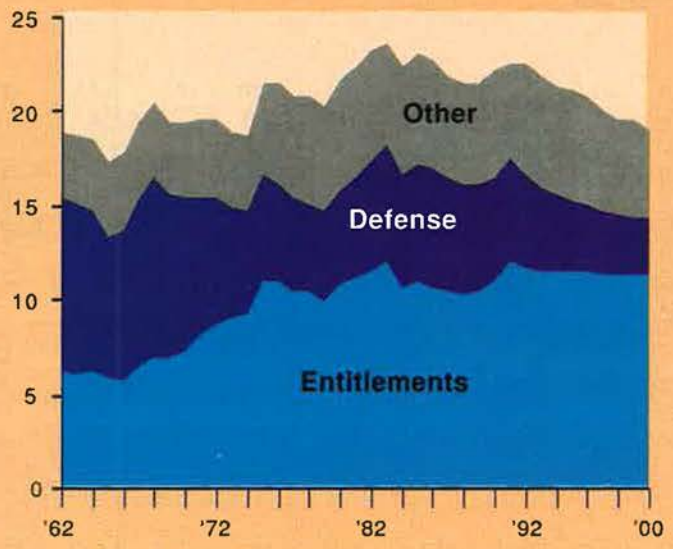
Federal Budget Categories
Current $ billions

Year	Total Outlays	Deficit	Entitlements	Defense
1962	$106.8	$5.9	$34.7	$52.6
1963	111.3	4.0	36.2	53.7
1964	118.5	6.5	38.9	55.0
1965	118.2	1.6	39.7	51.0
1966	134.5	3.1	43.4	59.0
1967	157.5	12.6	50.9	72.0
1968	178.1	27.7	59.7	82.2
1969	183.6	0.5	64.7	82.7
1970	195.6	8.7	72.6	81.9
1971	210.2	26.1	86.9	79.0
1972	230.7	26.4	100.9	79.3
1973	245.7	15.4	116.1	77.1
1974	269.4	8.0	131.0	80.7
1975	332.3	55.3	169.6	87.6
1976	371.8	70.5	189.4	89.9
1977	409.2	49.8	204.0	97.5
1978	458.7	54.9	227.7	104.6
1979	504.0	38.7	247.3	116.8
1980	590.9	72.7	291.5	134.6
1981	678.2	74.0	339.6	158.0
1982	745.8	120.1	370.9	185.9
1983	808.4	208.0	410.7	209.9
1984	851.9	185.7	405.8	228.0
1985	946.4	221.7	448.4	253.1
1986	990.5	238.0	462.0	273.8
1987	1,004.1	169.3	474.4	282.5
1988	1,064.5	194.0	505.3	290.9
1989	1,143.7	205.2	549.6	304.0
1990	1,253.2	277.8	627.3	300.1
1991	1,324.4	321.6	702.6	319.7
1992	1,381.7	340.5	716.6	302.6
1993	1,409.4	300.4	736.8	292.4
1994	1,461.7	258.8	784.0	282.3
1995	1,515.7	226.3	818.2	273.6
1996	1,560.5	174.0	857.5	266.0
1997	1,601.2	103.3	896.3	271.9
1998	1,651.4	29.2	938.6	269.6
1999	1,707.0	19.0	982.0	276.7
2000	1,739.0	7.0	1,028.0	274.1

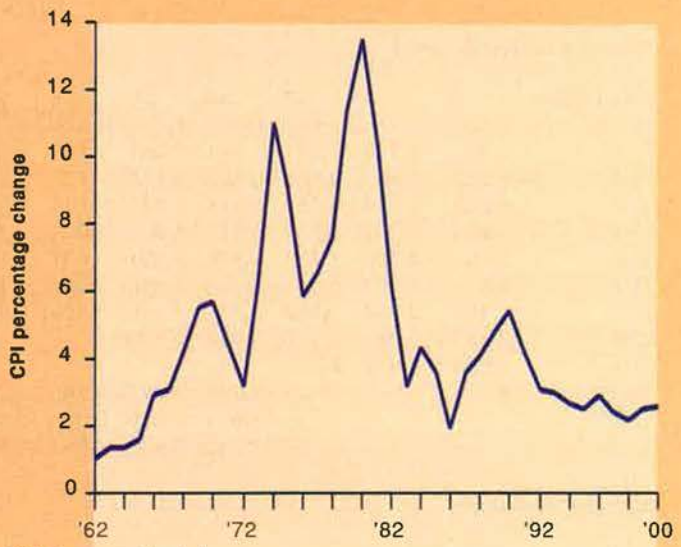
Federal Budget Categories
Constant FY00 $ billions

Year	Total Outlays	Deficit	Entitlements	Defense
1962	609.3	41.3	198.0	300.1
1963	626.9	27.7	203.9	302.4
1964	658.8	44.4	216.3	305.8
1965	646.8	10.8	217.2	279.1
1966	715.3	20.2	230.8	313.8
1967	812.4	79.8	262.5	371.4
1968	881.6	168.4	295.5	406.9
1969	861.5	2.9	303.6	388.0
1970	868.3	47.4	322.3	363.6
1971	893.8	136.3	369.5	335.9
1972	950.5	133.6	415.7	326.7
1973	953.2	73.4	450.4	299.1
1974	941.6	34.3	457.9	282.1
1975	1,064.6	217.6	543.3	280.6
1976	1,125.8	262.2	573.5	272.2
1977	1,163.4	173.9	580.0	277.2
1978	1,212.1	178.2	601.7	276.4
1979	1,196.6	112.8	587.1	277.3
1980	1,236.0	186.8	609.7	281.5
1981	1,286.1	172.3	644.0	299.6
1982	1,331.8	263.4	662.3	332.0
1983	1,398.8	442.0	710.6	363.2
1984	1,413.3	378.3	673.2	378.2
1985	1,515.5	436.0	718.0	405.3
1986	1,556.5	459.3	726.0	430.3
1987	1,523.1	315.4	719.6	428.5
1988	1,551.1	347.2	736.3	423.9
1989	1,590.2	350.4	764.2	422.7
1990	1,653.2	450.0	827.5	395.9
1991	1,676.7	500.0	889.5	404.7
1992	1,696.6	513.5	879.9	371.6
1993	1,680.2	439.8	878.4	348.6
1994	1,696.8	368.9	910.1	327.7
1995	1,716.5	314.7	926.6	309.9
1996	1,717.5	235.2	943.7	292.8
1997	1,720.9	136.3	963.3	292.2
1998	1,736.7	37.7	987.1	283.5
1999	1,751.4	23.9	1,007.5	283.9
2000	1,739.0	7.0	1,028.0	274.1

Federal Budget Outlay Categories
Percentages of GDP



Inflation Rates



CPI=Consumer Price Index

Year	Total Outlays	Deficit	Entitlements	Defense
1962	18.8	1.0	6.1	9.3
1963	18.6	0.7	6.0	9.0
1964	18.5	1.0	6.1	8.6
1965	17.2	0.2	5.8	7.4
1966	17.8	0.4	5.7	7.8
1967	19.4	1.6	6.3	8.9
1968	20.5	3.2	6.9	9.4
1969	19.4	0.1	6.8	8.7
1970	19.4	0.9	7.2	8.1
1971	19.5	2.4	8.1	7.3
1972	19.6	2.2	8.6	6.7
1973	18.8	1.2	8.9	5.9
1974	18.7	0.6	9.1	5.6
1975	21.4	3.6	10.9	5.6
1976	21.5	4.1	10.9	5.2
1977	20.8	2.5	10.4	4.9
1978	20.7	2.5	10.3	4.7
1979	20.2	1.6	9.9	4.7
1980	21.7	2.7	10.7	5.0
1981	22.3	2.4	11.1	5.2
1982	23.2	3.7	11.5	5.8
1983	23.6	6.1	12.0	6.1
1984	22.3	4.9	10.6	6.0
1985	23.0	5.4	10.9	6.2
1986	22.7	5.4	10.6	6.3
1987	21.8	3.7	10.3	6.1
1988	21.5	3.9	10.2	5.9
1989	21.4	3.8	10.3	5.7
1990	22.1	4.9	11.0	5.3
1991	22.6	5.5	12.0	5.5
1992	22.5	5.5	11.7	4.9
1993	21.8	4.6	11.4	4.5
1994	21.3	3.8	11.4	4.1
1995	21.1	3.1	11.4	3.8
1996	20.7	2.3	11.4	3.5
1997	20.1	1.3	11.2	3.4
1998	19.6	0.3	11.2	3.2
1999	19.5	0.2	11.2	3.1
2000	19.1	0.1	11.3	3.0

Year	% change
1962	1.0
1963	1.3
1964	1.3
1965	1.6
1966	2.9
1967	3.1
1968	4.2
1969	5.5
1970	5.7
1971	4.4
1972	3.2
1973	6.2
1974	11.0
1975	9.1
1976	5.8
1977	6.5
1978	7.6
1979	11.3
1980	13.5
1981	10.3
1982	6.2
1983	3.2
1984	4.3
1985	3.6
1986	1.9
1987	3.6
1988	4.1
1989	4.8
1990	5.4
1991	4.2
1992	3.1
1993	3.0
1994	2.7
1995	2.5
1996	2.9
1997	2.4
1998	2.2
1999	2.5
2000	2.6

Monthly Military Basic Rates of Pay

(Effective Jan. 1, 1999)

Commissioned Officers[a]

Pay Grade	Years of Service <2	>2	>3	>4	>6	>8	>10	>12	>14	>16	>18	>20	>22	>24	>26
O-10[a]	7,839	8,114	8,114	8,114	8,114	8,426	8,426	8,893	8,893	9,529	9,529	10,167	10,167	10,167	10,800
O-9[a]	6,947	7,129	7,281	7,281	7,281	7,466	7,466	7,777	7,777	8,426	8,426	8,893	8,893	8,893	9,529
O-8	6,292	6,481	6,635	6,635	6,635	7,129	7,129	7,466	7,466	7,777	8,114	8,426	8,634	8,634	8,634
O-7	5,228	5,584	5,584	5,584	5,834	5,834	6,173	6,173	6,481	7,129	7,620	7,620	7,620	7,620	7,620
O-6	3,875	4,257	4,537	4,537	4,537	4,537	4,537	4,537	4,691	5,432	5,710	5,834	6,173	6,381	6,694
O-5	3,100	3,639	3,891	3,891	3,891	3,891	4,008	4,224	4,508	4,845	5,122	5,278	5,462	—	—
O-4	2,612	3,181	3,393	3,393	3,456	3,609	3,855	4,072	4,257	4,445	4,567	—	—	—	—
O-3	2,428	2,714	2,902	3,211	3,365	3,485	3,674	3,855	3,950	—	—	—	—	—	—
O-2	2,117	2,312	2,778	2,871	2,930	—	—	—	—	—	—	—	—	—	—
O-1	1,838	1,913	2,312	—	—	—	—	—	—	—	—	—	—	—	—
O-3E[b]	—	—	—	3,211	3,365	3,485	3,674	3,855	4,008	—	—	—	—	—	—
O-2E[b]	—	—	—	2,871	2,930	3,023	3,181	3,303	3,393	—	—	—	—	—	—
O-1E[b]	—	—	—	2,312	2,470	2,561	2,654	2,746	2,871	—	—	—	—	—	—

Enlisted Members

E-9	—	—	—	—	—	—	2,877	2,942	3,008	3,078	3,147	3,208	3,376	3,507	3,705
E-8	—	—	—	—	—	2,413	2,483	2,547	2,614	2,683	2,744	2,811	2,977	3,109	3,308
E-7	1,685	1,819	1,886	1,952	2,019	2,083	2,150	2,217	2,317	2,383	2,449	2,480	2,647	2,779	2,977
E-6	1,449	1,580	1,646	1,715	1,780	1,844	1,912	2,010	2,073	2,140	2,173	—	—	—	—
E-5	1,272	1,384	1,451	1,515	1,614	1,680	1,746	1,811	1,844	—	—	—	—	—	—
E-4	1,186	1,253	1,327	1,429	1,485	—	—	—	—	—	—	—	—	—	—
E-3	1,118	1,179	1,226	1,275	—	—	—	—	—	—	—	—	—	—	—
E-2	1,076	—	—	—	—	—	—	—	—	—	—	—	—	—	—
E-1 4 mos.+	959	—	—	—	—	—	—	—	—	—	—	—	—	—	—
E-1<4 mos.	888	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Amounts have been rounded to the nearest dollar.

[a]Basic pay is limited to $9,225, regardless of cumulative years of service.

[b]Commissioned officers with more than four years' active service as enlisted members.

Basic pay while serving as Chairman of the Joint Chiefs of Staff or Chief of Staff of the Air Force is $11,916.60, regardless of cumulative years of service, but the general officer cap of $9,225 applies, as well.

Basic pay while serving as Chief Master Sergeant of the Air Force is $4,503, regardless of cumulative years of service.

Aviation Career Incentive Pay

(Effective Jan. 1, 1999)

Monthly Rate	Years of Aviation Service as an Officer
$125	2 or fewer
156	more than 2
188	more than 3
206	more than 4
650	more than 6
840	more than 14

Monthly Rate	Years of Service as an Officer
$585	more than 22
495	more than 23
385	more than 24
250	more than 25

Provided to qualified rated officers and flight surgeons.

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

Continuous pay ends following the 25th year of service. Grades O-6 and below with more than 25 years of service may receive $250 per month for continued operational flying.

Hazardous Duty Pay

(Effective Jan. 1, 1999)

Pay Grade	Monthly Rate
O-10	$150
O-9	$150
O-8	$150
O-7	$150
O-6	$250
O-5	$250
O-4	$225
O-3	$175
O-2	$150
O-1	$150
E-9	$200
E-8	$200
E-7	$200
E-6	$175
E-5	$150
E-4	$150
E-3	$150
E-2	$150
E-1	$150

Annual Pay for Federal Civilians

(Effective Jan. 1, 1999)

General Schedule

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
GS-1	$13,362	$13,807	$14,252	$14,694	$15,140	$15,401	$15,838	$16,281	$16,299	$16,718
GS-2	15,023	15,380	15,878	16,299	16,482	16,967	17,452	17,937	18,422	18,907
GS-3	16,392	16,938	17,484	18,030	18,576	19,122	19,668	20,214	20,760	21,306
GS-4	18,401	19,014	19,627	20,240	20,853	21,466	22,079	22,692	23,305	23,918
GS-5	20,588	21,274	21,960	22,646	23,332	24,018	24,704	25,390	26,076	26,762
GS-6	22,948	23,713	24,478	25,243	26,008	26,773	27,538	28,303	29,068	29,833
GS-7	25,501	26,351	27,201	28,051	28,901	29,751	30,601	31,451	32,301	33,151
GS-8	28,242	29,183	30,124	31,065	32,006	32,947	33,888	34,829	35,770	36,711
GS-9	31,195	32,235	33,275	34,315	35,355	36,395	37,435	38,475	39,515	40,555
GS-10	34,353	35,498	36,643	37,788	38,933	40,078	41,223	42,368	43,513	44,658
GS-11	37,744	39,002	40,260	41,518	42,776	44,034	45,292	46,550	47,808	49,066
GS-12	45,236	46,744	48,252	49,760	51,268	52,776	54,284	55,792	57,300	58,808
GS-13	53,793	55,586	57,379	59,172	60,965	62,758	64,551	66,344	68,137	69,930
GS-14	63,567	65,686	67,805	69,924	72,043	74,162	76,281	78,400	80,519	82,638
GS-15	74,773	77,265	79,757	82,249	84,741	87,233	89,725	92,217	94,709	97,201

Senior Executive Service

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6
$102,300	$107,100	$112,000	$118,000	$118,400	$118,400

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

Housing Allowance

(Effective Jan. 1, 1999)

Pay Grade	With Dependents	Without Dependents
O-10	$1,081.20	$878.40
O-9	1,081.20	878.40
O-8	1,081.20	878.40
O-7	1,081.20	878.40
O-6	973.50	805.80
O-5	938.40	776.10
O-4	827.10	719.10
O-3	684.30	576.60
O-2	584.40	457.20
O-1	522.60	385.20
O-3E	735.30	622.50
O-2E	663.60	528.90
O-1E	613.20	455.10
E-9	702.60	533.10
E-8	647.70	442.50
E-7	601.50	417.90
E-6	555.60	378.30
E-5	499.80	348.90
E-4	434.40	303.60
E-3	404.40	297.60
E-2	385.20	241.80
E-1	385.20	215.70

Subsistence Allowance

(Effective Jan. 1, 1999)

	Cash/In-Kind
Officers	157.26/month

Enlisted Members	E-1 <4 Months	All Other Enlisted
When on leave or authorized to mess separately	$6.93/day	$7.50/day
When rations in-kind are not available	$7.81/day	$8.46/day
When assigned to duty under emergency conditions where no US mess facilities are available	$10.36/day	$11.21/day

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Attn: Maj. Gen. Richard F. Gillis, USAF, Ret.
6905 N.W. 25th Street
Miami, FL 33122-1898
Phone: 305-599-6598
Fax: 305-513-2107
e-mail: gillisr@avsales.com
web site: www.avsales.com

Equipment

Total Active Inventory (TAI): aircraft assigned to operating forces for mission, training, test, or maintenance. Includes primary, backup, and attrition aircraft.
Primary Aircraft Inventory (PAI): aircraft assigned to meet Primary Aircraft Authorization (PAA).

Active Duty Inventory

(As of Sept. 30, 1998)

Type	TAI	PAI
Bomber		
B-1	73	54
B-2	21	10
B-52	85	49
Total	**179**	**113**
Cargo/transport		
C-5	81	70
C-9	23	4
C-12	34	33
C-17	43	39
C-20	13	12
C-21	76	73
C-27	7	0
C-32	2	2
C-130	191	164
C-135	4	4
C-137	4	4
C-141	122	93
NC-130	4	2
NT-39	2	2
VC-25	2	2
Total	**608**	**504**
Fighter/attack		
A-10	126	114
OA-10	91	69
F-15	615	514
F-16	792	661
F-22	2	2
F-117	53	46
YF-15	1	0
YF-117	3	3
Total	**1,683**	**1,409**
Helicopter		
HH-60	47	40
TH-53	6	4
UH-1	63	47
Total	**116**	**91**
Reconnaissance/battle management/C³I		
E-3	32	24
E-4	4	3
E-8	5	3
EC-18	3	3
EC-130	22	16
EC-135	9	6
EC-137	1	0
OC-135	2	2
RC-135	19	15
RQ-1	4	4
SR-71	2	0
U-2	35	32
WC-135	2	0
Total	**140**	**108**
Special Operations Forces		
AC-130	21	16
MC-130	53	45
MH-53	40	35
MH-60	9	8
Total	**123**	**104**
Tanker		
HC-130	9	9
KC-10	59	54
KC-135	255	229
NKC-135	3	3
Total	**326**	**295**
Trainer		
AT-38	93	71
T-1	180	86
T-3	110	103
T-37	418	312
T-38	416	274
T-39	1	1
T-41	3	3
T-43	11	10
C-18	2	0
C-135	2	2
G-3	3	2
G-4	14	10
G-7	9	8
G-9	4	4
G-10	1	0
G-11	2	2
UV-18	3	2
Total	**1,272**	**890**
Total active duty	**4,447**	**3,514**

Air National Guard Inventory

(As of Sept. 30, 1998)

Type	TAI	PAI
Bomber		
B-1	17	14
Cargo/transport		
C-5	13	12
C-21	4	4
C-22	3	2
C-26	16	10
C-130	225	205
C-135	1	0
C-141	18	16
Total	**280**	**249**
Fighter/Attack		
A-10	74	72
OA-10	26	18
F-15	116	90
F-16	607	490
Total	**823**	**670**
Helicopter		
HH-60G	17	15
Reconnaissance/battle management/C³I		
EC-130	8	6
Rescue		
HC-130	13	9
Tanker		
KC-135	223	204
Total ANG	**1,381**	**1,167**

Air Force Reserve Command Inventory

(As of Sept. 30, 1998)

Type	TAI	PAI
Bomber		
B-52	9	8
Cargo		
C-5	32	28
C-130	110	104
C-141	48	40
Total	**190**	**172**
Fighter/Attack		
A-10	27	24
OA-10	24	21
F-16	71	59
Total	**122**	**104**
Helicopter		
HH-60	23	20
Rescue		
HC-130	7	7
Special Operations		
MC-130	13	12
WC-130	10	10
Total	**23**	**22**
Tanker		
KC-135	72	64
Total AFRC	**446**	**397**

Total Number of USAF Aircraft in Service Over Time

(As of Sept. 30, 1998)

Type of aircraft	FY92	FY93	FY94	FY95	FY96	FY97	FY98
Bomber	248	225	178	183	185	177	179
Tanker	478	391	326	325	314	310	317
Fighter/interceptor/attack	2,000	1,848	1,781	1,750	1,637	1,631	1,613
Reconnaissance/electronic warfare	238	241	225	318	257	252	211
Cargo/transport	794	749	733	690	654	612	610
Search & rescue (fixed wing)	56	84	34	12	9	9	9
Helicopter (includes rescue)	206	203	189	123	174	178	165
Trainer	1,313	1,150	1,188	1,205	1,193	1,234	1,247
Utility/observation/other	89	95	107	104	98	98	96
Total active duty	**5,422**	**4,986**	**4,761**	**4,710**	**4,521**	**4,501**	**4,447**
Air National Guard	1,694	1,653	1,586	1,461	1,426	1,375	1,351
AFRC	524	543	468	462	447	454	430
Total active duty, ANG, and AFRC	**7,640**	**7,182**	**6,815**	**6,633**	**6,394**	**6,330**	**6,228**
Total aircraft, including foreign-government-owned	7,733	7,276	7,028	6,725	6,476	6,412	6,327

Age of the Active Duty Fleet

(As of Sept. 30, 1998)

	Age in Years									
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Average
A/OA-10					13	177	27			16.8
B-1				58	15					11.3
B-2	7	10	3	1						4.1
B-52									85	36.8
C-5				43	7				31	16.8
C-9								3	20	27.5
KC-10			1	11	30	17				13.7
C-12				4	8		1	21		19
C-17	20	19	4							3.1
C-18[a]		2				3				11.6
C-20	1	1		8	2	1				10.9
C-21					76					13.7
C-25			2							7.9
C-27		2	5							6.4
C-32	2									0.3
C-130[b]		16	17	13	7			49	198	26
C-135[b]									296	36.7
C-137[b]			1		2				2	19.6
C-141[b]									122	31.9
E-3					3	8	13	8		18.8
E-4								2	2	24.3
E-8	4		1							2.6
F-15		36	118	118	100	140	100	3	1	12.9
F-16	22	192	308	165	88	8	9			8.1
F-22	2									0.7
F-117[c]			56							7.4
G-3			3							7.6
G-4		4	1	1		3	5			13
G-7				4	1	4				13
G-9				4						11.6
G-10		1								3.6
G-11		2								3.2
H-1									63	27.7
H-53			1	5				1	39	25.9
H-60		5	30	11	2	8				9.5
RQ-1	4									1.2
SR-71									2	32.2
T-1	57	102	21							3.9
T-3	14	96								3.6
T-37									418	35.2
T-38									509	31.5
T-39									3	37.6
T-41									3	28.5
T-43									11	24.5
U-2			1	9	13	8			4	15
UV-18	1							2		14.5
Total	134	488	573	455	367	377	155	89	1809	19.7
Percent[d]	**3%**	**11%**	**13%**	**10%**	**8%**	**8%**	**3%**	**2%**	**41%**	

[a]Includes EC-18. [b]Includes all types. [c]Includes YF-117. [d]Percentages are rounded.

Age of the Air National Guard Fleet

(As of Sept. 30, 1998)

	Age in Years									
	0–3	**3–6**	**6–9**	**9–12**	**12–15**	**15–18**	**18–21**	**21–24**	**24+**	**Average**
A-10					1	40	60			17.8
B-1				19	1					11.3
C-5									13	27.4
C-21				2						11
C-22					3					13.7
C-26		9	3	2						5.3
C-38	2									0.5
C-130	19	30	38	17	26	13	16		87	18.3
C-135									225	38.4
C-141									12	32.5
F-15						1	70	44		20.6
F-16	1	17	81	223	165	83	10			11.7
H-60		7		11						7.8
Total	22	63	122	274	196	137	156	44	337	18.7
Percent	**2%**	**5%**	**9%**	**20%**	**15%**	**10%**	**12%**	**3%**	**25%**	

Percentages have been rounded.

Age of the Air Force Reserve Command Fleet

(As of Sept. 30, 1998)

	Age in Years									
	0–3	**3–6**	**6–9**	**9–12**	**12–15**	**15–18**	**18–21**	**21–24**	**24+**	**Average**
A-10					1	21	29			18.0
B-52									9	36.5
C-5								1	31	27.3
C-130	6	22	12	25	8	6			61	19.2
C-135									70	37.7
C-141									33	32.1
F-16			1	66	5					10.8
H-60			23							8.1
Total	6	22	36	91	14	27	29	1	204	22.0
Percent	**1%**	**5%**	**8%**	**21%**	**3%**	**6%**	**7%**	**0.2%**	**47%**	

Percentages have been rounded.

ICBMs and Spacecraft in Service

(As of Sept. 30, 1998)

Type of system	**FY92**	**FY93**	**FY94**	**FY95**	**FY96**	**FY97**	**FY98**
Minuteman II ICBM	375	0	0	0	0	0	0
Minuteman III ICBM	500	500	500	530	530	530	530
Peacekeeper ICBM	50	50	50	50	50	50	50
Total ICBMs	**925**	**550**	**550**	**580**	**580**	**580**	**580**
DMSP satellite	2	2	2	3	2	2	2
DSCS satellite	5	5	5	5	5	5	5
DSP satellite (data classified)	—	—	—	—	—	—	—
GPS satellite	19	24	24	25	26	26	26
Milstar	—	—	1	2	2	2	2
Total satellites	**26**	**31**	**32**	**35**	**35**	**35**	**35**

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

USAF Aircraft Flying Hours

(In thousands, as of Sept. 30, 1998)

	FY92	FY93	FY94	FY95	FY96	FY97	FY98
Active duty	2,195	1,993	1,750	1,709	1,657	1,680	1,644
ANG	441	442	412	403	380	375	361
AFRC	154	149	155	141	144	150	149
Total	**2,790**	**2,584**	**2,317**	**2,253**	**2,181**	**2,205**	**2,154**

USAF Squadrons by Mission Type

(As of Sept. 30, 1998)

	FY94	FY95	FY96	FY97	FY98
Active forces					
Bomber	12	10	10	10	10
Air refueling	25	24	23	23	25
Strategic command & control	0	1	1	1	2
Fighter	53	54	54	54	47
Reconnaissance	0	4	4	4	0
Electronic warfare	4	3	3	3	3
Special Operations Forces	16	15	16	16	13
Ground theater air control	5	5	5	5	8
Airborne theater air control	7	7	7	9	8
Weather	0	0	1	0	0
Rescue	6	6	7	7	7
Theater airlift	11	12	12	13	11
Long-range airlift	16	15	15	17	20
Special mission	2	2	2	2	2
Aeromedical airlift	3	3	3	3	3
ICBM	19	14	14	14	14
Space operations	6	9	10	10	10
Space communications	3	3	2	1	1
Space warning	10	11	9	8	8
Space surveillance	7	9	7	6	6
Space launch	5	5	5	5	5
Range	2	2	2	2	2
Total	**212**	**214**	**212**	**213**	**205**
Reserve forces					
ANG Selected Reserve	89	89	87	88	88
AFRC	59	48	48	60	62
Space operations	1	1	1	1	3
Total	**149**	**138**	**136**	**149**	**153**
Grand total	**361**	**352**	**348**	**362**	**358**

Aircraft per Active Duty USAF Squadron

(As of Sept. 30, 1998)

Aircraft	Number
A/OA-10	2, 4, 6, 9, 12, 17
B-1B	2, 6, 12, 16
B-2	8
B-52	1, 12
C-5	6, 16
C-9A	1, 3, 4, 11
C-17	7, 12
C-130	8, 10, 14, 16, 18, 20
AC-130	3, 6, 10
EC-130H	5
HC-130P/N	9
MC-130	4, 5, 7, 8, 10
MH-53J	5, 20
MH-60G	3, 8
KC-10A	12, 15
KC-135	6, 9, 10, 11, 12, 15, 24
C-141B	6, 9, 16
E-3	2, 25
F-15	4, 6, 8, 18, 67
F-15E	1, 2, 3, 5, 18, 24
F-16	7, 8, 9, 18, 24, 155
F-117A	1, 9, 18
HH-60G	1, 2, 4, 6, 7, 8

For some types of aircraft, squadrons vary in size, as shown here.

Air National Guard Air Defense Unit Fin Flashes

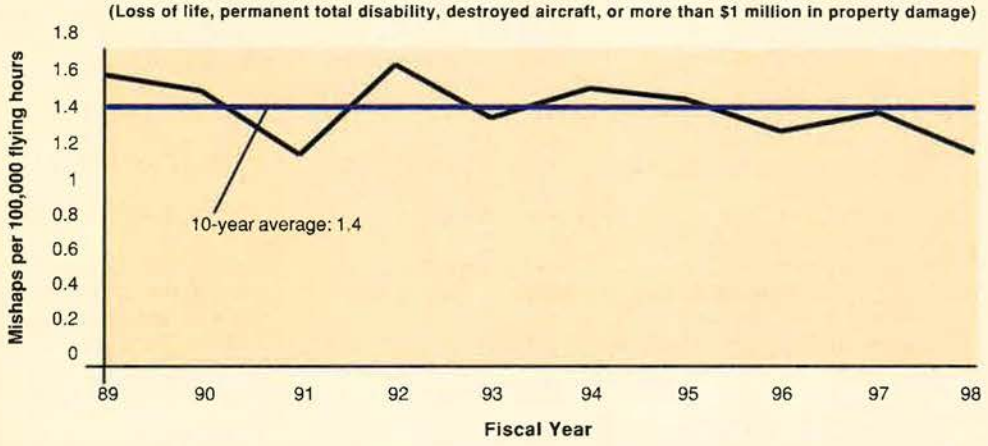
Description	Aircraft	Unit and Location
Minuteman over Massachusetts	F-15A/B	102d FW, Otis ANGB, Mass.
Red stripe with "Happy Hooligans" logo	F-16A/B	119th FW, Hector IAP, N.D.
Dark gray bison's skull against prairie/mountain profile	F-16A/B	120th FW, Great Falls IAP, Mont.[a]
Subdued hawk with banner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

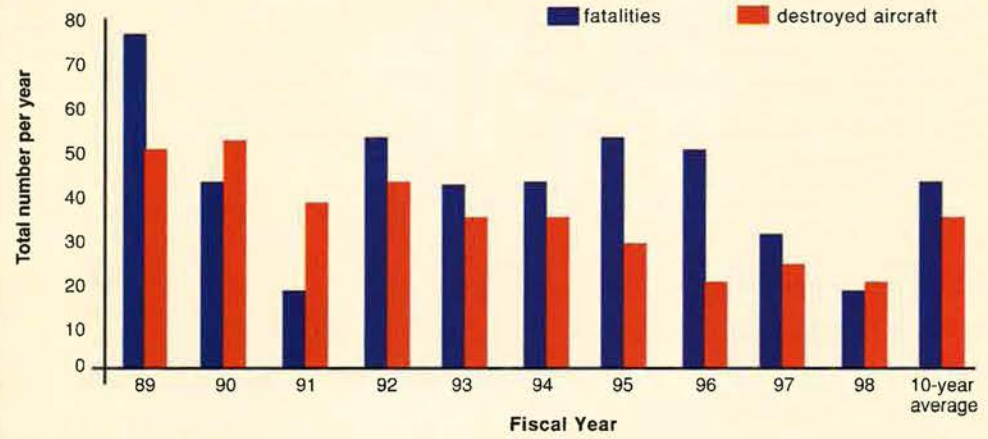
[a]General-purpose units (no longer Air Defense only).
[b]ANG training units.

Class A Aircraft Mishaps

(As of Sept. 30, 1998)

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





Data provided by USAF.

Photo by Ted Carlson

Two F-16Cs from the 144th Fighter Wing (ANG), Fresno Air Terminal, Calif., show off their distinctive black falcon tin flashes. In Fiscal 1998, ANG aircraft accumulated 361,000 flying hours. F-16s like these dominate the ANG aircraft inventory.

USAF Aircraft Tail Markings

Code	Aircraft	Unit and Location
AC	F-16	177th FW (ANG), Atlantic City IAP, N.J.
AF	Various	34th OG, USAF Academy, Colo.
AK	F-15C/D/E, C-130H, C-12, E-3B	3d Wing, Elmendorf AFB, Alaska
AK	F-16C/D, A/OA-10A	354th FW, Eielson AFB, Alaska
AL	F-16C/D	187th FW (ANG), Dannelly Fld, Ala.
AN	C-130H, HC-130, HH-60G	176th Wing (ANG), Anchorage, Alaska
AV	F-16C/D	31st FW, Aviano AB, Italy
AZ	F-16A/B/C/D	162d FW (ANG), Tucson IAP, Ariz.
BB	U-2R/S, T-38A	9th RW, Beale AFB, Calif.
BC	A/OA-10A	110th FW (ANG), Kellogg Arpt, Mich.
BD	A/OA-10A, B-52H	917th Wing (AFRC), Barksdale AFB, La.
CA	HH-60G, HC-130P	129th RW (ANG), Moffett Fed Afld,Calif.
CB	T-37B, AT-38B, T-38A, T-1A	14th FTW, Columbus AFB, Miss.
CC	F-16C/D	27th FW, Cannon AFB, N.M.
CI	C-130E	146th AW, Channel Islands ANGB, Calif.
CO	F-16C/D	140th Wing, Buckley ANGB, Colo.
CT	A/OA-10A	103d FW (ANG), Bradley IAP, Conn.
DC	F-16C/D	113th Wing (ANG), Andrews AFB, Md.
DE	C-130H	166th AW (ANG), New Castle Co. Arpt, Del.
DM	A/OA-10A, EC-130E/H	355th Wing, Davis–Monthan AFB, Ariz.
DR	HH-60G	939th RW (AFRC), Davis–Monthan AFB, Ariz.
DY	B-1B	7th BW, Dyess AFB, Texas
ED	Various	412th TW, Edwards AFB, Calif.
EF	F-16C/D	147th FW (ANG), Ellington Fld, Texas
EG	F-15C	53d FW, Eglin AFB, Fla.
EL	B-1B	28th BW, Ellsworth AFB, S.D.
EN	T-37B, T-38A, AT-38B	80th FTW, Sheppard AFB, Texas
ET	F-15A/B/C/D/E, F-16A/B/C/D, A-10A, UH-1N	46th TW, Eglin AFB, Fla.
FC	UH-1N	336th TRG, Fairchild AFB, Wash.
FE	UH-1N	90th SPW, F.E. Warren AFB, Wyo.
FF	F-15C/D	1st FW, Langley AFB, Va.
FL	HC-130N, HH-60G	939th RW (AFRC), Patrick AFB, Fla.
FM	F-16C/D	482d FW (AFRC), Homestead ARB, Fla.
FS	F-16C/D	188th FW (ANG), Fort Smith MAP, Ark.
FT	A/OA-10A	23d FG, Pope AFB, N.C.
FW	F-16C/D	122d FW (ANG), Fort Wayne IAP, Ind.
GA	B-1B	116th BW (ANG), Robins AFB, Ga.
GA	C-130H	165th AW (ANG), Savannah IAP, Ga.
HI	F-16C/D	419th FW (AFRC), Hill AFB, Utah
HL	F-16C/D	388th FW, Hill AFB, Utah
HO	F-117A, AT-38B, HH-60G	49th FW, Holloman AFB, N.M.
HO	F-4F	Luftwaffe RTU, Holloman AFB, N.M.
HT	AT-38B	46th TG, Holloman AFB, N.M.
HV	UH-1N	30th SPW, Vandenberg AFB, Calif.
ID	A/OA-10A, C-130E	124th Wing, Boise Air Terminal, Idaho
IL	C-130E	182d AW (ANG), Greater Peoria Arpt, Ill.
IS	HH-60G	85th Group, NAS Keflavik, Iceland
JZ	F-15A/B	159th FW (ANG), NAS JRB New Orleans
KC	A/OA-10	442d FW (AFRC), Whiteman AFB, Mo.
LA	B-52H	2d BW, Barksdale AFB, La.
LF	F-16A/B/C/D	56th FW, Luke AFB, Ariz.
LI	HC-130, HH-60G	106th RW (ANG), F.S. Gabreski IAP, N.Y.
LN	F-15C/D/E	48th FW, RAF Lakenheath, UK
LR	F-16C/D	944th FW (AFRC), Luke AFB, Ariz.
MA	A/OA-10A	104th FW (ANG), Barnes MAP, Mass.
MD	A/OA-10A	175th Wing (ANG), Martin State Arpt, Md.
MI	F-16	127th Wing, Selfridge ANGB, Mich.
MM	UH-1N	341st SPW, Malmstrom AFB, Mont.
MN	C-130	133d AW (ANG), Minn.–St. Paul IAP/ARS
MO	B-1B, F-15C/D/E, F-16C/D, KC-135R	366th Wing, Mountain Home AFB, Idaho
MT	B-52H	5th BW, Minot AFB, N.D.
MT	UH-1N	91st SPW, Minot AFB, N.D.
MY	A/OA-10A, F-16C/D, HC-130, HH-60G	347th Wing, Moody AFB, Ga.
NC	C-130H	145th AW (ANG), Charlotte/Douglas IAP, N.C.
NM	F-16C/D	150th FW (ANG), Kirtland AFB, N.M.
NO	A/OA-10A	926th FW (AFRC), NAS JRB New Orleans
NV	C-130E	152d AW (ANG), Reno/Tahoe IAP, Nev.
NY	F-16C/D	174th FW (ANG), Syracuse Hancock IAP, N.Y.
OF	Various	55th Wing, Offutt AFB, Neb.
OH	F-16C/D	178th FW (ANG), Springfield–Beckley MAP, Ohio
OH	C-130H	179th AW (ANG), Mansfield Lahm Arpt, Ohio
OH	F-16C/D	180th FW (ANG), Toledo Exp Arpt, Ohio
OK	F-16C/D	138th FW (ANG), Tulsa IAP, Okla.
OK	E-3B/C	552d ACW, Tinker AFB, Okla.
OK	C-130H	137th AW (ANG), Rogers World Arpt, Okla.
OS	A/OA-10A, F-16C/D, C-12J	51st FW, Osan AB, South Korea
OT	A-10, F-15A/C/E, F-16C/D, F-117, HH-60	53d Wing, Eglin AFB, Fla., Nellis AFB, Nev.
PA	A/OA-10A	111th FW (ANG), Willow Grove ARS, Pa.
PD	HC-130P, HH-60G, C-130E	939th RW (AFRC), Portland IAP, Ore.
PR	C-130E	156th AW (ANG), Marin IAP, Puerto Rico
RA	AT-38B, T-1A, T-3A, T-37B, T-38A T-43A	12th FTW, Randolph AFB, Hondo Arpt, Texas
RI	C-130E	143d AW (ANG), Quonset State Arpt, R.I.
RS	C-130E	86th AW, Ramstein AB, Germany
SA	F-16	149th FW (ANG), Kelly AFB, Texas
SI	F-16C/D	183d FW (ANG), Capital MAP, Ill.
SJ	F-15E	4th FW, Seymour Johnson AFB, N.C.
SL	F-15A/B	131st FW (ANG), Lambert–St. Louis IAP, Mo.
SP	A/OA-10A, F-15C/D, F-16C/D	52d FW, Spangdahlem AB, Germany
SW	F-16C/D	20th FW, Shaw AFB, S.C.
TH	F-16C/D	181st FW (ANG), Hulman RAP, Ind.
TX	C-130H	136th AW (ANG), NAS Dallas, Texas
TX	F-16C/D	301st FW (AFRC), Carswell Fld, Texas
TY	F-15C/D	325th FW, Tyndall AFB, Fla.
VA	F-16C/D	192d FW (ANG), Richmond IAP, Va.
VN	T-37B, T-38A, T-1A	71st FTW, Vance AFB, Okla.
WA	A-10, F-15C/D/E, F-16, HH-60, RQ-1	57th Wing, Nellis AFB, Nev.
WE	E-9A	53d Wing, Tyndall AFB, Fla.
WI	F-16C/D	115th FW (ANG), Truax Fld, Wis.
WM	B-2A, T-38A	509th BW, Whiteman AFB, Mo.
WP	F-16C/D	8th FW, Kunsan AB, South Korea
WR	E-8C	93d ACW, Robins AFB, Ga.
WV	C-130H	130th AW (ANG), Yeager Arpt, W. Va.
WV	C-130H	167th AW (ANG), Shepherd Fld, W. Va.
WW	F-16C/D	35th FW, Misawa AB, Japan
WY	C-130H	153d AW (ANG), Cheyenne MAP, Wyo.
XL	T-37B, T-1A, T-38A	47th FTW, Laughlin AFB, Texas
XP	C-130H	139th AW (ANG), Rosecrans Mem Arpt, Mo.
YJ	C-21A, C-130E/H, UH-1N	374th AW, Yokota AB, Japan
ZZ	F-15C/D, E-3B, KC-135R, HH-60G	18th Wing, Kadena AB, Japan

Source: USAF

USAF Grades and Insignia

Officer

Second Lieutenant
(O-1)

Brigadier General
(O-7)

First Lieutenant
(O-2)

Major General
(O-8)

Captain
(O-3)

Lieutenant General
(O-9)

Major
(O-4)

General
(O-10)

Lieutenant Colonel
(O-5)

Colonel
(O-6)

Enlisted

Airman Basic
(E-1)
No insignia

Airman
(E-2)

Airman First Class
(E-3)

Senior Airman
(E-4)

Staff Sergeant
(E-5)

Technical Sergeant
(E-6)

Master Sergeant
(E-7)

Senior Master Sergeant
(E-8)

Chief Master Sergeant
(E-9)

Chief Master Sergeant of
the Air Force

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

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

Awards and Decorations

This display represents, in correct order of precedence, selected ribbons from World War II to present day. For information regarding ribbons not depicted, refer to AFI 36-2803.

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

Devices

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

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

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

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

Silver Oak Leaf Cluster
represents the sixth, eleventh, etc., entitlements or is worn in lieu of five bronze oak leaf clusters.

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

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

Mobility Device
is worn with the Armed Forces Reserve Medal to denote active duty for at least one day during a contingency, such as the Persian Gulf War or Operation Joint Endeavor (Bosnia).

Hourglass Device
is issued for each succeeding award of the Armed Forces Reserve Medal.

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

Wings and Badges

Shown here and on p. 72 are current wings and badges. The basic level of wings or badges is illustrated. Most wings and badges have two other categories of accomplishment—senior and either commander, master, or chief. A star centered above the badge indicates the senior level, while a star surrounded by a wreath above the badge represents the master level.

Astronaut

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

Pilot

Navigator/Observer

Enlisted Aircrew

Flight Surgeon

Flight Nurse

Officer Aircrew Member

Missile with Operations Designator

Missile

Berets

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

Combat Control Team

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

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

Pararescue

Tactical Air Control Party

Badges, continued


Acquisition and Financial Management


Air Traffic Control


Band


Chaplain Service Support

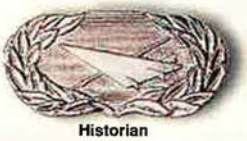

Civil Engineer


Command and Control


Communications and Information


Explosive Ordnance Disposal


Force Protection


Historian


Information Management


Intelligence


Judge Advocate


Logistics


Maintenance


Manpower and Personnel


Meteorologist


Operations Support


Parachutist


Paralegal


Public Affairs


Services


Space/Missile


Supply/Fuels


Transportation


Weapons Director

Medical


Biomedical Science Corps


Dental Corps


Enlisted Medical


Medical Corps


Medical Service Corps


Nurse Corps

Chaplain


Buddhist


Christian


Jewish


Muslim

USAF Almanac

Air Force Magazine's Guide to Aces and Heroes

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

Some Famous US Fighter Firsts

May 28, 1918	First US–trained AEF ace: Capt. Edward V. Rickenbacker
Dec. 7, 1941	First AAF victories of WW II (Pearl Harbor): Lts. Harry W. Brown, Philip M. Rasmussen, Lewis M. Sanders, Gordon H. Sterling Jr., Kenneth M. Taylor, George S. Welch
Dec. 16, 1941	First AAF ace of WW II: 1st Lt. Boyd D. Wagner
June 27, 1950	First USAF victories in the Korean War: Maj. James W. Little, Capt. Raymond E. Schillereff, and 1st Lts. Robert H. Dewald, William G. Hudson, Charles B. Moran, Robert E. Wayne
Nov. 8, 1950	First jet-to-jet victory of the Korean War: 1st Lt. Russell J. Brown
May 20, 1951	First USAF ace of the Korean War: Capt. James Jabara
Nov. 30, 1951	First USAF ace of two wars (WW II and Korea): Maj. George A. Davis Jr. (7 in WW II and 14 in Korea)
Jan. 2, 1967	First (and only) USAF ace with victories in WW II and Vietnam: Col. Robin Olds (12 in WW II and 4 in Vietnam)

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

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

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

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

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

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

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

American Aces of World War I

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

2d Lt. Frank Luke Jr.

1st Lt. George A. Vaughn

Leading Army Air Forces Aces of World War II

(14.5 or more victories)

Bong, Maj. Richard I.	40	Herbst, Lt. Col. John C.	18
McGuire, Maj. Thomas B., Jr.	38	Zemke, Lt. Col. Hubert	17.75
Gabreski, Lt. Col. Francis S.	28[a]	England, Maj. John B.	17.50
Johnson, Capt. Robert S.	27	Beeson, Capt. Duane W.	17.33
MacDonald, Col. Charles H.	27	Thornell, 1st Lt. John F., Jr.	17.25
Preddy, Maj. George E.	26.83	Varnell, Capt. James S., Jr.	17
Meyer, Lt. Col. John C.	24[a]	Johnson, Maj. Gerald W.	16.50
Schilling, Col. David C.	22.50	Godfrey, Capt. John T.	16.33
Johnson, Lt. Col. Gerald R.	22	Anderson, Capt. Clarence E., Jr.	16.25
Kearby, Col. Neel E.	22	Dunham, Lt. Col. William D.	16
Robbins, Maj. Jay T.	22	Harris, Lt. Col. Bill	16
Christensen, Capt. Fred J.	21.50	Welch, Capt. George S.	16
Wetmore, Capt. Ray S.	21.25	Beerbower, Capt. Donald M.	15.50
Voll, Capt. John J.	21	Brown, Maj. Samuel J.	15.50
Mahurin, Maj. Walker M.	20.75[a]	Peterson, Capt. Richard A.	15.50
Lynch, Lt. Col. Thomas J.	20	Whisner, Capt. William T., Jr.	15.50[a]
Westbrook, Lt. Col. Robert B.	20	Bradley, Lt. Col. Jack T.	15
Gentile, Capt. Don S.	19.83	Cragg, Maj. Edward	15
Duncan, Col. Glenn E.	19.50	Foy, Maj. Robert W.	15
Carson, Capt. Leonard K.	18.50	Hofer, 2d Lt. Ralph K.	15
Eagleston, Maj. Glenn T.	18.50[a]	Homer, Capt. Cyril F.	15
Beckham, Maj. Walter C.	18	Landers, Lt. Col. John D.	14.50
Green, Maj. Herschel H.	18	Powers, Capt. Joe H., Jr.	14.50

Maj. Richard I. Bong

Ranks are as of last victory in World War II.

[a]Aces who added to these scores by victories in the Korean War.

Capt. Joseph C. McConnell Jr.

USAF Aces of the Korean War

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

[a]In addition to World War II victories.

Capts. 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

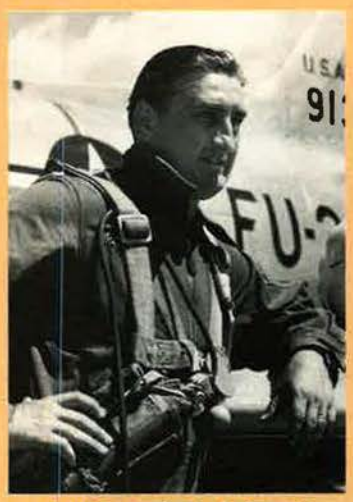
	WW II	Korean/Other	Total
Gabreski, Col. Francis S.	28	6.50	34.50
Meyer, Col. John C.	24	2	26
Mahurin, Col. Walker M.	20.75	3.50	24.25
Davis, Maj. George A., Jr.	7	14	21
Whisner, Maj. William T., Jr.	15.50	5.50	21
Eagleston, Col. Glenn T.	18.50	2	20.50
Garrison, Lt. Col. Vermont	7.33	10	17.33
Baker, Col. Royal N.	3.50	13	16.50
Jabara, Maj. James	1.50	15	16.50
Olds, Col. Robin	12	4[a]	16
Mitchell, Col. John W.	11	4	15
Brueland, Maj. Lowell K.	12.50	2	14.50
Hagerstrom, Maj. James P.	6	8.50	14.50
Hovde, Lt. Col. William J.	10.50	1	11.50
Johnson, Col. James K.	1	10	11
Ruddell, Lt. Col. George I.	2.50	8	10.50
Thyng, Col. Harrison R.	5	5	10
Colman, Capt. Philip E.	5	4	9
Heller, Lt. Col. Edwin L.	5.50	3.50	9
Chandler, Maj. Van E.	5	3	8
Hockery, Maj. John J.	7	1	8
Creighton, Maj. Richard D.	2	5	7
Emmert, Lt. Col. Benjamin J., Jr.	6	1	7
Bettinger, Maj. Stephen L.	1	5	6
Visscher, Maj. Herman W.	5	1	6
Liles, Capt. Brooks J.	1	4	5
Mattson, Capt. Conrad E.	1	4	5
Shaeffer, Maj. William F.	2	3	5

[a]Olds' 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, Lt. Col. Robert S.	27	WW II
MacDonald, Col. Charles H.	27	WW II
Preddy, Maj. George E.	26.83	WW II
Meyer, Col. John C.	26	WW II, Korea
Rickenbacker, Capt. Edward V.	26[b]	WW I
Mahurin, Col. Walker M.	24.25	WW II, Korea
Schilling, Col. David C.	22.50	WW II
Johnson, Lt. Col. Gerald R.	22	WW II
Kearby, Col. Neel E.	22	WW II
Robbins, Maj. Jay T.	22	WW II
Christensen, Capt. Fred J.	21.50	WW II
Wetmore, Capt. Ray S.	21.25	WW II
Davis, Maj. George A., Jr.	21	WW II, Korea
Voll, Capt. John J.	21	WW II
Whisner, Capt. William T., Jr.	21	WW II, Korea
Eagleston, Col. Glenn, T.	20.50	WW II, Korea
Lynch, Lt. Col. Thomas J.	20	WW II
Westbrook, Lt. Col. Robert B.	20	WW II
Gentile, Capt. Don S.	19.83	WW II

[b]Under World War II and Korean War counting rules, Rickenbacker would have been credited with 24.33 victories. The change would not alter his position on this list.

USAF Recipients of the Medal of Honor

Names, Alphabetically by Wars, and Rank at Time of Action	Hometown	Date of Action	Place of Action
World War I			
Bleckley, 2d Lt. Erwin R.	Wichita, Kan.	Oct. 6, 1918	Binarville, France
Goettler, 2d Lt. Harold E.	Chicago	Oct. 6, 1918	Binarville, France
Luke, 2d 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.[a]	Adamsville, Ala.	April 12, 1945	Koriyama, Japan
Femoyer, 2d 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, 2d 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, 2d 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.[a]	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	Vegesack, Germany
McGuire, Maj. Thomas B., Jr.	Ridgewood, N.J.	Dec. 25–26, 1944	Luzon, Philippines
Metzger, 2d Lt. William E., Jr.	Lima, Ohio	Nov. 9, 1944	Saarbrücken, Germany
Michael, 1st Lt. Edward S.	Chicago	April 11, 1944	Brunswick, Germany
Morgan, 2d 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, 2d 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, 2d 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.[a]	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.[a]	Sioux City, Iowa	Conspicuous gallantry while POW	
Dethlefsen, Maj. Merlyn H.	Greenville, Iowa	March 10, 1967	Thai Nguyen, N. Vietnam
Fisher, Maj. Bernard F.[a]	San Bernardino, Calif.	March 10, 1966	A Shau Valley, S. Vietnam
Fleming, 1st Lt. James P.[a]	Sedalia, Mo.	Nov. 26, 1968	Duc Co, S. Vietnam
Jackson, Lt. Col. Joe M.[a]	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.[a]	South Windsor, Conn.	Feb. 24, 1969	Long Binh, S. Vietnam
Sijan, Capt. Lance P.	Milwaukee	Conspicuous gallantry while POW	
Thorsness, Lt. Col. Leo K.[a]	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

[a]Living Medal of Honor recipient.

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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.

ACC Air Combat Command

Headquarters Langley AFB, Va.

Established June 1, 1992

Commander Gen. Richard E. Hawley

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, operations other than war, and major theater wars

Provide air combat forces to America's warfighting commands; nuclear-capable forces for USSTRATCOM; air defense forces to NORAD

Supply aircraft and support forces to the five geographic unified commands: Atlantic, European, Pacific, Southern, and Central Commands

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.

24 wings

OPERATIONAL ACTIVITY

Flying hours: 33,640 per month

Major overseas deployments

Southern/Northern Watch, Bright Star (USCENTCOM), Central Enterprise (USEUCOM), Cobra Gold (USPACOM), Northern Viking, Strong Resolve (USACOM), New Horizons (USSOCOM)

Major CONUS JCS exercises

Cooperative Zenith, JTFEX, Roving Sands, Fuertas Defense (USACOM); Global Guardian (USSTRATCOM); Baltops, TFW (USEUCOM)

Major training exercises

Air Warrior, Green Flag, Red Flag (Nellis AFB, Nev.); Air Warrior II (Barksdale AFB, La.); Blue Flag (Hurlburt Field, Fla.); Maple Flag (CFB Cold Lake, Canada)

PERSONNEL

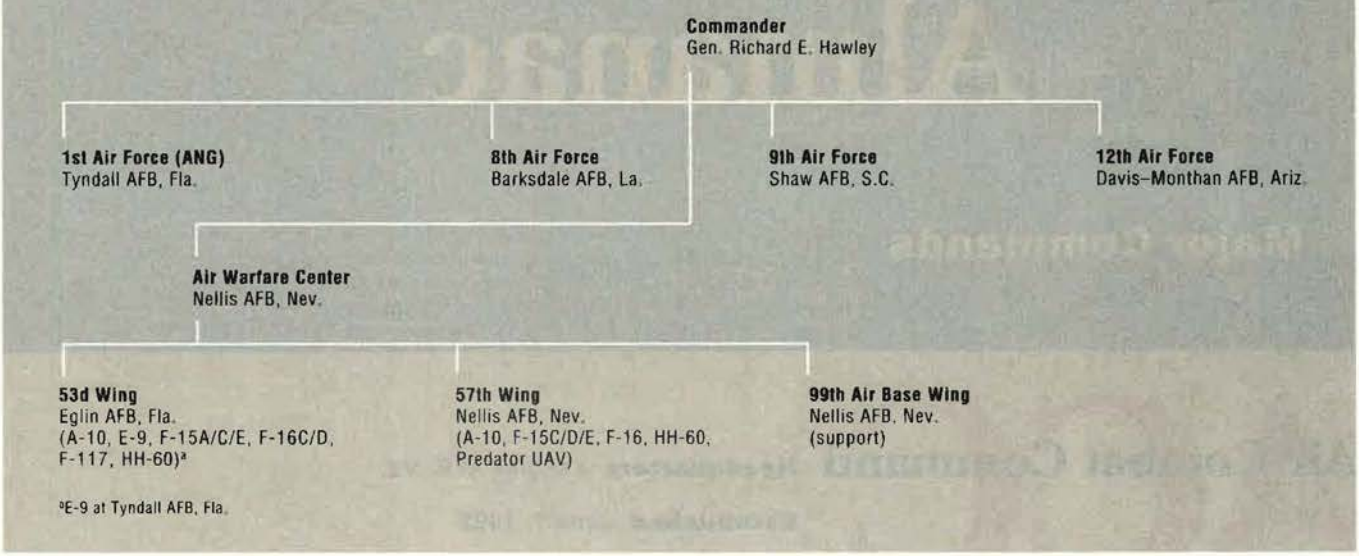
(as of Sept. 30, 1998)

Active duty		91,002
Officers	12,254	
Enlisted	78,748	
Reserve components		61,501
ANG	52,300	
AFRC	9,201	
Civilian		11,312
Total		**163,815**

USAF photo by SrA. Greg L. Davis

Deployed to Al Jaber AB, Kuwait, for Operation Southern Watch a year ago, SrA. Shane Phelps, a 523d Fighter Squadron avionics technician, gives a thumbs-up to personnel on the ground as he runs a diagnostic test on an F-16C. ACC racks up more than 33,000 flying hours a month.

AIR COMBAT COMMAND, LANGLEY AFB, VA.



EQUIPMENT

(Primary Aircraft Inventory as of Sept. 30, 1998)

Bombers (B-1B, B-2, B-52H)	109
Fighters (F-4, F-15, F-16)	424
Attack aircraft (A/OA-10, F-15E, F-117A)	284
Aerial refuelers (KC-135R)	6
Rescue (HC-130, HH-60)	37
Reconnaissance (E-8C, Predator UAV, RC-135, U-2)	49
Command and control (E-3, E-4, E-8, EC-130E)	42

UNIT	BASE	WEAPONS
1st Fighter Wing	Langley AFB, Va.	F-15C/D
2d 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
23d Fighter Group	Pope AFB, N.C.	A/OA-10
24th Wing	Howard AFB, Panama	—
27th Fighter Wing	Cannon AFB, N.M.	F-16C/D
28th Bomb Wing	Ellsworth AFB, S.D.	B-1B
33d Fighter Wing	Eglin AFB, Fla.	F-15C
49th Fighter Wing	Holloman AFB, N.M.	AT-38B, F-4, F-117A, HH-60, German F-4F
53d 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, Predator UAV
65th Air Base Wing	Lajes Field, the Azores (support)	—
85th Group	NAS Keflavik, Iceland	HH-60
93d 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-106, QF-4
509th Bomb Wing	Whiteman AFB, Mo.	B-2, T-38
552d Air Control Wing	Tinker AFB, Okla.	E-3B/C

*Part of 53d Wing

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

Commander
Maj. Gen. Larry K. Arnold

- **Southeast Air Defense Sector (ANG)**
  Tyndall AFB, Fla.
- **Northeast Air Defense Sector (ANG)**
  Rome, N.Y.
- **Western Air Defense Sector (ANG)**
  McChord AFB, Wash.

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

Commander
Lt. Gen. Ronald C. Marcotte

- **2d Bomb Wing**
  Barksdale AFB, La.
  (B-52H)
- **5th Bomb Wing**
  Minot AFB, N.D.
  (B-52H)
- **7th Bomb Wing**
  Dyess AFB, Texas
  (B-1B)
- **27th Fighter Wing**
  Cannon AFB, N.M.
  (F-16C/D)
- **28th Bomb Wing**
  Ellsworth AFB, S.D.
  (B-1B)
- **65th Air Base Wing**
  Lajes Field, the Azores
  (support)
- **509th Bomb Wing**
  Whiteman AFB, Mo.
  (B-2, T-38)
- **85th Group**
  NAS Keflavik, Iceland
  (HH-60)

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

Commander
Lt. Gen. Hal M. Hornburg

- **1st Fighter Wing**
  Langley AFB, Va.
  (F-15C/D)
- **4th Fighter Wing**
  Seymour Johnson AFB, N.C.
  (F-15E)
- **20th Fighter Wing**
  Shaw AFB, S.C.
  (F-16C/D)
- **33d Fighter Wing**
  Eglin AFB, Fla.
  (F-15C)
- **93d Air Control Wing**
  Robins AFB, Ga.
  (E-8C)
- **347th Wing**
  Moody AFB, Ga.
  (A/OA-10, F-16C/D, HC-130, HH-60)

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

Commander
Lt. Gen. Lansford E. Trapp Jr.

9th Reconnaissance Wing
Beale AFB, Calif.
(T-38, U-2R/S)

24th Wing
Howard AFB, Panama

49th Fighter Wing
Holloman AFB, N.M.
(AT-38B, F-4, F-117A, HH-60, German F-4F)

55th Wing
Offutt AFB, Neb.
(E-4B, OC-135B, RC-135S/U/V/W, TC-135S/W, WC-135W)

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)

552d Air Control Wing
Tinker AFB, Okla.
(E-3B/C)

AETC
Air Education and Training Command

Headquarters Randolph AFB, Texas

Established July 1, 1993

Commander Gen. Lloyd W. "Fig" Newton

MISSIONS
Recruit, train, and educate quality people for USAF
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: **2d,** 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: 40,229 per month

Recruiting, training, and education are AETC's main missions. The command has stepped up pilot training, as these T-38s from the 87th Flying Training Squadron at Laughlin AFB, Texas, demonstrate.

Staff photo by Guy Aceto

Major competitions
Top Flight, Top Tech

PERSONNEL
(as of Sept. 30, 1998)

Active duty		41,463
Officers	9,187	
Enlisted	32,276	
Reserve components		3,615
ANG	2,825	
AFRC	790	
Civilian		14,761
Contracted workers		9,836
Total		**69,675**

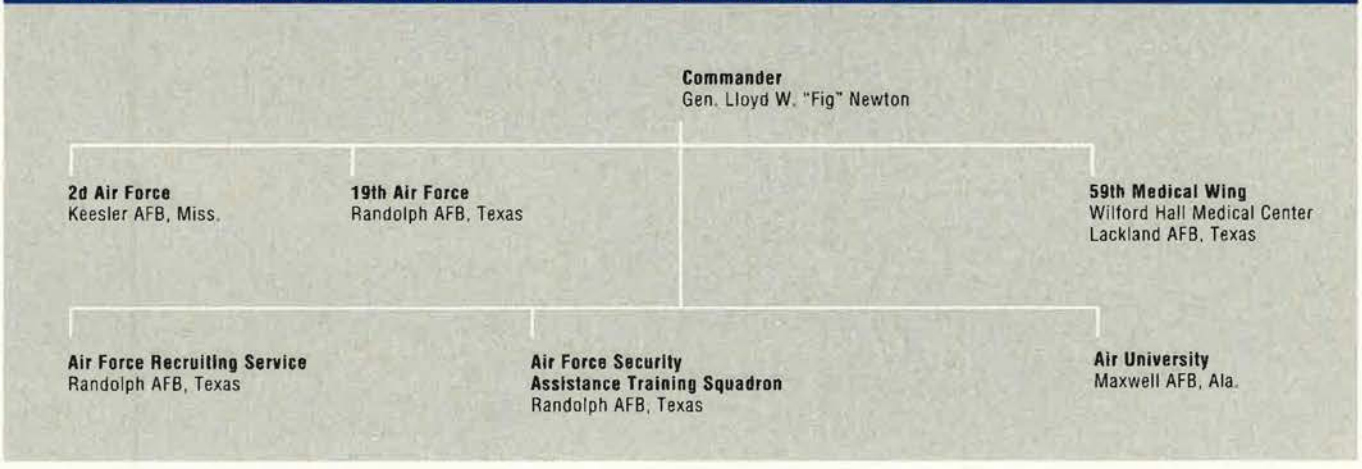
Students		239,189
Aircrew	7,326	
Survival training	6,631	
Basic military training	35,220	
Technical	107,339	
Medical	17,358	
Field training	35,500	
Air University	29,815	

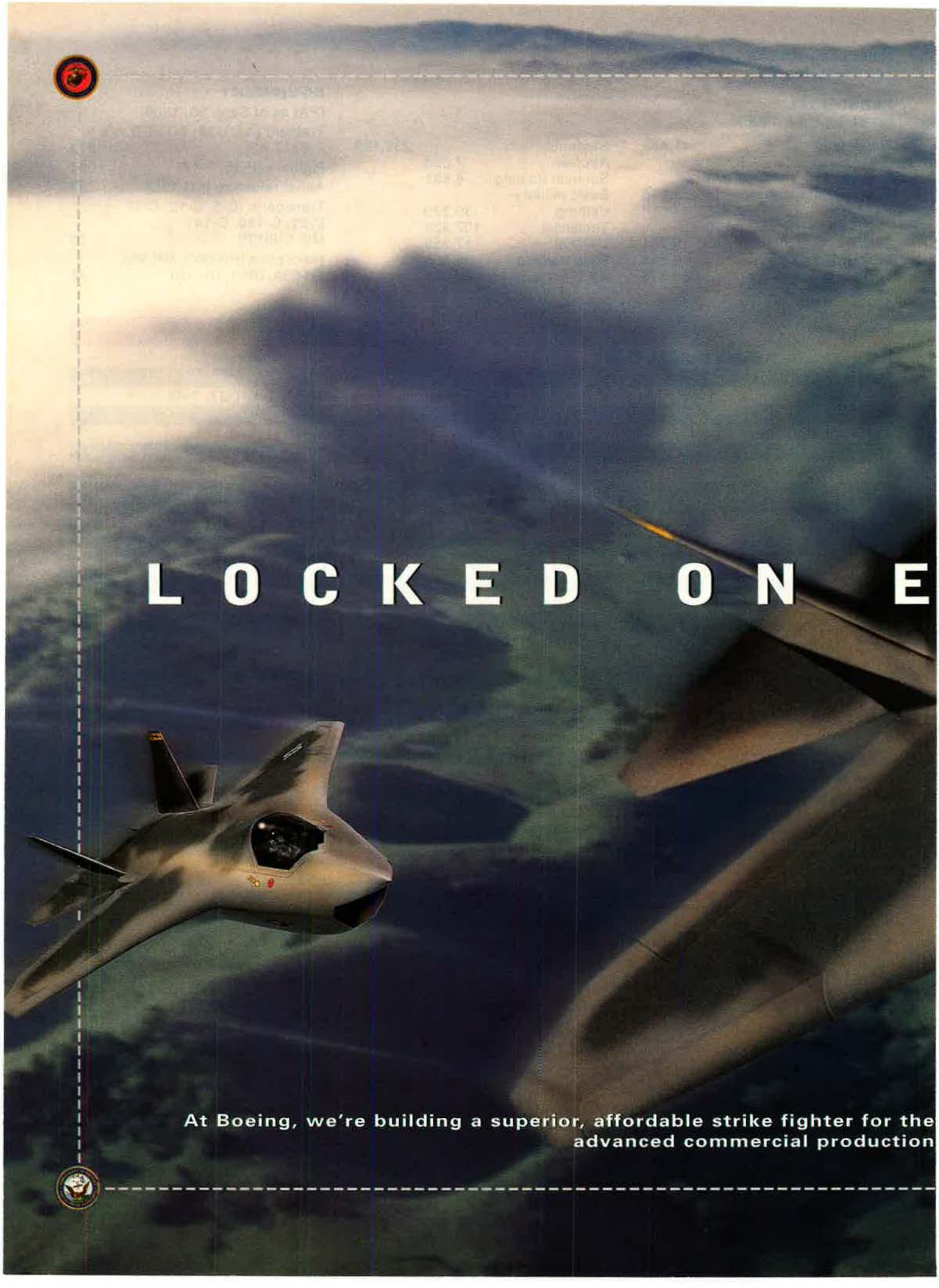
EQUIPMENT
(PAI as of Sept. 30, 1998)

Trainers (AT/T-38, T-1, T-3, T-37, T-43)	979
Fighters (F-15, F-16)	237
Aerial refuelers (KC-135)	24
Transports (C-5, C-12, C-17, C-21, C-130, C-141, MC-130H/P)	75
Helicopters (HH-60G, MH-53J, TH-53A, UH-1, UH-1N)	25

UNIT	BASE	WEAPONS
Flying/Aircrew Training Units (Active)		
3d Flying Training Squadron	Hondo Airport, Texas	T-3
12th FTW	Randolph AFB, Texas	AT/T-38, T-1, 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
557th Flying Training Squadron	US Air Force Academy, Colo.	T-3
Technical Training Units		
17th Training Wing	Goodfellow AFB, Texas	
37th Training Wing	Lackland AFB, Texas	
81st Training Wing	Keesler AFB, Miss.	
82d Training Wing	Sheppard AFB, Texas	
381st Training Group	Vandenberg AFB, Calif.	
Other Major Units		
Air University	Maxwell AFB, Ala.	
Air Force Recruiting Service	Randolph AFB, Texas	
42d Air Base Wing	Maxwell AFB, Ala.	
59th Medical Wing	Lackland AFB, Texas	

AIR EDUCATION AND TRAINING COMMAND, RANDOLPH AFB, TEXAS

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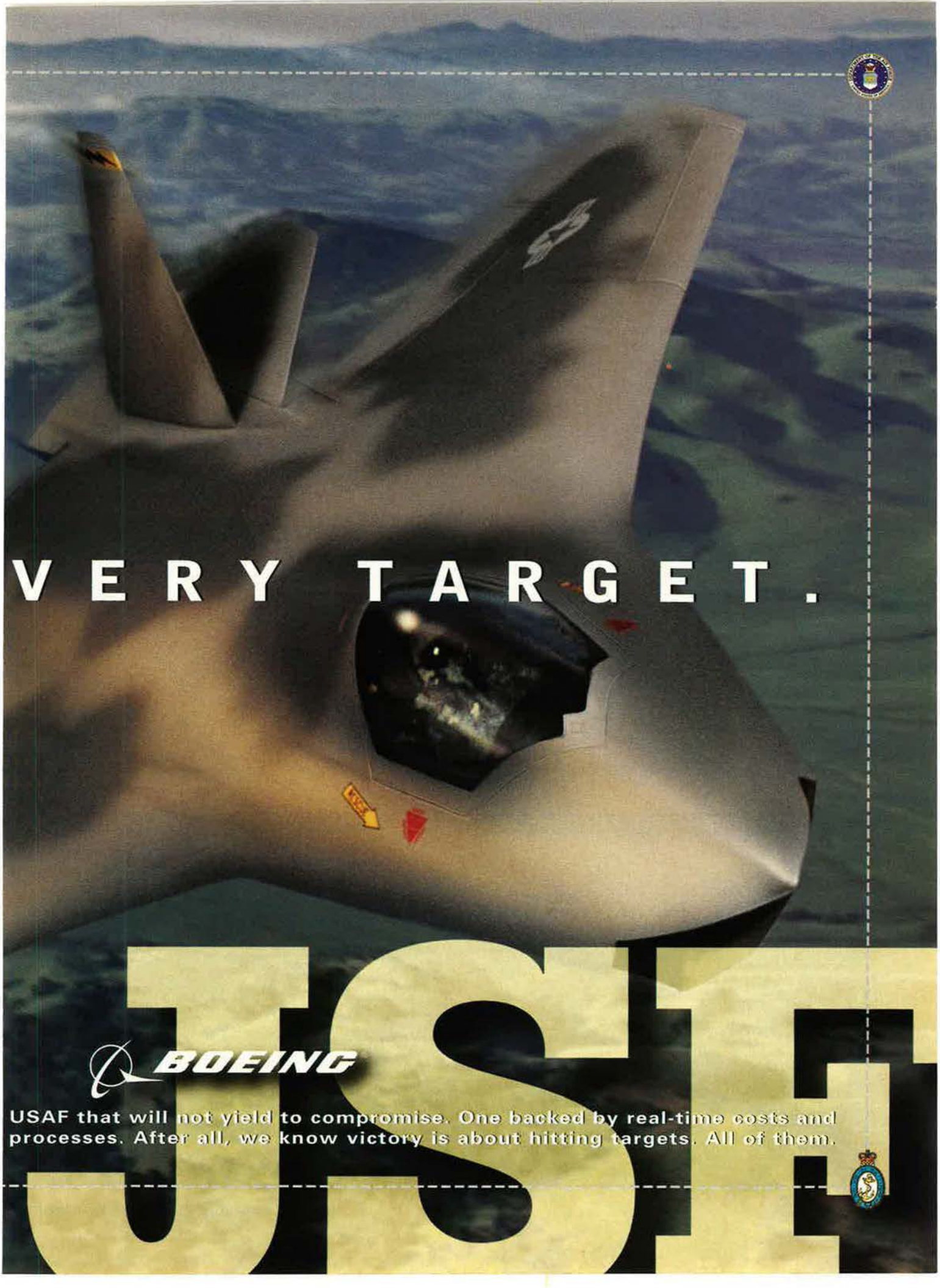
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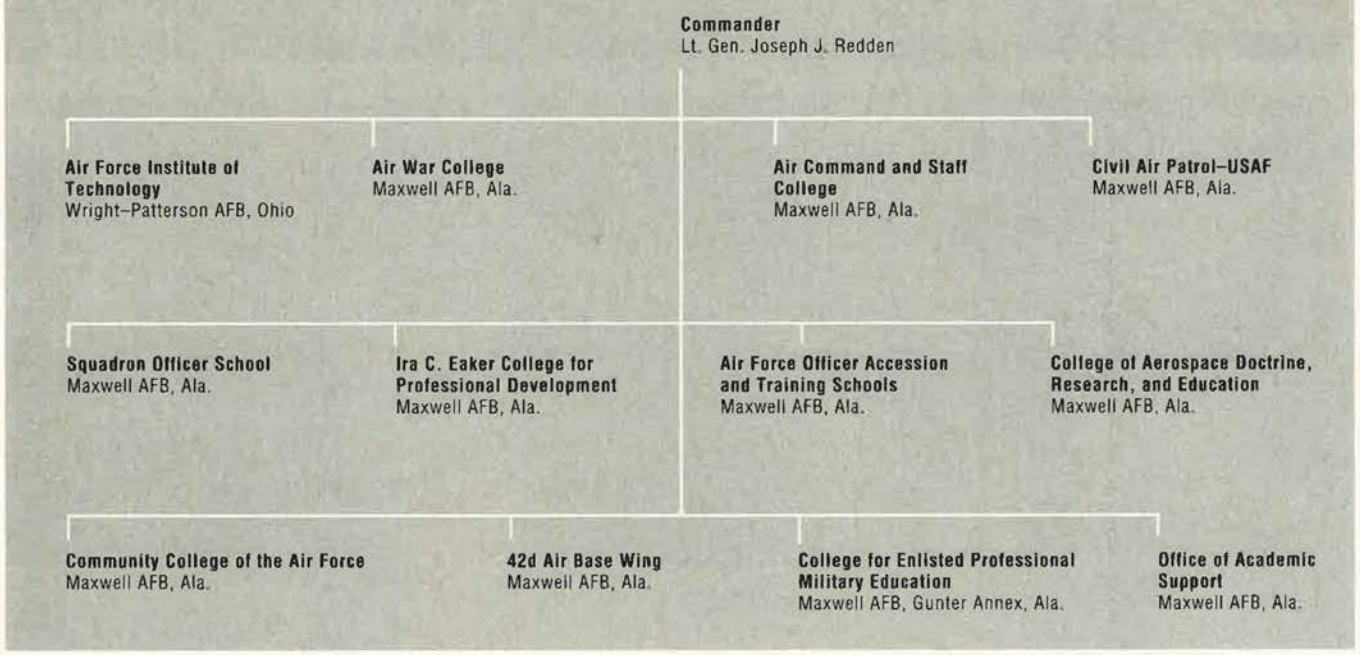
USAF that will not yield to compromise. One backed by real-time costs and processes. After all, we know victory is about hitting targets. All of them.
USAF

AIR UNIVERSITY (AETC), MAXWELL AFB, ALA.



2d AIR FORCE (AETC), KEESLER AFB, MISS.

*Tenant unit

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

*Tenant unit

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Air Force Materiel Command

Headquarters Wright–Patterson AFB, Ohio

Established July 1, 1992

Commander Gen. George T. Babbitt Jr.

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: 2,250 per month

PERSONNEL

(as of Sept. 30, 1998)

Active duty		31,782
Officers	8,992	
Enlisted	22,790	
Reserve components		5,045
ANG	2,692	
AFRC	2,353	
Civilian		70,369
Total		**107,196**

EQUIPMENT

(PAI as of Sept. 30, 1998)

Bombers (B-1B, B-2, B-52H)	4	Transport (C-12, C-17, C-130)	7
Fighters (F-15A/B/C/D/E, F-16A/B/C/D, F-22, F-117A)	64	Command and control (EC-130E/H, EC-135B/C/E/W)	8
Attack aircraft (A-10)	2	ARIA (C-18B, C-135E)	4
Aerial refuelers (KC-135E/R)	2	Helicopters (H-1N, H-60G)	5
		Trainers (T-38A/B/C, T-39A/B)	16

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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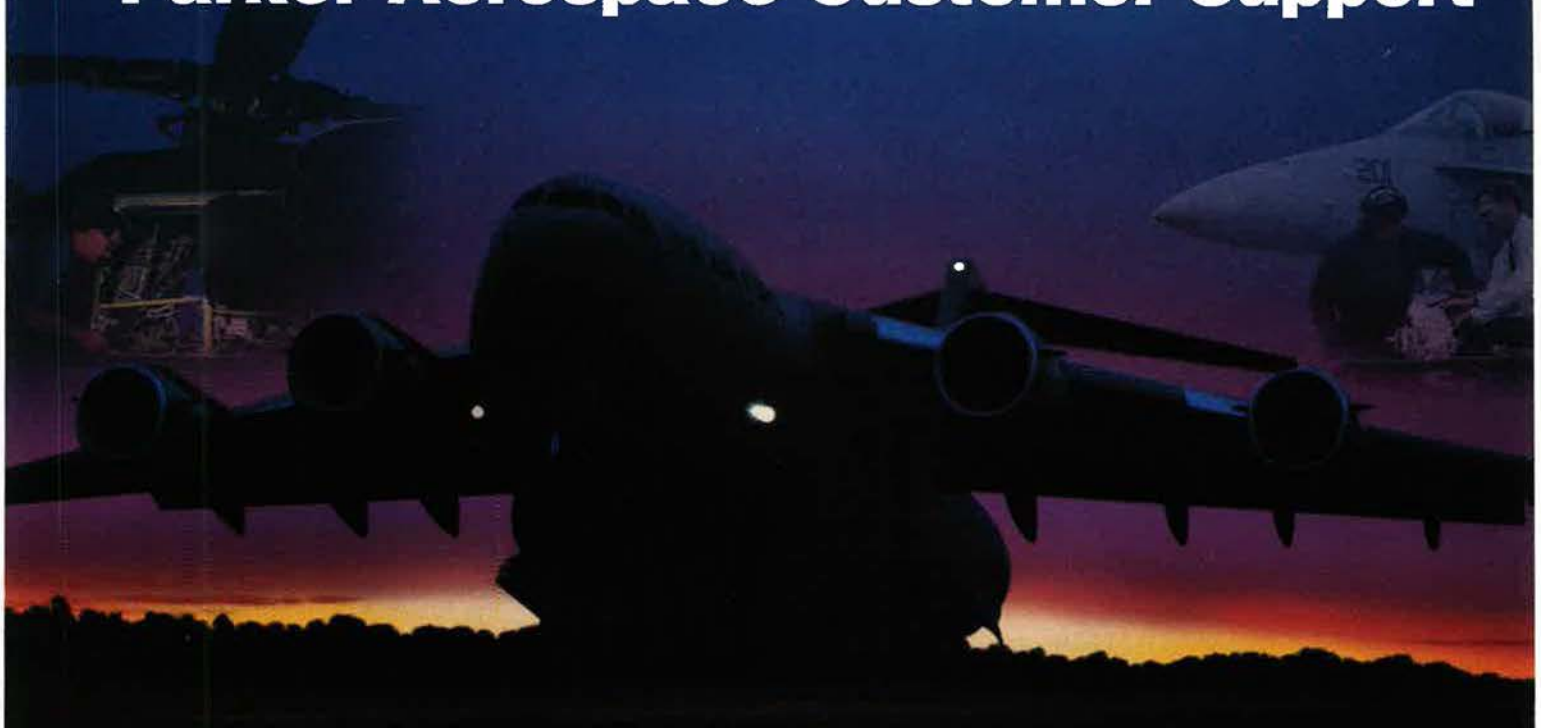

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Air Force Space Command

Headquarters Peterson AFB, Colo.

Established Sept. 1, 1982

Commander Gen. Richard B. Myers

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

Two space groups

PERSONNEL

(as of Sept. 30, 1998)

Active duty		19,224
Officers	3,813	
Enlisted	15,411	
Reserve components		1,079
ANG	305	
AFRC	774	
Civilian		4,323
Contractor personnel		11,643
Total		**36,269**

EQUIPMENT

(as of Sept. 30, 1998)

ICBMs

Peacekeeper	50
Minuteman III	500

Satellite systems

(as of Jan. 1, 1999):

GPS: Block II/IIA/IIR	27
DSCS III	10
Milstar	2
UHF Follow-on	8
DMSP	5

NATO III communications satellites

Boosters: Delta II, Atlas II, Titan II, Titan IV

Ballistic missile warning systems: Defense Support Program satellites, Ballistic Missile Early Warning System, Pave Paws radars, Perimeter Acquisition Radar Attack Characterization System, conventional radars

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

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)

Space environmental systems: Six solar observatories around the world, 17 digital ionospheric sounding systems, four ionospheric measuring systems

Helicopters (UH-1N): 26

AFSPC's responsibilities range from operating ICBM forces to supplying launch facilities. At Cape Canaveral AS, Fla., a Titan IV heavy-lift vehicle waits on the launchpad. It carries such payloads as DSP and Milstar satellites into space.

AIR FORCE SPACE COMMAND, PETERSON AFB, COLO.

Commander
Gen. Richard B. Myers

14th Air Force
Vandenberg AFB, Calif.

Space Warfare Center
Schriever AFB, Colo.

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

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

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

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-1N, 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-1N
91st Space Wing	Minot AFB, N.D.	Minuteman III ICBM, UH-1N
341st Space Wing	Malmstrom AFB, Mont.	Minuteman III ICBM, UH-1N
750th Space Group	Onizuka AS, Calif.	Command and control of DoD and Allied nations' satellites
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 Maj. Gen. Charles R. Holland

MISSIONS

Serve as the Air Force component of USSOC

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)

Four squadrons (one combat aviation advisory, one flight test, one combat weather, and one support operations)
USAF Special Operations School

OPERATIONAL ACTIVITY

Flying hours: 4,625 per month

PERSONNEL

(as of Sept. 30, 1998)

Active duty		9,164
Officers	1,420	
Enlisted	7,744	
Reserve components		2,324
ANG	1,120	
AFRC	1,204	
Civilian		544
Total		**12,032**

EQUIPMENT

(PAI as of Sept. 30, 1998)

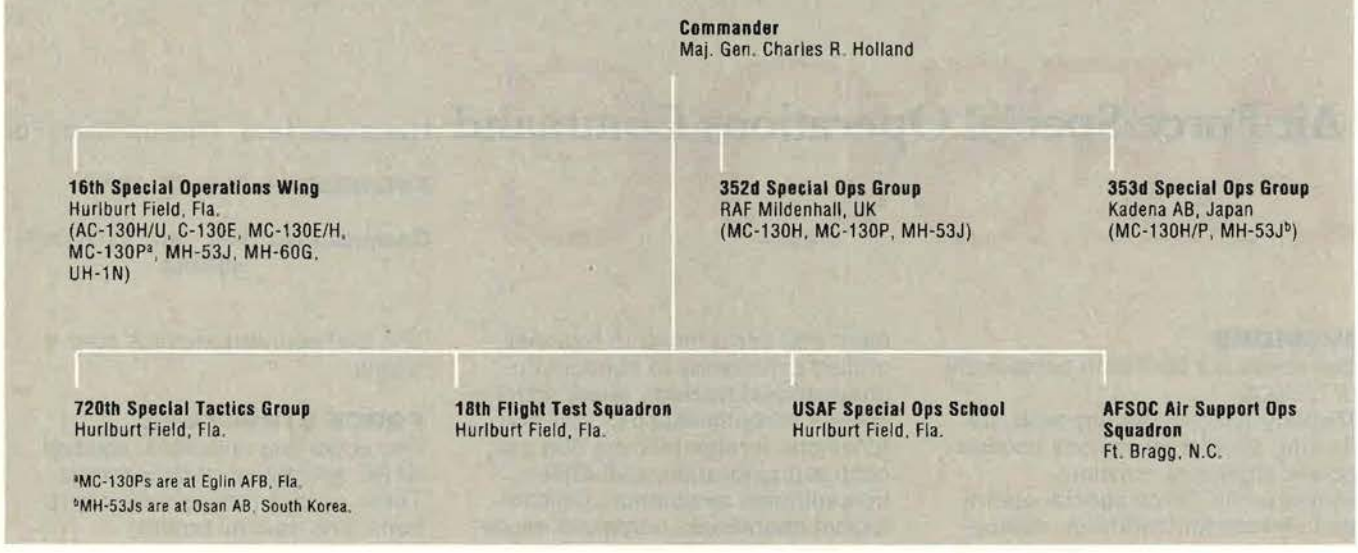
AC-130H Spectre gunships	8
AC-130U Spectre gunships	13
C-130E	4
EC-130	8
MH-53J Pave Low helicopters	34
MH-60G Pave Hawk helicopters	6
MC-130E Combat Talon I	14
MC-130H Combat Talon II	21
MC-130P Combat Shadow	24
UH-1N	2

A special ops heavy operator, the MH-53 Pave Low is part of AFSOC's specialized airpower, deployed anywhere, anytime.

USAF photo by SSgt. John E. Lasky

UNIT	BASE	WEAPONS
16th Special Operations Wing	Hurlburt Field, Fla.	AC-130H/U, C-130E, MC-130E/H, MC-130P(Eglin AFB, Fla.), MH-53J, MH-60G, UH-1N
18th Flight Test Squadron	Hurlburt Field, Fla.	—
352d Special Operations Group	RAF Mildenhall, UK	MC-130H, MC-130P, MH-53J
353d 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.



AMC Air Mobility Command

Headquarters Scott AFB, Ill.

Established June 1, 1992

Commander Gen. Charles T. "Tony" Robertson

MISSIONS

Provide rapid, global tactical and strategic airlift and aerial refueling for US armed forces
Serve as USAF component of US TRANSCOM
Support wartime taskings by providing forces to theater commands

COROLLARY MISSIONS

Provide operational support aircraft; visual documentation support
Perform stateside 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: 33,000+ per month

Major operations
Northern/Southern Watch (Iraq), Joint Forge (Bosnia), Phoenix Scorpion II and III (Persian Gulf build-ups), US Embassy bombings, FEMA relief (Hurricanes Danielle, Georges, and Mitch; Northeast and Canadian ice storms; Florida fires), Flight 111 Swiss Air crash, Indonesia fires, Typhoon Paka

Major training exercises
Cobra Gold, Tandem Thrust, Team Spirit (USPACOM); Battle Griffin, Central Enterprise, Dynamic Guard (USEUCOM); Bright Star (USCENTCOM); Fuertas Defense (USSOCOM); Ocean Venture (USACOM)

PERSONNEL

(as of Sept. 30, 1998)

Active duty		52,173
Officers	8,507	
Enlisted	43,666	
Reserve components		80,886
ANG	35,818	
AFRC	45,068	
Civilian		8,665
Total		**141,724**

USAF photo by SrA. Greg L. Davis

Photo by Erik Hildebrandt

Providing global and strategic airlift and aerial refueling, AMC aircraft like the C-17 above, at Tuzla AB, Bosnia, are always on the move. At left a crew forms up next to a giant C-5, while in the background a C-141—AMC's veteran workhorse—awaits its next sortie.

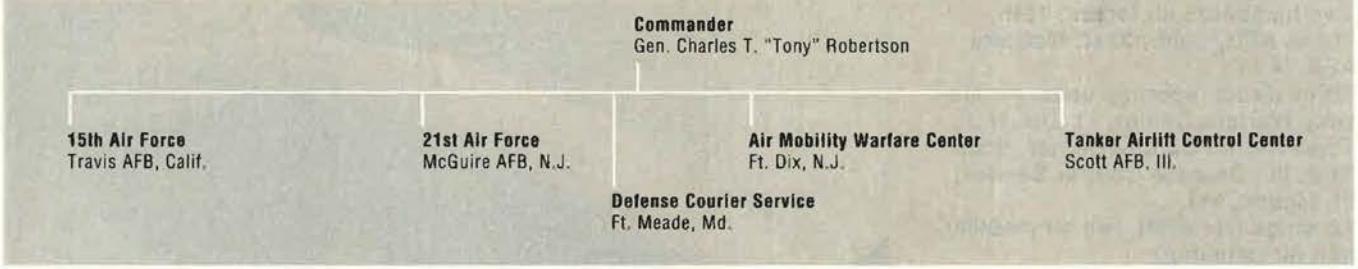
EQUIPMENT

(PAI as of Sept. 30, 1998)

Mobility aircraft (C-5, C-17, C-130, C-141, KC-10, KC-135)	502
Aeromedical evacuation (C-9)	11
Other aircraft (C-20, C-21, C-32, C-37, C-137, EC-135, UH-1, VC-25	88

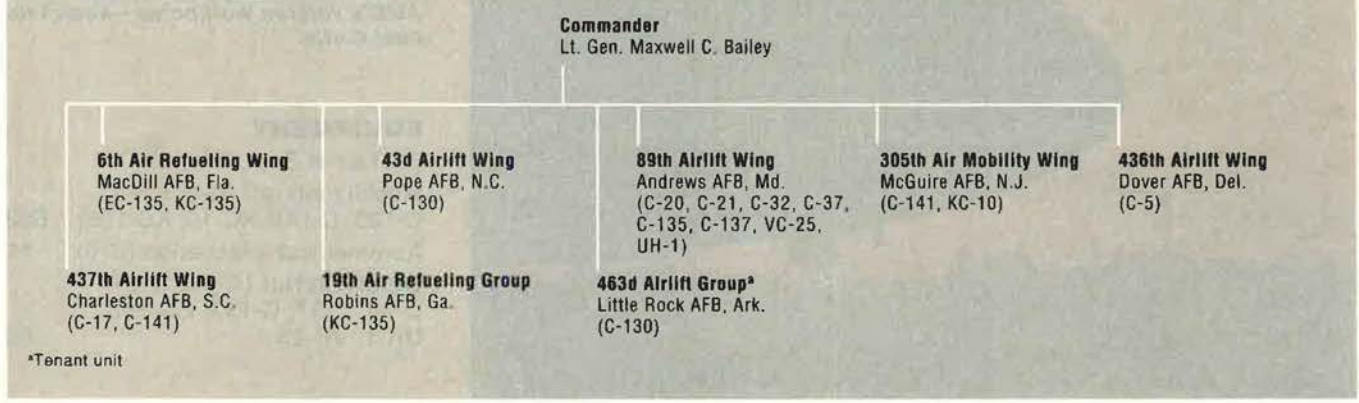
UNIT	BASE	WEAPONS
6th Air Refueling Wing	MacDill AFB, Fla.	EC-135, KC-135
19th Air Refueling Group	Robins AFB, Ga.	KC-135
22d Air Refueling Wing	McConnell AFB, Kan.	KC-135
43d Airlift Wing	Pope AFB, N.C.	C-130
60th Air Mobility Wing	Travis AFB, Calif.	C-5, KC-10
62d Airlift Wing	McChord AFB, Wash.	C-17, C-141
89th Airlift Wing	Andrews AFB, Md.	C-20, C-21, C-32, C-37, C-135, C-137, VC-25, UH-1
92d Air Refueling Wing	Fairchild AFB, Wash.	KC-135
305th Air Mobility Wing	McGuire AFB, N.J.	C-141, KC-10
317th Airlift Group	Dyess AFB, Texas	C-130
319th Air Refueling Wing	Grand Forks AFB, N.D.	KC-135
375th Airlift Wing	Scott AFB, Ill.	C-9, C-21
436th Airlift Wing	Dover AFB, Del.	C-5
437th Airlift Wing	Charleston AFB, S.C.	C-17, C-141
463d Airlift Group	Little Rock AFB, Ark.	C-130

AIR MOBILITY COMMAND, SCOTT AFB, ILL.



15th AIR FORCE (AMC), TRAVIS AFB, CALIF.

21st AIR FORCE (AMC), MCGUIRE AFB, N.J.



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 Pacific and Asian 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: 9,913 per month

Major training exercises

Cope Thunder (Alaska), Cope North/Keen Sword (Japan), Cobra Gold (Thailand), Commando Sling (Singapore), Cope Tiger (Thailand), Foal Eagle (South Korea), Keen Edge (Japan), Positive Force (Pacific), Reception Staging Onward Movement and Integration (South Korea), Tandem Thrust (Australia), Ulchi Focus Lens (South Korea)

USAF photo by TSgt. Lance S. Cheung

PACAF is a US forward presence that helps ensure stability in the Pacific Rim. Above, at Osan AB, South Korea, SrA. David Switzer inspects an OA-10 for proper panel fit during a landing gear retraction check.

PERSONNEL

(as of Sept. 30, 1998)

Active duty		31,528
Officers	3,875	
Enlisted	27,653	
Reserve components		4,527
ANG	4,017	
AFRC	510	
Civilian		8,504
Total		**44,559**

UNIT	BASE	WEAPONS
3d Wing	Elmendorf AFB, Alaska	C-12, C-130H, E-3B, 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, 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. John B. Hall Jr.

18th Wing
Kadena AB, Japan
(E-3B, 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. Joseph E. Hurd

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

3d Wing
Elmendorf AFB, Alaska
(C-12J/F, C-130H, E-3B, F-15C/D, F-15E)

354th Fighter Wing
Eielson AFB, Alaska
(A/OA-10A, F-16C/D)

EQUIPMENT

(PAI as of Sept. 30, 1998)

Fighters (F-15C/D/E, F-16C/D)	262
Attack aircraft (A-10A)	14
Forward air control (OA-10A)	27
Command & control (E-3)	4
Aerial refuelers (KC-135)	15
Transports (C-9, C-12, C-21, C-130, C-135)	42
Helicopters (UH-1, HH-60)	14

USAF photo by TSgt. Lance S. Cheung

SSgt. Carrol S. Parrish, of the 51st Communications Squadron at Osan, checks out a weather radar at Camp Humphries, South Korea.

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

Commander
Maj. Gen. Thomas C. Waskow

36th Air Base Wing
Andersen AFB, Guam

497th Fighter Training Squadron
Paya Lebar Airfield, Singapore[a]

[a]Base owned by Singapore government

USAFE

US Air Forces in Europe

Headquarters Ramstein AB, Germany

Established Aug. 7, 1945

Commander Gen. John P. Jumper

MISSIONS

Provide responsive forward presence and decisive air- and space power

Plan, conduct, control, coordinate, and support air and space operations to achieve US national and NATO objectives based on USEUCOM taskings

COROLLARY MISSIONS

Support US military plans and operations in parts of Europe, the Mediterranean, the Middle East, and Africa

FORCE STRUCTURE

Two numbered air forces: **3d,** RAF Mildenhall, UK; **16th,** Aviano AB, Italy
Six wings (one multimission, one air refueling, one airlift, and three fighter)

OPERATIONAL ACTIVITY

Flying hours: 8,208 per month

Major training exercises

African Eagle, Ardent Ground, Atlantic Resolve, Baltops, Blue Harrier, Brilliant Invader, Central Enterprise, Coldfire, Distant Thunder, Dynamic Mix, Ellipse Bravo, Juniper Falconry, Juniper Stallion, Phoenix Partner, Salty Hammer, Tactical Fighter Weaponry, Trailblazer

USAF photo by MSgt. Keith Reed

USAFE aircraft, like these F-16s, and personnel from the 510th Fighter Squadron, Aviano AB, Italy, are in the forefront of NATO's Operation Allied Force.

US AIR FORCES IN EUROPE, RAMSTEIN AB, GERMANY

Commander
Gen. John P. Jumper

3d Air Force
RAF Mildenhall, UK
Maj. Gen. William S. Hinton Jr.

16th Air Force
Aviano AB, Italy
Lt. Gen. Michael C. Short

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

Major operations
Deliberate Guard, Joint Endeavor (Bosnia); Provide Hope IV (former USSR); Northern Watch (northern Iraq)

PERSONNEL

(as of Sept. 30, 1998)

Active duty		26,879
Officers	3,490	
Enlisted	23,389	
Reserve components		405
ANG	0	
AFRC	405	
Civilian		5,232
Total		**32,516**

EQUIPMENT

(PAI as of Sept. 30, 1998)

Fighters (F-15C/D, F-16C/D)	108
Attack aircraft (A-10, F-15E)	60
Observation aircraft (OA-10)	6
Aerial refuelers (KC-135)	15
Transports (C-9, C-20, C-21, C-130)	37

USAF photo by SrA. Jeffrey Allen

Deployed to Aviano AB for Operation Allied Force, 494th Fighter Squadron load crew members from RAF Lakenheath, UK, prepare to attach a GBU-24 laser-guided bomb to an F-15E.

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
52d Fighter Wing	Spangdahlem AB, Germany	A/OA-10, F-15C/D, 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

3d AIR FORCE (USAFE), RAF MILDENHALL, UK

Commander
Maj. Gen. William S. Hinton Jr.

- **48th Fighter Wing**
  RAF Lakenheath, UK
  (F-15C/D, F-15E)
- **52d Fighter Wing**
  Spangdahlem AB, Germany
  (A/OA-10, F-15C/D, 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. Michael C. Short

- **31st Fighter Wing**
  Aviano AB, Italy
  (F-16C/D)
- **39th Wing**
  Incirlik AB, Turkey
  (Tactical range and contingency support, rotational aircraft)

Air Reserve Components

The Air Reserve Components for USAF are the Air National Guard and Air Force Reserve Command. Air Force Reserve Command stood up as a major command Feb. 17, 1997. The change in status, authorized by Congress in the Fiscal 1997 National Defense Authorization Act, was based on the experience gained from the Air Force Reserve component mobilization for Operations Desert Shield and Desert Storm.

AFRC Air Force Reserve Command

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, aeromedical evacuation, aerial fire fighting, weather reconnaissance, space operations, and airborne air control
Provide support and disaster relief in the US
Support national counterdrug efforts

FORCE STRUCTURE

One direct reporting unit: Air Reserve Personnel Center, Denver, Colo.
Three numbered air forces: **4th,** March ARB, Calif.; **10th,** NAS Fort Worth JRB, Carswell Field, Texas; **22d,** Dobbins ARB, Ga.
35 flying wings
Seven groups (one air refueling, one air control, one fighter training, one space, and three regional support)

OPERATIONAL ACTIVITY

Coronet Oak (Central and South America); airlift, air refueling, and fighter support (Bosnia); Northern/Southern Watch (Iraq); Uphold Democracy (Haiti)

USAF photo by SrA. Greg L. Davis

Reserve aircrews and support personnel are vital to the success of USAF missions around the globe. On an Operation Joint Guard resupply mission from Ramstein AB, Germany, to Tuzla AB, Bosnia, are C-130 crewmen (foreground) 1st Lt. Rob Hanna and Capt. Bill Price, both from the 815th Airlift Squadron (AFRC).

PERSONNEL

(as of Sept. 30, 1998)	
Officers	15,938
Enlisted	56,032
Civilians (non–ART)	5,350
Total	**77,320**

EQUIPMENT

(PAI as of Sept. 30, 1998)

Bombers (B-52H)	9	Aerial refuelers (KC-135)	70
Fighters (F-16C/D)	72	Rescue (HC-130N/P, HH-60G)	31
Attack aircraft (A/OA-10)	51	Weather (WC-130H)	10
Transports (C-5A/B, C-141B, C-130E/H)	174	Special operations (MC-130E, MC130P)	13

AIR FORCE RESERVE COMMAND, ROBINS AFB, GA.

Commander
Maj. Gen. James E. Sherrard III

4th Air Force
March ARB, Calif.

10th Air Force
NAS Fort Worth JRB,
Carswell Field, Texas

22d Air Force
Dobbins ARB, Ga.

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

Commander
Maj. Gen. Wallace W. Whaley

349th Air Mobility Wing
Travis AFB, Calif.
(C-5A/B, C-141B)

446th Airlift Wing
McChord AFB, Wash.
(C-141B)

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

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

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

932d Airlift Wing
Scott AFB, Ill.

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

507th Air Refueling Wing
Tinker AFB, Okla.
(KC-135R)

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

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

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

931st Air Refueling Group
McConnell AFB, Kan.
(KC-135R)

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

Commander
Brig. Gen. John A. Bradley

301st Fighter Wing
NAS Fort Worth JRB,[a]
Carswell Field, Texas
(F-16C/D)

919th Special Ops Wing
Duke Field, Fla.
(MC-130E/P)

310th Space Group
Schriever AFB, Colo.

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

926th Fighter Wing
NAS JRB New Orleans, La.[a]
(OA-10A)

340th Flying Training Group
Randolph AFB, Texas

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

513th Air Control Group
Tinker AFB, Okla.
(E-3)

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

939th Rescue Wing
Patrick AFB, Fla., Portland IAP, Ore., Davis-Monthan AFB, Ariz.,
(E-3A, HC-130N/P, HH-60G)

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

944th Fighter Wing
Luke AFB, Ariz.
(F-16C/D)

Det. 1
Shaw AFB, S.C.
(F-16C/D)

22d AIR FORCE (AMC), DOBBINS ARB, GA.

Commander
Maj. Gen. John J. Batbie Jr.

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

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

514th Air Mobility Wing
McGuire AFB, N.J.
(C-141B, KC-10A)

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

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

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

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

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

315th Airlift Wing
Charleston AFB, S.C.
(C-17A, C-141B)

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

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

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

403d Wing
Keesler AFB, Miss.
(C-130E, WC-130H)

512th Airlift Wing
Dover AFB, Del.
(C-5A/B)

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

[a]Tenant unit on naval base

ANGB Air National Guard Base
ARB Air Reserve Base
ARS Air Reserve Station
IAP International Airport
JRB Joint Reserve Base
NAS Naval Air Station

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

Joint Guard, Deny Flight, and Provide Promise (Bosnia); Northern/Southern Watch (Iraq); Coronet Nighthawk (Central America); Coronet Oak (South America); relief missions for victims of several major hurricanes; partnership programs with nations of the former Soviet Union

USAF photo by SrA. Greg L. Davis

Staff photo by Guy Aceto

TSgt. Chris Langloss, 114th Fighter Wing (ANG) from Joe Foss Field, S.D., observes his unit's F-16s starting up at Al Jaber AB, Kuwait, in support of Operation Southern Watch last year. ANG units like his are full partners in the Total Force.

At left, a Maryland ANG C-130 from the 135th Airlift Squadron flies over the Baltic Sea. Maryland and Michigan ANG members spent two weeks staging out of Lithuania during last year's multinational peacekeeping exercise called Baltic Challenge.

PERSONNEL

(as of Sept. 30, 1998)

Officers	13,235
Enlisted	94,861
Civilians	1,634
Total	**109,730**

EQUIPMENT

(PAI as of Sept. 30, 1998)

Bombers (B-1B)	20
Fighters (F-15A/B, F-16A/B/C/D)	696
Attack aircraft (A/OA-10)	100
Airlifters (C-5A/B, C-130E/H, C-141B)	257
Aerial refuelers (KC-135E/R)	225
Command & control (EC-130E)	8
Rescue (HC-130, HH-60G)	30

The Air National Guard by Major Command Assignment

(As of April 1, 1999)

Air Combat Command

A-10A	
103d Fighter Wing	Bradley IAP, Conn.
104th Fighter Wing	Barnes MAP, Mass.
110th Fighter Wing	W.K. Kellogg Airport, Mich.
124th Wing[a]	Boise Air Terminal, Idaho
175th Wing[a]	Baltimore, Md.
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.[b]
F-15—air defense	
102d Fighter Wing	Otis ANGB, Mass.
125th Fighter Wing	Jacksonville IAP, Fla.
142d 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.
122d Fighter Wing	Fort Wayne IAP, Ind.
127th Wing[a]	Selfridge ANGB, Mich.
132d 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.
183d 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.
192d Fighter Wing	Richmond IAP, Va.
F-16—air defense	
144th Fighter Wing	Fresno Air Terminal, Calif.
HC-130/HH-60	
106th Rescue Wing	Francis S. Gabreski IAP, N.Y.
MC-130/HH-60	
129th Rescue Wing	Moffett Federal Airfield, Calif.[c]
A/OA-10A	
111th Fighter Wing	Willow Grove ARS, Pa.

Air Education and Training Command

F-15	
173d Fighter Wing	Klamath Falls IAP, Ore.
F-16	
149th Fighter Wing	Kelly AFB, Texas
162d Fighter Wing	Tucson IAP, Ariz.
178th Fighter Wing	Springfield–Beckley MAP, Ohio
C-130 (training)	
189th Airlift Wing	Little Rock AFB, Ark.

[a] Also flies C-130s
[b] Naval base
[c] NASA installation
[d] Includes 210th Rescue Squadron with HC-130 and HH-60G aircraft
[e] Includes 203d Air Refueling Squadron with KC-135 aircraft

Air Force Special Operations Command

EC-130E	
193d Special Ops Wing	Harrisburg IAP, Pa.

Air Mobility Command

C-5A	
105th Airlift Wing	Stewart IAP, N.Y.
C-130	
109th Airlift Wing	Schenectady County Airport, N.Y.
118th Airlift Wing	Nashville Metropolitan Airport, Tenn.
123d Airlift Wing	Louisville IAP AGS, Ky.
130th Airlift Wing	Yeager Airport, W.Va.
133d Airlift Wing	Minneapolis–St. Paul IAP/ARS, Minn.
136th Airlift Wing	NAS Dallas, Texas[b]
137th Airlift Wing	Will Rogers World Airport, Okla.
139th Airlift Wing	Rosecrans Memorial Airport, Mo.
143d Airlift Wing	Quonset State Airport, R.I.
145th Airlift Wing	Charlotte/Douglas IAP, N.C.
146th Airlift Wing	Channel Islands ANGB, Calif.
152d Airlift Wing	Reno/Tahoe IAP, Nev.
153d Airlift Wing	Cheyenne MAP, Wyo.
156th Airlift Wing	Luis Munoz Marin IAP, Puerto Rico
165th Airlift Wing	Savannah IAP, Ga.
166th Airlift Wing	New Castle County Airport, Del.
167th Airlift Wing	Eastern West Virginia Regional Airport/Shepherd Field, W.Va.
179th Airlift Wing	Mansfield Lahm Airport, Ohio
182d Airlift Wing	Greater Peoria Airport, Ill.
C-141C	
164th Airlift Wing	Memphis IAP, Tenn.
172d Airlift Wing	Jackson IAP, Miss.
KC-135	
101st Air Refueling Wing	Bangor IAP, Maine
107th Air Refueling Wing	Niagara Falls IAP/ARS, N.Y.
108th Air Refueling Wing	McGuire AFB, N.J.
117th Air Refueling Wing	Birmingham Airport, Ala.
121st Air Refueling Wing	Rickenbacker IAP, Ohio
126th Air Refueling Wing	O'Hare IAP/ARS, Ill.
128th Air Refueling Wing	General Mitchell IAP/ARS, Wis.
134th Air Refueling Wing	McGhee Tyson Airport, Tenn.
141st Air Refueling Wing	Fairchild AFB, Wash.
151st Air Refueling Wing	Salt Lake City IAP, Utah
155th Air Refueling Wing	Lincoln MAP, Neb.
157th Air Refueling Wing	Pease ANGB, N.H.
161st Air Refueling Wing	Sky Harbor IAP, Ariz.
163d Air Refueling Wing	March ARB, Calif.
171st Air Refueling Wing	Pittsburgh IAP/ARS, Pa.
186th Air Refueling Wing	Key Field, Miss.
190th Air Refueling Wing	Forbes Field, Kan.

Pacific Air Forces

C-130	
154th Wing (204th Airlift Sq.)	Hickam AFB, Hawaii
176th Wing[d]	Anchorage, Alaska
F-15	
154th Wing[e] (199th FS)	Hickam AFB, Hawaii
HC-130/HH-60	
176th Wing (210th RQS)	Anchorage, Alaska
KC-135	
154th Wing (203d ARS)	Hickam AFB, Hawaii
168th Air Refueling Wing	Eielson AFB, Alaska

This Is AFA

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Information regarding AFA activity within a particular state may be obtained from the vice president of the region in which the state is located.

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John E. Craig II
947 26th St. S.
Arlington, VA 22202
(202) 863-2306

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Barbara M. Brooks-Lacy
7315 N. Curtis Ave.
Portland, OR 97217
(503) 283-4541

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Arizona, California, Guam, Hawaii, Nevada

Cheryl L. Waller
512 E. Church St.
Santa Maria, CA 93454
(805) 925-2265

Rocky Mountain Region
Colorado, Utah, Wyoming

Mark J. Worrick
3210 S. Oneida Way
Denver, CO 80224-2830
(303) 757-8565

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Illinois, Indiana, Kentucky, Michigan, Ohio, Wisconsin

W. Ron Goerges
4201 W. Enon Rd.
Fairborn, OH 45324
(937) 429-6070, ext. 102

South Central Region
Alabama, Arkansas, Louisiana, Mississippi, Tennessee

Marleen E. Eddlemon
2309 Linda Ln.
Jacksonville, AR 72076-2814
(501) 982-9777

Midwest Region
Iowa, Kansas, Missouri, Nebraska

Robert M. Williams
6014 Country Club Oaks Pl.
Omaha, NE 68152
(402) 572-7655

Southeast Region
Florida, Georgia, North Carolina, Puerto Rico, South Carolina

Jack H. Steed
309 Lake Front Dr.
Warner Robins, GA 31088-6064
(912) 929-3888

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Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

Francis F. Carmichael Jr.
14 Carmichael Way
West Wareham, MA 02576-1486
(508) 999-8642

Southwest Region
New Mexico, Oklahoma, Texas

Thomas J. Kemp
3608 Kimberly Ln.
Fort Worth, TX 76133-2147
(817) 695-7644

North Central Region
Minnesota, North Dakota, South Dakota

George E. Masters
1029 6th Ave. S.W.
Minot, ND 58701-3606
(701) 723-6697

Special Assistant Pacific

Gary L. McClain
Komazawa Garden House D-309
1-2-33 Komazawa
Setagaya-ku, Tokyo 154-0012
Japan
81-3-3405-1512

Northeast Region
New Jersey, New York, Pennsylvania

Raymond Hamman
9439 Outlook Ave.
Philadelphia, PA 19114-2617
(215) 677-0957

Special Assistant Europe

Frank M. Swords
PSC 3, Box 1469
APO AE 09021-1466
011-49-6308-7237

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Verbatim

All the Way with LBJ, Part II

"Our strikes have three objectives: First, to demonstrate the seriousness of NATO's opposition to aggression and its support for peace. Second, to deter President Milosevic from continuing and escalating his attacks on helpless civilians by imposing a price for those attacks. And, third, if necessary, to damage Serbia's capacity to wage war against Kosovo in the future by seriously diminishing its military capabilities."

President Clinton, in March 24, 1999, statement of goals at the start of NATO's campaign against Yugoslavia.

It's the War, Stupid

"The task here is to make sure it [NATO's bombing of targets in Yugoslavia] doesn't crowd out important domestic issues."

***Joe Lockhart, White House spokesman, quoted in April 12, 1999, issue of* US News & World Report.**

Just So Long as It Doesn't Crowd Out Important Domestic Issues...

"It is already clear that the crisis in Kosovo cannot have a happy ending. Even if NATO eventually succeeds in allowing the refugees to go back, well over 1 million people have been displaced. A massive legacy of hatred will exist in the Balkans, spilling over from Serbia and Kosovo into Albania, Bosnia, Croatia, Macedonia, and Montenegro. There will be a prolonged problem with Russia, and the need for a whole new exercise in containment to block Serbia from future military action. If NATO does not succeed, nearly 2 million Muslim Kosovars will suffer, the Balkans are up for grabs, and the credibility of NATO and peacekeeping in general will be severely undermined."

Military analyst Anthony H. Cordesman, in an April 6, 1999, report on Operation Allied Force.

Military Pre-emption by *Whom*?

"Since the end of World War II, Japan has sought to maintain the lowest possible military profile, not only to assuage the fears of its neighbors, but also because the atomic ending of the war turned many Japanese into bona fide peaceniks. The passive defense posture mandated by Japan's constitution was further abetted by the presence of an American security umbrella. ... Japan usually appears on the world stage in the role of conscientious conciliator, a champion of peace at any price.

"So when talk about pre-emptive strikes against North Korea starts emanating from Tokyo, you know that something serious is going on. According to a Japanese newspaper report, Defense Agency chief Hosei Norota believes the threat of missile attack from North Korea is now so great that Tokyo ought to consider that a pre-emptive strike could be a constitutionally permitted form of self-defense."

Asian Wall Street Journal *editorial, March 8, 1999.*

Fill 'er Up With Geritol

"If we do everything we plan to do, if we buy every airplane we have on the books to buy, by the year 2015, the average age of the Air Force airplane will be 30 [years]. We're going to have to learn to deal with a geriatric set of airplanes by upgrading the ones which are still very viable."

Gen. Michael E. Ryan, Air Force Chief of Staff, in March 4, 1999, statement during a visit at Davis–Monthan AFB, Ariz.

See Statement Above

"I'm not going to be here when the next bomber is built in 2037. I think it is unbelievable that we're going to talk about flying B-52s when they're over 80 years old. I think this needs to be rethought."

Rep. Norm Dicks (D–Wash.), in March 3, 1999, remarks concerning a USAF bomber roadmap plan to defer a new bomber for decades.

Dr. Inhofe's Diagnosis

"Regarding the Fiscal Year 2000 Military Construction Program request, let me be frank. It is 'dead on arrival.' Although the total value of the request is $8.4 billion, the Administration is requesting only $5.4 billion this year and deferring the remaining $3.1 billion to next year. Under this proposal, each project would be allocated less than 25 cents out of every dollar required for construction. Such a gimmick may make sense to the comptroller. However, it does not make sense to the civil engineer who has to execute the project nor the contractor who has to bid on a contract for which the money may not be there."

Sen. James M. Inhofe (R–Okla.), in March 10, 1999, statement to Senate Armed Services Subcommittee on Readiness.

Tunnel Vision

"The tempo of operations for what we call 'low density/high demand' forces remains a concern. ... One of the reasons for chronic overtasking of these limited capabilities can be traced to military reforms established under [the 1986] Goldwater–Nichols [law]. That legislation effectively removed the services from the process of developing options to deal with contingency situations and tailoring the force packages needed to implement those options. The result is a tendency for the geographic CINCs and their components to place unconstrained demands on scarce resources. ...

"There is no way for these regionally oriented staffs to balance their current needs against those of the other regions nor to weigh their current needs against those of Air Combat Command and the other force providers. Force providing commands such as mine are uniquely positioned to maintain awareness of the health of our units and to judge when the cumulative demands of regional requirements put the long term viability of the force at risk. But one unintended consequence of the Goldwater–Nichols reforms has been to exclude this perspective from the process used to task our forces."

Gen. Richard E. Hawley, ACC commander, in March 22, 1999, statement to House Armed Services Committee.

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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

Headquarters	Orlando, Fla.
Established	June 3, 1996
Commander	Col. Jimmy H. Wilson

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

Operations Support Division
Program Support Division
Services Support Division

PERSONNEL

Active duty		18
Officers	16	
Enlisted	2	
Reserve components		0
Civilians		15
Total		**33**

Air Force Audit Agency

Headquarters	Washington
Established	July 1, 1948
Director	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

Materiel and Systems Audits Directorate, Wright–Patterson AFB, Ohio
Financial and Support Audits Directorate, March ARB, Calif.
Field Activities Directorate, Arlington, Va.
Three regional offices
21 field offices

PERSONNEL

Active duty		3
Officers	2	
Enlisted	1	
Reserve components		0
Civilians		891
Total		**894**

The director of AFAA is the Auditor General of the Air Force.

Air Force Base Conversion Agency

Headquarters	Arlington, Va.
Established	Nov. 15, 1991
Director	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

Office of the Director
Regional divisions
Base-level operating locations

PERSONNEL

Active duty	0
Reserve components	0
Civilians	365
Total	**365**

Air Force Center for Environmental Excellence

Headquarters	Brooks AFB, Texas
Established	July 23, 1991
Director	Gary M. Erickson

MISSION, PURPOSE, OPERATIONS

Provide Air Force leaders the comprehensive expertise to protect, preserve, restore, develop, and sustain the nation's environmental and installation resources

STRUCTURE

Design and Construction Directorate
Environmental Restoration Directorate
Environmental Conservation and Planning Directorate
Environmental Quality Directorate
Three Regional Environmental Offices

PERSONNEL

Active duty		39
Officers	37	
Enlisted	2	
Reserve components		12
ANG	0	
AFRC	12	
Civilians		388
Total		**439**

Air Force Center for Quality and Management Innovation

Headquarters Randolph AFB, Texas
Established Dec. 19, 1996
Commander Col. John C. Vrba

MISSION, PURPOSE, OPERATIONS

Provide innovative, expert management capabilities to USAF organizations and functions to assist them in making fact-based decisions that will improve mission effectiveness
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

Operations, Logistics, and Readiness Division
Installations and Support Division
Outsourcing and Privatization Division
Programs Integration Division
Systems Integration and Support Division

PERSONNEL

Active duty		126
Officers	53	
Enlisted	73	
Reserve components		0
Civilians		84
CMEs		15
Total		**225**

Air Force Civil Engineer Support Agency

Headquarters Tyndall AFB, Fla.
Established Aug. 1, 1991
Commander Col. H. Dean Bartel

MISSION, PURPOSE, OPERATIONS

Provide the best tools, practices, and professional support to maximize Air Force civil engineer capabilities in base and contingency operations

STRUCTURE

Contingency Support Directorate
Technical Support Directorate
Operations Support Directorate
Field Support Directorate
Executive support staff

PERSONNEL

Active duty		91
Officers	24	
Enlisted	67	
Reserve components		2
ANG	1	
AFRC	1	
Civilians		115
Total		**208**

Air Force Cost Analysis Agency

Headquarters Arlington, Va.
Established Aug. 1, 1992
Executive Director 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

Aircraft/Weapons Division
Information Technology Division
Forces Analysis Division
Space Programs Division
Research/Resources Division

PERSONNEL

Active duty		31
Officers	30	
Enlisted	1	
Reserve components		0
Civilians		34
Total		**65**

Air Force Flight Standards Agency

Headquarters Andrews AFB, Md.
Established Oct. 1, 1991
Commander 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

USAF Representative to FAA, Washington
Flight Inspection Center, Oklahoma City
Airfield Operations Directorate, Andrews AFB, Md.
Operations Directorate, Andrews AFB, Md.
Resources and Requirements Directorate, Andrews AFB, Md.

PERSONNEL

Active duty		137
Officers	67	
Enlisted	70	
Reserve components		4
ANG	0	
AFRC	4	
Civilians		27
Total		**168**

EQUIPMENT

One C-21 Learjet
One NC-21 Learjet

Air Force Historical Research Agency

Headquarters Maxwell AFB, Ala.
Established Sept. 12, 1949
Commander 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

Information Systems Division
Research Division

PERSONNEL

Active duty		9
Officers	3	
Enlisted	6	
Reserve components		22
ANG	0	
AFRC	22	
Civilians		36
Total		**67**

Air Force History Support Office

Headquarters	Washington
Established	Sept. 30, 1994
Commander	Col. Christine L. Jaremko

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

Analysis and Reference Division
Products and Production Division
Pentagon Support Office

PERSONNEL

Active duty		5
Officers	3	
Enlisted	2	
Reserve components		3
ANG	0	
AFRC	3	
Civilians		24
Total		**32**

Air Force Inspection Agency

Headquarters	Kirtland AFB, N.M.
Established	Aug. 1, 1991
Commander	Col. Maria I. Cribbs

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 *The Inspector General* magazine

STRUCTURE

Acquisition Inspection Directorate
Field Operations Directorate
Medical Inspection Directorate
Operations Support and Development Directorate

PERSONNEL

Active duty		110
Officers	86	
Enlisted	24	
Reserve components		3
ANG	0	
AFRC	3	
Civilians		18
Total		**131**

Air Force Legal Services Agency

Headquarters	Bolling AFB, D.C.
Established	Sept. 1, 1991
Commander	Brig. Gen. (sel.) Jerald D. Stubbs

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; providing programs to benefit the Air Force family; and supporting legal services worldwide with state-of-the-art, specialized information technology

STRUCTURE

Air Force Court of Criminal Appeals
Civil Law and Litigation Directorate
Judiciary Directorate
Legal Information Services Directorate

PERSONNEL

Active duty		394
Officers	271	
Enlisted	123	
Reserve components		92
ANG	0	
AFRC	92	
Civilians		108
Total		**594**

Air Force Logistics Management Agency

Headquarters	Maxwell AFB, Gunter Annex, Ala.
Established	Sept. 30, 1975
Commander	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

Contracting Division
Logistics Plans Division
Maintenance and Munitions Division
Supply Division
Transportation Division
Support Division
Logistics Analysis Division

PERSONNEL

Active duty		48
Officers	29	
Enlisted	19	
Reserve components		0
Civilians		12
Total		**60**

Air Force Medical Operations Agency

Headquarters Bolling AFB, D.C.
Established July 1, 1992
Commander Maj. Gen. Earl W. Mabry II

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

Aerospace Medicine
Operational and Flight Medicine
Clinical and Biomedical Research and Development
Clinical Quality Management
Family Advocacy
Occupational and Environmental Health
Patient Administration
Preventive Medicine
USAF Radioisotope Committee Secretariat
Center of Excellence for Medical Multimedia
Office of Preventive Health Services and Assessments

PERSONNEL

Active duty		72
Officers	53	
Enlisted	19	
Reserve components		0
Civilians		45
Total		**117**

Air Force Medical Support Agency

Headquarters Brooks AFB, Texas
Established July 1, 1992
Commander Col. Sidney Brandler

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

Health Facilities Division
Medical Information Systems Division
Medical Logistics Division
Triservice Infrastructure Management Program Office
Medical Modernization and Planning

PERSONNEL

Active duty		40
Officers	32	
Enlisted	8	
Reserve components		0
Civilians		26
Total		**66**

Air Force News Agency

Headquarters Kelly AFB, Texas
Established June 1, 1978
Commander 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		337
Officers	17	
Enlisted	320	
Reserve components		35
ANG	0	
AFRC	35	
Civilians		112
Total		**484**

Air Force Office of Special Investigations

Headquarters Andrews AFB, Md.
Established Aug. 1, 1948
Commander Brig. Gen. Francis X. Taylor

MISSION, PURPOSE, OPERATIONS

Provide criminal investigative, counterintelligence 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

STRUCTURE

USAF Special Investigations Academy

Seven regional offices
Seven overseas squadrons
153 detachments and operating locations

PERSONNEL

Active duty		1,403
Officers	361	
Enlisted	1,042	
Reserve components		433
ANG	0	
AFRC	433	
Civilians		407
Total		**2,243**

Air Force Operations Group

Headquarters Washington
Established July 26, 1977
Commander 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

Command, Control, and Communications Division
Current Operations Division
CSAF Presentations Division
Weather Operations Division
Command, Control, Communications, and Computer Support Division
Aerial Events Division

PERSONNEL

Active duty		210
Officers	140	
Enlisted	70	
Reserve components		0
Civilians		9
Total		**219**

Air Force Personnel Center

Headquarters Randolph AFB, Texas
Established Oct. 1, 1995
Commander Maj. Gen. Donald A. Lamontagne

MISSION, PURPOSE, OPERATIONS

Provide personnel operations service

STRUCTURE

Assignments
Mission Support
Personnel Accountability
Personnel Data Systems
Personnel Programs Management
Customer Assistance
Civilian Personnel Operations
Civilian Career Management

PERSONNEL

Active duty		845
Officers	250	
Enlisted	595	
Reserve components		18
ANG	8	
AFRC	10	
Civilians		931
Total		**1,794**

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

Air Force Personnel Operations Agency

Headquarters Washington
Established Aug. 15, 1993
Director Brig. Gen. John F. Regni

MISSION, PURPOSE, OPERATIONS

Execute personnel programs and provide personnel support to Hq. USAF personnel in the Washington area
Develop and operate officer, enlisted, and civilian models and databases for management information
Execute the Air Force Civilian Employee Development program and training budgets
Manage the Air Force Civilian Relocation and Employee Inquiry/Complaint process
Support DCS, Personnel, computer operations

STRUCTURE

Analysis Division
Personnel Management Division
Systems Plans and Services Division
Work Force Appeals and Relations Division

PERSONNEL

Active duty		38
Officers	24	
Enlisted	14	
Reserve components		0
Civilians		24
Total		**62**

Air Force Program Executive Office

Headquarters Washington
Established November 1990
Air Force Acquisition Executive Vacant

MISSION, PURPOSE, OPERATIONS

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

STRUCTURE

Air Force Acquisition Executive
Program Executive Officers:
Brig. Gen. Craig P. Weston, Warning, Surveillance, and Control
Joseph G. Diamond, Weapons
Brent R. Collins, Space Programs
Oscar A. Goldfarb, Joint Logistics Systems
Brig. Gen. Robert W. Chedister, Airlift, Trainers, and Modeling and Simulation
Maj. Gen. Claude M. Bolton Jr., Fighter and Bomber Programs

PERSONNEL

Active duty		35
Officers	31	
Enlisted	4	
Reserve components		0
Civilians		14
Total		**49**

Air Force Real Estate Agency

Headquarters	Bolling AFB, D. C.
Established	Aug. 1, 1991
Director	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

Active duty	0
Reserve components	0
Civilians	12
Total	**12**

Air Force Review Boards Agency

Headquarters	Andrews AFB, Md.
Established	June 1, 1980
Director	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		8
Officers	3	
Enlisted	5	
Reserve components		3
ANG	1	
AFRC	2	
Civilians		32
Total		**43**

Air Force Safety Center

Headquarters	Kirtland AFB, N.M.
Established	Jan. 1, 1996
Commander	Maj. Gen. Francis C. Gideon Jr.

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

Aviation Safety Division
Ground Safety Division
Space, Missile, and Explosives Safety and Nuclear Surety Division
Computer/LAN Operations Division
Policy, Plans, and Programs Division
Education and Media Division
Staff Judge Advocate Division
Resources Management, Manpower, and Career Programs Division
Issues Division

PERSONNEL

Active duty		73
Officers	55	
Enlisted	18	
Reserve components		1
ANG	1	
AFRC	0	
Civilians		56
Total		**130**

The commander also holds the title of Air Force Chief of Safety. AFSC publishes *Flying Safety* and *Road and Rec* magazines and the *Weapons Journal.*

Air Force Security Forces Center

Headquarters	Lackland AFB, Texas
Established	March 17, 1997
Commander	Brig. Gen. Richard A. Coleman

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; Security Forces contingency requirement taskings

STRUCTURE

Corrections Division
Operations Division
Force Protection Division
Force Protection Battlelab
820th Security Forces Group

PERSONNEL

Active duty		196
Officers	50	
Enlisted	146	
Reserve components		10
ANG	1	
AFRC	9	
Civilians		13
Total		**219**

FACILITIES

Det. 1, US Disciplinary Barracks, Ft. Leavenworth, Kan.
Det. 2, Naval Consolidated Brig, NAS Miramar, Calif.
Det. 3, Naval Consolidated Brig, Charleston Naval Weapons Center, S.C.

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

Headquarters San Antonio
Established Feb. 5, 1991
Commander 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

PERSONNEL

Active duty		80
Officers	30	
Enlisted	50	
Reserve components		12
ANG	0	
AFRC	12	
Civilians		330
Total		**422**

Air Force Studies and Analyses Agency

Headquarters Washington
Established February 1991
Commander Col. Kurt A. Cichowski

MISSION, PURPOSE, OPERATIONS

Provide quality decision-making studies and analytic support for USAF senior leadership
Aid Air Force decision makers in addressing force-sizing and force-shaping issues, weapon systems employment, resource allocation, and arms reductions proposals
Support and assess results of Title 10 wargaming activities, with particular emphasis on the application of air- and space power

STRUCTURE

Senior Analysis Review Group
Force Analysis Division
Capabilities Assessment Division
Resource Management Division

PERSONNEL

Active duty		81
Officers	70	
Enlisted	11	
Reserve components		3
ANG	0	
AFRC	3	
Civilians		28
Total		**112**

Air Force Technical Applications Center

Headquarters Patrick AFB, Fla.
Established July 7, 1959
Commander 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

Headquarters and Analysis Center, Patrick AFB, Fla.
McClellan Central Laboratory, Technical Operations Division, McClellan AFB, Calif.
Operational sites/detachments in 18 countries

PERSONNEL

Active duty		752
Officers	166	
Enlisted	586	
Reserve components		0
Civilians		134
Total		**886**

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

Headquarters Offutt AFB, Neb.
Established Oct. 15, 1997
Commander 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.

PERSONNEL

Active duty		738
Officers	138	
Enlisted	600	
Reserve components		7
ANG	0	
AFRC	7	
Civilians		165
Total		**910**

Formerly Air Weather Service, established July 1, 1937.

Air Intelligence Agency

Headquarters Kelly AFB, Texas
Established Oct. 1, 1993
Commander Maj. Gen. (sel.) John R. Baker

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
26th Intelligence Group, Vogelweh, Germany
67th Intelligence Group, Kelly AFB, Texas
480th Intelligence Group, Langley AFB, Va.
497th Intelligence Group, Bolling AFB, D.C.
543d Intelligence Group, Kelly AFB, Texas
544th Intelligence Group, Peterson AFB, Colo.
690th Information Operations Group, Kelly AFB, Texas
692d Intelligence Group, Hickam AFB, Hawaii
694th Intelligence Group, Ft. Meade, Md.

PERSONNEL

Active duty		11,608
Officers	1,643	
Enlisted	9,965	
Reserve components		2,248
ANG	187	
AFRC	2,061	
Civilians		2,106
Total		**15,962**

EQUIPMENT

Worldwide communications equipment
Two AN/FLR-9 antennas located in Alaska and Japan

OPERATIONAL ACTIVITY

Southern/Northern Watch (Iraq), Joint Forge (Bosnia)

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

Headquarters	Andrews AFB, Md.
Established	August 1997
Commander	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		78
Officers	52	
Enlisted	26	
ANG		353
Officers	126	
Enlisted	227	
Civilians		278
Total		**709**

Joint Combat Rescue Agency

Headquarters	Langley AFB, Va.
Established	Nov. 29, 1996
Commander	Col. Denver L. Pletcher

MISSION, PURPOSE, OPERATIONS

Enhance the nation's ability to recover distressed personnel during wartime or contingency operations by working to ensure a credible Combat Search and Rescue capability
Provide functional expertise to DoD components and assist them in implementing OSD CSAR policy and directives
Advise unified combatant commanders and military services concerning CSAR training, planning, and operations
Recommend CSAR doctrine, procedures, capabilities, and improvements to DoD and JCS
Ensure interoperability of CSAR assets

STRUCTURE

Plans Division
Interoperability Division
Operations and Training Division

PERSONNEL

Active duty		12
Officers	9	
Enlisted	3	
Reserve components		0
Civilians		2
Total		**14**

Joint Services Survival, Evasion, Resistance, and Escape Agency

Headquarters	Ft. Belvoir, Va.
Established	Nov. 15, 1991
Commander	Col. J. Mike Bergstresser

MISSION, PURPOSE, OPERATIONS

Serve as OSD executive agent for DoD Code of Conduct/SERE training and DoD's Operational Evasion, Escape, and Recovery program
Serve as JCS focal point for joint evasion and recovery and operational POW/MIA matters and personnel recovery
Develop evasion and recovery doctrine, area SERE contingency guides, evasion charts, blood chits, survival equipment, training programs and films, SERE aids for use by joint commands in regional and counterdrug operations, and repatriation guidelines for the CINCs and services

STRUCTURE

Current Operations Directorate
SERE Information Directorate
Resource Directorate
Training and Special Operations Directorate
Three operating locations and a CINC liaison

PERSONNEL

Active duty		31
Officers	6	
Enlisted	25	
Reserve components		7
ANG	0	
AFRC	7	
Civilians		82
Total		**120**

FACILITIES

Headquarters at Ft. Belvoir, Va.
Operating locations in Virginia, Washington, and Florida

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

Headquarters Washington
Established April 1, 1997
Commander Lt. Gen. William J. Donahue

MISSION, PURPOSE, OPERATIONS

Apply information technology to USAF's mission and business processes
Lead USAF efforts to develop, implement, and enforce system architectures for communications and information systems
Manage communications and information resources
Provide communications and information 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		97
Officers	82	
Enlisted	15	
Reserve components		2
ANG	1	
AFRC	1	
Civilians		62
Total		**161**

Air Force Doctrine Center

Headquarters Maxwell AFB, Ala.
Established Feb. 24, 1997
Commander Maj. Gen. Timothy A. Kinnan

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 joint campaign models and exercise scenarios
Collect and maintain 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.
OL, Ft. Bliss, Texas
OL, Ft. Knox, Ky.
OL, Ft. Sill, Okla.
OL, Ft. Rucker, Ala.
OL, Ft. Leavenworth, Kan.
OL, Nellis AFB, Nev.
Air Force Liaison, Pentagon

PERSONNEL

Active duty		87
Officers	79	
Enlisted	8	
Reserve components		1
ANG	0	
AFRC	1	
Civilians		10
Total		**98**

Air Force Operational Test and Evaluation Center

Headquarters Kirtland AFB, N.M.
Established Jan. 1, 1974
Commander Maj. Gen. Jeffrey G. Cliver

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

Det. 1, Kirtland AFB, N.M.
Det. 2, Eglin AFB, Fla.
Det. 3, Kirtland AFB, N.M.
Det. 4, Peterson AFB, Colo.
Det. 5, Edwards AFB, Calif.

PERSONNEL

Active duty		544
Officers	371	
Enlisted	173	
Reserve components		0
Civilians		191
Total		**735**

US Air Force Academy

Headquarters Colorado Springs, Colo.
Established April 1, 1954
Superintendent Lt. Gen. Tad J. Oelstrom

MISSION, PURPOSE, OPERATIONS

Develop and inspire air and space leaders with a vision for tomorrow
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 10 squadrons each, with about 100 cadets assigned to a squadron. Each squadron consists of members of all four classes.

PERSONNEL

Active duty		2,283
Officers	1,066	
Enlisted	1,217	
Reserve components		0
Civilians		1,806
Total		**8,115**

EQUIPMENT

93 aircraft (T-3A aerobatics trainers; T-41D basic trainers; UV-18 jump planes; ASK-21 sailplanes; Cessna 150s; TG-3 and TG-4 gliders; and TG-7A and TG-11A motorized gliders)

FACILITIES

18,325-acre site
Three parallel runways
One crosswind runway
One sailplane landing area
Two auxiliary airfields

Cadets complete four years of study for a bachelor of science degree, choosing from 30 different academic majors. Four primary areas of military development are stressed in military art and science, theoretical and applied leadership experiences, aviation science and airmanship programs, and military training.

11th Wing

Headquarters	Bolling AFB, D.C.
Established	July 15, 1994
Commander	Col. Duane W. Deal

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 with Staff, Operations, Support, Logistics, and Medical Groups

PERSONNEL

Active duty		1,580
Officers	180	
Enlisted	1,400	
Reserve components		50
ANG	0	
AFRC	50	
Civilians		1,200
Total		**2,830**

USAF Almanac

Guide to Air Force Installations Worldwide

Major Installations

Altus AFB, Okla. 73523-5000; within Altus city limits, 120 miles SW of Oklahoma City and 54 miles W of Lawton. **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., an additional 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, 148 (83 more slated for this month), enlisted, 650 (101 more this month); unaccompanied, UAQ/UEQ, 394; visiting, VOQ, 320, VAQ/VEQ, 345, TLF, 20. **Hospital:** The 97th Medical Gp. is scheduled to become a clinic this month; as which, it will still provide outpatient services and same-day surgeries. Inpatient services are to be transferred to Jackson County Memorial Hospital in Altus.

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, 22d 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, 2,211; DoD civilians, 700. **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:** 7,550 acres (including easements). **Runways:** 9,300 ft. and 9,755 ft. **Altitude:** 281 ft. **Personnel:** permanent party military, 15,231; DoD civilians, 1,168; contract employees, 584. **Housing:** single family, officer, 325, enlisted, 1,753; leased units, 414 off base; unaccompanied, UAQ/UEQ, 974; visiting, VOQ, 201, VAQ/VEQ, 56, TLF, 68. **Hospital:** 235-bed multispecialty hospital and dental facility.

Arnold AFB, Tenn. 37389; approx. 7 mi. SE of Manchester. **Phone:** 931-454-3000; 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 AAF. **Area:** 39,081 acres. **Runway:** inactive, 6,000 ft. **Altitude:** 1,100 ft. **Personnel:** permanent party military, 103; DoD civilians, 210; contract employees, 2,800. **Housing:** single family, officer, 23, enlisted, 17; visiting, TLF, 45. **Medical:** aid station and small VA clinic.

Aviano AB, Italy, APO AE 09601; 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 tenant:** 16th Air Force (USAFE). **Geographically separated units:** 31st RED HORSE Flt. and 31st Munitions Sq., Camp Darby, Italy; 91st Expeditionary Air Base Sq., Pisa, Italy; 31st Munitions Support Sq., Ghedi AB, Italy; 496th Air Base Sq., Morón AB, Spain; 731st Munitions Support Sq., Araxos AB, Greece; Det. 1, Expeditionary 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, 3,881; DoD civilians, 246; local nationals, 702. **Housing:** single family, officer, 81, enlisted, 454; unaccompanied, UAQ/UEQ, 558; 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:** 2d 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 (~8,000 acres reserved for recreation). **Runway:** 11,756 ft. **Altitude:** 166 ft. **Personnel:** permanent party military, 6,155; DoD civilians, 1,366. **Housing:** single family, officer, 130, enlisted, 426; unaccompanied, UAQ/UEQ, 780; visiting, VOQ, 139, VAQ/VEQ, 102, TLF, 24. **Superclinic** (2d Medical Gp.).

Beale AFB, Calif. 95903-5000; 13 mi. E of Marysville. **Phone:** 530-634-3000; DSN 368-1110. **Majcom:** ACC. **Host:** 9th Reconnaissance Wing. **Mission:** U-2, T-38 aircraft. **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, 2,672; DoD civilians, 435; contract employees, 66. **Housing:** single family, officer, 187, enlisted, 1,526; unaccompanied, UOQ, 5, UAQ/UEQ, 823; visiting, VOQ, 53, VAQ/VEQ, 125, TLF, 17. **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. **Ma-**

jor tenants: Air Force Chief of Chaplains; Air Force Surgeon General; Air Force History Support Office; Air Force Office of Special Investigations; Air Force Real Estate Agency; Air Force Medical Operations Agency; Defense Intelligence Agency; Air Force Legal Services Agency; 497th Intelligence Group. **History:** activated October 1917. Named for Col. Raynal C. Bolling, first high-ranking Air Service officer killed in WWI. **Area:** 607 acres. **Runway:** Helipad only. **Altitude:** 20 ft. **Personnel:** permanent party military, 1,390; DoD civilians, 1,160. **Housing:** single family, officer, 285, enlisted, 1,100; unaccompanied, UOQ, 3, 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:** produces human-centered products for USAF and DoD weapons and support systems; enhances human performance and manages health and safety risks; executes more than 140 technology acquisition and sustainment programs; trains 7,000+ aeromedical personnel annually. **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, 1,649; DoD civilians, 1,539; contract employees, 774. **Housing:** single family, officer, 70, enlisted, 100; unaccompanied, none; visiting, VOQ, 151, VAQ/VEQ, 44, TLF, 8. **Clinic.**

Cannon AFB, N.M. 88103-5000; 7 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:** 25,663 acres. **Runways:** 10,400 ft. and 8,000 ft. **Altitude:** 4,295 ft. **Personnel:** permanent party military, 3,205; DoD civilians, 410; contract employees, 196. **Housing:** single family, officer, 173, enlisted, 1,549; unaccompanied, UAQ/UEQ, 1,346 dorm spaces; visiting, VOQ, 6, TLF, 45. **Hospital.**

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 aircraft. **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, 150, enlisted, 1,062; unaccompanied, UAQ/UEQ, 799 dorm spaces; visiting, VOQ, 36, VAQ/VEQ, 132, TLF, 27. **Clinic.**

Columbus AFB, Miss. 39710-1000; 10 mi. NW of Columbus. **Phone:** 601-434-7322; 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:** 6,000 ft., 6,300 ft., 8,000 ft., and 12,000 ft. **Altitude:** 214 ft. **Personnel:** permanent party military, 1,363; DoD civilians, 1,303. **Housing:** single family, officer, 357, enlisted, 261; unaccompanied, UOQ, 136, UAQ/UEQ, 224; 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-130H and EC-130E 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: 2d Lt. Samuel H. Davis, killed Dec. 28, 1921, and 2d 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. **Hospital.**

Dover AFB, Del. 19902-7219; 3 mi. SE of Dover. **Phone:** 302-677-3000; DSN 445-3000. **Majcom:** AMC. **Host:** 436th Airlift Wing. **Mission:** operates the largest aerial port facility on the East Coast. **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, 925; contract employees, 610. **Housing:** single family, officer, 107, enlisted, 1,441; unaccompanied, UAQ/UEQ, 704 dorm spaces; visiting, VOQ, 40, VAQ/VEQ, 128, 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, 5,077; DoD civilians, 489. **Housing:** single family, officer, 159, enlisted, 974; visiting, VOQ, 78, VAQ/VEQ, 92, TLF, 40. **Hospital.**

Edwards AFB, Calif. 93524; 15 mi. E of Rosamond. **Phone:** 805-277-1110; 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. **Major tenants:** AFRL's Propulsion Det. (AFMC); Dryden Flight Research Center (NASA). **History:** activities began September 1933. Originally Muroc AAF; renamed 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, 3,678; DoD civilians, 7,412; contract employees, 2,435. **Housing:** single family, officer, 310, enlisted, 1,512; unaccompanied, UOQ, 62, UAQ/UEQ, 762; visiting, VOQ, 97, VAQ/VEQ, 189, TLF, 50. **Hospital.**

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); 33d Fighter Wing (ACC); 53d 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:** 10,000 ft. and 12,000 ft. **Altitude:** 85 ft. **Personnel:** permanent party military, 7,710; DoD civilians, 3,638 (excluding Hurlburt Field); contract employees, 2,957. **Housing:** single family, officer, 216, enlisted, 2,118; 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, 2,937; DoD civilians, 1,014. **Housing:** single family, officer, 181, enlisted, 1,345; unaccompanied, UOQ, 8 officer units, UAQ/VEQ, 418 dorm spaces; visiting, VOQ, 222, VAQ/VEQ, 246. **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, 372d 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, 2,988; DoD civilians, 969. **Housing:** single family, officer, 198, enlisted, 1,882; visiting, VOQ, 127, VAQ/VEQ, 57, TLF, 30. **Hospital:** no 24-hour emergency room.

Elmendorf AFB, Alaska 99506-5000; bordering Anchorage. **Phone:** 907-552-1110; DSN 317-552-1110. **Majcom:** PACAF. **Host:** 3d 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 plane. **Area:** 13,100 acres. **Runways:** 7,500 ft. and 10,000 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:** 92d Air Refueling Wing. **Mission:** KC-135R, KC-135T operations. **Major tenants:** 336th Training Gp. (USAF Sur-

vival 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. **Hospital:** 30 beds.

Goodfellow AFB, Texas 76908-4410; SE of San Angelo. **Phone:** 915-654-3231; DSN 477-3231. **Majcom:** AETC. **Host:** 17th Training Wing. **Mission:** trains all Air Force members entering intelligence career fields; members of all US military services, civilian intelligence agencies, and foreign military services in cryptologic training; all US Air Force, Army, and Marine Corps personnel requiring fire protection and rescue training; and students in special instruments training. **Major tenants:** 17th SPTG; 17th TRG; 17th MDG; 344th Military Intelligence Battalion (US Army); Navy Technical Training Center det.; Marine Corps det. **History:** activated January 1941. Named for Lt. John J. Goodfellow Jr., WWI observation airplane pilot killed in combat Sept. 14, 1918. **Area:** 1,136 acres. **Runway:** none. **Altitude:** 1,877 ft. **Personnel:** permanent party military, 1,477; DoD civilians, 523. **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. Missile complex covers an additional 7,500 sq. mi. **Runway:** 12,351 ft. **Altitude:** 911 ft. **Personnel:** permanent party military, 4,353; DoD civilians, 422. **Housing:** single family, enlisted, 2,263. **Hospital.**

Hanscom AFB, Mass. 01731-5000; 17 mi. NW of Boston. **Phone:** 781-377-4441; DSN 478-5980. **Majcom:** AFMC. **Host:** Electronic Systems Center (AFMC). **Mission:** manages development and acquisition of command-and-control systems. **Major tenants:** AFRL's Space Vehicles Directorate–Hanscom; AFRL's Sensors Directorate–Hanscom. **History:** activated 1941. Named for Laurence G. Hanscom, a pre–WWII advocate of private aviation, killed in a lightplane accident in 1941. **Area:** 846 acres. **Runway:** no flying mission; transient USAF aircraft use runways of Laurence G. Hanscom Field, state-operated airfield adjoining the base. **Altitude:** 133 ft. **Personnel:** permanent party military, 1,483; DoD civilians, 156; contract employees, 980. **Housing:** single family, officer, 388, enlisted, 472; unaccompanied, UOQ, 40; visiting, VOQ and VAQ/VEQ, 131, TLF, 35. **Clinic.**

Air Force Installations

Major installations	FY95	FY96	FY97	FY98	FY99	FY00
US and possessions	81	77	75	74	74	74
Foreign	14	13	13	13	13	13
Worldwide	95	90	88	87	87	87
Minor installations						
US and possessions	86	81	82	81	81	80
Foreign	6	4	4	3	3	3
Worldwide	92	85	86	84	84	83

Includes Air National Guard and Air Force Reserve Command.

Hickam AFB, Hawaii 96853-5000; 9 mi. W of Honolulu. **Phone:** 808-471-7110 (Oahu military operator); DSN 471-7110. **Majcom:** PACAF. **Host:** 15th Air Base Wing. **Mission:** provides base and logistical support for nearly 140 associate and tenant units in Hawaii and other Pacific–region locations; C-135 executive transport; and maintenance and refueling support for aircraft transiting between the US mainland and the western Pacific. **Major tenants:** PACAF; 154th Wing (ANG). **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., 6,952 ft., and 9,000 ft. **Altitude:** 13 ft. **Personnel:** permanent party military, 4,590; DoD civilians, 2,023; contract employees, 300. **Housing:** single family, officer, 564, enlisted, 2,093; unaccompanied, UOQ, 16, UAQ/UEQ, 766; 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 F-16s and C-130s; handles logistics management and maintenance for Minuteman and Peacekeeper ICBMs; 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); Defense Megacenter 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. **Hospital.**

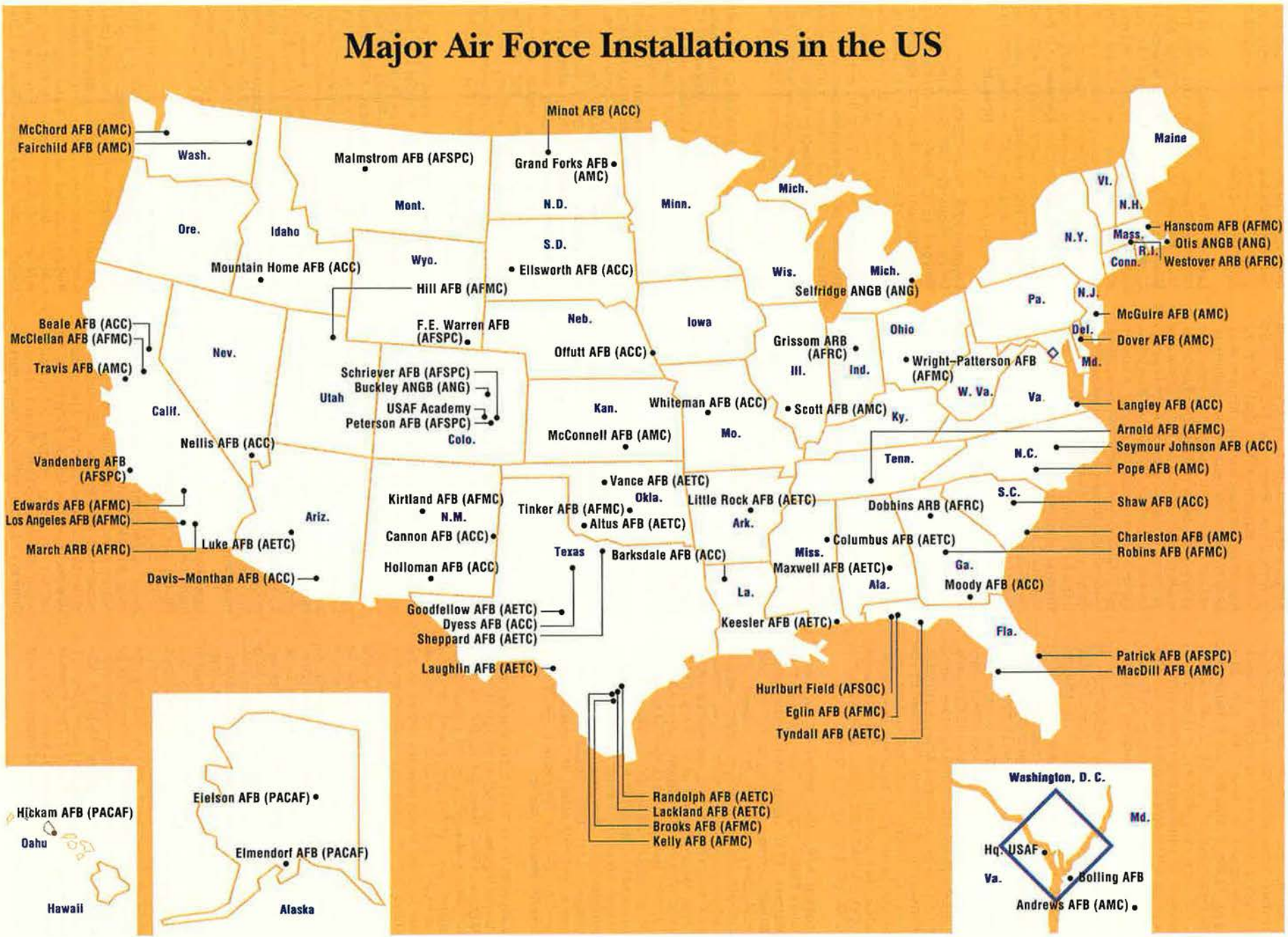
Holloman AFB, N.M. 88330-5000; 8 mi. SW of Alamogordo. **Phone:** 505-475-6511; DSN 867-1110. **Majcom:** ACC. **Host:** 49th Fighter Wing. **Mission:** F-117 operations; QF-4 drone operations. High Speed Test Track; German air force F-4F and Tornado aircrew training. **Major tenants:** 46th Test Gp. (AFMC); Det. 1, 82d Aerial Target Sq. (AFMC); 4th Space Surveillance Sq. (AFSPC); German Air Force Tactical Training Center. **History:** activated 1942. Named for Col. George Holloman, guided-missile pioneer. **Area:** 59,639 acres. **Runways:** 10,577 ft., with 1,000-ft. overrun; 12,133 ft., with 1,000-ft. overrun; and 8,055 ft., with 7,044-ft. overrun. **Altitude:** 4,093 ft. **Personnel:** permanent party military, 4,877; DoD civilians, 866; German air force, 378. **Housing:** single family, officer, 190, enlisted, 1,331, unaccompanied, UAQ/UEQ, 975; visiting, VOQ, 136, VAQ/VEQ, 149, DV suites, 6, TLF, 50. **Hospital.**

Howard AFB, Panama, APO AA 34001-5000. **Phone:** DSN 313-284-9805. **Majcom:** ACC. **Host:** 24th Wing. **Mission:** represents USAF in operations throughout Latin America. **Major tenants:** Joint Interagency Task Force South (USSOUTHCOM); 640th Air Mobility Sq. (AMC). **History:** established 1928 as Bruja Point Military Reservation; later named for Maj. Charles Harold Howard. **Personnel:** permanent party military, 1,854; DoD civilians, 1,100. **Housing:** single family, officer, 238, enlisted, 933; visiting, VOQ, 120, VAQ/VEQ, 554, TLF, 6.

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 Pave Low III helicopters, MH-60G Pave Hawk helicopters, MC-130P Combat Shadows (located at Eglin AFB), C-130Es, and UH-1N Huey helicopters. USAF Special Operations School. **Major tenants:** Air Force Special Operations Command; USAF Command and Control Training and Innovation Center; C^2 Battle Management 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, 7,202; DoD civilians, 527. **Housing:** single family, officer, 52, enlisted, 628 (300 leased); visiting, VAQ/VEQ, 195, TLF, 24. **Clinic.**

Incirlik AB, Turkey, APO AE 09824; 10 mi. E of Adana. **Phone:** (cmcl, from CONUS) 011-90-322-316-1110; DSN 676-1110. **Majcom:** USAFE. **Host:** 39th Wing. **Mission:** supports rotational weapons training deployments and Operation Northern Watch with Combined Task Force assets, including Turkish F-4Es, F-16s, and KC-135s, British Tornados and VC-10s, US C-12s, E-3s, EA-6Bs, F-16s, F-15s, HC-

Major Air Force Installations in the US



130s, KC-135s, HH-60s, MH-60s, and UH-60As. **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, 2,062; DoD civilians, 2,253; local nationals, 1,400; contract US employees, 85. **Housing:** single family, officer, 5, enlisted, 635; unaccompanied, UOQ, 50, UAQ/UEQ, 460 dorm rooms; visiting, VOQ, 151, VAQ/VEQ, 289, TLF, 80. **Hospital:** 19 beds.

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:** F-15C/D, KC-135R, E-3, and HH-60 operations. **Major tenants:** Support Center Pacific (AFMC); 353d Special Operations Gp. (AFSOC), 390th Intelligence Sq.; 82d Reconnaissance Sq. (ACC); 633d 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. **Personnel:** permanent party military, 7,751; DoD civilians, 653; 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:** 2d Air Force (AETC); 403d Wing (AFRC). **History:** activated June 12, 1941. Named for 2d 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, 10,216; DoD civilians, 4,158. **Housing:** single family, officer, 287, enlisted, 1,664; visiting, VOQ, 458, VAQ/VEQ, 1,176, TLF, 73. **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 OV-10, A-37, F-5, and C-47. It also overhauls F100, TF39, and T56 engines and manages more than 55 percent of the active USAF engine inventory, fuel, and lubricants used by the Air Force and NASA. **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; 433d 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 Kelly will deactivate. **Area:** 4,660 acres. **Runway:** 11,550 ft. **Altitude:** 689 ft. **Personnel:** permanent party military, 4,840; DoD civilians, 12,786; Contract employees, 1,431. **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 readiness and 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, 5,600; DoD civilians, 3,810; contract employees, 11,870. **Housing:** single family, officer, 307, enlisted, 1,597; 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, 143d 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, 2,717; DoD civilians, 30; local nationals, 400. **Housing:** unaccompanied, UOQ, 229, UAQ/UEQ, 2,483; visiting, VOQ, 28, VAQ/VEQ, 59. **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, 8,343; DoD civilians, 4,194; students, 8,852. **Housing:** single family, officer, 109, enlisted (NCO), 561; visiting, VOQ, 388, VAQ/VEQ, 1,285, TLF, 157, student, 884. **Hospital:** 288 beds.

Lajes Field, Azores, Portugal, APO AE 09720-5000; Terceira Island, 900 mi. W of Portugal. **Phone:** (cmcl, from CONUS) 011-351-95-540100-1110; DSN from US 535-1110, from Europe 245-1110. **Majcom:** ACC. **Host:** 65th Air Base Wing. **Mission:** conduct operations within the Azores to include US military and host-nation coordination and deployment and sustainment of forces passing through the Azores. **Major tenants:** US Forces Azores; 952d 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, 983; 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; ACC Heritage of America Band; US Army TRADOC flight det. **History:** activated Dec. 30, 1916. Langley is one of the oldest continuously active air bases in the US. Named for aviation pioneer and scientist Samuel Pierpont Langley, who died in 1906. **Area:** 3,216 acres. **Runway:** 10,000 ft. **Altitude:** 11 ft. **Personnel:** permanent party military, 8,600; DoD civilians, 2,400. **Housing:** single family, officer, 351, enlisted, 1,074; visiting, VOQ, 101, VAQ/VEQ, 215, TLF, 100. **Hospital.**

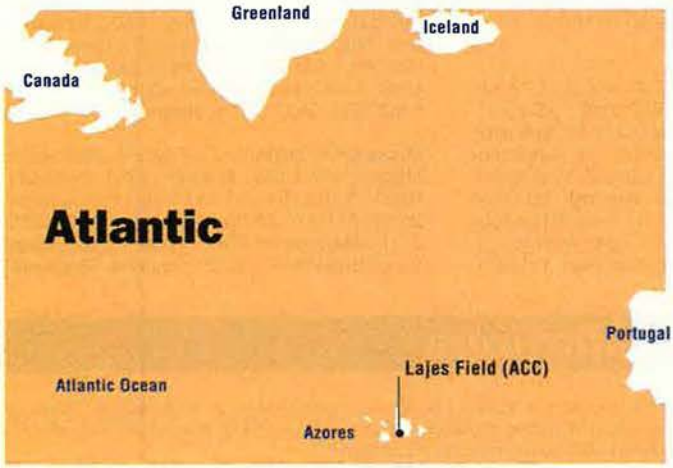
Laughlin AFB, Texas 78843-5000; 6 mi. E of Del Rio. **Phone:** 830-298-3511; DSN 732-1110. **Majcom:** AETC. **Host:** 47th Flying Training Wing. **Mission:** Specialized UPT. **History:** activated July 1942. Named for 1st Lt. Jack Thomas Laughlin, Del Rio native, B-17 pilot killed over Java Jan. 29, 1942. **Area:** 5,131 acres. **Runways:** 6,246 ft., 8,310 ft., and 8,858 ft. **Altitude:** 1,082 ft. **Personnel:** permanent party military, 1,374; DoD civilians, 1,074; contract employees, 853. **Housing:** single family, officer, 307, enlisted, 248; unaccompanied, UOQ, 245, UAQ/UEQ, 264; visiting, VOQ, 16, VAQ/VEQ, 14, TLF, 20. **Clinic.**

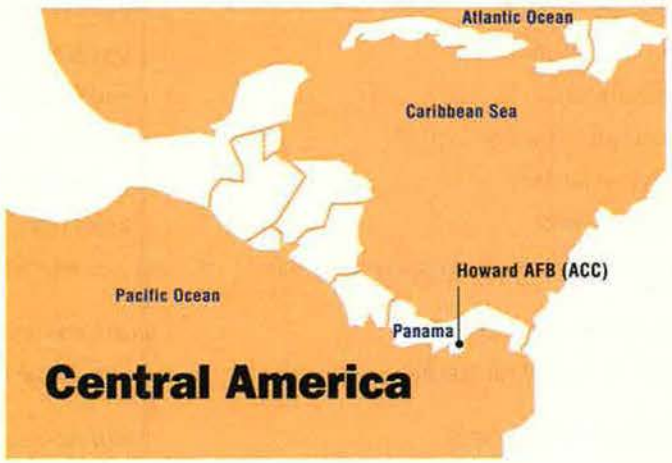
Little Rock AFB, Ark. 72099-4940; 17 mi. NE of Little Rock in the city of Jacksonville. **Phone:** 501-987-3131; DSN 731-3601. **Majcom:** AETC. **Host:** 314th Airlift Wing. **Mission:** only C-130 training base in DoD; trains crew members from all branches of military service and 27 foreign countries. **Major tenants:** 463d Airlift Group (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:** 7,210 acres. **Runway:** 12,000 ft. **Altitude:** 310 ft. **Personnel:** permanent party military, more than 4,300; DoD civilians, approx. 400; contract US employees, approx. 500. **Housing:** single family, officer, 185, enlisted, 1,350; unaccompanied, UAQ/UEQ, 10 single-occupancy dorms housing 541; visiting, VOQ, 197, VAQ/VEQ, 207. **Clinic.**

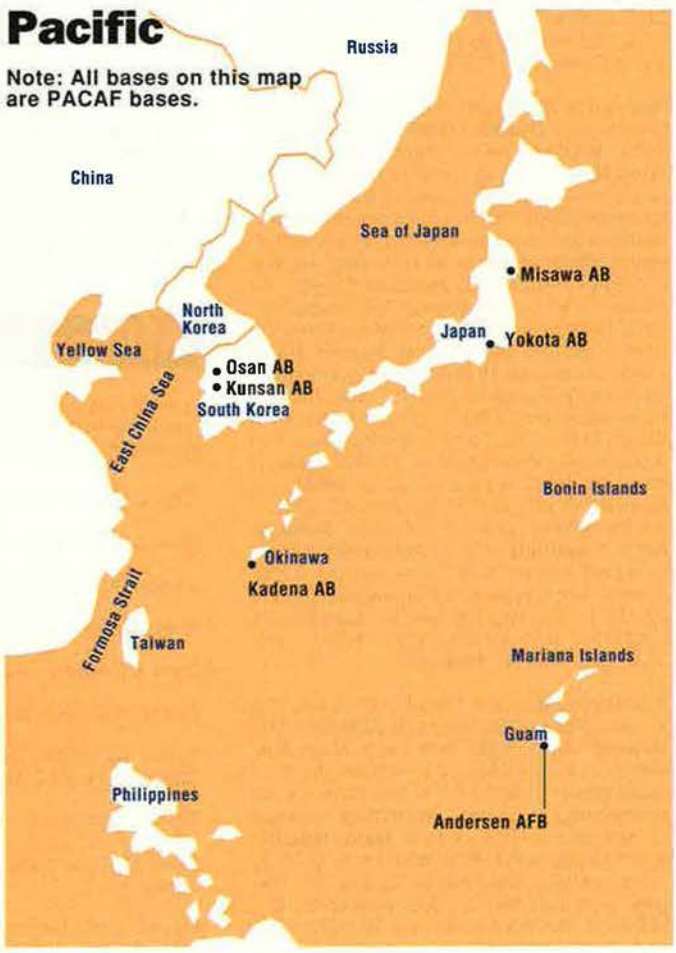
Los Angeles AFB, Calif. 90245-4657; in El Segundo, 3 mi. SE of Los Angeles IAP; base housing and support facilities 18 mi. S of the main base, in San Pedro. **Phone:** 310-363-1110; DSN 833-1110. **Majcom:** AFMC. **Host:** Space and Missile Systems Center. **Mission:** responsible for research, development, acquisition, on-orbit testing, and sustainment of military space and missile systems. **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, 1,419; DoD civilians, 990. **Housing:** single family, at Ft. MacArthur Annex, 574 townhouses, 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 2d 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,

Major Air Force Installations Overseas







near Murvaux, France. Luke is the largest fighter training base in the world. **Area:** 2,679,090 acres. **Runways:** 10,000 ft. and 9,910 ft. **Altitude:** 1,090 ft. **Personnel:** permanent party military, 5,500; DoD civilians, 1,300; contract employees, 2,000. **Housing:** single family, officer, 95, enlisted, 779; unaccompanied, UAQ/UEQ, 752; 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, 3,539; DoD civilians, 624. **Housing:** single family, officer, 258, enlisted, 1,148; unaccompanied, UAQ/UEQ, 956 units (12 dormitories); visiting, VOQ, 36, VAQ/VEQ, 29, TLF, 38. **Clinic.**

Maxwell AFB, Ala. 36112-5000; 1 mi. WNW of Montgomery. **Phone:** 334-953-1110; DSN 493-1110. **Majcom:** AETC. **Host:** 42d 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 2d Lt. William C. Maxwell, killed in air accident Aug. 12, 1920, in the Philippines. **Area:** 4,104 acres. **Runway:** 8,006 ft. **Altitude:** 172 ft. **Personnel:** permanent party military, 5,081; DoD civilians, 3,691; contract employees, 459. **Housing:** single family, officer, 372, enlisted, 548; unaccompanied, UAQ/UEQ, 420; visiting, VOQ, 1,530, VAQ/VEQ, 619, TLF, 33. **Hospital.**

McChord AFB, Wash. 98438-5000; 10 mi. S of Tacoma. **Phone:** 253-984-1910; DSN 984-1110. **Majcom:** AMC. **Host:** 62d Airlift Wing. **Mission:** C-141s; scheduled to receive the C-17 Globemaster III as the C-141 fleet retires. Base is adjacent to Ft. Lewis, its primary customer for strategic airlift worldwide. **Major tenants:** 446th Airlift Wing (AFRC); Western Air Defense Sector (ANG); 22d 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, 3,748; DoD civilians, 1,014. **Housing:** single family, officer, 88, enlisted, 895; unaccompanied, UAQ/UEQ, 900 dorm rooms; visiting, VOQ, 70, VAQ/VEQ, 287, TLF, 12. **Dispensary.** Daytime medical clinic (62d Medical Gp., McChord AFB). 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:** provides logistics management, procurement, maintenance, and distribution support for EF-111 and A-10 and, as a second source, for the F-15 and KC-135 weapon systems. The ALC is also program manager for the F-117A stealth fighter and the F-22. Other responsibilities include more than 200 electronic systems and programs and eight space systems and technology centers for very-high-speed integrated circuits, fiber optics, and advanced composites. The ALC has a unique capability for robotic nondestructive inspection using X-ray and neutron radiography on fighter-sized aircraft. **Major tenants:** Defense Commissary Agency Western Pacific Region; Technical Operations Div., Air Force Technical Applications Center; 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. Scheduled to close in July 2001. **Area:** 3,763 acres. **Runway:** 10,600 ft. **Altitude:** 75 ft. **Personnel:** permanent party military, 2,080; DoD civilians, 7,511; contract employees, 550. **Housing:** single family, officer, 100, enlisted, 564; visiting, VOQ, 72, VAQ/VEQ, 24, TLF, 19. **McClellan Clinic** for active duty and Tricare Prime members only. **Clinic and hospital** located at Mather Field, six mi. SE of Sacramento.

McConnell AFB, Kan. 67221-5000; SE corner of Wichita. **Phone:** 316-652-6100; DSN 743-1110. **Majcom:** AMC. **Host:** 22d 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 plane crash Oct. 25, 1945), and 2d 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, 2,947; 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:** 7,124 ft. and 10,001 ft. **Altitude:** 133 ft. **Personnel:** permanent party military, 5,000; DoD civilians, 1,192. **Housing:** single family, officer, 192, enlisted, 1,562; visiting, VAQ/VEQ, 124, 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, 4,620; DoD civilians, 589. **Housing:** single family, officer, 468, enlisted, 1,965; unaccompanied, UOQ, 28, UAQ/UEQ, 1,233 dorm spaces; visiting, VOQ, 39, VAQ/VEQ, 33, TLF, 39. **Hospital.**

Misawa AB, Japan, APO AP 96319-5000; within Misawa city limits. **Phone:** (cmcl, from CONUS) 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 ten-**

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 AS, Fla. 32925-5000 (AFSPC)	DSN 467-1110
Cape Cod AS, Mass. 02561-9314 (AFSPC)	DSN 557-2277
Cavalier AS, N.D. 58220-5000 (AFSPC)	DSN 330-3292
Cheyenne Mountain AS, Colo. 80914-5515 (AFSPC)	DSN 268-1211
Clear AS, Alaska, APO AP 99704 (AFSPC)	DSN 317-585-6110
Onizuka AS, Calif. 94088-3430 (AFSPC)	DSN 561-3000
Prince Sultan AB, Saudi Arabia (363d Air Expeditionary Wing), Unit 70408, Box 8, 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
Woomera AS (Australia), APO AP 96552 (AFSPC)	DSN 730-1350

ants: 3d 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. **History:** occupied by US forces September 1945. **Area:** 3,865 acres. **Runway:** 10,000 ft. **Altitude:** 119 ft. **Personnel:** permanent party military, 4,663; DoD civilians, 273; local nationals, 1,068. **Housing:** single family, officer, 295, enlisted, 1,999; unaccompanied, UOQ, 120 (Navy, 108), UAQ/UEQ, 823 (Navy, 196); visiting, VOQ, 82, VAQ/VEQ, 44 (Navy, 160), 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. **History:** activated June 1941. Named for Maj. George P. Moody, killed May 5, 1941, while test-flying a Beech AT-10. **Area:** 6,050 acres. **Runway:** 8,000 ft. **Altitude:** 233 ft. **Personnel:** permanent party military, 5,200; DoD civilians, 800. **Housing:** single family, officer, 32, enlisted, 270; visiting, VOQ, 36, VAQ/VEQ, 19, TLF, 12. **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 F-16Cs (HARM), F-15C/Ds, F-15Es, B-1Bs, 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, 3,977; DoD civilians, 427. **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:** Air Warfare Center. **Missions:** Operations wing: 57th Wing, A-10, F-15, F-15E, F-16, Predator UAV, and HH-60G. 57th Wing includes USAF Weapons School; USAF Air Ground Operations School; USAF Air Demonstration Sq. (Thunderbirds); 414th Combat Training Sq. (Red Flag); 549th Combat Training Sq. (Air Warrior). Support wing: 99th Air Base Wing. **Major tenants:** 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 with a range restricted area of 3.1 million acres, plus 12,000 sq. mi. of airspace over the range and the military operating area. **Runways:** 10,055 ft. and 10,119 ft. **Altitude:** 1,868 ft. **Personnel:** permanent party military, 7,338; DoD civilians, 938; contract employees, 765. **Housing:** single family, officer, 70, enlisted, 1,263; visiting, VOQ, 377, VAQ/VEQ, 372, TLF, 60. **Medical:** Joint Air Force–VA Hospital (Mike O'Callaghan Federal 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 Center (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, 8,775; DoD civilians, 1,715. **Housing:** single family, officer, 337, enlisted, 2,275; visiting, VOQ/VAQ/VEQ, 166, 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:** F-16C/D, C-12J, A-10, and OA-10A operations. **Major tenant:** 7th Air Force (PACAF). **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, 5,273; DoD civilians, 109; local nationals, 530. **Housing:** single family, 248; unaccompanied, UOQ, 350, UAQ/UEQ, 4,642; visiting, VOQ, 80, VAQ/VEQ, 302, 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 AS, 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, 1,842; DoD civilians, 1,289; contract employees, 6,411. **Housing:** single family, officer, 185, enlisted, 1,364; unaccompanied, UAQ/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; 302d 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:** 43d 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:** 23d 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, 1917, 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, 4,700; DoD civilians, 350. **Housing:** single family, officer, 99, enlisted, 370; unaccompanied, UAQ/UEQ, 1,208 dorm spaces; visiting, VOQ, 153, VAQ/VEQ, 111, TLF, 8.

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-15E and the F-15C/D 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:** 2,226 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, 302, enlisted, 1,249 (plus 1,037 govt.-leased); unaccompanied, UAQ/UEQ, 764; visiting, VOQ, 62, VAQ/VEQ, 128 bed spaces, TLF, 33. **Regional medical center:** 40 beds.

RAF Mildenhall, United Kingdom, APO AE 09459-5000; 20 mi. NE of Cambridge. **Phone:** (cmcl, from CONUS) 011-44-1638-54-3000; DSN 238-3000. **Majcom:** USAFE. **Host:** 100th 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:** 3d Air Force (USAFE); 352d 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. **Hospital:** annex for aircrews and families.

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:** USAFE. **Host:** 86th Airlift Wing. **Mission:** C-130E, C-9, C-20, and C-21 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 (43,000) 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, 14,392; DoD US civilians, 4,042; local nationals, 6,733; contract US employees, 2,471. **Housing:** single family, officer, 464, enlisted, 4,673; unaccompanied, UOQ, 82 (includes NATO), dormitory rooms, 1,724 (Air Force only); visiting, VOQ, 585, VAQ/VEQ, 1,521, TLF, 123. **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 T-37, T-38, AT-38, and T-1A pilot instructor training; T-43 joint Undergraduate Navigator Training; C-21A airlift; and T-3 flight screening at Hondo, Texas, and the US Air Force Academy. **Major tenants:** Air Education and Training Command; 19th Air Force; Air Force Personnel Center; Air Force Center for Quality and Management Innovation; Air Force Services Agency; Air Force Recruiting Service. **History:** activated 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, (E) 8,350 ft. and (W) 9,350 ft. **Altitude:** 761 ft. **Personnel:** permanent party military, 5,015; DoD civilians, 4,368; contract employees, 2,077. **Housing:** single family, officer, 218, enlisted, 801; unaccompanied, UOQ, 173, UAQ/UEQ, 348; 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 the F-15, C-130 and C-141, helicopters, missiles, and remotely piloted vehicles; handles C-5 airlifter depot maintenance workload. 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:** 93d 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 Air Corps, who died June 16, 1940. **Area:** more than 8,700 acres. **Runway:** 12,000 ft. **Altitude:** 294 ft. **Personnel:** permanent party military, 4,939; DoD civilians, 12,071; contract employees, 2,640. **Housing:** single family, officer, 245, enlisted, 1,227; 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. **History:** activated October 1985 as Falcon AFB. Renamed in March 1998 for Gen. Bernard A. Schriever. **Area:** 3,840 acres. **Runway:** none. **Altitude:** 6,267 ft. **Personnel:** permanent party military, 2,339; DoD civilians, 361; contract employees, 1,102. **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 (relocating from O'Hare IAP, Ill., as of summer 1999). **Major tenants:** US Transportation Command; Air Mobility Command; Air Force Communications Agency; Air Force Combat Climatology Center; 126th Air Refueling Wing (ANG); 932d 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. **Runway:** 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, 257, enlisted, 1,441; unaccompanied, UAQ/UEQ, 558 bed spaces; visiting, VOQ, 220 bed spaces, VAQ/VEQ, 170 bed spaces, TLF, 36 units. **Hospital** (plus aeromedical staging facility): 45-bed facility able to expand to 348 during wartime, with 100 of those in the aeromedical staging flight.

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-135 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, 4,331; DoD civilians, 1,100; contract employees, 1,000. **Housing:** single family, officer, 152, enlisted, 1,544; unaccompanied, UAQ/UEQ, 10 dorms (880 spaces); visiting, VOQ, 43, VAQ/VEQ, 33, TLF, 29. **Clinic.**

Shaw AFB, S.C. 29152-5000; 10 mi. WNW of Sumter. **Phone:** 803-668-8110; 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 2d 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, 5,850; DoD civilians, 541. **Housing:** single family, officer, 162, enlisted, 1,542; unaccompanied, UAQ/UEQ, 988; visiting, VOQ, 74, VAQ/VEQ, 66, TLF, 40. **Hospital** with urgent care clinic (no emergency room).

Sheppard AFB, Texas 76311-5000; 4 mi. N of Wichita Falls. **Phone:** 940-676-2511; DSN 736-2511. **Majcom:** AETC. **Host:** 82d Training Wing. **Mission:** conducts courses in financial management, communications, electronics, aircraft maintenance, munitions, aerospace ground equipment, transportation, civil engineering skills, education/training, biomedical sciences, dentistry, health service administration, medical readiness, medicine, nursing, Physician Assistant Training Program; provides weapon system training at training detachments and operating locations 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:** 6,000 ft., 7,000 ft., 8,800 ft., and 13,100 ft. **Altitude:** 1,015 ft. **Personnel:** permanent party military, 3,387; DoD civilians, 1,385; support personnel, 2,303. **Housing:** single family, officer, 195, enlisted, 1,056; unaccompanied, UOQ, 144, UAQ/UEQ (permanent party, not pipeline), 564; visiting, VOQ, 427, VAQ/VEQ, 2,126. **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:** 52d Fighter Wing. **Mission:** two F-16 squadrons with the only HARM targeting capability in Europe; other squadrons fly F-15C/Ds and A/OA-10s. 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, 5,600; DoD US civilians, 290; local nationals, 605; contract US employees, 98. **Housing:** single family, officer, 152, enlisted, 1,941; visiting, 116 rooms, TLF, 39. **Hospital:** 15 beds.

Tinker AFB, Okla. 73145-3010; 8 mi. SE of Oklahoma City. **Phone:** 405-732-7321; DSN 884-1110. **Majcom:** AFMC. **Host:** Oklahoma City Air Logistics Center. **Mission:** manages and provides logistics support and depot maintenance for more than 850 aircraft, including the B-1B, B-2, B-52, E-3, E-6, and KC-135. **Major tenants:** 552d Air Control Wing (ACC); 507th Air Refueling Wing (AFRC); Navy Strategic Communications Wing One; Defense Logistics Agency's Defense Distribution Depot Oklahoma City; 3d Combat Communications Gp.; 38th Engineering Installation Wing (AFMC); Oklahoma City Megacenter. **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:** 10,000 ft. and 11,100 ft. **Altitude:** 1,291 ft. **Personnel:** permanent party military, 7,765; DoD civilians, 13,375. **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, 7,069; DoD civilians, 1,681; contract employees, 51; NAF employees, 1,116. **Housing:** single family, officer, 267, enlisted, 2,201; unaccompanied, UAQ/UEQ, 1,080 spaces; visiting, VOQ, 138, VAQ/VEQ, 242, TLF, 84. **Hospital:** 155 beds for acute care; 55 aeromedical staging flight beds; 52 dental treatment rooms.

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); 475th 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 on active duty July 15, 1930, in a P-1 crash. **Area:** 29,102 acres. **Runways:** 10,000 ft., 8,075 ft., and 7,000 ft. **Altitude:** 18 ft. **Personnel:** permanent party military, 4,317; DoD civilians, 645; contract employees, 1,626. **Housing:** single family, officer, 123, enlisted, 859; unaccompanied, UAQ/UEQ, 7 dorms/435 beds; visiting, VOQ, 6 dorms/219 beds, VAQ/VEQ, 7 dorms/270 beds, TLF, 5 units/40 suites. **Hospital.**

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:** inspire and develop 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:** 2,300 ft., 3,500 ft., and 4,500 ft. **Altitude:** 7,200 ft. **Personnel:** permanent party military, 2,338; cadets, 3,988; 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:** 580-213-2121; DSN 448-2121. **Majcom:** AETC. **Host:** 71st Flying Training Wing. **Mission:** provides joint, Specialized UPT, 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 gradu-

ate, and Medal of Honor recipient, killed July 26, 1944, when air-evac plane 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, 823; DoD civilians, 188; contract employees, 1,200. **Housing:** single family, officer, 118, enlisted, 112; unaccompanied, UOQ, 200, UAQ/UEQ 154; visiting, VOQ, 46, TLF, 10. **Clinic.**

Vandenberg AFB, Calif. 93437-5000; 8 mi. NNW of Lompoc. **Phone:** 805-734-8232 (ext. 6-1611); 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). **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, 485, enlisted, 1,474. **Hospital.**

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:** 442d Fighter Wing (AFRC); 1st Battalion, 135th Aviation (ARNG). **History:** activated 1942. Named for Sedalia resident 2d 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, 4,312; DoD civilians, 1,786. **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:** develop, acquire, modernize, and sustain 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, 7,200; DoD civilians, 12,600; contract employees, 3,400. **Housing:** single family, officer, 647, enlisted, 1,603; 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, 3,699; DoD civilians, 1,553; local nationals, 1,973. **Housing:** single family, officer, 611, enlisted, 1,864; unaccompanied, UOQ, 220, UAQ/UEQ, 794; visiting, VOQ, 75, VAQ/VEQ, 135, TLF, 58. **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.

Anchorage, Alaska (Kulis ANGB) 99502; at Anchorage International Airport. **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.

Atlantic City International Airport, 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 International Airport, Me. 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 Municipal Airport, 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, Idaho (Gowen Field) 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:** field named for Lt. Paul R. Gowen, killed in B-10 crash in Panama 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 International Airport, Windsor Locks, Conn. 06026-5000; 15 mi. N of Hartford at East Granby. **Phone:** 860-292-2526; DSN 636-8310. **Units:** 103d 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. Base named for Lt. John H. Buckley, National Guardsman, killed in France Sept. 27, 1918. **Area:** 3,832 acres. **Runway:** 11,000 ft. **Altitude:** 5,663 ft. **Full-time personnel:** 302.

Burlington International Airport, 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 Municipal Airport, Ill. 63707-5000; 2 mi. NW of Springfield. **Phone:** 217-753-8850; DSN 892-8210. **Unit:** 183d 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 International Airport, 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 Municipal Airport, Cheyenne, Wyo. 82001. **Phone:** 307-772-6201; DSN 943-6201. **Unit:** 153d 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); 232d Combat Communications Sq. **History:** named for Ens. Clarence Dannelly, Navy pilot killed at Pensacola, Fla., during WWII. **Area:** 51 acres. **Runway:** 9,000 ft. **Altitude:** 221 ft. **Full-time personnel:** 289.

Des Moines International Airport, Iowa 50321; within city of Des Moines. **Phone:** 515-256-8502; DSN 939-8210. **Unit:** 132d 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. 22d 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, WWII pilot killed near Sicily, Italy. **Area:** 1,660 acres. **Runway:** 10,000 ft. **Altitude:** 1,068 ft. NAS Atlanta and Lockheed Martin Aeronautical Systems Co./Air Force Plant 6 adjoin Dobbins ARB and use airfield facilities.

Duluth International Airport, 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 Regional Airport/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 Municipal Airport, 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 International Airport, Ind. 46809-5000; 5 mi. SSW of Fort Wayne. **Phone:** 219-478-3210; DSN 786-1210. **Unit:** 122d Fighter Wing (ANG). **Area:** 138 acres. **Runway:** 12,000 ft. **Altitude:** 800 ft. **Full-time personnel:** 287.

Francis S. Gabreski International Airport, 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, third leading USAAF/USAF ace of all time. **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 International Airport/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:** 168.

Greater Peoria Airport, Ill. 61607-1498; 7 mi. SW of Peoria. **Phone:** 309-791-2282; DSN 724-2282. **Unit:** 182d Airlift Wing (ANG). **Area:** 381 acres. **Runway:** 9,500 ft. **Altitude:** 660 ft. **Full-time personnel:** 273.

Great Falls International Airport, 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, a training base for carrier pilots. Reactivated June 1954 as Bunker Hill AFB. Renamed in May 1968 in honor of Lt. Col. Virgil I. "Gus" Grissom, killed Jan. 27, 1967, at Cape Kennedy, Fla., with astronauts Edward White and Roger Chaffee 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.

Gulfport–Biloxi Regional Airport, 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); 173d 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 International Airport, Pa. 17057; 10 mi. E of Harrisburg. **Phone:** 717-948-2200; DSN 430-9200. **Unit:** 193d Special Operations Wing (ANG). **Area:** ANG, 39 acres. **Runway:** 9,500 ft. **Altitude:** 310 ft. **Full-time personnel:** 303.

Hector International Airport, Fargo, N.D. 58105-5536. **Phone:** 701-237-6030; DSN 362-8110. **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:** 482d Fighter Wing (AFRC); Det. 1, 125th Fighter Wing (Fla. ANG, NORAD). **Area:** approx. 1,000 acres. **Runway:** 11,200 ft. **Altitude:** 11 ft. **Full-time personnel:** 800. Billeting available.

Hulman Regional Airport, 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 International Airport, Miss. 39208-0810; 7 mi. E of Jackson. **Phone:** 601-939-3633; DSN 731-9210. **Unit:** 172d Airlift Wing (ANG). **Area:** ANG, 116 acres. **Runway:** 8,500 ft. **Altitude:** 346 ft. **Full-time personnel:** 298.

Jacksonville International Airport, 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 of South Dakota, 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 Hwys. 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 International Airport (Kingsley Field), Ore. 97603-0400; 5 mi. SE of Klamath Falls. **Phone:** 503-883-6350; DSN 830-6350. **Units:** 173d Fighter Wing (ANG); 142d OLAD (ANG). **Area:** 1,072 acres. **Runway:** 10,300 ft. **Altitude:** 4,092 ft. **Full-time personnel:** 334.

Lambert–St. Louis International Airport, 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 Municipal Airport, 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 International Airport AGS (Standiford Field), Ky. 40213. **Phone:** 502-364-9400; DSN 989-4400. **Units:** 123d Airlift Wing (ANG); 223d Communications Sq. (ANG). **Area:** 69 acres. **Runway:** 10,000 ft. **Altitude:** 497 ft. **Full-time personnel:** 289.

Luis Munoz Marin International Airport, 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:** 452d Air Mobility Wing (AFRC). **Phone:** 909-655-4520; DSN 947-4520. 4th Air Force (AFRC); 163d 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 2d Lt. Peyton C. March Jr., who died in Texas 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, 1,335; ANG, 272. **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 F-104 accident in 1961. **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 International Airport, 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 International Airport/ARS, Minn. 55450-2000; in Minneapolis, near confluence of the Mississippi and Minnesota rivers. **AFRC phone:** 612-713-1000; DSN 783-1000. **ANG phone:** 612-713-2450; DSN 783-2450. **Majcom:** AFRC. **Units:** 934th Airlift Wing (AFRC), C-130s; 133d Airlift Wing (ANG), C-130s; 210th Engineering Installation Sq. (ANG); Naval Reserve Readiness Command, Region 16; USAF 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, 146; ANG, 208. Lodging, clubs, and exchange available.

Nashville Metropolitan Airport, Tenn. 37217-0267; 6 mi. SE of Nashville. **Phone:** 615-313-3001; 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 International Airport/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:** 9,100 ft. **Altitude:** 590 ft. **Full-time personnel:** 270. Lodging and exchange available.

O'Hare International Airport/ARS, Ill. 60666-5022; 22 mi. NW of Chicago's Loop. **Phone:** 773-825-6000; DSN 930-6000. **Units:** 126th Air Refueling Wing (ANG); Defense Contract Management Area Operations, Ft. Dearborn (US Army Reserve). **History:** activated April 1946. Named for Lt. Cmdr. Edward H. "Butch" O'Hare, USN, Medal of Honor recipient, killed Nov. 26, 1943, during battle for Gilbert Islands. **Area:** 644 acres; ANG area, 36 acres. **Runway:** 13,000 ft. **Altitude:** 643 ft. **Full-time personnel:** 312. ANG's 126th ARW is slated to relocate to Scott AFB, Ill., by the time the base closes July 31, 1999.

Otis ANGB, Mass. 02542-5001; 7 mi. NNE of Falmouth. **Phone:** 508-968-4667; DSN 557-4667. **Units:** 102d Fighter Wing (ANG), F-15A/Bs; 567th USAF Band (ANG); 101st and 202d 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 International Airport/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; 171st Air Refueling Wing (ANG). **History:** activated 1943. **Area:** AFRC, 115 acres; ANG, 179 acres. **Runway:** 11,500 ft. **Altitude:** 1,203 ft. **Full-time personnel:** 409. **Housing:** VOQ, 24, VEQ, 230. No on-base housing. Limited exchange.

Portland International Airport, Portland, Ore. 97218-2797. **Phone:** 503-335-4020; DSN 638-4020. **Units:** 142d Fighter Wing (ANG); 244th Combat Communications Sq. (ANG); 272d 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:** 143d Airlift Wing (ANG). **Area:** 79 acres. **Runway:** 8,000 ft. **Altitude:** 19 ft. **Full-time personnel:** 248.

Reno/Tahoe International Airport (May Field), Nev. 89502; 5 mi. SE of Reno at 1776 ANG Way. **Phone:** 702-788-4500; DSN 830-4500. **Unit:** 152d 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 International Airport (Byrd Field), Va. 23150; 4 mi. SE of downtown Richmond. **Phone:** 804-236-6429; DSN 864-6129. **Unit:** 192d 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 International Airport, 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, in honor of Capt. Edward V. Rickenbacker, top US WWI ace and Medal of Honor recipient, who died July 23, 1973. 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 International Airport, 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 International Airport, 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, first Army officer to fly an airplane and first fatality of powered flight, killed Sept. 17, 1908, at Ft. Myer, Va., when plane piloted by Orville Wright crashed. **Area:** 3,070 acres. **Runway:** 9,000 ft. **Altitude:** 583 ft. **Full-time personnel:** ANG, 438; AFRC, 692; ART, 177; DoD civilians, 59.

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 International Airport, 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 Municipal Airport, 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 International Airport, 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 International Airport, 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; 152d Tactical Control 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 Regional Airport), 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 International Airport, Ariz. 85734; within Tucson city limits. **Phone:** 602-295-6210; DSN 924-6210. **Unit:** 162d Fighter Wing (ANG). **Area:** 84 acres. **Runway:** 11,000 ft. **Altitude:** 2,650 ft. **Full-time personnel:** 979.

Tulsa International Airport, 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, in crash near Burbank, Calif. **Area:** 2,386 acres. **Runway:** 11,600 ft. **Altitude:** 245 ft. **Full-time personnel:** ART, 502; DoD civilians, 557. **Housing:** VOQ, 78, VAQ, 614 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, first man to break the sound barrier. **Area:** 269 acres. **Runway:** 6,300 ft. **Altitude:** 981 ft. **Full-time personnel:** 232.

Youngstown–Warren Regional Airport 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:** 261. ■

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 national records as world records.

Since 1922, the National Aeronautic Association, based in Arlington, Va., has been the US representative to the FAI. The NAA supervises all attempts at world and world-class records in the United States. Absolute world records are the supreme achievements of all the records open to flying machines.

Speed around the world, nonstop, nonrefueled: 115.65 mph (186.11 kph). Richard G. Rutan and Jeana L. Yeager in *Voyager* experimental aircraft at Edwards AFB, Calif., Dec. 14–23, 1986.

Great circle distance without landing: 24,986.727 miles (40,212.139 kilometers). Richard G. Rutan and Jeana L. Yeager in *Voyager* at Edwards AFB, Calif., Dec. 14–23, 1986.

Distance in a closed circuit without landing: 24,986.727 miles (40,212.139 kilometers). Richard G. Rutan and Jeana L. Yeager in *Voyager* at Edwards AFB, Calif., Dec. 14–23, 1986.

Altitude: 123,523.58 feet (37,650.00 meters). Alexander Fedotov flying E-266M, a modified MiG-25, at Podmoskovnoye, USSR, Aug. 31, 1977.

Altitude in an aircraft launched from a carrier airplane: 314,750.00 feet (95,935.99 meters). USAF Maj. Robert M. White flying North American X-15 No. 3 at Edwards AFB, Calif., July 17, 1962.

Altitude in horizontal flight: 85,068.997 feet (25,929.031 meters). USAF Capt. Robert C. Helt (pilot) and USAF Maj. Larry A. Elliott (RSO) in Lockheed SR-71A Blackbird at Beale AFB, Calif., July 28, 1976.

Speed over a straight course: 2,193.16 mph (3,529.56 kph). USAF Capt. Eldon W. Joersz (pilot) and USAF Maj. George T. Morgan Jr. (RSC) in Lockheed SR-71A Blackbird at Beale AFB, Calif., July 28, 1976.

Speed over a closed circuit: 2,092.294 mph (3,367.221 kph). USAF Majs. Adolphus H. Bledsoe Jr. (pilot) and John T. Fuller (RSO) in Lockheed SR-71A Blackbird at Beale AFB, Calif., July 27, 1976.

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** (World War I).
1921 **Grover Loening.** Aerial yacht.
1922 **US Air Mail Service.** One year without fatality.
1923 **US Air Mail Service.** Commercial night flying.
1924 **US Army Air Service.** First aerial flight around world.
1925 **S. Albert Reed.** Metal propeller.
1926 **Maj. E.L. Hoffman.** Practical parachute.
1927 **Charles L. Lawrance.** Radial air-cooled engine.
1928 **Commerce Dept., Aeronautics Branch.** Airways, air navigation facilities.
1929 **National Advisory Committee for Aeronautics.** Cowling for radial air-cooled engines.
1930 **Harold Pitcairn and staff.** Autogiro.
1931 **Packard Motor Car Co.** Diesel aircraft engine.
1932 **Glenn L. Martin.** Two-engined, high-speed, weight-carrying airplane.
1933 **Hamilton Standard Propeller Co., Frank W. Caldwell.** Controllable-pitch propeller.

The Robert J. Collier Trophy, continued

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 **Dr. 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 **Dr. 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, and 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 **Dr. 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 **Dr. 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 and Tactical Air Command.** Red Flag.
1978 **Sam B. Williams, Williams Research Corp.** Turbofan cruise missile engines.
1979 **Dr. Paul B. MacCready, AeroEnvironment, Inc., Bryan Allen.** *Gossamer Albatross.*
1980 **NASA's Voyager mission team, Dr. 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.** and **Gulfstream V industry team.** Gulfstream V.

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	2d Lt. Henry H. Arnold
1913	2d Lts. Joseph E. Carberry and Fred Seydel
1914	Capt. Townsend F. Dodd and Lt. S.W. Fitzgerald
1915	Lt. B.Q. Jones
1916–17	Inactive
1918	Capt. Edward V. Rickenbacker
1919	Lt. Col. Harold E. Hartney; Capts. John O. Donaldson, Lowell H. Smith, and F. Steinle; Lts. B.G. Bagby, D.B. Gish, E.M. Manzelman (posthumously), Belvin N. Maynard, R.S. Northington, and Alexander Pearson Jr.
1920	Capt. St. Clair Streett; 1st Lt. Clifford C. Nutt; 2d Lts. C.H. Crumrine, Ross C. Kirkpatrick, and Eric H. Nelson; Sgts. Joe E. English, Edmond Henriques, and Albert T. Vierra
1921	Lt. John A. Macready
1922	Lts. John A. Macready and C.G. Kelly
1923	Lts. John A. Macready and C.G. Kelly
1924	Capt. Lowell H. Smith; 1st Lts. Leslie P. Arnold, Eric H. Nelson, and Leigh Wade; 2d Lts. John Harding Jr. and Henry H. Ogden
1925	Lts. Cyrus K. Bettis and Jimmy Doolittle
1926	Pan American Goodwill Fliers: Maj. H.A. Dargue; Capts. Ira C. Eaker, A.B. McDaniel, and C.F. Woolsey (posthumously); 1st Lts. J.W. Benton (posthumously), M.S. Fairchild, C.McK. Robinson, B.S. Thompson, L.D. Weddington, and E.C. Whitehead
1927	Lts. Albert F. Hegenberger and Lester J. Maitland
1928	1st Lt. Harry A. Sutton
1929	Capt. A.W. Stevens
1930	Maj. Ralph Royce
1931	Brig. Gen. Benjamin D. Foulois
1932	11th Bombardment Sq., March Field, Calif., 1st Lt. Charles H. Howard
1933	Capt. Westside T. Larson
1934	Brig. Gen. Henry H. Arnold
1935	Capts. O.A. Anderson and A.W. Stevens
1936	Capt. Richard E. Nugent; 1st Lts. Joseph A. Miller and Edwin G. Simenson; 2d Lts. Burton W. Armstrong, Herbert Morgan Jr., and William P. Ragsdale Jr.; TSgt. Gilbert W. Olson; SSgt. Howard M. Miller; Cpl. Air Mechanic 2d Class Frank B. Connor
1937	Capts. Carl J. Crane and George V. Holloman
1938	2d Bombardment Group, Lt. Col. Robert Olds
1939	Majs. Caleb V. Haynes and William D. Old; Capt. John A. Samford; 1st Lts. Richard S. Freeman and Torgils G. Wold; MSgt. Adolph Cattarius; TSgts. William J. Heldt, Henry L. Hines, and David L. Spicer; SSgts. Russell E. Junior and James E. Sands
1940–46	Inactive
1947	Capt. Charles E. Yeager
1948	Lt. Col. Emil Beaudry
1949	Capt. James G. Gallagher and crew of *Lucky Lady II*
1950	27th Fighter Wing
1951	Col. Fred J. Ascani
1952	Majs. Louis H. Carrington Jr. and Frederick W. Shook; Capt. Wallace D. Yancey
1953	40th Air Division, SAC
1954	308th Bombardment Wing (M) and 38th Air Div., SAC
1955	Col. Horace A. Hanes
1956	Capt. Iven C. Kincheloe Jr., Air Research and Development Command
1957	93d Bombardment Wing, SAC
1958	TAC Air Strike Force, X-Ray Tango
1959	US Air Force Thunderbirds
1960	6593d Test Sq., Hickam AFB, Hawaii
1961	Lt. Col. William R. Payne and Majs. William L. Polthemus and Raymond R. Wagener, 43d Bomb Wing, SAC.
1962	Maj. Robert G. Sowers and Capts. Robert MacDonald and John T. Walton
1963	Capts. Donald R. Mack, John R. Ordemann, and Warren P. Tomsett; TSgt. Edsol P. Inlow; SSgts. Frank C. Barrett and Jack E. Morgan
1964	464th Troop Carrier Wing, TAC
1965	YF-12A Test Force (Col. Robert L. Stephens; Lt. Col. Daniel Andre; Majs. Walter F. Daniel and Noel T. Warner; Capt. James P. Cooney)
1966	Lt. Col. Albert R. Howarth
1967	Maj. John H. Casteel; Capts. Dean L. Hoar and Richard L. Trail; MSgt. Nathan C. Campbell
1968	Lt. Col. Daryl D. Cole
1969	49th Tactical Fighter Wing, TAC
1970	Capt. Alan D. Milacek and AC-119K crew (Capts. Roger E. Clancy, Ronald C. Jones, Brent C. O'Brien, and James A. Russell; TSgt. Albert A. Nash; SSgts. Adolfo Lopez Jr. and Ronald R. Wilson; Sgt. Kenneth E. Firestone; A1C Donnell H. Cofer)
1971	Lt. Col. Thomas B. Estes and Maj. Dewain C. Vick
1972	Capts. Charles B. DeBellevue, Jeffrey S. Feinstein, and Richard S. "Steve" Ritchie
1973	MAC aircrews
1974	Majs. Willard R. MacFarlane, David W. Peterson, and Roger J. Smith
1975	Maj. Robert W. Undorf
1976	Capt. James A. Yule
1977	C-5 aircrew (Capt. David M. Sprinkel and crew)
1978	C-5 aircrews (Lt. Col. Robert F. Schultz and crew and Capt. Todd H. Hohberger and crew, 436th Military Airlift Wing)
1979	Maj. James E. McArdle Jr.
1980	Crews S-21 and S-31, 644th Bombardment Sq.
1981	Capt. John J. Walters
1982	B-52 Crew E-21, 19th Bombardment Wing
1983	Capt. Robert J. Goodman and his crew, 42d Bombardment Wing, SAC
1984	Lt. Col. James L. Hobson Jr.
1985	Lt. Col. David E. Faught
1986	KC-10 crew (Capts. M.D. Felman and T.M. Ferguson; MSgts. C. Bridges Jr., P.S. Kennedy, and G.G. Treadwell; TSgts. L.G. Bouler and G.M. Lewis; SSgts. S.S. Flores, S.A. Helms, and G.L. Smith), 68th Air Refueling Group, SAC
1987	Det. 15, USAF Plant Representative Office, and B-1B SPO
1988	C-5 crew, 436th Military Airlift Wing
1989	B-1B crew, 96th Bomb Wing
1990	AC-130 crew, 16th Special Operations Sq.
1991	MH-53 crew, 20th Special Operations Sq.
1992	C-130 crew, 310th Airlift Sq., ACC, Howard AFB, Panama
1993	B-52 crew, 668th Bomb Sq., ACC
1994	HH-60G crew of Air Force Rescue 206 and 208, 56th Rescue Sq., ACC, NAS Keflavik, Iceland
1995	Aircrew BAT-01, Dyess AFB, Texas
1996	Aircrew Duke 01, 2d Bomb Wing, Barksdale AFB, La.
1997	Crew of Whiskey-05, 7th Special Operations Sq., RAF Mildenhall, UK

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 presentation
1975 Maj. Gen. Thomas P. Stafford
1976 Gen. William J. Evans
1977 Lt. Col. Charles G. Fullerton, Fred W. Haise Jr.
1978 No presentation
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 Dr. 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 Lt. Gen. Patrick P. Caruana
1997 Gen. Howell M. Estes III

The Hughes Trophy

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	83d 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	32d 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	43d TFS, Elmendorf AFB, Alaska	F-4E
1973	555th TFS, Udorn RTAB, Thailand	F-4D
1974	119th FIG (ANG), Hector Field, N.D.	F-101B
1975	318th FIS, McChord AFB, Wash.	F-106A/B
1976	57th FIS, NAS Keflavik, Iceland	F-4C
1977	43d TFS, Elmendorf AFB, Alaska	F-4E
1978	49th FIS, Griffiss AFB, N.Y.	F-106A/B
1979	32d TFS, Soesterberg AB, Netherlands	F-15A/B
1980	32d 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	22d 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	493d FS, RAF Lakenheath, UK	F-15C

USAF Almanac

Gallery of USAF Weapons

By Susan H.H. Young

***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. 23, 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 North American; 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 mines and up to 30 CBU-87/89/97s.

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 the primary role of high-subsonic, low-altitude penetration.

The bomber's offensive avionics include forward-looking radar, Moving Target Indicator (MTI), and Terrain-Following Radar (TFR), an extremely accurate Inertial Navigation System (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.

***B-2** Spirit* (Ted Carlson)

The current defensive avionics package, built around the ALQ-161 ECM system, is supplemented by 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 towed decoy will be added by December for 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. B-1B's speed, superior handling qualities, and large payload make it a key element of any joint/composite strike force, with a flexibility to deliver Mk 82 conventional general-purpose bombs, Mk 62 naval mines, CBU-87 and CBU-89 cluster munitions, and CBU-97 Sensor Fuzed Weapons (to be fitted with the Wind-Corrected Munitions Dispenser kits); or to carry additional fuel, as required. The Joint Direct Attack Munition (JDAM) GPS–guided weapon will be added to the B-1B's list of weapons this fiscal year.

The B-1B's conventional 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 will include 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 planned.

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 150,000–160,000 lb, gross 350,000 lb.

Ceiling: 50,000 ft.

Performance: minimum approach speed 161 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: 16 Mk 84 2,000-lb bombs, up to 16 2,000-lb GBU-36/B (GAM), 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, JDAM, and up to 32 CBU-87/89/97 cluster bombs. JASSM and JSOW are presently being added to B-2 Block 30 aircraft through Fiscal 2003.

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 centerbody. These bays contain rotary launchers or bomb rack assemblies capable of carrying a total weapons load of 40,000 lb; however, 16 nuclear weapons would be normal under the nation's Single Integrated Operational Plan (SIOP).

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 blocks of capability. Block 10 aircraft carried B83 nuclear bombs or 16 Mk 84 2,000-lb conventional munitions. All Block

10 aircraft have been upgraded to Block 20 or Block 30 configuration.

Block 20 aircraft additionally carry the B61/7 and B61/11 nuclear gravity bombs, as well as two GPS–Aided Munitions, the GBU-37 and GBU-38B, providing an interim, near-precision strike capability. Up to 16 GBU-36Bs or 8 GBU-37s can be carried on two rotary launcher assemblies.

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 Sensor Fuzed Weapons, 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). All 21 aircraft will reach Block 30 capability by 2000.

Extensions of the B-2's conventional capabilities beyond Block 30 configuration are under consideration.

The first test B-2 is to be refurbished for service as an operational bomber by 2000, providing a total fleet of 21. Procurement of 21 operational B-2s will enable the 509th BW, Whiteman AFB, Mo., to field two squadrons, each with eight operational aircraft.

The first combat mission took place March 24, 1999, against Serb targets in Operation Allied Force. Two B-2s made a 30-hour-plus round-trip from Whiteman AFB, Mo., to attack "a variety of hard and soft targets, including, but not limited to, command-and-control sites and airfields." Each aircraft dropped 16 2,000-pound 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 turbofans, each 17,000 lb thrust.
Accommodation: two pilots, side by side, plus navigator, radar navigator, and electronic warfare officer.
Dimensions: span 185 ft, length 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 Harpoons in under-wing clusters.

COMMENTARY

A key element of USAF's manned strategic bomber force for 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 system, thus improving combat ability and low-level flight capability. Pilots have Night Vision Goggles (NVGs) to further enhance night operation.

The B-52's Electronic Countermeasures (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-52H** Stratofortress* (Ted Carlson)

B-52C. Multimission version with increased gross weight and larger under-wing tanks. Powered by J57-P-19W or -29WA engines. First flown March 1956, 35 were delivered June–December 1956. Majority retired 1971.

B-52D. Long-range bomber version, first flown June 1956. Total of 170 built, with deliveries beginning late 1956. Retired 1982–83.

B-52E. Version with improved bombing, navigation and electronics systems. First flown October 1957. One hundred delivered October 1957–June 1958. Retired 1969–70.

B-52F. Version with uprated J57-P-43WA engines, first flown in May 1958. Eighty-nine delivered June 1958–February 1959. Retired 1978.

B-52G. Introduced important design changes, including a redesigned wing containing integral fuel tanks for increased range, fixed under-wing external tanks, a shorter tail fin of greater chord, and a remotely controlled tail gun turret that allowed the gunner to be repositioned with the rest of the crew. Initial flight August 1958, with the first of 193 aircraft entering service in February 1959. Withdrawn 1994.

B-52H. The only version 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.

An ongoing modernization program is enhancing the conventional capabilities of the remaining B-52 fleet, extending the bomber's service life well into the next 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 JDAM, JSOW, Wind-Corrected Munitions Dispenser, and JASSM. Installation of a heavy stores adapter beam will standardize aircraft to carry all B-52-certified munitions.

Current plans envisage an eventual force of around 71 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, USAFE, ANG, AFRC.
First Flight: Feb. 15, 1975 (preproduction).
Delivered: November 1975–March 1984.
IOC: October 1977.
Production: 713.
Inventory: 369.
Unit Location: Active: Barksdale AFB, La., Davis–Monthan AFB, Ariz., Eielson AFB, Alaska, Moody AFB, Ga., Nellis AFB, Nev., Osan AB, South Korea, Pope AFB, N.C., Spangdahlem AB, Germany, Whiteman AFB, Mo. ANG: Baltimore, Md., Barnes MAP, Mass., Boise Air Terminal, Idaho, Bradley IAP, Conn., NAS JRB New Orleans, La., W.K. Kellogg Airport, Mich. AFRC: Willow Grove ARS, Pa.
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

***A-10A** Thunderbolt II* (Ted Carlson)

or guided bombs, Combined Effects Munition (CEM) dispensers, gun pods, up to six AGM-65 Maverick missiles, up to four AIM-9 Sidewinder missiles, and jammer pods. Chaff and flares carried internally to counter radar-directed or infrared-directed threats. The centerline pylon and the two flanking fuselage pylons cannot be occupied simultaneously.

COMMENTARY

Reflecting 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, affectionately 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.

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.

ANG A-10s (the first first-line aircraft to be assigned to the Guard) have received a major night capability upgrade.

Used extensively during the Persian Gulf War, A-10s deploy to Aviano AB, Italy, in support of NATO operations in Bosnia. In addition, a squadron of 24 A-10s, based permanently at Al Jaber AB in southern Kuwait, provides on-call airpower, supplementing Operation Southern Watch.

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-130U (Ted Carlson)

F-15C Eagle (Ted Carlson)

F-15E Strike Eagle (SrA. Jeffrey Allen)

AC-130 Spectre

Brief: Heavily armed aircraft using side-firing weapons integrated with sophisticated sensor, navigation and fire-control systems to provide precise firepower or area saturation for long periods at night and in adverse weather.

Function: Attack aircraft.
Operator: AFSOC.
First Flight: 1967.
Delivered: 1968–95.
IOC: 1972 (AC-130H); 1995 (AC-130U).
Production: 39.
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-130Hs 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-130Us are the latest 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 slaved 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: Tactical fighter.
Operator: ACC, AETC, PACAF, USAFE, ANG.
First Flight: July 27, 1972.
Delivered: from November 1974.
IOC: September 1975.
Production: 874.
Inventory: 526.
Unit Location: Active: Edwards AFB, Calif., Eglin AFB, Fla., Elmendorf AFB, Alaska, Kadena AB, Japan, Langley AFB, Va., Nellis AFB, Nev., RAF Lakenheath, UK, Spangdahlem AB, Germany, Tyndall AFB, Fla. ANG: Hickam AFB, Hawaii, Jacksonville IAP, Fla., Klamath Falls IAP, Ore., Lambert–St. Louis IAP, Mo., 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 23,770 lb thrust, standard since 1985.
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, with CFTs 3,570 miles.
Armament: one internally mounted M61A1 20 mm six-barrel cannon; four AIM-9L/M Sidewinder and four AIM-7F/M Sparrow air-to-air missiles, or eight AIM-120 AMRAAMs, carried externally.

COMMENTARY

A supremely capable aircraft, 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 in support of Operation Desert Storm accounted for 29 of the 37 USAF air-to-air victories. They have since been deployed to southern Iraq in support of Operation Southern Watch, to Turkey in support of Operation Provide Comfort, and to Bosnia, currently in support of NATO operations.

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, 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 final 43 aircraft included improved APG-70 radar, and more than 148 C/Ds are scheduled to receive an APG-63 upgrade.

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, PACAF, USAFE.
First Flight: Dec. 11, 1986.
Delivered: December 1988–present.
IOC: May 1989.
Production: 221.
Inventory: 201.
Unit Location: 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 29,100 lb thrust.
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 height Mach 2.5, max range 2,762 miles.
Armament: one internally mounted M61A1 20 mm six-barrel cannon; four AIM-9L/M Sidewinder and four AIM-7F/M Sparrow air-to-air missiles, or eight AIM-120 AMRAAMs; up to six AGM-65 Maverick air-to-surface missiles, AGM-130; EO, IR, and standard bombs; CBU

87/89/97 cluster munitions; and nuclear weapons. Future options include JSOW and JASSM.

COMMENTARY

F-15E has a strengthened airframe for increased gross weight at takeoff and maneuver at 9g 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. Conformal Fuel Tanks (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 forged a successful operational partnership with Joint STARS aircraft. More recent deployments include AEF missions to the Middle East, Operation Deliberate Force over Bosnia, and Operation Allied Force in Yugoslavia.

F-16 Fighting Falcon

Brief: A compact, versatile, and low-cost multirole fighter aircraft, one 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, PACAF, USAFE, ANG, AFRC.

First Flight: Dec. 8, 1976 (full-scale development).

Delivered: August 1978–present.

IOC: October 1980, Hill AFB, Utah.

Production: 2,206.

Inventory: 1,448.

Unit Location: 14 active wings, 23 ANG, and five 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. F-16s are currently deployed to patrol the no-fly zones in southern Iraq and to Bosnia in support of NATO operations.

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 multimode radar with a clutter-free look-down capability, advanced radar warning receiver, a 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 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.

A forward-looking, three-staged plan for the aircraft, known as the Multinational Staged Improvement Program (MSIP), was implemented in 1980 to ensure 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 mission.

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 defense suppression/destruction 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 will have the ability to autonomously locate enemy threat radars and launch HARM missiles at them in the range known mode.

In another program, 229 Block 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.

Follow-on improvements to be considered as part of an MSIP Phase IV include Joint Helmet Mounted Cuing System, AIM-9X, Link 16 Data Link, and improved weapons capabilities.

F-16CJ designated aircraft are used for the Suppression of Enemy Air Defenses (SEAD) role.

F-16B (Ted Carlson)

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: Tactical fighter.

Operator: ACC.

First Flight: Sept. 7, 1997.

Delivery: 2001 (anticipated first production).

***Block 40 F-16C** Fighting Falcon* (Guy Aceto)

***Block 50 F-16C** Fighting Falcon* (Guy Aceto)

***F-22** Raptor* (Ted Carlson)

IOC: December 2005.

Production: 339 (planned).

Inventory: two test aircraft.

Unit Location: TBD

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, AIM-9 Sidewinders stored internally in the sides of the fuselage, and/or AIM-120 AMRAAMs in the main weapons bay; for ground attack, two 1,000-lb JDAMs will replace two 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 Hughes Common Integrated Pro-

***F-117A** Nighthawk* (Guy Aceto)

cessor (CIP) will tie together various avionics functions.

Two **YF-22** 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 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.

Provision for ground-attack capability has been included since 1993. Further mission capabilities that may be explored in the future include strategic attack/interdiction, reconnaissance and surveillance, and lethal and non-lethal SEAD missions.

F-117 Nighthawk

Brief: World's first operational aircraft designed to exploit low-observable 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: 52.
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: classified.
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

Revealed officially in November 1988, the F-117's first operational deployment was to Panama in support of Operation Just Cause. During the Persian Gulf War, a fleet of more than 40 F-117As undertook 1,270 missions, attacking top-priority targets in highest-threat areas. No aircraft were lost or damaged by hostile fire. An F-117 was lost March 27, 1999, while participating in Operation 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 37th TFW, 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.

Wind tunnel model of the YAL-1A Attack Laser platform

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. A range of midlife improvements is being studied.

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, thus can fly over friendly territory to kill TBMs as they are launched.

Function: Attack laser.
Operator: ACC.
First Flight: spring 2002 (planned full system).
Delivered: TBD
IOC: Fiscal 2006 (planned).
Production: seven (planned).
Inventory: seven (planned).
Unit Location: TBD
Contractor: Boeing, TRW, Lockheed Martin.
Power Plant: four GE C2B5F turbofans, each 61,500 lb thrust.

***E-3C** Sentry* (Tec Carlson)

Accommodation: flight crew of two, plus four mission specialists.
Dimensions: span 211 ft 5 in, length 225 ft 2 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 50 nautical miles from the enemy, but can be moved forward as US forces gain air superiority.

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 1.5-meter-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.

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^3 for tactical and air defense forces. Capable of surveillance from Earth's surface up to the stratosphere, over land or water, at more than 200 miles.

Function: Airborne early warning, Battle Management C^3.
Operator: ACC, PACAF, AFRC.
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

The basic 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, known as Extend Sentry Program. Additionally, 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 is scheduled for Fiscal 2000, with contract completion after 2000.

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 200 km. Such data are then transmitted via data link to ground stations or other aircraft.

Function: Ground surveillance, battle management, command and control.

Operator: ACC.

First Flight: December 1988.

Delivered: May 1996–present.

IOC: Dec. 18, 1997.

Production: 14 to be delivered to USAF by 2005.

Inventory: four.

Unit Location: Robins AFB, Ga.

Contractor: Northrop Grumman.

Power Plant: four Pratt & Whitney JT3D-3B turbojets, each 18,000 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, 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 Operations Desert Storm (with two E-8A development aircraft) and Joint Endeavor (with one E-8A and one test bed E-8C). As a result of their success, Joint STARS' original role was expanded to include bomb-damage assessment, SEAD, and the detection of mobile missile launchers and their decoys.

Two E-8C aircraft returned to Europe in late 1996 to support Joint Endeavor. E-8Cs also participated in USAF and joint exercises throughout 1997. The E-8C deployed to Korea in 1998.

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.

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: three.

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.

***E-8C** Joint STARS* (Ted Carlson)

***RC-135U** Combat Sent* (Jim Haseltine)

***RC-135W** Rivet Joint* (Ted Carlson)

Operator: ACC.

First Flight: not available

Delivered: circa 1973.

IOC: circa 1969.

Production: 16, two in Fiscal 1999.

Inventory: 19.

Unit Location: Offutt AFB, Neb.

Contractor: Raytheon.

Power Plant: four Pratt & Whitney TF33-P-5/9 turbofans, each 18,000 lb thrust.

Accommodation: flight crew of four; 25–35 mission crew.

Dimensions: span 130 ft 10 in, length 134 ft 6 in, height 38 ft 4 in.

Weight: gross 299,000 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. One aircraft, a revamped RC-135X, is receiving the latest sensor upgrades, featuring sensors on both sides of the aircraft.

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. Fourteen aircraft 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. Two additional Ws are being acquired. The aircraft's recon systems are continuously upgraded to keep pace with new threats. Rivet Joints have operated in the Persian Gulf region since 1990. IOC: 1973.

RQ-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.

***RQ-1A** Predator* (Guy Aceto)

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.

Function: Unmanned reconnaissance aircraft.

Operator: ACC.

First Flight: July 1994.

Delivered: November 1996–present.

IOC: TBD

Production: 12 systems planned (system consists of four air vehicles, one ground control station, and one Trojan Spirit II comm system).

Inventory: five systems (as of Dec. 1, 1998).

Unit Location: Indian Springs AFAF, Nev.

Contractor: General Atomics.

Power Plant: one Rotax 914 engine.

Accommodation: unmanned system.

Dimensions: length 26 ft 8 in, height 7 ft 3 in, span 48 ft 8 in.

Weight: empty 1,200 lb, gross 2,500 lb.

Ceiling: 25,000 ft.

Performance: cruise speed 75 mph, continuous coverage on station with multiple air vehicles and relief on station, 400 nautical miles from base at altitude of 10,000–15,000 ft.

COMMENTARY

Delivery of Predator vehicles has begun to the 11th

Global Hawk (Ted Carlson)

RS, the unit that officially took over operations from the US Army on Sept. 3, 1996, following Predator's Advanced Concept Technology Demonstration. The second Predator UAV unit, the 15th RS, was activated Aug. 1, 1997. The 15th will assume operational deployment commitments while the 11th will conduct initial qualification training. This UAV has already demonstrated its capability during surveillance missions over Bosnia. Navigation is by GPS/INS. Equipped with EO/IR and SAR sensors with Ku-band satellite data link allowing real-time transmissions of video images to a ground station.

Global Hawk
Brief: A high-altitude, long-range, long-endurance Unmanned Aerial Vehicle.
Function: Unmanned reconnaissance aircraft.
Operator: TBD
First Flight: Feb. 28, 1998.
Delivered: TBD
IOC: TBD
Production: decision in Fiscal 2001.
Inventory: TBD
Unit Location: TBD
Contractor: Teledyne Ryan.
Power Plant: one Allison AE 3007H turbofan, 7,050 lb thrust.
Accommodation: unmanned system.
Dimensions: length 44 ft 5 in, height 15 ft 2 in, span 116 ft 2 in.
Weight: empty 8,940 lb, gross 25,600 lb.
Ceiling: 65,000 ft.
Performance: design goals incl endurance of up to 40 hr at a cruise speed of 400 mph and at an altitude of 65,000 ft. This would allow loiter on station 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.

DarkStar
Brief: A stealthy, high-altitude, endurance Unmanned Aerial Vehicle.
Function: Unmanned reconnaissance aircraft.
Operator: (production canceled)
First Flight: March 29, 1996.
Delivered: (production canceled)
IOC: (production canceled)
Production: canceled.
Inventory: (production canceled)
Unit Location: (production canceled)
Contractor: Boeing/Lockheed Martin.
Power Plant: one Williams International F129 (FJ44) turbofan, 1,900 lb thrust.
Accommodation: unmanned system.
Dimensions: length 15 ft, height 5 ft, span 69 ft.
Weight: gross 8,600 lb.
Ceiling: above 45,000 ft.
Performance: cruise speed 300 mph, flight endurance 12 hr.
COMMENTARY
Designed to complement Global Hawk, DarkStar is a low-observable UAV, intended to operate in high-threat environments at altitudes in excess of 45,000 ft for at least eight hours, 575 miles from its base.

***U-2** Dragon Lady* (Guy Aceto)

***WC-130H** Hercules* (Ted Carlson)

Navigation is via INS/GPS. 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. It will be capable of monitoring a mission area of 18,500 square miles, using a recon/optical EO camera or an SAR, transmitting primarily fixed-frame images while in flight. Following the loss of the prototype on its second flight, flight testing resumed with DarkStar 2 at Edwards AFB, Calif., on June 30, 1998.
The Pentagon announced termination of the program in late January 1999.

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).
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 (U-2R); more than 73,500 ft (U-2S).
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, 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 the next 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 U-2s and tactical TR-1s were consolidated under the designation U-2R.
U-2S (single-seat) and **U-2ST** (two-seat) are R and RT aircraft that have been 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 aircraft and four two-seat trainers was completed this year.

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: not available
Delivered: not available
IOC: 1959 (B model), 1962 (E), 1964 (H).
Production: five (WC-130B).
Inventory: 10.
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. Current improved version, operated by the 53d 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. Six weather-capable versions of the latest C-130 model are scheduled for delivery from Fiscal 1998.

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, command, control, and communications 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^3 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). Newly developed 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: two.
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: six.
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 327,000 lb.
Ceiling: 42,000 ft.
Performance: max level speed 627 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-135 A/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 452d FTS, the two aircraft support USAF and USN missile testing and are also capable of monitoring and controlling UAVs.

EC-130E
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.

E-9 (Ted Carlson)

***EC-130E** ABCCC* (Ted Carlson)

***EC-130E** Commando Solo* (Ted Carlson)

Production: seven.
Inventory: seven.
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 Command and Control Center. Seven aircraft were updated by Unisys to ABCCC III standard. EC-130s have been deployed in support of NATO operations in Bosnia.
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 missions, including support for Operations Just Cause and Desert Shield/Storm and Haitian operations. They also have a role in civil emergencies. Secondary mission is electronic attack in the military frequency spectrum.

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: not available
Inventory: 14.
Unit Location: Davis–Monthan AFB, Ariz.
Contractor: Lockheed Martin.
Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp.
Accommodation: standard crew 13.
Dimensions: span 132 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 Bosnia.

EC-135
Brief: Modified KC-135 tanker aircraft extensively equipped with sophisticated communications equipment and capable of flying in continuous airborne alert in support of national command and control; also telemetry and voice relay aircraft.
Function: Command and control aircraft; ARIA aircraft.
Operator: ACC, AFMC.
First Flight: not available
Delivered: not available
IOC: Feb. 3, 1961.

***EC-130H** Compass Call* (Ted Carlson)

***KC-135E** Stratotanker* (Randy Jolly)

Production: not available
Inventory: seven.
Unit Location: Edwards AFB, Calif., Offutt AFB, Neb.
Contractor: Boeing.
Power Plant: (EC-135C) four Pratt & Whitney TF33-P-9 turbofans, each 18,000 lb thrust.
Accommodation: flight crew of four, plus 19 specialists.
Dimensions: span 130 ft 10 in, length 136 ft 3 in, height 38 ft 4 in.
Weight: (EC-135C) gross 299,000 lb.
Ceiling: 40,600 ft.
Performance: (EC-135C) max speed at 25,000 ft 616 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 USAFE; **EC-135J/P** by PACAF; and **EC-135K** by TAC. **EC-135N**s 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, support 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. Equipment includes HF/VF/UHF radios, AFSATCOM, Milstar, and HF/UHF low-speed data communications capability. Continuous airborne alert status ended July 24, 1990, but at least one of these air refuelable aircraft has since flown a mission each day. All retired by October 1998 as the USN's E-6B aircraft took over the NCP mission.

EC-135A/E Advanced Range Instrumentation Aircraft (ARIA) function as telemetry data recording and relay stations to supplement land and marine telemetry stations that support DoD and NASA space and missile programs.

***KC-135R** Stratotanker* (Ted Carlson)

***KC-10A** Extender* (Ted Carlson)

HC-130P (Ted Carlson)

Tanker Aircraft

KC-10 Extender
Brief: A modified McDonnell Douglas DC-10 which combines in a single aircraft the operations of aerial refueling and long-range cargo transport.
Function: Aerial refueling/transport.
Operator: AMC, AFRC.
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.
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. It played a key role in deployment for the Persian Gulf War and in later humanitarian and UN peacekeeping missions.

The KC-10 can be air refueled by a KC-135 or another KC-10, increasing its range and dispensing with 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, a boom operator's station with 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 long-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, USAFE, ANG, AFRC.
First Flight: August 1956.
Delivered: January 1957–66.
IOC: June 1957, Castle AFB, Calif.
Production: 732.
Inventory: 552.
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, Offutt AFB, Neb., 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 80 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 120,000 lb of transfer fuel 11,192 miles.
COMMENTARY
Backbone of the USAF tanker fleet, the long-serving KC-135 is similar in size and appearance to commercial 707 aircraft but was designed to military specifications, incorporating different structural details and materials. The KC-135 fuel 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 the next century. The lower wing skin was renewed, adding 27,000 flying hours to the aircraft. A further program permits operation by a two-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 and integrated INS/GPS. About 45 KC-135Rs are being 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.

During the Persian Gulf War, KC-135 aircraft flew around-the-clock missions to maintain the operability of coalition warplanes. More recent KC-135 deployments include support for operations in Somalia, Bosnia, Rwanda, Haiti, and the Middle East.

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 helicopters or to air-drop small special operations teams, small bundles, and zodiac and combat rubber raiding craft.
Function: Air refueling for SOF helicopters/airdrop.
Operator: AETC, AFSOC, ANG, AFRC.
First Flight: Dec. 8, 1964 (as HC-130H).
Delivered: from 1965.
IOC: 1986.
Production: not available
Inventory: 57.
Unit Location: Active: Eglin AFB, Fla., Kadena AB, Japan, Kirtland AFB, N.M., Moody AFB, Ga., Patrick AFB, Fla., RAF Mildenhall, UK. ANG: Francis S. Gabreski IAP, N.Y., Moffett Federal Airfield, Calif. AFRC: Duke Field, 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. In 1990, during Operation Desert Storm, they provided air refueling of SOF helicopters over friendly and hostile territory as well as psychological operations and leaflet drops.

MC-130P. Active duty forces have 28 MC-130P (formerly HC-130N/P) in service. All are 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. Several of these 130 tankers serving with active, ANG, and AFRC search-and-rescue units still retain the HC-130 designation.

Strategic Transports

C-5 Galaxy

Brief: A heavy-cargo transport designed to provide massive strategic airlift over long ranges for deployment and supply of combat and support forces.

Function: Strategic airlift.
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: Westover ARB, Mass.
Contractor: Lockheed.
Power Plant: four General Electric TF39-GE-1C turbofans, each 41,000 lb thrust.
Accommodation: crew of six, rest area for 15 (relief crew, etc.); seating for 75, and 36 standard 463L pallets or assorted vehicles, such cargo as two M60 tanks or three CH-47 Chinook helicopters, or a maximum of 340 passengers in an airbus configuration.
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.

COMMENTARY

This long-range, air refuelable, heavy transport is one of the world's biggest aircraft, 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. Its special capabilities have made the C-5 a valuable asset in humanitarian and relief missions and in support of combat operations.

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 a program is in hand to upgrade the fleet with the avionics subsystems developed for the C-5B (see below).

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.

All of USAF's Galaxys are having their flight-management systems modernized and GPS receivers installed; new, safer interior panels are also being fitted. A number of C-5s have been equipped with a prototype missile defense system.

C-5C. Two C-5As assigned to Travis AFB, Calif., were modified to carry outsize space cargo by extending the cargo bay and modifying the aft doors.

C-17 Globemaster III

Brief: A heavy-lift, air refuelable cargo transport for inter- and intratheater 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: 120 minimum planned.
Inventory: 45 as of December 1998.
Unit Location: Altus AFB, Okla., Charleston AFB, S.C.
Contractor: Boeing.
Power Plant: four Pratt & Whitney F117-PW-100 turbofans, each 41,700 lb thrust.
Accommodation: normal flight crew of three (two pilots plus loadmaster). Provisions for the 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; air-drop capability for up to 60,000-lb single platforms or 110,000-lb multiple platforms.
Dimensions: span over winglet tips 170 ft 9 in, length 173 ft 11 in, height 55 ft 1 in.
Weight: empty 277,000 lb, max payload (2.25g) 170,900 lb, gross 585,000 lb.
Ceiling: 45,000 ft.

C-5B Galaxy (Ted Carlson)

C-17 Globemaster III

Performance: normal cruising speed at height 518 mph (Mach 0.77), unrefueled range with 130,000-lb payload 3,200 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 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 multifunction electronic displays. Operational deployments have been made in support of Operation Vigilant Warrior in the Persian Gulf region and to Bosnia, where the C-17 was the only aircraft capable of carrying outsize cargo into Tuzla AB.

A total of 120 production aircraft have been approved through 2004. Planned disposition of the C-17 includes 48 aircraft each to Charleston AFB, S.C., and McChord AFB, Wash., eight to an AETC training unit at Altus AFB, Okla., and six to ANG's 172d AW at Jackson IAP, Miss.; the remaining 10 aircraft will be used for backup.

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.
First Flight: May 1961.
Delivered: 1961–1962.
IOC: circa 1961.
Production: 48, plus five WC/TC-135s.
Inventory: six.
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: 10,700 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.

C-141B (SOLL) Starlifter (Ted Carlson)

Function: Long-range troop and cargo airlift.
Operator: AETC, AFMC, AMC, ANG, AFRC.
First Flight: Dec. 17, 1963.
Delivered: October 1964–June 1982.
IOC: May 1965.
Production: 285.
Inventory: 207.
Unit Location: Active: Altus AFB, Okla., Edwards AFB, Calif. ANG: Allen C. Thompson Field, Miss., Memphis IAP, Tenn. AFRC: Andrews AFB, Md., Charleston AFB, S.C., March ARB, Calif., McChord AFB, Wash., McGuire AFB, N.J., Travis AFB, Calif., 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. It played a major role in Operation Desert Storm and has deployed to numerous humanitarian and emergency situations.
C-141A entered service with MAC in April 1965, and 285 were built, some of which were structurally modified to accommodate the Minuteman ICBM. One C-141A has been greatly modified as an Advanced Radar Test Bed (ARTB) for use as an airborne laboratory platform to test a wide range of sensors in a dynamic ECM environment.
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 air-drop 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 touch screens and digital readouts. The first version, which rolled out at Warner Robins ALC, Ga., Oct. 1, 1997, is assigned to AFRC's 452d Air Mobility Wing, March ARB, Calif. ANG and AFRC are slated to get 64 of these glass-cockpit transports.

C-9 Nightingale (Ted Carlson)

C-12 Huron (Ted Carlson)

C-20 Gulfstream III (Ken Hammond)

C-21 (Ted Carlson)

Theater and Special Use Transports

C-9 Nightingale
Brief: A twin-engine, medium-range, swept-wing jet aircraft used primarily for the aeromedical evacuation mission. A modified version of the DC-9, it is the only USAF aircraft specifically designed for the movement of litter and ambulatory patients.
Function: Aeromedical evacuation.
Operator: AMC, PACAF, USAFE, AFRC.
First Flight: August 1968.
Delivered: August 1968–February 1975.
IOC: circa 1968.
Production: 24.
Inventory: 23.
Unit Location: Andrews AFB, Md., 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 attache 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: 33.
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, under AMC control.
C-12D. Similar to C model and also deployed to overseas embassies.
C-12F. With uprated PT6A-42 engines, can support medical airlift.
C-12J. A military version of the larger Beechcraft Model 1900, operated by PACAF.

C-20 Gulfstream
Brief: A twin-engine turbofan aircraft acquired to provide airlift for high-ranking government and DoD officials.
Function: Operational support airlift; special air missions.
Operator: AMC, USAFE.
First Flight: December 1979.
Delivered: 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 turbofans, each 11,400 lb thrust; C-20H: two Rolls–Royce Tay MK611-8 turbofans, each 13,850 lb thrust.
Accommodation: crew of five; 12 passengers.
Dimensions: span 77 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 USAFE'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, USAFE, ANG.
First Flight: January 1973.
Delivered: April 1984–October 1985.
IOC: April 1984.
Production: 84.
Inventory: 76.
Unit Location: Andrews AFB, Md., Howard AFB, Panama, Keesler AFB, Miss., Langley AFB, Va., Maxwell AFB, Ala., Offutt AFB, Neb., Peterson AFB, Colo., Ramstein AB, Germany, Randolph AFB, Texas, Scott AFB, Ill., Wright–Patterson AFB, Ohio, Yokota AB, Japan.
Contractor: Learjet.
Power Plant: two AlliedSignal TFE731-2 turbofans, each 3,500 lb thrust.
Accommodation: crew of two and up to eight passengers or 3,153 lb cargo. Convertible to aeromedical evacuation configuration.
Dimensions: span 39 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 turbofans, each 14,000 lb thrust.
Accommodation: flight crew of four, plus three or four cabin crew; up to 89 passengers.
Dimensions: span 108 ft, length 133 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. Four Boeing 727 commercial transports were 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.

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, range with internal auxiliary tanks 1,700 miles.
COMMENTARY
Development is continuing of this variant of the Marine Corps MV-22, expected to fulfill the Air Force special operations requirement for high-speed, long-range 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 2,487 nautical 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 communications 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. All four EMD aircraft are currently in flight test.

C-26
Brief: A modified commuter transport aircraft.
Function: Transport and medevac.
Operator: ANG.
First Flight: not available
Delivered: March 1989–present.
IOC: March 1989.
Production: not available
Inventory: 16.
Unit Location: To be located at ANG units throughout the US.
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.

C-22 (Ted Carlson)

C-26 (Ted Carlson)

C-32 (Robert F. Dorr)

C-37A Gulfstream V (Robert F. Dorr)

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. Thirty **C-26B**s were ordered in 1991, with deliveries from January 1992. C-26Bs have TCAS II, GPS, and microwave landing systems.

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: three (as of December 1998).
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 38,300 ft.
COMMENTARY
Four new Boeing 757-200s were ordered as C-32As, to replace 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.
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 0.88, cruise altitude up to 51,000 ft.
COMMENTARY
The C-37A, along with the C-32, will replace the VC-137B/C aircraft. It will provide capability to 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 will be flown and 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 paradropping of troops and equipment into hostile areas.

Function: Intratheater airlift.

Operator: AETC, AFSOC, AMC, PACAF, USAFE, ANG, AFRC.

First Flight: August 1954 (C-130A).

Delivered: December 1956–present.

IOC: September 1970.

Production: more than 1,000.

Inventory: 687.

Unit Location: Active: Dyess AFB, Texas, Elmendorf AFB, Alaska, Hurlburt Field, Fla., Little Rock AFB, Ark., Pope AFB, N.C., Ramstein AB, Germany, Yokota AB, Japan. ANG: 24 units. AFRC: nine units.

Contractor: Lockheed Martin.

Power Plant: (C-130H) four Allison T56-A-15 turboprops, each 4,508 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 80,606 lb, max payload 38,536 lb, 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 43 years ago and has been delivered to more than 60 countries. Basic and specialized versions operate throughout USAF, performing a diversity of roles in both peace and war situations, including airlift support, DEW Line and 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. 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, including eight funded in FY 1996. 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 **DC-130Hs** were modified for UAV control duties.

C-130J. USAF is purchasing some of the new C-130J version. This model features a two-crew flight system, 6,000 shp Allison AE 2100D3 engines, digital avionics and mission computers, enhanced performance, and improved reliability and maintainability.

***C-130H** Hercules* (Ted Carlson)

***LC-130H** Hercules* (Guy Aceto)

***C-130J** Hercules* (Guy Aceto)

***MC-130H** Combat Talon II* (Ted Carlson)

MC-130 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: 38.

Inventory: 14 (E); 24 (H).

Unit Location: MC-130E at Duke and Hurlburt Fields, Fla. 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 modified new-build C-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.

C-137 Stratoliner

Brief: A modified Boeing 707 that provides 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

Two specially modified Boeing 707 transports are operated by AMC's 89th Airlift Wing for VIP duties. Replacement of these aircraft by new Boeing 757-200s, designated C-32A, and two Gulfstream-5s, designated C-37A, is scheduled for 1999.

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 were the original 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 second Air Force One, tail #27000, entered service Aug. 4, 1972.

VC-25 Air Force One

Brief: A specially configured Boeing 747-200B used for air transport of the President and his entourage. When the President is aboard, it has the radio call sign "Air Force One."

Function: Air transport of the President.

Operator: AMC.

First Flight: First flown as Air Force One Sept. 6, 1990.

Delivered: August–December 1990.

IOC: circa 1990.

Production: two.

Inventory: two.

Unit Location: Andrews AFB, Md.

Contractor: Boeing.

Power Plant: four General Electric CF6 turbofans, each 56,700 lb thrust.

Accommodation: crew of 26; up to 76 passengers.

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 tanker/transport/bomber training.

Operator: AETC, AFRC.

First Flight: Sept. 22, 1989 (Beechcraft 400A).

Delivered: Jan. 17, 1992–July 1997.

IOC: January 1993.

Production: 180.

Inventory: 179.

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 16,100 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 bombers, such as the B-52 and B-1B.

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 used by the Air Force to screen pilot candidates by exposing them to military style traffic patterns and aerobatics. It is also used to teach takeoff and landing, stalls, slow flight, ground operations, and mission planning.

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: Hondo Airport, Texas, USAFA, Colo.

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 Mescalero, the fully aerobatic T-3A has been used since March 1994 by AETC at Hondo Airport, Texas, and since 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. Planned modifications to the fleet may extend the suspension until 2001.

T-1 Jayhawk (Guy Aceto)

T-3 Firefly (Guy Aceto)

T-6A Texan II

T-6A Texan II

Brief: A single engine, propeller-driven aircraft that will be used for training undergraduate pilots, undergraduate navigators, and tactical navigator students in fundamentals of aircraft handling and instrument, formation, and night flying.

Function: Primary trainer.

Operator: AETC.

First Flight: July 15, 1998.

Delivery: from Fiscal 1999 (planned).

IOC: Fiscal 2001 (planned).

Production: USAF 372, USN 339 (planned).

Inventory: USAF 372 (planned).

Unit Location: Columbus AFB, Miss.; Laughlin, Randolph, and Sheppard AFBs, Texas; Vance AFB, Okla. Navy: NAS Corpus Christi, Texas; NASs Whiting and Pensacola, Fla.

Contractor: Raytheon.

Power Plant: one Pratt & Whitney Canada PT6A-68 turboprop, 1,708 shp.

Accommodation: two, in tandem, on zero/zero ejection seats.

Dimensions: span 33 ft 5 in, length 33 ft 4 in, height 10 ft 8 in.

Weight: empty (approx) 4,415 lb.

Ceiling: 35,000 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 new aircraft will replace USAF's T-37Bs and USN's T-34Cs in training entry-level pilots, as well as supporting undergraduate naval flight officer and USAF navigator training. Delivery will be made initially to Randolph, followed by Laughlin, Vance, Columbus, and Sheppard.

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: 419.

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.

T-37 Tweet (Guy Aceto)

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 dark 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 plans to replace the T-37B with the new T-6A Texan II from 1999.

T-38 Talon (Guy Aceto)

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., Randolph, Laughlin, and Sheppard AFBs, Texas, 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, and a full avionics upgrade is planned. 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, with delivery beginning in 1999.

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.


T-43 (Ted Carlson)


UV-18 Twin Otter (Ted Carlson)

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: Paradrop.
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.

Helicopters

HH-1 Iroquois
Brief: Modified Bell Model 205 helicopter, used to support Air Force ICBM facilities.
Function: Utility helicopter.
Operator: AFSPC.
First Flight: Oct. 20, 1956 (UH-1).
Delivered: October 1971–1973.
IOC: circa 1971.
Production: 30.
Inventory: six.
Unit Location: Grand Forks AFB, N.D.
Contractor: Bell.
Power Plant: one Lycoming T53-L-13B turboshaft; 1,400 shp.
Accommodation: two pilots and 12 passengers; or two crew and 2,400 lb of cargo.
Dimensions: rotor diameter 48 ft 4 in, length of fuselage 42 ft, height 13 ft.
Weight: gross 9,500 lb.
Ceiling: 13,450 ft, at mission gross weight.
Performance: max speed 120 mph, range with max fuel 347 miles.
COMMENTARY
HH-1H is a general-purpose military version of the Bell Model 205 helicopter, first ordered by USAF in 1970. It is used for site support duties by Air Force Space Command, which operates USAF ICBM sites.

UH-1 Iroquois
Brief: Modified Bell Model 212 helicopter, used to support Air Force ICBM facilities and administrative airlift.
Function: Utility helicopter.
Operator: AETC, AFSOC, AFSPC, AMC, PACAF.
First Flight: Oct. 20, 1956 (UH-1).
Delivered: from September 1970.
IOC: circa 1970.
Production: 79.
Inventory: 64.
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, length of fuselage 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, 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.

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: AFSOC, AETC.
First Flight: March 1967.
Delivered: from July 1987 (MH-53J).
IOC: 1988 (MH-53J).
Production: not available
Inventory: 46.
Unit Location: Hurlburt Field, Fla., Kirtland AFB, N.M., 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 24 ft 11 in.
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, have been upgraded to MH-53J Pave Low III "Enhanced" standard from 1986.
MH-53J. These highly sophisticated aircraft are equipped with a nose-mounted FLIR, an integrated digital avionics suite that includes terrain-following and terrain-avoidance radar, GPS, INS, Doppler, secure communications, armor plating, and an ECM suite with radar and IR missile jammers, flare/chaff dispensers, radar warning receivers, and missile launch detectors.
Programmed modifications include the capacity to integrate on-board EW systems with off-board, over-the-horizon intelligence. Additionally, a Service Life Extension Program (SLEP) was implemented to upgrade the aircraft's hydraulics, wiring, and basic airframe structure for increased gross weight, as well as a shipboard fold/compatibility modification.
MH-53Js were used extensively in Operations Just Cause and Desert Storm, performing both SOF and combat rescue missions, and more recently in Bosnia.
TH-53A. The 58th SOW also uses six TH-53As, which are modified USMC CH-53As, as basic qualification trainers. Modifications include the installation of General Electric T64-GE-100 engines, air refueling probe, and some standard USAF equipment.

MH/HH-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, AFSOC, PACAF, ANG, AFRC.
First Flight: October 1974.
Delivered: 1982.
IOC: circa 1982.
Production: 98.
Inventory: 99.
Unit Location: MH-60G at Hurlburt Field, Fla. HH-60G at Holloman AFB, N.M., Kadena AB, Japan, Kirtland AFB, N.M., Moody AFB, Ga., NAS Keflavik, Iceland, Nellis AFB, Nev. ANG: Francis J. Gabreski IAP , N.Y., Kulis ANGB, Alaska, Moffett Federal Airfield, Calif., AFRC: Davis–Monthan 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 MH and 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.
MH-60G. The six MH-60Gs operated by AFSOC's 16th SOW provide a wide variety of SOF mission capabilities, including infiltration/exfiltration and personnel recovery, and humanitarian relief.

***UH-1N** Iroquois* (Ken Hammond)

***MH-53** Pave Low* (Randy Jolly)

***MH-60G** Pave Hawk* (Randy Jolly)

HH-60G. Used by active duty, ANG, and AFRC air rescue units for combat search and rescue and various mission-support activities worldwide.

Strategic Missiles

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 or several 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: first stage: Thiokol M-55 solid-propellant motor, 210,000 lb thrust; second stage: Aerojet–General SR19-AJ-1 solid-propellant motor, 60,300 lb thrust; third stage: Thiokol SR73-AJ-1 solid-propellant motor, 34,400 lb thrust.
Guidance: inertial guidance system.
Warheads: 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.
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. The Minuteman I version that was 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. The Minuteman II version that incorporated a larger second stage, an improved guidance package, had greater range and payload capability, and was hardened 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 11 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, Mont., 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 viability into the next century. Major upgrades include replacement of the aging guidance system, 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.
BMD. The possibility of deploying 20 modified Minuteman ICBMs, armed with defensive kinetic-kill vehicles, to meet the requirement for an emergency response national missile defense system is under consideration. The first refurbished Minuteman II, with a targeting test payload, was successfully launched in September 1996.

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. Peacekeeper, also known as "MX," was developed in response to an increased Soviet strategic threat. However, the ending of the Cold War caused the US to cap deployment at only 50 Peacekeeper missiles in the Fiscal 1990 budget, and development of a rail-garrison mode of deployment was terminated.

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, already ratified by the US Senate but not by the Russian Duma, and no retirement action will occur until its terms come into force.

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., Fairchild AFB, Wash., Minot AFB, N.D.
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.
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. One has been tested with an improved GPS, flying for five hours before precisely impacting the target in a new steep terminal dive maneuver devised for delivering penetrator warheads.

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-30G

LGM-118A

AGM-86 (USAF photo by SSgt. Jim Howard)

AGM-129A (Guy Aceto)

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).
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, wingspan 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 operational service in Fiscal 1983. This version equips USAF F-15s and F-16s (ADF).
AIM-7R is designed to improve missile performance against sophisticated ECM by means of a new IR seeker added to the guidance and control section, incorporated in a multimode seeker.
During the Gulf War, 22 Iraqi fixed-wing aircraft and three helicopters were hit by Sparrow missiles.
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, finspan 2 ft 1 in.
Weight: launch weight 190 lb.
Performance: max speed above Mach 2, range 8.7+ nautical 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 Fiscal 1981 with an order for approximately 1,280 missiles.
AIM-9M-9. A modification to improve IRCCM capability of early missiles.
AIM-9X. Development of a replacement for the AIM-9M continues, with award in 1996 of $169 million contract to Hughes (Raytheon) for the engineering/manufacturing phase of its Evolved Sidewinder, de-

rived from an AIM-9X demonstration/validation contract funded jointly by the Navy and the Air Force.

The AIM-9X possesses a high off-boresight seeker that when used in conjunction with a helmet-mounted sight provides enhanced target acquisition and tracking. It incorporates airframe improvements and thrust vector control and combines a high-performance focal plane array sensor and advanced tracker with the existing AIM-9M rocket motor, warhead, and fuze.

AIM-9X will be integrated on USAF F-15, F-16, and F-22 aircraft.

AIM-120 AMRAAM

Brief: A new-generation radar-guided, all-weather, 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: Gencorp Aerojet two-stage 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-120A 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, improved ECCM 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 33d TFW at Eglin AFB, Fla.

AIM-120B and **AIM-120C** versions are currently in production, the latter with smaller control surfaces to permit increased internal carriage capability in the F-22.

An improvement program seeks to develop AMRAAM capabilities, including software reprogrammability, advanced counter-countermeasures, and options for improved propulsion. The missile is combat-tested, having scored two kills during Operation Desert Storm and one in Bosnia.

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 125-lb high-explosive, shaped charge; AGM-65G 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 Persian 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.

***AIM-7** Sparrow* (Guy Aceto)

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. Upgraded TV Maverick with significant reliability, maintainability, and performance improvements over the AGM-65B.

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: not available

***AIM-9** Sidewinder (top), **AIM-120** AMRAAM (middle), **AGM-88** HARM (bottom)* (Ted Carlson)

***AGM-65** Maverick* (Guy Aceto)

***AGM-84** Harpoon*

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 US Navy Harpoon that has been adapted for use on B-52 bombers, which can carry eight missiles.

All B-52H airframes are now Harpoon capable, providing both the 5th BW at Minot AFB, N.D., and the 2d BW at Barksdale AFB, La., full squadron strength capability.

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. HARMs now equip F-16 Block 50/52s dedicated to the SEAD mission and have been used against Iraqi defenses as part of Operation Southern Watch.

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 USAFE, PACAF, and ACC HARMs, permitting changes to missile memory in the field.

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, or CBU-75.
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 triple 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-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, carried by Air Force heavy bombers, that gives these 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. Primary carrier aircraft are conventional-mission B-52Hs.

AGM-154 Joint Standoff Weapon

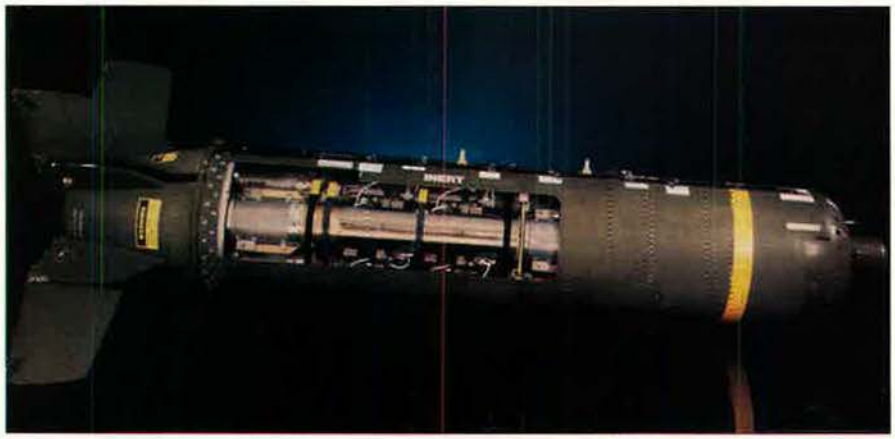
Brief: First in a joint USAF and Navy family of low-cost, highly lethal glide weapons with a standoff capability, usable against heavily defended targets.

Function: Air-to-surface guided missile.

AGM-130

***AGM-142** Have Nap*

***AGM-154** JSOW*



***CBU-97** Cut away to show the BLU-108 submunitions*

First Flight: December 1994.
Delivered: from 1998.
IOC: 1998 (Navy); 2000 (USAF).
Production: not available
Inventory: not available
Contractor: Raytheon.
Guidance: AGM-154A and JSOW/BLU-108 tightly coupled INS/GPS; JSOW/Unitary tightly coupled INS/GPS midcourse, IIR terminal.
Dimensions: length 13 ft 4 in.
Weight: 1,065–1,500 lb.
Performance: range: low-altitude launch 17 miles, high-altitude launch 40+ miles.

COMMENTARY

JSOW allows for the integration of several different submunition and unitary warheads, non-lethal payloads, various terminal sensors, and different modes of propulsion into a common glide vehicle. The services are integrating JSOW with BLU-97 combined effects bomblets, BLU-108 Sensor Fuzed Weapon submunitions, and unitary BLU-111 for area and armored targets.

AGM-154A. The baseline BLU-97 variant, now in production.

AGM-154B. The BLU-108 variant.

AGM-154C. The third variant, JSOW/Unitary integrates an IIR terminal seeker and a 500-lb unitary warhead.

A wide range of testing has been completed on the F-15E and F-16, as well as fit checks on the F-15E, F-16, F-117A, F/A-18, A-6E, AV-8B, B-1, B-52, Tornado, and Jaguar. JSOW will also equip B-2 bombers.

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: 1996–present.
IOC: 1997.
Production: TBD
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. The Air Force is already working on improved versions, 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.

CBU-105. USAF plans to retrofit its existing 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. The first will be mated later this year.

GBU-15

Brief: An unpowered glide weapon carried by the F-15E and used to destroy high-value enemy targets from short standoff distances.

Function: Air-to-surface guided munition.
First Flight: 1975.
Delivered: 1983–
IOC: 1983.
Production: >2,000.
Inventory: classified.
Contractor: Boeing and Raytheon.
Guidance: TV or IIR seeker.
Warhead: Mk 84 bomb (2,000-lb unitary) or BLU-109.
Dimensions: length 12 ft 10 in, body diameter 1 ft 6 in, wingspan 4 ft 11 in.
Weight: 2,450 lb.
Performance: cruising speed subsonic.

COMMENTARY

GBU-15 is an air-launched, cruciform-wing glide bomb fitted with a guidance system designed to give it pinpoint accuracy from low or medium altitudes. It also has a standoff capability. Development began in 1974, based on experience gained in Vietnam with the earlier Pave Strike GBU-8 modular weapon program. The GBU-15 is intended for tactical use to suppress enemy defenses and to destroy heavily defended targets. The

target-detecting device is carried on the front of the warhead. The control module, with autopilot and data link module, attaches to the rear.

The weapon has two modes of attack. In direct attack, the weapon is locked on to the target before launch and flies a near line-of-sight profile to impact. In the indirect mode, the seeker can be locked on to the target after launch, or the operator can fly the weapon manually to impact, using guidance updates provided through the data link. A "buddy" system may be operated whereby the weapon is launched from one aircraft and controlled by another. The GBU-15 is deployed with the F-15E.

GBU-15(V)1/B. A TV–guided variant, qualified for operational service in 1983 (production complete).

GBU-15(V)2/B. IIR version entered service in 1987.

GBU-15-I. Combines accuracy of GBU-15 with the penetration capability of the improved 2,000-lb BLU-109/B penetrator bomb.

During Operation Desert Storm F-111F pilots used GBU-15 glide bombs with great effect to address numerous targets.

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: circa 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.

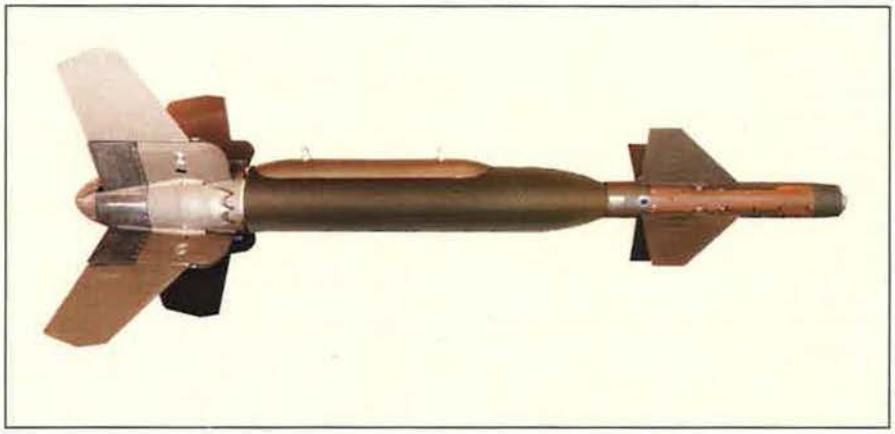
GBU-27

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: circa 1988–
IOC: 1988 (unconfirmed).
Production: not available
Inventory: not available
Contractor: Lockheed Martin.
Guidance: semi-active laser.
Dimensions: span 5 ft 6 in, length 13 ft 11 in.
Weight: 2,170 lb.
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.

GBU-28

Brief: A huge, 5,000-lb air-to-ground penetrating glide bomb equipped with an advanced guidance kit, uniquely useful 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: Lockheed Martin.
Dimensions: length 19 ft 2 in, diameter 1 ft 2 in.
Weight: 5,707 lb.
Performance: Capable of penetrating more than 100 ft of dirt or 20 ft of concrete.
COMMENTARY
Under USAF's rapid-response program, a new bunker-busting weapon was developed for Operation 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

GBU-15 (Erik Simonsen)



GBU-24

GBU-31 JDAM (Guy Aceto)

Feb. 27, 1991. The body design is based on the BLU-109/B penetrator, extended by 54 in to 152 in, and doubling the wall thickness to 2.25 in. Guidance is by a modified GBU-27 system. USAF built 125, with funds for an additional 160 requested. All are to be upgraded with an improved fuze and guidance system.

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: 13 m CEP with GPS; 30 m 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.

GBU-32. Variant that adds an INS/GPS guidance kit to the 1,000-lb general-purpose Mk 83 bomb.

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: TBD
Delivered: TBD
IOC: Fiscal 2001 (planned).
Production: 2,400 (USAF planned); TBD (Navy).
Inventory: TBD
Contractor: Lockheed Martin.
Power Plant: Teledyne Ryan J402.
Dimensions: not available
Weight: not available
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. USAF officials announced April 9, 1998, that Lockheed Martin won over Boeing after the two-year definition and risk reduction phase. Lockheed Martin expects to begin the Engineering and Manufacturing Development program in November.

DoD plans to use JASSM with the B-1B, B-2, B-52H, F-15E, F-16C/D, F/A-18E/F, F-117, 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 guidance system corrects for launch transients caused by the force of winds and preserves high accuracy.
Function: Guidance tail kit.
First Flight: February 1996.
Delivered: not available
IOC: 1998.
Production: not available
Inventory: not available
Contractor: Lockheed Martin.
Dimensions: not available
Weight: not available
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 will carry mines, cluster bomblets, or anti-armor submunitions. Successful flight testing began in February 1996. Carrier aircraft are expected to include B-1s, B-52Hs, F-15Es, F-16s, F-117s, and F-22s.

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: 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, wingspan 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.
Function: Medium spacelift vehicle.
Operator: AFSPC.
First Launch: December 1957; Feb. 10, 1992 (Atlas IIA).
IOC: September 1959.
Launches Scheduled: one (FY99); two (FY00).
Unit Location: Patrick AFB, Fla., Vandenberg AFB, Calif.
Contractor: Lockheed Martin.
Power Plant: uprated Boeing MA-5 propulsion system in Atlas stage, comprising central sustainer motor and two boosters; total thrust 488,000 lb. Atlas IIAS version adds four Thiokol Castor IVA solid rocket motors. Atlas III uses single NPO Energomash–Pratt & Whitney RD-180 engine.
Dimensions (Atlas stage): length 81 ft 7 in, max body diameter 10 ft.
Launch Weight: 416,000 lb.
Performance: in Atlas IIAS configuration, capable of putting 19,050 lb into a Low Earth Orbit (LEO) from Cape Canaveral AS, Fla. Range of payloads Atlas II through Atlas IIAS 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, Calif.
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, Atlas II has been 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 for the basic Atlas. Changes include lower-cost advanced avionics, an improved flight computer, booster engines with greater thrust, and longer propellant tanks. The engine and tank changes have been made to both the Atlas and Centaur stages.
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.

***FIM-92** Stinger*

Atlas III, with a Russian–designed RD-180 engine, will be used starting in 1999, enhancing payload capacity to 8,900 lb to GTO.

Centaur
Brief: A high-energy upper stage with multiburn and extended coast capability.
Function: High-energy upper stage.
Operator: AFSPC.
First Launch: November 1963; earlier flight in May 1962 unsuccessful.
IOC: 1966.
Launches Scheduled: one (FY99); one (FY00).
Unit Location: Patrick AFB, Fla., Vandenberg AFB, Calif.
Contractor: Lockheed Martin.
Power Plant: two Pratt & Whitney liquid oxygen/liquid hydrogen rocket engines; D-1A: RL10A-4 engines, each with 20,500 lb thrust: G-prime: RL10A-3-3A engines, each with 16,500 lb thrust.
Dimensions: D-2A: length 33 ft, diameter 10 ft; 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.

Atlas IIA

Delta II

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 IIAR will have a single RL-10 engine.
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 spacelift vehicle.
Operator: AFSPC.
First Launch: May 13, 1960; Feb. 14, 1989 (Delta II).
IOC: 1989 (Delta II).
Launches Scheduled: three (FY99); five (FY00).
Unit Location: Patrick AFB, Fla., Vandenberg AFB, Calif.
Contractor: Boeing.
Power Plant: first stage: Boeing North American RS-27A liquid-propellant engine, 237,000 lb thrust; second stage: Aerojet AJ10-118K engine, 9,750 lb thrust; third stage: Thiokol STAR-48B solid-propellant motor, 14,920 lb thrust; strap-on GEM solid rocket motors, 100,270 lb thrust (sea level).
Dimensions: length 130 ft, diameter 8 ft; bulbous payload fairing, max diameter 10 ft.
Launch Weight: 511,190 lb.
Performance: up to 11,100 lb to near Earth orbit, up to 4,010 lb to geo transfer orbit, up to 2,000 lb to geosynchronous orbit.
COMMENTARY
The Delta program has had more than 250 successful domestic and foreign military and commercial launches.
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 geostationary transfer orbit.
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, the third stage 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.

Evolved Expendable Launch Vehicle
Brief: EELV is USAF's spacelift modernization program aimed at a 25 to 50 percent reduction over current systems in the cost to launch the government's medium to heavy payloads. The requirement is to place payloads of 2,500 to 45,000 lb into LEO.
Function: Medium/heavy space launch vehicle.
Operator: commercial (oversight AFSPC).
IOC: 2003 (planned).
Launches Scheduled: first government FY02.
Unit Location: Patrick AFB, Fla., Vandenberg AFB, Calif.
Contractor: Boeing and Lockheed Martin.
COMMENTARY
Following a 15-month low-cost concept validation phase for the EELV by Alliant, Boeing, Lockheed Martin, and McDonnell Douglas (now Boeing), on Dec. 20, 1996, Lockheed Martin and McDonnell Douglas were each awarded a $60 million contract for the 17-month pre–EMD phase. EMD contracts for $500 million were awarded Oct. 16, 1998, to Boeing and Lockheed Martin. Initial launch services contracts for Fiscal 2003–06 were awarded to Boeing for 19 launches and to Lockheed Martin for nine launches. Both versions will be operated as commercial systems with competitively awarded government launches. The first government medium-lift variant will launch in Fiscal 2002, the heavy-lift in Fiscal 2003.

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: AFSPC.
First Launch: October 1982.
IOC: circa 1982.
Launches Scheduled: two (FY99).
Unit Location: Patrick AFB, Fla., Vandenberg AFB, Calif.
Contractor: Boeing.
Power Plant: aft-stage solid rocket motor 59,000 lb thrust; forward-stage solid rocket motor 25,000 lb thrust.
Guidance: inertial.
Dimensions: length 17 ft, diameter 9 ft 6 in.
Launch Weight: 32,600 lb.
Performance: 5,200 lb into GEO when used on Titan IVA or 5,350 lb with 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: Space launch vehicle (small payload).
Operator: AFSPC.
First Launch: April 5, 1990.
IOC: circa 1996 (DoD).
Launches Scheduled: none.
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
USAF's smallest launcher, this three-stage winged vehicle is air-launched from a B-52. 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. Now managed by the Air Force, it will support 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. Pegasus had undertaken 25 launches by the end of 1998. Orbital Sciences now uses an L-1011 aircraft to launch Pegasus.

Taurus
Brief: A small ground-based launch vehicle for use in testing a quick-readiness, mobile launch facility.
Function: Space launch vehicle (small payload).
Operator: AFSPC.
First Launch: March 13, 1994.
IOC: March 13, 1994.
Launches Scheduled: none.
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, diameter 50–92 in.
Weight: gross 50,000 lb.
Performance: capable of lifting 3,200 lb to LEO and 1,130 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 and will be used to test a quick-readiness, mobile launch facility. 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: Space launch vehicle.
Operator: AFSPC.
First Launch: April 1964 (NASA's Titan II–Gemini).
IOC: Sept. 5, 1988 (USAF).
Launches Scheduled: one (FY99).
Unit Location: Vandenberg AFB, Calif.
Contractor: Lockheed Martin.
Power Plant: first and second stages: Aerojet liquid hypergolic propellant rocket engines; first stage 430,000 lb thrust; second stage 100,000 lb thrust.
Guidance: inertial guidance system.
Dimensions: first and second stages: height 94 ft, diameter 10 ft; payload fairing heights 20, 25, and 30 ft, diameter 10 ft.
Launch Weight: 408,000 lb.

Taurus

Titan IV

Function: Heavy spacelift vehicle.
Operator: AFSPC.
First Launch: June 14, 1989.
IOC: June 14, 1989.
Launches Scheduled: two (FY99); two (FY00).
Unit Location: Cape Canaveral AS, Fla., Vandenberg AFB, Calif.
Contractor: Lockheed Martin.
Power Plant: Aerojet liquid hypergolic propellant rocket engines; first stage, two engines 551,200 lb thrust each; second stage 106,150 lb thrust; initially two United Technologies solid rocket boosters, each 1,400,000 lb peak thrust; later two Alliant (formerly Hercules) solid rocket boosters, each 1,800,000 lb peak thrust.
Guidance: digital avionics system on Titan IVB.
Dimensions: first and second stages: height 119 ft 2 in, diameter 10 ft.
Launch Weight: 1,900,000 lb.
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 the Defense Support Program (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. Titan IVA is capable of placing a 32,000-lb payload into low polar orbit and 39,000 lb into LEO. With a modified Centaur G–prime upper stage, it can place 10,200 lb into GEO. With an alternative Inertial Upper Stage (IUS), it can place 5,200 lb into GEO. The Titan IVA is no longer in production and has completed all launch operations.
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 launch from Cape Canaveral was made successfully Feb. 23, 1997; the first from Vandenberg AFB, Calif., will be in 1999. The latest program decision is to use a maximum of 39 vehicles.

Pegasus mounted beneath L-1011 carrier aircraft

Performance: more than 4,200 lb to low Earth polar orbit.
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 have since been 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 (DMSP), National Oceanic and Atmospheric Administration (NOAA) satellites, and other government agencies' satellites into polar orbit through the turn of the century.

Titan IV
Brief: A heavy-lift space launch vehicle used to carry Department of Defense payloads such as Defense Support Program and Milstar satellites into space. It is the newest and the largest unmanned space booster used by the Air Force.

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: early 1970s.
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 and 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 AS, 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 18 DSP satellites have been launched by USAF. Procurement will end with No. 23, canceling the further satellites originally planned.

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 consolidates all DSP ground processing in one CONUS Mission Processing Station at Buckley ANGB, Colo., with completion in Fiscal 1999. Increment 2 fields the High Component starting in Fiscal 2002, and Increment 3 fields the Low Component starting in Fiscal 2006. 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 Fiscal 2002. Two flight experiments support Low Component risk reduction efforts: the Flight Demonstration System, with a TRW/Raytheon team, and the Low Altitude Demonstration System, with a Boeing/Lockheed Martin team.

Defense Meteorological Satellite Program

Brief: Space vehicles that collect wide-area weather data for US military weather forecasters to use to monitor and predict regional and global weather patterns for military operations.

Function: Weather data 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: three yr.

Launch Vehicle: Titan II.

Unit Location: Suitland, Md.

Orbit Altitude: approx 500 miles.

Contractor: Lockheed Martin.

Power Plant: solar arrays generating 1,000 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 about two decades.

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 determine the severity of thunderstorms, hurricanes, and typhoons.

DMSP satellites also have sensors that measure atmospheric moisture and temperature levels, X rays, and electrons that cause auroras. The satellites can locate and determine the intensity of auroras—electromagnetic phenomena that can interfere with radar operations and long-range communications. Last USAF satellite was launched April 4, 1997. Satellite weather systems operated by DoD and NOAA are to be managed by the NPOESS integrated program office.

Block 5D-3, with a projected first launch in 1999, will provide increased capabilities, including improved sensors and a longer life span.

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: AFSC.

First Launch: 1971 (DSCS II); 1982 (DSCS III).

Defense Support Program satellite mounted atop an Inertial Upper Stage booster.

Navstar Global Positioning System satellite

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: 22,300+ miles in geosynchronous orbit.

Contractor: Lockheed Martin.

Power Plant: solar arrays generating 1,240 watts, decreasing to 980 watts after 10 yr.

Dimensions: rectangular body 6 ft x 6 ft x 7 ft; 38-ft span with solar arrays deployed.

Weight: 2,550 lb.

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.

Navstar 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 a few 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: 11,000 miles.

Contractor: Boeing and Lockheed Martin.

Power Plant: solar arrays generating 700 watts (II/IIA); 1,143 watts (IIR).

Dimensions: width 5 ft, length 17 ft 6 in, incl solar array.

Weight: 1,860 lb (II/IIA), 2,445 lb (IIR) in 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 (latitude, 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 NAVWAR and GPS modernization efforts. There are currently 27 satellites on orbit: eight Block II, 18 IIA, and one IIR.

Also benefiting from the GPS are such functions as mapping, aerial refueling and rendezvous, geodetic surveys, and search-and-rescue operations.

Milstar Satellite Communications System

Brief: A satellite communications system that provides secure, jam-resistant worldwide C^2 communications for tactical and strategic forces in all levels of conflict, linking command authorities to ground forces, ships, submarines, and aircraft.

Function: Communications satellite.

Operator: AFSPC.

First Launch: Feb. 7, 1994.

IOC: July 1997 (Milstar I).

Constellation: six.

Design Life: 10 yr.

Launch Vehicle: Titan IV/Centaur.

Unit Location: Schriever AFB, Colo.

Orbit Altitude: 22,400 miles.

Contractor: Lockheed Martin.

Power Plant: solar arrays generating 8,000 watts.

Dimensions: 52 ft x 116 ft (with full solar array extension).

Weight: 10,000 lb.

Performance: The constellation will consist of four 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 four Milstars (to be launched between 1999 and 2002) will include low-data-rate and medium-data-rate payloads able to transmit higher data rates to highly mobile forces.

Fleet Satellite Communications System

Brief: A satellite communication system providing a secure link between the USAF, USN, and the Presidential command network.

Function: Communications satellite.

Operator: AFSPC, US Navy.

First Launch: Feb. 9, 1978.

IOC: 1978.

Constellation: four.

Design Life: five yr.

Launch Vehicle: Atlas E.

Unit Location: Schriever AFB, Colo., worldwide Navy locations.

Orbit Altitude: 22,300 miles.
Contractor: TRW.
Power Plant: Solar arrays generating up to 1,540 watts.
Dimensions: length 50 in, diameter 8 ft.
Weight: 4,250–5,061 lb.
COMMENTARY
The two remaining satellites, providing backup to UHF Follow-On satellite system, each have 23 channels (12 for Air Force, 10 for Navy, one reserved for the National Command Authority). Operational since 1978 in geosynchronous orbit, the FLTSATCOM system carries a secure link among the three, providing UHF (and on the last two satellites EHF) communications.

UHF Follow-On Satellite Systems
Brief: New-generation communications satellites to replace FLTSATCOM.
Function: Communications satellite.
Operator: AFSPC, US Navy.
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: 36,000 km.
Contractor: Raytheon (Hughes).
Power Plant: two deployed three-panel solar arrays generating approx 2,400 watts.
Dimensions: length 60 ft 6 in, diameter 9 ft 6 in.
Weight: 2,600 lb.
COMMENTARY
New generation of satellites with 39 channels, providing UHF communications to replace FLTSATCOM satellites. Compatible with the terminals used by the earlier systems. UFO-4 was the first in the series to include an EHF communications package, constituting an additional 11 channels, with enhanced anti-jam telemetry, command, broadcast, and fleet interconnectivity.
UFO-8, -9, and -10 will host GBS phase 2 payloads, providing direct broadcast of digital multimedia information to small tactical terminals.

Aerial Targets

MQM-107 Streaker
Brief: A jet-powered, variable speed, recoverable target drone.
Function: Aerial target.
Operator: ACC.
First Flight: not available
Delivered: 1984–86 (B).
IOC: 1987.
Production: 70 (B); 221 (D).
Inventory: not available
Unit Location: Tyndall AFB, Fla.
Contractor: Raytheon (D model); Tracor (E model).
Power Plant: initially on D model, one Teledyne CAE 373-8 engine, 960 lb thrust; MQM-107Ds delivered since 1989 have 1,060 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; high-g autopilot provisions (D model); 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) 1,460 lb.
Performance: operating speed 230–594 mph, operating height 50–40,000 ft, endurance 2 hr 15 min (D model); operating speed 207–631 mph, operating height 50–40,000 ft, endurance 2 hr 15 min (E model).
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, the E model will be the Air Force's standard subscale target. In operational service.

BQM-34 Firebee
Brief: A jet-powered, variable speed, recoverable target drone.
Function: Aerial target.
Operator: ACC.
First Flight: 1951.
Delivered: circa 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 20 ft to more than 60,000 ft, max range 796 miles, endurance (typical configuration) 30 min.

***MQM-107** Streaker* (Guy Aceto)

***BQM-34** Firebee* (Guy Aceto)

QF-4 (Ted Carlson)

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: September 1993.
IOC: not available
Inventory: not available
Unit Location: Tyndall AFB, Fla.
Contractor: Tracor.
Power Plant: two Pratt & Whitney J79-GE-17 turbojets, each with approx 17,000 lb thrust with afterburning.
Guidance and Control: remote-control methods incl the GRDCUS and the Drone Formation and Control System and will also accommodate the triservice Next-Generation Target Control System currently under development.
Dimensions: length 63 ft, height 16 ft 5.5 in, wingspan 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
Replacing the QF-106 as a joint-service Full-Scale Aerial Target (FSAT), the QF-4 has an improved flight-control system and greater payload compared with the earlier drone. Approximately 300 F-4s will be converted to FSATs.

QF-106
Brief: A converted, remotely piloted F-106 fighter used for full-scale training or testing.
Function: Aerial target.
Operator: ACC.
First Flight: not available
IOC: not available
Inventory: approx 194.
Contractor: Honeywell.
Power Plant: one Pratt & Whitney J75-P-17 turbojet, 24,500 lb thrust with afterburning.
Guidance and Control: remote-control methods include the GRDCUS and, for Holloman AFB, N.M., operations, both the Drone Formation and Control System (the US Army's predecessor to the GRDCUS) and the Drone Tracking and Control System (a microwave command guidance system scheduled for phase-out).
Dimensions: length 70 ft 8.75 in, height 20 ft 8.5 in, wingspan 38 ft 3.5 in.
Weight: mission operational weight 40,500 lb.
Performance: max speed Mach 2, ceiling 50–55,000 ft, typical radius 575 miles.
COMMENTARY
Replacing the QF-100 in USAF service from late 1991, the QF-106 permits higher supersonic speeds while under remote control and increased maneuverability. ■

QF-106 (Guy Aceto)

AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

Air Force Magazine Honors Foreign Air

Staff photo by Guy Aceto

The dean of the air attache corps, Air Commodore James Barclay (center), chats with (left) Doyle Larson, AFA chairman of the board, and Gen. Michael Ryan, USAF Chief of Staff, at the 19th annual foreign air attache reception.

Air force officers from 41 countries accepted an invitation to the 19th annual foreign air attache reception in Arlington, Va., sponsored by *Air Force* Magazine. Guest of honor was Air Commodore James S. Barclay, from the New Zealand Defense Force, dean of the foreign air attache corps.

Other countries represented at the reception were Algeria, Argentina, Australia, Austria, Belarus, Brazil, Britain, Cameroon, China, Colombia, Croatia, Dominican Republic, Finland, France, Germany, Greece, Hungary, Israel, Italy, Japan, Jordan, Lebanon, Lithuania, Macedonia, Niger, Norway, Oman, Romania, Russia, South Africa, Spain, Sweden, Tunisia, Turkey, Ukraine, United Arab Emirates, Uruguay, Vietnam, Yemen, and Yugoslavia.

In his remarks to the gathering, Barclay said, "AFA provides a powerful and effective lobby to advance the cause of the US Air Force, while also protecting and promoting the welfare of the Air Force men and women who currently serve." He also acknowledged the important role of AFA symposiums, gatherings, and *Air Force* Magazine.

US Air Force leaders who attended included Chief of Staff Gen. Michael E. Ryan, Vice Chief of Staff Gen. Ralph E. Eberhart, and the heads of many USAF offices. A large number of defense industry representatives—from 29 companies—also took the opportunity to mingle with foreign air force attaches.

AFA Chairman of the Board Doyle E. Larson was joined by several Aerospace Education Foundation, Air Force Memorial, and AFA regional and chapter leaders at the gathering.

The tradition of the air attache reception dates to 1980 and began as a way to focus on an important group of foreign military officers, many of whom go on to become heads of air forces in their homelands. It has also given the magazine a chance to remind this select group of readers that it covers issues important to foreign military leaders. "A Half Century of NATO" in the April issue is one example.

AFA Membership Directory Available Online—To Members Only

The *Air Force Association 50th Anniversary Directory of Members 1996,* which was printed in 1997, is now going to be accessible in a searchable format in the Members Only section of AFA's World Wide Web site.

The association is making this data available online to help respond to numerous member requests for help in locating old friends and compatriots.

The data about each individual is the same information he or she provided for the listing in the 1996 membership directory (with any address or telephone updates an individual may have already provided to AFA headquarters). The entries include name, address, home and work telephone numbers, fax number, e-mail address, rank/title, and AFA chapter affiliation.

If a member has notified AFA headquarters of address and telephone changes, they will be incorporated into the online directory. If any of the other information has changed since the printing of the directory, a member can correct the data personally via the web site. (Visit AFA at www.afa.org, enter the Members Only area and follow the instructions for correcting the listing.)

AFA plans eventually to include members not already listed in the 1996 membership directory in the online membership directory. However, automatic inclusion will not take place until each member has been notified and given a chance to opt out of the online directory.

NOTE: If for any reason a member does not want to be included in the online membership directory, he or she should contact the AFA Customer Service Department immediately. The record will be hidden from view. Customer Service can hide records at any time.

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Fax: 703-247-5853 **E-Mail:** custserv@afa.org
Mail: Air Force Association, Attn: Customer Service, 1501 Lee Hwy., Arlington, VA 22209-1198

Attaches

To foster stronger ties with foreign air attaches, the magazine in 1992 began a concerted effort to visit their embassies in Washington. By the end of that year it had established contact with 56 of them, as well as with 33 USAF air attaches stationed in foreign capitals. Today, AFA maintains ties with 95 foreign air attache offices. USAF air attaches abroad receive shipments of *Air Force* Magazine and distribute them to more than 1,200 military leaders and defense officials.

AFA's relationship with foreign air attaches continues throughout the year, as they frequently turn to the association for Air Force information. In addition, AFA provides foreign air attaches with transcripts from AFA and AEF symposiums, invites them to the Eaker Institute colloquiums, and even sends greetings on their national independence or anniversary days.

USAF photo by Kenn Brown

It had been 24 years since he had flown a T-38 as an instructor pilot, but AFA National President Thomas McKee (left) said it's "surprising how it all comes back so quickly." He said his flight—made during a visit to the Golden Triangle (Miss.) Chapter—renewed his understanding of how instructor pilots and students cope with training in a period of austere resources. Capt. Eric Friesel is at right.

In Flight

For AFA National President Thomas J. McKee it was a bit of deja vu. He visited the **Golden Triangle (Miss.) Chapter** and Columbus AFB in March and, in a highlight of the visit, flew a T-38 Talon.

McKee, who earned his USAF pilot wings at Reese AFB, Texas, was a T-38 Instructor Pilot and check pilot at Williams AFB, Ariz.

He began his visit to Columbus with an official welcome from Col. Marne Peterson, 14th Flying Training Wing commander and a chapter member, and four flight commanders from Specialized Undergraduate Pilot Training Class 99-06. He then listened to a briefing on the wing's mission and participated in the graduation ceremony for SUPT Class 99-06. A luncheon with wing leaders followed. The guests included Mississippi State President Billy Boyd and Golden Triangle Chapter President David McIntosh.

That afternoon, McKee spent an hour in the air, flying the T-38 with Capt. Eric Friesel, a 50th Flying Training Squadron IP.

McKee met several times with chapter members during this visit, and McIntosh said an unusually large number of people responded to the notice that the AFA president would be guest speaker for a chapter event at a hunting lodge, featuring a quail dinner. Boyd said the members were encouraged to bring a friend, so McKee's remarks covered the advantages of joining AFA, as well as USAF issues important to the association, active duty service members, and military retirees.

Revitalization Story

A year ago, **Pensacola (Fla.) Chapter** President Brian P. McLaughlin wrote, "I am currently trying to bolster a chapter from near ruin."

The active duty personnel who three years ago started the chapter had transferred out of the area, and McLaughlin was telephoning the remaining members one by one to encourage their interest and to create a better membership balance.

He consulted with AFA leaders in the state, including Martin H. Harris, national director emeritus; Robert E. Patterson, then Florida state president; David R. Cummock, current state president; Tommy G. Harrison; and Raymond Turczynski. He even called on then–Michigan state president James W. Rau, who was visiting the area, to advise the membership committee on how to revitalize the chapter.

McLaughlin is a T-34C IP at the Flight Instructor Training Unit at Training Wing 6 at NAS Pensacola. Scheduled to leave the area in December, he said his goal has been to build up the chapter to the point where many people are handling "lots of little jobs, so that no one person has to do everything." He said, "Right now, I'm looking at a list with 19 names of people doing little things." By spreading the responsibility, he said he hopes to leave the chapter in good shape.

He especially credits four chapter members who worked with him in monthly planning sessions and stepped forward to fill vacant positions: William L. Moore Jr., treasurer; Edmund B. Swanson, secretary; Maj. Dennis R. Davoren, vice president for member-

Capt. Brian McLaughlin (right), Pensacola (Fla.) Chapter president, has recharged the chapter over the past year. Its first significant program recently featured airline captain Al Haynes (left). McLaughlin also signed up the chapter's first Community Partners, Tom and Ginger LaConte (center).

ship; and Ray B. Sitton, a retired lieutenant general who joined AFA 11 years before McLaughlin was even born.

The group concentrated on planning one or two events. They also addressed the challenge of communication: Capt. Carl E. Hodges started a four-page chapter newsletter last fall, and the chapter established a web page—one of two Florida chapters to do so. The chapter even landed its first Community Partner, Laser Tech of Pensacola, Inc.

In January, the Pensacola Chapter began to see results when more than 40 people—active duty, retirees, civilians, and Civil Air Patrol and AFJROTC cadets—turned out for a meeting featuring United Airlines pilot Alfred C. Haynes.

In July 1989 Haynes was lead pilot on a UAL DC-10, en route from Denver to Philadelphia, when its No. 2 tail-mounted engine failed during cruise flight. Fragmentation and forceful discharge of the engine's parts led to loss of three hydraulic systems powering the flight controls. The aircraft made an emergency landing at Sioux City, Iowa, but ignited and cartwheeled on the ground. More than half of the 296 on board survived. Haynes had worked for United for 33 years at the time of the accident.

Rather than detail the accident, Haynes stressed the role of the community, praising the preparation and training of the police, firemen, and medical community. He called the airport manager and air traffic controllers the real heroes.

Haynes had actually been scheduled to speak to a Navy audience in Pensacola, but McLaughlin saw an opportunity for his chapter to piggyback on that event: He arranged for Haynes to arrive a day early to speak to the AFA group.

Visions Classrooms and Grants

The Aerospace Education Foundation reported that AFA chapters supported 1,206 "Visions of Exploration" classrooms last fall.

The joint *USA Today*–AEF program encourages in elementary school students an interest in math, science, and aerospace. For the youngsters, the program provides subscriptions to the newspaper and other materials. It provides a lesson guide for the teachers.

Local AFA chapters sponsor Visions classrooms at $89 each, with AEF providing a dollar-for-dollar match. The program began in 1991 with 30 classrooms. Today the **Gen. E.W. Rawlings (Minn.) Chapter** holds the record for the most Visions classrooms—200 this year—sponsored. This is the highest number ever sponsored by a chapter.

Another AEF program, Chapter Matching Grants of up to $1,000, paid for a wide range of aerospace education–related needs, last year. Fifteen chapters received grants to help them promote the role of aerospace through such means as science fair awards, field trips, booths, and equipment.

AEF also reported that in 1998 it awarded 333 Educator Grants of $250 to teachers, helping to cover expenses for aerospace-oriented programs and activities.

In 1998, 100 AFJROTC and Civil Air Patrol groups received AEF grants to support their aerospace education activities.

Enid (Okla.) Chapter Secretary Oscar Curtis recently presented a $250 AFJROTC grant—and matching funds from the chapter—to retired Lt. Col. Daniel J. Hollingsworth, aerospace science instructor at Enid High School.

Curtis noted that Hollingsworth, a chapter member, started the AF-

Jim Ryan of the Phoenix Sky Harbor (Ariz.) Chapter tries out an F-16 simulator during a visit to the Warfighter Training Research Division of the Air Force Research Lab. Maj. Guy Schmidt (left) was his guide.

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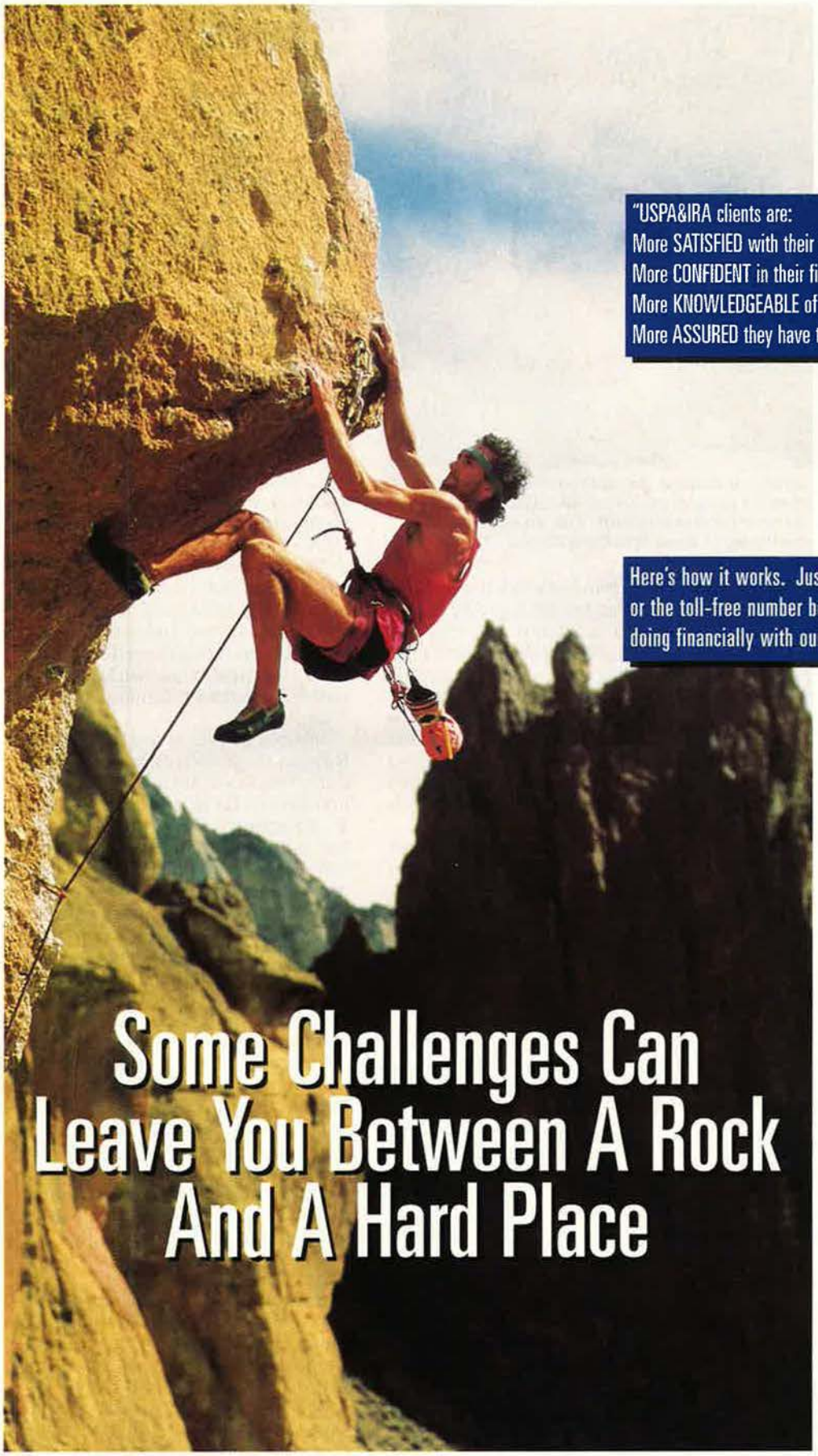

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A financial program, by itself, cannot assure that all retirement or other financial goals will be met.

United Services Planning Association, Inc. (USPA)

During a recent chapter meeting aimed at college basketball fans, Col. Samuel Snider, Willamette Valley (Ore.) Chapter president, presented $200 to cadet Brian Reed, who heads the local Arnold Air Society unit. The donation will help the AAS in its work this year with local Boys and Girls Clubs of America.

JROTC program at Enid just over two years ago. More than 140 stucents, in a school of 550, participate in the program and help at functions in Enid and at nearby Vance AFB, Okla. Curtis said the chapter helps the cadets financially and with publicity.

Training to Win

In February the **Phoenix Sky Harbor (Ariz.) Chapter** toured the Warfighter Training Research Division, located at the former Williams AFB—now called Williams Gateway Airport—in Mesa, Ariz.

The division is part of the Air Force Research Lab's Human Effectiveness Directorate. Its mission is "to develop, demonstrate, evaluate, and transition training technology and methods to train warfighters to win."

Maj. Guy Schmidt, AFRL project officer, gave the chapter members an idea of how this is accomplished. He guided the 19 visitors through a 90-minute tour of the facility and its equipment, such as F-16, C-130, and night vision goggles simulators.

This was the third time chapter members have visited the facility, noted Hector F. Evans Jr., chapter president.

Ducks vs. Beavers

With part of its membership living in the college town of Eugene—home of the University of Oregon's "Ducks"—and part of them living in Corvallis—home of the Oregon State University "Beavers"—the **Willamette Valley (Ore.) Chapter** decided that the annual showdown between the basketball rivals was the perfect way to lure members to a chapter meeting. (As of March 20, Willamette Valley is the new name for the Eugene Chapter.)

The chapter offered pregame activities at OSU's field house with a barbeque cooked by Chapter Treasurer Charles C. Tomlinson. OSU Arnold Air Society cadets set up this dinner and handled the cleanup afterwards.

While waiting for the business meeting to get under way, chapter member Raymond J. Lorenz entertained the group with "As Flak Goes By," a parody of "As Time Goes By." Lorenz, a B-24 pilot with Fifteenth Air Force in World War II Italy, explained that his comrades used to sing the ditty to poke fun at the more high-profile Eighth Air Force. "It's still the same ol' story," go the words. "The Eighth gets all the glory." Lorenz said he told the audience beforehand, "Now, this is just in jest."

The business portion of the evening included a presentation by Brian Reed, commander of OSU's Arnold Air Society, on AFROTC and AAS activities at his school. Chapter members, whom Chapter President Col. Samuel E. Snider described as "a rowdy crowd," also participated in an auction. They raised funds to endow scholarships and to support at least six classrooms in the *USA Today*–AEF "Visions of Exploration" program.

More OSU than U of O fans turned out for the chapter event, "and they were not disappointed," reported Snider, who commands OSU's AFROTC Det. 685. "The Beavers won a nail-biter, 68–65."

Town and Gown

Integrating AFA activities with the local university had been a regular and successful practice for the **Lexington (Ky.) Chapter**—even before Col. James S. "Steve" Parker, the AFROTC commander at the University of Kentucky in Lexington, became chapter president.

Most recently, C.M. Newton, athletic director of the university, spoke to a chapter luncheon of more than 40 people.

Commissioned in 1953 from the same university where he now directs the varsity sports programs, Newton said the lessons he learned in the Air Force helped him later in life. Turning to the dozen AFROTC cadets in the luncheon audience, he commended them for choosing a USAF career.

Newton has headed UK athletics since 1989. Before then he served as a university basketball coach for 32 years, taking the University of Alabama to three Southeastern Conference championships, two NCAA tournaments, and four National Invitation Tournaments.

Special guests at the luncheon for Newton were ANG Brig. Gen. Verna Fairchild, the state's assistant adjutant general for air and a **Gen. Russell E. Dougherty (Ky.) Chapter** member, and retired Col. Maxine J. "Micki" King, who earned a gold medal in the 3-meter springboard diving competition at the 1972 Olympics in Munich.

Earlier in the year, AFAers and cadets held their fourth annual AFA–AFROTC mixer at the UK campus. This year 40 cadets from Det. 290 turned out for the event.

In keeping with what has become a mixer tradition, the chapter members summarized their Air Force careers for the cadets, talking about experiences ranging from World War II and the Berlin Airlift to the Korean and Vietnam wars. Elwood T. Waddell, a cadet chapter member, said talking to these veterans "made me more aware of the proud Air Force tradition."

From O'Hare to Scott

Scott Memorial (Ill.) Chapter members received firsthand information on the upcoming move of the 126th Air Refueling Wing (ANG) from O'Hare IAP/ARS, Ill., to Scott AFB, Ill.

ANG Brig. Gen. Harold Keistler, wing commander, spoke to a luncheon meeting co-sponsored by the

AFA chapter and several other groups. He said, "The new facilities being built at Scott will be the premiere Air National Guard facility in the country."

Not all the buildings will be completed by July, when the wing is scheduled to move from O'Hare, but Keistler said about half of the 126th will move anyway, into temporary facilities on base. About 180 ANG personnel are expected to follow the wing to Scott, 70 of them full-time members. The move was mandated by a Defense Base Closure and Realignment Commission that targeted O'Hare's Reserve facility for closure.

Chapter President Jack Pledger presented Keistler with a plaque, thanking him for his presentation.

POW–MIA Salute

Twenty-one former Prisoners of War from World War II and the Korean War attended the annual POW–MIA luncheon, sponsored by the **Harry S. Truman (Mo.) Chapter** and a local Military Order of the World Wars chapter.

The group was led in prayer by James M. Snyder, chapter chaplain. The guests—dressed in red blazers and service caps—spoke briefly about their war experiences, such as surviving the Bataan Death March and being shot down during a bombing raid on Ploesti, Romania. All the ex–POWs received Certificates of Appreciation from Chapter President Rodney G. Horton and MOWW Commander James Tobin.

AFRES Col. Mike Lynch, commander of the 442d Fighter Wing (AFRC) at Whiteman AFB, Mo., served as guest speaker for the luncheon, held in a Disabled American Veterans facility in Raytown, Mo. Lynch spoke about AFRC's operations tempo and his unit's OA-10 mission.

Experimental Aircraft

The **Cochise (Ariz.) Chapter** participated in a vicarious visit to the Experimental Aircraft Association's famous Fly-In Convention at Oshkosh, Wis.

At the chapter's March meeting, Clifford Van Vleet, a former president of the EAA chapter in Sierra Vista, Ariz., presented a program of slides that he had taken of EAA's facilities and of four fly-ins between 1988 and 1998.

He brought photos concentrating on classic warbirds such as the B-17, B-24, and B-29, then challenged the audience to tell him about the various aircraft. He said the tactic got them "all revved up" and telling war stories.

The experimental aircraft Van Vleet

showed included several of Burt Rutan's one-of-a-kind aircraft. He also showed photos of fly-in visitors astronauts Neil Armstrong, Jim Lovell, and Frank Borman with his Bell P-63 Kingcobra.

Chapter President Robert J. Toothman was especially interested in the topic of home-built aircraft. A World War II pilot in Fifth Air Force, he is building a Zenith 601 HD XL in his garage. The two-passenger, all-metal aircraft will be the first airplane he's ever built, and he aims to complete it by March 2000.

What's New at the Air Zoo?

Gerard Pahl, director for education and marketing at the Kalamazoo Aviation History Museum in Kalamazoo, Mich., spoke at the March meeting of the **James H. Straubel (Mich.) Chapter,** providing an update on projects and programs.

In a slide presentation called "What's New at the Air Zoo," he talked about the completed restoration of a rare WACO CT4A cargo glider, a PT-23 Cornell, and a PT-22 Ryan Recruit. Pahl said the museum has finished restoring for its aeroengines section a cutaway of a 28-cylinder R-4360 Wasp Major radial engine.

The Straubel Chapter has sponsored a museum trip for seven classrooms, so Pahl explained how their donation was spent: He showed slides of students taking part in two educational programs at the museum. In one program the youngsters learned principles of flight, using everyday objects like Ping-Pong balls. They also rode in a flight simulator. In the follow-on program, they sat with a pilot in a Piper Cub and learned about cockpit instruments.

The 20-year-old museum now has nearly 60 classic aircraft in its collection. It is nicknamed the "Air Zoo" because of the animal-named aircraft in its original collection: the Curtiss P-40 Warhawk, the Douglas C-47 "Gooney Bird," and three US Navy Grumman "cats"—the F4F Wildcat, F8F Bearcat, and F6F Hellcat.

CAP Awards

The **Greater Cincinnati (Ohio) Chapter** helped present the honors at an AFA–CAP awards banquet in February at the Blue Ash Air National Guard facility in Blue Ash, Ohio.

Capt. Paul E. Jara, commandant of cadets at Miami University in Oxford, Ohio, and 2d Lt. Elizabeth Lineberry, assistant regional director of admissions for AFROTC at Wright–Patterson AFB, Ohio, received AFA Certificates of Appreciation. Lineberry, who is a chapter member, and Jara had helped develop for high school counselors a seminar on AFROTC and ANG opportunities.

Also receiving certificates were the chapter's aerospace education vice president, Stephen J. Dillenburg, and ANG Majs. Norman Poklar and Ron Taylor, who provide support for AFA activities at Blue Ash.

Carl Woodruff and Army ROTC cadet Angie Zugay received aerospace education awards, recognizing their achievements in CAP's educational mission.

Honoring Tuskegee Airmen

A February luncheon focusing on the Tuskegee Airmen—the nation's first African–American fighter pilots—brought the **William A. Jones III (Va.) Chapter** media coverage from a local television station, radio station, and newspaper.

Guests of honor were retired Lt. Col. Howard L. Baugh, a Tuskegee Airman from Midlothian, Va., and **Wright Memorial (Ohio) Chapter** member Charles S. Cooper III and Ann Cooper, co-authors of the book *Tuskegee's Heroes.*

Ann Cooper told the audience of 100 guests, "Blacks fought in two wars: They fought bigotry and they fought fascism." Baugh's speech covered his wartime experiences and what it was like to return to a segregated America at the end of World War II. He commented that the struggle for racial equality continues today. He received a standing ovation.

The chapter co-sponsored this luncheon with a local aviation club. Guests included nine students from Monticello High School in Charlottesville, Va., who had written essays on the Tuskegee Airmen as part of Black History Month activities. Evita Rush submitted the winning essay.

More AFA/AEF News

■ The commandant of the Tyndall AFB NCO Academy, CMSgt. Karen E. Saline, spoke to the **Col. H.M. "Bud" West (Fla.) Chapter** about the development of professional military education for the enlisted force and the Expeditionary Aerospace Force concept. Shirley A. Jones, chapter president, noted that the meeting was unique because it focused on NCOs. Also present were Tallahassee Mayor Scott Maddox, two past chapter presidents—John G. Brennan and Virginia Wise—and Florida State University cadets who performed the POW–MIA remembrance ceremony that opens every chapter meeting.

■ "In the March issue of *Air Force* Magazine there was an article on 'AFA Supports Full Burial Honors,' " wrote Jack Dennis, **Mercer County (N.J.) Chapter** secretary. "I agree that all veterans deserve honors at their funerals and I, as an AFA mem-

AFA Conventions

April 30–May 2	**New Jersey State Convention,** Cape May, N.J.
May 7–8	**Alabama State Convention,** Huntsville, Ala.
May 7–8	**South Carolina State Convention,** Columbia, S.C.
May 7–8	**Tennessee State Convention,** Knoxville, Tenn.
May 13–16	**California State Convention,** Sacramento, Calif.
June 4–6	**Arizona–Nevada–New Mexico State Convention,** Laughlin, Nev.
June 4–6	**Iowa State Convention,** Sioux City, Iowa
June 4–6	**New York State Convention,** Owego (near Binghamton), N.Y.
June 4–6	**Ohio State Convention,** Dayton, Ohio
June 11–12	**Mississippi State Convention,** Jackson, Miss.
July 9–10	**Oklahoma State Convention,** Tinker AFB, Okla.
July 16–18	**Pennsylvania State Convention,** Trevose, Pa.
July 17	**Minnesota–So. Dakota–No. Dakota State Convention,** Minneapolis, Minn.
July 17–18	**Virginia State Convention,** Arlington/Alexandria, Va.
July 23–25	**Texas State Convention,** McAllen, Texas
July 30–31	**Florida State Convention,** Daytona Beach, Fla.
July 30–31	**North Carolina State Convention,** Fayetteville, N.C.
July 30–31	**Washington–Oregon State Convention,** McChord AFB, Wash.
Aug. 4–5	**Michigan State Convention,** Fort Wayne, Ind.
Aug. 7–8	**Missouri State Convention,** Branson, Mo.
Aug. 14	**Georgia State Convention,** Warner Robins, Ga.
Aug. 20–21	**Colorado State Convention,** Colorado Springs, Colo.
Aug. 21	**Illinois State Convention,** Galesburg, Ill.
Aug. 21	**Indiana State Convention,** Indianapolis, Ind.
Aug. 27–28	**Arkansas State Convention,** Fayetteville, Ark.
Sept. 11	**Delaware State Convention,** Dover AFB, Del.
Sept. 13–15	**AFA National Convention,** Washington, D.C.

ber, have volunteered to play 'Taps' at all of our chapter members' graveside services." A Korean War–era Air Force medic, Dennis began playing the trumpet in high school. Now he plays in instrumental groups at two churches and has volunteered to play "Taps" at any military funeral near his home in Trenton, N.J. "If there is any way I can be of service at any veteran's service, I will be glad to do so free of charge," he said.

■ The Collings Foundation of Stow, Mass., brought the B-17 *Nine-O-Nine* to the Weeks Air Museum in Miami in February, and as a fund-raising event the **John W. DeMilly Jr. (Fla.) Chapter** raffled a ride in the restored bomber. Chapter member Alan F. Estis won the raffle but gave the prize to his friend, Michael D. Anderson. Anderson flew DC-3s, as well as C-130s, from 1955 to 1966 in the Air Force, so he happily joined the DeMilly Chapter after his B-17 ride. Miami was the fourth stop in the Collings Foundation's 1999 tour, featuring *Nine-O-Nine* and a restored B-24J *All American*.

John H. deRussy (1914–1999)

Retired Col. John H. deRussy, a national vice president (Southeast Region) from 1978 to 1981, died Feb. 20 in Indian Harbour Beach, Fla. He was 84 years old.

He had also served as Florida state vice president and president and had received several state and chapter awards, including an AFA Medal of Merit.

DeRussy was born in Baltimore and entered military service with the Army at Schofield Barracks, Hawaii, in 1934. He went on to serve in the Air Corps and, from 1947 to 1967, in USAF. He was with Eighth Air Force during World War II and completed 30 years of active duty with an assignment at Air Force Logistics Command, Wright–Patterson AFB, Ohio.

In his civilian career, he was a logistics engineer consultant with Boeing Services International. He was a member of the **Cape Canaveral (Fla.) Chapter.**

Have AFA/AEF News?

Contributions to "AFA/AEF National Report" should be sent to *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Phone: (703) 247-5828. Fax: (703) 247-5855. E-mail: afa-aef@afa.org. ■

Unit Reunions

reunions@afa.org

1st CEG/RBS (SAC). Sept. 26–30, 1999, in Bossier City, LA. **Contact:** Cecil M. Thomson, PO Box 0184, Barksdale AFB, LA 71110-0184 (mike.calvert@barksdale.af.mil) (heydanwood @aol.com) (d.borchardt@everetts.net).

1st Strategic Air Depot Assn and Eighth AF veterans stationed at Honington–Troston, UK (1942–46). Sept. 23–26, 1999, in Cincinnati. **Contact:** Herb Kaster, 720 Society Hill, Cherry Hill, NJ 08003 (609-751-1763).

4th FIW, Korea (1950–54). Sept. 23–26, 1999, at the Ramada Inn Airport in Nashville, TN. **Contact:** Gene Bossard (941-287-9627) or Andy Whipple, Box 236, Groveport, OH 43125 (614-837-3698).

8th ARS (SAC), RC-47s, Peterson Field, CO, and Stead AFB, NV. Sept. 23–26, 1999, in Williamsburg, VA. **Contact:** Alex Kuras, 112 Pasbehegh Dr., Williamsburg, VA 23185-1417 (757-220-3083).

8th FG (33d, 35th, 36th, and 80th FSs and headquarters and 8th Fighter Control Sq). Sept. 30–Oct. 2, 1999, in Odessa, TX. **Contact:** Paul Kiser, Rt. 5, Box 217, Tahoka, TX 79373 (806-998-4951).

8th TFS, Takhli RTAB, Thailand (1972). Sept. 24–26, 1999, near Eglin AFB, Fla. **Contact:** Paul Raudenbush, 1725 Weston Brent Ln., El Paso, TX 79935 (915-592-3700) (JFRX62a@prodigy.com).

11th ARS Alumni Assn (KC-97Gs), Dyess AFB, TX, and Dover AFB, DE. Sept. 22–26, 1999, at the Embassy Suites Northwest in San Antonio. **Contact:** Dick Kahler (817-261-9420) (110005.2140 @compuserve.com).

19th BG Assn. Sept. 17–21, 1999, at the Drawbridge Inn & Convention Center in Fort Mitchell, KY. **Contact:** Robert E. Ley, 3574 Wellston Ct., Simi Valley, CA 93063 (818-703-7717).

27th Air Transport Gp (WWII), including the 310th, 311th, 312th, and 325th Ferrying Sqs., 86th, 87th, 320th, and 321th Transport Sqs., and 519th and 520th Service Sqs. Sept. 23–25, 1999, in Minneapolis. **Contact:** Fred Garcia, 11903 N. 77th Dr., Peoria, AZ 85345 (602-878-7007).

30th Air Div, Willow Run AFS, MI (all years including WWII USAAC) and **Sampson AFB, NY,** personnel. May 20–22, 1999, in Romulus, MI. **Contact:** Walt Steesy, PO Box 299, Interlaken, NY 14847 (607-532-4204) (SamAFBvet@aol.com) or Leonn Boone, 3624 Bayview Dr., Allegan, MI 49010 (616-673-8086).

34th BG Assn, Eighth AF (WWII). Sept. 10–13, 1999, at The Savery Hotel & Spa in Des Moines, IA. **Contact:** Robert H. Wright, 411 Parkovash Ave., South Bend, IN 46617 (219-232-4287).

56th FG, assigned squadrons and SOW (1941–present). June 24–26, 1999, at the Hope Hotel, Wright–Patterson AFB, Ohio. **Contact:** Leo Lester, 600 E. Prospect St., Kewanee, IL 61443 (309-856-6826).

70th Air Refueling Assn. Sept. 21–26, 1999, in Jacksonville, AR. **Contact:** Jack Loomis, 9204 Peach Tree Ln., Sherwood, AR 72120 (501-835-7747) (tabyanan@yell.com).

79th FG Assn, 85th, 86th, and 87th FSs. Sept. 29–Oct. 2, 1999, at the Marriott Hotel Dayton in Dayton, Ohio. **Contact:** Edwin P. Newbould, 1206 S.E. 27th Ter., Cape Coral, FL 33904 (941-574-7098).

90th BG (H) (WWII). Sept. 29–Oct. 2, 1999, in Oklahoma City. **Contact:** Robert E. Simmons, 3309 N. Preston Dr., Oklahoma City, OK 73122 (405-942-7746).

93d TCS, 439th TCG. Sept. 15–19, 1999, at the Little America Hotel in Cheyenne, WY. **Contact:** Tom Morris, 456 St. George's Ct., Satellite Beach, FL 32937 (407-773-6960) (tomruth3@aol.com).

98th BG/BW Vets Assn. Sept. 7–11, 1999, at the Cavanaughs Ridpath Hotel in Spokane, WA. **Contact:** Stan Flentje, 310 Sunnywood Ln., San Marcos, TX 78666-8914 (512-396-2509).

111th TRS (WWII). Sept. 5–10, 1999, at the Holiday Inn Chattanooga Choo-Choo in Chattanooga, TN. **Contact:** Roy D. Simmons Jr., 3730 Edgewater Dr., Nashville, TN 37217-4620 (615-366-1191).

246th Sig. Ops. Co (WWII). Aug. 12–15, 1999, at the Ramada Inn in Jonesborough, TN. **Contact:** Marie Huggins, 30031 S.W. 169th Ave., Homestead, FL 33030 (305-247-0150).

368th FG, Ninth AF (WWII). Sept. 23–26, 1999, at the Holiday Inn O'Hare Chicago in Chicago. **Contact:** Randolph Goulding, 2000 Clearview Ave. N.E., Atlanta, GA 30340 (phone: 770-455-8555 or fax: 770-455-7391).

376th BG (H) (WWII). Sept. 2–6, 1999, at the Doubletree Hotel at Red Park in Tucson, AZ. **Contact:** Joel Lynn, 1660 N. 2000 East Rd., Stonington, IL 62567-9602 (217-325-3327).

456th BG (H), Fifteenth AF, Italy (WWII). May 5–9, 1999, at the Renaissance Orlando Resort in Orlando, FL. **Contact:** Ed S. Moore, Box 507, Hays, KS 67601 (785-625-7515 or 785-625-6666).

485th BG (H), Venosa, Italy (WWII). Sept. 15–19, 1999, at the Marriott Hotel Southeast in Denver. **Contact:** Joe Cathcart, 510 Old Hickory Blvd., Apt. #304, Nashville, TN 37209 (615-352-9540).

494th BG (H) Assn, Inc. May 12–16, 1999, at Wyndham Franklin Plaza Hotel in Philadelphia. **Contact:** Paul Swartz, 743 Surrey Rd., Clifton Heights, PA 19108 (610-623-0738).

530/9th Aviation Sq. Sept. 30–Oct. 3, 1999, in Mystic, CT. **Contact:** Todd Sagraves, 318 Commonwealth Ave., New Britain, CT 06053-2408 (860-225-6591) (todd.sagraves@worldnet.att.net).

620th TCS, including detachments (Vietnam). July 17–19, 1999, at the Sheraton Old Town in Albuquerque, NM. **Contact:** George Pyfrom, 1268 N. Acapulco Ave., Simi Valley, CA 93065 (805-581-2403) (gpyfrom@vines.littondsd.com).

793d Military Police Bn (1942–present). Sept. 22–25, 1999, at the Holiday Inn Greentree Central in Pittsburgh. **Contact:** Frank De Rosa, 640 S. Kaspar Ave., Arlington Heights, IL 60005-2320 (847-255-3977).

919th Aviation Maintenance Co (SCARWAF), 6010th Engineer Aviation Co (SCARWAF), and 919th Engineer Co (Vietnam), 1949–56 (Ft. Gordon, GA; Okinawa; Korea; and Japan) and 1966–72 (Ft. Hood, TX, and Vietnam). June 15–

Unit Reunions

17, 1999, in Cincinnati. **Contact:** Paul E. Repsher, Rt. 1, Box 351, Henryetta, OK 74437-9731 (918-650-0967).

6927th RSM, Onna Point, Okinawa. Sept. 27–30, 1999, at the Holiday Inn Boardwalk Casino in Las Vegas. **Contact:** Ray Thibodaux, 6018 Milne Blvd., New Orleans, LA 70124-2014 (504-488-8214) (raytib@aol.com).

Air Force Photo Mapping Assn. Sept. 29–Oct. 2, 1999, at the Marriott Palm Beach Gardens in Palm Beach Gardens, FL. **Contact:** Dick Hinz, 652 Cypress Key Cir., Atlantis, FL 33462-1225 (561-641-9927).

B-36 SAC Crew LS35, Loring AFB, ME (1952–56). May 14–16, 1999, at Biloxi Beach Resort Motor Inn in Biloxi, MS. **Contact:** O.J. Buttner (phone: 817-472-0944 or fax: 817-472-6274).

Class 66-H, Vance AFB, OK . June 3–6, 1999, in Colorado Springs, CO. **Contact:** Skip Foster, 10312 Summer River Ave., Las Vegas, NV 89134 (fax: 702-256-9173) (mjfoster@compuserve.com).

EC-47 mission, Southeast Asia (1966–74), 360th, 361st, 362d TEWS and 6994th Security Sq personnel, including Dets 1, 2, and 3. May 29–31, 1999, at the Best Western Oak Hills in San Antonio. **Contact:** James C. Wheeler, HC 62, Box 6, Clarksville, AR 72830 (501-754-3507) (jc@ec47.com).

FB-111A, Carswell AFB, TX; Pease AFB, NH; Plattsburgh AFB, NY (1969–92). July 23–25, 1999, in Warner Robins, GA. **Contact:** Gerry Patterson, 503 W. Bailey Rd., Naperville, IL 60565 (630-961-9918) (Gpatter455@aol.com).

Moroccan Reunion Assn, all persons stationed in Morocco. Sept. 22–24, 1999, in San Antonio. **Contact:** Robert Bradshaw, PO Box 13362, Omaha NE 68113-0362 (402-291-3321).

Ninth AF Assn. Sept. 16–18, 1999, at the Best Western Central Executive Center in Omaha, NE. **Contact:** Bob Hogg, RR 2, Box 80, Mead NE 68041-9652 (402-624-2755) or Charles S. Neisky, 248 S. McKenna Ave., Gretna NE 68028-7804 (402-332-3143).

Nürnberg American High School. June 17–20, 1999, at the Beaver Run Resort in Breckenridge CO. **Contact:** Nürnberg Alumni Assn, Inc., PO Box 835308, Richardson, TX 75083-5308 or Gila Erving Montfort (972-479-1965).

PBY Catalina International Assn. Sept. 29–Oct. 3, 1999, in Ottawa, Ontario, Canada. **Contact:** James Thompson, 1510 Kabel Dr., New Orleans, LA 70131-3632 (504-392-1227).

Roswell AAF/Walker AFB Veterans Assn. Sept. 17–19, 1999, at the Best Western Sally Port Inn & Suites in Roswell, NM. **Contact:** Alfred H. Wilbur, PO Box 2744, Roswell, NM 88202 (505-622-5413).

Sampson AFB, NY, 3650th BMTW, all personnel. Sept. 9–12, 1999, at the Hyatt Fair Lakes in Fairfax, VA. **Contact:** Walt Steesy, PO Box 299, Interlaken, NY 14847 (607-532-4204) (SamAFBvet@aol.com).

UPT Class 69-07, Vance AFB, OK. May 6–9, 1999, at Vance AFB. **Contact:** Rick Vieth, 7265 Ross Rd., New Carlisle, OH 45344 (937-845-8872)(RVieth6907@aol.com).

Seeking former **5240th Support Sq,** Oslo, Norway, personnel for a possible reunion. **Contact:** Roger H. Baum, 10171 Humbolt St., Los Alamitos, CA 90720 (phone: 562-596-5538 or fax: 562-493-3495) (rhbaum@aol.com).

Seeking members of **OCS Class 59-B** for a reunion. **Contact:** Allen Partin, 114 E. Rahn Rd., Dayton, OH 45429 (937-436-9588).

Seeking members of **Pilot Training Class 49-A,** Randolph AFB, TX, for a reunion in May 1999. **Contact:** Earl F. Steeb, 1302 S. 6th St., St. Joseph, MO 64501-3637 (816-364-0840). ■

Mail unit reunion notices well in advance of the event to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.

Bulletin Board

bulletin@afa.org

Seeking information on **1st Lt. Joseph W. Trammell** or C-47 flight #7793, reported missing between Chabua and Calcutta, India, with a crew of four and 11 passengers, June 14, 1944. **Contact:** Robert C. Trammell, 1119 N. Franklin Rd., Greenville, SC 29617-7525.

For a book, seeking photos of **MATS transport aircraft,** flight lines, loading/unloading operations, maintenance, or terminal scenes. **Contact:** Nick Williams, 1002 Ridgewood Blvd., Waverly, IA 50677-1114.

Seeking contact with **SSgt. Leo A. Powell and Flt. Officer James N. Dingwall** and anyone who knew **Sgt. Francis T. Hall,** a nose gunner, 744th BS, 456th BG (H), Fifteenth AAF, killed July 21, 1944, near Brux, Czechoslovakia. **Contact:** Pryor Hall II, 1310 Kerry Dr., Sebring, FL 33872-5309.

Seeking current and former members of the **421st Fighter Sq** to join 421st Fighter Assn. **Contact:** Jeff Kolin, 17125 Briar St., Yelm, WA 98597 (Blkwidw421@aol.com).

Seeking contact with **Capt. Ron Pieri,** of Florida, who was a member of a RED HORSE Sq in Baghdad, Iraq, 1994–95. **Contact:** Darryl Sweeney (fleur.darryl@paradise.com.nz).

Seeking photos of aircraft used by the US, UN, or communist forces during the **Korean War. Contact:** Jim Mesko, 4363 Hohman Cir., Akron, OH 44319 (330-644-5885).

Seeking contact with family members of **1st Lt. Theodore E. Kubala** of Cleveland, OH; **2d Lt. William Graham Jones** of Tuscaloosa, AL; and **Flt. Officer John A. DeBell** of Houston, TX, who were crew members on a B-26 shot down April 21, 1944, over Pas de Calais, France. **Contact:** Jim Pascoe, 6501 Milam Way, North Highlands, CA 95660-4030 (baubo@calweb.com).

Seeking SAS members of the **Rooney, D.V. Laws, and Maynard** sticks who dropped into eastern France in August 1944 as part of Operation Rupert. **Contact:** Jacques Adnet, 4360 Diamondback Dr., Colorado Springs, CO 80921-2364 (Adnet@divide.net).

Seeking information on or contact with **Sgt. Robert McCormic,** who was stationed at Barksdale AFB, LA, with the Field Training Detachment in 1958. **Contact:** M.L. Molander, 1618 28th Ave., Greeley, CO 80631 (970-356-0083).

Seeking colored **posters** of WWII aircraft in action, for refurbished officers' club. Specifically interested in 24-by-36–inch unframed pictures. **Contact:** J. Don Seed, 4020 Constitution Ave., Fairfield, CA 94533.

Seeking information on a **P-51 pilot** shot down in the Gelsenkirchen, Germany, area Nov. 1, 1944, and fellow P-51 pilots flying in the same area that day. **Contact:** Everett R. Jones Jr., 8080 N. Central Expressway, Ste. 1420, Dallas, TX 75206.

For a book, seeking photos of, anecdotes, patches, and information on the **16th SOS** and the AC-130 gunship and contact with former and current 16th SOS members. **Contact:** Greg Davis, PO Box 42, Peru, ME 04290 (207-562-8822 or 207-778-2075) (gdavis@megalink.net).

Seeking members of **Class 44-B,** twin-engine advanced, Stockton, CA. **Contact:** Donald O. Carlson, 4550 Pinebrook Cir., #206, Bradenton, FL 34209-8016 (941-794-0980).

For a book, seeking contact with anyone who had experience with the **North American F-82 Twin Mustang.** Especially interested in hearing from members of the 52d FG (All Weather) and 325th FG (All Weather). **Contact:** Warren E. Thompson, 7201 Stamford Cove, Germantown, TN 38138 (901-754-1852) (migaley@ibm.net).

Seeking 9-by-12–inch photos of a **B-36, B-52, and F-16. Contact:** Herta McNatt, 10303 Stubble Quail Cir., Austin, TX 78758-5028.

For an exhibit, seeking **letters or postcards** written between 1939–July 1945 from soldiers to their families, canceled by Field Post Offices in Europe, Africa, or the Pacific. Also seeking letters from POWs that were delivered by the Red Cross, specifically those bearing German, Italian, or Japanese cancellations. Also interested in contact with veterans who fought in Europe, Africa, or in the Pacific during this time. **Contact:** Matache Adrian, Str. Arh Nicolae Dan-Bonia-15, R 1100 Cravela-7, Romania.

Seeking unsatisfactory maintenance statistics reports for **B–57 Canberra and J65 and W5b engines** published in *Air Force* Magazine's predecessor, *The Official Service Journal of the US Army Air Forces.* **Contact:** W. Mack Palmer, Wind Ridge #365, 2928 Barton Skyway, Austin, TX 78746. ■

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.

AFA Colorado Springs/Lance Sijan Chapter

Outstanding Squadron Dinner

and Associated Events

Thursday, May 27
Outstanding Squadron Dinner

AFA's 40th annual Outstanding Squadron Dinner will be held at The Broadmoor Hotel, Colorado Springs, Colo., on Thursday, May 27. The dinner honors cadets of the United States Air Force Academy for the 1998–99 school year. The price is $80 per person, and $800 per table. The featured speaker will be Gen. Richard E. Hawley, Commander, Air Combat Command.

Wednesday, May 26
Golf Tournament and Reception

The golf tournament will start at 8 a.m. on the USAF Academy Golf Course. The price of $115 (only $75 if you are registered for the symposium) for civilians includes greens fees, golf cart, prizes, and reception. The fee for the reception only is $40.

Thursday, May 27
Air Force Acquisition Update Symposium

The ninth annual Air Force Acquisition Update Symposium, "Acquisition & Industry: Partnering in the 21st Century," sponsored by the Colorado Springs/Lance Sijan Chapter of AFA, will focus on the dynamic changes in the Air Force and DoD acquisition process. The program is aimed at industry executives and government leaders. It will be held at The Broadmoor Hotel and will be unclassified. The cost for the symposium is $250 for AFA civilian individual or Industrial Associate members. The registration fee includes a continental breakfast, coffee breaks, lunch, and a reception (Wednesday evening, May 26) in honor of the speakers. Additional individual reception tickets are $40.

The symposium will include the following speakers:

Maj. Gen. Bruce A. Carlson, Director, Operational Requirements, USAF DCS, Air & Space Operations

Lt. Gen. Roger G. DeKok, USAF DCS, Plans and Programs

Lt. Gen. Lance W. Lord, Vice Commander, Air Force Space Command

Lt. Gen. Gregory S. Martin, Principal Deputy Assistant Secretary of the Air Force for Acquisition

For reservations at The Broadmoor Hotel, call (800) 634-7711 and identify yourself as an attendee of the Air Force Association symposium or dinner.

Dinner & Symposium Only: "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."

If you have any questions regarding the Acquisition Update Symposium or golf tournament, please contact **Judy Arnold, (719) 277-4028, fax: (719) 277-4372.**

If you have any questions regarding the USAFA Outstanding Squadron Dinner, please contact **Barbara Coffey, (800) 727-3337, ext. 5805.**

Note: Government prices for the golf tournament and symposium are available.

Pieces of History

Photography by Paul Kennedy

A Little Bit of Everything

From a flight helmet to the ubiquitous computer keyboard, these items represent the many career fields—for both enlisted and officer members—in the US Air Force. Training certificates and a desert camouflage hat also convey the range and worldwide scope of USAF responsibilities today. In the same way, Air Force Magazine's premier "USAF Almanac" has taken a comprehensive look at USAF each year since 1958—covering changes, trends, and developments in the Total Force.

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