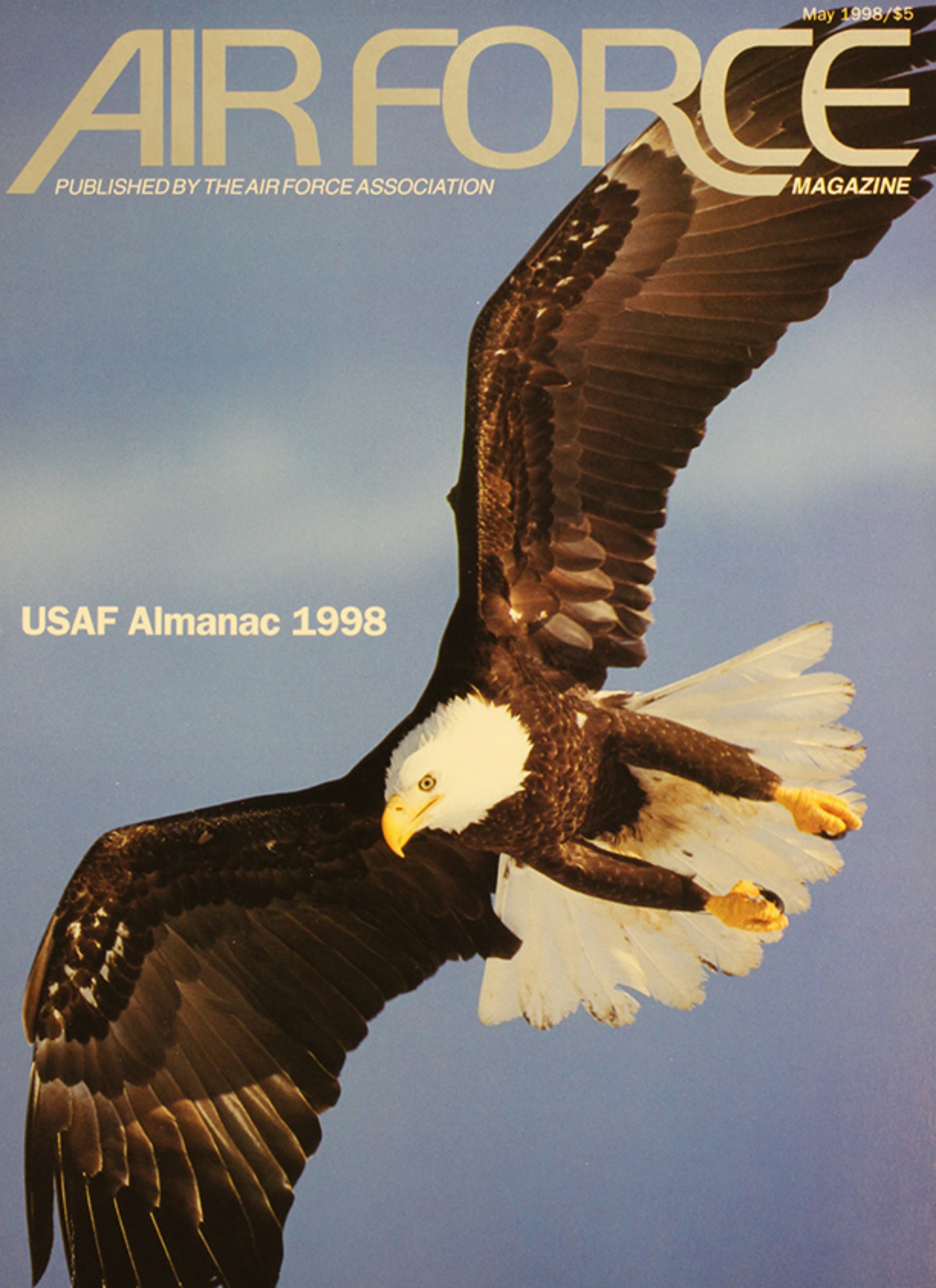
May 1998/$5

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE



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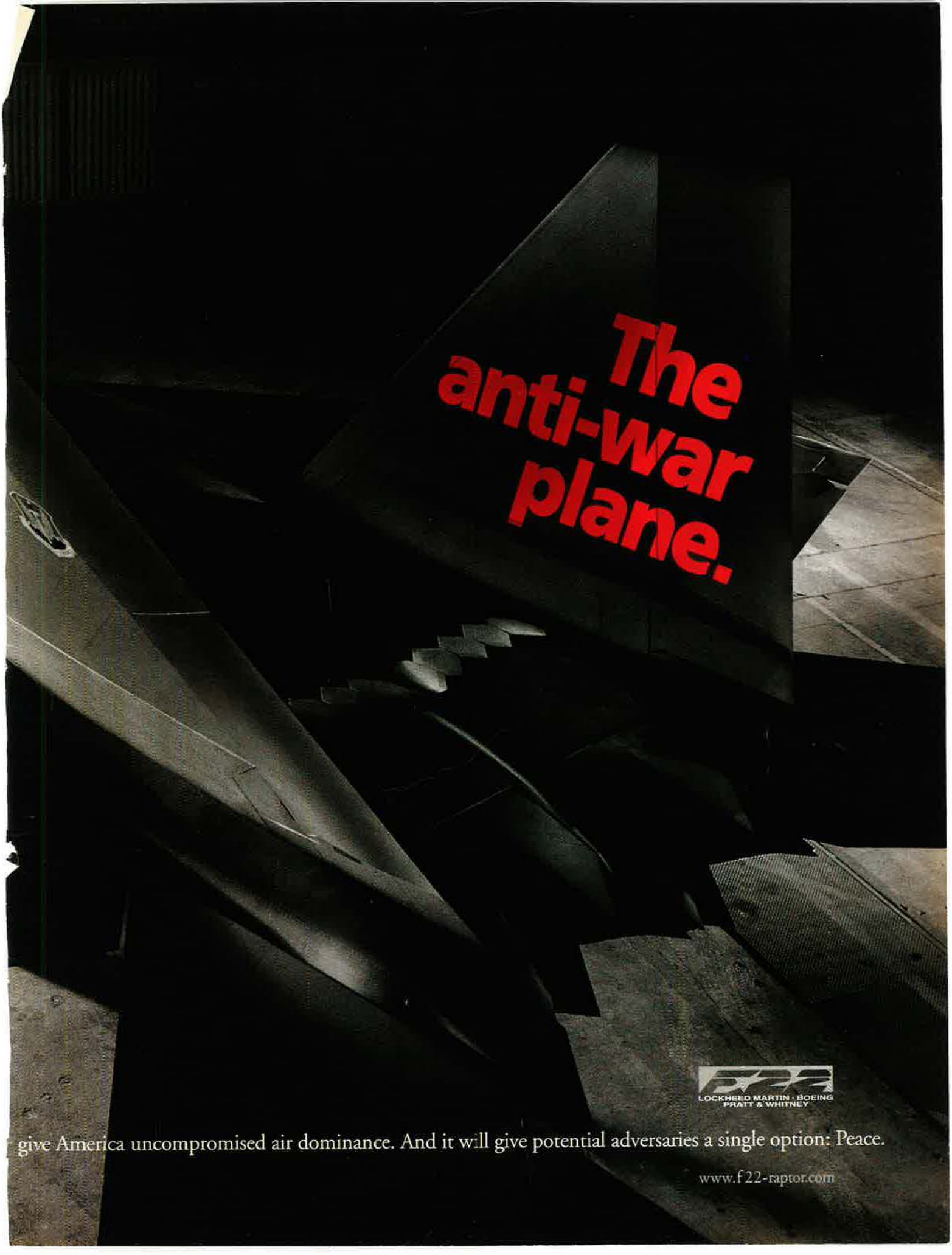
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May 1998, Vol. 81, No. 5

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

About the cover: An eagle on the wing symbolizes the US Air Force, now under way in its 51st year. Photo © Tom and Pat Leeson.

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A JOINT SERVICE PROGRAM

Editorial

By John T. Correll, Editor in Chief

A Strategy of Uncertainty

ONE of the first things the Clinton Administration did upon taking office was dump the Weinberger Doctrine. In 1984, Secretary of Defense Caspar Weinberger had formulated a series of tests to be satisfied before American troops would be sent into combat.

Is a vital US interest at stake? Will we commit sufficient resources to win? Will we sustain the commitment? Are the objectives clearly defined? Is there reasonable expectation that the public and Congress will support the operation? Have we exhausted our other options?

Unlike our failed adventure in Vietnam, the Gulf War of 1991 met all of the Weinberger criteria. The nation had learned its lesson—or so it seemed at the time—and had found a wiser standard for when and how our armed forces go to war.

However, Les Aspin, the first Secretary of Defense in the Clinton Administration, rejected what he called the "All or Nothing" school of strategy and sought a less restrictive rule for committing troops to combat. He endorsed a "Limited Objectives" approach in which, for example, the purpose of air strikes might be to send political signals to an adversary.

A year later, Aspin was gone from the Pentagon, in part because 18 American soldiers died when an insufficiently supported and supposedly limited humanitarian relief mission in Somalia suddenly turned into a lethal firefight, but the "Limited Objectives" concept rolled on.

Since then, the United States has progressively lowered the threshold for engaging in combat. We have become increasingly willing to employ the armed forces in situations where the military purposes are vague or undefined.

For the past eight years, we have maintained a military force in the vicinity of the Persian Gulf to "contain" Saddam Hussein's regime in Iraq. We have conducted several symbolic strikes against Iraq. These were not meant to have any real military effect, but rather to send messages. There have also been countless threats and warnings. Somewhere along the way, the coalition that stood with the United States in the Gulf War atrophied.

Last fall, in a prelude to the latest crisis, we responded to violation of the no-fly zone by bringing in an aircraft carrier from the South China Sea, 7,000 miles away, "to send a signal to Iraq." A clearer signal, perhaps, was sent by our presumption that we could not call upon—or even mention in the Administration's blustery warnings—the 120 Air Force combat aircraft already there.

In the recent crisis in the Gulf, our objectives kept shifting. Furthermore, our commitment was weak and tentative.

A month later, Saddam threw out the Americans on the UN inspection teams looking for his hidden chemical and biological weapons. When he grew bolder in his defiance, declaring various sites off limits to inspectors, the United States responded with—what else?—more warnings.

We built up a large theater force, including hundreds of aircraft, dozens of ships, and 33,000 troops. It was not clear, though, what we actually intended to do if Saddam did not take the messages we were sending him to heart.

Our objective was also unclear. In January, it was to "deny" Saddam the ability to build and use weapons of mass destruction. A month later, it was to "substantially reduce or delay" his acquisition of such weapons.

As the prospect of a shooting war drew closer, it was obvious that we were improvising. We had put our faith in sending signals and when that failed, we were caught short in our planning.

The Administration finally understood that "pinprick" attacks would be useless. Airpower was our best asset, but we could not find and destroy Saddam's entire chemical weapons capability with air strikes. The connection was tenuous, at best, between the force we threatened to unleash and the results we expected to achieve by doing so.

To make matters worse, our determination was lukewarm. Secretary of State Madeleine Albright explained that "toppling Saddam requires a far vaster commitment of military force and a far greater risk" than we were prepared to undertake.

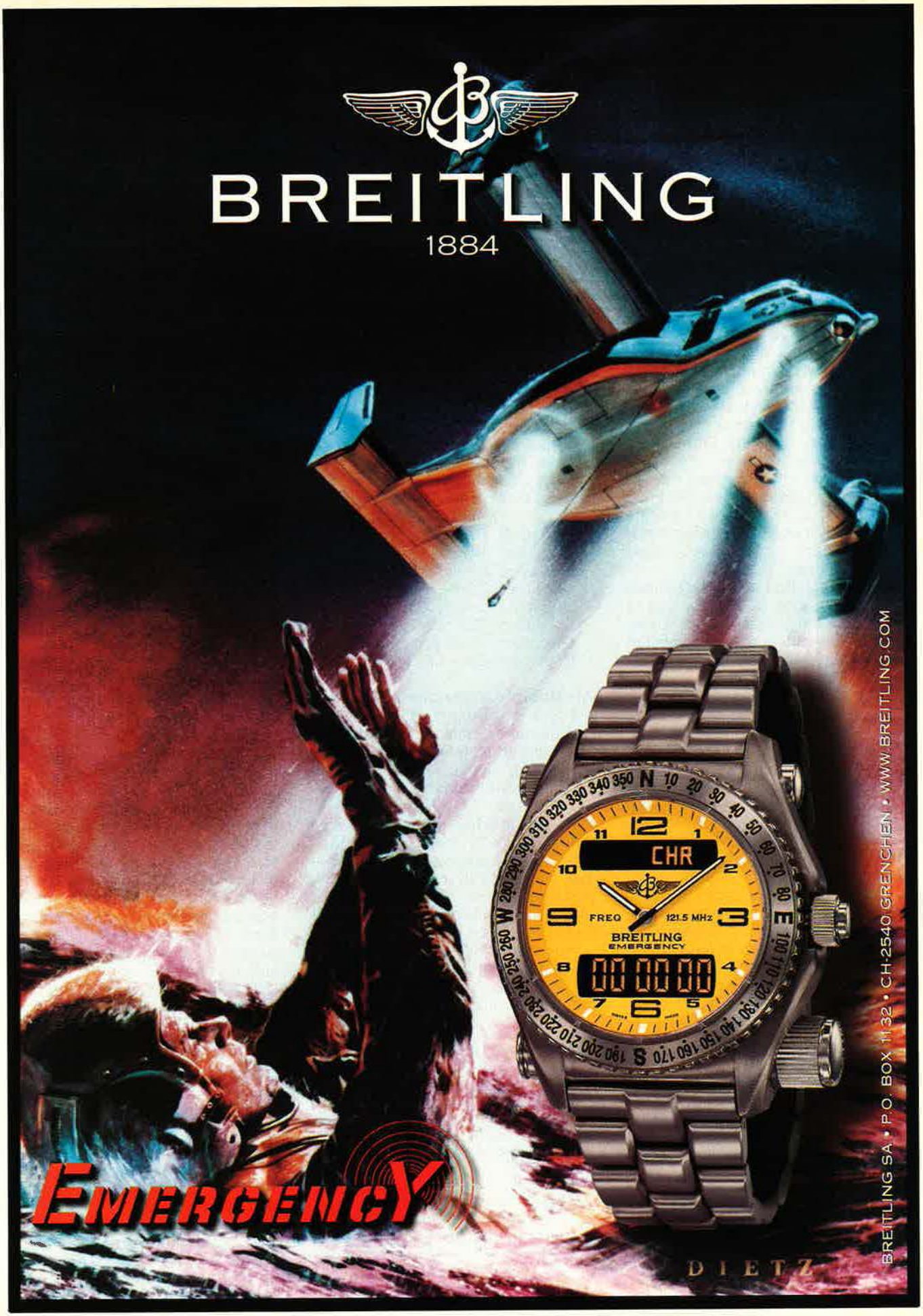
We eventually settled for Saddam's promise to let the inspectors back in, in return for which he received all sorts of valuable concessions. No wonder he declared Feb. 23 the "Day of the Flag" to mark Iraq's victory over the United States.

For all of the things that were wrong with his mission to Baghdad, UN Secretary General Kofi Annan got us off a difficult hook. We were not in a position to follow through on what had been said in all of our signals, messages, and warnings. The nation gained another chance to learn about the exercise of power.

The Administration could benefit from study of the Weinberger Doctrine, which holds up quite well against the backdrop of recent events. The use of military force to send signals to an adversary fits comfortably within it—provided we are ready to take serious, relevant, and sustained action if our warning shot fails.

Strategy must be based on objectives that can be specified and which we have the means and the will to accomplish. It will not work if we do not know what our objectives are or if we are short on either capability or will.

Improvisation and warnings that we are not fully determined to back up are not a substitute for strategy. They are an invitation to disaster. ■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Letters

More Mustangs

I just read the article "Mustangs" *[p. 52]* in the March issue. I don't understand why there is no listing for Gen. Robert E. "Dutch" Huyser. I remember being staff duty officer at Strategic Air Command headquarters one evening when he, as director of Command Control, was waiting on some folks to take on a tour of the underground. A young Elite Guard asked him if he had ever expected to make general. He responded, "When I made tech sergeant I thought I had gone as far as I could go." Later he told the airman, "My grandmother never forgave me for not making master sergeant."

I also recall that he touted himself as being the first USAF four star to come from the enlisted ranks. There must be something of which I am not aware that precludes his being included in this group.

Col. Tommy G. Harrison,
USAF (Ret.)
Apopka, Fla.

■ *We took our Mustang list from the Air Force Enlisted Heritage Research Institute at Gunter Annex, Maxwell AFB, Ala., and included all of the Mustangs on the "Wall of Achievers" there. Since publication of the article we—and the institute—have been informed of other Mustangs. We have forwarded the names, listed below, that we have received to the institute, which is pleased to have them. In addition, our article wrongly listed Lt. Gen. Trevor A. Hammond as a brigadier general.*—THE EDITORS

Brig. Gen. William J. Becker
Maj. Gen. Gary C. Blair
Brig. Gen. Stanford E. Brown
Maj. Gen. Rupert H. Burris
Maj. Gen. (Rev.) Richard Carr
Maj. Gen. George E. Chapman
Lt. Gen. Joseph R. DeLuca
Gen. Russell E. Dougherty
Lt. Gen. Hans H. Driessnack
Lt. Gen. Walter D. Druen Jr.
Maj. Gen. James C. Enney
Maj. Gen. D.L. Evans
Maj. Gen. John L. France
Brig. Gen. Eugene W. Gauch Jr.
Gen. James V. Hartinger
Gen. Robert E "Dutch" Huyser
Gen. Andrew P. Iosue
Gen. Richard L. Lawson
Maj. Gen. William E. Masterson
Gen. William V. McBride
Brig. Gen. Lawrence A. Mitchell
Brig. Gen. Robert L. Moeller
Brig. Gen. Haskell E. Neal
Maj. Gen. Earl G. Peck
Brig. Gen. Attilio Pedroli
Maj. Gen. Thomas F. Rew
Gen. Thomas C. Richards
Brig. Gen. Billy F. Rogers
Brig. Gen. John P. Rollston
Brig. Gen. Albin H. Schweers
Brig. Gen. Robert L. Scott Jr.
Brig. Gen. William L. Shields Jr.
Maj. Gen. Joseph L. Shosid
Brig. Gen. Regis F.A. Urschler
Brig. Gen. James M. Vande Hey
Brig. Gen. Rudolph F. Wacker
Gen. Larry D. Welch
Brig. Gen. Edwin F. Wenglar

Air Mobility, Operational Mission

I find it worrisome that you use "maintenance, supply and acquisition of materiel" to expand the "value of logistics," without discussing transportation *["Air Mobility Is an Operational Mission," March, p. 4].*

If one thing has really changed in recent years in the logistics business, it is transportation. Rapid, flexible, and relatively inexpensive transportation is a combat force multiplier (operational mission), like it had never been in the past.

Recent deployments to Southwest Asia have been leveraged by express carriers (both commercial and Air Mobility Command's), and support for our aircraft fleets has been exceptional. It must be understood that transportation, regardless of who provides it, is an integral part of the logistics chain, which includes maintenance, supply, and acquisition. The key word is integrated. The more folks [who] understand this, the more efficient our power projection and sustainment will become.

It's true that the Berlin Airlift effort was truly admirable; however, people tend to forget "the rest of the story": All the integrated links of the logistics chain that also were part of that effort, such as maintenance, supply, acquisition, and transportation of materiel to get the "stuff" to the airlift aircraft. That was quite a story also!

Col. Guy "V8" Vanderman,
Commander, 49th Logistics Group
Holloman AFB, N.M.

I mean no offense, but I think you were in error with your editorial. If your notion were followed, a truck convoy would be an operational mission as would a rail movement of troops or supplies. I doubt you intend that.

Air mobility is in truth an aspect of the logistics world. If we might accept that logistics is a system established to create and sustain military capability, then everything in the Air Force other than the combat operations, and perhaps intelligence (although I think intelligence should also be considered a logistics element), is in reality part and parcel of logistics.

This concept seems, at last, to be gaining favor in the Air Force. In the latest issue of the *Air Force Journal of Logistics,* Lt. Gen. William P. Hallin states the new thought that manpower (not his terminology), as an example, is in fact part of logistics. If one were to consider [that] the creation and sustainment of military capability is impossible without manpower, one could readily see how that element fits in the logistics system. The same is true, and has been for more than a hundred years, about transportation in which air mobility is a vital part.

You even stated, "The primary wartime role of air mobility is to get

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the other forces to the fight and sustain them until sealift begins to arrive, several weeks later." I think you have, unintentionally, used the above definition of logistics and turned it to support your claim [that] air mobility is an operational mission. I do believe you short change the logistics world by omitting a basic element of transportation from it.

Jerome G. Peppers Jr.
Fairborn, Ohio

We should all be aware of the value of airpower in any military campaign, but many tend to overlook air mobility's contribution to airpower. The term "airpower" usually evokes images of sleek fighters, attack aircraft, or huge bombers. They are without a doubt the cutting edge of our air arm. However, by the time these aircraft first arrive at their forward location—thanks to extensive air refueling—the airlifters have already been there, delivering ground equipment, supplies, support personnel, and ammunition. As my group commander likes to say: "Nothing happens until we happen."

Correll's editorial was eerily familiar to me. I attended the NCO Academy last fall, and I chose airlift as the theme of my final paper and speech. Though I was heavily restricted in format and length by the curriculum (one of the reasons I had to limit myself to the airlift side of air mobility), my position, and even some of the examples I used, were very much like those in [Correll's] editorial.

Simply stated, air mobility is the linchpin of airpower. Without air mobility we would not be able to achieve and maintain air supremacy. Air mobility is not a glamorous business. It gets no press, no glory. It's not the theme of books or major motion pictures. But no one can deny that an airlifter, loaded with paratroopers, on its way to an unfriendly drop zone is the epitome of Global Reach, Global Power.

TSgt. Carlos D. Cisneros,
McChord AFB, Wash.

LeMay

The cover story *["LeMay," p. 60]* in your March edition about Gen. Curtis E. LeMay was very well done and long overdue. The author contends that LeMay was the greatest air commander of all time. I would heartily agree and add that, in my judgment, he was the greatest American of his generation.

LeMay is usually pictured as a tough iron ass, with little regard for the feelings of others. Few people recognized that inside, he was a real softy. He accepted the loneliness and isolation that is the lot of military commanders who are constantly faced with making tough decisions concerning the life and death of others, but he loved his men and it distressed him when they had to die needlessly. This is why he was so intolerant of incompetence. It cost lives.

When he commanded XX Bomber Command in the China–Burma–India Theater, I commanded one of his groups. At the same time, SSgt. George E. Wallace was a member of my group. For this reason, LeMay's decision to run for vice president on George Wallace's ticket in the 1968 Presidential election seemed stranger to me than it must have to most people. [I had the opportunity to ask] him why he was doing what he was.

He knew, of course, that he couldn't win and his present action would tear holes in his reputation as a legendary commander and wartime hero. He told me, as was his way, in a very few well-chosen words that it was a job he didn't particularly enjoy, but it was a job that needed to be done and there didn't seem to be anyone else around to take it on. This was, when you looked at it, typical LeMay—just like so many of the tough decisions that he had been called on to make during his military career. He faced a difficult decision, took the action that he knew was best for his country, and let the chips fall where they may.

I consider myself fortunate to have known him and to have worked for him. I loved him in a very special way, as did thousands of guys like me who had been lucky enough to have served under him.

Lt. Gen. James V. Edmundson,
USAF (Ret.)
Longboat Key, Fla.

Walter Boyne's expertise on aviation topics crash-landed when he attempted to overfly the political history of LeMay's failure as vice presidential candidate in the 1968 election. George Wallace had been elected governor of Alabama in 1962 with a segregation platform similar to his opponents. By 1968, he was neither a segregationist nor governor.

The Wallace philosophy pushed states' rights, allowing the military to win the Vietnam War, respect for the flag, cutting foreign aid to our enemies, putting strict constructionists on the Supreme Court, and stopping pro-communist agitators. Which of these did LeMay allegedly "despise"? Furthermore, the week before LeMay joined the American Independent Party team, the polls pegged Wallace support at 28 percent, Humphrey at

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Letters

31 percent, and Nixon at 38 percent. If LeMay made the race just to prevent Humphrey from winning the White House, he almost did the opposite. The general's personality and his "misstatements" to the press put the Wallace campaign into an immediate nosedive. "The Wallace Error" was thinking an expert in strategic bombing could be equally successful in political combat.

J.L. Crowder
Edmond, Okla.

"LeMay" brought back a lot of memories about Strategic Air Command. I recall being taught, as a young KC-135 tanker copilot, the importance of adherence to checklists. Everything we did was done "by the book," and the book was written by LeMay.

Interestingly, I was also told a contrary [saying], which I have never been able to verify, attributed to LeMay which said, "Checklists were designed for those who [don't] know what to do." Sounds like "Look before you leap" vs. "He who hesitates is lost."

As much as we acknowledge LeMay's greatness, we should also pause to reflect that it was a good thing for him personally that America won World War II. If the Japanese had prevailed, LeMay would have swung at the end of a rope following his conviction for war crimes at a Japanese version of the Nuremberg trials. His firebombing of industrial targets in Japanese cities killed hundreds of thousands of civilians. The prosecutors would not have needed to even mention the two atomic bomb attacks.

Lt. Col. Douglas W. Schott,
USAF (Ret.)
Clinton, Tenn.

My thanks for a superb article. Many years ago, I first saw LeMay in an issue of *National Geographic* magazine. I will always remember reading about this man and his Air Force. I was given this prized 1965 issue. It is a keepsake.

I am very fortunate to have another—my own interview with LeMay in May 1987. I met the "Father of SAC" when he visited Wurtsmith AFB, Mich., with an inspector general team. What a way for me to start out in the Air Force! Here I was, a two-striper, fresh out of basic training and undergoing my first IG. I was now sitting across the table from one of the most famous generals of all time! It really was a childhood dream come true.

LeMay was a true leader. He always put his country and the Air Force before himself. He certainly was the right man at the right time for this nation. When I recall the days of SAC, the Cold War, alerts, and "elephant walks" at Wurtsmith, I'll always remember this man. He was one of the reasons I joined the Air Force and why I still believe in it so strongly.

Andrew Biscoe
Post Falls, Idaho

Your article on LeMay brought back memories. One fine day a B-52 landed and to everyone's surprise out came LeMay, cigar and all. He made his customary calls to the "head shed," shook hands with the wing and base commanders while I stood at attention trying to look inconspicuous, three stripes and all. Here he came right at me, extending his paw and chomping his cigar: "My name's LeMay, take me around the base, son."

For the next three hours, we went everywhere: the airmen's quarters, clubs, hospital, commissary, flight line, front gate, back gate—you name it—he saw it. He stopped, he talked, he shook hands, he chomped and sometimes relit his cigar. He went to a dining hall and had chow with the troops and swapped stories all around.

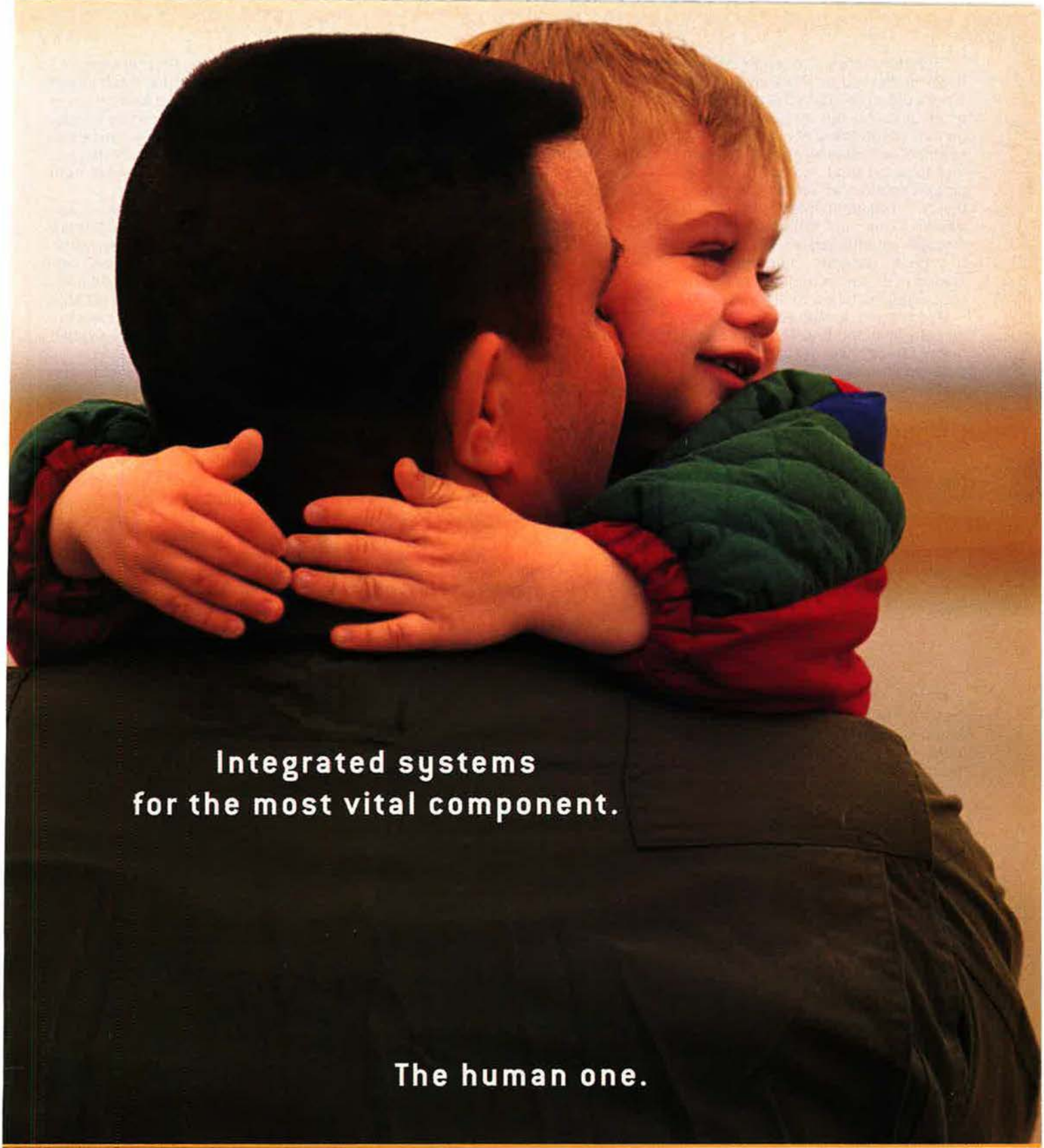
He not only was a great general, he was one hell of a fine gentleman. What else can I say?

CMSgt. Lloyd Greenwell,
USAF (Ret.)
Sherwood, Ark.

LeMay was good for SAC. [However,] in the 1964–65 time period when the war in Vietnam was escalating, we had captains holding flight commander slots in F-105 and RF-101 units. We, who were flying combat, could not get spot promotions for our deserving aircrews. At that same time, SAC aircrews had their spots because they received high marks on relatively safe noncombat bombing missions. Yes, LeMay was a great leader, tactician, etc., etc., and he took good care of his SAC crews.

Lt. Col. Tony Weissgarber,
USAF (Ret.)
San Antonio

Those of us who served under Curt LeMay when the B-36s were being phased in tend to remember him with a cigar in his face, which made him look even tougher than he did without one.



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The story went that when he had been in the South Pacific, he had smoked a pipe, as in the photos on p. 60 and 63, but at one point the people responsible for shipping PX supplies overseas had been unaware that tobacco products not sealed in airtight packets would inevitably turn moldy in the damp heat of the South Pacific. The only tobacco that got through undamaged was in the form of cigars, possibly Upmans, each sealed in its own aluminum cylinder. So LeMay switched to cigars.

By contrast, Joseph Stalin, our gallant ally in World War II, favored and never abandoned a curvy-stemmed pipe that made him look so avuncular that he was commonly referred to as "Uncle Joe."

If fate had decreed that Stalin had overcome his distaste for anything so bourgeois as cigars, and LeMay had had his choice of pipe tobacco while in the South Pacific, we Americans might have got over our notion that we had to be nice to our wartime ally sooner than we did, and LeMay might have emerged as a slightly more mellow version of Mr. Tough Guy.

Lt. Col. Frank Holan,
USAF (Ret.)
Putney, Vt.

No one could be more delighted than I am with the cover of the March issue. At last the public can see these uniforms and memorabilia. I have been campaigning since 1996 to get the [National Air and Space Museum] to appreciate the disgraceful way in which they house the LeMay uniforms and artifacts. When I saw them in 1996 they were stored in what looks like an industrial refrigerator with slits of windows in the doors. They were spread out on shelves in such a way that the uniforms and artifacts could be viewed only with some difficulty. This box is at the foot of a flight of stairs in a waiting room amid old, beat-up furniture and soft drink dispensers in an atmosphere that reminds me of a tired, old manufacturing plant's locker room.

The late Mrs. LeMay and her daughter gave these artifacts to the museum with the understanding that they would be properly displayed in a setting that would be in keeping with the stature of their husband and father. They specifically selected the NASM as the repository for these artifacts, expecting that they would be in the hands of a museum management that would respect them. Such appears not to be the case.

William A. Rooney
Wilmette, Ill.

■ *It should be noted that the NASM was very cooperative in working our request to photograph the LeMay memorabilia.—THE EDITORS*

Wrong Name

Of course, we are quick to point out mistakes, so long as it's your error not mine. [In the] March issue, the picture at the top of p. 66, second person from left is Lt. Col. Joe O'Grady, not O'Brady.

Bill Strang
Uniontown, Ark.

Comparing Defense Spending

Your article on US defense spending *["How US Defense Spending Compares," March, p. 72]* is fundamentally misleading. It would be more accurate if you compared US spending in the NATO theater to that of our Allies. Remember, we "choose" to be a major world military power, whereas our Allies are "content" to provide basic national and regional defense. Yes, the burden is ours, and it is self-created.

Capt. Joseph L. Stupic,
Hanscom AFB, Mass.

Your article was very informative and provocative. Such a study, however, could lead to shortsighted discussions about the advantages of reducing even further our already scanty defense spending.

Since our military role is still global in scope, it makes more sense to compare US spending with all important countries in the world—including China, Russia, and Japan, as well as several others. Such a study will not only put our defense spending in proper perspective, but it will also inevitably suggest the need for further examination of the connection between our lead in world technology and our global position in defense spending.

The other issue in your article which makes me nervous is the question about relative spending on hardware and personnel. This may lead to a slippery slope where one gets sacrificed in favor of the other. In order to maintain our lead militarily, we must emphasize both so that our national interests are always defended by the best people using the most advanced technology.

Peter Kenney
Birmingham, Ala.

Making the Case for FEHBP

"Making the Case for FEHBP" *[p. 40]* in the March issue makes the third consecutive month in which *Air Force* [Magazine] has devoted space to the topic of converting military retirees over 64 to the federal workers'/retirees' health program. Each month you skirted the fact that federal workers have contributed funding to support our program throughout our working lives while the military person and dependents used government facilities for free.

FEHBP took our contributions, copayments, and deductibles while we were younger and needed less care. Now that we are older and will certainly require increased medical attention, the funds will be available from our own contributions as well as from younger workers. This system works fine.

Insert the aging military person with dependents and the system becomes skewed with extra demands for medical insurance once these folks join FEHBP, having never contributed a dime to its support. I debate [the author's] point that only a diminished number of retirees would join the federal program. Depending on coverage choice, a retiree could judiciously eliminate the added expense of Medicare Part B—a selling point to many who could use the extra cash.

I know that the federal government has not lived up to its military health care pact. When I was in the service, I heard these same, now empty, promises. I admit that it is self-serving, but as a federal retiree, I do not want my health premiums to rise based on a sudden addition of aging participants to my health plan. I would have no objection if the "separate risk pool" [were] strictly maintained. But I now have visions of my health care program becoming unattainable if the "Feds" eventually trash their insurance covenants with federal retirees based on increased budgetary costs.

Roger C. Ferguson
Sleepy Hollow, Ill.

Your article was both interesting and informative. Health care for retired military personnel on a par with our civilian brethren is long overdue.

I am a medically retired senior master sergeant, 66 years of age, and also retired from the postal service four years ago. I carried my FEHBP insurance over into retirement. One does not have the option of rejoining the program after you once drop it. Currently Medicare is my primary health insurer and FEHBP is my secondary, whereas my wife, who is 64, has FEHBP as primary and Tricare Standard as secondary.

I agree with the Military Coalition that costs would not be as high as feared. One reason is that current FEHBP enrollees have children. Obviously this adds to the cost of the

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program. There would be relatively few FEHBP–65 enrollees with children.

Tricare Standard utilizes a different formula and pays less than the old CHAMPUS program. We receive very little in Tricare benefits. Routinely, Tricare Standard allows only 75 to 85 percent of the amount that FEHBP allows. Because of the small amount that Tricare pays, few of my wife's health care providers file with Tricare. They deem it not worth the administrative overhead.

I enthusiastically support the FEHBP–65 demonstration program. The military health care afforded [military] retirees is a joke and health care needed by senior retirees and their families is no joke! Logically, Medicare would shoulder the bulk of the expense as primary insurer. A separate risk rate should be established as most enrollees would have FEHBP–65 as secondary insurer.

SMSgt. Daniel J. Harkins Jr.,
USAF (Ret.)
Middleburg, Fla.

First: "The Department is not opposed to an FEHBP demonstration program ... where Tricare Prime is not offered." Since Tricare eligibility ends at age 65, which is where almost all FEHBP proposals start, what does one have to do with the other? DoD doesn't have a better idea—Tricare Prime, even if extended, certainly isn't one. In a similar vein, in an article a few months ago, the Air Force Surgeon General was adamantly opposed to FEHBP because of its impact on Tricare, yet the programs have no discernable overlap in any remotely viable proposal. Why the opposition?

Second: "Those who will be reluctant to pay FEHBP premiums on top of their Medicare Part B costs." Is FEHBP simply an expensive Medicare supplement? Why else should anyone pay both FEHBP and Medicare Part B? If there's some linkage, I've managed to miss all references to it. Third: Where do those who are under 65 yet forcibly transferred from Tricare to Medicare, e.g., a dependent who becomes disabled prior to age 65, fit in the FEHBP picture?

Lt. Col. Michael Hansen,
USAF (Ret.)
Alexander, Ark.

Tricare Prime Is Dead in Dallas

Col. David E. Langdon *["Letters," March, p. 6]* hit the bull's-eye. He noted, "This area's two largest primary care groups, [with] 15–20 respected physicians each, no longer participate" in Tricare.

After a few years of being reimbursed 75 percent of CHAMPUS allowable charges which were often less than half the doctors' fees, when Tricare Prime became available in north Texas a little over a year ago, I embraced it with hopeful enthusiasm. All was fine for a year. I had a good primary care physician, and referrals to specialists were made as needed. However, two months ago my primary care physician informed me that she would no longer participate in the Tricare Prime program.

I have been unable to find a participating Tricare Prime primary care physician in the immediate area. I have found a grandfatherly general practitioner in a town 15 miles away who accepts Tricare patients, I believe, out of pity.

The doctors in this area gave Tricare Prime a good try. It apparently is not worth their while. The program is of no use if hassles and low reimbursement rates drive providers away. Tricare Prime wasn't DOA in the Dallas area, but it died in the emergency room.

Maj. Ralph Hamm,
USAF (Ret.)
Frisco, Texas

More on Dereliction of Duty

R.D. Truitt admits to never having read anything more than a review of H.R. McMaster's book; yet he (she) criticizes the work *["Letters," March, p. 7]*. I took the time to read the book.

Operating on the assumption that this is a scholarly work that has been exhaustively researched, I have to take the interviews, testimonies, and other evidence McMaster offers as a true and accurate picture of not only Robert Strange McNamara, but Lyndon Johnson, McGeorge Bundy, the various members of the JCS, and other notable figures involved with getting the US into that "quagmire."

There are several direct quotes by McNamara in which he uses his knowledge of statistical analysis to make the numbers say what he wants them to say. According to McMaster, McNamara's tenure at Ford Motor Co. was marked by his tendency to keep his own counsel and ignore the advice and wisdom of others he regarded as inferior; apparently that was a rather large crowd. He continued along that path when the Kennedy brothers selected him for the job of Secretary of Defense. He was so blinded by his faith in statistical analysis that he was unable to discern the limits of that rather limited discipline. He coldbloodedly chose his own course of action while completely ignoring the counsel of the Joint Chiefs, whom he considered to be inferior. His actions assured the deaths of countless millions of lives.

I took the title and content of McMaster's book to mean that not only were McNamara and the civilian component of the US government derelict, the Joint Chiefs were derelict as well in not opposing more vigorously McNamara's ill conceived plan of action.

[I] served through that entire period, [and] McMaster's book confirmed what I either suspected or was told about the decision making processes of the day. Yes. The whole damned bunch was derelict, and Truitt needs to refrain from shooting from the lip.

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

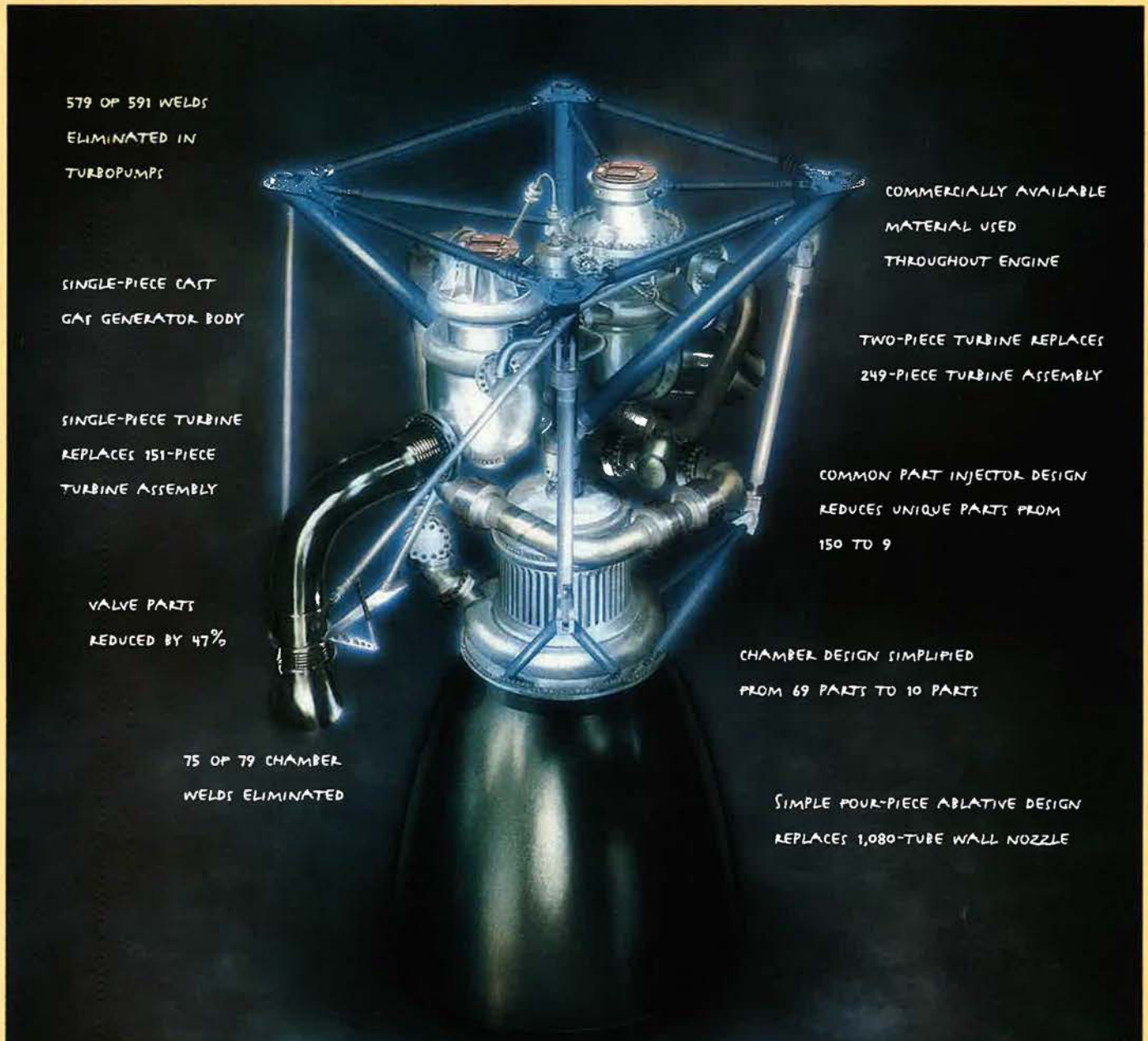
Yesterday I finished reading H.R. McMaster's [book], and today I opened my copy of *Air Force* Magazine and found the letter from R.D. Truitt concerning the book. Like Truitt, I was made aware of McMaster's book by the description of it in the January issue of the magazine, but unlike him I looked for the book and read it. What is new in the book is the meticulous documentation of research material hitherto unavailable.

Nowhere does McMaster indulge in "sensationalizing" or in "gratuitous name-calling," nor does he accuse anyone of deliberately setting out to subvert the Constitution. Rather he shows in a painstakingly thorough way how this resulted from a series of politically motivated decisions abetted by deceptions, compromises, and mistrust of the people and their representatives. The end result was the entry of the US into a long, bloody, undeclared war that many feel was "the wrong war fought in the wrong place for the wrong reasons."

Truitt made the case that a better book could be written about the mistakes made in Southeast Asia by backing the wrong type of government to stop the spread of communism. This may be so, but I think that an examination of McMaster's book shows that in the case of Vietnam, the Johnson Administration, assisted by the Joint Chiefs, prevented Congress from considering a declaration of war as is its constitutional prerogative, thus preventing the very debate that could have kept us from that kind of mistake.

Lt. Col. Richard A. Ward,
USAF (Ret.)
Seaford, N.Y.

R.D. Truitt faults Maj. H.R. McMaster for "gratuitous name-calling"



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based on "hindsight" because McMaster says the Kennedy–Johnson Administration in the Pentagon was "deceitful." I am perhaps the only survivor of the tiny group of journalists, led by Hanson W. Baldwin, then military editor of the *New York Times*, who charged Robert S. McNamara with a pattern of deceit from his earliest months in office. The price we paid for that, Baldwin included, was to be driven out of print by editors who fairly worshiped McNamara and his "Whiz Kids."

Having by then returned to active duty, I was present on March 2, 1966, when McNamara read to a press conference a detailed listing of US forces available for deployment, supposedly refuting a Senate Armed Services Committee staff report that US forces, worldwide, were being gutted to support the Vietnam buildup. The McNamara statement was false on its face. The deployments described could not have been carried out without 15 National Guard divisions that McNamara had declared "excess to military requirements" and was in [the] process of disbanding. The one reporter who dared to question McNamara's figures was thrown out in front of a national television audience. The rest sat like so many sheep, well aware that their bosses would tolerate no criticism of McNamara.

In short, one big reason why the Kennedy–Johnson Administration got the compliant military leadership McMaster ably and accurately describes was because the press stood ready to denounce any military chief who dared to question the civilian leadership in the crucial early 1960s.

As concerns Truitt's notion that the Vietnamese communists were "altruistic," I recommend to him Ho Chi Minh's last testament in which he reduces his country to a mere appendage of the Communist Internationale. The only true Vietnamese nationalist—as confirmed by time in prison as an anti-colonialist under the French—who has ever led any part of Vietnam up to and including the present day was President Ngo Dinh Diem of South Vietnam, whom the Kennedy Administration abandoned. Credit McNamara with having opposed that fatal betrayal, fatal to Diem and ultimately to us.

Col. William V. Kennedy,
USA (Ret.)
Wiscasset, Maine

In shortening my letter concerning the H.R. McMaster book, you omitted all but the penultimate sentence of my final two paragraphs. By lifting this sentence and inserting it at the end of some earlier paragraphs, you inadvertently rendered it, and my conclusion, a non sequitur.

The [stricken] paragraphs read: I think this book will be very useful, however, to those who would like ammunition in the quest to convince doubters that a course of action advocated by the military is probably the most effective and efficient course, where force is to be applied. There is a slight problem with swallowing this thesis whole, however, and that is the danger that military leaders, who are not elected on the basis of their political acumen, can misconceive an international situation as solely subject to a military solution of overwhelming force, or none at all, where a show of force, token strikes, or posturing (saber rattling) might be much more effective in changing minds or altering behavior. This is where political acumen and leadership come in.

In sum, we seem to hate the middle ground, but that is where politicians operate most effectively. That this Jeremiad would have you believe otherwise is not its major flaw; it is that it tries to purposely skew the data.

Postscript: Panama, Haiti, Bosnia, and now Iraq II, may be fairly considered examples of effective "middle ground" politico–military strategies.

R.D. Truitt
Summit, N.J.

■ *As stated in our "Letters" policy, we reserve the right to condense letters. We do not think that cutting the referenced paragraphs altered the opinion expressed by reader Truitt on McMaster's book.*—THE EDITORS

Employ the B-2

I was delighted to read in the March issue of *Air Force* Magazine that the Air Force is using the B-2—even if it is simply to buzz the Super Bowl. As one who flew "Buffs" and worked on the B-1 and B-2 programs, I can't for the life of me figure out why we haven't seen any inclination to employ B-2s in the Iraqi theater of operations. How can this nation justify spending a billion dollars a copy for an airplane just to use it for flybys?

In the same issue, there is a discussion by the National Defense Panel that "the NDP is pushing for longer-range aircraft" and that the US doesn't "have a long-range aircraft on the drawing boards that follows or replaces existing systems." If we don't use weapon systems like the B-2 because of their cost, it doesn't matter how invulnerable they are. If we aren't going to use them, why would you need a replacement?

One B-2 can carry the precision ordnance of four F-117s. Anyone who has seen the film of the GPS–aided bomb drops conducted by two B-2s last year has got to ask why these birds aren't orbiting Baghdad at this very moment (especially when you consider the survival rate of a B-1 flying a Sensor Fused Weapon sortie over the Republican Guard at 300 feet!). B-2s: Use 'em or lose 'em.

Lt. Col. E.T. Van Keuren,
USAF (Ret.)
Bellevue, Neb.

Airborne Diplomacy

I applaud and concur with [retired] Lt. Col. Bert Pryor's letter *[p. 6]* in the March issue—especially the last comment about the Airborne Battlefield Command and Control Center's omission from the Electronic Triad. ABCCC has been involved in every contingency since Vietnam, not to mention a few others not published. It's unfortunate that such a proven platform never gets the recognition it truly deserves. ABCCC's [unit (7th ACCS) flag] had battle streamers galore hanging from it. Since [the unit's] recent move to Davis–Monthan AFB, Ariz., [it was] redesignated the 42d ACCS to fall in numerical order with the other units. The 7th ACCS flag was transferred to an ever fading EC-135 platform at Offutt AFB, Neb. With the EC-135's deactivation this year, ABCCC's true designation (7th ACCS) will fade away forever.

My suggestion is to salvage a very historic unit and give them back their name and history! I thought a few years back they wanted to keep unit designators with the most historic value. New regime, new policy?

TSgt. Larry P. Helland,
USAF (Ret.)
La Plata, Md.

Why They Leave

Kudos to retired Lt. Col. John Cary *["Letters," March, p. 8],* but colonel, a couple of corrections. There were a lot of complaints about ticket punching in Vietnam, and it is more than just pilots getting out, now. I have 19 years in and have never thought more about getting out until the last year.

My young loadmasters are getting out in droves, too, even though they tell me they love their jobs. The reason: ticket punchers. At my wing in the three years I have been here, we have had two wing commanders, three operations group commanders, three squadron commanders, and seven operations officers. Many have been super people and great leaders, but the problem is consistency. Every time we achieve a clear path, an-

other leader comes along and wants to chart a new path. The unstableness is what drives even the most stout of heart to punch out, and even reenlistment bonuses and increased pay don't make people want to stay around and reintroduce a new set of senior leadership to the unit's mission every six months.

MSgt. Kevin Perdue,
Little Rock AFB, Ark.

Tankers and More

Air Force historian Richard K. Smith's outstanding tribute to the 3,000 "invisible" women and men who maintain and fly the the 500 "invisible" tankers explained in simple terms why the Air Force has global reach and global power *["Letters," March, p. 6].* Arguably, tankers are not only the greatest single advancement in military aviation but also in military tactics. The recent exercise that saw American parachutists land in oil rich Kazakhstan proved the wisdom of buying the C-17s, but it was a ho-hummer for the "invisible" tanker folks who made the nonstop airlift trip from our east coast possible.

As Smith stated tankers didn't just simply happen. Truth be known the Air Force had to be dragged screaming and kicking to adopt tankers in the first place. They were persona non grata during World War II, not because our bases were close enough to our enemies, as foolishly stated in a postwar training film, but because they would have upset the sacred tradition of high-altitude formation flying.

The old Army Air Corps could have realized its golden dream of bringing Japan to the peace table by conventional airpower alone if it had accepted tankers when first proposed to aid in bombing Japan. B-29s converted to tankers in 1944 instead of 1948 could easily have instituted single airplane nighttime bombing, found so successful late in the war, from Midway island. This scenario could have saved thousands of American service casualties incurred in fighting for airfields closer to Japan for our pitifully short-range "long-range" bombers. The atomic bombings, the ridiculous five day Soviet entry, the division of Korea, and the subsequent war with its millions of casualties could all have been avoided. Those who advocated tankers in 1943 and those who opposed them remain "invisible." Hopefully historian Smith's soon-to-be-published history of in-flight refueling will shed some light on the subject.

William J. Spelliscy
Orange, Calif.

[Per] Richard K. Smith's letter it seems that [he] has felt the sting many of us in the Air Force feel about not being recognized for our contributions to the mission. I'm sure he realizes that without the efforts of hundreds, perhaps thousands, of dedicated support troops nobody could get on the base, let alone fly a mission. So you probably need to add a few more words to the [letter]—civil engineer, services, security forces, military personnel, communications, etc.

TSgt. Mark B. Isaman,
Kelly AFB, Texas

Battle of Arlington Ridge

The letters [in the January and February issues about the location of the Air Force Memorial on Arlington Ridge] from those *who weren't there,* bring to mind much that happened on and around Iwo Jima in 1945 *["Letters," January, p. 6, and February, p. 5].*

For their sacrifice and valor in capturing Iwo, 20th Air Force veterans have always revered every member of the 3d, 4th, and 5th Marine Divisions. We couldn't ease their plight, but they said just seeing "trouble on the way to the homeland" helped their morale. Members of both services, *who were there,* had tremendous affection for each other, so anyone attempting to speak for us today should know how we felt—and feel.

That war wasn't "over" for the 2,400+ B-29s landing at Iwo. Most were quickly refueled/repaired and returned to combat. Those crews were trained, combat ready, adequately equipped, in the war zone, and ready to go. They were priceless gifts to the American people, made possible by valor of the 3d, 4th, and 5th Marine Divisions, to whom 20th Air Force personnel have always offered a respectful "Semper Fi!"

Iwo was more than a crippled-bomber's emergency room. Brig. Gen. Mickey Moore's 7th Fighter Command soon took up residence, and its intrepid P-51 pilots flew 750 miles to Japan, with 20 minutes of fuel allotted for finding, engaging the enemy, and then disengaging, with 750 miles yet to fly "home"—all over water or the enemy homeland, in a single-engine fighter. Airmen were as expendable as Marines, and many didn't return. Instrument weather invariably lay en route or over Iwo. One day, the 7th lost 27 pilots trying to penetrate the weather front. Next day, the 7th was back at it. The 7th would never, never, never quit!

Marines who died at Iwo, like airmen who set foot there but were later lost in aerial combat, would likely want the two memorials as close as they felt to each other, a closeness America should memorialize at every opportunity and never forget. Marine survivors often say, "I would not have survived an invasion of Japan and, because 20th Air Force stopped that war without an invasion, 20th Air Force saved my life," while many 20th Air Force veterans know—and even more believe—Iwo's taking by the 3d, 4th, and 5th Marine Divisions saved their lives. Anyone attempting to speak on behalf of those gallant men should not permit partisanship to discredit their memory, their sacrifice, or either memorial. All were Americans.

The Air Force Memorial should be placed sufficiently close to America's magnificent Marine War Memorial that, when parents and grandparents—especially Iwo survivors—go there, they may walk with their children or grandchildren from one memorial to the other and explain why the two are so located and the rest of this story of valor, cooperation, and sacrifice by American boys who gave all for their country a very, very long way from Arlington Ridge.

Or is Arlington Ridge more sacrosanct than Iwo Jima itself or Arlington National Cemetery, where the nation's dead are buried without regard to rank, race, war, sex, or military service? We think not.

James L. Pattillo
20th Air Force Association
Santa Barbara, Calif.

In your January "Letters" column *[p. 7],* retired Air Force Col. [Mark A. Torreano] sent a letter asking the Marine Corps leadership to "do the right thing." I know most active, reserve, and retired Air Force personnel think that the Marines are the "bad guys" for objecting to the site. I hope every reader does take into consideration that they oppose the site. I must apologize for the pro-Marine reader, who regarded the Air Force Memorial as trash; quite frankly I think that individual needs to learn some respect.

However, judging the Corps' "Jointness" and "civility," I think, is just as bad as calling the Air Force Memorial trash. There are thousands of miles in this great land. Does the [Air Force] Memorial have to be right there? I will get as many people to sign this letter as I can to protest the site. When [I] get out of Marine Corps boot camp and visit the Marine Memorial, I want to see the Marine Memorial, not the Air Force Memorial down the hill, above the tree line. That is why I personally oppose the site. The Ma-

rine Memorial is for Marines—past, present, and future—and to those who appreciate what they have done for our great country. We're not forced to speak Japanese, right?

Robert Leu
Ross Ford, Ohio

Rep. Gerald Solomon(R–N.Y.) opposes the site for the Air Force Memorial because he says it would negatively impact the Marine Corps Memorial. I disagree with his premise; however, his opposition has, at a minimum, given us a chance to reflect on the design of a memorial that would best represent the heroic service of millions of Air Force veterans.

I appreciate all the work the design committee and others have expended thus far, but if the design doesn't dynamically reflect the history of the Air Force or the gallant service of so many, can it truly be one we should construct on this site? I believe the Air Force Memorial should stir the emotions of the viewer and pay homage to those Air Force personnel who sacrificed for the survival of our nation.

I would suggest that we keep the Arlington Ridge site but seriously consider reopening the design phase while we still have the opportunity. We owe it to those who made the ultimate contribution to our freedom no less an effort.

Col. Ross Peeler,
USAF (Ret.)
Fort Myers, Fla.

Greenland Rescue

John Frisbee's story about the Greenland Rescue *["Valor," March, p. 77]* was well done, except that it forgot to include the man in the right seat—Lt. Charles Blackwell. [Lt. Col. Emil Beaudry and Blackwell] were both awarded the Mackay Trophy for "the most meritorious military flight of the year." I am proud to say that I flew all over the Arctic in 1948 as [Blackwell's] navigator in the same C-47 ski airplane. I knew both of the pilots and they were very fine, unassuming gentlemen.

Don Julin
Suisun, Calif.

I take issue with the statement "Lt. Col. Emil Beaudry was USAF's foremost expert in Arctic rescues." For extensive rescue mission experiences on the Greenland ice cap from 1941 to 1943, primarily out of Bluie West–8, which he commanded, Col. Bernt Balchen was presented with the Soldier's Medal with Oak Leaf Cluster and a long overdue Distinguished Flying Cross.

In December 1948, Balchen received a call from Washington in reference to the seven airmen who had crash-landed on the ice cap and a request for advice on how to get them out. Balchen recommended that the rescue airplane be a ski-equipped C-47, [and that it] land there and take off with a JATO assist, or next best, a PBY seaplane, also with JATO, to land on its belly on the ice as Balchen and his crew had done on Greenland rescues during the war. The third alternative was a glider landing and a pickup by a tow airplane, which was the method at first tried by Beaudry. Washington headquarters sought counsel from the person they believed to be USAF's foremost expert in Arctic rescues, Balchen; and his first recommendation proved to be the solution.

It is not my intent to belittle or detract from Beaudry's Arctic rescue accomplishments or to dispute his expertise. [Flying] a ski-equipped C-47 with JATO assist requires a high degree of pilot skill. I know, for I served with Balchen when he commanded the 10th Rescue Squadron in Alaska.

Lt. Col. Victor W. Rudd Jr.,
USAF (Ret.)
Montgomery, Ala.

Frisbee's article on Lt. Col. Emil Beaudry brings to mind an even more daring Greenland ice pack rescue by the Cmdr. Richard Byrd Transatlantic and South Pole hero—Col. Bernt Balchen—in 1942–43. [Balchen] performed a number of Greenland ice pack rescues [through] outstanding Arctic flying before the November 1942 rescue for which he was recommended for the Congressional Medal of Honor.

A B-17 looking for a wrecked C-53 crashed into a crevice 80 miles inland from the auxiliary station at Atterbury Dome, injuring [some] of the crew. Two weeks later, after finding the wrecked B-17, Balchen directed Coast Guard pilot Lieutenant Pritchard, flying a Grumman amphibian, to the site. Pritchard picked up two of the crew members. The next afternoon, he returned, picking up the radio operator. The weather shut down and unfortunately Pritchard's Grumman crashed into a mountain on the flight back.

Due to the bad winter Greenland weather, it was almost four months before Balchen was able to accomplish a then unheard-of PBY belly landing in a snowdrift to save the remaining crew. After the crew and rescued airmen succeeded in breaking the Catalina loose from the ice, Balchen then flew out all but three. Due to the weather, it was another six weeks before Balchen was able to land again with a seasoned rescue party of three, dogs, and sledges.

After landing, Balchen and his rescue party, using snowshoes, dogs, and sledges, reached the three remaining downed airmen and sledded them back to the Catalina. As the Catalina was now overloaded, Balchen directed his copilot, Lieutenant Dunlap, to fly the downed airmen out. Balchen and his three rescue personnel, using snowshoes and dog sledges, elected to go over the cold, fog-bound Greenland ice pack 80 miles to Atterbury Dome, with only a compass and Balchen's Arctic expertise to guide them.

Col. William B. Taylor III,
USAF (Ret.)
Arlington, Va.

■ *Maj. Allen V. Mundt, USAF (Ret.), of Reno, Nev., also wrote in about Balchen and supplied further details about Beaudry's 1948 rescue effort. Reader Rudd also reminded us of the article, "Col. Bernt Balchen," we published in July 1980.—THE EDITORS*

Who's Right?

I wish to correct some of the data contained in "Valor" *["Heroic Noncombants," January, p. 69]*. The ship is named *Oryoku Maru*. There were 1,619 POWs—officers, enlisted men, and a few civilians.

Chaplain Robert P. Taylor never worked in the coal mine at Fukuoka. I was there until the end of the war. Besides, no chaplains were ever required to work at any of the 635 prison camps that were run under the jurisdiction of the Japanese, and in most camps officers of captain and above did not work at manual labor, chaplain or otherwise.

Almost all officers who landed at Omuta, Japan, during January 1945 were sent to Mukden, Manchuria, to be held as pawns in the war games being played by the Japanese. Many enlisted men were also sent to this same location. I talked to the only remaining chaplain who is alive of the 37 who were in the Pacific as POWs, and he confirmed that no chaplains ever did manual labor in the POW camps.

MSgt. Ray H. Thompson,
USAF (Ret.)
Phoenix, Ariz.

■ *One of our main references was the book* Days of Anguish, Days of Hope, *by Billy Keith, with an introduction by Chaplain Robert P. Taylor. It states that Taylor worked in the mines.—THE EDITORS*

Aerospace World

By Peter Grier

B-2s Make First Deployment

Air Combat Command successfully executed a forward deployment of B-2 stealth bombers. The March 23–April 3 deployment of two aircraft and some 200 airmen to Andersen AFB, Guam, marked the first-ever deployment of B-2 bombers for a sustained training operation from a forward location.

The aircraft and personnel came from the 509th Bomb Wing at Whiteman AFB, Mo.

The purpose of the action was to demonstrate the B-2's ability to deploy and operate from locations around the world, officials said. Exercises included weapons drops at a bombing range in the Northern Marianas and a series of low-level mission flights.

The action came not long after a senior Pentagon official cast doubt on whether the B-2s were ready to take part in real-world operations. Deputy Defense Secretary John J. Hamre, meeting with reporters on Feb. 25, maintained that only two or three B-2s have been modified to the advanced Block 30 configuration which allows them to carry a full load of conventional weapons.

"It takes a long time to develop a warbird, and this one is still developing, to be honest," said Hamre.

DoD photo by A1C Carl Fresia

The B-2* Spirit of Louisiana *takes off from Andersen AFB, Guam, on a 12-hour mission which included mock bomb drops over the Northern Marianas during a 12-day deployment—the first sustained operation from a forward location for the new stealth bombers.

Boeing Plans Kelly Unit

Boeing will establish a logistics and support center for large aircraft at Kelly AFB, Texas, company officials announced on Feb. 20.

The new center will handle both military and civilian aircraft, with its workload split evenly between the two categories. Its first job, set for this spring, will involve modifying DC-10 and MD-11 cargo airplanes for Federal Express. Boeing will also soon move its C-17 support activities to Kelly.

The announcement comes nearly three years after a Base Realignment and Closure Commission voted to close Kelly by 2001 and move its Air Force work to other government depots. The new Boeing operation—established under a 20-year lease with the Greater Kelly Development Corp.—will create some 800 jobs. That is far short of the 12,000 workers employed at the big depot at its peak, but the number could grow as the Defense Department steers more depot maintenance work to private contractors.

Justice, DoD Seek to Halt Lockheed–Northrop Merger

In a move that could bring the end of the rapid consolidation of US defense industries, the Justice Department on March 23 filed suit in federal court to block Lockheed Martin's proposed $12 billion purchase of Northrop Grumman.

Government officials said they are concerned about lack of competition in a number of key areas of technology if the deal is allowed to proceed. The Justice Department contends that the new firm would have a monopoly in airborne radars and electro-optical missile warning systems, according to a court filing.

Lockheed Martin/Northrop Grumman might also have a dominant position in stealth technologies and remote mine-hunting gear, they said.

Furthermore, the Pentagon is worried about the dwindling number of US corporations capable of producing combat aircraft. If Lockheed Martin and Northrop Grumman are allowed to combine it would be one of only two such firms—Boeing/McDonnell Douglas being the other.

Attorney General Janet Reno and Defense Secretary William S. Cohen announced the lawsuit, saying the combination of the No. 1 and No. 3 defense contractors would stifle competition and dampen innovation. "This merger isn't just about dollars and cents," Reno said. "It's about winning wars and saving lives."

Lockheed Martin and Northrop Grumman executives vowed to fight the government in court. They said their union is necessary if they are to be able to compete against electronics giant Raytheon for new business. If the deal does not go through, Northrop Grumman in particular might become isolated as a weaker fourth competitor in a market dominated by Lockheed Martin, Boeing, and Raytheon, said analysts.

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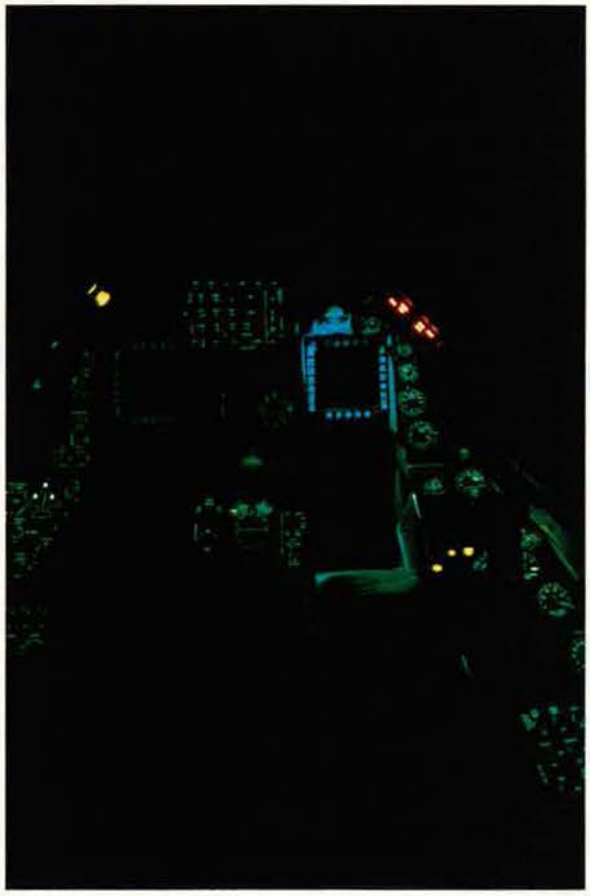
USAF Space Support Improved Since '91 Persian Gulf War

Since the end of the Gulf War in 1991, the US Air Force has vastly improved its ability to deliver precise targeting and location information from space, said top officials of US Space Command in a Feb. 18 Pentagon news conference.

The upgrades of the last seven years mean US forces would rely heavily on space support during any future conflict in the Gulf region. "Space-based information has become like electricity or water—nobody really appreciates it until they flip that switch or turn that faucet, and it's not there. That information is important now and will become even more critical to our future warfighting capability," said Maj. Gen. Gerald F. Perryman Jr., commander of 14th Air Force, a US Space Command component which oversees USAF space operations from Vandenberg AFB, Calif.

Theater missile warning is one area that is much better today than it was during Desert Storm. During the war with Iraq it took nearly five minutes to alert people on the ground of an incoming Scud missile. Warning time now is "dramatically better," said



This Block 40 F-16 cockpit displays the new interior lighting being installed to make the fighters compatible with night-vision goggles. Lockheed Martin is modifying 43 F-16s at Aviano AB, Italy, to provide both interior and exterior NVG compatibility. The exterior lighting change will make it easier to distinguish a wingman's aircraft from other light sources.

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Photo by MSgt. Rick Corral

Retired Col. Ralph Albertazzie, a former Air Force One pilot, talks with reporters aboard aircraft 26000, the VC-137 which is most well known as the aircraft that carried President John F. Kennedy's body back to Washington. USAF retired 26000 after 35 years.

Space Command Commander in Chief Gen. Howell M. Estes III. The exact figure is classified.

That is at least partially due to the establishment of the 11th Space Warning Squadron at Falcon AFB, Colo., in 1995. That unit is the only one in USAF specially tasked with using information from Defense Support Program early warning satellites to identify theater ballistic missile launches.

The squadron has a window of about 30 seconds to determine if a flash detected by DSP equipment is indeed a hostile launch. Information about confirmed Scud shots is disseminated via both voice and data networks.

Location information is another much-improved area that is reliant on space systems. US military forces now have access to a full constellation of 24 Global Positioning System satellites, as opposed to only 16 during the Gulf War. GPS is also now linked to precision guided weapon systems.

"This new generation of smart weapons will save lives," said Perryman. "Our pilots are no longer tied to their target. ... They can 'fire and forget' thanks to the accuracy provided by GPS targeting and guidance systems."

B-2 Panel Releases Findings

A Congressionally mandated review board has concluded that the Air Force should use its B-2 bomber

Enola Gay Exhibit Closes

The *Enola Gay* exhibition will end its long run at the National Air and Space Museum in Washington May 18 because of major structural renovations to the museum. The exhibition, built around the famous B-29 that dropped the first atomic bomb on Hiroshima, has drawn almost four million visitors since it opened in June 1995.

It has been, by a wide margin, the most popular special exhibition in the history of the museum, but it is not the exhibit originally planned by the curators and the since-departed museum director. In 1994, *Air Force* Magazine and AFA touched off a national controversy by reporting on the museum's intention to use the *Enola Gay* as a prop in a political horror show. That scheme was eventually scrapped and a new director appointed.

Donald D. Engen, the current director, directed that the exhibition remain open through Armed Forces Day on May 16 and close the following Monday, when major refurbishing—much needed by the museum which is showing the effects of 22 years of visitor traffic—gets under way.

The *Enola Gay* will be a central element in the National Air and Space Museum's Dulles Center, scheduled to open in suburban Virginia in late 2001.

The Battle of Arlington Ridge

ARLINGTON, VA., April 3—The campaign by Marine Corps veterans and a neighborhood group to block construction of an Air Force Memorial on Arlington Ridge, overlooking the Potomac River, intensified as it entered its second year.

The dispute began in April 1997 when local residents formed a group called "Friends of Iwo Jima" and began collecting names on a petition to "relocate" the Air Force Memorial. Their main concern seemed to be that it might bring more cars and visitors to the area. Their public statements, however, centered on the claim that the Air Force Memorial encroached on the "sacred ground" of the Marine Corps Memorial, which occupies about a third of Arlington Ridge.

Marine Corps veterans soon rallied to the alarm and joined efforts with the neighborhood group in a relentless media and Congressional lobbying program. The Marine Corps, which had been notified in 1994 of plans for the Air Force Memorial and posed no objection, has lent its support to the campaign as well.

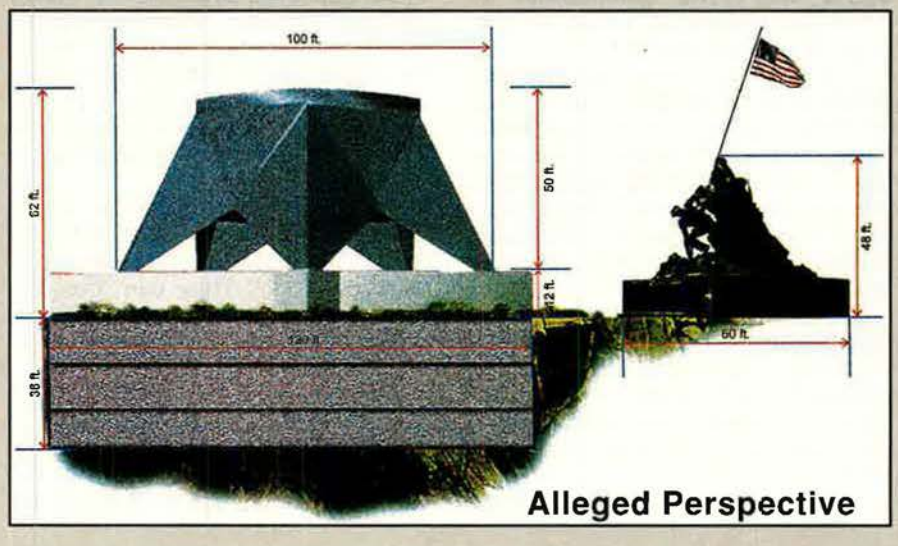
In March of this year, all three of the organizations—the National Park Service, the National Capital Planning Commission, and the Commission of Fine Arts—designated by Congress to review plans for memorials and which had given the Air Force Memorial their clearance to go ahead found themselves under attack.

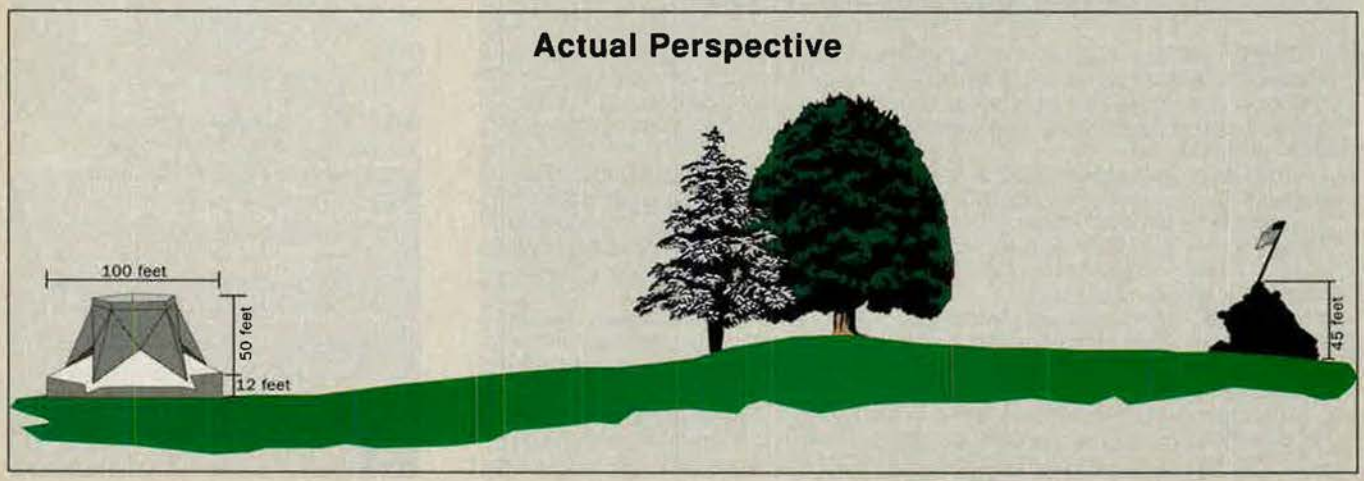
An affidavit filed on behalf of Friends of Iwo Jima in federal district court accused the National Capital Planning Commission of yielding to "improper influence" from the Air Force Memorial Foundation in approving the project. Thus far, there has been no public explanation of the charge.

Eight US senators, all former Marines, wrote to Secretary of the Interior Bruce Babbitt asking for a full review of the National Park Service's environmental study of the site for the Air Force Memorial. The letter was signed by Senators Dale Bumpers (D–Ark.), Conrad Burns (R–Mont.), John Chafee (R–R.I.), John Glenn (D–Ohio), Pat Roberts (R–Kan.), Charles S. Robb (D–Va.), Craig Thomas (R–Wyo.), and John W. Warner (R–Va.).

The controversy surged, however, when the Friends of Iwo Jima discov-

The drawing at right, published by the Marine Corps Reserve Officers' Association, depicts the Air Force Memorial as crowding the Iwo Jima Memorial and towering above it. The actual perspective is shown in the architect's certified drawing below. The Air Force Memorial is down a hill, more than 500 feet away. The top of it will be lower than the highest part of the central sculpture of the Marine Corps monument.





ered and circulated to the news media the transcript of a 1994 meeting of the Commission of Fine Arts in which J. Carter Brown, the commission chairman, had referred to the Iwo Jima Memorial on Arlington Ridge as "kitsch." The dictionary definition of kitsch is "something that appeals to popular or lowbrow taste and is often of poor quality."

The context for Brown's statement was a discussion about what form the Air Force Memorial might take. Brown said that one option would be to "put up a statue of an airman that would bring us all to tears. I don't see that happening. I think we are going to get kitsch if we do that. ... I would say that the Iwo Jima Memorial is kitsch. ... It was taken from a photograph, it is by a sculptor, even though he was a member of this commission at one point, who is not going to go down as a Michelangelo in history—and yet it is very effective, largely because of its site."

Marine veterans called for Chairman Brown's ouster, as did Rep. Gerald B.H. Solomon (R–N.Y.), a former Marine, who has joined the Friends of Iwo Jima in a lawsuit to stop the Air Force Memorial. Solomon is also chairman of the House Rules Committee and sponsor of two of the three bills now pending in Congress to keep the Air Force Memorial off Arlington Ridge. His latest measure, introduced Feb. 11, provides for the federal government to reimburse the Air Force Memorial Foundation for "site specific design expenses" up to $1.5 million if the project is moved to another location.

Retired Maj. Gen. Charles D. Link, the new president of the Air Force Memorial Foundation, has been taking members of Congress and other public officials for tours of the Arlington Ridge site to show them that much of what they have heard is misleading or wrong. "If I had to rely only on the information provided by opponents of our memorial, I, too, would be concerned," Link says.

Link's own information package reproduces a "perspective" drawing that appeared in the November–December issue of *The Word,* journal of the Marine Corps Reserve Officers' Association. It supports the "encroachment" theme and leaves the clear impression that the Air Force Memorial will rise above the Iwo Jima Memorial and crowd it. *The Word* exhorts its readers to write to Congress to stop this outrage.

The true relative size and elevation of the two memorials are seen in the architect's certified drawing. The Air Force Memorial is well separated from the Iwo Jima monument, and will be located down a hill and screened by a stand of tall, mature trees.

Col. Andy Harp, president of the Marine Corps Reserve Officers' Association, continues the attack in the March–April issue of *The Word,* declaring that the Air Force Memorial will have a "drive-in garage" and be "within 150 yards" of the Iwo Jima Memorial. The distance is more than 500 feet and the garage exists only in Harp's imagination.

Of the 25 acres in the Arlington Ridge tract, the Marine Corps Memorial and parade ground take eight acres, the portion allotted when the memorial was built in the 1950s. The Netherlands Carillon takes another three acres. Two acres have been approved for the Air Force Memorial, leaving the remaining 12 acres as open space. Link points out to visitors touring the site that commercial establishments across Route 50 are closer to the Marine Corps Memorial than the Air Force Memorial is.

People who attended the dedication of the Air Force Memorial site last October noticed that they could not see any part of the Iwo Jima Memorial—not even the flag flying above it—from where they stood down the slope.

The project to build an Air Force Memorial started in 1992 with the creation of the Air Force Memorial Foundation. Since then, it has followed the elaborate process prescribed for proposed monuments by Congress, and has satisfied all of the requirements imposed by oversight authorities. The design of the memorial is based on a five-pointed star. The structure will be open to the elements, capturing the impression of space and air. It was designed by James Ingo Freed, who was also the architect for the US Holocaust Memorial Museum.

USAF Can't Use "Don't Promote Me" Letters

Congress is looking askance at an Air Force proposal to reject separation pay for officers who have written letters to promotion boards asking not to be advanced.

Lawmakers understand that the service has a problem with some members whom it believes are attempting to manipulate the personnel system to obtain involuntary severance bonuses. Senate aides have asked Air Force officials to find another way to deal with the trend.

The manipulation works like this: Officers know that being passed over twice for promotion is important in becoming eligible for involuntary separation pay. Those who are planning to leave the service anyway, but want severance cash, simply communicate to promotion boards that they do not want a promotion. Last year, boards received 107 letters asking to defer promotions to major, for instance.

The incentive to use this ploy is considerable. Separation pay can range up to $52,000 for a captain with 12 years of service.

Using these letters against the writers when it comes to handing out severance bonuses would be problematic, however. Currently, all correspondence to promotion boards is considered to be confidential.

One solution might be to direct the boards to simply ignore all such letters. Lt. Gen. Michael D. McGinty, the service's top personnel officer, has already announced that officers who turn down proffered promotions will no longer be considered passed over. They will continue to serve at their lower rank but will stay on the "selected" list, negating chances of involuntary separation cash.

Feingold Attacks Navy Super Hornet

Sen. Russell Feingold (D–Wis.), a harsh critic of the F/A-18E/F Super Hornet, took to the Senate floor March 23 to deliver a scathing attack on the Navy's newest fighter, which has been troubled in recent times by wing drop and other anomalies in its testing program.

"We should discontinue the ... program before the American taxpayers are asked to shell out additional tens of billions of dollars for an unnecessary and flawed program," he said.

The senator maintained that the aircraft is in technical trouble and doesn't provide much of a boost in capability over the current F/A-18C/D models. "The ... 'Super Hornet' program is foundering, and the Defense Department is doing everything in its power to keep it afloat," said Feingold.

He said that, after reviewing the program, investigators from the General Accounting Office recommended that the Navy take a more cautious approach to the program and conduct detailed tests before buying more of the airplanes.

Even so, he said, the Super Hornet team is struggling to keep the aircraft alive by minimizing its problems, the senator charged. "The story has a little bit of deception and what might be called good old-fashioned government cover-up," he said.

The Navy maintains that the aircraft is in solid shape and is vitally needed as a replacement for the A-6, F-14, and F/A-18C/D carrier aircraft that have either aged out of the inventory already or will do so over the next decade.

Chief Benken Goes to the Hill

In three appearances before committees of Congress, CMSAF Eric W. Benken vowed that the Air Force will continue to push for new and improved housing for married and single airmen, along with programs to boost morale, welfare, and recreation.

The Chief Master Sergeant of the Air Force asked the lawmakers with whom he met to continue to support construction projects and other quality-of-life programs for Air Force people who are having to cope with very high operation and personnel tempos.

He said, "Never in America's history has its armed forces been as strong as [they are] today. Never before has its air arm been as mighty. Never in our 51-year history have we asked our blue-suiters to do so much."

The chief said everyone understands that the national mission today requires high tempos. However, he noted, the effect on Air Force people could be negative. "We are busy," Benken said. "The numbers show that. But more importantly, our people and their families are feeling it." ■

money for the baseline stealth program and to upgrade the deployability, survivability, and maintainability of the existing B-2 force—not attempt to procure more of the stealth bombers.

The Panel to Review Long Range Airpower was charged by lawmakers with deciding whether the upgrade approach or continued low-rate production should be the continuing focus on the B-2 program.

Heading the panel was a former USAF Chief of Staff, Gen. Larry D. Welch. Another ex-service chief, Gen. Merrill A. McPeak, and former Air Force Secretary Donald B. Rice were among its other members. The panel also included Samuel Adcock, Daimler-Benz Corp.; former Sen. James Exon (D–Neb.); John Foster, TRW Inc.; Frederick L. Frostic, Booz•Allen & Hamilton, Inc.; Walter Morrow, Massachusetts Institute of Technology Laboratory; and retired Air Force Gen. Robert L. Rutherford.

The review board also recommended that the Pentagon make better use of its current bomber force—B-1s and B-52s, as well as B-2s—through more operational attention and more money for support and upgrades. DoD needs to develop a long-term bomber sustainment plan, said panel members.

USAF Eyes U-2 Follow-On

The U-2 surveillance airplane has been one of US intelligence's most valuable tools since the early days of the Cold War. But the design is aging, and Air Force officials believe now is the time to begin planning the U-2's replacement.

By the end of the year service planners expect to draw up a mission requirements statement for a next-generation spy aircraft dubbed "U-X." Current concepts call for U-X to be able to operate in both manned and unmanned modes and to be capable of collecting a wide variety of data, including imagery, signals intelligence, and measurement and signature intelligence.

Still to be determined: Whether U-X will be a traditional air breather or a transatmospheric vehicle and whether it should be capable of hypersonic speed.

The U-X will not be a derivative of current unmanned aerial vehicle programs such as the Global Hawk, according to the Air Force.

Development of the new system is expected to begin in 2010, with first aircraft delivery scheduled for eight years later. The current fleet of 35 U-2s would be phased out by 2025,

An F-22 Air Combat Simulator under development by Aeronautical Systems Center, Wright–Patterson AFB, Ohio, calls for two standard F-22 production cockpits to sit amidst 360-degree, hemispherical, visual systems capable of displaying blue sky, sun, and clouds, as well as friendly and enemy aircraft. Lockheed Martin and Raytheon are working with ASC on one such system, depicted by this graphic.

the end of their predicted structural lifetime.

U-2s are already undergoing upgrades in an effort to keep them fully capable until their replacement shows up in adequate numbers. Modifications include replacement of the airplane's Pratt & Whitney engine with a General Electric F118-GE-101 capable of boosting the airplane's operational altitude by 5,000 feet and radar and defensive system upgrades.

C-141 Accident Laid to German Aircraft

A USAF investigating board blamed a German aircraft flying at the wrong altitude for the Sept. 13 crash of an Air Force C-141 in the south Atlantic. The accident claimed the lives of nine on the C-141. Another 24 aboard the German aircraft, a Tu-154, also perished.

The Air Force on March 31 released the accident investigation report detailing the circumstances of the midair collision of the two aircraft off the coast of Namibia, in southwest Africa. The board, headed by Col. William H.C. Schell Jr., 375th Airlift Wing vice commander, Scott AFB, Ill., said the Tu-154 was flying at the wrong cruise altitude. The board further learned that the German aircraft's planned and actual flight altitudes violated the rules of the International Civil Aviation Organization.

The C-141 had departed Namibia for Ascension Island in the Atlantic after delivering US Army personnel and mine-clearing equipment to Windhoek Field, Namibia.

Hans Von Ohain, Jet Age Pioneer Dies

Hans Joachim Pabst von Ohain, a seminal figure in the development of jet aircraft and a retired chief scientist of the former Aero Propulsion Laboratory at Wright–Patterson AFB, Ohio, died in Melbourne, Fla., on March 13. He was 86.

Ohain was born in Dessau, Germany, on Dec. 14, 1911. As a student, he began experimenting with reaction jet propulsion as a means of powering aircraft in flight. Eventually he perfected an early gas turbine engine, and a flight test of his creation in a Heinkel 178, on Aug. 27, 1939, ranks as the first flight of a jet airplane. (British scientist Frank Whittle developed similar technology concurrently, but his prototype did not fly until 1941.)

Following World War II, Ohain was brought to the United States as part of Project Paper Clip and assigned to Wright Field. He remained there for 32 years, rising from a researcher in propulsion to chief scientist of a number of important Air Force research organizations.

Congress Throws Up Base Closure Roadblock

Squeezed between stagnant budgets and growing procurement accounts, the service chiefs are becoming increasingly anxious to get authority to close dozens of excess bases that are draining funds urgently needed for new weapons.

Air Force officials have been particularly vocal. They argue that the requirement to spread their 20 fighter wings, 136 heavy bombers, and other aircraft over 30 US bases wastes money and strains support personnel during the increasingly frequent deployments of Air Expeditionary Forces.

F. Whitten Peters, acting Air Force Secretary, suggested just abandoning unneeded bases if Congress does not reauthorize the Base Realignment and Closure Commission process that was used to close 95 major bases since 1988.

However, the urgent appeals to renew the BRAC process have run into a stone wall on Capitol Hill.

"Absolutely zero!" That was how Rep. James V. Hansen (R–Utah)—a key opponent of base closure—judged the chances of a new BRAC round.

"It's an uphill struggle, no question about that," Deputy Defense Secretary John J. Hamre conceded.

The resistance is based on a number of factors. These include political fear of losing the jobs that come with military bases and concerns that defense already has been cut too deeply, Congressional aides and observers said.

Among many lawmakers, moreover, there is simmering anger over President Clinton's violation of a supposedly nonpolitical BRAC process.

In 1996, during his reelection campaign, he promised to shield the vote-rich states of California and Texas from the decisions of the 1995 commission. That commission called for the closure of the huge Sacramento Air Logistics Center at McClellan AFB, Calif., and the San Antonio Air Logistics Center at Kelly AFB, Texas. According to the rules of BRAC, these bases would have been targeted for closure. On early campaign swings, however, Clinton pledged to protect most of the jobs at these ALCs and has managed to do so.

"The President ... violated the base closing agreement," said retired Air Force Lt. Gen. Thomas G. McInerney, president of Business Executives for National Security. "It was done for political purposes. That violated the trust."

The backlash from that political gesture could force the services to spend billions of dollars in extra base-support costs that they need for the next generation of aircraft, ships, and missiles. Some members of Congress are threatening to cut Air Force funding next year by $468 million, the amount they say is being wasted by keeping the two depots open.

The White House claims it is carrying out the intent of the 1995 commission by seeking to shift most of the depot work from federal workers to private firms using the government facilities, a process called "privatization in place."

The Air Force is preparing bid requests for competitions that are supposed to pit its three other ALCs against private firms for the right to do the repair and conversion work done at Sacramento and San Antonio. In the first such competition, USAF announced last September that the Warner Robins ALC at Robins AFB, Ga., successfully outbid Lockheed Martin and Boeing to win the San Antonio ALC's C-5 airlifter depot maintenance work.

However, some members of Congress insist that the 1995 commission ordered McClellan and Kelly to be closed and that its members intended for the work to be shifted outright to the Air Force's other depots—Odgen ALC at Hill AFB, Utah; Oklahoma City ALC at Tinker AFB, Okla.; and Warner Robins.

These lawmakers argue that it simply is not possible to hold a truly fair competition, given the fact that Clinton's campaign promises require the Air Force to protect most of the jobs of workers at the two bases. McClellan and Kelly employed 13,000 and 19,000 workers, respectively.

Hansen provided documents in which Gen. George T. Babbitt Jr., the head of Air Force Materiel Command, admits he has set "employment goals" of 8,700 jobs at McClellan and 16,000 at Kelly through 2001—when the depots should be vacant under BRAC rules.

"If the underlying factor is the employment goals, how can it be fair?" asked a House aide involved in the depot issue.

The aide also noted that the Air Force plans to offer the depot work in "bundles" that virtually guarantee a private aircraft builder will win. By that, he means that the Air Force will put together various types of work orders. The General Accounting Office said it can find no economic reason to group engines and hydraulics repairs, for instance, with aircraft structural work, but that is what's happening.

Hamre, the number two Pentagon official, insisted, "All we're obligated to do is hold a fair and honest competition. If the depots don't win the competition, we can't protect those jobs."

Some lawmakers are charging that Babbitt and other Air Force officials are violating restrictions Congress placed on the pending competition in the Fiscal 1998 defense authorization. Sen. James Inhofe (R–Okla.) opened a recent hearing of his Senate Armed Services subcommittee on Readiness by charging that some Administration officials "are attempting to violate the spirit and the letter" of those restrictions.

That behavior "could jeopardize the working relations between Congress and the Administration," he warned.

Sen. John McCain (R–Ariz.), a member of Inhofe's panel who does not have a depot to protect, also criticized the Air Force for withholding data the GAO needed to evaluate its planned competition. Later, however, he said, "The Air Force is in an impossible situation" because of Clinton's campaign pledges.

Nearly everyone agrees the services need to close more bases. Pentagon officials note that the size of the US military force has been cut by more than a third—and is still shrinking—while bases have been reduced less than one-fourth.

Even Hansen told defense officials at a hearing: "You want another round of base closings and you probably should have it." However, he said Congress would not authorize another BRAC "until they show they can get this one right," referring to the 1995 process.

Hansen, who represents the Ogden ALC constituency, chairs the Congressional Depot Caucus, a group of 50 representatives and senators whose constituents work at military depots and shipyards.

"We have enough in just that caucus to kill it," Hansen said in reference to the push for a new BRAC round.

Though few in numbers, the depot group is widely considered the strongest caucus in Congress because its members occupy key positions on the committees dealing with defense issues.

Many familiar with the controversy say the depot issue is a convenient cover for lawmakers who do not want to risk losing a base in their jurisdiction in future BRAC rounds.

"Members of Congress who do not want to do BRAC can always use Kelly and McClellan as an explanation for why they won't support it," Hamre said.

However, even members who are willing to risk losing a base fear they may be treated unfairly if Clinton again protects Texas and California, which have more bases than any other state.

Last year, Defense Secretary William S. Cohen requested additional BRAC rounds in 1999 and 2003, but he was overwhelmingly rejected in both the House and Senate. His proposal to slide the process to 2001 and 2005—after Clinton leaves the White House—also appears doomed unless Kelly and McClellan are closed.

—Otto Kreisher

F-16 Crashes Off Korea

A pilot assigned to the 51st Fighter Wing, Osan AB, South Korea, died on March 25 in the crash of his F-16 fighter over the Yellow Sea between the Korean peninsula and China.

The crash occurred during a routine combat training mission being carried out by a formation of four aircraft, USAF said.

The Air Force identified the pilot as Capt. Keith A. Sands of Tulsa, Okla. The body of Sands was located by a search team about 11 hours after the crash.

The cause of the accident is unknown. The Air Force said it had launched a formal crash investigation.

Cohen Orders Training Changes

In a sweeping directive aimed at improving basic training, Defense Secretary William S. Cohen on March 16 ordered US military services to toughen physical fitness standards for recruits, as well as do more to separate male and female enlistees in their boot camp living quarters.

The guidance marked Cohen's response to the work of a special panel on training issues headed by Nancy Kassebaum Baker, the former Republican Senator from Kansas.

At least for now, Cohen rejected the panel's recommendation that the military services segregate trainees by sex for much of their basic experience.

Still, the Pentagon chief insisted that his orders will improve one of the most crucial periods in the life of all US military members. "We must do more to ensure that basic training provides the skills, the discipline necessary to become a valuable member of our armed forces," said Cohen.

SECDEF's Training Changes

The new plan addressed three general training areas:

- Leadership. Cohen ordered the Air Force, Army, Navy, and Marines to develop rewards and incentives that emphasize the value of assignment as a basic trainer and counter notions that a stint as a drill sergeant is detrimental to a military career.
- Training rigor. The Secretary directed the services to review and toughen their physical fitness standards. "I have been rather surprised to find that I perhaps can do more of the physical activity than some of the recruits—even at my advanced age [57]," said Cohen. "I think that does not bode well for those young people."
- Billeting. While Cohen stopped

short of ordering male and female basic recruits to live in separate buildings, he did direct that they live in separate areas, complete with alarms, guards, and closed doors. "The goal is a basic training system which provides gender privacy and dignity in safe, secure living conditions," he said.

In addition, the Pentagon will accept a number of other recommendations made by the Kassebaum Baker panel, said Cohen. They include increases in the number of female recruiters and trainers, reexamination of recruitment advertising to put more emphasis on patriotism and challenge, and institution of training meant to produce professional relationships without use of such blanket policies as "no talk, no touch" between the sexes.

Drawdown Incentive Plan Closes

The 1998 Air Force drawdown incentive program for officers has ended early, service officials announced on Feb. 18.

Plans had called for 1,000 officers to take early retirement and another 700 to leave after being granted service commitment waivers in 1998. Last year, applications for the drawdown plan were accepted into late summer. This year the numbers choosing to leave are such that the program was closed March 3.

Photo by Dave Faylinger

Fifty years after Maj. Ernest J. Fawbush and Capt. Robert C. Miller at Tinker AFB, Okla., made the nation's first tornado prediction, relatives and national, state, and USAF officials gathered on March 25 at the base to unveil a granite monument commemorating the event.

The early retirement program is voluntary. The Air Force started accepting paperwork for those wanting entry last Dec. 2. A week later they were nearly a quarter of the way toward their 1,700 goal.

Officer Training Selection Rates Up

Now is a good time for airmen and civilians to apply to Officer Training School, because selection rates are currently high, say Air Force officials.

At an OTS selection board in February, 35 percent of 650 applicants were chosen to attend the 13-week course, which commissions graduates as second lieutenants.

"We're ramping up our OTS production to meet the Air Force's need for new line officers," said Maj. Dori Johnson, chief of line officer accessions for USAF Recruiting Service. "Although OTS selection remains very competitive, across the board our selection rates are way up."

Civilian college graduates can apply for OTS through Air Force recruiting offices. Active duty enlisted members apply through base education offices. Applicants can choose from four OTS programs: pilot, navigator, technical, and nontechnical.

Some categories are in greater demand than others. Seventy percent of applicants in the navigator program were accepted, more than double the rate of last year. The pilot selection rate was more than 31 percent. Figures for technical and nontechnical program applicants were 49 percent and 14.3 percent, respectively.

OTS applicants must be US citizens, 18 to 29 years old, and meet certain physical requirements.

Wing Drop Problem "Solved," Navy's Top Admiral Asserts

Wing drop problems in the F/A-18E/F have been essentially solved, Chief of Naval Operations Adm. Jay

Senior Staff Changes

NOMINATION: To be **Lieutenant General:** Hal M. **Hornburg.**

CHANGES: Brig. Gen. (sel.) David A. **Deptula,** from Sr. AF Representative, NDP, Pentagon, to Cmdr., CTF, Operation Northern Watch, USEUCOM, Incirlik AB, Turkey ... Brig. Gen. (sel.) Leonard D. **Fox,** from Civil Engineer, USAFE, Ramstein AB, Germany, to Dir., Civil Engineering, AMC, Scott AFB, Ill. ... Brig. Gen. Michael S. **Kudlacz,** from Dir., Personnel Prgms., Education, and Tng., DCS, Personnel, USAF, Pentagon, to Dep. Dir., Ops. and Tng., DCS, Air and Space Ops , USAF, Pentagon ... Brig. Gen. Edward L. **LaFountaine,** from Vice Cmdr., 5th AF, PACAF, Yokota AB, Japan, to Vice Cmdr., AFSOC, Hurlburt Field, Fla. ... Maj. Gen. (sel.) Donald A. **Lamontagne,** from Cmdr., CTF, Operation Northern Watch, USEUCOM, Incirlik, AB, Turkey, to Cmdr., AFPC, Randolph AFB, Texas.

Maj. Gen. Susan L. **Pamerleau,** from Cmdr., AFPC, Randolph AFB, Texas, to Dir., Personnel Prgms., Education and Tng., DCS, Personnel, USAF, Pentagon .. Maj. Gen. Roger R. **Radcliff,** from Cmdr., JTF–Southwest Asia, USCENTCOM, to Vice Cmdr., 9th AF, ACC, Shaw AFB, S.C. ... Brig. Gen. (sel.) Lawrence H. **Stevenson,** from Cmdr., 22d ARW, AMC, McConnell AFB, Kan., to Vice Cmdr., 5th AF, PACAF, Yokota AB, Japan ... Brig. Gen. Billy K. **Stewart,** from Vice Cmdr., Warner Robins ALC, AFMC, Robins AFB, Ga., to Dir. of Supply, DCS, Instl. and Log., USAF, Pentagon ... Maj. Gen. (sel.) Herbert M. **Ward,** from Dep. Dir., Ops. and Tng., DCS, Air and Space Ops., USAF, Pentagon, to Dep. Dir., Ops., Tng., and Space Integration, DCS, Air and Space Ops., USAF, Pentagon.

Brig. Gen. (sel.) William M. **Wilson** Jr., from Associate Dir. for Log. Resources, DCS, Instl. and Log., USAF, Pentagon, to Vice Cmdr., Warner Robins ALC, AFMC, Robins AFB, Ga. ... Brig. Gen. (sel.) Gary A. **Winterberger,** from Cmdr., 47th FTW, AETC, Laughlin AFB, Texas, to Dir., P&P, AETC, Randolph AFB, Texas. ■

L. Johnson told Congress March 12. The Navy still had to give Pentagon officials a formal briefing on the change and receive their concurrence.

In the wing drop phenomenon, asymmetric lift causes uncommanded banking of the aircraft during flight. To fix it "the porous wing full fairing is the right answer for us," Johnson said.

Researchers are currently fine-tuning the exact porosity of such fairings and are no longer considering any other approaches, added Rear Adm. Dennis McGuinn, the Navy's director of warfare.

The wing drop glitch endangered F/A-18E/F funds. Defense Secretary William S. Cohen testified earlier that he would not allow the release of $2.39 billion in 1998 money for the Lot II buy of 20 airplanes unless the problem was solved.

Falcon Name Changes

The Air Force has approved changing the name of Falcon AFB, Colo., to Schriever AFB in honor of retired Air Force Gen. Bernard A. Schriever, father of the USAF space and missile program. Falcon, which derives its current name from a nearby town, is home to the 50th Space Wing, the Joint National Test Facility, and the Space Warfare Center, including the Space Battlelab.

Among his other accomplishments, Schriever was responsible for crucial development of the ICBM program when he was commander of the Western Development Division of Air Research and Development Command in the mid-1950s. He also helped transform Atlas and Titan missiles into reliable launching systems for sending men into space in the Mercury and Gemini programs. He retired in April 1966.

News Notes

■ On March 23, an F-16 fighter of the 388th Fighter Wing, Hill AFB, Utah, veered off the runway during landing, forcing its pilot to eject. The pilot, who sustained minor injuries, had completed a night surface attack tactics mission over the Utah Test and Training Range and was returning to the base when the incident occurred. A mishap board is investigating the cause of the accident.

■ The Global Hawk unmanned aerial vehicle made its first flight at Edwards AFB, Calif., on Feb. 28. Under autonomous guidance, the aircraft flew a bowtie-shaped track for 56 minutes and reached an altitude of 32,000 feet.

■ Air Force pilots are not rushing to accept new bonuses meant to lure them into continuing their military commitment, according to the Air Force. Several months into the new plan, barely a third of those pilots eligible had accepted the long-term bonus, which raised the rate for staying on active duty for 14 years from $12,000 to $22,000 per year.

■ F-22 flight testing is on schedule for its planned mid-April start despite a recent engine failure, according to USAF officials. The Air Force suspended tests on the aircraft's F119 engine in early March after a knife-edged seal broke while the power plant was operating in afterburner mode. But indications are the problem was a component failure rather than a design flaw.

■ According to one news source, a Congressionally mandated Pentagon study of the impact of accelerating development of the Navy version of the Joint Strike Fighter from Fiscal 2008 to 2005 would cost an additional $4.9 billion in procurement funds. It would strain deployment schedules for the Air Force and Marine Corps variants of the aircraft, with a subsequent negative impact on the age of those services' fighter inventories.

■ Maxwell AFB, Ala., has begun construction on a new $38 million Officer Training School campus. The school—scheduled to be completed by 2002—will include a two-story academic facility, two auditoriums, conference rooms, and a computer lab.

■ MSgt. Sandra Cooper–McKay (AFRES), a firefighter from the 419th Civil Engineer Squadron at Hill AFB, Utah, was named GEICO Reservist of the Year for 1997 on March 18. She will receive a $2,500 cash award plus an all-expenses-paid trip for two to Washington, D.C.

■ The 14th Air Force's Flying Tigers celebrated their 55th anniversary in March. Today the numbered air force oversees the launch and control of Air Force satellites and space surveillance and missile warning forces, but it traces its lineage to the famous Flying Tigers of Claire Chennault and their epic battles with Japanese aircraft in the skies over China and Burma during World War II.

■ On Feb. 24, President Clinton nominated Dr. Sue Bailey to become assistant secretary of defense for health affairs, the Pentagon's top health official. A veteran physician, Bailey served as deputy secretary for health affairs from July 1994 to June 1995.

■ Capt. Susan Shelley, Medical Service Corps utilization and education manager, was named the Air Force's Young Health Care Administrator of the Year for 1997 on March 4.

■ Despite a series of accidents last September, the US military lost fewer airplanes in crashes in 1997 than in any year since at least 1975, the General Accounting Office said in a report released March 23. The armed forces suffered 54 crash losses in

■ Fiscal 1997, as compared to 221 in 1975, said the GAO.

■ US service personnel who lost personal property during the devastating flood that hit the Grand Forks, N.D., region last April have until this Sept. 30 to file claims for recompense with the government. US officials estimate about 400 military members from Grand Forks AFB may be eligible for such aid, but only about 150 had filed personal property claims as of early March.

■ They are normally based hundreds of miles apart, but a father and son who both serve as Air Force communications specialists found themselves deployed to the Gulf region together on Feb. 21 and stationed in close proximity. SMSgt. Russell Sinclair, from Langley AFB, Va., and his son A1C Chris Sinclair, from Robins AFB Ga., said their family was in fact glad they were near each other in a tense part of the world. "My mom was happy we were both going together—so we could take care of each other," said the younger Sinclair.

■ F-16s from the 177th Fighter Wing, New Jersey Air National Guard, helped save a straying civilian aviator lost over the Atlantic on Feb. 28. The private pilot was heading from Rochester, N.Y., to Teterboro, N.J., but his navigational equipment had failed and he was 225 miles out to sea. The F-16s caught his attention by flashing their running lights and lighting their afterburners. They managed to turn him around and he landed safely near Atlantic City, N.J.

■ On March 20 at F.E. Warren AFB, Wyo., USAF tested the capability of launch control centers from the 400th Missile Squadron and Airborne Launch Control Center aircraft from Offutt AFB, Neb. The test allowed both systems to execute their warfighting mission with Giant Pace 98-1P, a Simulated Electronic Launch–Peacekeeper, or SELP. The purpose was to exercise the ground and airborne command-and-control elements and exercise the Peacekeeper ICBM up to initiation of the launch-eject gas generator.

■ Via a program dubbed Hickam Family Helping Families more than 150 volunteers renovated kitchens and bathrooms in 10 older homes at Hickam AFB, Hawaii, recently. Work included replacing cabinets, sinks, countertops, and floors. The project saved the base $10,000 to $15,000 per home due to its use of free labor.

■ The Air Force Chief of Staff announced the winners of the 1997 Outstanding Civil Engineer Unit Awards on Feb. 26. Winner for the large base category was the 52d Civil Engineer Squadron, Spangdahlem

A Hungarian air force MiG-29 taxis past a USAF MC-130P Combat Shadow on the flight line at Kecskemet AB, Hungary, where USAF personnel and equipment from the 352d Special Operations Group, RAF Mildenhall, UK, deployed in March for a Joint exercise dubbed Carpathian Exchange.

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AB, Germany. The award for the small base category went to the 4th Civil Engineer Squadron, Seymour Johnson AFB, N.C.

■ The new Tricare Management Activity began operations on Feb. 10. Formed from a consolidation of the Tricare Support Office, the Defense Medical Programs Activity, and various other health management programs, the new TMA will oversee management of the Tricare health program. Both TMA and its acting executive director, Diana G. Tabler, will report to the office of the Assistant Secretary of Defense for Health Affairs.

■ William D. Stroud was awarded the Purple Heart on Feb. 23—53 years after the B-24 the then-private was flying in was downed over Czechoslovakia by a German fighter. Struck in the head by shrapnel, Stroud was a prisoner of war for over a year. It is unclear why Stroud did not receive the decoration shortly after his release, but his daughter said the award was still welcome after all these years. "He deserves it. He went through so much," said Joyce H. Ward, who submitted the Purple Heart paperwork for her father.

■ Alliant Techsystems unveiled the first production Outrider tactical unmanned aerial vehicle at its Hopkins, Minn., facility on Feb. 19. The Outrider was developed under a two-year Advanced Concept Technology Demonstration program and promises to provide tactical commanders invaluable real-time target acquisition information, said company officials. ■

Top 100 Defense Contractors of 1997

Largest Dollar Volume of DoD Prime Contract Awards

Rank	Company	Award
Top 10		
1	Lockheed Martin	$11.6 billion
2	Boeing	9.6 billion
3	Northrop Grumman	3.5 billion
4	General Dynamics	3.0 billion
5	Raytheon	2.9 billion
6	General Motors	2.8 billion
7	United Technologies	1.8 billion
8	General Electric	1.7 billion
9	Litton Industries	1.6 billion
10	Textron	1.4 billion
11	Science Applications International Corp.	
12	GTE	
13	ITT Industries	
14	TRW	
15	CBS Corp.	
16	Newport News Shipbuilding	
17	Computer Sciences Corp.	
18	Foundation Health Systems	
19	Avondale Industries	
20	Humana	
21	United Defense, LP	
22	Tracor	
23	Allied Signal	
24	Exxon	
25	Dyncorp	
26	Texas Instruments	
27	Standard Missile Co. LLC	
28	Rockwell International	
29	BDM International	
30	Alliant Techsystems	
31	US Department of Energy	
32	MIT	
33	Electronic Data Systems	
34	Longbow LLC	
35	Logicon	
36	Sverdrup	
37	FMC	
38	Renco Group	
39	Motorola	
40	MITRE	
41	The Aerospace Corp.	
42	OHM	
43	Shell Oil	
44	Halliburton Co. Inc.	
45	Federal Express	
46	NASSCO Holdings	
47	Johnson Controls	
48	Chevron	
49	Stewart & Stevenson Services	
50	Bechtel Group	
51	Atlantic Richfield	
52	Nichols Research Corp.	
53	General Electric Co. PLC	
54	Booz•Allen & Hamilton Inc.	
55	Worldcorp	
56	Procter & Gamble	
57	Rolls-Royce PLC	
58	Philipp Holzmann AG	
59	Highmark Inc.	
60	MCI Communications	
61	Maersk	
62	Texas Instruments/Martin Marietta	
63	Harris Corp.	
64	Triwest Healthcare Alliance	
65	Unisys	
66	Oshkosh Truck	
67	AT&T	
68	Government of Canada	
69	Hensel Phelps Construction	
70	Mantech International	
71	Federal Prison Industries Inc.	
72	Honeywell	
73	Clark Enterprises	
74	Charles Stark Draper Laboratory	
75	Chrysler	
76	Johns Hopkins University Inc.	
77	Government Technology Services	
78	Boeing Sikorsky Comanche Team	
79	IBM	
80	Vanstar	
81	American Automar	
82	Olin Corp.	
83	Thiokol	
84	Ssangyong (USA) Inc.	
85	Southwest Marine Inc.	
86	Kuwait Petroleum Corp.	
87	Soltek of San Diego	
88	Philip Morris Companies Inc.	
89	Gencorp Inc.	
90	Kaman	
91	Allegheny Teledyne Inc.	
92	BTG	
93	VSE Corp.	
94	Gulfstream Aerospace	
95	Government of Germany	
96	Primex Technologies Inc.	
97	International Shipholding Corp.	
98	Bergen Brunswig Corp.	
99	Bell Atlantic	
100	McKesson Corp.	

Source: Department of Defense

USAF Almanac

ac 1998

The Air Force in Facts and Figures

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

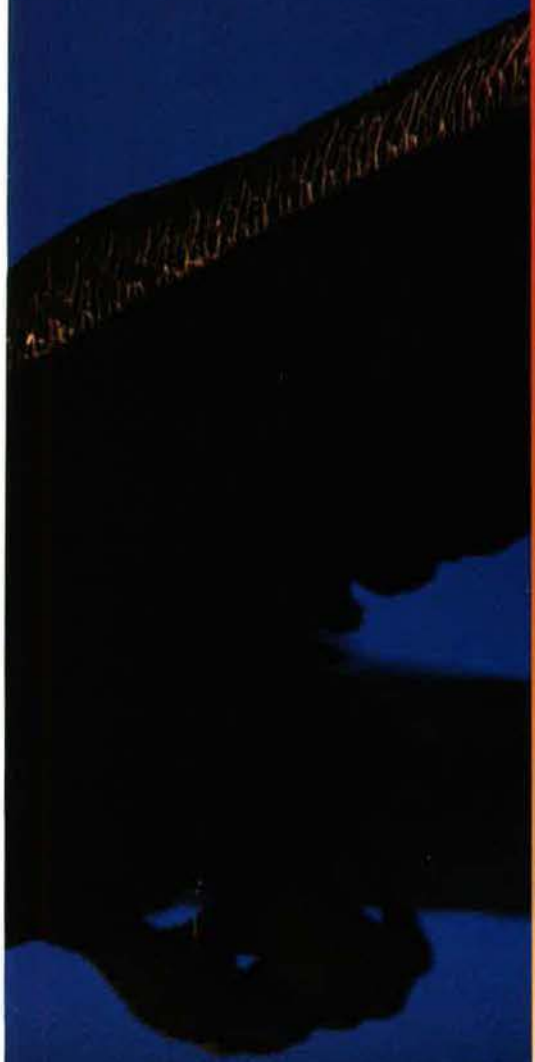

Photo © Tom and Pat Leeson

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

For USAF leaders since 1948, see "USAF Leaders Through the Years." 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.

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 preexisting military agencies—the War Department and the Navy Department. Subordinate to DoD are the three military departments (Army, Navy, and Air Force), each headed by a civilian secretary.

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

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

Most units of the Air Force are assigned to one of the **major commands** (see p. 74). 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 Police 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.

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For information contact Air Force Business Development, Raytheon, Waco at (254) 867-4202, fax at (254) 867-4230, or visit our Internet site at http://www.raytheon.com/e-sys

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People

Air Force Personnel Strength

Year	Strength	Year	Strength	Year	Strength
1907	3	1937	19,147	1967	897,426
1908	13	1938	21,089	1968	904,759
1909	27	1939	23,455	1969	862,062
1910	11	1940	51,165	1970	791,078
1911	23	1941	152,125	1971	755,107
1912	51	1942	764,415	1972	725,635
1913	114	1943	2,197,114	1973	690,999
1914	122	1944	2,372,292	1974	643,795
1915	208	1945	2,282,259	1975	612,551
1916	311	1946	455,515	1976	585,207
1917	1,218	1947	305,827	1977	570,479
1918	195,023	1948	387,730	1978	569,491
1919	25,603	1949	419,347	1979	559,450
1920	9,050	1950	411,277	1980	557,969
1921	11,649	1951	788,381	1981	570,302
1922	9,642	1952	973,474	1982	582,845
1923	9,441	1953	977,593	1983	592,044
1924	10,547	1954	947,918	1984	597,125
1925	9,670	1955	959,946	1985	601,515
1926	9,674	1956	909,958	1986	608,199
1927	10,078	1957	919,835	1987	607,035
1928	10,549	1958	871,156	1988	576,446
1929	12,131	1959	840,028	1989	570,880
1930	13,531	1960	814,213	1990	535,233
1931	14,780	1961	820,490	1991	510,432
1932	15,028	1962	883,330	1992	470,315
1933	15,099	1963	868,644	1993	444,351
1934	15,861	1964	855,802	1994	426,327
1935	16,247	1965	823,633	1995	400,409
1936	17,233	1966	886,350	1996	389,001
				1997	377,385
				1998	371,577[a]

[a] Programmed

Active Duty Force Demographics

(As of Sept. 30, 1997)

Grade	Total	Blacks	Women	Other Minorities
Officers				
General	273	9	6	2
Colonel	3,818	119	240	78
Lieutenant Colonel	10,055	654	1,203	199
Major	15,738	995	2,243	400
Captain	29,702	1,723	5,220	1,388
First Lieutenant	7,688	458	1,712	555
Second Lieutenant	6,709	495	1,384	591
Total	**73,983**	**4,453**	**12,008**	**3,213**
Enlisted				
Chief Master Sergeant of the Air Force	1			
Chief Master Sergeant	3,021	577	262	55
Senior Master Sergeant	6,056	1,077	658	174
Master Sergeant	30,794	6,335	3,417	1,233
Technical Sergeant	36,776	7,362	4,415	1,644
Staff Sergeant	77,911	14,580	10,847	4,253
Sergeant/Senior Airman	72,415	10,719	15,237	4,180
Airman First Class	43,277	6,705	10,763	4,590
Airman	17,867	3,109	4,717	1,890
Airman Basic	11,255	1,951	2,851	1,122
Total	**299,373**	**52,415**	**53,167**	**19,141**
Total personnel	**373,356**	**56,868**	**65,175**	**22,354**

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

Total does not include 4,029 cadets.

USAF Educational Levels

(As of Sept. 30, 1997)

Level	Number	Percent
Enlisted		
Below high school	43	0.01
High school	63,707	21.28
Some college (< 2 years)	133,739	44.67
AA/AS degree	40,464	13.52
2–3 years college	46,451	15.52
Baccalaureate degree	13,211	4.41
Master's degree or higher	1,758	0.59
Total	**299,373**	**100.00**
Officers		
Below baccalaureate/ unknown	1,215	.64
Baccalaureate degree	31,605	42.72
Master's degree	34,126	46.13
Doctoral and professional degrees	7,037	9.51
Total	**73,983**	**100.00**

Numbers are rounded and may not sum to totals.
Total does not include 4,029 cadets.

Armed Forces Manpower Trends

(End strength figures in thousands)

	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99[a]
Active duty military								
Air Force	470	444	426	400	389	377	371	371
Army	611	572	541	509	491	492	488	480
Marine Corps	185	178	174	175	175	174	173	172
Navy	542	510	469	435	417	396	387	373
Total	**1,808**	**1,705**	**1,611**	**1,519**	**1,472**	**1,439**	**1,419**	**1,396**
Selected Guard and Reserve								
Air National Guard	119	117	114	110	110	110	108	107
AFRC	82	81	80	78	74	72	73	74
Army National Guard	426	410	397	375	370	370	362	357
Army Reserve	303	276	260	241	226	213	208	208
Marine Corps Reserve	42	42	41	41	42	42	41	40
Naval Reserve	142	132	108	101	98	95	94	91
Total	**1,114**	**1,058**	**998**	**946**	**920**	**902**	**886**	**877**
Direct-hire civilian[b]								
Air Force[c]	321.2	295.7	262.7	249.1	238.1	236.6	171.8	163.1
Army[c]	309.3	284.6	266.1	248.8	229.4	214.2	226.3	222.1
Navy/Marine Corps	205.9	200.3	188.2	182.0	176.0	174.6	204.1	201.1
Defense agencies	136.8	150.8	151.3	141.9	135.4	134.7	128.8	122.3
Total[c]	**973.2**	**931.4**	**868.3**	**821.7**	**778.9**	**760.0**	**731.0**	**708.6**

Numbers are rounded and may not sum to totals.

[a] Programmed manpower as of FY 1999 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 Personnel Strength by Commands, FOAs, and DRUs

(DoD figures as of Sept. 30, 1997)

	Military	Civilian	Total
Major commands			
Air Combat Command (ACC)	90,164	11,519	101,683
Air Education and Training Command (AETC)	65,729	14,382	80,111
Air Force Materiel Command (AFMC)	32,509	71,085	103,594
Air Force Space Command (AFSPC)	21,057	4,738	25,795
Air Force Special Operations Command (AFSOC)	9,428	538	9,966
Air Mobility Command (AMC)	54,304	8,955	63,259
Pacific Air Forces (PACAF)	32,866	8,679	41,545
United States Air Forces in Europe (USAFE)	26,904	5,092	31,996
Air Force Reserve Command (AFRC)	345	14,573	14,918
Total major commands	**333,306**	**139,561**	**472,867**
Field operating agencies (FOAs)			
Air Force Agency for Modeling and Simulation	18	0	18
Air Force Audit Agency	2	903	905
Air Force Base Conversion Agency	0	311	311
Air Force Center for Environmental Excellence	48	362	410
Air Force Center for Quality and Management	136	82	218
Air Force Civil Engineer Support Agency	98	115	213
Air Force Cost Analysis Agency	28	69	97
Air Force Flight Standards Agency	135	22	157
Air Force Historical Research Agency	11	52	63
Air Force History Support Office	6	34	40
Air Force Inspection Agency	124	23	147
Air Force Legal Services Agency	388	123	511
Air Force Logistics Management Agency	49	14	63
Air Force Medical Operations Agency	55	70	125
Air Force Medical Support Agency	46	37	83
Air Force News Agency	362	114	476
Air Force Office of Special Investigations	1,417	415	1,832
Air Force Operations Group	218	14	232
Air Force Personnel Center	942	809	1,751
Air Force Personnel Operations Agency	42	22	64
Air Force Program Executive Office	38	13	51
Air Force Real Estate Agency	0	12	12
Air Force Review Boards Agency	10	36	46
Air Force Safety Center	70	59	129
Air Force Services Agency	63	205	268
Air Force Studies and Analyses Agency	85	22	107
Air Force Technical Applications Center	849	0	849
Air Force Weather Agency	819	230	1,049
Air Intelligence Agency	10,637	2,102	12,739
Air National Guard Readiness Center	92	478	570
Joint Combat Rescue Agency	12	2	14
Joint Services Survival, Evasion, Resistance, and Escape Agency	32	73	105
Total FOAs	**16,832**	**6,823**	**23,655**
Direct reporting units (DRUs)			
Air Force Communications & Information Center	841	640	1,481
Air Force Doctrine Center	51	6	57
Air Force Operational Test and Evaluation Center	545	187	732
Air Force Security Forces Center	216	15	231
United States Air Force Academy	2,246	1,785	4,031
11th Wing	1,514	846	2,360
Total DRUs	**5,413**	**3,479**	**8,892**
Other			
Other Active Duty	17,805	29,321	47,126
USAFA cadets	4,029		
Total for all categories	**377,385**	**179,184**	**552,540**

[a]Includes Air Reserve technicians.

USAF Personnel by Geographic Area

(As of Sept. 30, 1997)

Total military personnel	**377,385**
US territory and special locations	**315,133**
Total in foreign countries	**62,252**
Western and southern Europe	**34,500**
Germany	15,171
UK	9,596
Turkey	2,516
Italy	4,190
Spain	223
All other countries	2,804
East Asia and Pacific	**25,058**
Japan/Okinawa	14,027
South Korea	8,618
Guam	2,049
All other countries	364
Africa, Near East, south Asia	**422**
Saudi Arabia	226
Egypt	64
All other countries	132
Western hemisphere	**2,046**
Panama	1,814
Canada	89
All other countries	143
Other areas	**226**

Active Duty Force by Grade

(As of Sept. 30, 1997)

Grade	Number
Officers	
General	11
Lieutenant General	36
Major General	81
Brigadier General	145
Colonel	3,818
Lieutenant Colonel	10,055
Major	15,738
Captain	29,702
First Lieutenant	7,688
Second Lieutenant	6,709
Total	**73,983**
Cadets	4,029
Enlisted	
Chief Master Sergeant of the Air Force	1
Chief Master Sergeant	3,021
Senior Master Sergeant	6,056
Master Sergeant	30,794
Technical Sergeant	36,776
Staff Sergeant	77,911
Sergeant/Senior Airman	72,415
Airman First Class	43,277
Airman	17,867
Airman Basic	11,255
Total	**299,373**
Total strength	**377,385**

Air Force Installations

	FY94	FY95	FY96	FY97	FY98	FY99
Major installations						
US and possessions	85	79	77	75	74	74
Foreign	17	15	13	13	13	13
Worldwide	102	94	90	88	87	87
Minor installations						
US and possessions	110	113	84	85	82	80
Foreign	12	7	4	4	4	3
Worldwide	122	120	88	89	86	83

Includes Air National Guard and Air Force Reserve Command.

Specialties in the Enlisted Force

(As of Sept. 30, 1997)

Code	Career Field	Assigned	Percentage
1A	Aircrew Operations	6,797	2.3
1C	Command Control Systems Operations	11,596	3.9
1N	Intelligence	11,335	3.8
1S	Safety	386	0.1
1T	Aircrew Protection	2,570	0.9
1W	Weather	2,566	0.9
2A	Manned Aerospace Maintenance	64,040	21.4
2E	Communications–Electronics Systems	16,558	5.5
2F	Fuels	3,955	1.3
2G	Logistics Plans	717	0.2
2M	Missile & Space Systems Maintenance	2,919	1.0
2P	Precision Measurement	1,502	0.5
2R	Maintenance Management Systems	1,840	0.6
2S	Supply	13,827	4.6
2T	Transportation & Vehicle Maintenance	12,893	4.3
2W	Munitions & Weapons	15,591	5.2
3A	Information Management	12,644	4.2
3C	Communications–Computer Systems	14,763	4.9
3E	Civil Engineering	18,761	6.3
3H	Historian	107	<0.1
3M	Morale, Welfare, Recreation, & Services	4,753	1.6
3N	Public Affairs	1,648	0.6
3P	Security Forces[a]	20,408	6.8
3R	Printing Management	178	<0.1
3S	Mission Support	9,911	3.3
3U	Manpower	731	0.2
3V	Visual Information	1,677	0.6
4X	Medical	23,912	8.0
4Y	Dental	2,682	1.0
5J	Paralegal	1,068	0.4
5R	Chapel Service Support	482	0.2
6C	Contracting	1,304	0.4
6F	Financial	3,970	1.3
7S	Special Investigation	731	0.2
8	Special Duty Identifiers	6,193	2.1
9	Reporting Identifiers	4,354	1.5
	Unassigned	4	—
Total		**299,373**	**100**

Percentages have been rounded. [a]Changed from Security Police Oct. 31, 1997.

Specialties in the Officer Force

(As of Sept. 30, 1997)

Code	Utilization Field Title	Assigned	Percentage
X0	Commander & Director	920	1.2
11	Pilot	13,410	18.1
12	Navigator	4,632	6.3
13	Space, Missile, Command & Control	4,898	6.6
14	Intelligence	2,820	3.8
15	Weather	751	1.0
16	Operations Support	1,392	1.9
21	Aircraft Maintenance & Munitions	4,268	5.8
31	Security Forces[a]	739	1.0
32	Civil Engineering	1,601	2.2
33	Communications–Computer Systems	4,867	6.6
34	Morale, Welfare, Recreation, & Services	363	0.5
35	Public Affairs	412	0.6
36	Personnel	1,755	2.4
37	Information Management*	—	—
38	Manpower	338	0.5
4X	Medical	13,590	18.4
51	Law	1,303	1.8
52	Chaplain	602	0.8
61	Scientific/Research	1,091	1.5
62	Developmental Engineering	3,022	4.1
63	Acquisition	2,407	3.3
64	Contracting	1,060	1.4
65	Financial	972	1.3
71	Special Investigations	363	0.5
8X	Special Duty Identifiers	1,924	2.6
9X	Reporting Identifiers	4,480	6.0
	Other	3	—
Total		**73,983**	**100**

* Merged with 33/36.

[a]Changed from Security Police Oct. 31, 1997.

Total does not include 4,029 cadets. Percentages have been rounded.

USAF Total Force

	FY92	FY93	FY94	FY95	FY96	FY97	FY98
Air Force active duty							
Officers	90,400	84,073	81,003	78,444	76,388	73 ,983	72,732
Enlisted	375,700	356,126	341,317	317,938	308,608	299,373	294,845
Cadets	4,215	4,152	4,007	4,027	4,005	4,029	4,000
Total Air Force military	**470,315**	**444,351**	**426,327**	**400,409**	**389,001**	**377,385**	**371,577**
Career reenlistments (second term)	49,100	38,300	41,000	37,200	37,200	34,900	340,000
Rate	88%	90%	89%	88%	87%	86%	86%
First-term reenlistments	21,000	17,600	13,100	13,500	12,900	12,300	12,100
Rate	59%	61%	60%	65%	59%	56%	56%
Civilian personnel							
Direct hire (excluding technicians)	170,549	158,631	155,385	146,180	143,662	139,517	134,097
ANG	24,741	24,958	24,063	24,174	23,931	23,404	22,968
Technicians: AFRC	10,467	9,827	9,398	9,432	9,436	9,422	9,634
Indirect hire—foreign nationals	8,652	8,246	7,643	6,643	6,695	6,841	6,433
Total civilian personnel	**214,409**	**201,662**	**196,489**	**186,429**	**183,724**	**179,184**	**173,132**
Guard and Reserve							
Air National Guard, Selected Reserve	119,083	117,162	113,587	109,826	110,471	110,023	108,057
AFRC, paid	83,396	80,562	79,621	78,706	76,138	73,311	73,598
AFRC, nonpaid	74,330	111,509	98,848	99,000	71,910	66,827	66,750
Total Ready Reserve	**276,809**	**309,233**	**292,056**	**287,532**	**258,519**	**250,161**	**248,405**
Standby	16,000	13,042	9,926	14,435	14,437	14,500	13,200
Total Guard and Reserve	**292,809**	**322,275**	**301,982**	**301,967**	**272,956**	**264,661**	**261,605**

Numbers are rounded and may not sum to totals. FYs 1992–97 are actual figures; FY 1998 is an estimate.

The Civilian Force

(As of Sept. 30, 1997)

General Schedule/ Other

Grade	Force
1	1
2	42
3	806
4	4,419
5	11,276
6	6,969
7	9,156
8	1,332
9	13,089
10	826
11	16,441
12	19,758
13	10,611
14	3,266
15	1,209
16	0
17	0
18	0
ST[a]	26
SES[b]	167
Other	276
Total	**99,670**

Wage Grade

Grade	Force
1	3
2	251
3	271
4	152
5	1,065
6	1,163
7	1,761
8	3,267
9	3,602
10	14,603
11	3,979
12	1,705
13	233
14	83
15	1
Total	**32,139**

Wage Grade Leader

Grade	Force
1	0
2	6
3	3
4	1
5	27
6	34
7	51
8	103
9	278
10	850
11	118
12	47
13	0
14	1
15	0
Total	**1,519**

Wage Grade Supervisory

Grade	Force
1	11
2	25
3	35
4	59
5	84
6	157
7	222
8	270
9	995
10	1,265
11	486
12	261
13	161
14	196
15	131
16	88
17	40
18	19
Total	**4,505**

Air Force Civilian Personnel: Average Age and Length of Service

Average length of service (overall)	**17 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).

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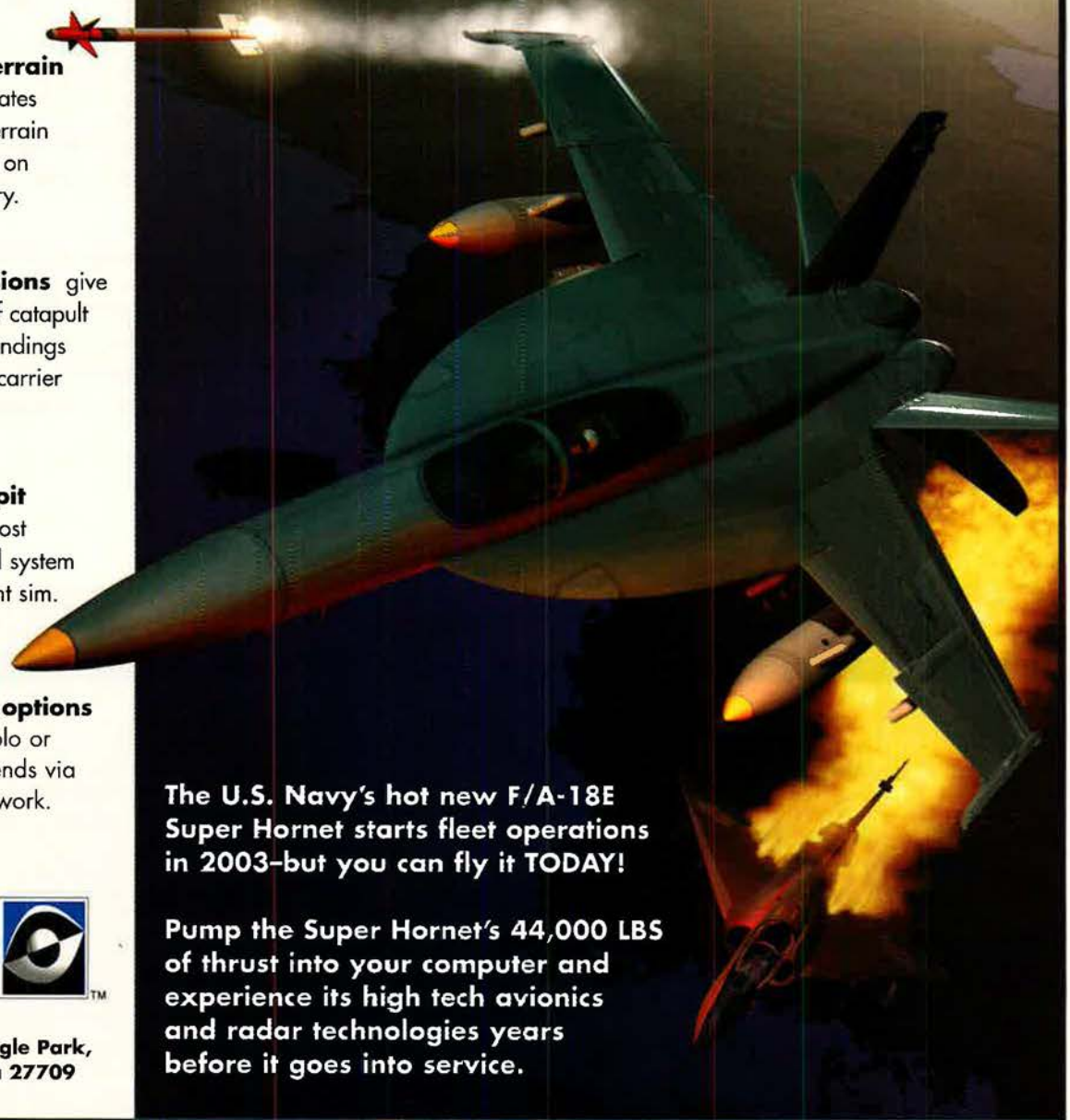

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Budgets

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.

Annual Pay for Federal Civilians

(Effective Jan. 1, 1998)

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	$12,960	$13,392	$13,823	$14,252	$14,685	$14,938	$15,362	$15,791	$15,809	$16,214
GS-2	14,571	14,918	15,401	15,809	15,985	16,455	16,925	17,395	17,865	18,335
GS-3	15,899	16,429	16,959	17,489	18,019	18,549	19,079	19,609	20,139	20,669
GS-4	17,848	18,443	19,038	19,633	20,228	20,823	21,418	22,013	22,608	23,203
GS-5	19,969	20,635	21,301	21,967	22,633	23,299	23,965	24,631	25,297	25,963
GS-6	22,258	23,000	23,742	24,484	25,226	25,968	26,710	27,452	28,194	28,936
GS-7	24,734	25,558	26,382	27,206	28,030	28,854	29,678	30,502	31,326	32,150
GS-8	27,393	28,306	29,219	30,132	31,045	31,958	32,871	33,784	34,697	35,610
GS-9	30,257	31,266	32,275	33,284	34,293	35,302	36,311	37,320	38,329	39,338
GS-10	33,320	34,431	35,542	36,653	37,764	38,875	39,986	41,097	42,208	43,319
GS-11	36,609	37,829	39,049	40,269	41,489	42,709	43,929	45,149	46,369	47,589
GS-12	43,876	45,339	46,802	48,265	49,728	51,191	52,654	54,117	55,580	57,043
GS-13	52,176	53,915	55,654	57,393	59,132	60,871	62,610	64,349	66,088	67,827
GS-14	61,656	63,711	65,766	67,821	69,876	71,931	73,986	76,041	78,096	80,151
GS-15	72,525	74,943	77,361	79,779	82,197	84,615	87,033	89,451	91,869	94,287

Senior Executive Service

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6
$99,200	$103,900	$108,600	$114,500	$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.

Aviation Career Incentive Pay

Phase I

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

Phase II

Monthly Rate	Years of Service as an Officer
$585	more than 18
495	more than 20
385	more than 22
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, 1998

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

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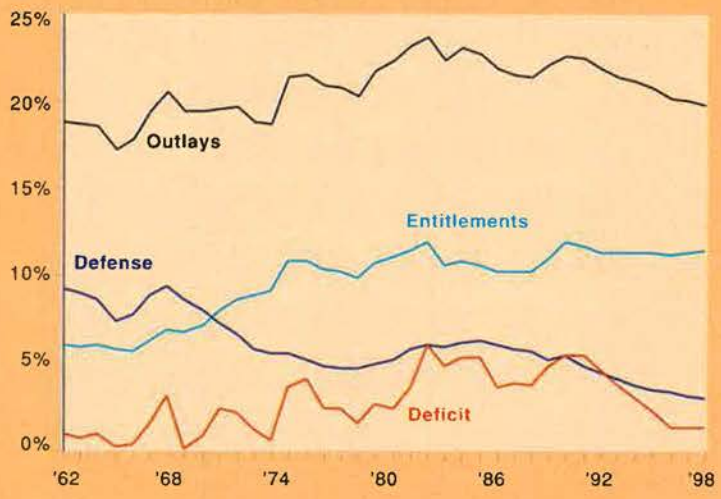
Federal Budget Categories as Percentages of GDP



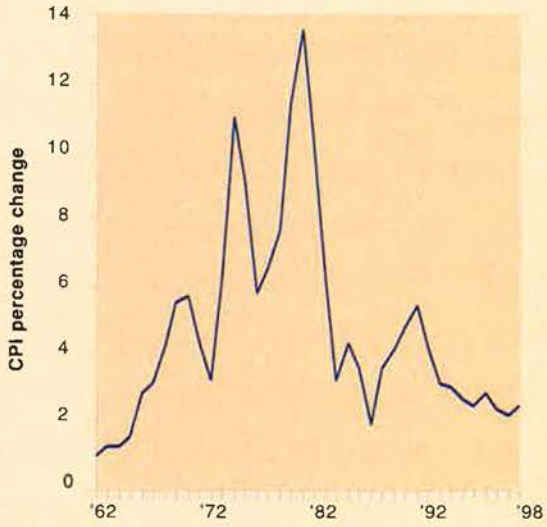
Year	Outlays	Deficit	Entitlements	Defense
1962	18.8	1.0	6.1	9.3
1963	18.6	0.7	6.0	9.0
1964	18.5	1.0	6.1	8.6
1965	17.2	0.2	5.8	7.4
1966	17.8	0.4	5.7	7.8
1967	19.4	1.6	6.3	8.9
1968	20.5	3.2	6.9	9.4
1969	19.4	0.1	6.8	8.7
1970	19.4	0.9	7.2	8.1
1971	19.5	2.4	8.1	7.3
1972	19.6	2.2	8.6	6.7
1973	18.8	1.2	8.9	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	20.0	1.3	11.3	3.2
1999	19.8	1.3	11.5	3.1

Explanatory Note

Data for 1962–97 are historical. Data for 1998–99 are projections. These four tables are based on "The Economic and Budget Outlook: Fiscal Years 1999–2008," published by the Congressional Budget Office, January 1998. (Constant dollar figures are derived.)

Inflation Rates

CPI=Consumer Price Index



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

Federal Budget Categories

Current $ billions

Year	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	946.5	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	1,600.9	103.3	894.6	271.9
1998	1,670.0	105.0	950.0	269.0
1999	1,731.0	115.0	1,003.0	267.0

Federal Budget Categories

Constant FY99 $ billions

Year	Outlays	Deficit	Entitlements	Defense
1962	593.9	32.8	193.0	292.5
1963	611.0	22.0	198.7	294.8
1964	642.1	35.2	210.8	298.0
1965	630.4	8.5	211.7	272.0
1966	697.1	16.1	225.0	305.8
1967	791.8	63.3	255.9	362.0
1968	859.3	133.6	288.0	396.6
1969	839.6	2.3	295.9	378.2
1970	846.3	37.6	314.1	354.4
1971	871.1	108.2	360.1	327.4
1972	926.4	106.0	405.2	318.5
1973	929.1	58.2	439.0	291.5
1974	917.7	27.3	446.3	274.9
1975	1,037.6	172.7	529.6	273.5
1976	1,097.3	208.1	559.0	265.3
1977	1,134.0	138.0	565.3	270.2
1978	1,181.3	141.4	586.4	269.4
1979	1,166.2	89.5	572.2	270.3
1980	1,204.7	148.2	594.3	274.4
1981	1,253.5	136.8	627.7	292.0
1982	1,298.0	209.0	645.5	323.5
1983	1,363.3	350.8	692.6	354.0
1984	1,377.5	300.3	656.2	368.7
1985	1,477.1	346.0	699.8	395.0
1986	1,517.1	364.5	707.6	419.4
1987	1,484.5	250.3	701.4	417.7
1988	1,511.8	275.5	717.6	413.1
1989	1,549.9	278.1	744.8	412.0
1990	1,611.3	357.2	806.5	385.8
1991	1,634.2	396.8	866.9	394.5
1992	1,653.6	407.5	857.6	362.2
1993	1,637.6	349.0	856.1	339.8
1994	1,653.8	292.8	887.0	319.4
1995	1,673.0	249.8	903.1	302.0
1996	1,673.9	186.6	919.8	285.3
1997	1,677.0	108.2	937.1	284.8
1998	1,711.8	107.6	973.8	275.7
1999	1,731.0	115.0	1,003.0	267.0

The 1990s Air Force

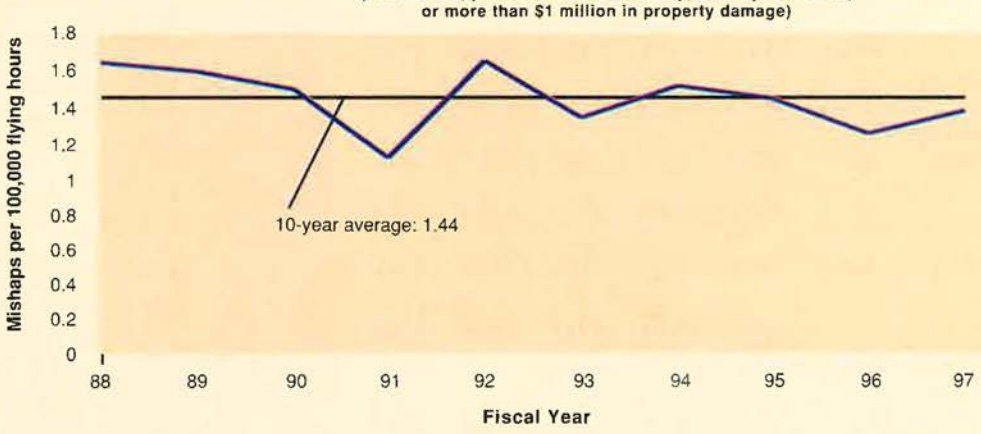
Total Obligation Authority, FY99 Constant Billions

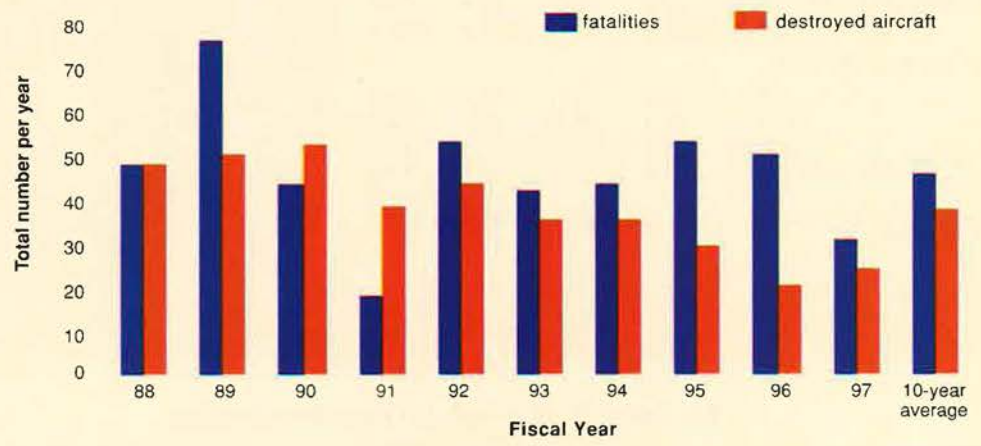
	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Forces										
Strategic Forces	$15.7	$14.6	$12.2	$9.6	$6.2	$5.1	$5.1	$3.9	$4.3	$3.9
General-Purpose Forces	25.7	24.5	20.1	17.6	17.3	16.8	16.8	16.3	15.9	16.4
Airlift Forces	6.7	5.9	6.9	8.1	8.6	9.0	8.6	8.6	8.5	9.3
Guard and Reserve Forces	7.4	6.5	6.9	7.1	7.2	7.5	7.1	7.0	7.3	7.2
Special Operations Forces	1.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total	56.8	51.7	46.5	42.8	39.7	38.7	38.1	36.2	36.4	37.3
Support										
Intelligence & Communications	$21.5	$20.0	$21.4	$21.1	$20.5	$17.9	$18.3	$18.0	$18.5	$18.7
Research & Development	10.9	9.4	9.0	8.4	7.4	8.4	8.4	8.2	7.8	7.0
Central Supply & Maintenance	12.1	10.4	7.1	6.4	4.4	4.4	4.1	3.9	3.8	4.0
Training, Medical, & General Personnel	11.9	13.6	9.4	9.1	8.5	8.8	8.6	8.1	8.2	8.2
Administration & Other	1.7	1.7	1.7	1.6	1.7	1.5	1.6	1.7	1.5	1.9
Total	58.1	55.0	48.6	46.6	42.5	40.9	40.9	39.8	39.8	39.8

Totals do not sum due to rounding.

Class A Aircraft Mishaps

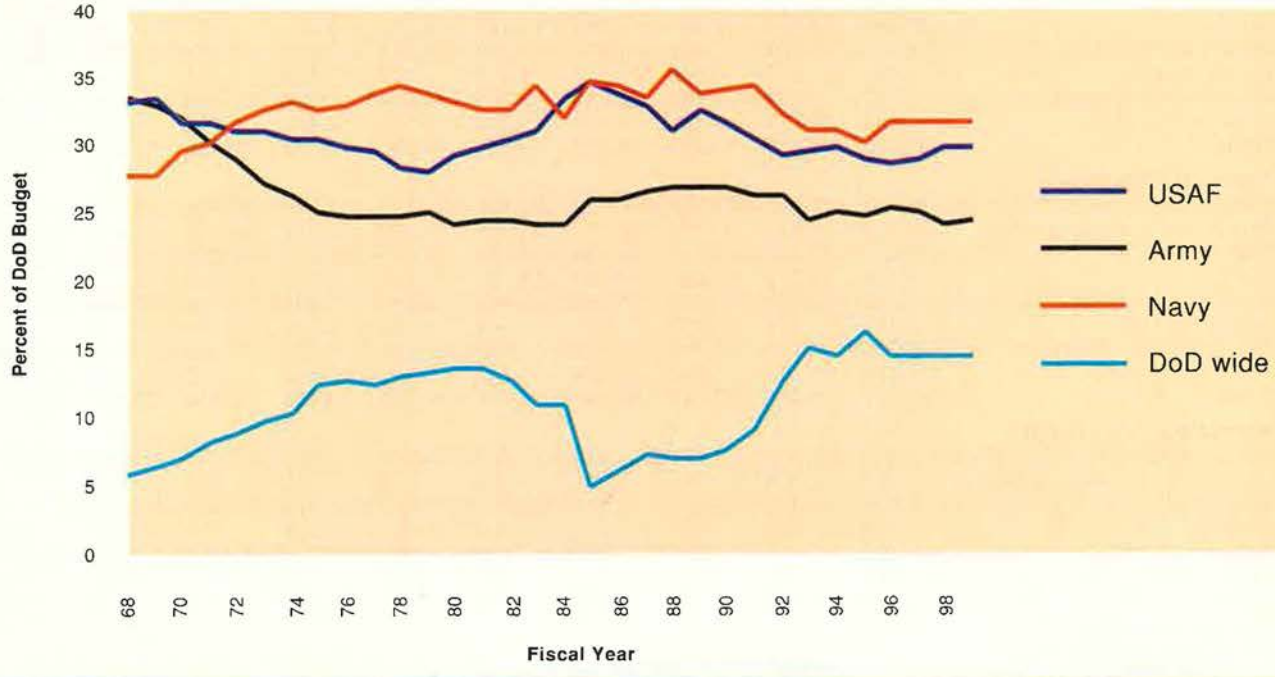
(Loss of life, permanent total disability, destroyed aircraft, or more than $1 million in property damage)





Data provided by USAF.

Service Shares



Defense Department Budget Top Line and Service Shares

($ billions)

	FY98	FY99	FY00	FY01	FY02	FY03
Budget authority (current $)	254.9	257.3	262.9	271.1	274.3	284.0
Budget authority (constant FY99 $)	260.1	257.3	257.2	259.5	256.7	259.7
Outlays (current $)	251.4	252.6	255.8	257.1	259.7	275.8
Outlays (constant FY99 $)	256.4	252.6	250.4	246.2	243.2	252.9

	FY95	FY96	FY97	FY98	FY99
Service Shares (budget authority, current $ billions)					
Air Force	74.4	73.0	72.4	74.4	76.7
Army	62.7	64.5	62.4	60.5	63.8
Navy	78.2	80.0	78.9	80.9	81.3
Defense agencies, DoD–wide	37.3	37.0	36.4	39.0	35.4
Total	**252.6**	**254.4**	**250.0**	**254.9**	**257.3**
Percentages (budget authority)					
Air Force	29.5	28.7	29.0	29.2	29.8
Army	24.8	25.4	25.0	23.7	24.8
Navy	30.9	31.4	31.6	31.7	31.6
Defense agencies, DoD–wide	14.8	14.5	14.5	15.3	13.8

Fiscal 1999 figures are those contained in the Clinton Administration's budget request. Numbers have been rounded.

Pay Grade	With Dependents	Without Dependents
O-10	$1,362.06	$1,154.81
O-9	1,362.06	1,154.81
O-8	1,362.06	1,154.81
O-7	1,362.06	1,154.81
O-6	1,224.38	1,048.21
O-5	1,163.61	994.57
O-4	1,026.16	923.48
O-3	841.68	730.83
O-2	719.67	568.67
O-1	652.57	484.85
O-3E	914.19	801.70
O-2E	822.58	670.96
O-1E	764.82	565.14
E-9	874.56	678.23
E-8	804.21	629.14
E-7	747.83	534.71
E-6	690.39	489.08
E-5	620.59	450.83
E-4	540.00	404.35
E-3	504.27	402.60
E-2	490.76	400.45
E-1	488.07	380.44

Note: All data are averages.

Air Force Budget—A 10-Year Perspective

(Budget authority in $ millions)

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98
Current dollars										
Military personnel	$21,851	$21,777	$22,755	$21,381	$20,141	$18,168	$19,602	$19,309	$19,186	$19,253
Operations and maintenance	24,973	25,160	29,061	22,816	22,179	24,525	24,561	23,519	22,728	23,479
Procurement	30,981	30,276	24,041	23,249	21,803	17,716	16,529	15,558	14,247	15,503
RDT&E	14,696	13,507	12,207	12,867	12,979	12,021	11,787	12,427	14,017	14,031
Military construction	1,445	1,453	1,117	1,200	1,053	1,554	816	1,285	1,567	1,439
Family housing	921	870	888	1,112	1,212	923	1,106	1,124	1,135	1,111
Rev. and mgmt. funds	187	121	1,672	n/a	n/a	n/a	n/a	n/a	790	33
Trust and receipts	-369	-274	-485	-286	-221	-332	-470	-231	-453	-440
Total	**94,685**	**92,890**	**91,257**	**82,340**	**79,146**	**74,575**	**73,933**	**72,992**	**73,218**	**74,409**
Constant FY99 dollars										
Military personnel	29,121	28,557	28,529	26,025	23,490	20,677	21,782	20,969	20,263	19,810
Operations and maintenance	32,528	31,942	33,115	26,767	25,286	27,226	26,987	25,244	23,821	23,824
Procurement	38,083	35,986	27,787	26,250	24,121	19,240	17,629	16,311	14,702	15,756
RDT&E	18,449	16,318	14,216	14,618	14,424	13,106	12,611	13,047	14,467	14,260
Military construction	1,773	1,722	1,288	1,353	1,165	1,686	869	1,348	1,618	1,464
Family housing	1,154	1,051	1,027	1,261	1,344	1,003	1,182	1,178	1,170	1,127
Rev. and mgmt. funds	238	147	1,949	n/a	n/a	n/a	n/a	n/a	813	34
Trust and receipts	-469	-335	-569	-326	-246	-361	-503	-242	-466	-446
Total	**120,877**	**115,388**	**107,342**	**95,946**	**89,584**	**82,576**	**80,556**	**77,856**	**76,387**	**75,829**
Percentage real growth										
Military personnel	-2.1	-1.9	-0.1	-8.8	-9.7	-12.0	5.3	-3.7	-3.4	-2.2
Operations and maintenance	3.7	-1.8	4.1	-19.2	-5.5	7.7	-0.9	-6.5	-5.6	0.0
Procurement	11.6	-5.5	-22.9	-5.5	-8.1	-20.2	-8.4	-7.5	-9.9	7.2
RDT&E	-3.4	-11.6	-12.9	2.8	-1.3	-9.1	-3.8	3.5	10.9	-1.4
Military construction	-1.7	-2.9	-25.2	5.0	-13.9	44.7	-48.5	55.1	20.0	-9.5
Family housing	6.9	-8.9	-2.3	22.8	6.6	-25.4	17.8	-0.3	-0.7	-3.7
Total	**3.0**	**-4.5**	**-7.0**	**-10.6**	**-6.6**	**-7.8**	**-2.4**	**-3.4**	**–1.9**	**-0.7**

Totals may not sum due to rounding.

Allowances for Housing and Subsistence

(Effective Jan. 1, 1998)

	Cash/In-Kind
Officers	$155.70/month

Enlisted Members	E-1 <4 Months	All Other Enlisted
When on leave or authorized to mess separately	$6.86/day	$7.43/day
When rations in-kind are not available	$7.73/day	$8.38/day
When assigned to duty under emergency conditions where no US mess facilities are available	$10.26/day	$11.10/day

Monthly Military Basic Rates of Pay

(Effective Jan. 1, 1998)

Pay Grade	Years of Service: < 2	2	3	4	6	8	10	12	14	16	18	20	22	24	26
Commissioned Officers[a]															
O-10[a]	7,566	7,832	7,832	7,832	7,832	8,133	8,133	8,584	8,584	9,198	9,198	9,814	9,814	9,814	10,425
O-9	6,706	6,881	7,028	7,028	7,028	7,207	7,207	7,507	7,507	8,133	8,133	8,584	8,584	8,584	9,198
O-8	6,074	6,256	6,404	6,404	6,404	6,881	6,881	7,207	7,207	7,507	7,832	8,133	8,334	8,334	8,334
O-7	5,047	5,390	5,390	5,390	5,632	5,632	5,958	5,958	6,256	6,881	7,355	7,355	7,355	7,355	7,355
O-6	3,740	4,109	4,379	4,379	4,379	4,379	4,379	4,379	4,528	5,244	5,511	5,632	5,958	6,159	6,462
O-5	2,992	3,513	3,756	3,756	3,756	3,756	3,869	4,078	4,351	4,677	4,944	5,095	5,273	5,273	5,273
O-4	2,522	3,071	3,275	3,275	3,336	3,483	3,721	3,930	4,109	4,290	4,408	4,408	4,408	4,408	4,408
O-3[b]	2,343	2,620	2,801	3,099	3,248	3,364	3,546	3,721	3,812	3,812	3,812	3,812	3,812	3,812	3,812
O-2[b]	2,044	2,232	2,681	2,771	2,829	2,829	2,829	2,829	2,829	2,829	2,829	2,829	2,829	2,829	2,829
O-1[b]	1,774	1,847	2,232	2,232	2,232	2,232	2,232	2,232	2,232	2,232	2,232	2,232	2,232	2,232	2,232
Commissioned Officers With More Than Four Years of Active Duty Enlisted Service															
O-3E	—	—	—	3,099	3,248	3,364	3,546	3,721	3,869	3,869	3,869	3,869	3,869	3,869	3,869
O-2E	—	—	—	2,771	2,829	2,918	3,071	3,188	3,275	3,275	3,275	3,275	3,275	3,275	3,275
O-1E	—	—	—	2,232	2,384	2,472	2,562	2,651	2,771	2,771	2,771	2,771	2,771	2,771	2,771
Enlisted Members															
E-9	—	—	—	—	—	—	2,777	2,840	2,904	2,971	3,038	3,096	3,259	3,386	3,576
E-8	—	—	—	—	—	2,329	2,396	2,459	2,523	2,590	2,648	2,714	2,873	3,001	3,194
E-7	1,626	1,756	1,820	1,884	1,949	2,011	2,075	2,140	2,236	2,300	2,363	2,394	2,555	2,682	2,873
E-6	1,399	1,525	1,588	1,656	1,718	1,780	1,845	1,940	2,001	2,066	2,097	2,097	2,097	2,097	2,097
E-5	1,228	1,336	1,401	1,462	1,558	1,622	1,686	1,748	1,780	1,780	1,780	1,780	1,780	1,780	1,780
E-4	1,145	1,209	1,280	1,379	1,434	1,434	1,434	1,434	1,434	1,434	1,434	1,434	1,434	1,434	1,434
E-3	1,079	1,138	1,183	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230
E-2	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038
E-1[c]	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926

Amounts have been rounded to the nearest dollar.
Basic pay while serving as Chairman of the Joint Chiefs of Staff or Chief of Staff of the Air Force is $11,502.60, regardless of cumulative years of service, but the general officer cap ([a] below) applies, as well.
Basic pay while serving as Chief Master Sergeant of the Air Force is $4,346.40, regardless of cumulative years of service.
[a]Basic pay is limited to $9,225, regardless of cumulative years of service.
[b]Does not apply to commissioned officers who have been credited with more than four years' active service as enlisted members.
[c]Basic pay for E-1s with less than four months of service is $856.80.

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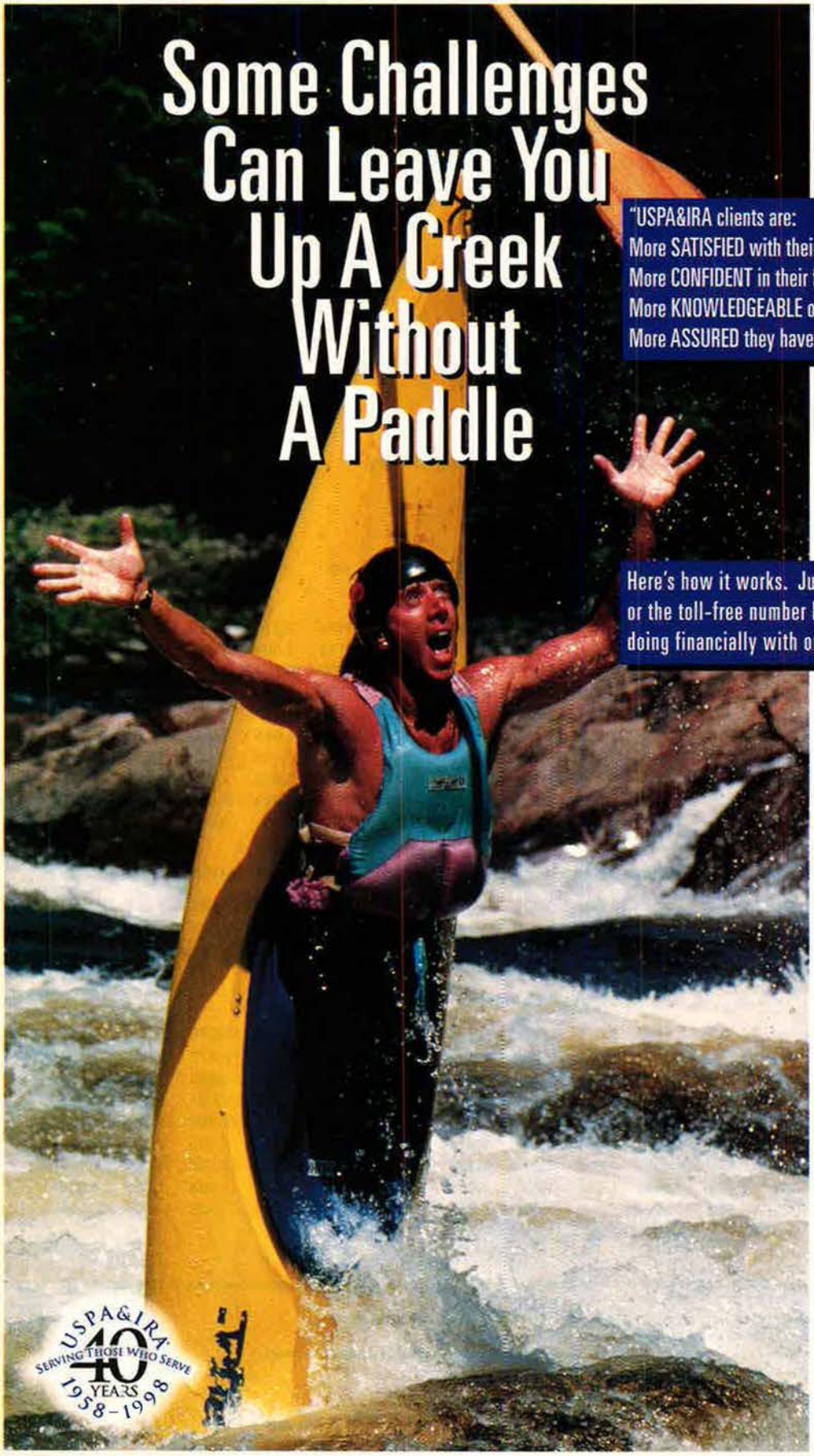

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A financial program, by itself, cannot assure that all retirement or other financial goals will be met.

Equipment

Aircraft per Active Duty USAF Squadron

(As of Sept. 30, 1997)

Aircraft Type	Number
A/OA-10	6, 12, or 17
B-1B	6, 10, or 18
B-2	8
B-52	8 or 12
C-5	16
C-9A	3–11
C-17	12
C-130	8, 10, 12, 13, 14, or 16
AC-130	6 or 10
EC-130H	5
HC-130P/N	4–10
MC-130	4–12
MH-53J	5 or 22
MH-60G	8
KC-10A	9 or 10
KC-135	8–12
C-141B	14 or 16
E-3	2 or 7
F-4	3
F-15	18
F-15E	18 or 24
F-16	18 or 24
EF-111A	24
F-117A	18
HH-60G	4, 5, or 8

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

Aircraft Type, Total Active Inventory, and Primary Aircraft Inventory

(As of Sept. 30, 1997)

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).

Type	TAI	PAI
Bomber		
B-1	77	36
B-2	20	8
B-52	85	49
Total	**182**	**93**
Cargo/transport		
C-5	81	70
C-9	23	22
C-12	34	28
C-17	34	31
C-20	13	12
C-21	76	73
C-23	3	3
C-27	7	7
C-130	197	166
C-135	4	3
C-137	5	5
C-141	139	111
NC-130	4	2
NC-141	2	2
NT-39	2	2
VC-25	2	2
Total	**626**	**539**
Electronic warfare/combat		
EF-111	33	12
Total	**33**	**12**
Fighter/attack		
A-10	130	117
OA-10	90	69
F-4E	3	3
F-15	617	518
F-16	802	666
F-117	54	47
YF-15	1	0
YF-117	3	3
Total	**1,700**	**1,423**
Helicopter		
HH-1	6	4
HH-60	49	39
TH-53	6	4
UH-1	64	45
Total	**125**	**92**
Reconnaissance/battle management/C³I		
E-3	32	26
E-4	4	3
E-8	2	2
EC-18	4	4
EC-130	22	16
EC-135	14	10
EC-137	1	0
OC-135	2	2
RC-135	19	14
RQ-1	2	1
U-2	31	27
WC-135	2	0
Total	**135**	**105**
Special Operations Forces		
AC-130	21	16
MC-130	53	46
MH-53	40	35
MH-60	10	9
Total	**124**	**106**
Tanker		
HC-130	9	9
KC-10	59	54
KC-135	255	228
NKC-135	2	2
Total	**325**	**293**
Trainer		
AT-38	94	62
T-1	179	86
T-3	110	103
T-37	419	272
T-38	377	235
T-39	1	1
T-41	3	3
T-43	11	11
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	1
G-11	2	2
U-2RT/ST	4	4
UV-18	3	2
Total	**1,238**	**808**
Total active duty	**4,488**	**3,471**

ICBMs and Spacecraft in Service

Type of system	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Minuteman II ICBM	450	375	0	0	0	0	0
Minuteman III ICBM	500	500	500	500	530	530	530
Peacekeeper ICBM	50	50	50	50	50	50	50
Total ICBMs	**1,000**	**925**	**550**	**550**	**580**	**580**	**580**
DMSP satellite	2	2	2	2	3	2	2
DSCS satellite	5	5	5	5	5	5	5
DSP satellite (data classified)	—	—	—	—	—	—	—
GPS satellite	16	19	24	24	25	26	26
Milstar	—	—	—	1	2	2	2
Total satellites	**23**	**26**	**31**	**32**	**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.

Total Number of USAF Aircraft in Service and Flying Hours

Type of aircraft	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Bomber	290	248	225	178	183	185	177
Tanker	539	478	391	326	325	314	310
Fighter/interceptor/attack	2,497	2,000	1,848	1,781	1,750	1,637	1,631
Reconnaissance/electronic warfare	303	238	241	225	318	257	252
Cargo/transport	812	794	749	733	690	654	612
Search & rescue (fixed wing)	32	56	84	34	12	9	9
Helicopter (includes rescue)	213	206	203	189	123	174	178
Trainer	1,415	1,313	1,150	1,188	1,205	1,193	1,234
Utility/observation/other	88	89	95	107	104	98	98
Total active duty	**6,189**	**5,422**	**4,986**	**4,761**	**4,710**	**4,521**	**4,501**
Air National Guard	1,793	1,694	1,653	1,586	1,461	1,426	1,375
AFRC	528	524	543	468	462	447	454
Total active duty, ANG, and AFRC	**8,510**	**7,640**	**7,182**	**6,815**	**6,633**	**6,394**	**6,330**
Total aircraft, including foreign-government-owned	8,603	7,733	7,276	7,028	6,725	6,476	6,412
Flying hours (in thousands)							
USAF active duty	2,551	2,195	1,993	1,750	1,709	1,657	1,680
Air National Guard	458	441	442	412	403	380	375
AFRC	157	154	149	155	141	144	150
Total flying hours	**3,166**	**2,790**	**2,584**	**2,317**	**2,253**	**2,181**	**2,205**

Air Defense Unit Fin Flashes

Description	Aircraft	Unit and Location
Air National Guard Units		
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.
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-16A/B	144th FW, Fresno Air Terminal, Calif.
Texas star on subdued jagged stripes with "Houston" logo	F-16A/B	147th FW, Ellington Field, Texas
Stars of Little Dipper constellation and "Duluth" logo	F-16A/B	148th FW, Duluth IAP, Minn.
Black falcon with "Vermont" on subdued stripe	F-16A/B	158th FW, Burlington IAP, Vt.
Stylized "Jersey Devil" and "New Jersey" logo	F-16A/B	177th FW, Atlantic City Airport, N.J.
Air Defense Training Units (ANG)		
Subdued eagle and "Oregon" logo	F-16A/B	114th FS (173d FW), Klamath Falls IAP, Ore.
Starburst state flag and "Arizona" logo	F-16A/B	162d FW, Tucson IAP, Ariz.

USAF Flying Squadrons by Mission Type

	FY93	FY94	FY95	FY96	FY97	FY98 1st quarter
Active forces						
Heavy bomber	15	12	10	10	10	10
Air refueling	31	25	24	23	23	25
Strategic command & control	2	—	1	1	1	2
Intelligence	3	—	—	—	—	—
Fighter	61	53	54	54	54	47
Reconnaissance	0	0	4	4	4	0
Electronic warfare	3	4	3	3	3	3
Special Operations Forces	11	16	15	16	16	13
Ground theater air control	9	5	5	5	5	8
Airborne theater air control	5	7	7	7	9	8
Weather	1	—	—	1	—	—
Rescue	8	6	6	7	7	7
Theater airlift	12	11	12	12	13	11
Long-range airlift	21	16	15	15	17	20
Special mission	2	2	2	2	2	2
Aeromedical airlift	3	3	3	3	3	3
ICBM	19	19	14	14	14	14
Space operations	8	6	9	10	10	10
Space communications	3	3	3	2	1	1
Space warning	7	10	11	9	8	8
Space surveillance	9	7	9	7	6	6
Space launch	3	5	5	5	5	5
Range	3	2	2	2	2	2
Total	**239**	**212**	**214**	**212**	**213**	**205**
Reserve forces						
ANG Selected Reserve	92	89	89	87	88	88
AFRC	59	59	48	48	60	62
Space operations	1	1	1	1	1	3
Total	**152**	**149**	**138**	**136**	**149**	**153**
Grand total	**391**	**361**	**352**	**348**	**362**	**358**

The Air National Guard Fleet

(As of Sept. 30, 1997)

	Age in Years										
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Average	Total number
A-10	—	—	—	—	11	65	24	—	—	16.8	100
B-1	—	—	—	17	—	—	—	—	—	10.3	17
C-5	—	—	—	—	—	—	—	1	12	26.4	13
C-21	—	—	—	4	—	—	—	—	—	10.0	4
C-22	—	—	—	—	3	—	—	—	—	12.7	3
C-26	6	5	5	—	—	—	—	—	—	4.8	16
C-130	27	34	34	24	17	15	8	—	87	17.3	246
C-135	—	—	—	—	—	—	—	—	224	37.4	224
C-141	—	—	—	—	—	—	—	—	18	31.2	18
F-15	—	—	—	—	—	1	106	9	—	19.6	116
F-16	12	12	124	258	151	46	4	—	—	10.8	607
H-60	—	7	10	—	—	—	—	—	—	6.7	17
Total	**45**	**58**	**173**	**303**	**182**	**127**	**142**	**10**	**341**	**17**	**1,381**
Percent[a]	3	4	13	22	13	9	10	0.7	25		

[a]Percentages have been rounded.

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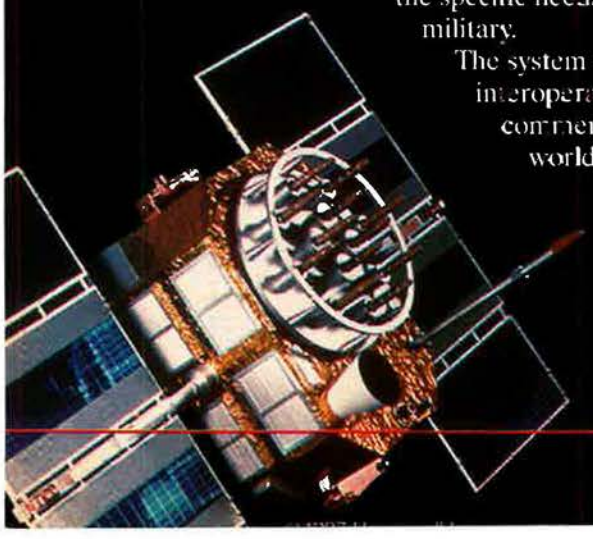

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The Active Duty Fleet

(As of Sept. 30, 1997)

	Age in Years										
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Average	Total number
A/OA-10	—	—	—	—	50	166	4	—	—	15.8	220
B-1	—	—	—	75	2	—	—	—	—	10.3	77
B-2	11	6	3	—	—	—	—	—	—	3.3	20
B-52	—	—	—	—	—	—	—	—	85	35.8	85
C-5	—	—	11	39	—	—	—	—	31	15.8	81
C-9	—	—	—	—	—	—	—	3	20	26.5	23
KC-10	—	—	1	23	24	11	—	—	—	12.7	59
C-12	—	—		4	8	—	5	17	—	18	34
C-17	18	15	1	—	—	—	—	—	—	2.7	34
C-18[a]	—	2	—	—	—	4	—	—	—	11.4	6
C-20	1	1	—	8	3	—	—	—	—	9.9	13
C-21	—	—	—	4	72	—	—	—	—	12.7	76
C-23	—	—	—	—	3	—	—	—	—	12.9	3
C-25	—	—	2	—	—	—	—	—	—	6.9	2
C-27	—	5	2	—	—	—	—	—	—	5.4	7
C-130[b]	3	17	14	18	1	—	8	53	192	25.1	306
C-135[b]	—	—	—	—	—	—	—	—	300	35.7	300
C-137[b]	—	1	—	1	1	—	—	—	3	21.3	6
C-141[b]	—	—	—	—	—	—	—	—	141	31.0	141
E-3	—	—	—	—	5	9	14	4	—	17.8	32
E-4	—	—	—	—	—	—	—	2	2	23.3	4
E-8	2	—	—	—	—	—	—	—	—	1.2	2
F-4	—	—	—	—	—	—	—	—	3	27.9	3
F-15	—	73	133	96	106	170	38	1	1	11.9	618
F-16	42	228	340	128	49	9	6	—	—	7.1	802
EF-111	—	—	—	—	—	—	—	—	33	29.2	33
F-117[c]	—	—	57	—	—	—	—	—	—	6.4	57
G-3	—	—	3	—	—	—	—	—	—	6.6	3
G-4	4	—	1	1	1	3	4	—	—	12.0	14
G-7	—	—	—	4	5	—	—	—	—	12.0	9
G-9	—	—	—	4	—	—	—	—	—	10.6	4
G-10	1	—	—	—	—	—	—	—	—	2.6	1
G-11	2	—	—	—	—	—	—	—	—	2.2	2
H-1	—	—	—	—	—	—	—	—	70	26.5	70
H-53	—	—	1	5	—	—	—	3	37	24.9	46
H-60	—	15	25	9	10	—	—	—	—	8.4	59
RQ-1	2	—	—	—	—	—	—	—	—	0.9	2
T-1	90	89	—	—	—	—	—	—	—	2.9	179
T-3	78	32	—	—	—	—	—	—	—	2.6	110
T-37	—	—	—	—	—	—	—	—	419	34.2	419
T-38	—	—	—	—	—	—	—	—	471	30.2	471
T-39	—	—	—	—	—	—	—	—	3	36.6	3
T-41	—	—	—	—	—	—	—	—	3	27.5	3
T-43	—	—	—	—	—	—	—	9	2	23.5	11
U-2	—	—	3	8	13	1	—	—	3	13.6	28
UV-18	1	—	—	—	—	—	2	—	—	13.5	3
Total	255	484	597	427	353	373	81	92	1,819	18.8	4,481
Percent[d]	**6**	**11**	**13**	**10**	**8**	**8**	**2**	**2**	**41**		

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

The Air Force Reserve Command Fleet

(As of Sept. 30, 1997)

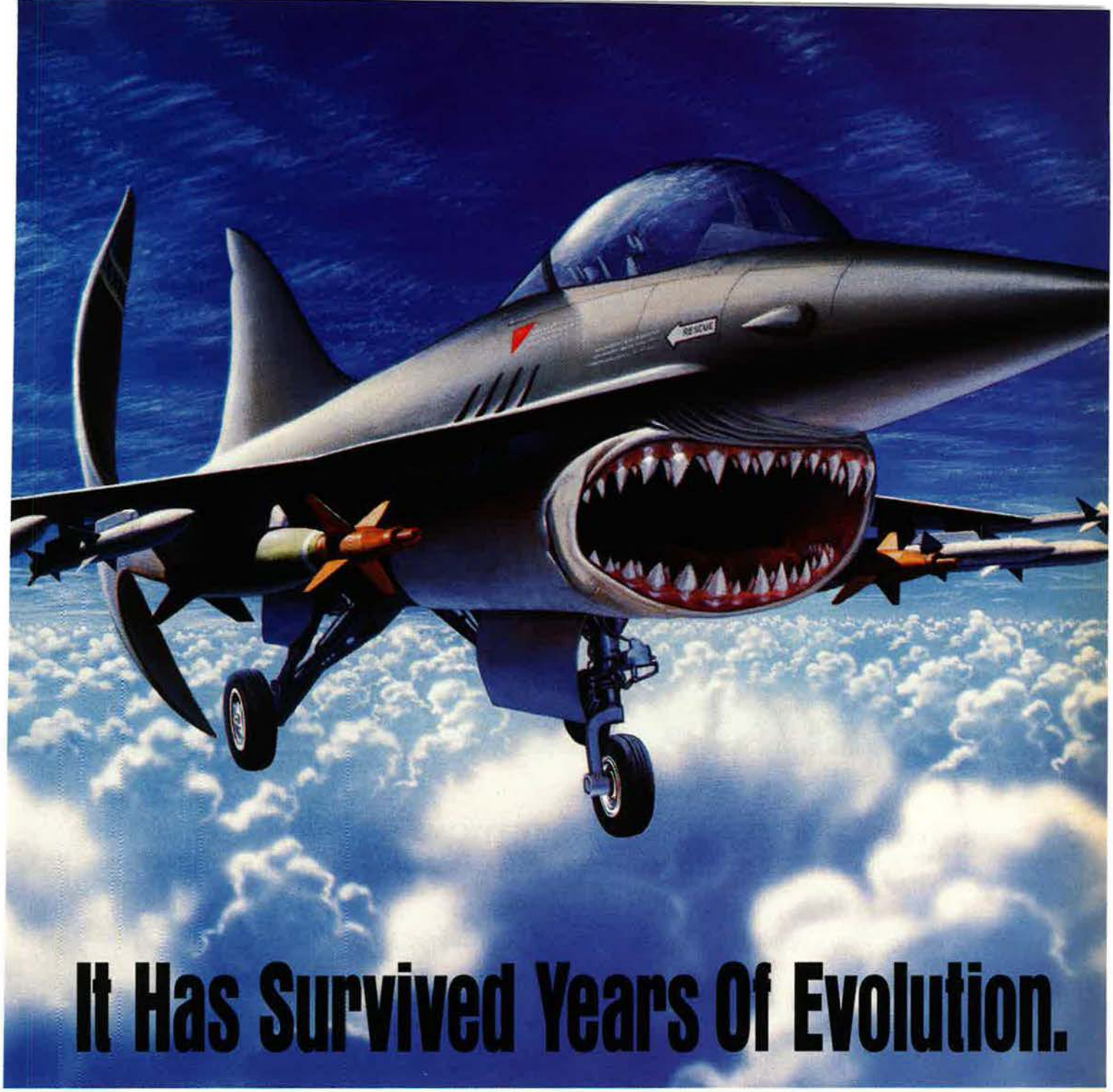
	Age in Years										
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Average	Total number
A-10	—	—	—	—	1	47	3	—	—	17.0	51
B-52	—	—	—	—	—	—	—	—	9	35.5	9
C-5	—	—	—	—	—	—	—	1	31	26.3	32
C-130	15	17	15	24	7	1	—	—	61	18.2	140
C-135	—	—	—	—	—	—	—	—	72	36.8	72
C-141	—	—	—	—	—	—	—	—	48	30.9	48
F-16	—	—	17	53	1	—	—	—	—	9.8	71
H-60	—	—	23	—	—	—	—	—	—	7.1	23
Total	15	17	55	77	9	48	3	1	221	21.5	446
Percent[a]	**3**	**4**	**12**	**17**	**2**	**11**	**0.7**	**—**	**50**		

[a]Percentages have been rounded.

USAF Aircraft Tail Markings

Code	Aircraft	Unit, Location, and Command
AC	F-16C/D	177th FW, Atlantic City IAP, N.J. (ANG)
AF	Various	34th OG, USAF Academy, Colo.
AK	F-15C/D/E, C-130H, C-12F/J,E-3B	3d Wing, Elmendorf AFB, Alaska (PACAF)
	F-16C/D, A/OA-10A	354th FW, Eielson AFB, Alaska (PACAF)
AL	F-16C/D	187th FW, Dannelly Field, Ala. (ANG)
AN	C-130H, HC-130, HH-60G	176th Wing, Anchorage, Alaska (ANG)
AV	F-16C/D	31st FW, Aviano AB, Italy (USAFE)
AZ	F-16A/B/C/D	162d FW, Tucson IAP, Ariz. (ANG)
BB	U-2R/S, T-38A	9th RW, Beale AFB, Calif. (ACC)
BC	A/OA-10A	110th FW, W.K. Kellogg Airport, Mich. (ANG)
BD	A/OA-10A, B-52H	917th Wing, Barksdale AFB, La. (AFRC)
CA	HH-60G, HC-130P	129th Rescue Wing, Moffett Federal Airfield, Calif. (ANG)
CB	T-37B, AT-38B, T-38A, T-1A	14th FTW, Columbus AFB, Miss. (AETC)
CC	F-16C/D	27th FW, Cannon AFB, N.M. (ACC)
CI	C-130E	146th AW, Channel Islands ANGB, Calif. (ANG)
CO	F-16C/D	140th Wing, Buckley ANGB, Colo. (ANG)
CT	A/OA-10A	103d FW, Bradley IAP, Conn. (ANG)
DC	F-16C/D	113th Wing, Andrews AFB, Md. (ANG)
DE	C-130H	166th AW, New Castle County Airport, Del. (ANG)
DM	A/OA-10A, EC-130E/H	355th Wing, Davis–Monthan AFB, Ariz. (ACC)
DR	HH-60G	939th Rescue Wing, Davis–Monthan AFB, Ariz. (AFRC)
DY	B-1B	7th BW, Dyess AFB, Texas (ACC)
ED	Various	412th TW, Edwards AFB, Calif. (AFMC)
EG	F-15C	33d FW, Eglin AFB, Fla. (ACC)
EL	B-1B	28th BW, Ellsworth AFB, S.D. (ACC)
EN	T-37B, T-38A, AT-38B	80th FTW, Sheppard AFB, Texas (AETC)
ET	F-15A/B/C/D/E, F-16A/B/C/D, A-10A, UH-1N	46th TW, Eglin AFB, Fla. (AFMC)
FC	UH-1N	336th TRG, Fairchild AFB, Wash. (AETC)
FE	UH-1N	90th SPW, F.E. Warren AFB, Wyo. (AFSPC)
FF	F-15C/D	1st FW, Langley AFB, Va. (ACC)
FL	C-130E, HC-130N/P, HH-60G	939th Rescue Wing, Patrick AFB, Fla. (AFRC)
FM	F-16C	482d FW, Homestead ARB, Fla. (AFRC)
FS	F-16C/D	188th FW, Fort Smith MAP, Ark. (ANG)
FT	A/OA-10A	23d FG, Pope AFB, N.C. (ACC)
FW	F-16C/D	122d FW, Fort Wayne IAP, Ind. (ANG)
GA	B-1B	116th BW, Robins AFB, Ga. (ANG)
	C-130H	165th AW, Savannah IAP, Ga. (ANG)
GF	HH-1H	321st MG, Grand Forks AFB, N.D. (AFSPC)
HI	F-16C/D	419th FW, Hill AFB, Utah (AFRC)
HL	F-16C/D	388th FW, Hill AFB, Utah (ACC)
HO	F-117A, AT-38B, HH-60G	49th FW, Holloman AFB, N.M. (ACC)
	F-4F	Luftwaffe RTU, Holloman AFB, N.M.
HT	AT-38B	46th TG, Holloman AFB, N.M. (AFMC)
HV	UH-1N	30th SPW, Vandenberg AFB, Calif. (AFSPC)
ID	A/OA-10A,C130E	124th Wing, Boise Air Terminal, Idaho (ANG)
IL	C-130E	182d AW, Greater Peoria Airport, Ill. (ANG)
IS	HH-60G	85th Group, NAS Keflavik, Iceland (ACC)
JZ	F-15A/B	159th FW, NAS JRB New Orleans, La. (ANG)
KC	A/OA-10A	442d FW, Whiteman AFB, Mo. (AFRC)
LA	B-52H	2d BW, Barksdale AFB, La. (ACC)
LF	F-16A/B/C/D	56th FW, Luke AFB, Ariz. (AETC)
LI	HC-130, HH-60G	106th Rescue Wing, Francis S. Gabreski IAP, N.Y. (ANG)
LN	F-15C/D/E	48th FW, RAF Lakenheath, UK (USAFE)
LR	F-16C/D	944th FW, Luke AFB, Ariz. (AFRC)
MA	A/OA-10A	104th FW, Barnes MAP, Mass. (ANG)
MD	A/OA-10A, C-130E	175th Wing, Baltimore, Md. (ANG)
MI	F-16C/D	127th Wing, Selfridge ANGB, Mich. (ANG)
MM	UH-1N	341st SPW, Malmstrom AFB, Mont. (AFSPC)
MN	C-130	133d AW, Minneapolis–St. Paul IAP/ARS, Minn. (ANG)
MO	B-1B, F-15C/D/E, F-16C/D, KC-135R	366th Wing, Mountain Home AFB, Idaho (ACC)
MT	B-52H	5th BW, Minot AFB, N.D. (ACC)
	UH-1N	91st SPW, Minot AFB, N.D. (AFSPC)
MY	A/OA-10A, F-16C/D, HC-130, HH-60G	347th Wing, Moody AFB, Ga. (ACC)
NC	C-130H	145th AW, Charlotte/Douglas IAP, N.C. (ANG)
NM	F-16C/D	150th FW, Kirtland AFB, N.M. (ANG)
NO	A/OA-10A	926th FW, NAS JRB New Orleans, La. (AFRC)
NV	C-130E	152d AW, Reno/Tahoe IAP, Nev. (ANG)
NY	F-16C/D	174th FW, Syracuse Hancock IAP, N.Y. (ANG)
OF	Various	55th Wing, Offutt AFB, Neb. (ACC)
OH	F-16C/D	178th FW, Springfield–Beckley MAP, Ohio (ANG)
	C-130H	179th AW, Mansfield Lahm Airport, Ohio (ANG)
	F-16C/D	180th FW, Toledo Express Airport, Ohio (ANG)
OK	F-16C/D	138th FW, Tulsa IAP, Okla. (ANG)
	E-3B/C	552d ACW, Tinker AFB, Okla. (ACC)
	C-130H	137th AW, Will Rogers World Airport, Okla. (ANG)
OS	A/OA-10A, F-16C/D, C-12J	51st FW, Osan AB, South Korea (PACAF)
OT	A-10, F-15A/C/E, F-16C/D, F-117 HH-60	53d Wing, Eglin AFB, Fla., and Nellis AFB, Nev. (ACC)
PA	A/OA-10A	111th FW, Willow Grove ARS, Pa. (ANG)
PD	HC-130P, HH-60G, C-130E	939th Rescue Wing, Portland IAP, Ore. (AFRC)
PR	C-130E	156th AW, Luis Muniz Marin IAP, Puerto Rico (ANG)
RA	AT-38B, T-1A, T-3A, T-37B, T-38A, T-43A	12th FTW, Randolph AFB and Hondo Airport, Texas (AETC), US Air Force Academy, Colo.
RI	C-130E	143d AW, Quonset State Airport, R.I. (ANG)
RS	C-130E	86th AW, Ramstein AB, Germany (USAFE)
SA	F-16C/D	149th FW, Kelly AFB, Texas (ANG)
SI	F-16C/D	183d FW, Capital MAP, Ill. (ANG)
SJ	F-15E	4th FW, Seymour Johnson AFB, N.C. (ACC)
SL	F-15A/B	131st FW, Lambert–St. Louis IAP, Mo. (ANG)
SP	A/OA-10A, F-15C/D, F-16C/D	52d FW, Spangdahlem AB, Germany (USAFE)
SW	F-16C/D	20th FW, Shaw AFB, S.C. (ACC)
TH	F-16C/D	181st FW, Hulman Regional Airport, Ind. (ANG)
TX	C-130H	136th AW, NAS Dallas, Texas (ANG)
	F-16C/D	301st FW, NAS Fort Worth JRB Carswell Field, Texas (AFRC)
TY	F-15C/D	325th FW, Tyndall AFB, Fla. (AETC)
VA	F-16C/D	192d FW, Richmond IAP, Va. (ANG)
VN	T-37B, T-38A, T-1A	71st FTW, Vance AFB, Okla. (AETC)
WA	A-10, F-15C/D/E, F-16, HH-60, RQ-1	57th Wing, Nellis AFB, Nev. (ACC)
WE	E-9A	53d Wing, Tyndall AFB, Fla. (ACC)
WI	F-16C/D	115th FW, Truax Field, Wis. (ANG)
WM	B-2A, T-38A	509th BW, Whiteman AFB, Mo. (ACC)
WP	F-16C/D	8th FW, Kunsan AB, South Korea (PACAF)
WR	E-8C	93d ACW, Robins AFB, Ga. (ACC)
WV	C-130H	130th AW, Yeager Airport, W.Va. (ANG)
	C-130H	167th AW, Eastern West Virginia Regional Airport/Shepherd Field, W.Va. (ANG)
WW	F-16C/D	35th FW, Misawa AB, Japan (PACAF)
WY	C-130H	153d AW, Cheyenne MAP, Wyo. (ANG)
XL	T-37B, T-1A, T-38A	47th FTW, Laughlin AFB, Texas (AETC)
XP	C-130H	139th AW, Rosecrans Memorial Airport, Mo. (ANG)
YJ	C-21A, C-130E/H, C-9, UH-1N	374th AW, Yokota AB, Japan (PACAF)
ZZ	F-15C/D, E-3B, KC-135R, HH-60G	18th Wing, Kadena AB, Japan (PACAF)

Sources: USAF and William R. Peake.



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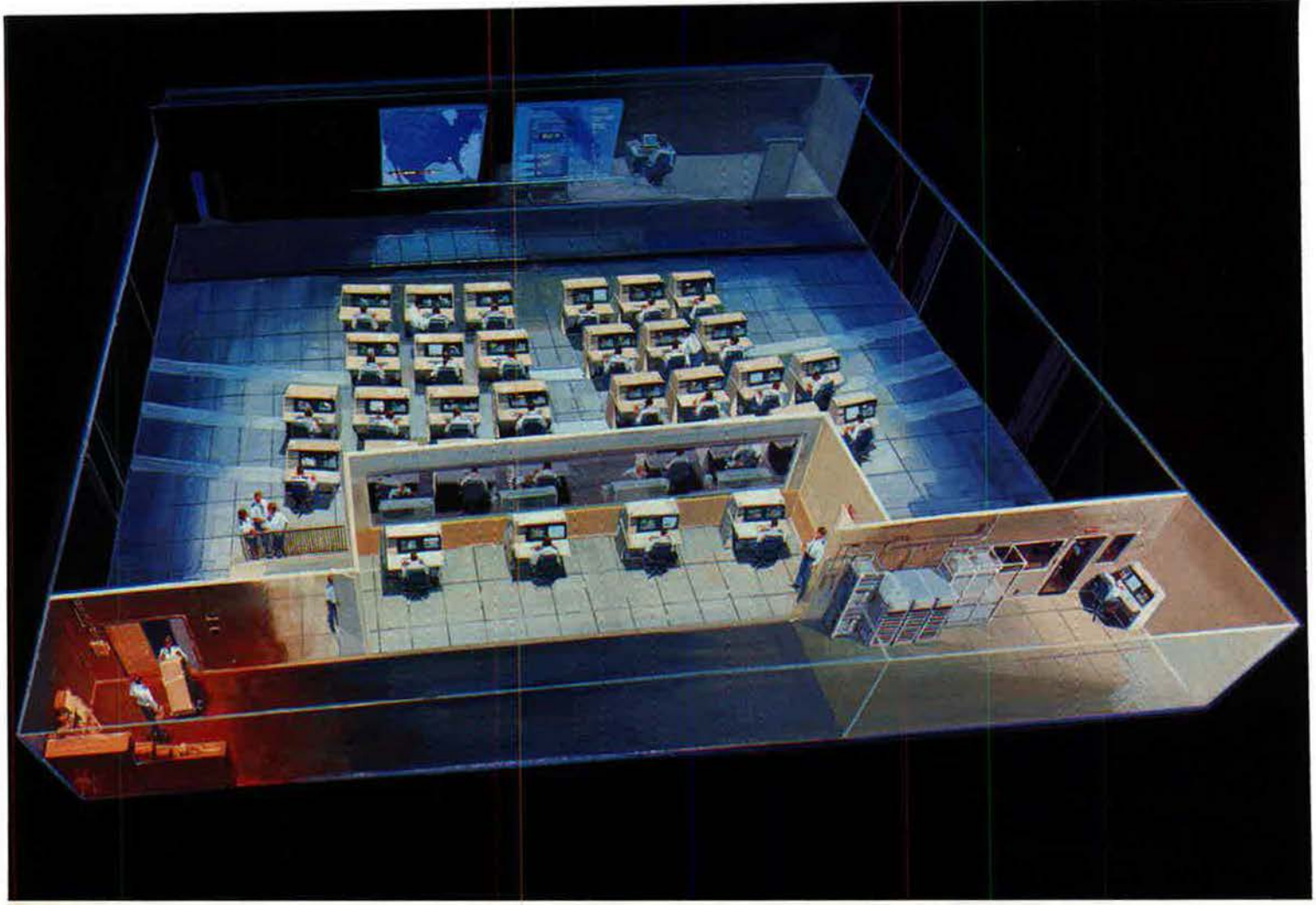

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(O-1)

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(O-7)

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(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)

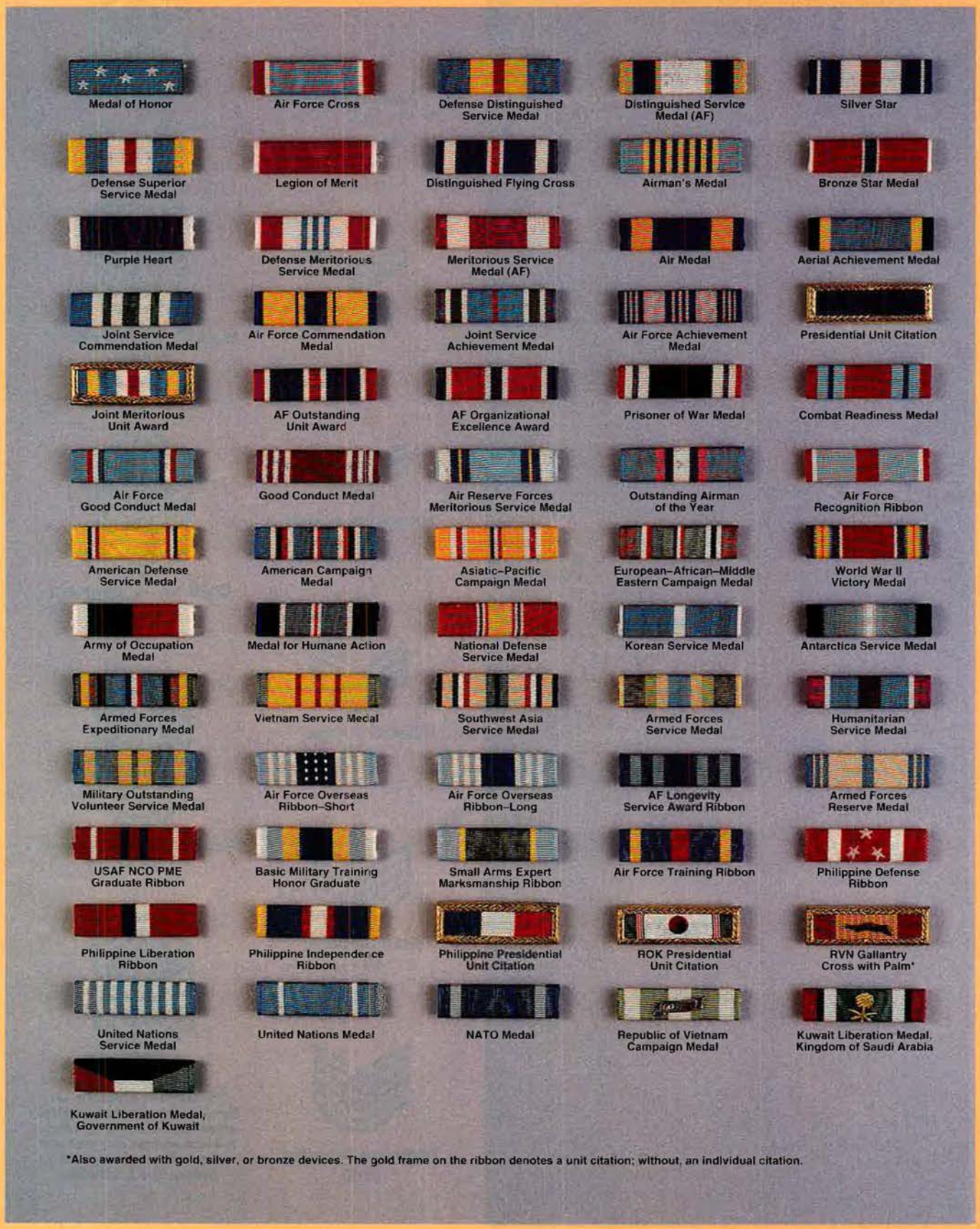
Chief Master Sergeant of
the Air Force

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.

Awards and Decorations

This display represents, in correct order of precedence, 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).

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 are the aeronautical badges. The basic level of wings or badges is illustrated on the following two pages. Most wings and badges have two other categories of accomplishment—senior and master. A star centered above the badge indicates the senior level, while a star surrounded by a wreath above the badge represents the master level.

Pilot

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.

Navigator/Observer

Enlisted Aircrew

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

Flight Surgeon

Flight Nurse

Officer Aircrew Member

Missile with Operations Designator

Missile

Badges, continued

Occupational badges are shown here in alphabetical order. Officers wear the basic badge after graduating from technical school or after attaining a fully qualified Air Force Specialty Code when technical school is not required. Enlisted personnel wear the basic badge after completing technical school.


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

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  - **Relocations**
- **Logistics Support**
  - **Spares**
  - **Return and Repair**
  - **Training**
  - **Emergency Technical Assistance**
- **Engineering Services**
- **Field Service Support**
- **ISDN**
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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. Reestablished 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	

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	

Since March 16, 1972, the chief of Air Force Reserve had also been commander, Hq. Air Force Reserve (AFRES). Maj. Gen. Thomas Marchbanks Jr. served as chief, Air Force Reserve, from Jan. 18, 1968, to Feb. 1, 1971. Formerly Air Force Reserve, AFRC became a major command Feb. 17, 1997.

Air Force Space Command

Gen. James V. Hartinger	Sept. 1, 1982	July 30, 1984
Gen. Robert T. Herres	July 30, 1984	Oct. 1, 1986
Maj. Gen. Maurice C. Padden	Oct. 1, 1986	Oct. 29, 1987
Lt. Gen. Donald J. Kutyna	Oct. 29, 1987	March 29, 1990
Lt. Gen. Thomas S. Moorman Jr.	March 29, 1990	March 23, 1992
Gen. Donald J. Kutyna	March 23, 1992	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	

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	

Air National Guard

Col. William A.R. Robertson	Nov. 28, 1945	Oct. 1948
Maj. Gen. George G. Finch	Oct. 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	Apr. 1, 1981
Maj. Gen. John B. Conaway	Apr. 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
Brig. Gen. Paul A. Weaver Jr.	Jan. 28, 1998	

ANG and AFRC primary responsibilities came under Continental Air Command 1948–68.

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 AF (1942). Redesignated Alaskan Air Command (1945). Redesignated 11th AF 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	Aug. 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.

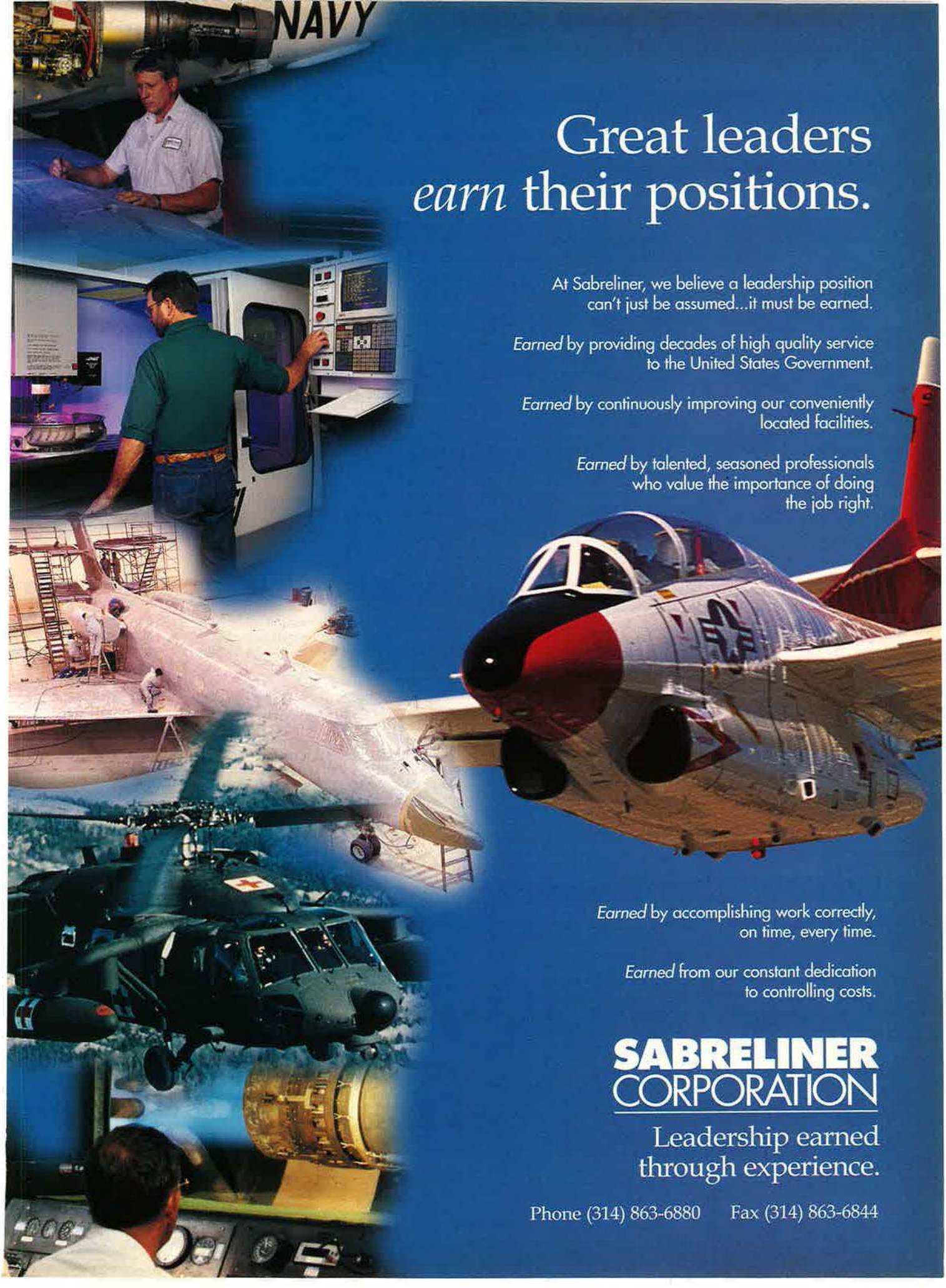
Military Airlift Command

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.

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



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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	

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

Strategic Air Command

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

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

Tactical Air Command

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

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

US Air Forces in Europe

Brig. Gen. John F. McBlain (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
Lt. 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). Redesignated USAFE Aug. 7, 1945.

US Air Forces Southern Command/Caribbean

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

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

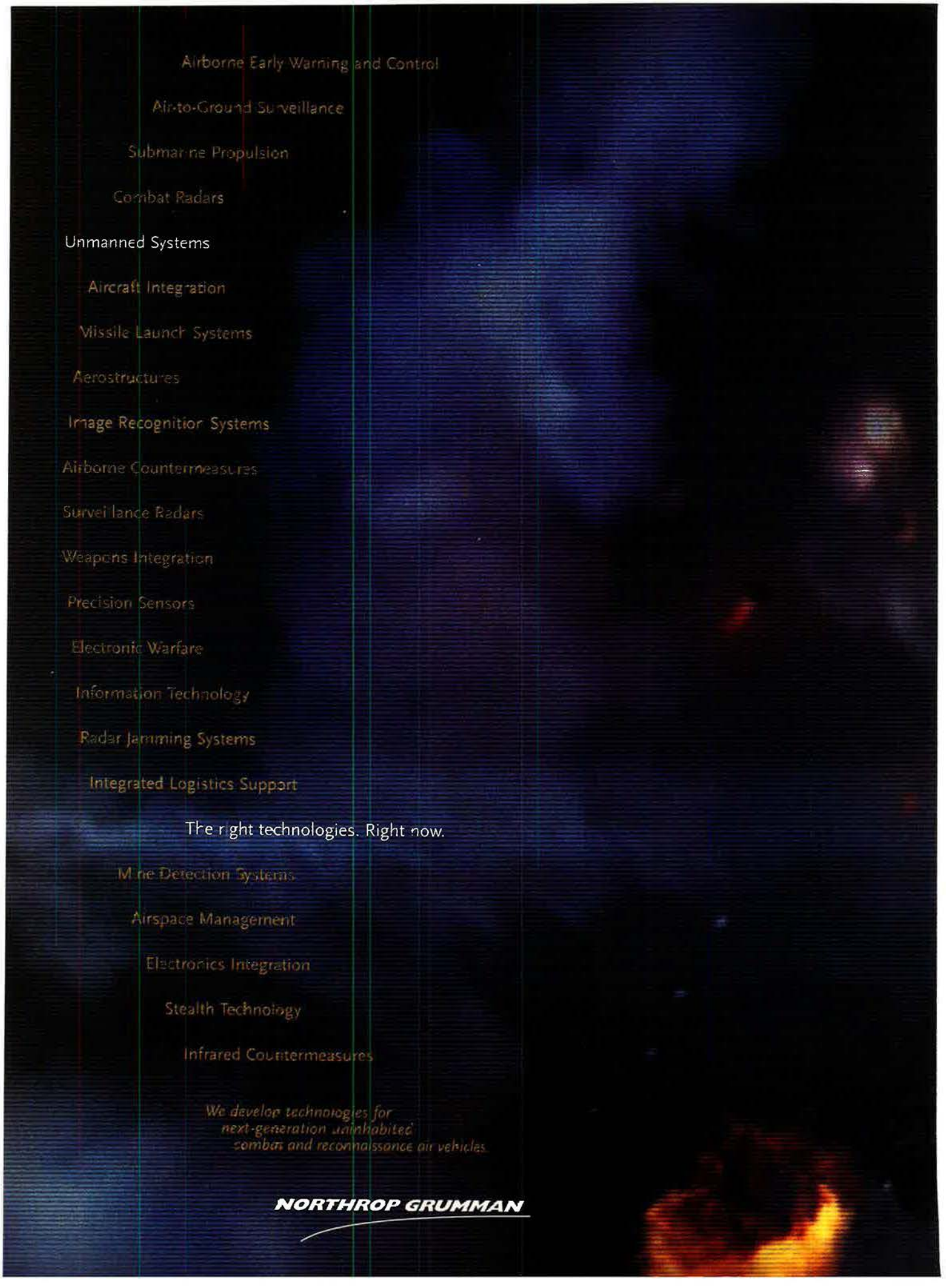
USAF Academy Superintendents

Lt. Gen. Hubert R. Harmon	July 27, 1954	July 27, 1956
Maj. Gen. James E. Briggs	July 28, 1956	Aug. 16, 1959
Maj. Gen. William S. Stone	Aug. 17, 1959	June 30, 1962
Maj. Gen. Robert H. Warren	July 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	

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.[1]	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.[1]	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.[1]	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.[1]	Sioux City, Iowa	Conspicuous gallantry while POW	
Dethlefsen, Maj. Merlyn H.	Greenville, Iowa	March 10, 1967	Thai Nguyen, N. Vietnam
Fisher, Maj. Bernard F.[1]	San Bernardino, Calif.	March 10, 1966	A Shau Valley, S. Vietnam
Fleming, 1st Lt. James P.[1]	Sedalia, Mo.	Nov. 26, 1968	Duc Co, S. Vietnam
Jackson, Lt. Col. Joe M.[1]	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.[1]	South Windsor, Conn.	Feb. 24, 1969	Long Binh, S. Vietnam
Sijan, Capt. Lance P.	Milwaukee	Conspicuous gallantry while POW	
Thorsness, Lt. Col. Leo K.[1]	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

[1]Living Medal of Honor recipient.


Airborne Early Warning and Control
Air-to-Ground Surveillance
Submarine Propulsion
Combat Radars
Unmanned Systems
Aircraft Integration
Missile Launch Systems
Aerostructures
Image Recognition Systems
Airborne Countermeasures
Surveillance Radars
Weapons Integration
Precision Sensors
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Information Technology
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USAF Almanac

Air Force Magazine's Guide to Aces

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 30, 1918	First US–trained AEF ace: Capt. Edward V. Rickenbacker
Dec. 7, 1941	First AAF victories of WW II: Six pilots at Pearl Harbor
Dec. 16, 1941	First AAF ace of WW II: 1st Lt. Boyd D. Wagner
June 27, 1950	First USAF victories in the Korean War
Nov. 8, 1950	First jet-to-jet victory of the Korean War
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 plane. 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 front-seater and one to the back-seater. 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
Luke, 2d Lt. Frank, Jr.	18
Vaughn, 1st Lt. George A.	13
Kindley, 1st Lt. Field E.	12
Springs, 1st Lt. Elliott W.	12
Landis, 1st Lt. Reed G.	10
Swaab, 1st Lt. Jacques M.	10
Baer, 1st Lt. Paul P.	9
Cassady, 1st Lt. Thomas G.	9
Hamilton, 1st Lt. Lloyd A.	9
Wright, 1st Lt. Chester E.	9
Clay, 1st Lt. Henry R., Jr.	8
Coolidge, Capt. Hamilton	8
Donaldson, 2d Lt. John O.	8
Erwin, 1st Lt. William P.	8
Hunter, 1st Lt. Frank O'D.	8
Jones, 2d Lt. Clinton	8
Meissner, Capt. James A.	8
Stenseth, 1st Lt. Martinus	8
White, 2d Lt. Wilbert W.	8
Burdick, 2d Lt. Howard	7
Chambers, 1st Lt. Reed M.	7
Cook, 1st Lt. Harvey W.	7
Creech, 1st Lt. Jesse O.	7
Holden, 1st Lt. Lansing C.	7
Robertson, 1st Lt. Wendel A.	7
Rummell, 1st Lt. Leslie J.	7
Schoen, 1st Lt. Karl J.	7
Sewall, 1st Lt. Sumner	7
Beane, 1st Lt. James D.	6
Biddle, Capt. Charles J.	6
Campbell, 1st Lt. Douglas	6
Curtis, 1st Lt. Edward P.	6
Guthrie, 1st Lt. Murray K.	6
Hammond, 1st Lt. Leonard C.	6
Hays, 2d Lt. Frank K.	6
Hudson, 1st Lt. Donald	6
Knotts, 2d Lt. Howard C.	6
Lindsay, 1st Lt. Robert O.	6
MacArthur, 2d Lt. John K.	6
Ponder, 2d Lt. William T.	6
Putnam, 1st Lt. David E.	6
Stovall, 1st Lt. William H.	6
Tobin, 1st Lt. Edgar G.	6
Vasconcells, 1st Lt. Jerry C	6
Badham, 2d Lt. William T.	5
Bair, 1st Lt. Hilbert L.	5
Bissell, 1st Lt. Clayton L.	5
Brooks, 2d Lt. Arthur R.	5
Buckley, 1st Lt. Harold R.	5
Cook, 1st Lt. Everett R.	5
D'Olive, 1st Lt. Charles R.	5
Easterbrook, 1st Lt. Arthur L.	5
Furlow, 1st Lt. George W.	5
George, 1st Lt. Harold H.	5
Grey, 1st Lt. Charles G.	5
Haight, 1st Lt. Edward M.	5
Healy, 1st Lt. James A.	5
Knowles, 1st Lt. James, Jr.	5
Larner, 1st Lt. G. DeFreest	5
Luff, 1st Lt. Frederick E.	5
O'Neill, 2d Lt. Ralph A.	5
Owens, 2d Lt. John S.	5
Porter, 2d Lt. Kenneth L.	5
Ralston, 1st Lt. Orville A.	5
Seerley, 1st Lt. John J.	5
Strahm, Capt. Victor H.	5
Todd, 2d Lt. Robert M.	5
Vernam, 1st Lt. Remington D.	5
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
McGuire, Maj. Thomas B., Jr.	38
Gabreski, Lt. Col. Francis S.	28[a]
Johnson, Capt. Robert S.	27
MacDonald, Col. Charles H.	27
Preddy, Maj. George E.	26.83
Meyer, Lt. Col. John C.	24[a]
Schilling, Col. David C.	22.50
Johnson, Lt. Col. Gerald R.	22
Kearby, Col. Neel E.	22
Robbins, Maj. Jay T.	22
Christensen, Capt. Fred J.	21.50
Wetmore, Capt. Ray S.	21.25
Voll, Capt. John J.	21
Mahurin, Maj. Walker M.	20.75[a]
Lynch, Lt. Col. Thomas J.	20
Westbrook, Lt. Col. Robert B.	20
Gentile, Capt. Don S.	19.83
Duncan, Col. Glenn E.	19.50
Carson, Capt. Leonard K.	18.50
Eagleston, Maj. Glenn T.	18.50[a]
Beckham, Maj. Walter C.	18
Green, Maj. Herschel H.	18
Herbst, Lt. Col. John C.	18
Zemke, Lt. Col. Hubert	17.75
England, Maj. John B.	17.50
Beeson, Capt. Duane W.	17.33
Thornell, 1st Lt. John F., Jr.	17.25
Varnell, Capt. James S., Jr.	17
Johnson, Maj. Gerald W.	16.50
Godfrey, Capt. John T.	16.33
Anderson, Capt. Clarence E., Jr.	16.25
Dunham, Lt. Col. William D.	16
Harris, Lt. Col. Bill	16
Welch, Capt. George S.	16
Beerbower, Capt. Donald M.	15.50
Brown, Maj. Samuel J.	15.50
Peterson, Capt. Richard A.	15.50
Whisner, Capt. William T., Jr.	15.50[a]
Bradley, Lt. Col. Jack T.	15
Cragg, Maj. Edward	15
Foy, Maj. Robert W.	15
Hofer, 2d Lt. Ralph K.	15
Homer, Capt. Cyril F.	15
Landers, Lt. Col. John D.	14.50
Powers, Capt. Joe H., Jr.	14.50

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

Ranks are as of last victory in World War II.

Maj. Richard I. Bong

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	Other[a]	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

Col. John C. Meyer

Maj. James Jabara

Col. Robin Olds

[a]Olds' four additional victories came during the Vietnam War; all others' during the Korean War.

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 WW 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 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 Air National Guard and Air Force Reserve Command gained)
Operate 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 and wartime defense
Provide air combat forces to America's warfighting commands
Provide nuclear-capable forces for US Strategic Command
Provide air defense forces to North American Aerospace Defense Command
Supply aircraft 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

EQUIPMENT

(Primary Aircraft Inventory)

Bombers (B-1B, B-2, B-52H)	109
Fighters (F-15A/C, F-16, F-4)	372
Attack aircraft (A/OA-10, F-15E, F-117A)	184
EC/EW aircraft (EF-111A)	12
Aerial refuelers (KC-135E/R)	6
Rescue (HC-130, HH-60)	35
Reconnaissance (U-2, RC-135, E-8C)	44
UAV (Predator)	3
Command and control (EC-130E, EC-135, E-3, E-4, E-8	38

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

PERSONNEL

Active duty	90,112
Officers	12,772
Enlisted	77,340
Reserve components	63,763
ANG	53,127
AFRC	10,636
Civilian	16,065
Total	**169,940**

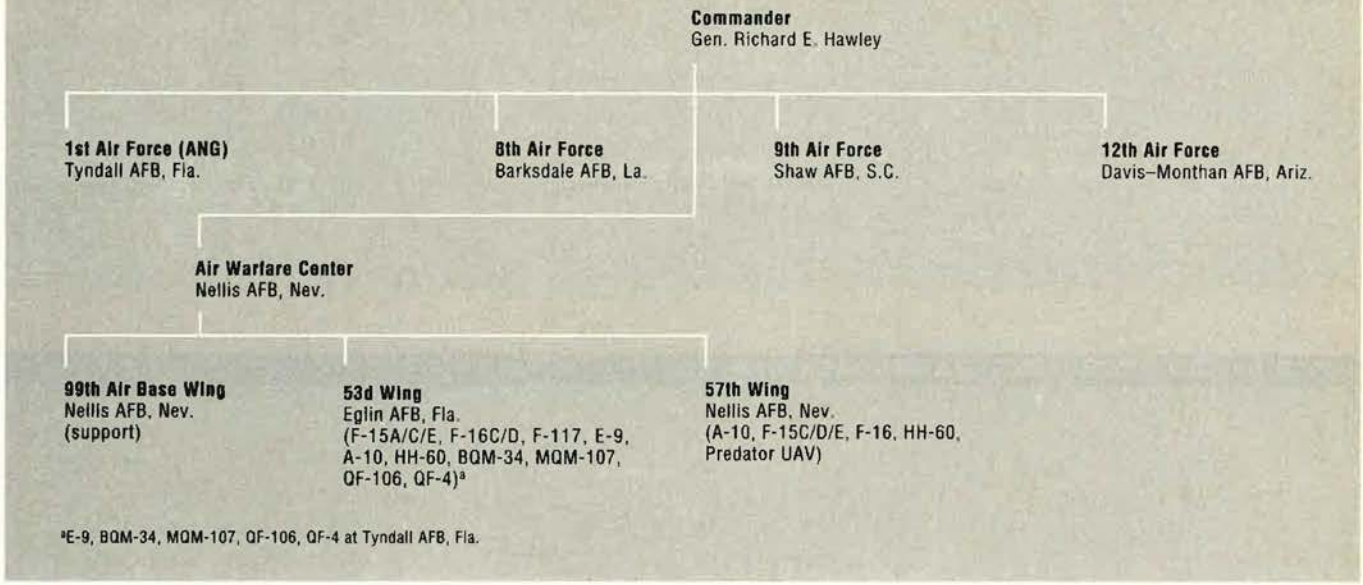
OPERATIONAL ACTIVITY

Flying hours ..... 33,640 per month

USAF photo by MSgt. Val Gempis

Air Combat Command deploys worldwide on the forefront of many USAF operations. Above, an F-117 from the 8th Fighter Squadron, Holloman AFB, N.M., moves out from Al Jaber AB, Kuwait, on an Operation Southern Watch mission.

AIR COMBAT COMMAND, LANGLEY AFB, VA.



[a]E-9, BQM-34, MQM-107, QF-106, QF-4 at Tyndall AFB, Fla.

Major overseas deployments
Bright Star (Central Command), Central Enterprise (European Command), Cobra Gold (Pacific Command), Northern Viking, Strong Resolve (Atlantic Command)

Major CONUS JCS exercises
Global Guardian (STRATCOM), Internal Look (CENTCOM), JTFEX (USACOM), Roving Sands (USACOM), Unified Endeavor (USACOM)

Major training exercises
Air Warrior, Nellis AFB, Nev.; Air Warrior II, Barksdale AFB, La., and Little Rock AFB, Ark.; Blue Flag, Hurlburt Field, Fla.; Green Flag, Nellis AFB, Nev.; Maple Flag, CFB Cold Lake, Canada; Red Flag, Nellis AFB, Nev.

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 Wing	Dyess AFB, Texas	B-1B
9th Reconnaissance Wing	Beale AFB, Calif.	U-2R/S, T-38
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.	F-4, F-117A, AT-38B, HH-60, German F-4E/F
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, RC-135S/U/V/W, EC-135C, TC-135S/W, KC-135E, WC-135W, OC-135B
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.	F-16C/D, A/OA-10, HC-130, HH-60
355th Wing	Davis–Monthan AFB, Ariz.	A/OA-10, EC-130E/H
366th Wing	Mountain Home AFB, Idaho	F-15C/D/E, F-16C/D, KC-135R, B-1B
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. Phillip J. Ford

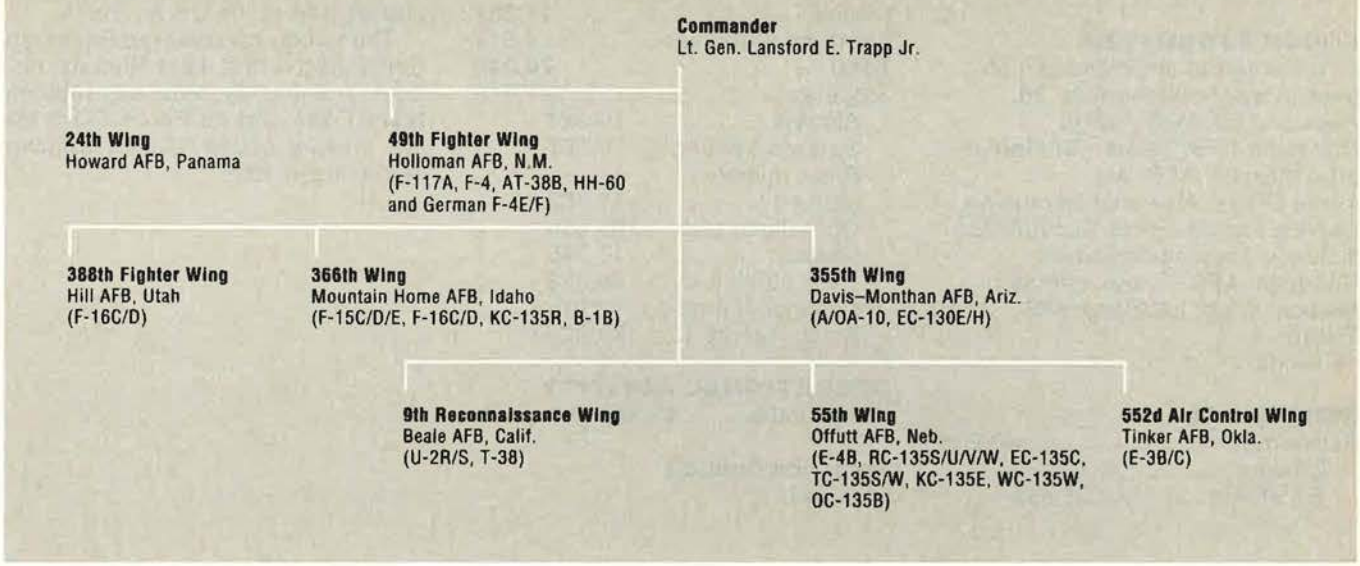
- **509th Bomb Wing**
  Whiteman AFB, Mo.
  (B-2, T-38)
- **27th Fighter Wing**
  Cannon AFB, N.M.
  (F-16C/D)
- **5th Bomb Wing**
  Minot AFB, N.D.
  (B-52H)
- **28th Bomb Wing**
  Ellsworth AFB, S.D.
  (B-1B)
- **7th Wing**
  Dyess AFB, Texas
  (B-1B)
- **2d Bomb Wing**
  Barksdale AFB, La.
  (B-52H)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

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

Commander
Lt. Gen. Carl E. Franklin

- **1st Fighter Wing**
  Langley AFB, Va.
  (F-15C/D)
- **4th Fighter Wing**
  Seymour Johnson AFB, N.C.
  (F-15E)
- **23d Fighter Group**
  Pope AFB, N.C.
  (A/OA-10)
- **33d Fighter Wing**
  Eglin AFB, Fla.
  (F-15C)
- **347th Wing**
  Moody AFB, Ga.
  (F-16C/D, A/OA-10, HH-60, HC-130)
- **93d Air Control Wing**
  Robins AFB, Ga.
  (E-8C)
- **20th Fighter Wing**
  Shaw AFB, S.C.
  (F-16C/D)

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



COMMAND NOTES

Air Combat Command, with headquarters at Langley AFB, Va., is the primary provider of combat air forces and is the proponent for fighter, bomber, reconnaissance, battle-management, and rescue aircraft and command, control, communications, and intelligence systems.

AETC Air Education and Training Command

Headquarters Randolph AFB, Texas

Established July 1, 1993

Commander Gen. Lloyd W. Newton

MISSIONS

Recruit, access, commission, train, and educate Air Force enlisted and officer personnel

Provide basic military training, initial and advanced technical training, flying training, and professional military and degree-granting professional education

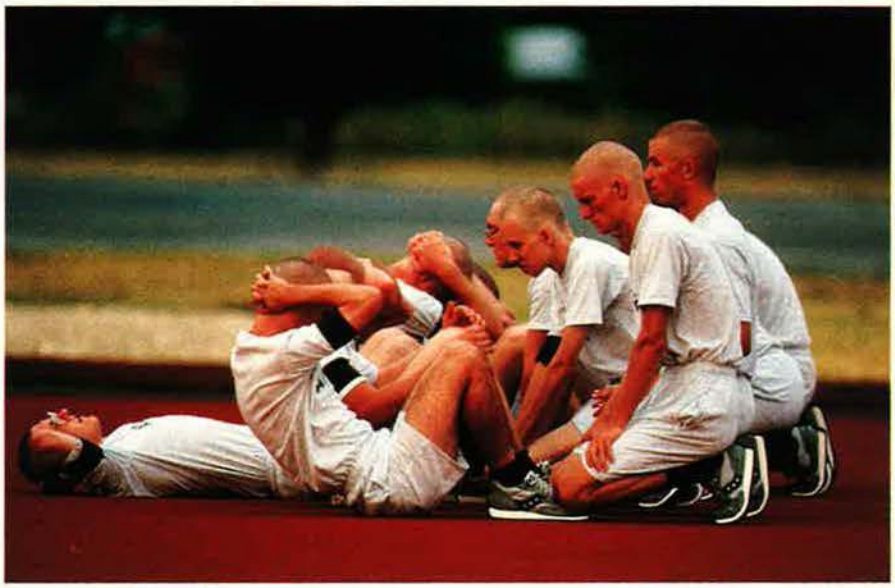
Conduct Joint medical service, readiness, and Air Force security assistance training

OTHER RESPONSIBILITIES

Recall of Individual Ready Reservists. Mobility and contingency tasking support to combatant commanders

EQUIPMENT

Trainers (T-1, T-3, T-37, T-38, T-43, AT-38) 1,206
Fighters (F-15, F-16) 269
Transports and tankers (C-5, C-12, C-17, C-21, C-130, C-141, KC-135, MC-130P,



USAF photo by MSgt. Val Gempis

It all starts here. Air Education and Training Command's Lackland AFB is the gateway to the Air Force. Each year the Texas facility trains 35,000 recruits for USAF, the Air National Guard, and Air Force Reserve. AETC also provides professional military education throughout their Air Force careers.

MC-130H) 114
Helicopters (MH-53J, TH-53A, UH-1, UH-1N, HH-60G) 30

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

PERSONNEL

Active duty 43,081
Officers 9,226
Enlisted 33,855
Reserve components 3,963
ANG 2,855
AFRC 1,108
Civilian 14,382
Contracted workers 9,514
Total **70,940**
Students 381,618
Aircrew 10,926
Survival training 6,167
Basic military training 31,362
Operations tech. 105,350
Medical 17,745
Field training 28,328
Distance learning 12,918
Air University 168,822

OPERATIONAL ACTIVITY

Flying hours ..... 41,922 per month

Major competition
Top Tech

COMMAND NOTES

Air Education and Training Command recruits, trains, and educates the men and women of the US Air Force.

The turboprop-powered Raytheon Beech Mk. II, the Joint Primary Aircraft Training System, will replace Navy T-34s and Air Force T-37s for the primary phase of pilot training beginning in 1999.

UNIT	BASE	WEAPONS
Flying Training Units (Active)		
3d Flying Training Squadron	Hondo Airport, Texas	T-3
12th FTW	Randolph AFB, Texas	AT-38, T-1, T-37, T-38, T-43
14th FTW	Columbus AFB, Miss.	AT-38, T-1, T-37, T-38
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, MC-130P, MH-53J, TH-53A, UH-1, UH-1N, HH-60G
71st FTW	Vance AFB, Okla.	T-1, T-37, T-38
80th FTW	Sheppard AFB, Texas	AT-38, T-37, T-38
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
Operations 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 Space and Missile Training Group	Vandenberg AFB, Calif.	
Major Educational Units		
Air University	Maxwell AFB, Ala.	
Air Command and Staff College		
Air Force Institute of Technology	Wright–Patterson AFB, Ohio	
Air Force Officer Accession and Training Schools		
Air War College		
College for Aerospace Doctrine, Research, and Education		
College for Enlisted Professional Military Education		
Community College of the Air Force		
Ira C. Eaker College for Professional Development		
Office of Academic Support		
Squadron Officer School		
Major Recruiting Units		
USAF Recruiting Service	Randolph AFB, Texas	
360th Recruiting Group	Hanscom AFB, Mass.	
367th Recruiting Group	Robins AFB, Ga.	
369th Recruiting Group	Lackland AFB, Texas	
372d Recruiting Group	Hill AFB, Utah	
Other Units		
42d Air Base Wing	Maxwell AFB, Ala.	
59th Medical Wing	Lackland AFB, Texas	

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AIR EDUCATION AND TRAINING COMMAND, RANDOLPH AFB, TEXAS

Commander
Gen. Lloyd W. Newton

- **Air Force Recruiting Service**, Randolph AFB, Texas
- **Air Force Security Assistance Training Squadron**, Randolph AFB, Texas
- **59th Medical Wing**, Wilford Hall USAF Medical Center, Lackland AFB, Texas
- **2d Air Force**, Keesler AFB, Miss.
- **19th Air Force**, Randolph AFB, Texas
- **Air University**, Maxwell AFB, Ala.

AIR UNIVERSITY (AETC), MAXWELL AFB, ALA.

Commander
Lt. Gen. Joseph J. Redden

- **Air Force Institute of Technology**, Wright-Patterson AFB, Ohio
- **Air War College**, Maxwell AFB, Ala.
- **Air Command and Staff College**, Maxwell AFB, Ala.
- **Civil Air Patrol–USAF**, Maxwell AFB, Ala.
- **Squadron Officer School**, Maxwell AFB, Ala.
- **Ira C. Eaker College for Professional Development**, Maxwell AFB, Ala.
- **Air Force Officer Accession and Training Schools**, Maxwell AFB, Ala.
- **College of Aerospace Doctrine, Research, and Education**, Maxwell AFB, Ala.
- **Community College of the Air Force**, Maxwell AFB, Ala.
- **42d Air Base Wing**, Maxwell AFB, Ala.
- **College for Enlisted Professional Military Education**, Maxwell AFB, Gunter Annex, Ala.
- **Office of Academic Support**, Maxwell AFB, Ala.

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

Commander
Maj. Gen. Andrew J. Pelak Jr.

- **37th Training Wing**, Lackland AFB, Texas
- **17th Training Wing**, Goodfellow AFB, Texas
- **381st Space and Missile Training Group**, Vandenberg AFB, Calif.
- **81st Training Wing**, Keesler AFB, Miss.
- **82d Training Wing**, Sheppard AFB, Texas

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

AFMC 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
Three test centers
Five air logistics centers
Three specialized centers
One laboratory

PERSONNEL

Active duty	32,357
Officers	9,216
Enlisted	23,141
Reserve components	5,135
ANG	2,784
AFRC	2,351
Civilian	71,000
Total	**108,492**

OPERATIONAL ACTIVITY

Flying hours ..... 2,250 per month

UNIT	BASE
Aeronautical Systems Center	Wright–Patterson AFB, Ohio
Electronic Systems Center	Hanscom AFB, Mass.
Human Systems Center	Brooks AFB, Texas
Space and Missile Systems Center	Los Angeles AFB, Calif.
Hq. Air Force Research Laboratory	Wright–Patterson AFB, Ohio
Arnold Engineering Development Center	Arnold AFB, Tenn.
Air Force Development Test Center	Eglin AFB, Fla.
Air Force Flight Test Center	Edwards AFB, Calif.
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 and Regeneration Center	Davis–Monthan AFB, Ariz.
Air Force Security Assistance Center	Wright–Patterson AFB, Ohio
Joint Logistics Systems Center	Wright–Patterson AFB, Ohio

COMMAND NOTES

Air Force Materiel Command delivers systems that maintain the leading edge in research, acquisition, and sustainment of weapon systems. The Air Force Research Laboratory is responsible for research and technology development to support USAF's future and existing aircraft and weapon systems. AFMC evaluates the systems in three test centers. Five air logistics centers provide life-cycle weapon system sustainment, maintenance, and repair. Specialized centers focus on security assistance, "retired" weapon systems, and Joint logistics systems.

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The world's military services must be ready to go at all times. In peace or conflict.

Parker Aerospace Customer Support Military is a specialized organization dedicated to the unique needs of the military users of Parker Aerospace systems and components.

We're here to help our customers maximize their operational readiness while minimizing support costs.

Global support. Whether for proven systems or leading-edge aircraft, our worldwide network of facilities and representatives assures you of precision service. And our global capability enables Parker Customer Support Military to customize services to meet your exact requirements.

Ready for you. Contact Parker Customer Support Military. For service that's as ready as the customers we serve.

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Fuel Systems – *Fuel handling equipment, including pumps, valves, and refuel/defuel subsystems • Fuel measurement and management systems • Engine fuel control and monitoring • Pressure fueling • Instrumentation • Electronic controllers • Injection nozzles • Augmenters • Global customer support*

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Flight Control Systems – *Hydromechanical actuation systems and components • Power-by-wire systems and components • Smart actuation systems and components • Fly-by-wire actuation systems and components • Electrohydraulic servovalves • Electronic control modules • Electrohydrostatic actuation, controllers, and power electronics • Global customer support*

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AIR FORCE MATERIEL COMMAND, WRIGHT-PATTERSON AFB, OHIO

Commander
Gen. George T. Babbitt Jr.

Research
Hq. Air Force Research Laboratory
Wright-Patterson AFB, Ohio

Development	Test	Operational Support	Specialized Support
Space and Missile Systems Center Los Angeles AFB, Calif.	**Air Force Flight Test Center** Edwards AFB, Calif.	**Ogden Air Logistics Center** Hill AFB, Utah	**Aerospace Maintenance and Regeneration Center** Davis-Monthan AFB, Ariz.
Electronic Systems Center Hanscom AFB, Mass.	**Air Force Development Test Center** Eglin AFB, Fla.	**Oklahoma City Air Logistics Center** Tinker AFB, Okla.	**Joint Logistics Systems Center** Wright-Patterson AFB, Ohio
Aeronautical Systems Center Wright-Patterson AFB, Ohio	**Arnold Engineering Development Center** Arnold AFB, Tenn.	**Sacramento Air Logistics Center** McClellan AFB, Calif.	**Air Force Security Assistance Center** Wright-Patterson AFB, Ohio
Human Systems Center Brooks AFB, Texas		**San Antonio Air Logistics Center** Kelly AFB, Texas	
		Warner Robins Air Logistics Center Robins AFB, Ga.	

Air Force Space Command

Headquarters Peterson AFB, Colo.

Established Sept. 1, 1982

Commander Gen. Howell M. Estes III

MISSIONS

Operate and test USAF ICBM forces for US Strategic Command
Operate missile warning radars, sensors, and satellites
Operate national space-launch facilities and operational boosters
Operate worldwide space surveillance radars and optical systems
Operate worldwide space environmental systems
Provide command and control for DoD satellites
Provide ballistic missile warning to NORAD and US Space Command
Provide space weather support to entire DoD

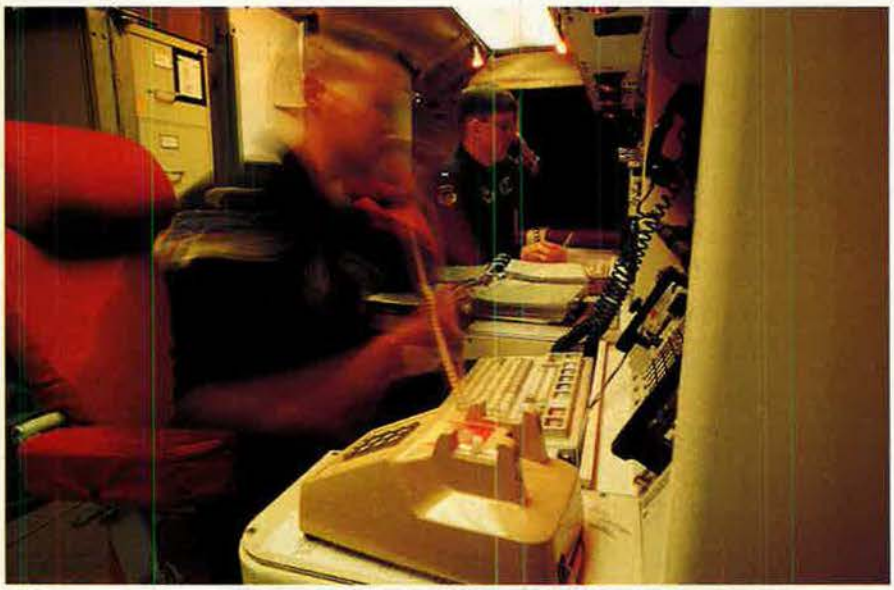
COROLLARY MISSIONS

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
Supply range and launch facilities for military, civil, and commercial space launch
Provide technology safeguard monitors to support launches of US satellites on foreign launch vehicles

Staff photo by Guy Acelo



Air Force Space Command missileers 2d Lt. Mike Kleppe (foreground) and 1st Lt. Mark McDonald coordinate actions with topside units from an underground Minuteman launch control center—such routine exercises hone their skills.

EQUIPMENT

ICBMs

Peacekeeper	50
Minuteman III	530

Satellite systems (USAF spacecraft in service as of Jan. 1, 1998):

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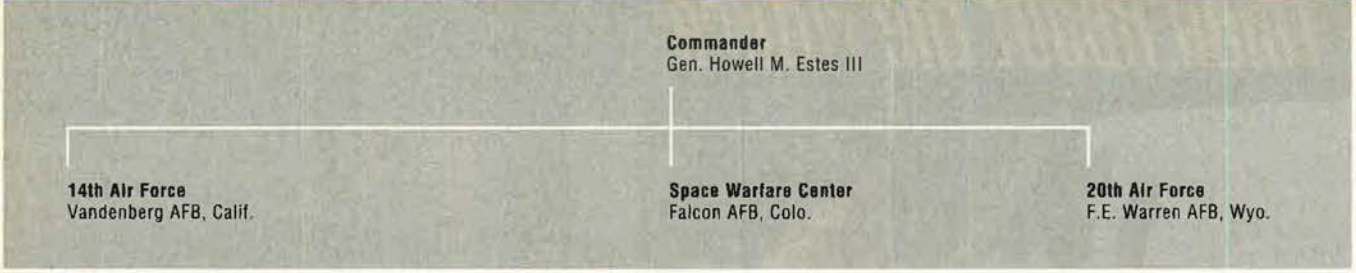
AIR FORCE SPACE COMMAND, PETERSON AFB, COLO.



GPS: Block II/IIA/IIR 28
DSCS II 1
DSCS III 10
Milstar 2
UHF Follow-on 6
DMSP 6

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: Maui space surveillance, Ground-based 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, 16 digital ionospheric sounding systems, four ionospheric measuring systems

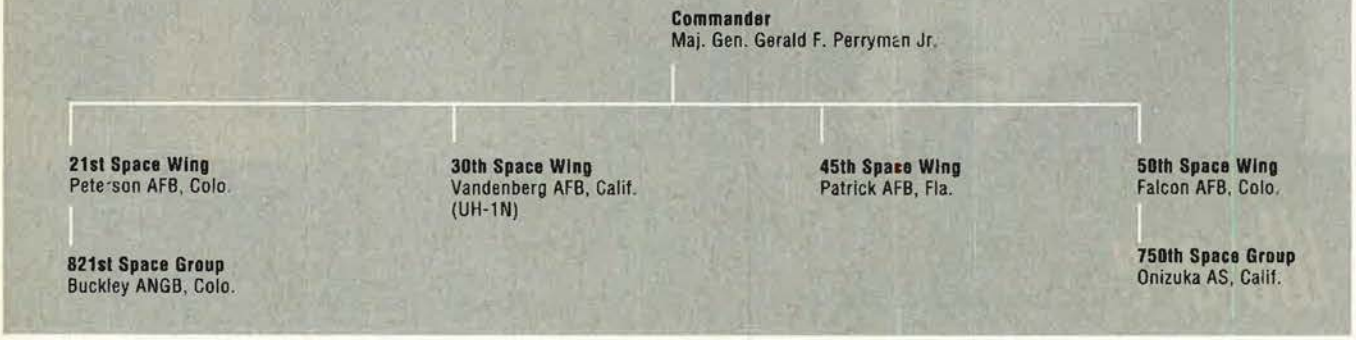
FORCE STRUCTURE

Two numbered air forces: **14th,** Vandenberg AFB, Calif.; **20th,** F.E. Warren AFB, Wyo.
One direct reporting unit: Space Warfare Center
Seven space wings
Three groups (two space, one missile)

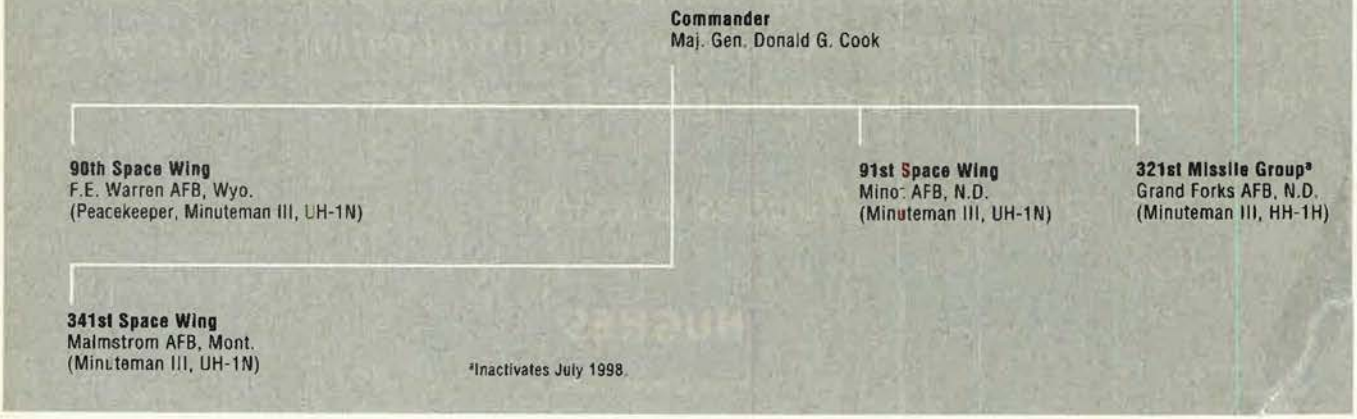
PERSONNEL

Active duty 20,979
Officers 4,167
Enlisted 16,812
Reserve components 718
ANG 279
AFRC 439
Civilian 4,834
Contractor personnel 11,326
Total 37,857

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



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



[a]Inactivates July 1998.

COMMAND NOTES

The commander of Air Force Space Command is also commander in chief of NORAD and US Space Command. 14th Air Force is a component of US-SPACECOM for space forces; 20th Air Force is a component of US Strategic Command for ICBM forces.

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.	UH-1N, Minuteman III and Peacekeeper ICBMs
91st Space Wing	Minot AFB, N.D.	UH-1N, Minuteman III ICBM
321st Missile Group*	Grand Forks AFB, N.D.	HH-1H, Minuteman III ICBM
341st Space Wing	Malmstrom AFB, Mont.	UH-1N, Minuteman III ICBM
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

*Inactivates July 1998.

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 US Special Operations Command, one of nine unified commands in the US military's combatant command structure

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

EQUIPMENT

AC-130H Spectre gunships	8
AC-130U Spectre gunships	13
MH-53J Pave Low helicopters	35
MH-60G Pave Hawk helicopters	6
MC-130E Combat Talon I	14
MC-130H Combat Talon II	21
C-130E	4
EC-130	8
MC-130P Combat Shadow	24
UH-1N	2

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

PERSONNEL

Active duty	9,444
Officers	1,410
Enlisted	8,034
Reserve components	2,293
ANG	1,032
AFRC	1,261
Civilian	537
Total	**12,274**

OPERATIONAL ACTIVITY

Flying hours: 4,572 per month

The F119 is the dependable engine for the F-22, making its derivative the most affordable engine for the Joint Strike Fighter. Backed by the same

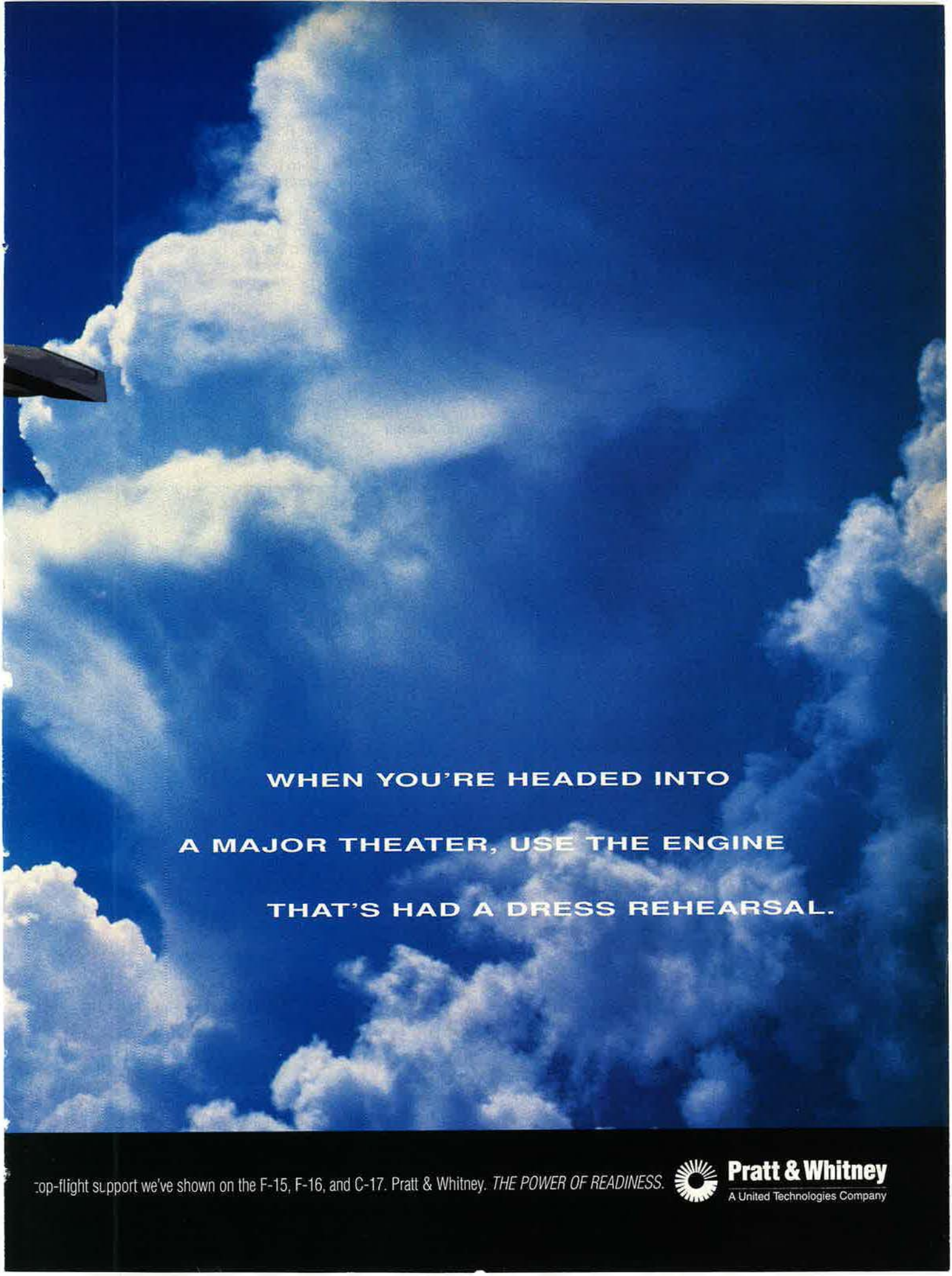

WHEN YOU'RE HEADED INTO
A MAJOR THEATER, USE THE ENGINE
THAT'S HAD A DRESS REHEARSAL.
:op-flight support we've shown on the F-15, F-16, and C-17. Pratt & Whitney. THE POWER OF READINESS.
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Photo by Randy Jolly

With specially trained personnel and specially modified aircraft such as this MH-60G Pave Hawk in the background, Air Force Special Operations Command applies unique combat power to a wide range of missions.

COMMAND NOTES

On average, special operations forces are deployed 144 days per year and, in some cases, up to 200 days per year—far longer than the Air Force goal of 120 days. The 193d Special Operations Wing at Harrisburg IAP, Pa., has the highest operations tempo of any Air National Guard unit. The 193d SOW flies the EC-130E Commando Solo aircraft, which can broadcast over radio and television bands, to conduct psychological operations.

AIR FORCE SPECIAL OPERATIONS COMMAND, HURLBURT FIELD, FLA.

UNIT	BASE	WEAPONS
16th Special Operations Wing	Hurlburt Field, Fla.	AC-130H/U, MC-130E/H, MH-53J, C-130E, UH-1N, MH-60G, MC-130P(Eglin AFB, Fla.)
18th Flight Test Squadron	Hurlburt Field, Fla.	—
193d Special Operations Wing (ANG)	Harrisburg IAP, Pa.	EC-130E
352d Special Operations Group	RAF Mildenhall, UK	MH-53J, MC-130P, MC-130H
353d Special Operations Group	Kadena AB, Japan	MC-130H/P MH-53J (Osan AB, South Korea)
720th Special Tactics Group	Hurlburt Field, Fla.	—
919th Special Operations Wing (AFRC)	Duke Field, Fla.	MC-130E/P
USAF Special Operations School	Hurlburt Field, Fla.	—

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AMC Air Mobility Command

Headquarters Scott AFB, Ill.

Established June 1, 1992

Commander Gen. Walter Kross

Photo by Erik Hildebrandt

A C-17 launches into the evening sky. With the capability to air-land or air-drop outsize cargo in a tactical environment, the new airlifter greatly increases Air Mobility Command's ability to transport and sustain US armed forces.

MISSIONS

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

COROLLARY MISSIONS

Provide operational support aircraft
Perform stateside aeromedical evacuation missions
Provide visual documentation support

EQUIPMENT

Mobility aircraft (C-5, C-17, C-26, C-130, C-141, KC-10, KC-135) 1,283
Aeromedical evacuation (C-9) 1
Other aircraft (C-9, C-20, C-21, C-135, VC-25, VC-137, UH-1N 83

UNIT	BASE	WEAPONS
6th Air Refueling Wing	MacDill AFB, Fla.	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-141
89th Airlift Wing	Andrews AFB, Md.	C-9, C-20, C-21, VC-25, C-135, VC-137, 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

FORCE STRUCTURE

Two numbered air forces: **15th,** Travis AFB, Calif.; **21st,** McGuire AFB, N.J.
Two direct reporting units: Air Mobility Warfare Center, Ft. Dix, N.J.; Tanker Airlift Control Center, Scott AFB, Ill.
12 wings (six airlift, two air mobility, four air refueling)
Three groups (two airlift, one air refueling)

PERSONNEL

Active duty 52,991
Officers 8,678
Enlisted 44,313
Reserve components 80,692
ANG 35,428
AFRC 45,264
Civilian 9,240
Total **142,923**

OPERATIONAL ACTIVITY

Flying hours ..... 28,500+ per month

Major operations
Vigilant Sentinel (Kuwait), Caribbean Express (Hurricane Marilyn), Quick Lift (Croatia), Joint Endeavor (Bosnia), Assured Response (Liberia), Northern and Southern Watch (Iraq)

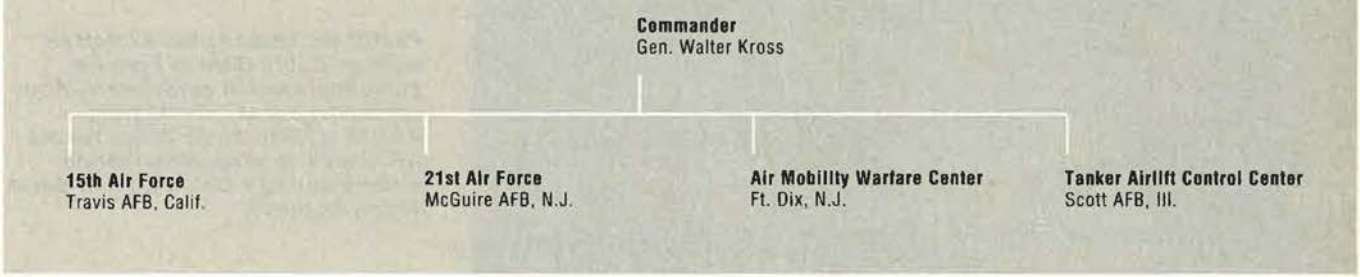
Major training exercises
Cobra Gold, Tandem Thrust, Team Spirit (Pacific Command); Battle Griffin, Central Enterprise, Dynamic Guard (European Command); Bright Star (Central Command); Fuertas Defense (Southern Command); Ocean Venture (Atlantic Command)

COMMAND NOTES

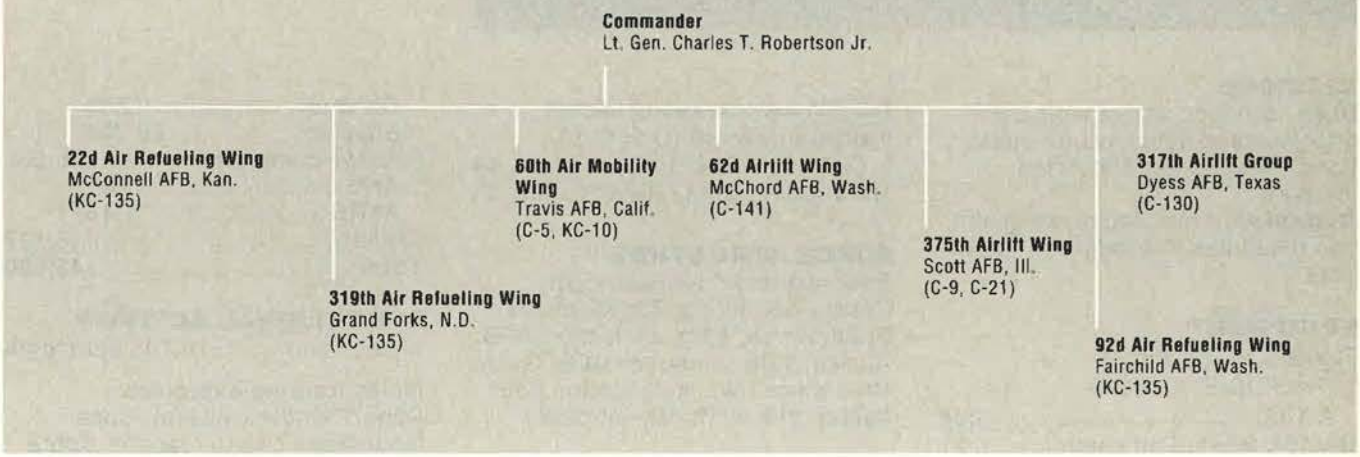
AMC's commander serves as commander in chief of US Transportation Command.

AMC also plays a crucial role in providing humanitarian support at home and around the world.

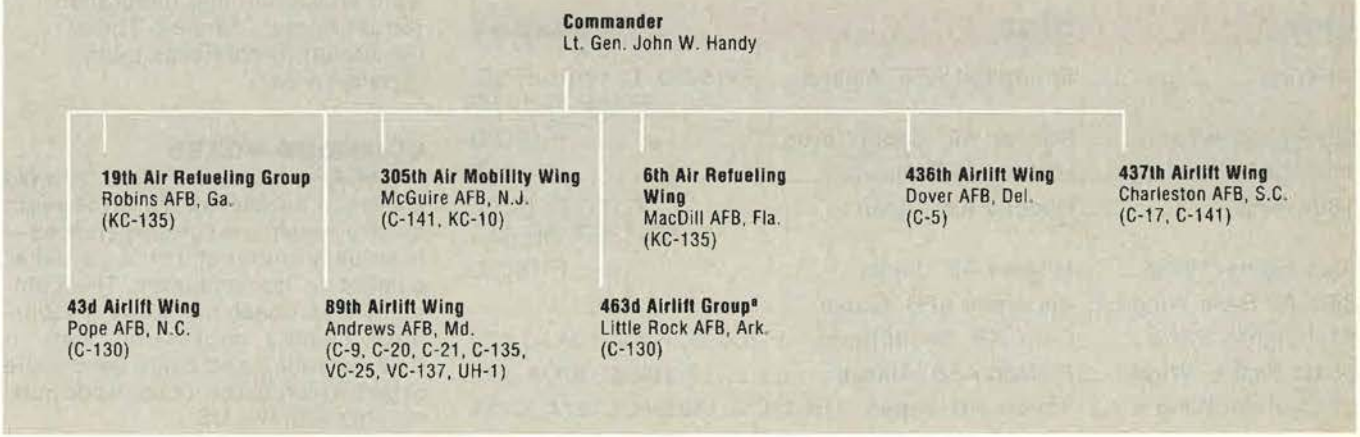
AIR MOBILITY COMMAND, SCOTT AFB, ILL.



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



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



PACAF

Pacific Air Forces

Headquarters Hickam AFB, Hawaii

Established July 1, 1957

Commander Gen. Richard B. Myers

USAF photo by MSgt. Val Gempis

Pacific Air Forces uses exercises such as Cobra Gold to keep its personnel combat ready. Here, Army personnel board a C-130 from PACAF's 374th Airlift Wing, Yokota AB, Japan, in preparation for an airdrop during a Cobra Gold at Surat Thani, Thailand.

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

EQUIPMENT

Fighters/attack aircraft (F-15C/D/E, F-16C/D, A-10A) 284
OA-10A forward air control 21
E-3 Airborne Warning and Control System aircraft 4
KC-135 aerial refueling aircraft 15
Transport aircraft (C-9, C-12, C-21, C-130, C-135) 44
Helicopters (UH-1, HH-60) 13

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)

PERSONNEL

Active duty 32,682
Officers 3,884
Enlisted 28,798
Reserve components 5,051
ANG 4,703
AFRC 348
Civilian 8,197
Total 45,930

OPERATIONAL ACTIVITY

Flying hours ..... 10,195 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)

UNIT	BASE	WEAPONS
3d Wing	Elmendorf AFB, Alaska	F-15C/D, C-130H, E-3B, F-15E, C-12J/F
8th Fighter Wing	Kunsan AB, South Korea	F-16C/D
15th Air Base Wing	Hickam AFB, Hawaii	C-135E
18th Wing	Kadena AB, Japan	F-15C/D, E-3B, 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	F-16C/D, A/OA-10A, C-12J
354th Fighter Wing	Eielson AFB, Alaska	F-16C/D, A/OA-10A
374th Airlift Wing	Yokota AB, Japan	UH-1N, C-130E/H, C-21A, C-9A

COMMAND NOTES

PACAF's airpower and forward presence enable US forces to react quickly—even over great distances—to virtually any theater crisis, whether combat or humanitarian. The command's far-reach capability discourages military aggression, aids in disaster relief, and helps secure the region's multibillion-dollar trade partnership with the US.

PACIFIC AIR FORCES, HICKAM AFB, HAWAII

Commander
Gen. Richard B. Myers

- **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.

- **374th Airlift Wing**
  Yokota AB, Japan
  (UH-1N, C-130E/H, C-21A, C-9A)
- **18th Wing**
  Kadena AB, Japan
  (F-15C/D, E-3B, KC-135R, HH-60G)
- **35th Fighter Wing**
  Misawa AB, Japan
  (F-16C/D)

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
  (F-16C/D, A/OA-10A, C-12J)

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

Commander
Lt. Gen. David J. McCloud

- **354th Fighter Wing**
  Eielson AFB, Alaska
  (F-16C/D, A/OA-10A)
- **3d Wing**
  Elmendorf AFB, Alaska
  (F-15C/D, F-15E, C-12J/F, C-130H, E-3B)

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

Commander
Maj. Gen. John R. Dallager

- **497th Fighter Training Squadron**
  Paya Lebar Airfield, Singapore[a]
- **36th Air Base Wing**
  Andersen AFB, Guam

[a]Base owned by Singapore government.

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 spacepower.

Plan, conduct, control, coordinate, and support air and space operations to achieve US national and NATO objectives based on taskings assigned by the commander in chief, US European Command

COROLLARY MISSIONS

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

EQUIPMENT (Active)

Fighters (F-15C/D, F-16C/D) 108
Attack aircraft (A-10, F-15E) 60
Observation aircraft (OA-10) 6
Other aircraft (tankers, transports, reconnaissance) 46

Conventional weapons (general-purpose bombs, cluster bombs, guided bombs, rockets, air-to-surface missiles)

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)

PERSONNEL

Active duty 27,126
  Officers 3,233
  Enlisted 23,893
Reserve components 362
  ANG 0
  AFRC 362
Civilian 5,232
Total **32,720**

OPERATIONAL ACTIVITY

Flying hours ..... 8,681 per month

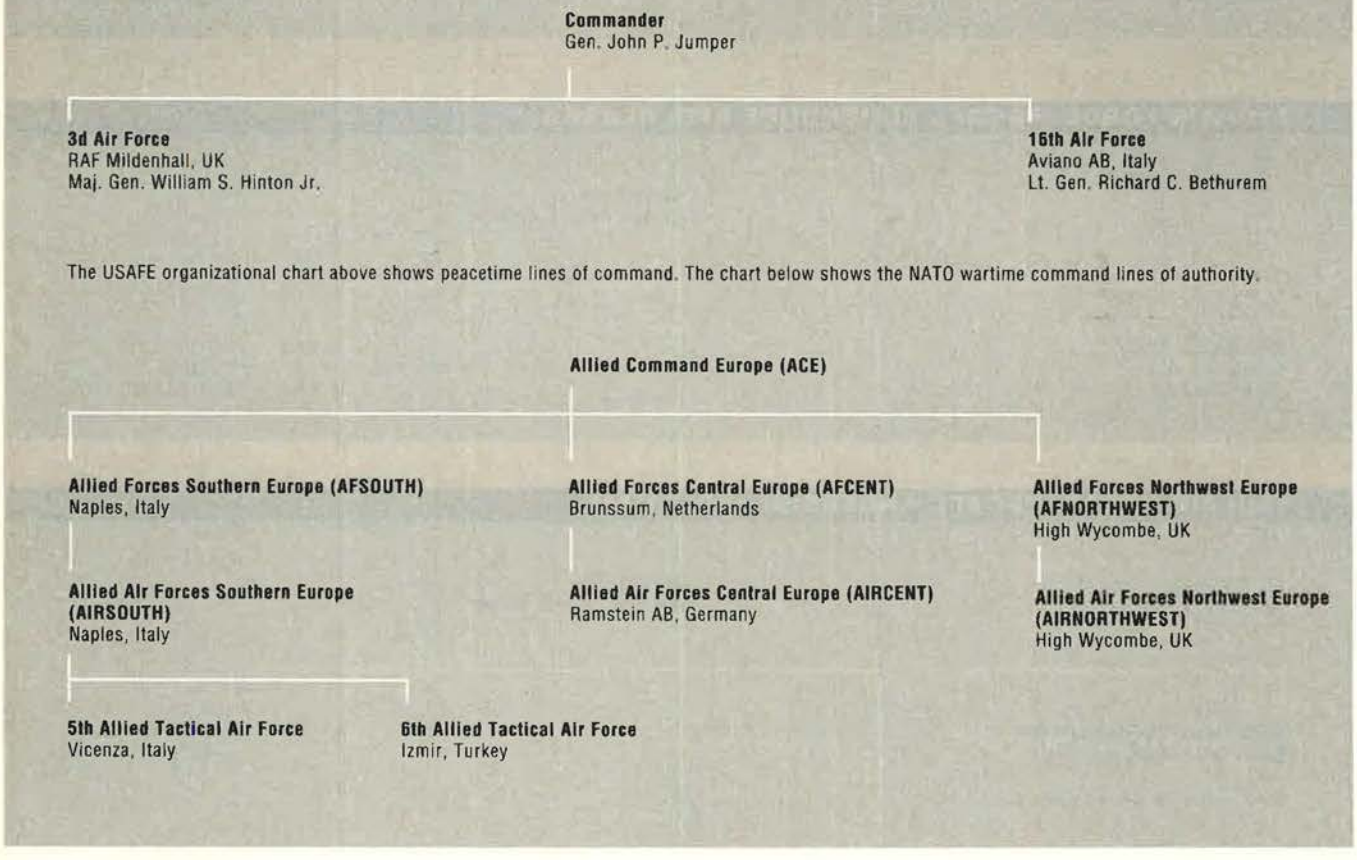
Major training exercises

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

Major operations

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

US AIR FORCES IN EUROPE, RAMSTEIN AB, GERMANY



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-15E, F-15C/D
52d Fighter Wing	Spangdahlem AB, Germany	F-15C/D, A/OA-10, F-16C/D
86th Airlift Wing	Ramstein AB, Germany	C-9, C-20, C-21, C-130E
100th Air Refueling Wing	RAF Mildenhall, UK	KC-135R

COMMAND NOTES

US Air Forces in Europe shares common systems, procedures, and training with NATO forces. Headquarters USAFE is collocated with Headquarters Allied Air Forces Central Europe (AIRCENT), which operationally controls Immediate Reaction Forces, Rapid Reaction Forces, and Main Defense Forces of NATO–nation air forces during wartime. ■

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

Commander
Maj. Gen. William S. Hinton Jr.

52d Fighter Wing
Spangdahlem AB, Germany
(F-15C/D, F-16C/D, A/OA-10)

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

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

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

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

Commander
Lt. Gen. Richard C. Bethurem

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

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

USAF photo by A1C Greg L. Davis

Five crosses painted beneath the canopy of this 555th Fighter Squadron F-16C symbolize victories accrued during mock aerial battles against German Air Force F-4Fs that the squadron trained with during an air combat maneuvering exercise. For US Air Forces in Europe units, such training with NATO Allies helps maintain a strong forward presence.

Air Reserve Components

The Air Reserve Components for USAF are the Air National Guard and Air Force Reserve Command. The 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, is based on the experience gained from 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. Robert A. McIntosh

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
Six groups (one air refueling, one air control, one space, and three regional support)

PERSONNEL

Officers	15,645
Enlisted	57,666
Civilians (non–ART)	5,426
Total	**78,737**

EQUIPMENT

B-52H bombers	8
F-16C/D fighters	60
A/OA-10 attack aircraft	45
Airlifters (C-5A/B, C-141B, C-130E/H)	172
KC-135E/R tankers	64
HC-130N/P	9
HH-60G rescue helicopters	21
WC-130H weather aircraft	10
Special operations aircraft (MC-130E, MC130P)	12

OPERATIONAL ACTIVITY

Coronet Oak (Central and South America), Deny Flight and Provide Promise (Bosnia), Provide Comfort and Northern Watch (northern Iraq), Provide Hope II (former Soviet Union), Provide Relief (Kenya and Somalia), Uphold Democracy (Haiti), Joint Endeavor and Joint Guard (Bosnia)

NOTES

The AFRC commander also serves as chief of Air Force Reserve. AFRC serves under federal government jurisdiction. Officer and enlisted personnel figures are Selected Reserve, including Air Reserve technicians—civil service employees in dual status. Approximately 12,000 of these Air Force Reservists are assigned to active duty units under the Individual Mobilization Augmentee program. Reserve crews also fly active duty KC-10, C-5, C-141, KC-135, C-17, C-9, and E-3A aircraft daily under the associate program.

Photo by Ted Carlson

Airlift accounts for a large portion of Air Force Reserve Command's contribution to the Total Force. AFRC also provides 67 percent of USAF's medical crews and 62 percent of its special operations Talon 1 capability.

AIR FORCE RESERVE COMMAND, ROBINS AFB, GA.

Commander
Maj. Gen. Robert A. McIntosh

- **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, KC-10A, 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.[1]
  (KC-135E, C-141B)
- **931st Air Refueling Group**
  McConnell AFB, Kan.
  (KC-135R)
- **434th Air Refueling Wing**
  Grissom ARB, Ind.[1]
  (KC-135R)
- **507th Air Refueling Wing**
  Tinker AFB, Okla.
  (KC-135R)
- **932d Airlift Wing**
  Scott AFB, Ill.
  (C-9A)
- **445th Airlift Wing**
  Wright-Patterson AFB, Ohio
  (C-141B)
- **916th Air Refueling Wing**
  Seymour Johnson AFB, S.C.
  (KC-135R)
- **940th Air Refueling Wing**
  Beale AFB, Calif.
  (KC-135E)

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

Commander
Brig. Gen. John A. Bradley

- **301st Fighter Wing**
  NAS Fort Worth JRB[2]
  Carswell Field, Texas
  (F-16C/D)
- **482d Fighter Wing**
  Homestead ARB, Fla.[1]
  (F-16C)
- **926th Fighter Wing**
  NAS JRB New Orleans, La.[2]
  (OA-10A)
- **310th Space Group**
  Schriever AFB, Colo.
- **513th Air Control Group**
  Tinker AFB, Okla.
- **939th Rescue Wing**
  Patrick AFB, Fla., Portland IAP, Ore., Davis-Monthan AFB, Ariz., Tinker AFB, Okla.
  (HC-130N/P, HH-60G, E-3A)
- **419th Fighter Wing**
  Hill AFB, Utah
  (F-16C/D)
- **917th Wing**
  Barksdale AFB, La.
  (OA-10A, B-52H)
- **944th Fighter Wing**
  Luke AFB, Ariz.
  (F-16C/D)
- **442d Fighter Wing**
  Whiteman AFB, Mo.
  (OA-10A)
- **919th Special Operations Wing**
  Duke Field, Fla.
  (MC-130E/P)

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

Commander
Maj. Gen. James E. Sherrard III

- **94th Airlift Wing**
  Dobbins ARB, Ga.[1]
  (C-130H)
- **439th Airlift Wing**
  Westover ARB, Mass.[1]
  (C-5A)
- **514th Air Mobility Wing**
  McGuire AFB, N.J.
  (C-141B, KC-10A)
- **913th Airlift Wing**
  Willow Grove ARS, Pa.[1]
  (C-130E)
- **302d Airlift Wing**
  Peterson AFB, Colo.
  (C-130H)
- **440th Airlift Wing**
  General Mitchell IAP/ARS, Wis.[1]
  (C-130H)
- **908th Airlift Wing**
  Maxwell AFB, Ala.
  (C-130H)
- **914th Airlift Wing**
  Niagara Falls IAP/ARS, N.Y.[1]
  (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[1]
  (C-130H)
- **934th Airlift Wing**
  Minneapolis-St. Paul IAP/ARS, Minn.[1]
  (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.[1]
  (C-130H)

[1] AFRC installation
[2] Tenant unit on naval base

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

ANG Air National Guard

Headquarters ..... Washington
Established ..... Sept. 18, 1947
Director ..... Maj. Gen. Paul A. Weaver Jr.

MISSIONS

Provide trained units and individuals in support of national military objectives, as a full partner in the Total Air Force
Support state governors by providing equipment and trained individuals to help preserve peace, order, and public safety

FORCE STRUCTURE

Flying units: 90 wings
Major command assignments
- Air Combat Command
- Air Education and Training Command
- Air Force Materiel Command
- Air Force Special Operations Command
- Air Mobility Command
- Pacific Air Forces

PERSONNEL

Officers	13,307
Enlisted	96,716
Civilians	1,610
Total	**111,633**

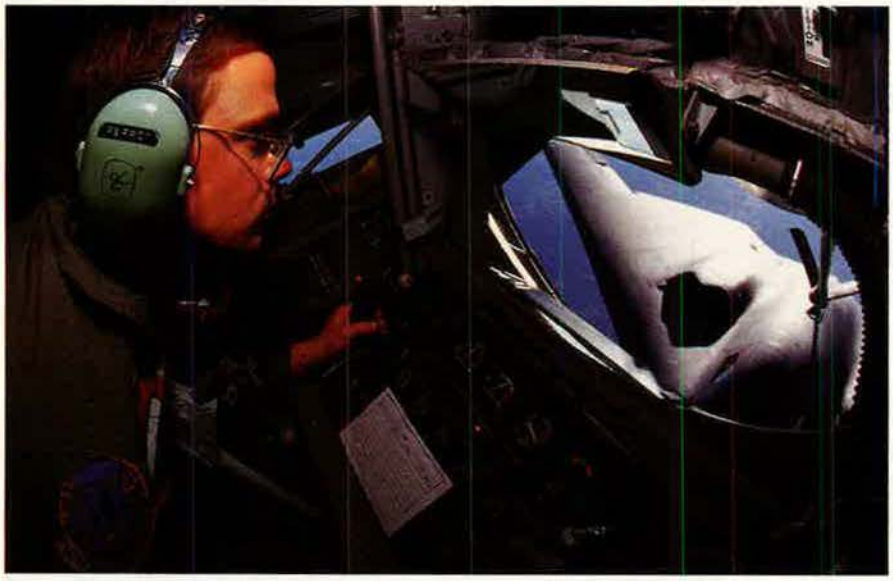
OPERATIONAL ACTIVITY

Joint Guard, Deny Flight, and Provide Promise (Bosnia), Northern Watch (northern Iraq), Southern Watch (southern 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

NOTES

ANG serves under state government jurisdiction except in emergencies. With almost 1,200 aircraft, it provides 100 percent of USAF's fighter–interceptor force, 44 percent of tactical airlift, 43 percent of KC-135 air refueling, 33 percent of fighters, 28 percent of rescue, 27 percent of the aeromedical evacuation force, 10 percent of the bomber force, eight percent of strategic airlift capability, and six percent of special operations. In addition, in nonflying mission areas, ANG's tasks include 100 percent of aircraft control and warning and 68 percent of combat communications (excluding JCSS units).

Photo by Erik Hildebrandt



Upwards of 1,400 Air National Guard and Air Force Reservists are deployed somewhere in the world every day. On a training mission above, boom operator SSgt. James J. Perrott from the 171st Air Refueling Wing (ANG), Pittsburgh IAP/ARS, Pa., refuels a B-2. At the right, deployed at Al Jaber AB, Kuwait, TSgts. Steve Engebretson and Joel Grace from the 114th FW (ANG), Joe Foss Field, S.D., do a little trouble shooting on an F-16.

USAF photo by MSgt. Val Gempis

The Air National Guard by Major Command Assignment

(As of April 1, 1998)

Air Mobility Command

C-5A transport
105th Airlift Wing ..... Stewart IAP, N.Y.

C-130 transport
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[a]
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 Muniz 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.
189th Airlift Wing[b] ..... Little Rock AFB, Ark.

C-141B transport
164th Airlift Wing ..... Memphis IAP, Tenn.
172d Airlift Wing ..... Jackson IAP, Miss.

KC-135 tanker
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.

Air Combat Command

A/OA-10A attack aircraft
103d Fighter Wing ..... Bradley IAP, Conn.
104th Fighter Wing ..... Barnes MAP, Mass.
110th Fighter Wing ..... W.K. Kellogg Airport, Mich.
124th Wing[c] ..... Boise Air Terminal, Idaho
175th Wing[c] ..... Baltimore, Md.

B-1 bomber
116th Bomb Wing ..... Robins AFB, Ga.
184th Bomb Wing ..... McConnell AFB, Kan.

F-15A/B fighter
131st Fighter Wing ..... Lambert–St. Louis IAP, Mo.
159th Fighter Wing ..... NAS JRB New Orleans, La.[a]

F-15A/B fighter–air defense
102d Fighter Wing ..... Otis ANGB, Mass.
142d Fighter Wing ..... Portland IAP, Ore.
125th Fighter Wing ..... Jacksonville IAP, Fla.

F-16A/B/C/D fighter
113th Wing ..... Andrews AFB, Md.
114th Fighter Wing ..... Joe Foss Field, S.D.
115th Fighter Wing ..... Truax Field, Wis.
122d Fighter Wing ..... Fort Wayne IAP, Ind.
127th Wing[c] ..... Selfridge ANGB, Mich.
132d Fighter Wing ..... Des Moines IAP, Iowa
138th Fighter Wing ..... Tulsa IAP, Okla.
140th Wing ..... Buckley ANGB, Colo.
149th Fighter Wing ..... Kelly AFB, Texas
150th Fighter Wing ..... Kirtland AFB, N.M.
169th Fighter Wing ..... McEntire ANGB, S.C.
174th Fighter Wing ..... Syracuse Hancock IAP, N.Y.
178th Fighter Wing ..... Springfield–Beckley MAP, Ohio
180th Fighter Wing ..... Toledo Express Airport, Ohio
181st Fighter Wing ..... Hulman Regional Airport, Ind.
183d Fighter Wing ..... Capital MAP, Ill.
185th Fighter Wing ..... Sioux City MAP, Iowa
187th Fighter Wing ..... Dannelly Field, Ala.
188th Fighter Wing ..... Fort Smith MAP, Ark.
192d Fighter Wing ..... Richmond IAP, Va.

F-16A/B fighter–air defense
119th Fighter Wing ..... Hector IAP, N.D.
120th Fighter Wing ..... Great Falls IAP, Mont.
144th Fighter Wing ..... Fresno Air Terminal, Calif.
147th Fighter Wing ..... Ellington Field, Texas
148th Fighter Wing ..... Duluth IAP, Minn.
158th Fighter Wing ..... Burlington IAP, Vt.
177th Fighter Wing ..... Atlantic City Airport, N.J.

HC-130/HH-60G rescue aircraft
106th Rescue Wing ..... Francis S. Gabreski IAP, N.Y.
129th Rescue Wing ..... Moffett Federal Airfield, Calif.[d]

A/OA-10A observation aircraft
111th Fighter Wing ..... Willow Grove ARS, Pa.

Air Education and Training Command

F-16A/B/C/D fighter
162d Fighter Wing ..... Tucson IAP, Ariz.
173d Fighter Wing ..... Klamath Falls IAP, Ore.

Pacific Air Forces

C-130 transport
154th Wing (204th Airlift Sqdn.) .... Hickam AFB, Hawaii
176th Wing[e]
(199th Fighter Sqdn.) ..... Anchorage, Alaska

F-15A/B fighter
154th Wing[f] ..... Hickam AFB, Hawaii

KC-135 tanker
168th Air Refueling Wing ..... Eielson AFB, Alaska
154th Wing (203d ARS) ..... Hickam AFB, Hawaii

Air Force Special Operations Command

EC-130E special operations aircraft
193d Special Operations Wing ... Harrisburg IAP, Pa.

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

Pushing into the Future

Photo courtesy Robert F. Dorr

Northrop's XP-56 was one of several "pusher" fighters tested at Muroc AAB (now Edwards AFB), Calif. Called the "Black Bullet" because of its stubby shape—it was less than 30 feet long with a wingspan of 42.6 feet—it had a number of unique features, including the ability to jettison its contra-rotating propellers to enable the pilot to bail out. Two Black Bullets were built and tested in the early 1940s, but flight test results were disappointing. Subsequent wind tunnel tests enforced the conclusion that the design was not airworthy, so the project was abandoned—a decision influenced by the arrival of the jet engine.

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USAF Almanac

Field Operating Agencies

A field operating agency (FOA) 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
Implement USAF, Joint, and DoD modeling and simulation policies and standards
Manage, coordinate, and integrate major USAF/Joint modeling and simulation programs and initiatives
Support corporate USAF modeling and simulation operations
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.
Two regional offices
48 field offices

PERSONNEL

Active duty	3
Officers	2
Enlisted	1
Reserve components	0
Civilians	907
Total	**910**

NOTES

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. (acting)

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 49
  Officers 47
  Enlisted 2
Reserve components 10
  ANG 0
  AFRC 10
Civilians 390
Total 449

Air Force Center for Quality and Management Innovation

Headquarters ..... Randolph AFB, Texas
Established ..... Dec. 19, 1996
Commander ..... Brig. Gen. Hugh C. Cameron

MISSION, PURPOSE, OPERATIONS

Provide innovative, expert management capabilities to the Air Staff, Air Force functional communities, and major commands. Assist them in making intelligent, fact-based decisions that will improve Air Force mission effectiveness. Lead process improvement and organization performance efforts (can be in workshops and other group sessions) to allow managers to make fact-based resource management decisions
Research and develop innovative, future-focused management concepts and best practices for the Air Force
Conduct studies for identifying optimal organizational staffing, resource allocation, and outsourcing and privatization options
Promote and manage USAF–wide manpower/quality awards and productivity programs
Serve as the Air Force focal point for keeping abreast of government and industry manpower/quality issues
Develop and manage the USAF–level manpower/quality training architecture
Provide operational contingency support to Hq. USAF

STRUCTURE

Operations, Logistics, and Readiness Division
Installations and Support Division
Outsourcing and Privatization Division
Programs Integration Division
Systems Integration and Support Division
Future Concepts 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 94
  Officers 24
  Enlisted 70
Reserve components 2
  ANG 1
  AFRC 1
Civilians 116
Total 212

Air Force Cost Analysis Agency

Headquarters ..... Arlington, Va.
Established ..... Aug. 1, 1992
Commander ..... Col. Ed Weeks

MISSION, PURPOSE, OPERATIONS

Develop independent life-cycle cost estimates of major weapon and information systems
Conduct special cost reviews for the Air Force Secretariat and for other organizations as directed
Research emerging changes in technologies, acquisition priorities, and industry
Develop cost-estimation tools, techniques, methodologies, and databases

STRUCTURE

Aircraft Division
Automated Information Systems Division
Command, Control, and Communications Division
Missiles and Munitions Division
Space Systems Division
Technical Support Division
Operations Division

PERSONNEL

Active duty 27
  Officers 26
  Enlisted 1
Reserve components 0
Civilians 21
Total 48

Air Force Flight Standards Agency

Headquarters ..... Andrews AFB, Md.
Established ..... Oct. 1, 1991
Commander ..... Col. Patrick F. Nolte

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, navigation systems, and instrument approaches during combat, contingencies, and Joint Staff exercises
Represent the Secretary of the Air Force and Hq. USAF in FAA airspace management and air traffic control issues
Represent DoD on international airspace and air traffic control issues
Provide flight standards and aeronautical services to develop USAF instrument requirements and training
Certify procedures and directives for cockpit display technologies and navigation systems

Provide USAF with air traffic control, airfield, functional management, operational evaluation of air traffic control systems, and airspace management procedures
Lead ATCALS coordination with FAA and military services

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	148
Officers	77
Enlisted	71
Reserve components	4
ANG	0
AFRC	4
Civilians	28
Total	**180**

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 the Air Force historical document collection
Answer requests for historical information
Operate research facilities for professional military education students, faculty, visiting scholars, and the general public
Determine the lineage and honors of Air Force organizations
Maintain official emblem records of Air Force organizations
Verify Air Force aerial victory credits
Provide manpower and historical support to preserve documents during contingency operations
Prepare historical data, analyses, and manuscripts to support the Air Staff and major commands
Conduct an oral history program
Operate a USAF–wide automated historical data system

STRUCTURE

Information Systems Division
Research Division

PERSONNEL

Active duty	9
Officers	3
Enlisted	6
Reserve components	20
ANG	0
AFRC	20
Civilians	42
Total	**71**

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 through the Air Force Historian to Hq. USAF
Record and disseminate Air Force history to enable decision makers and planners to formulate strategy, plans, and doctrine to conduct operations; educate Air Force students at professional military schools; provide scholars with research and teaching materials; and inform the public about the role of the Air Force 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	26
Total	**34**

NOTES

AFHSO was formerly the Center for Air Force History.

Air Force Inspection Agency

Headquarters ..... Kirtland AFB, N.M.
Established ..... Aug. 1, 1991
Commander ..... Col. James C. Robertson III

MISSION, PURPOSE, OPERATIONS

Provide Air Force leadership with objective and independent assessments of Air Force readiness, discipline, and management efficiency and effectiveness
Recommend improvements to existing Air Force processes, practices, and programs for fulfilling peacetime, contingency, and wartime missions
Conduct special reviews and inquiries as directed by the Air Force Secretary, Chief of Staff, and Inspector General

STRUCTURE

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

PERSONNEL

Active duty	111
Officers	87
Enlisted	24
Reserve components	0
Civilians	21
Total	**132**

Air Force Legal Services Agency

Headquarters ..... Bolling AFB, D.C.
Established ..... Sept. 1, 1991
Commander ..... Col. Jerald D. Stubbs

MISSION, PURPOSE, OPERATIONS

Provide Air Force 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 Air Force 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
- Commercial Litigation Division
- Environmental Law and Litigation Division
- General Claims Division
- General Litigation Division
- Legal Assistance Division
- Tort Claims and Litigation Services Division

Judiciary Directorate
- Appellate Defense Division
- Clemency, Corrections, and Officer Review Division
- Government Trial and Appellate Counsel Division
- Military Justice Division
- Trial Defense Division
- Trial Judiciary Division

Legal Information Services Directorate

PERSONNEL

Active duty	397
Officers	275
Enlisted	122
Reserve components	87
ANG	0
AFRC	87
Civilians	124
Total	**608**

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

Functional directorates
- Contracting
- Logistics Plans
- Maintenance and Munitions
- Supply
- Transportation

Support directorates
- Logistics Analysis
- Plans and Programs

PERSONNEL

Active duty	60
Officers	43
Enlisted	17
Reserve components	0
Civilians	15
Total	**75**

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	82
Officers	62
Enlisted	20
Reserve components	3
ANG	0
AFRC	3
Civilians	52
Total	**137**

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

Directorate of Medical Support
- Health Facilities Division
- Medical Information Systems Division
- Medical Logistics Division
- Triservice Infrastructure Management Program Office
- Medical Modernization and Planning

PERSONNEL

Active duty	36
Officers	31
Enlisted	5
Reserve components	0
Civilians	37
Total	**73**

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 Televison 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 Internal Information

PERSONNEL
Active duty	354
Officers	23
Enlisted	331
Reserve components	35
ANG	0
AFRC	35
Civilians	135
Total	**524**

Air Force Office of Special Investigations

Headquarters Bolling AFB, D.C.
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
154 detachments and operating locations

PERSONNEL
Active duty	1,415
Officers	359
Enlisted	1,056
Reserve components	431
ANG	0
AFRC	431
Civilians	424
Total	**2,270**

Air Force Operations Group

Headquarters Washington
Established July 26, 1977
Commander Col. James S. Sheehan

MISSION, PURPOSE, OPERATIONS
Support the Air Force Chief of Staff and Deputy Chief of Staff for Air and Space Operations for Air Force operational issues
Maintain a 24-hour watch on all current operations and process emergency messages
Provide facilities, policy, procedures, training, and staffing for the Hq. USAF Crisis Action Team during crises, contingencies, and exercises
Develop policy and coordinate USAF participation in memorial flyover events
Coordinate actions among USAF major commands, other field operating agencies, and direct reporting units in response to taskings from the Joint Chiefs of Staff and Hq. USAF leadership
Provide Air Force Chief of Staff and other Hq. USAF leaders with daily status of current Air Force operations
Prepare and provide weather data to the President, Secretary of Defense, Joint Chiefs of Staff, NMCC, Army Operations Center, and other federal agencies

STRUCTURE
Command, Control, and Communiations Division
Current Operations Division
CSAF Presentations Division
Weather Operations Division
Command, Control, Communications, and Computer Support 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. Susan L. Pamerleau

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	854
Officers	256
Enlisted	598
Reserve components	8
ANG	2
AFRC	6
Civilians	961
Total	**1,823**

NOTES
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 Susan A. O'Neal

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 Deputy Chief of Staff, Personnel, computer operations

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

PERSONNEL

Active duty 39
  Officers 23
  Enlisted 16
Reserve components 0
Civilians 25
Total 64

Air Force Program Executive Office

Headquarters ..... Washington
Established ..... November 1990
Air Force Acquisition Executive ..... Arthur L. Money

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:
John M. Gilligan, Battle Management
Brig. Gen. (sel.) Craig P. Weston, Warning, Surveillance, and Control
Harry E. Schulte, Weapons
Brent R. Collins, Space Programs
Oscar Goldfarb, Joint Logistics Systems
Brig. Gen. Richard V. Reynolds, Airlift and Trainer Programs
Maj. Gen. Robert F. Raggio, Fighter and Bomber Programs
Brig. Gen. Leslie P. Kenne, Joint Strike Fighter

PERSONNEL 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
  Air Force Personnel Board
  Board of Review
  Clemency and Parole Board
  Decorations Board
  Discharge Review Board
  DoD Civilian/Military Service Review Board
  Physical Disability Appeal Board

PERSONNEL

Active duty 9
  Officers 3
  Enlisted 6
Reserve components 3
  ANG 1
  AFRC 2
Civilians 34
Total 46

Air Force Safety Center

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

MISSION, PURPOSE, OPERATIONS

Execute Air Force aviation, ground, weapons, space, and nuclear safety policies, plans, and programs
Oversee all USAF mishap-prevention programs, including nuclear weapons, ballistic missiles, remotely piloted vehicles, and satellites
Conduct courses for USAF aircraft mishap investigators, chiefs of safety offices, and flight safety officers
Contract ground safety training for USAF personnel
Investigate and report on- and off-duty mishaps
Oversee major command mishap investigations and evaluate corrective actions for applicability and implementation USAF–wide

STRUCTURE

Mission divisions
  Aviation Safety
  Ground Safety
  Weapons, Space, and Nuclear Safety
Support divisions
  Data Operations and Analyses
  Policy, Plans, and Programs
  Public and Media Affairs
  Staff Judge Advocate
  Resources and Manpower

PERSONNEL

Active duty 81
  Officers 62
  Enlisted 19
Reserve components 3
  ANG 0
  AFRC 3
Civilians 59
Total 143

NOTES

AFSC publishes *Flying Safety* and *Road and Rec* magazines and the *Nuclear Surety/Weapons Safety Journal.*

Air Force Services Agency

Headquarters ..... San Antonio
Established ..... Feb. 5, 1991
Commander ..... Col. Gary C. Bradham

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	61
Officers	18
Enlisted	43
Reserve components	10
ANG	0
AFRC	10
Civilians	347
Total	**418**

Air Force Studies and Analyses Agency

Headquarters ..... Washington
Established ..... February 1991
Commander ..... Col. Thomas L. Allen

MISSION, PURPOSE, OPERATIONS

Provide analyses and simulation and modeling tools to support the assessment of force-structure options and acquisition decisions for the Secretary, Chief of Staff, and senior leadership of the Air Force
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 spacepower
Serve as the configuration manager for a variety of simulation models used by the Air Force, other DoD agencies, and civilian contractors

STRUCTURE

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

PERSONNEL

Active duty	82
Officers	71
Enlisted	11
Reserve components	2
ANG	0
AFRC	2
Civilians	26
Total	**110**

Air Force Technical Applications Center

Headquarters ..... Patrick AFB, Fla.
Established ..... May 1, 1960
Commander ..... Col. John T. Wigington III

MISSION, PURPOSE, OPERATIONS

Monitor compliance with several international nuclear treaties, including the Limited Test Ban Treaty, Threshold Test Ban Treaty, and Peaceful Nuclear Explosion Treaty
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.
Seven operational sites/detachments worldwide

PERSONNEL

Active duty	812
Officers	171
Enlisted	641
Reserve components	0
Civilians	171
Total	**983**

EQUIPMENT

15 seismic arrays and 10 single-instrument locations consisting of seismometers and associated central terminals and workstations
Six hydroacoustic recording locations
More than 130 sensors on 36 satellites, with associated ground systems instrumentation and data-processing equipment
Ground-based equipment to collect nuclear event debris
Military and civilian laboratories that perform low-level radioactive sample analysis

Air Force Weather Agency

Headquarters ..... Offutt AFB, Neb.
Established ..... Oct. 15, 1997
Commander ..... Col. John L. Hayes

MISSION, PURPOSE, OPERATIONS

Provide centralized weather, climatological, and combat-applications support to the Air Force and Army
Render technical advice, develop procedures, and field systems for the integrated weather support system

STRUCTURE

Air Force Combat Climatology Center, Scott AFB, Ill.
Air Force Combat Weather Center, Hurlburt Field, Fla.

PERSONNEL

Active duty	838
Officers	166
Enlisted	672
Reserve components	8
ANG	0
AFRC	8
Civilians	182
Total	**1,028**

NOTES

Formerly Air Weather Service, established on July 1, 1937.

Air Intelligence Agency

Headquarters ..... Kelly AFB, Texas
Established ..... Oct. 1, 1993
Commander ..... Brig. Gen. James E. Miller Jr.

MISSION, PURPOSE, OPERATIONS

Provide direct intelligence, security, electronic combat, foreign-technology, and treaty-monitoring support to national decision makers and field air component commanders
Develop principles and doctrines of information superiority for application in future warfare

Provide combat commanders with data enabling them to decide when to exploit, jam, deceive, or destroy hostile military communications
Provide scientific–technical intelligence support
Provide tailored intelligence assessments in support of Air Staff planning and policy formulation
Conduct USAF Sensitive Compartmented Information security functions
Assist Air Force components in the development of concepts, exercises, and employment of agency assets to support low-intensity conflict and special operations

EQUIPMENT

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

FORCE 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.
544th Intelligence Group, Peterson AFB, Colo.
692d Intelligence Group, Hickam AFB, Hawaii
694th Intelligence Group, Ft. Meade, Md.
Intelligence Systems Group, Kelly AFB, Texas

PERSONNEL

Active duty	11,522
Officers	1,564
Enlisted	9,958
Reserve components	2,248
ANG	187
AFRC	2,061
Civilians	2,014
Total	**15,784**

OPERATIONAL ACTIVITY

Provide Comfort (northern Iraq), Southern Watch (southern Iraq), Support/Uphold Democracy (Haiti), Joint Endeavor/Decisive Edge (multiple locations)

NOTES

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 agency reports directly to the Deputy Chief of Staff for Operations. In 1996, the agency supported more than 50 worldwide, Joint, unified, and specified command-sponsored exercises. The AIA commander also serves as director of the Joint Command and Control Warfare Center.

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 contigency operations by working to ensure a credible combat search and rescue capability
Provide CSAR functional expertise to DoD components and assist them in implementing OSD CSAR policy and directives
Advise the unified combatant commanders and military services concerning CSAR training, planning, and operations
Recommend CSAR doctrine, procedures, capabilities, and improvements to the Secretary of Defense and the Chairman of the Joint Chiefs of Staff and ensure integration into the DoD Personnel Recovery Program
Address CSAR procedures, training, and equipment standards to 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. John C. Chapman Jr.

MISSION, PURPOSE, OPERATIONS

Serve as Office of the Secretary of Defense executive agent for DoD Code of Conduct/SERE training and DoD's Operational Evasion, Escape, and Recovery program
Serve as Chairman of the Joint Chiefs of Staff executive agent office of primary responsibility for Joint Evasion and Recovery and operational POW/MIA matters
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

Operations Support Division
Information Division
SERE Training Division
Special Training Division
Mission Support Division
Requirements Division
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

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

NOTES

In 1997, the Joint Services SERE Agency provided assistance to operational units in South Korea, Bosnia, Europe, southwest Asia, Latin America, and South America. JSSA advised the Joint Staff, OSD, combatant commanders, and non–DoD government agencies on technical, training, and operational matters related to SERE, including the development and publication of a new Personnel Recovery DoD Directive and Operational Guidance. JSSA helped develop a future Combat Survivor/Evader Locator radio for DoD's operational forces. JSSA trained high-risk-of-capture personnel worldwide, using both in-resident training and mobile training teams. JSSA also assisted the services to improve SERE training and operational exercises for all high-risk-of-capture operators in DoD.

USAF Almanac

Direct Reporting Units

A direct reporting unit (DRU) 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 the mission and business processes of the Air Force
Lead Air Force efforts to develop, implement, and enforce system architectures for communications and information systems
Oversee implementation of designated Air Force–wide systems
Manage resources of the communications and information community and Air Force radio frequency spectrum requirements and access
Provide communications and information services to the Air Staff, Secretariat, and selected elements of the Joint Staff and Office of the Secretary of Defense, as well as staff support to the Air Force's chief information officer
Ensure through its subordinate units that information technology systems are integrated and interoperable
Develop technical standards and solutions that 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	64
Officers	50
Enlisted	14
Reserve components	2
ANG	1
AFRC	1
Civilians	57
Total	**123**

Air Force Doctrine Center

Headquarters ..... Maxwell AFB, Ala.
Established ..... Feb. 24, 1997
Commander ..... Maj. Gen. Ronald E. Keys

MISSION, PURPOSE, OPERATIONS

Develop and publish basic and operational doctrine for the Air Force
Provide Air Force input into Joint and multinational doctrine development
Advocate doctrinally correct representation of air- and space-power in service and Joint campaign models and exercise scenarios
Collect and maintain inputs from exercises and operations for Air Force lessons learned
Participate in the development and investigation of future operational concepts, technologies, and strategies
Maintain awareness of future Air Force planning

STRUCTURE

Det. 1, Langley AFB, Va.
OL, Ft. Bliss, Texas
OL, Ft. Knox, Ky.
OL, Ft. Sill, Okla.
OL, Ft. Benning, Ga.
OL, Ft. Rucker, Ala.
OL, Ft. Leavenworth, Kan.
Air Force Liaison, Washington

PERSONNEL

Active duty	86
Officers	79
Enlisted	7
Reserve components	0
Civilians	10
Total	**96**

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 and conduct impartial and responsive operational testing and evaluation of Air Force and other DoD systems to enhance mission effectiveness and suitability

STRUCTURE

Det. 2, Eglin AFB, Fla.
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**

NOTES
The center is conducting tests that involve the B-2 stealth bomber, Cheyenne Mountain upgrades, Joint Surveillance and Target Attack Radar System aircraft, Sensor Fuzed Weapons, and numerous command-and-control systems.

Air Force Security Forces Center

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

MISSION, PURPOSE, OPERATIONS
Develop Air Force Security Forces guidance, policy, and training requirements to safeguard and protect personnel and resources
Prepare guidance on air base defense operations and Security Force continuation training; mission related resource security and law enforcement operations; resource protection; and antiterrorism
Develop and implement base-level and combat arms training and ground combat weapons maintenance programs
Assist in planning, allocating, and evaluating Security Force resources, equipment, and future technology requirements
Manage USAF corrections program and activities; DoD military working dog activities; and Air Force Security Force contingency requirement taskings

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

PERSONNEL
Active duty 94
  Officers 28
  Enlisted 66
Reserve components 10
  ANG 1
  AFRC 9
Civilians 8
Total **112**

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.

NOTES
Air Force Security Police Agency was redesignated Air Force Security Forces Center, a new DRU, March 17, 1997.

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 2,306
  Officers 1,061
  Enlisted 1,245
Reserve components 0
Cadets 4,061
Civilians 1,822
Total **8,189**

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

NOTES
Cadets complete four years of study for a bachelor of science degree, choosing from 29 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 ..... Brig. Gen. (sel.) Peter U. Sutton

MISSION, PURPOSE, OPERATIONS
Provide administrative and ceremonial support to Air Force members in the National Capital Region, all 50 states, and more than 96 countries
Provide administrative support to more than 25,000 people assigned to the 11th Wing, Hq. USAF, and other Joint military entities
Support the President, Secretary of the Air Force, and Air Force Chief of Staff 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 1,395
  Officers 166
  Enlisted 1,229
Reserve components 0
Civilians 1,180
Total **2,575**

Valor

By John L. Frisbee, Contributing Editor

When Push Came to Shove

Deep over North Korea, Robbie Risner's wingman was hit by flak that disabled his F-86. Getting him to safety called for heroic measures.

BRIG. Gen. Robinson Risner's heroism during seven and a half years of imprisonment and torture in North Vietnam is legendary. Less known is the fact that he was a jet ace in Korea with eight confirmed victories. Few are aware, at least in detail, of an incredible feat of flying performed over North Korea by Robbie Risner in an attempt to save the life of another pilot. That courageous act is dismissed with a couple of sentences in Risner's book *The Passing of the Night.*

Risner's career as a fighter pilot began in Panama, where he whiled away the World War II years. When peace came, he joined the Oklahoma Air Guard. His squadron was called to active duty during Korea and began transitioning from P-51s to F-80s but with no immediate prospects of getting into the war. With the bare required minimum of 100 hours of jet time, Risner volunteered for combat duty as a photoreccе pilot, arriving in Korea on May 10, 1952. Three weeks later, he wangled his way into the famous 4th Fighter Wing at Kimpo and into F-86s, the world's best fighter at that time. On Sept. 21, the fast-learning Captain Risner became our 20th jet ace.

A few weeks later while escorting fighter–bombers in an attack on a chemical plant along the Yalu River, Risner tangled with what he describes as the finest fighter pilot he ever encountered. From 30,000 feet to the deck they went, with Risner scoring several solid hits, then across the Yalu into forbidden territory and down the runway of a Chinese airfield where the damaged MiG-15 crashed. All the while, Robbie's wingman, Lt. Joe Logan, stayed with the fight, protecting his leader.

As they climbed back across the Yalu near Antung, Logan's F-86 took a burst of flak. Fuel and hydraulic fluid poured out the belly of his aircraft. With only five minutes' fuel left, he would, it seemed, have to bail out in enemy territory. But Robbie Risner was not about to lose a fine wingman who was also a close friend.

"A typical fighter pilot," says General Risner, "thinks less about risk than about his objective," and Risner's objective was to keep Joe Logan out of enemy hands. Jet ace Risner immediately embarked on an undeniably high-risk venture to achieve that objective. The Air Force had a rescue detachment at Cho Do Island, about 60 miles to the south—and with plenty of flak en route. Risner decided to try something that, to his knowledge, had never been done successfully before. He would push the damaged F-86 to Cho Do, where Logan could bail out safely.

Risner told Logan to shut down his engine, now almost out of fuel. Then he gently inserted the upper lip of his air intake into the tailpipe of Logan's F-86. "It stayed sort of locked there as long as we both maintained stable flight, but the turbulence created by Joe's aircraft made stable flight for me very difficult. There was a point at which I was between the updraft and the downdraft. A change of a few inches ejected me either up or down," Risner, now retired and living in Austin, Texas, recalls.

Each time Risner re-established contact between the battered nose of his F-86 and Logan's aircraft was a potential disaster that was made even more likely by the film of hydraulic fluid and jet fuel that covered his windscreen and obscured his vision. It was, one imagines, something like pushing a car at 80 miles an hour down a corduroy road in a heavy fog.

Miraculously, Risner nudged Joe Logan's F-86 all the way to Cho Do, maintaining an airspeed of 190 knots and enough altitude to stay out of range of automatic weapons. Near the island, Logan bailed out, landing in the water near shore. Ironically, Risner's heroic effort ended in tragedy. Although Logan was a strong swimmer, he became tangled in his chute lines and drowned before rescuers could reach him. But the measure of a heroic act lies not in success. It lies in the doing.

After Korea, Robbie Risner's Air Force career continued to be marked by acts of physical and moral courage, culminating in his leadership of American POWs during those long years in Hanoi's prisons.

The standards of valor, loyalty, and dedication he set for himself, and met superbly throughout his years in uniform, have established a goal to be sought by generations of airmen yet to come. ■

There have been many requests over the years to rerun some of author Frisbee's earliest "Valor" pieces. This one was published in December 1983.

USAF Almanac

Guide to Air Force Installations Worldwide

Major Installations

Note: A major installation is an Air Force Base, Air Base, Air Reserve Base, or Air Guard Base that serves as a self-supporting center for Air Force combat, combat support, or training operations. Active duty, Air National Guard (ANG), or Air Force Reserve Command (AFRC) units of wing size or larger operate the installation with all land, facilities, and support needed to accomplish the unit mission. There must be real property accountability through ownership of all real estate and facilities. Agreements with foreign governments that give the Air Force jurisdiction over real property meet this requirement. Shared-use agreements (as opposed to joint-use agreements where the Air Force owns the runway) do not meet the major installation criteria.

Altus AFB, Okla. 73523-5000; within Altus city limits. Phone (405) 482-8100; DSN 866-1110. AETC base. Host: 97th Air Mobility Wing, C-5, KC-135, C-141, and C-17 aircraft. Operates AETC's strategic airlift and aerial refueling flying training schools. Base activated January 1943; inactivated May 1945; reactivated January 1953. Area 4,735 acres, plus 818 leased and 1,069 easement/right-of-way. Runways 13,440 ft., with an additional 9,000-ft. parallel runway and 3,500-ft. assault strip. Altitude 1,381 ft. Military 3,500; civilians 550; approx. 400 TDY students (officer and enlisted) in training per month. Payroll $144.4 million. Housing: 148 officer, 652 enlisted, 292 VAQ, 285 VOQ, 34 TLF. 15-bed hospital.

Andersen AFB, Guam, APO AP 96543-5000; 2 mi. N of Yigo. Phone (commercial, from CONUS) 671-366-1110; DSN 315-366-1110. PACAF base. Host: 36th Air Base Wing. Tenants: 13th Air Force (PACAF); 634th Air Mobility Sq. (Guam ANG); Det. 1, 13th Air Support Sq.; Det. 5, 750th Space Gp. (AFSPC); Det. 602, Air Force Office of Special Investigations; Helicopter Combat Support Sq. 5 (Navy). Andersen is the Pacific center for power projection, regional cooperation, and multinational training. It serves as a logistic support and staging base for aircraft operating in the Pacific and Indian oceans. Base 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 (north) 10,555 ft. and (south) 11,182 ft. Altitude 612 ft. Military 2,730; civilians 711. Payroll $46.2 million. Housing: 236 officer, 1,153 enlisted, 109 VOQ, 120 VAQ, 18 TLF, 1,017 UEQ, 30 UOQ. Clinic.

Andrews AFB, Md. 20762-5000; 10 mi. SE of Washington. Phone (301) 981-1110; DSN 858-1110. AMC base. Host: 89th Airlift Wing. Responsible for Presidential support and base operations; supports all branches of the armed services, several major commands, and federal agencies. Tenants: Det. 302, AFOSI; Air Force Flight Standards Agency; 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. Gateway to the nation's capital and home of Air Force One. Base 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. Military 12,214; civilians 1,425. Payroll $318 million. Housing: 325 officer, 1,753 enlisted, 414 off-base units, 974 UEQ, 68 TLF, 21 DV suites, 180 VOQ, 56 VAQ. 185-bed hospital.

Arnold AFB, Tenn. 37389; approx. 7 mi. SE of Manchester. Phone (931) 454-3000; DSN 340-5011. AFMC base. Host: Arnold Engineering Development Center, the world's largest complex of wind tunnels, jet and rocket engine test cells, space simulation chambers, and hyperballistic ranges. AEDC supports the acquisition of new aerospace systems by conducting research, development, and evaluation testing for DoD, other government agencies, and commercial aerospace firms. Base dedicated June 25, 1951. Named for Gen. of the Army H. H. "Hap" Arnold, wartime Chief of the AAF. Area 39,081 acres. Inactive 6,000-ft. runway. Altitude 1,100 ft. Military 111; civilians 202; NAF 49; contract employees 2,979. Payroll $134.6 million. Housing: 23 officer, 17 enlisted, 45 transient. Medical aid station and small VA clinic.

Aviano AB, Italy, APO AE 09601; adjacent to Aviano, 50 mi. N of Venice. Phone (commercial, from CONUS) 011-39-434-667111; DSN 632-1110. USAFE base. Host: 31st Fighter Wing 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. Tenants: 16th Air Force (USAFE); 603d Air Control Sq. (AMC). Geographically separated units: 31st RED HORSE Flight 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. 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. Military 3,367; civilians 1,102. Payroll $158.9 million. Housing: 619 govt.-leased units, 34 billeting spaces, 552-bed dorm. No TLF, 20 VOQ, 14 VAQ. Clinic with 24-hour acute-care clinic. American medical services at Sacile Hospital (20 minutes from base) with OB/GYN, general surgery, and orthopedics; two inpatient units; 20–22-bed hospital.

Barksdale AFB, La. 71110-5000; in Bossier City. Phone (318) 456-1110; DSN 781-1110. ACC base. Host: 2d Bomb Wing, B-52H operations. Tenants: 8th Air Force (ACC); 49th Test Sq. (ACC); 917th Wing (AFRC), B-52H and A-10 operations; Det. 5, 57th Wing (ACC); Naval Mobile Construction Battalion 28 Seabees (Navy Reserve); Det. 1, 307th RED HORSE Sq. (AFRC); 8th Air Force Museum. Base activated Feb. 2, 1933. Named for Lt. Eugene H. Barksdale, WWI airman killed in an August 1926 crash near Wright Field, Ohio. Area 22,000 acres (18,000 acres reserved for recreation). Runway 11,756 ft. Altitude 166 ft. Military 6,155; civilians 1,366. Payroll $397.3 million. Housing: 105 officer, 324 enlisted, 1,650 UEQ, 24 guest houses, 139 VOQ, 20 family campground tent spaces, and 18 RV spaces. 45-bed hospital. No emergency services.

Beale AFB, Calif. 95903-5000; 13 mi. E of Marysville. Phone (916) 634-3000; DSN 368-1110. ACC base. Host: 9th Reconnaissance Wing, U-2, T-38 aircraft. Tenants: Det. 1, 612th Air Operations Gp. (ACC); 7th Space Warning Sq. (AFSPC). 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. Military 3,078; civilians 492. Payroll $102.5 million. Housing: 186 officer, 1,518 enlisted, 823 UEQ, 6 UOQ, 53 VOQ, 125 VAQ, 17 TLF. Clinic.

Bolling AFB, D.C. 20332-5000; 3 mi. S of US Capitol. Phone (703) 545-6700; DSN 227-0101. Host: 11th Wing. Tenants: USAF Honor Guard; USAF Band; Air Force Office of Scientific Research (AFMC); 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. Activated October 1917. Named for Col. Raynal C. Bolling, first high-ranking Air Service officer killed

in WWI. Area 607 acres. No runway. Military 1,885; civilians 1,687. Payroll $123 million. (Payroll figures apply to 11th Wing only.) Housing: 285 officer, 1,100 enlisted, 502 dorm spaces, 24 DV, 44 VOQ, 71 VAQ, 50 TLF. Clinic.

Brooks AFB, Texas 78235; in SE San Antonio. Phone (210) 536-1110; DSN 240-1110. AFMC base. Host: Human Systems Center. Tenants: USAF School of Aerospace Medicine; Air Force Research Lab Armstrong Research Site, Human Systems Program Office; Det. 2, Air Force Institute of Technology; Air Force Medical Support Agency; 68th Intelligence Sq. (AIA); Air Force Center for Environmental Excellence; Medical Systems Implementation and Training Element. Base activated Dec. 8, 1917. Named for Cadet Sidney J. Brooks Jr., killed Nov. 13, 1917, on his commissioning flight. Area 1,310 acres. No runway. Altitude 600 ft. Military 1,701; civilians 1,587. Payroll $140 million. Housing: 70 officer, 100 enlisted. Clinic.

Cannon AFB, N.M. 88103-5000; 7 mi. W of Clovis. Phone (505) 784-3311; DSN 681-1110. ACC base. Host: 27th Fighter Wing, F-16 operations. Base 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. Military 3,969; civilians 724. Payroll $154 million. Housing: 173 officer, 1,549 enlisted, 1,346 dorm spaces, 6 DVQ, 45 TLF. 15-bed hospital.

Charleston AFB, S.C. 29404-5000; in North Charleston, 10 mi. from downtown Charleston. Phone (805) 963-6000; DSN 673-1110. AMC base. Joint-use airfield. Host: 437th Airlift Wing, C-17, C-141 aircraft. Tenants: 315th AW (AFRC Assoc.); Det. 1, 158th Fighter Wing (Vermont ANG); Field Training Det. 317; Det. 310, AFOSI; 1st Combat Camera Sq.; Det. 1, 33d Flight Test Sq. Base activated October 1942; inactivated March 1946; reactivated August 1953. Area 6,033 acres (including auxiliary airfield). Runway 9,000 ft. Altitude 46 ft. Military 4,500, civilians 1,500. Payroll $145 million. Housing: 150 officer, 1,062 enlisted, 799 dorm spaces, 75 mobile home, 8 DV, 28 VOQ, 4 SNCO suites, 128 VAQ, 27 TLF. Clinic.

Columbus AFB, Miss. 39710-1000; 10 mi. NW of Columbus. Phone (601) 434-7322; DSN 742-1110. AETC base. Host: 14th Flying Training Wing, Undergraduate Pilot Training and Introduction to Fighter Fundamentals. Base activated 1941 for pilot training. Area 6,015 acres. Runways 6,000 ft., 6,300 ft., 8,000 ft., and 12,000 ft. Altitude 214 ft. Military 1,398; civilians 1,318. Payroll $102 million. Housing: 295 officer, 440 enlisted, 28 VAQ, 61 VOQ, 26 TLF/TLH.

Davis–Monthan AFB, Ariz. 85707-5000; within Tucson city limits. Phone (520) 228-1110; DSN 228-1110. ACC base. Host: 355th Wing, A-10 combat crew training; OA-10 and FAC training and operations; EC-130H and EC-130E operations. Tenants: 12th Air Force (ACC); 305th Rescue Sq. (AFRC), MH-60G Pave Hawk helicopters; Det. 1, 120th Fighter Wing (Montana ANG), F-16 air defense operations; Aerospace Maintenance and Regeneration Center (AFMC), storage location for excess DoD aerospace vehicles. Base activated 1927. Named for two local early aviators: 1st Lt. Samuel H. Davis, killed Dec. 28, 1921, and 2d Lt. Oscar Monthan, killed March 27, 1924. Area 11,000 acres. Runway 13,645 ft. Altitude 2,620 ft. Military 6,235; civilians 1,385. Payroll $194.8 million. Housing: 133 officer, 1,106 enlisted, 132 VAQ, 188 VOQ, 16 TLF. 37-bed hospital.

Dover AFB, Del. 19902-7219; 3 mi. SE of Dover. Phone (302) 677-3000; DSN 445-3000. AMC base. Host: 436th Airlift Wing. Tenant: 512th AW (AFRC Assoc.). Dover operates the largest aerial port facility on the East Coast. Base activated December 1941; inactivated 1946; reactivated February 1951. Area 3,908 acres. Runway 12,900 ft. Altitude 28 ft. Military 5,850; civilians 1,025. Payroll $184 million. Housing: 107 officer, 1,441 enlisted, 704 dorm spaces, 128 VAQ, 35 VOQ, 24 TLF. Clinic.

Dyess AFB, Texas 79607-1980; WSW border of Abilene. Phone (915) 696-0212; DSN 461-1110. ACC base. Host: 7th Bomb Wing, two B-1B squadrons (one operational, one training). 7th BW conducts all B-1 combat crew training for the Air Force. Tenant: 317th Airlift Gp. (AMC), C-130 operations. Base 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. Military 5,077; civilians 489. Payroll $152 million. Housing: 159 officer, 974 enlisted, 92 VAQ, 69 VOQ, 9 DVQ, 40 TLF. 15-bed hospital.

Edwards AFB, Calif. 93524; 20 mi. E of Rosamond. Phone (805) 277-1110; DSN 527-1110. AFMC base. Host: Air Force Flight Test Center, 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. Tenants: AFRL's Propulsion Det. (AFMC); Dryden Flight Research Center (NASA). Base is a secondary landing site for space shuttle missions. Base 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. 21 runways from 4,000 to 39,000 ft. Altitude 2,302 ft. Military 4,196; civilians 6,600; 265 NAF. Payroll $843 million (all, except NAF). Housing: 310 officer, 1,679 enlisted, 900 UEQ, 62 UOQ, 16 USNCOQ, 178 VEQ, 97 VOQ, 11 VSNCOQ, 51 TLF, 188 trailer spaces. 10-bed 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. AFMC base. Host: Air Force Development Test Center, Unmanned Aerial Vehicle Battlelab. Tenants: Aeronautical Systems Center (Eglin) and AFRL's Munitions Directorate (AFMC); 33d Fighter Wing (ACC); 53d Wing (ACC); 919th Special Operations Wing (AFRC); 20th Space Surveillance Sq. (AFSPC); 9th Special Operations Sq. (AFSOC); 728th Tactical Control Sq.; a US Army Ranger training battalion; a US Navy Explosive Ordnance Disposal School; Air Force Armament Museum. Eglin is the nation's largest Air Force base in terms of acreage, covering an area roughly two-thirds the size of Rhode Island. Base activated 1935. Named for Lt. Col. Frederick I. Eglin, WWI flier killed in aircraft accident Jan. 1, 1937. Area 463,452 acres. Runways 10,000 ft. and 12,000 ft. Altitude 85 ft. Military 7,660; civilians 3,705 (excluding Hurlburt Field). Payroll $470.6 million (excluding Hurlburt Field). Housing: 243 officer, 2,090 enlisted, 1,048 UEQ, 226 trailer spaces, 88 TLF. 85-bed hospital. Clinic at Hurlburt Field.

Eielson AFB, Alaska 99702-5000; 26 mi. SE of Fairbanks. Phone (907) 377-1110; DSN (317) 377-1110. PACAF base. Host: 354th Fighter Wing, F-16C/D, A-10, and OA-10 operations. Tenants: Arctic Survival School (AETC); 168th Air Refueling Wing (ANG); Det. 460, Air Force Technical Applications Center. Base hosts recurring Cope Thunder exercises, which provide realistic combat training. Base 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. Military 2,735; full-time civilians (NAF, AAFES, Civil Service) 883 (includes ANG Civil Service technicians). Payroll $117.5 million. Housing: 151 officer, 1,367 enlisted. Unaccompanied housing: 8 officer units, 426 rooms, 750 dorm spaces (includes NCOQ), 216 VOQ, 240 VAQ spaces, 6 enlisted and 6 officer DVQ.

Ellsworth AFB, S.D. 57706-5000; 10 mi. E of Rapid City. Phone (605) 385-1000; DSN 675-1000. ACC base. Host: 28th Bomb Wing, two B-1B squadrons. Tenant: South Dakota Air and Space Museum. Base 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. Military 2,884; civilians 969. Payroll $135.3 million. Housing: 198 officer, 1,882 enlisted, 57 VAQ, 125 VOQ, 2 DVQ, 30 TLF. 15-bed hospital.

Elmendorf AFB, Alaska 99506-5000; bordering Anchorage. Phone (907) 552-1110; DSN (317) 552-1110. PACAF base. Host: 3d Wing, F-15C/D and F-15E fighter and C-130 and C-12 airlift operations, E-3 Airborne Warning and Control System operations. Tenants: Alaskan Command; 11th Air Force (PACAF); Alaskan NORAD Region; 11th Rescue Coordination Center (ANG); 381st Intelligence Sq. (AIA); 632d Air Mobility Support Sq. (AMC); various US Army, Navy, and Marine activities. Hub for air traffic to and from the Far East. Base 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. Military 6,998; civilians 1,917. Payroll $380 million. Housing: 174 officer, 1,432 enlisted, 90 VOQ, 170 VAQ, 1,036 UEQ, 80 officer and 422 enlisted contingency facilities, 103 TLF. 110-bed hospital.

Fairchild AFB, Wash. 99011-5000; 12 mi. WSW of Spokane. Phone (509) 247-1212; DSN 657-1212. AMC base. Host: 92d Air Refueling Wing, KC-135R, KC-135T operations. Tenants: 336th Training Gp. (USAF Survival School, AETC); 141st Air Refueling Wing (Washington ANG, KC-135E); 2d Support Sq. (ACC). Base activated January 1942. Named for Gen. Muir S. Fairchild, USAF vice chief of staff at his death in 1950. Area 4,543 acres. Runway 13,901 ft. Altitude 2,426 ft. Military 4,940; civilians 1,021. Payroll $145 million. Housing: 117 officer, 1,230 NCO, 18 TLF, 163 BAQ/VAQ, 151 VOQ. Clinic.

Falcon AFB, Colo. See Schriever AFB, Colo.

F.E. Warren AFB, Wyo. 82005-5000; adjacent to Cheyenne. Phone (307) 993-1110; DSN 481-1110. AFSPC base. Host: 90th Space Wing, 50 Peacekeeper and 150 Minuteman III ICBMs, UH-1N helicopters. Tenants: 20th Air Force (AFSPC); 37th Rescue Flight. Air Force ICBM Museum. Base 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. No runway. Altitude 6,142 ft. Military 3,500; civilians 590. Payroll $125.8 million. Housing: 831 family units. 35-bed hospital.

Goodfellow AFB, Texas 76908-5000; SE of San Angelo. Phone (915) 654-3217; DSN 477-3231. AETC base. Host: 17th Training Wing, 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. Tenants: Goodfellow NCO Academy; 344th Military Intelligence Battal-

ion (US Army); Naval Technical Training det.; US Marine Corps det. Base activated January 1941. Named for Lt. John J. Goodfellow Jr., WWI observation airplane pilot killed in combat Sept. 14, 1918. Area 1,136 acres. No runway. Altitude 1,877 ft. Military 1,485; civilians 777. Payroll $163 million. Housing: 299 enlisted, 1,352 student dorm spaces, 180 permanent party dorm spaces, 730 VAQ, 95 VOQ, 29 TLF. Clinic.

Grand Forks AFB, N.D. 58205-5000; 16 mi. W of Grand Forks. Phone (701) 747-3000; DSN 362-1110. AMC base. Host: 319th Air Refueling Wing, KC-135R operations. Tenant: 321st Missile Gp. (AFSPC), inactivates July 1998, Minuteman III, HH-1H operations. Home of the first of AMC's core air refueling wings. Base 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. Military 4,353; civilians 422. Payroll $78.6 million. Housing: family 2,263, 1,115 dorm spaces. 15-bed hospital.

Hanscom AFB, Mass. 01731-5000; 17 mi. NW of Boston. Phone (781) 377-4441; DSN 478-5980. AFMC base. Host: Electronic Systems Center (AFMC), manages development and acquisition of command-and-control systems. Tenants: AFRL's Space Vehicles Directorate–Hanscom, center for the study of aerospace environment and its effects on military systems; AFRL's Sensors Directorate–Hanscom, center for electromagnetics sensor technology. Base has no flying mission; transient USAF aircraft use runways of Laurence G. Hanscom Field, state-operated airfield adjoining the base. Named for Laurence G. Hanscom, a pre–WWII advocate of private aviation, killed in a lightplane accident in 1941. Area 846 acres. Altitude 133 ft. Military 1,566; civilians 1,781. Payroll $157 million. Housing: 388 officer, 472 enlisted, 35 TLF, 754 BOQ/VOQ. Clinic.

Hickam AFB, Hawaii 96853-5000; 9 mi. W of Honolulu. Phone (808) 471-7110 (Oahu military operator); DSN 471-7110. PACAF base. Host: 15th Air Base Wing, supporting Air Force units and installations in Hawaii and throughout the Pacific. Tenants: Pacific Air Forces; 154th Wing (ANG); 324th Intelligence Sq. (AIA); 635th Air Mobility Support Sq. (AMC). Base 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. Four joint-use runways shared with Honolulu IAP: 12,357 ft., 12,000 ft., 6,952 ft., 9,000 ft. Altitude sea level. Military 4,590; civilians 2,023. Payroll $290.8 million. Housing: 562 officer, 2,087 enlisted, 8 UOQ, 832 UEQ, 203 VOQ, 208 VAQ. Clinic.

Hill AFB, Utah 84056-5990; 25 mi. N. of Salt Lake City. Phone (801) 777-7221; DSN 777-1110. AFMC base. Host: Ogden Air Logistics Center, 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. Tenants: 388th Fighter Wing (ACC); 419th FW (AFRC); Defense Megacenter Ogden; 388th Range Sq. (ACC), which manages the 2,675 sq. mi. Utah Test and Training Range; Hill Aerospace Museum. Base 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. Runway 13,500 ft. Altitude 4,788 ft. Military 4,439; civilians 9,532. Payroll $482 million. Housing: 179 officer, 966 enlisted, 34 DV, 96 VOQ, 140 VAQ, 40 TLF. 16-bed hospital.

Holloman AFB, N.M. 88330-5000; 8 mi. SW of Alamogordo. Phone (505) 475-6511; DSN 867-1110. ACC base. Host: 49th Fighter Wing, F-117 operations; F-4F aircrew training; HH-60 helicopters. Site of German Air Force Tactical Training Center: Twelve German Tornado aircraft and 350 German personnel arrived in early 1996 and are permanently assigned to 49th FW. Tenants: 46th Test Gp. (AFMC); 4th Space Surveillance Sq. (AFSPC); Det. 1, 82d Aerial Target Sq. (QF-4 drone operations). Base activated 1942. Named for Col. George Holloman, guided-missile pioneer. Area 59,000 acres. Runways 10,575 ft., 12,131 ft., and 8,054 ft. with 7,044 ft. overrun. Altitude 4,093 ft. Military 4,150; civilians 865. Payroll $159.9 million. Housing: 191 officer, 1,359 enlisted, 145 VAQ, 208 VOQ, 50 TLF. 8-bed hospital.

Howard AFB, Panama, APO AA 34001-5000. DSN (313) 284-9805. ACC base. Host: 24th Wing, represents USAF in operations throughout Latin America. Tenants: Joint Interagency Task Force South (USSOUTHCOM); 640th Air Mobility Support Sq. (AMC). Established 1928 as Bruja Point Military Reservation; later named for Maj. Charles Harold Howard. Military 1,748; civilians 1,237. Payroll $53.3 million. Housing: 238 officer, 933 enlisted, 554 VAQ, 120 VOQ, 6 TLF.

Hurlburt Field, Fla. 32544-5000; 5 mi. W of Fort Walton Beach. Phone (850) 884-1110; DSN 579-1110. AFSOC base. Host: 16th Special Operations Wing, 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. Tenants: Air Force Special Operations Command; USAF Command and Control Training and Innovation Center; C^2 Battle Management Battlelab; 823d RED HORSE Civil Engineering Sq. (ACC); USAF Combat Weather Center; 25th Intelligence Sq. (AIA); Det. 1, 335th Training Sq. (Tactical Air Control Party and Combat Weather) (AETC); Det. 309, AFOSI. Base 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. Military 7,348; civilians 798. Payroll $310 million. Housing: 52 officer, 628 enlisted, 300 govt.-leased enlisted houses; 195 transient; 24 TLF. Clinic. 65-bed hospital at Eglin AFB, 12 mi. away.

Incirlik AB, Turkey, APO AE 09824; 10 mi. E of Adana. Phone (commercial, from CONUS) 011-90-322-316-1110; DSN 676-1110. USAFE base. Host: 39th Wing, supports Operation Northern Watch and rotational weapons training deployments for USAFE fighter aircraft. Combined Task Force assets include 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-130s, KC-135s, HH-60s, MH-60s, and UH-60As. Tenant: 628th Air Mobility Support Sq. (AMC), which provides a full aerial port operation. Base 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. Military 2,062, 1,555 TDY personnel supporting Northern Watch; civilians 2,253. Payroll $150 million. Housing: 920 units, 60 BOQ, 80 TLF, 289 VAQ, 151 VOQ, 564 dorm rooms. 26-bed regional hospital, expandable to 180 beds.

Kadena AB, Japan, APO AP 96368-5000; 15 mi. N of Naha, Okinawa, Japan. Phone (commercial, from CONUS) 011-81-98938-1111; DSN 634-1110. PACAF base. Host: 18th Wing, F-15C/D, KC-135, E-3, and HH-60 operations. Tenants: Support Center Pacific (AFMC), 353d Special Operations Gp. (AFSOC), and Training Det. 15 (AETC). Base named for city of Kadena, Okinawa. Area 4,930 acres. Runway length 12,100 ft. Military 8,346; civilians 10,354; local nationals 2,520. Payroll $135 million. Housing: 968 officer, 3,062 enlisted, 122 TLF, 274 UO/CQ, 2,582 UEQ, 301 VOQ, 276 VAQ. Clinic. US Naval Hospital at Camp Lester.

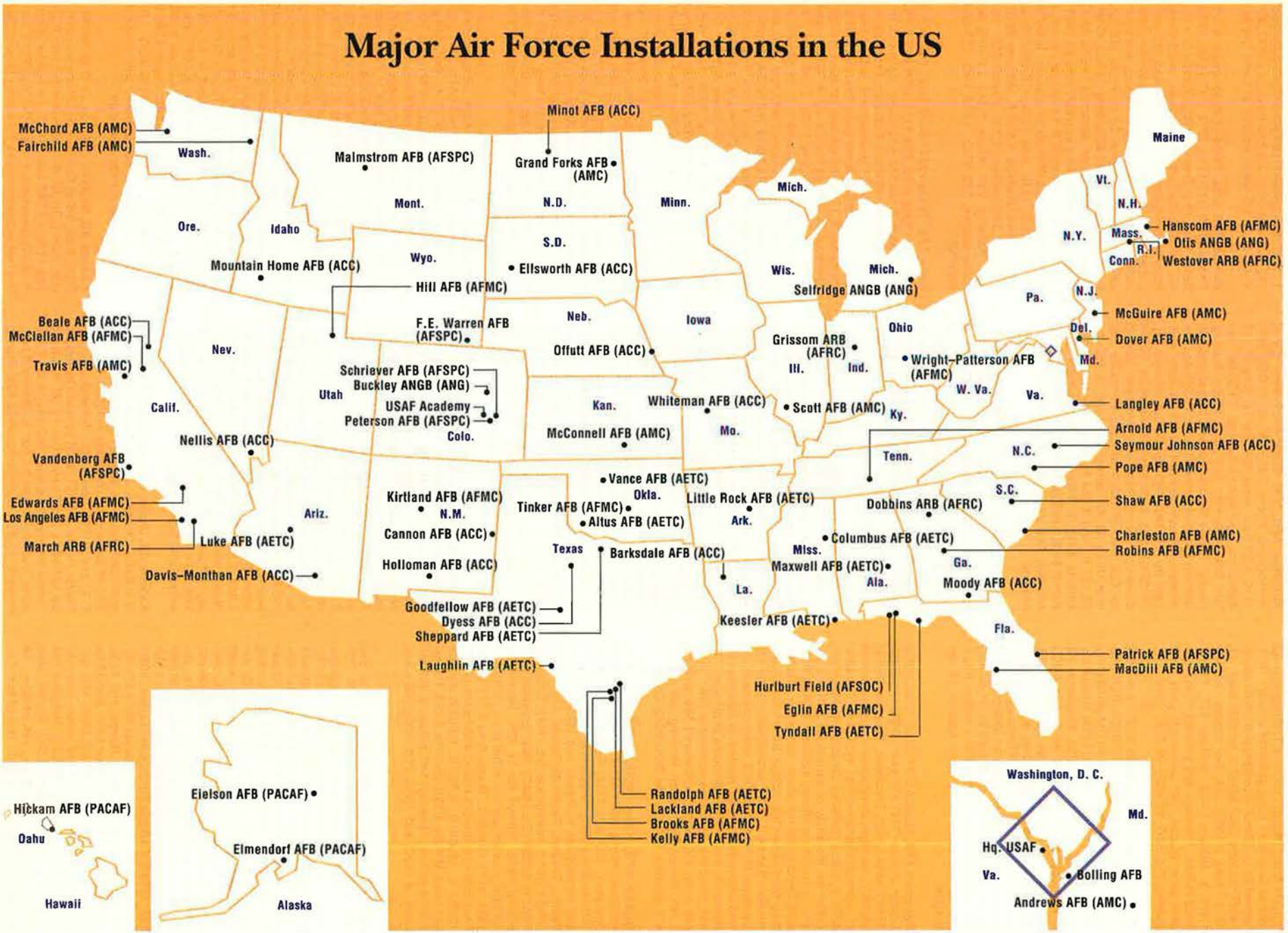
Keesler AFB, Miss. 39534-5000; located in Biloxi. Phone (228) 377-1110; DSN 597-1110. AETC base. Host: 81st Training Wing, conducts training for avionics, communications, electronics, radar systems, computer and command-and-control systems, weather, precision equipment, physician residencies, specialized nursing, and medical technicians. Tenants: 2d Air Force (AETC); Keesler Medical Center; 403d Wing (AFRC); AFMC engineering installation squadron; AETC NCO Academy–Keesler. Base 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. Military 8,535; civilians 4,436. Payroll $321 million. Housing: 287 officer, 1,664 enlisted, 49 trailer spaces, 312 VOQ, 1,495 VAQ. 250-bed hospital.

Kelly AFB, Texas 78241-5000; 5 mi. SW of San Antonio. Phone (210) 925-1110; DSN 945-1110. AFMC base. Host: San Antonio Air Logistics Center. Information Warfare Battlelab. Provides logistics management, procurement, and systems support for such Defense Department 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. Tenants: 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. 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. 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. Area 4,660 acres. Runway 11,550 ft. Altitude 689 ft. Military 5,713; civilians 13,739. Payroll $518 million. Housing: 57 officer, 374 enlisted. Clinic.

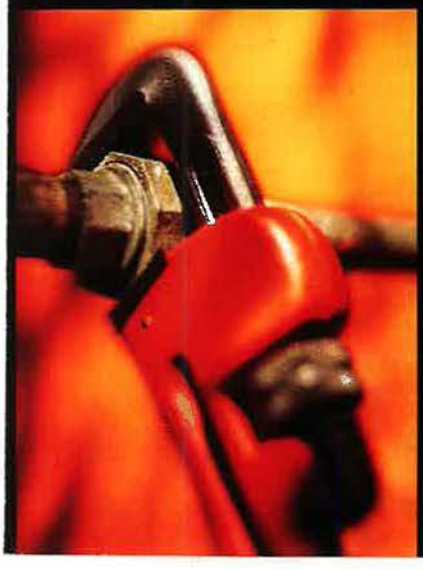
Kirtland AFB, N.M. 87117-5606; SE quadrant of Albuquerque. Phone (505) 846-0011; DSN 246-0011. AFMC base. Host: 377th Air Base Wing. Tenants: 58th Special Operations Wing (AETC); Air Force Operational Test and Evaluation Center; AFRL's Space Vehicle Technology Directorate (AFMC); 150th Fighter Wing (ANG); Field Command's Defense Special Weapons Agency; Sandia National Laboratories; DoE's Albuquerque Operations Office; Kirtland NCO Academy; 898th Munitions Sq.; Defense Nuclear Weapons School; Air Force Inspection Agency; Air Force Safety Center. These agencies furnish nuclear, advanced weapons, and space research, development, and testing; advanced helicopter training and search-and-rescue operations; pararescue training; and operational test and evaluation. Base 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 52,678 acres. Runway 19,375 ft. Altitude 5,352 ft. Military 5,600; civilians 15,040. Payroll $785.9 million. Housing: 2,122 homes, 130 VOQ, 180 VAQ. Air Force–Veterans Affairs joint medical center located outside base gate.

Kunsan AB, Republic of Korea, APO AP 96264-5000; 8 mi. SW of Kunsan City. Phone (commercial, from CONUS) 011-82-654-470-1110; DSN 782-1110. PACAF base. Host: 8th Fighter Wing, F-16C/D operations, home of the "Wolf Pack" and the first active overseas F-16 wing (September

Major Air Force Installations in the US



With all the EXTRA stuff you have to keep track of, it's easy to lose SIGHT of your mission.



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1981). Tenants: US Army's Echo and Foxtrot Batteries, 1st Battalion, 143d Air Defense Artillery; US Army Contracting Command Korea. Base built by the Japanese in 1938. Area 2,556 acres. Runway length 9,000 ft. Altitude 29 ft. Military 2,362; civilians 33; local nationals 346. Payroll $100.6 million. 247 UOQ, 3,142 UEQ, 9 VIP, 28 VOQ, 109 VAQ. 4-bed hospital.

Lackland AFB, Texas 78236-5000; 8 mi. SW of downtowr San Antonio. Phone (210) 671-1110; DSN 473-1110. AETC base. Host: 37th Training Wing, the largest training wing in the Air Force. It provides basic military training for about 35,000 civilian recruits entering the Air Force, Air National Guard, and Air Force Reserve annually; conducts more than 200 operations training courses in a wide array of base support functions for more than 36,000 people annually from all military services. Its Defense Language Institute English Language Center conducts English language training for 2,400 international and US military students annually; Inter-American Air Forces Academy conducts professional, operations, and management training in Spanish to military forces and governmental agencies from Latin American and Caribbean nations for about 900 students per year. Tenants: 59th Medical Wing (Wilford Hall USAF Medical Center), the Air Force's largest medical facility; Air Force Security Forces Center; Force Protection Battlelab. Base activated 1941. Named for Brig. Gen. Frank D. Lackland, early commandant of Kelly Field flying school, who died in 1943. Area 6,725 acres. No runway. Altitude 745 ft. Military 7,663; civilians 4,969; students 9,070. Payroll $583 million. Housing: 109 officer, 611 NCO, 1,237 VAQ, 374 VOQ, 158 TLF. 350-bed hospital.

Lajes Field, Azores, Portugal, APO AE 09720-5000; Terceira Island, 900 mi. W of Portugal. Phone (commercial, from CONUS) 011-351-95-540100-1110; DSN from US 535-1110, from Europe 245-1110. ACC base. Host: 65th Air Base Wing. Tenants: US Forces Azores; Army 952d Transportation Co.; 629th Air Mobility Support Sq. (AMC); Det. 6, Air Force Broadcasting Service. US operations began at Lajes Field 1946. Area 1,148 acres. Runway 10,865 ft. Altitude 180 ft. Military 983; civilians 894. Payroll $43.1 million. Housing: 80 officer, 403 enlisted, 30 TLF, 122 VOQ, 342 VAQ, 6 DVQ, 4 Chief. Clinic.

Langley AFB, Va. 23665-5000; 3 mi. N of Hampton. Phone (757) 764-1110; DSN 574-1110. ACC base. Host: 1st Fighter Wing, F-15 operations. Tenants: Air Combat Command; ACC Heritage of America Band; US Army TRADOC Flight Det. Base 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. NASA's Langley Research Center is adjacent to the base. Area 3,216 acres. Runway 10,000 ft. Altitude 11 ft. Military 7,843; civilians 1,045. Payroll $306 million. Housing: 351 officer, 1,074 NCO, 215 VAQ, 101 VOQ, 100 TLF. 50-bed hospital.

Laughlin AFB, Texas 78843-5000; 6 mi. E of Del Rio. Phone (830) 298-3511; DSN 732-1110. AETC base. Host: 47th Flying Training Wing, specialized UPT. Base activated July 1942. Named for 1st Lt. Jack Thomas Laughlin, Del Rio native, B-17 pilot killed over Java Jan. 29, 1942. Area 5,226 acres. Runways 6,246 ft., 8,310 ft., and 8,850 ft. Altitude 1,082 ft. Military 1,337; civilians 1,775. Payroll $75 million. Housing: 600 units, 54 trailer spaces, 36 transient, 22 TLF. Clinic.

Little Rock AFB, Ark. 72099-5000; 17 mi. NE of Little Rock. Phone (501) 988-3131; DSN 731-1110. AETC base. Host: 314th Airlift Wing, only C-130 training base in DoD, trains crew members from all branches of military service and 27 foreign countries. Tenants: 463d Airlift Group (AMC), C-130s; 189th Airlift Wing (ANG), C-130s; 96th Mobile Aerial Port Sq.; 348th USAF Recruiting Sq.; Det. 251, AFOSI; Det. 4, 373d Training Sq.; Det. 234, Air Force Audit Agency; Combat Aerial Delivery School (ACC); Hq. Arkansas ANG. Base activated 1955. Area 11,373 acres. Runway 12,000 ft. Altitude 310 ft. Military 5,108; civilians 581. Payroll $176.9 million. Housing: 140 officer, 1,395 enlisted, 12 single-occupancy dorms housing 940, 216 VAQ, 201 VOQ. 12-bed hospital.

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. AFMC base. Host: Space and Missile Systems Center, 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. No runway. Altitude 95 ft. Military 1,312; civilians 924. Payroll $150 million. Housing at Ft. MacArthur Annex: 574 townhouses. Clinics, base exchanges, and child development centers at main base and Ft. MacArthur; commissary and Family Support Center at main base.

Luke AFB, Ariz. 85309-5000; 20 mi. WNW of downtown Phoenix. Phone (602) 856-7411; DSN 896-1110. AETC base. Host: 56th Fighter Wing, F-16 operations. Tenants: 944th Fighter Wing (AFRC), F-16 operations; 607th Air Control Sq., forward air control operations. Luke is the largest fighter training base in the world; conducts USAF and allied F-16 aircrew training. Base 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, near Murvaux, France. Area 4,197 acres, plus 2.7 million–acre Goldwater training range at Gila Bend, Ariz. Runways 10,000 ft. and 9,910 ft. Altitude 1,090 ft. Military 5,600; civilians 1,300. Payroll $161.2 million. Housing: 95 officer, 779 enlisted, 132 VOQ, 84 VAQ, 40 TLF. 20-bed hospital.

MacDill AFB, Fla. 33621-5000; located on the Interbay Peninsula in southern Tampa. Phone (813) 828-1110; DSN 968-1110. AMC base. Host: 6th Air Refueling Wing, KC-135 operations. Tenants: US Special Operations Command; US Central Command; Joint Communications Support Element; NOAA Aircraft Operations Center; 622d Aeromedical Evacuation Sq.; 290th Joint Communications Support Sq. The 6th ARW provides worldwide air refueling and airlift for resident warfighting commands. Base 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. Military 5,170; civilians 1,937. Payroll $2.6 billion. Housing: 103 officer, 514 enlisted, 20 DVQ, 77 VAQ, 116 VOQ, 24 TLF. 50-bed hospital.

Malmstrom AFB, Mont. 59402-5000; 1.5 mi. E of Great Falls. Phone (406) 731-1110; DSN 632-1110. AFSPC base. Host: 341st Space Wing, Minuteman III ICBMs, UH-1 helicopters. Tenant: 819th RED HORSE Civil Engineering Sq. Base 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. No runway. Altitude 3,525 ft. Military 3,500; civilians 468. Payroll $129.9 million. Housing: 258 officer, 1,148 enlisted, 103 transient. Clinic.

Maxwell AFB, Ala. 36112-5000; 1 mi. WNW of Montgomery. Phone (334) 953-1110; DSN 493-1110. AETC base. Host: 42d Air Base Wing. 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; Air Force Institute of Technology (at Wright-Patterson AFB, Ohio); 908th Airlift Wing (AFRC); Air Force Historical Research Agency; Air Force Doctrine Center. Air University conducts professional military, graduate, and professional continuing education for precommissioned and commissioned officers, enlisted personnel, and civilians. Base activated 1918. Named for 2d Lt. William C. Maxwell, killed in air accident Aug. 12, 1920, in the Philippines. Area 3,488 acres. Runway 8,000 ft. Altitude 168 ft. Military 4,438; civilians 3,327. Payroll $334.8 million. Housing: 268 officer, 364 enlisted, 1,115 VOQ, 65 VAQ, 30 TLF. 20-bed hospital.

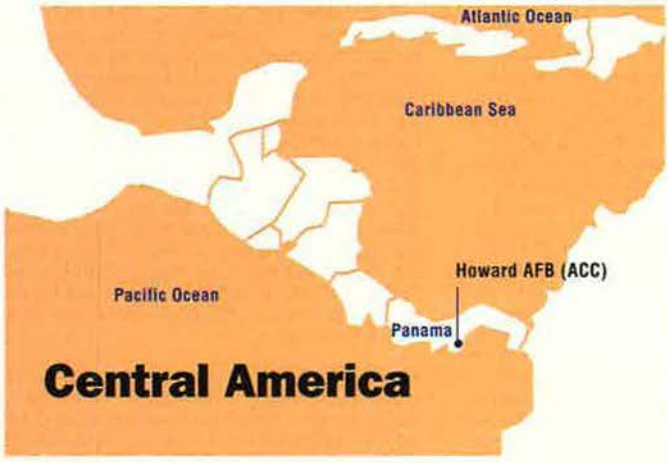
Maxwell AFB, Gunter Annex, Ala. 36114; 4 mi. NE of Montgomery. Phone (334) 416-1110; DSN 596-1110. AETC base. Under Air University: College for Enlisted Professional Military Education (includes USAF Senior NCO Academy); Extension Course Institute. Tenants: Standard Systems Group (AFMC); Air Force Logistics Management Agency. Activated Aug. 27, 1940. Named for William A. Gunter, longtime mayor of Montgomery and airpower advocate who died in 1940. Area 376 acres. No runway. Altitude 220 ft. Military and civilian populations and payroll data included in Maxwell entry. Housing: 104 officer, 217 enlisted, 212 VOQ, 501 VAQ, 3 TLF.

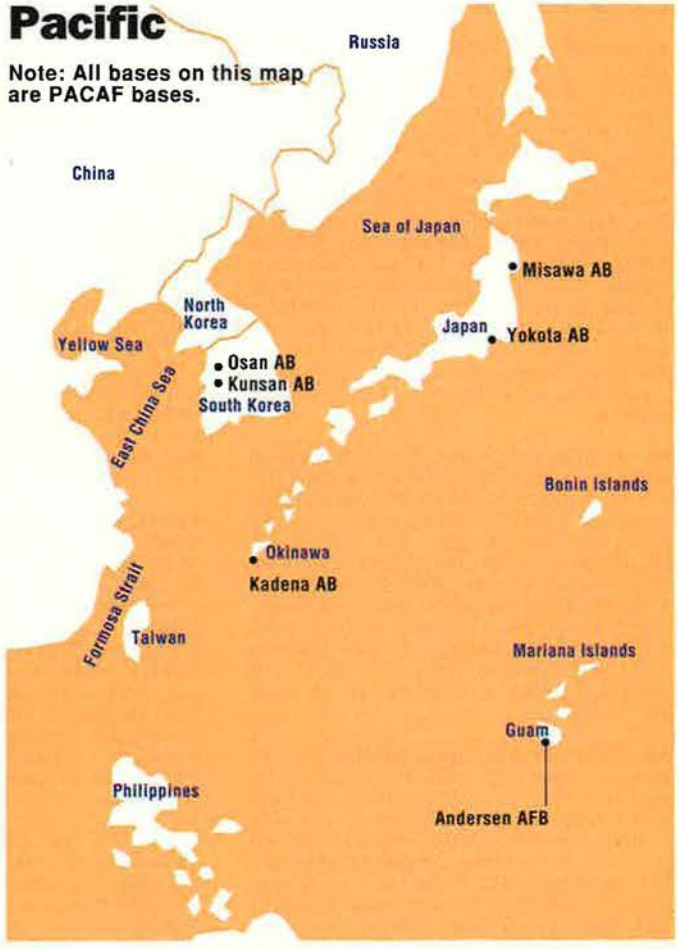
McChord AFB, Wash. 98438-5000; 10 mi. S of Tacoma. Phone (253) 984-1910; DSN 984-1110. AMC base. Host: 62d Airlift Wing, C-141s, scheduled to receive the C-17 Globemaster III as the C-141 fleet retires. Tenants: 446th Airlift Wing (AFRC); Western Air Defense Sector (ANG); 22d Special Tactics Sq. Base is adjacent to Ft. Lewis, its primary customer for strategic airlift worldwide. Base 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. Military 3,776; civilians 1,014. Payroll $221.2 million. Housing: 88 officer, 830 enlisted, 841 dorm rooms, 287 VAQ, 70 VOQ, 12 TLF. Dispensary. Madigan Army Medical Center is located 4 mi. SE, with 414 beds (expandable to 622 in an emergency).

McClellan AFB, Calif. 95652-5000; 9 mi. NE of Sacramento. Phone (916) 643-2111; DSN 633-1110. AFMC base. Host: Sacramento Air Logistics Center, 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. Tenants: Defense Distribution Region West–McClellan; Defense Commissary Agency Western Pacific Region; 938th Engineering Installation Sq.; Technical Operations Div., Air Force Technical Applications Center; US Coast Guard Air Station, Sacramento (DoT). Base activated April 9, 1939. Named for Maj. Hezekiah McClellan, pioneer in Arctic aeronautical experiments, killed in a crash May 25, 1936. Area 3,763 acres. Runway 10,600 ft. Military 2,737; civilians 8,956. Payroll $450 million. Housing: 100 officer, 564 enlisted, 19 transient. 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. AMC base. Host: 22d Air Refueling Wing, KC-135 operations. Tenants: 931st Air Refueling Gp. (AFRC Assoc.); 184th Bomb Wing (ANG). Base

Major Air Force Installations Overseas





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). Area 3,113 acres. Two 12,000-ft. runways. Altitude 1,371 ft. Military 2,969; DoD civilians 463. Payroll $200 million. Housing: 69 officer, 437 enlisted. 49 VOQ, 66 VAQ, 49 temporary units off base. Clinic.

McGuire AFB, N.J. 08641-5000; 18 mi. SE of Trenton. Phone (609) 724-1100; DSN 440-1100. AMC base. Host: 305th Air Mobility Wing, C-141 and KC-10 operations. 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.); McGuire NCO Academy (AETC). Base 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. Military 10,042 (including ANG and AFRC); civilians 1,192. Payroll N/A. Housing: 192 officer, 1,562 enlisted, 78 VOQ/VAQ, 124 VAQ (E-1–E-4), 30 TLF. Clinic.

Minot AFB, N.D. 58705-5000; 13 mi. N of Minot. Phone (701) 723-1110; DSN 453-1110. ACC base. Host: 5th Bomb Wing, B-52H operations. Tenant: 91st Space Wing (AFSPC), Minuteman III ICBMs, UH-1N helicopters. Base 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. Military 4,620; civilians 589. Payroll $143.3 million. Housing: 468 officer, 1,965 enlisted, 28 UOQ, 1,233 dorm spaces, 33 VAQ, 39 VOQ, 39 TLF. 49-bed hospital.

Misawa AB, Japan, APO AP 96319-5000; within Misawa city limits. Phone (commercial, from CONUS) Direct: 011-81-3117-66-1111. Switchboard: 011-81-176-53-5181; DSN 94-315-226-1110. PACAF base. Host: 35th Fighter Wing, F-16C/D operations. Tenants: 3d Space Surveillance Sq. (AFSPC); 301st Intelligence Sq. (AIA); Naval Air Facility; Naval Security Gp. Activity; 750th Military Intelligence Det. (Army); Company E, US Marine Support Battalion. Base occupied by US forces September 1945. Area 3,865 acres. Runway 10,000 ft. Altitude 119 ft. Military 5,023; civilians 167; local nationals 987. Payroll $168.2 million. Housing: 302 officer, 1,843 enlisted, 115 UOQ, 811 UEQ, 229 transient. Navy: 108 UOQ, 356 UEQ (196 permanent party, 160 transient). 15-bed hospital, expandable to 65 for contingencies.

Moody AFB, Ga. 31699-5000; 10 mi. NNE of Valdosta. Phone (912) 257-4211; DSN 460-1110. ACC base. Host: 347th Wing, F-16C/D (LANTIRN–equipped), A/OA-10; HC-130, HH-60. Tenants: 336th USAF Recruiting Sq.; Det. 717, AFOSI; 322d Training Det. (AETC); 71st Air Control Sq. Base 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. Military 5,200; civilians 800. Payroll $106.5 million. Housing: 32 officer, 270 enlisted, 19 VAQ, 36 VOQ, 12 TLF, 30 trailer spaces. Clinic.

Mountain Home AFB, Idaho 83648-5000; 45 mi. SE of Boise. Phone (208) 828-2111; DSN 728-2111. ACC base. Host: 366th Wing, USAF's Air Expeditionary Wing, ready to deploy rapidly worldwide with F-16Cs (HARM), F-15C/Ds, F-15Es, B-1Bs, and KC-135Rs. Air Expeditionary Force Battlelab. Base activated August 1943. Area 9,112 acres. Runway 13,500 ft. Altitude 3,000 ft. Military 3,977; civilians 427. Payroll $134.4 million. Housing: 196 officer, 1,325 enlisted, 47 VAQ, 48 VOQ, 16 TLF. 30-bed hospital.

Nellis AFB, Nev. 89191-5000; 8 mi. NE of Las Vegas. Phone (702) 652-1110; DSN 682-1110. ACC base. Host: Air Warfare Center. 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); 57th Director of Tactics; 99th Range Gp.; 414th Combat Training Sq. (Red Flag); 549th Combat Training Sq. (Air Warrior); 11th Recon Sq. and 15th Recon Sq. (UAV). Support wing: 99th Air Base Wing. Tenants: 820th RED HORSE Civil Engineering Sq. and 422d Test and Evaluation Sq. (53d Wing, ACC); 896th Munitions Sq. (AFMC). Base 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. 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. Military 7,338; civilians 938. Payroll $266.1 million. Housing: 70 officer, 1,182 enlisted, 370 VAQ, 260 VOQ, 60 TLF. 114-bed Mike O'Callaghan Federal Hospital, a joint Air Force–Veterans Affairs venture assigned to Nellis' 99th Medical Gp.

Offutt AFB, Neb. 68113-5000; 8 mi. S of Omaha. Phone (402) 294-1110; DSN 271-1110. ACC base. Host: 55th Wing. Tenants: US Strategic Command; Joint Intelligence Center (USSTRATCOM); Air Force Weather Agency; National Airborne Operations Center (JCS); ACC Heartland of America Band. Base 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. Military 9,111; civilians 2,660. Payroll $351.9 million. Housing: 337 officer, 2,293 enlisted,170 VAQ, 160 VOQ, 60 TLF. 45-bed hospital.

Osan AB, Republic of Korea, APO AP 96278-5000; 38 mi. S of Seoul. Phone (commercial, from CONUS) 011-82-333-661-1110; DSN 784-4110. PACAF base. Host: 51st Fighter Wing, F-16C/D, C-12J, A-10, and OA-10A operations. Tenants: 7th Air Force (PACAF); 303d Intelligence Sq. (AIA); 631st Air Mobility Support Sq. (AMC); 5th Reconnaissance Sq. (ACC); 31st Special Operations Sq. (AFSOC); Det. 1, 4th Space Surveillance Sq. (AFSPC). 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. Military 5,137; civilians 125; local nationals 535. Payroll N/A. Housing: 152 officer, 134 enlisted, 602 UOQ and USNCO, 4,136 UEQ, 80 VOQ, 117 VAQ. 30-bed hospital.

Patrick AFB, Fla. 32925-3237; 2 mi. S of Cocoa Beach. Phone (407) 494-1110; DSN 854-1110. AFSPC base. Host: 45th Space Wing, supports DoD, NASA, US Navy (Trident), and other government agency and commercial missile and space programs. Launch vehicles: Delta II, Atlas II, Titan II, and Titan IV. 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. Besides host responsibilities for Patrick AFB and Cape Canaveral AS, 45th SW also oversees operations at tracking stations on Antigua and Ascension islands. Patrick has supported more than 3,000 space launches from Cape Canaveral since 1950. Base 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. Military 3,200; civilians 1,300. Payroll $180 million. Housing: 165 officer, 1,384 enlisted. Superclinic.

Peterson AFB, Colo. 80914-5000; at eastern edge of Colorado Springs. Phone (719) 556-7321; DSN 834-7011. AFSPC base. Host: 21st Space Wing. Tenants: North American Aerospace Defense Command; US Space Command; Air Force Space Command; Army Space Command; 302d Airlift Wing (AFRC); Edward J. Peterson Air and Space Museum. Base 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. Military 3,875; civilians 5,478. Payroll $227.3 million. Housing: 107 officer, 384 enlisted, 72 VOQ, 98 VAQ, 40 TLF. Clinic.

Pope AFB, N.C. 28308-2391; 12 mi. NNW of Fayetteville. Phone (910) 394-1110; DSN 424-1110. AMC base. Host: 43d Airlift Wing, C-130 operations. Tenants: 23d Fighter Group (ACC); 18th Air Support Operations Gp. (ACC); 21st and 24th Special Tactics Sqs. (AFSOC); 53d Aerial Port Sq. (AFRC); 373d Training Sq., Det. 2 (AETC); 427th Special Operations Sq. (AFSOC); USAF Combat Control School. Base adjoins Army's Ft. Bragg and provides intratheater combat airlift and close air support for airborne forces and other personnel, equipment, and supplies. Base 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. Military 4,700; civilians 350. Payroll $234 million. Housing: 99 officer, 370 enlisted, 1,208 dorm spaces, 153 VOQ, 111 VAQ, 8 TLF.

RAF Lakenheath, United Kingdom, APO AE 09464-5000; 70 mi. NE of London; 25 mi. NE of Cambridge. Phone (commercial, from CONUS) 011-44-1638-52-3000; DSN 226-1110. Royal Air Force base. Host: 48th Fighter Wing (USAFE), flies the F-15E and the F-15C/D and trains for and conducts air operations in support of NATO. Base activated 1941; 48th FW began operations at RAF Lakenheath January 1960. Named after nearby village. Area 2,226 acres. Runway 9,000 ft. Altitude 32 ft. Military 5,200; civilians 2,300. Payroll $230 million. Housing: 1,249 units, 1,037 govt.-leased housing, 421 billeting spaces. 40-bed regional medical center.

RAF Mildenhall, United Kingdom, APO AE 09459-5000; 20 mi. NE of Cambridge. Phone (commercial, from CONUS) 011-44-1638-54-3000; DSN 238-3000. USAFE base. Host: 100th Air Refueling Wing, KC-135R Stratotanker and European Tanker Task Force operations, conducting air refueling, force reception, force deployment, and support operations for US and NATO. Tenants: 3d Air Force (USAFE); 352d Special Operations Gp. (AFSOC), MC-130H, MC-130N/P, and MH-53J aircraft; 95th Reconnaissance Sq. (ACC), RC-135 aircraft; 488th Intelligence Sq. (AIA); 627th Air Mobility Support Sq. (AMC), provides aerial port for AMC tanker airlift and aircraft; Naval Air Facility, C-12 aircraft. Geographically separated units: 422d Air Base Sq., RAF Croughton; 423d Air Base Sq., RAF Molesworth; 424th Air Base Sq., RAF Fairford; 426th Air Base Sq., Stavanger, Norway. Base activated 1934; US presence began July 1950. Named after nearby town. Area 1,144 acres. Runway length 9,227 ft. Altitude 33 ft. Military 4,980; civilians 1,896. Payroll $150.5 million. Housing: 40 officer, 79 enlisted, US govt.-leased housing shared with RAF Lakenheath. Transient: 41 TLF, 210 VOQ, 152 VAQ. Hospital annex for aircrews and families. Regional medical center at RAF Lakenheath.

Ramstein AB, Germany, APO AE 09094-0385: adjacent to the city of Ramstein, 10 mi. W of Kaiserslautern. Phone (commercial, from CONUS) 011-49-6371-47-113; DSN 480-1110. USAFE

and Allied Air Forces Central Europe (NATO) base. Host: 86th Airlift Wing, 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. The KMC encompasses more than 1,000 sq. mi. and 12 USAF and US Army military installations. Base activated and US presence began 1953. Area 10,261 acres. Runway 8,015 ft. Altitude 782 ft. Military 12,900; civilians 3,600. Payroll $884 million. Housing: 1,797; 9 govt.-leased units; 1,078 transient units. Clinic on base, and Landstuhl Regional Medical Center (200 beds) is 15 minutes from the base.

Randolph AFB, Texas 78150-5000; 17 mi. ENE of San Antonio. Phone (210) 652-1110; DSN 487-1110. AETC base. Host: 12th Flying Training Wing, 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. 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; USAF Occupational Measurement Sq.; Air Force Recruiting Service. Base activated June 1930. Named for Capt. William M. Randolph, killed Feb. 17, 1928, when his AT-4 crashed on takeoff at Gorman, Texas. Area 5,011 acres. Two parallel runways (east, 8,350 ft.; west, 9,350 ft.). Altitude 761 ft. Military 5,237; civilians 4,303. Payroll $381.8 million. Housing 218 officer, 801 enlisted, 171 VAQ, 384 VOQ, 348 UEQ, 173 UOQ, 30 TLF. Clinic.

Robins AFB, Ga. 31098; 15 mi. SSE of Macon at Warner Robins. Phone (912) 926-1110; DSN 468-1110. AFMC base. Host: Warner Robins Air Logistics Center, provides worldwide logistics management for the F-15, C-130 and C-141, helicopters, missiles, and remotely piloted vehicles. In September 1997 won the C-5 airlifter depot maintenance workload previously done at San Antonio ALC, Texas. 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. Tenants: 93d Air Control Wing (ACC); Air Force Reserve Command; 116th Bomb Wing (ANG), B-1B; 78th Air Base Wing (AFMC); 19th Air Refueling Gp. (AMC); 5th Combat Communications Gp. (ACC); 78th Communications–Computer Systems Gp. (AFMC). Base 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. Military 4,936; civilians 10,637. Payroll $629 million. Housing: 245 officer, 1,216 enlisted, 40 TLF, 137 VOQ. Clinic.

Schriever AFB, Colo. 80912-5000; 10 mi. E of Colorado Springs. Phone (719) 567-1110; DSN 560-1110. AFSPC base. Host: 50th Space Wing. Tenants: Joint National Test Facility; Space Warfare Center; 76th Space Operations Sq. (AFSPC); Space Battlelab. Base activated October 1985 as Falcon AFB. Renamed in March 1998 for Gen. B.A. Schriever. Area 3,840 acres. No runway. Altitude 6,267 ft. Military 2,339; civilians 361; contractors 1,102. No housing or transient quarters. Medical aid station and dental clinic.

Scott AFB, Ill. 62225-5000; 6 mi. ENE of Belleville. Phone (618) 256-1110; DSN 576-1110. AMC base. Host: 375th Airlift Wing, C-9 and C-21 operations. Tenants: US Transportation Command; Air Mobility Command; Air Force Communications Agency; Air Weather Service; Combat Climatology Center; 932d Airlift Wing (AFRC Assoc.). Base 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. Joint use airfield. Runway 7,061 ft. Altitude 453 ft. Military 8,147; civilians 4,070. Payroll $588 million. Housing: 304 officer, 1,394 enlisted, 82 mobile home spaces, 300 transient. 55-bed hospital; 82-bed aeromedical staging facility.

Seymour Johnson AFB, N.C. 27531; within city limits of Goldsboro. Phone (919) 736-5400; DSN 488-1110. ACC base. Host: 4th Fighter Wing, F-15E operations. Tenant: 916th Air Refueling Wing (AFRC), KC-135 operations. Base 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. Military 4,354; civilians 1,200. Payroll $180.4 million. Housing: 154 officer, 1,508 enlisted, 10 dorms housing 880 personnel, 10 DVQ, 6 USNCOQ, 43 VOQ, 33 VAQ, 29 TLF. 15-bed hospital.

Shaw AFB, S.C. 29152-5000; 10 mi. WNW of Sumter. Phone (803) 668-8110; DSN 965-1110. ACC base. Host: 20th Fighter Wing, F-16 operations. Tenant: 9th Air Force (ACC). Base 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. Military 5,677; civilians 506. Payroll $179.9 million. Housing: 170 officer, 1,534 enlisted, 897 UEQ, 44 VAQ, 96 VOQ, 40 TLF. 25-bed hospital.

Sheppard AFB, Texas 76311-5000; 4 mi. N of Wichita Falls. Phone (940) 676-7441; DSN 736-7441. AETC base. Host: 82d Training Wing, 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. 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. Base 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. Military 9,541; civilians 1,501. Payroll $246 million. Housing: 191 officer, 1,034 enlisted, 1,772 VAQ, 4,698 UPH, 564 UEPH, 58 TLF, 103 UOQ, 368 VOQ. 65-bed hospital.

Spangdahlem AB, Germany, APO AE 09126-5000; 20 mi. NE of Trier; 9 mi. E of former Bitburg AB. Phone (commercial, from CONUS) 011-49-6565-61-1110; DSN 452-1110. USAFE base. Host: 52d Fighter Wing, includes 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. Base built 1953 by French and given to US. Named after nearby town. Area 1,282 acres. Runway 10,000 ft. Altitude 1,196 ft. Military 5,750; civilians 798. Payroll $146 million. Housing: 157 officer, 2,039 enlisted, 499 govt.-leased units, 155 transient spaces. Clinic; 20-bed hospital at Bitburg Annex.

Tinker AFB, Okla. 73145-3010; 8 mi. SE of Oklahoma City. Phone (405) 732-7321; DSN 884-1110. AFMC base. Host: Oklahoma City Air Logistics Center, 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. 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. Base 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. Military 8,253; civilians 18,217. Payroll $775 million. Housing: 108 officer, 622 enlisted. 22-bed hospital.

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
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

Travis AFB, Calif. 94535-5000; 50 mi. NE of San Francisco at Fairfield. Phone (707) 424-1110; DSN 837-1110. AMC base. Host: 60th Air Mobility Wing, C-5 and KC-10 operations. Tenants: 15th Air Force (AMC); 349th Air Mobility Wing (AFRC Assoc.); David Grant Medical Center; America's Band of the Golden West; Air Museum. Base activated May 17, 1943. Named for Brig. Gen. Robert F. Travis, killed Aug. 5, 1950, in a B-29 accident. Area 6,258 acres. Two runways, each approximately 11,000 ft. Altitude 62 ft. Military 7,920; civilians 2,100. Payroll $249 million. Housing: 370 officer, 2,102 enlisted, 1,464 enlisted dorm spaces, 79 TLF, 201 VOQ, 644 VAQ. 298-bed hospital (acute care), 75 aeromedical staging flight beds, 52 dental treatment rooms.

Tyndall AFB, Fla. 32403-5000; 12 mi. E of Panama City. Phone (904) 283-1113; DSN 523-1113. AETC base. Host: 325th Fighter Wing, F-15 operations. 325th FW provides training for USAF F-15 air-to-air pilots. Tenants: 1st Air Force (ANG); Southeast Air Defense Sector (ANG); 475th Weapons Evaluation Gp. (ACC); Air Force Civil Engineer Support Agency. Base activated Dec. 7, 1941. Named for 1st Lt. Frank B. Tyndall, WWI fighter pilot killed July 15, 1930, in a P-1 crash. Area 29,115 acres. Runways 10,000 ft., 8,075 ft., and 7,065 ft. Altitude 18 ft. Military 4,740; civilians 2,150. Payroll $191.8 million. Housing: 1,080 family units. 20-bed hospital.

US Air Force Academy, Colo. 80840-5025; N of Colorado Springs. Phone (719) 333-1818; DSN 333-3110. Host: USAFA is direct reporting unit. Established April 1, 1954. Moved to permanent location August 1958. Aircraft flown: 94 T-3A aerobatics trainers; T-41D basic trainers; TG-3 and TG-4 gliders; TG-7A and TG-11A motorized gliders; ASK-21 sailplanes; UV-18 jump planes; Cessna 150s. Tenant: 557th Flying Training Sq. (AETC). Area 18,325 acres. Runways 2,300 ft., 3,500 ft., and 4,500 ft. Altitude 7,200 ft. Military 2,318; cadets 4,007; civilians 1,802. Payroll $187.2 million. Housing: 619 officer, 609 enlisted, 76 VOQ, 25 TLF. 55-bed hospital.

Vance AFB, Okla. 73705-5000; 3 mi. SSW of Enid. Phone (580) 213-2121; DSN 448-2121. AETC base. Host: 71st Flying Training Wing, provides Joint, specialized UPT, T-1, T-37, and T-38 aircraft. Base activated November 1941. Named for Lt. Col. Leon R. Vance Jr., Enid native, 1939 West Point graduate, and Medal of Honor recipient, killed July 26, 1944, when air-evac plane returning to the US went down in the Atlantic near Iceland. Area 4,394 acres. Runways 5,000 ft., 9,200 ft., and 9,200 ft. Altitude 1,007 ft. Military 854; DoD civilians 105, contract employees 1,305. Payroll $77 million. Housing: 268 officer (118 family, 150 dorm), 192 enlisted (112 family, 80 dorm), 34 VOQ, 10 TLF. Clinic.

Vandenberg AFB, Calif. 93437-5000; 8 mi. NNW of Lompoc. Phone (805) 734-8232 (ext. 6-1611); DSN 276-1110. AFSPC base. Host: 30th Space Wing, 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; test support for DoD space and ICBM systems; furnishes facilities and essential services to more than 36 aerospace contractors. Launch vehicles: Delta II, Atlas IIAS, Titan II, Titan IIIB, Pegasus, Taurus. Aircraft: UH-1N helicopters. Tenants: 14th Air Force (AFSPC); 381st Space and Missile Training Gp. (AETC). 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. Military 3,765; civilians 1,063; civilian contractors 3,696. Payroll $122.4 million. Housing: 485 officer, 1,474 enlisted, 172 trailer spaces, 287 transient. 8-bed hospital.

Whiteman AFB, Mo. 65305-5000; 2 mi. S of Knob Noster. Phone (816) 687-1110; DSN 975-1110. ACC base. Host: 509th Bomb Wing, B-2 operations. Tenant: 442d Fighter Wing (AFRC). Base 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. Military 4,162; civilians 1,786. Payroll $117.9 million. Housing: 96 officer, 893 enlisted, 77 VAQ, 61 VOQ (3 houses), 31 TLF. Clinic.

Wright–Patterson AFB, Ohio 45433; 10 mi. ENE of Dayton. Phone (937) 257-1110; DSN 787-1110. AFMC base. Host: Aeronautical Systems Center, including Wright–Patterson Medical Center; 88th Air Base Wing; Systems Acquisition Mission unit. Tenants: Air Force Materiel Command; Air Force Research Laboratory (AFMC); Air Force Security Assistance Center (AFMC); Joint Logistics Systems Center (AFMC); 445th Airlift Wing (AFRC); Air Force Institute of Technology (AETC); several DoD activities and government agencies. Site of the US Air Force Marathon, held annually on the Saturday nearest Sept. 18. 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. Area 8,145 acres. Runway 19,600 ft. Altitude 824 ft. Military 7,200; civilians 11,700. Payroll $912 million. Housing: 796 officer, 1,519 enlisted. 301-bed hospital.

Yokota AB, Japan, APO AP 96328-5000; in metropolitan Tokyo, approx. 28 mi. W of downtown. Phone (commercial, from CONUS) 011-81-0425-2510, ext. 113; DSN 315-225-7020. PACAF base. Host: 374th Airlift Wing, C-130, C-9, C-21, and UH-1N operations. 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. Primary aerial port in Japan. Base opened as Tama AAF by the Japanese in 1939. Area 1,750 acres. Runway 11,000 ft. Altitude 457 ft. Military 3,899; civilians 1,553; local nationals 1,936. Payroll $110 million. Housing: 645 officer, 1,787 enlisted, 58 TLF, 184 UOQ, 900 UEQ, 43 SNCOQ, 75 VOQ, 135 VAQ, 123 aircrew rooms, 17 DV rooms. 30-bed 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 AFRC and ANG 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 at Anchorage International Airport) 99502. Phone (907) 249-1444; DSN 317-626-1659. 176th Wing (ANG); 144th Airlift Sq. (ANG) and 210th Air Rescue Sq. (ANG). Base named for Lt. Albert Kulis, killed in training flight in 1954. Area 129 acres. Runway 10,900 ft. Altitude 124 ft. Military 1,218, full-time personnel 416. Payroll $35.2 million.

Atlantic City Airport, N.J. 08232-9500; 10 mi. W of Atlantic City. Phone (609) 645-6000; DSN 455-6000. 177th Fighter Wing (ANG). Area 286 acres. Runway 10,000 ft. Altitude 76 ft. Military 718, full-time support 291. Payroll $18.6 million.

Baltimore, Md. (Martin State Airport) 21220-2899; 8 mi. E of Baltimore. Phone (410) 780-8270; DSN 243-6210. 175th Wing (ANG). Area 175 acres. Runway 7,000 ft. Altitude 24 ft. Military 1,441, full-time personnel 164. Payroll $29.8 million.

Bangor International Airport, Me. 04401-3099; 4 mi. NW of Bangor. Phone (207) 990-7700; DSN 698-7700. 101st Air Refueling Wing (ANG); 776th Radar Sq. (ACC). Area 457 acres. Runway 11,400 ft. Altitude 192 ft. Military 768, full-time personnel 324. Payroll $18.1 million. Small BX.

Barnes Municipal Airport, Mass. 01085; 3 mi. N of Westfield. Phone (413) 568-9151; DSN 636-9210. 104th Fighter Wing (ANG). Area 186 acres. Runway 9,000 ft. Altitude 270 ft. Military 791, full-time personnel 259. Payroll $17.7 million.

Birmingham Airport, Ala. 35217. Phone (205) 841-9200; DSN 778-2210. 117th Air Refueling Wing (ANG). Area 118 acres. Runway 10,000 ft. Altitude 650 ft. Military 782, full-time personnel 278. Payroll $19.3 million.

Boise Air Terminal, Idaho (Gowen Field) 83707; 6 mi. S of Boise. Phone (208) 422-5011; DSN 941-5011. 124th Wing (ANG). Also host to ARNG (Army field training site) and Marine Corps Reserve. Airport 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. Military 895, full-time personnel 413. Payroll $26.2 million. Limited transient facilities available during ARNG camps.

Bradley International Airport, Windsor Locks,

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Conn. 06026-5000; 15 mi. N of Hartford at East Granby. Phone (860) 292-2526; DSN 636-8310. 103d Fighter Wing (ANG); ARNG aviation battalion. Named for Lt. Eugene M. Bradley, killed in P-40 crash August 1941. Area 126 acres. Runway 9,500 ft. Altitude 173 ft. Military 756, full-time personnel 267. Payroll $17.6 million.

Buckley ANGB, Colo. 80011; 8 mi. E of Denver. Phone (303) 340-9555; DSN 877-9011. 140th Wing (ANG); Hq. Colorado ANG; 227th Air Traffic Control Flt. (ANG); 240th Civil Engineering Flt. (ANG). Also host to Navy Reserve, Marine Corps Reserve, ARNG, and Air Force units. Base 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. Military 875, full-time personnel 341. Payroll $22.3 million.

Burlington International Airport, Vt. 05401; 3 mi. E of Burlington. Phone (802) 660-5215; DSN 220-5210. 158th Fighter Wing (ANG). Area 241 acres. Runway 7,800 ft. Altitude 334 ft. Military 753, full-time personnel 307. Payroll $19.7 million.

Capital Municipal Airport, Ill. 63707-5000; 2 mi. NW of Springfield. Phone (217) 753-8850; DSN 892-8210. 183d Fighter Wing (ANG). Area 91 acres. Runway 8,000 ft. Altitude 592 ft. Military 831, full-time personnel 295. Payroll $19.8 million.

Channel Islands ANGB, Point Mugu, Calif. 93041-4001. Phone (805) 986-8000; DSN 893-7000. 146th Airlift Wing (ANG). Area 206 acres. Runway 11,100 ft. Altitude 12 ft. Military 883, full-time personnel 271. Payroll $19.4 million.

Charlotte/Douglas International Airport, Charlotte, N.C. 28208. Phone (704) 391-4100; DSN 583-9210. 145th Airlift Wing (ANG). Area 79 acres. Runway 10,000 ft. Altitude 749 ft. Military 1,088, full-time personnel 284. Payroll $21.8 million.

Cheyenne Municipal Airport, Cheyenne, Wyo. 82001. Phone (307) 772-6201; DSN 943-6201. 153d Airlift Wing (ANG). Area 70 acres. Runway 8,600 ft. Altitude 6,156 ft. Military 821, full-time personnel 272. Payroll $18.9 million.

Dannelly Field, Ala. 36196; 7 mi. SW of Montgomery. Phone (205) 284-7100; DSN 385-7200. 187th Fighter Wing (ANG). Base hosts 232d Combat Communications Sq. Field named for Ens. Clarence Dannelly, Navy pilot killed at Pensacola, Fla., during WWII. Area 51 acres. Runway 9,000 ft. Altitude 221 ft. Military 773, full-time personnel 303. Payroll $19.7 million.

Des Moines International Airport, Iowa 50321; within city of Des Moines. Phone (515) 256-8502; DSN 939-8210. 132d Fighter Wing (ANG). Area 113 acres. Runway 9,000 ft. Altitude 957 ft. Military 774, full-time personnel 291. Payroll $19.4 million.

Dobbins ARB, Ga. (Marietta) 30069-5010; 16 mi. NW of Atlanta. Phone (770) 919-5000; DSN 925-5000. AFRC base. Hq. 22d Air Force (AFRC); 94th Airlift Wing (AFRC); 151st Medical Battalion (ARNG); US Army Reserve Center. Base activated 1943. Named for Capt. Charles Dobbins, WWII pilot killed near Sicily. Area 1,660 acres. Runway 10,000 ft. Altitude 1,068 ft. AFRC: active 25, civilians 678, Reservists 2,011. Payroll $52 million. Army Reserve: active 8, Reservists 1,600. 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. 148th Fighter Wing (ANG). Area 329 acres. Runway 10,200 ft. Altitude 1,429 ft. Military 757, full-time personnel 306. Payroll $18.8 million.

Eastern West Virginia Regional Airport/Shepherd Field, W.Va. 25401; 4 mi. S of Martinsburg. Phone (304) 267-5100; DSN 242-9210. 167th Airlift Wing (ANG). Area 420 acres. Runway 7,000 ft. Altitude 556 ft. Military 954, full-time personnel 265. Payroll $19.5 million.

Ellington Field, Texas 77034-5586; a city of Houston airport 17 mi. SE of downtown Houston. Phone (713) 929-2110; DSN 954-2110. 147th Fighter Wing (ANG). Tenants: NASA Flight Operations, US Coast Guard, ARNG, FAA. Base named for Lt. Eric L. Ellington, pilot killed November 1913. Area 216 acres. Runway 9,000 ft. Altitude 40 ft. Military 763, full-time personnel 300. Payroll $19.6 million.

Forbes Field, Kan. 66619-5000; 2 mi. S of Topeka. Phone (913) 231-4210; DSN 720-4210. 190th Air Refueling Wing (ANG). Area 193 acres. Runway 12,800 ft. Altitude 1,079 ft. Military 684, full-time personnel 285. Payroll $16.5 million.

Fort Smith Municipal Airport, Ark. 72906. Phone (501) 648-5210; DSN 962-8210. 188th Fighter Wing (ANG). Area 113 acres. Runway 8,000 ft. Altitude 468 ft. Military 753, full-time personnel 291. Payroll $18.9 million.

Fort Wayne International Airport, Ind. 46809-5000; 5 mi. SSW of Fort Wayne. Phone (219) 478-3210; DSN 786-1210. 122d Fighter Wing (ANG). Area 138 acres. Runway 12,000 ft. Altitude 800 ft. Military 744, full-time personnel 291. Payroll $18.7 million.

Francis S. Gabreski International Airport, Westhampton Beach, N.Y. 11978-1294. Phone (516) 288-7300; DSN 456-7300. 106th Rescue Wing (ANG). Named for Col. Francis S. Gabreski, third leading USAAF/USAF ace of all time. Area 71 acres. Runway 9,000 ft. Altitude 67 ft. Military 646, full-time personnel 226. Payroll $14.3 million.

Fresno Air Terminal, Calif. 93727-2199; 5 mi. NE of Fresno. Phone (209) 454-5100; DSN 949-5100. 144th Fighter Wing (ANG). Area 126 acres. Runway 9,200 ft. Altitude 332 ft. Military 659, full-time personnel 321. Payroll $20.0 million.

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. AFRC base. 440th Airlift Wing (AFRC). AFRC area 103 acres. 128th Air Refueling Wing (ANG). ANG area 111 acres. Reservists 1,300, full-time Air Reserve technicians and civilians 418. Payroll $23 million. ANG military 897, full-time personnel 282. Payroll $18.8 million.

Greater Peoria Airport, Ill. 61607-1498; 7 mi. SW of Peoria. Phone (309) 791-2282; DSN 724-2282. 182d Airlift Wing (ANG). Area 381 acres. Runway 9,500 ft. Altitude 660 ft. Military 1,104, full-time personnel 272. Payroll $18.9 million.

Great Falls International Airport, Mont. 59401-5000; 5 mi. SW of Great Falls. Phone (406) 791-2282; DSN 279-2282. 120th Fighter Wing (ANG). Area 139 acres. Runway 10,500 ft. Altitude 3,674 ft. Military 898, full-time personnel 294. Payroll $28 million.

Grissom ARB, Ind. 46971-5000; 15 mi. N of Kokomo. Phone (765) 688-5211; DSN 928-1110. AFRC base. 434th Air Refueling Wing (AFRC). 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. Military 1,040, civilians 700. Payroll $42 million. Housing: 485 transient. Small BX.

Gulfport–Biloxi Regional Airport, Miss. 39501; in city of Gulfport. Phone (601) 868-6200; DSN 363-8200. 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. Military 422, full-time personnel 109. Payroll $6.5 million.

Harrisburg International Airport, Pa. 17057; 10 mi. E of Harrisburg. Phone (717) 948-2200; DSN 430-9200. 193d Special Operations Wing (ANG). ANG area 39 acres. Runway 9,500 ft. Altitude 310 ft. Military 1,058, full-time personnel 307. Payroll $12.6 million.

Hector International Airport, Fargo, N.D. 58105-5536. Phone (701) 237-6030; DSN 362-8110. 119th Fighter Wing (ANG). Area 209 acres. Runway 9,500 ft. Altitude 900 ft. Military 1,059, full-time personnel 298. Payroll $55.2 million.

Homestead ARB, Fla. 33039-1299; 5 mi. NE of Homestead. Phone (305) 224-7303; DSN 791-7303, Fax (DSN) 791-7302. AFRC base. 482d Fighter Wing (AFRC); Det. 1, 125th Fighter Wing (Fla. ANG, NORAD). Available billeting. Area approximately 1,000 acres. Runway 11,200 ft. Altitude 11 ft. Military 34, full-time personnel 28. Payroll $1.5 million.

Hulman Regional Airport, Ind. 47803-5000; 5 mi. E of Terre Haute. Phone (812) 877-5210; DSN 724-1210. 181st Fighter Wing (ANG). Area 279 acres. Runway 9,000 ft. Altitude 585 ft. Military 966, full-time personnel 265. Payroll $21.8 million.

Jackson International Airport, Miss. 39208-0810; 7 mi. E of Jackson. Phone (601) 939-3633; DSN 731-9210. 172d Airlift Wing (ANG). ANG area 116 acres. Runway 8,500 ft. Altitude 346 ft. Military 1,125, full-time personnel 276. Payroll $26.4 million.

Jacksonville International Airport, Fla. 32229; 15 mi. NW of Jacksonville. Phone (904) 741-7100; DSN 460-7100. 125th Fighter Wing (ANG). Area 332 acres. Runway 10,000 ft. Altitude 26 ft. Military 1,019, full-time personnel 341. Payroll $27.6 million.

Joe Foss Field, Sioux Falls, S.D. 57104; N side of Sioux Falls. Phone (605) 988-5700; DSN 939-7700. 114th Fighter Wing (ANG). 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. Military 980, full-time personnel 281. Payroll $21.2 million.

Key Field, Meridian, Miss. 39302-1825; at municipal airport near Hwys. 20 and 59. Phone (601) 484-9000; DSN 778-9210. 186th Air Refueling Wing (ANG); 238th Combat Communications Sq. (ANG). Area 117 acres. Runway 8,000 ft. Altitude 297 ft. Military 1,024, full-time personnel 306. Payroll $21.5 million.

Klamath Falls International Airport (Kingsley Field), Ore. 97603-0400; 5 mi. SE of Klamath Falls. Phone (503) 883-6350; DSN 830-6350. 173d Fighter Wing (ANG); 142d OLAD (ANG). Area 1,072 acres. Runway 10,300 ft. Altitude 4,092 ft. Military 407, full-time personnel 314. Payroll $20.2 million.

Lambert–St. Louis International Airport, Bridgeton, Mo. 63145; 3 mi. W of St. Louis. Phone (314) 263-6200; DSN 693-6200. 131st Fighter Wing (ANG). Area 49 acres. Runway 10,600 ft. Altitude 605 ft. Military 1,310, full-time personnel 352. Payroll $43.7 million.

Lincoln Municipal Airport, Neb. 68524-1897; 1 mi. NW of Lincoln. Phone (402) 458-1111; DSN 946-1111. 155th Air Refueling Wing (ANG). Also hosts ARNG unit. Area 179 acres. Runway 12,900 ft. Altitude 1,207 ft. Military 922, full-time personnel 278. Payroll $20.1 million.

Louisville International Airport AGS (Standiford Field), Ky. 40213. Phone (502) 364-9400; DSN 989-4400. 123d Airlift Wing (ANG); 223d Communications Sq. (ANG). Area 69 acres. Runway 10,000 ft. Altitude 497 ft. Military 1,188, full-time personnel 279. Payroll $17.7 million.

Luis Muniz Marin International Airport, Puerto Rico 00914; E of San Juan. Phone (809) 253-5100; DSN 979-1514. 156th Airlift Wing (ANG). ANG installation named for Lt. Col. José A. Muniz, killed in aircraft accident July 4, 1960. Area 84 acres. Runway 10,000 ft. Altitude 9 ft. Military 1,016, full-time personnel 310. Payroll $31.5 million.

Mansfield Lahm Airport, Ohio 44901-5000; 3 mi. N of Mansfield. Phone (419) 521-0100; DSN 696-6210. 179th Airlift Wing (ANG). Named for nearby city and aviation pioneer Brig. Gen. Frank P. Lahm. Area 224 acres. Runway 9,000 ft. Altitude 1,296 ft. Military 931, full-time personnel 241. Payroll $16.4 million. Coast Guard exchange.

March ARB, Calif. 92518-5000; 9 mi. SE of Riverside. Phone (909) 655-1110; DSN 947-1110. AFRC base. Host: 452d Air Mobility Wing (AFRC). Phone (909) 655-4520; DSN 947-4520. Tenants: 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, and US Customs Service Domestic Air Interdiction Coordination Center. Base 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. ANG and AFRC 4,500, civilian 1,799 (includes 515 ARTs). Payroll: $73 million. Housing: 150 VAQ beds, 101 VOQ beds.

McEntire ANGB, S.C. 29044; 12 mi. E of Columbia. Phone (803) 695-6300; DSN 583-8201. Host unit: 169th Fighter Wing (ANG). Tenants: 240th Combat Communications Sq. (ANG) and 1/151st Aviation Battalion (ARNG). 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. Military 1,229, full-time personnel 327. Payroll $25.6 million.

McGhee Tyson Airport, Tenn. 37901; 10 mi. SW of Knoxville. Phone (615) 985-3200; DSN 266-8200. 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. Military 1,073, full-time personnel 322. Payroll $30 million.

Memphis International Airport, Tenn. 38181-0026; within Memphis city limits. Phone (901) 541-7111; DSN 966-8210. 164th Airlift Wing (ANG). ANG occupies 103 acres. Runway 9,300 ft. Altitude 332 ft. Military 1,052, full-time personnel 263. Payroll $20.4 million.

Minneapolis–St. Paul International Airport/ARS, Minn. 55450-2000; in Minneapolis, near confluence of the Mississippi and Minnesota rivers. AFRC phone (612) 713-1110; DSN 783-1110. ANG phone (612) 713-2450; DSN 783-2450. AFRC base. Host unit: 934th Airlift Wing (AFRC), C-130s. Tenants: 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). AFRC area 300 acres (ANG, 130.5 acres). AFRC full-time personnel 150, civilians 199, Reservists 1,150. (ANG 1,250, full-time personnel 274.) AFRC payroll $27 million (ANG, $20 million). Runway 10,000 ft. Altitude 840 ft. Lodging and exchange available.

Nashville Metropolitan Airport, Tenn. 37217-0267; 6 mi. SE of Nashville. Phone (615) 313-3001; DSN 788-6210. 118th Airlift Wing (ANG). Area 85 acres. Runway 10,200 ft. Altitude 597 ft. Military 1,152, full-time personnel 302. Payroll $21.3 million.

New Castle County Airport, Del. 19720; 5 mi. S of Wilmington. Phone (302) 323-3500; DSN 445-7500. 166th Airlift Wing (ANG); ARNG aviation company. Area 57 acres. Runway 7,200 ft. Altitude 80 ft. Military 977, full-time personnel 232. Payroll $17.1 million.

Niagara Falls International Airport/ARS, N.Y. 14304-5001; 6 mi. E of Niagara Falls. Phone (716) 236-2000; DSN 238-2000. AFRC base. Host unit: 914th Airlift Wing, C-130Hs. Tenant: 107th Air Refueling Wing (ANG), KC-135s. Base activated January 1952. Area 979 acres (ANG 104 acres). Runway 9,100 ft. Altitude 590 ft. AFRC Reservists 1,200, civilians 373. (ANG military 800, full-time personnel 273.) Payroll $53 million (ANG, $20.3 million). 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. AFRC base. 126th Air Refueling Wing (ANG); Defense Contract Management Area Operations, Ft. Dearborn (US Army Reserve). Base 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 36 acres). Runway 13,000 ft. Altitude 643 ft. Reservists 1,337, full-time personnel and civilians (all units) 411. ANG's 126th ARW is slated to relocate to Scott AFB, Ill., by the time the AFRC base closes July 31, 1999. ANG 1,326, full-time personnel 315. Total payroll for facility $76 million (ANG payroll $25.1 million).

Otis ANGB, Mass. 02542-5001; 7 mi. NNE of Falmouth. Phone (508) 968-4667; DSN 557-4667. Host unit: 102d Fighter Wing (ANG), F-15A/Bs. Tenants: 567th USAF Band (ANG); 101st and 202d Weather Flts. (ANG). Base 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. ANG military 1,186, full-time personnel 387. Payroll $55.4 million.

Pease ANGB, Portsmouth, N.H. 03803-6505. Phone (603) 430-2453; DSN 852-2453. 157th Air Refueling Wing (ANG). Area 229 acres. Runway 11,300 ft. Altitude 101 ft. Military 922, full-time personnel 302. Payroll $24.6 million.

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. AFRC base. Host unit: 911th Airlift Wing. Tenant: 171st Air Refueling Wing (ANG). Base activated 1943. AFRC area 115 acres. (ANG, 179 acres.) Runway 11,500 ft. Altitude 1,203 ft. ART 160, civilians 222, Reservists 1,030. (ANG military 1,420, full-time personnel 406.) AFRC payroll $32.7 million (ANG, $25.4 million). Housing: 24 VOQ, 230 VEQ. No on-base housing. Limited exchange.

Portland International Airport, Portland, Ore. 97218-2797. Phone (503) 335-4020; DSN 638-4020. 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. Military 1,020, full-time personnel 418. Payroll $26.6 million.

Quonset State Airport, R.I. 02852; 20 mi. S of Providence. Phone (401) 886-1200; DSN 476-3210. 143d Airlift Wing (ANG). Area 79 acres. Runway 8,000 ft. Altitude 19 ft. Military 963, full-time personnel 236. Payroll $21.8 million.

Reno/Tahoe International Airport, Nev. 89502; 5 mi. SE of Reno at 1776 ANG Way. Phone (702) 788-4500; DSN 830-4500. 152d Airlift Wing (ANG). ANG installation named for Maj. Gen. James A. May, Nevada adjutant general, 1947–67. Area 123 acres. Runway 10,000 ft. Altitude 4,411 ft. Military 1,031, full-time personnel 310. Payroll $23 million.

Richmond International Airport (Byrd Field), Va. 23150; 4 mi. SE of downtown Richmond. Phone (804) 236-6429; DSN 864-6129. 192d Fighter Wing (ANG). Field named for Adm. Richard E. Byrd, Arctic and Antarctic explorer. Area 143 acres. Runway 9,000 ft. Altitude 167 ft. Military 1,028, full-time personnel 293. Payroll $22 million.

Rickenbacker International Airport, Ohio 43217-5887; 13 mi. SSW of Columbus. Phone (614) 492-4223; DSN 950-8211. Base transferred from SAC to ANG April 1, 1980. 121st Air Refueling Wing (ANG); Naval Air Reserve and Naval Construction. Base 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. Area 2,016 acres. Runway 12,100 ft. Altitude 744 ft. ANG military 1,345, full-time personnel 389. Payroll $33.6 million.

Rosecrans Memorial Airport, Mo. 64503; 4 mi. W of St. Joseph. Phone (816) 236-3300; DSN 956-3300. 139th Airlift Wing (ANG). Area 302 acres. Runway 8,100 ft. Altitude 826 ft. Military 738, full-time personnel 368. Payroll $18.4 million.

Salt Lake City International Airport, Utah 84116; 3 mi. W of Salt Lake City. Phone (801) 595-2200; DSN 924-9200. 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. Military 1,367, full-time personnel 383. Payroll $27.7 million.

Savannah International Airport, Ga. 31402; 4 mi. NW of Savannah. Phone (912) 966-8201; DSN 860-8201. 165th Airlift Wing (ANG); field training site. Area 20 acres. Runway 9,400 ft. Altitude 50 ft. Military 1,036, full-time personnel 326. Payroll $22.7 million. Housing: 156 officer, 736 enlisted.

Schenectady County Airport, Scotia, N.Y. 12302-9752; 2 mi. N of Schenectady. Phone (518) 786-4502; DSN 974-9210. 109th Airlift Wing (ANG). Area 106 acres. Runway 7,000 ft. Altitude 378 ft. Military 1,222, full-time personnel 363. Payroll $22.5 million.

Selfridge ANGB, Mich. 48045-5046; 3 mi. NE of Mount Clemens. Phone (810) 307-5553; DSN 273-5553. 127th Wing (ANG); 927th Air Refueling Wing (AFRC). Also hosts Air Force, Army, Navy Reserve, Marine Corps Reserve, Army Reserve units, and US Coast Guard Air Station for Detroit. Base 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. ANG military 1,273, full-time personnel 455. Payroll $30.6 million. AFRC military 811, civilians 60, ART 176. Payroll $18.8 million.

Sioux City Municipal Airport, Iowa 51110; 7 mi. S of Sioux City. Phone (712) 279-7500; DSN 939-6500. 185th Fighter Wing (ANG). Area 118 acres. Runway 9,000 ft. Altitude 1,098 ft. Military 952, full-time personnel 297. Payroll $25.9 million.

Sky Harbor International Airport, Phoenix, Ariz. 85034. Phone (602) 231-8200; DSN 853-9000. 161st Air Refueling Wing (ANG). Area 58 acres. Runway 11,000 ft. Altitude 1,230 ft. Military 912, full-time personnel 285. Payroll $24.7 million.

Springfield–Beckley Municipal Airport, Ohio 45501-1780; 5 mi. S of Springfield. Phone (513) 327-2100; DSN 346-2100. 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. Military 1,115, full-time personnel 313. Payroll $29.4 million.

Stewart International Airport, Newburgh, N.Y. 12550-0031; 15 mi. N of US Military Academy (West Point). Phone (914) 563-2001; DSN 636-2001. Hq. N.Y. ANG; 105th Airlift Wing (ANG); USMA subpost airport. Stewart AFB until 1969; acquired by state of New York in 1970. ANG area 276 acres. Runway 9,800 ft. Altitude 491 ft. ANG military 1,555, full-time personnel 594. Payroll $41.5 million. 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. 174th Fighter Wing (ANG). Base 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. Military 1,095, full-time personnel 310. Payroll $26.7 million.

Toledo Express Airport, Swanton, Ohio 43558; 14 mi. W of Toledo. Phone (419) 866-4078; DSN 580-4078. 180th Fighter Wing (ANG). Area 114 acres. Runway 10,600 ft. Altitude 684 ft. Military 1,017, full-time personnel 275. Payroll $25.4 million.

Truax Field (Dane County Regional Airport), Wis. 53704-2591; 2 mi. N of Madison. Phone (608) 242-4200; DSN 724-8210. 115th Fighter Wing (ANG). 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. Military 1,041, full-time personnel 280. Payroll $24.3 million. Housing: 7 transient.

Tucson International Airport, Ariz. 85734; within Tucson city limits. Phone (602) 295-6210; DSN 924-6210. 162d Fighter Wing (ANG). Area 84 acres. Runway 11,000 ft. Altitude 2,650 ft. Military 1,590, full-time personnel 938. Payroll $69 million.

Tulsa International Airport, Okla. 74115. Phone (918) 832-8300; DSN 956-5210. 138th Fighter Wing (ANG); 219th Electronic Installation Sq. Area 82 acres. Runway 10,000 ft. Altitude 676 ft. Military 1,207, full-time personnel 301. Payroll $23.6 million.

Volk Field, Wis. 54618-5001; 90 mi. NW of Madison. Phone (608) 427-1210; DSN 798-3210. ANG field training site featuring air-to-air and air-to-ground gunnery ranges. Field 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. Military 209, full-time personnel 111. Payroll $7.8 million.

W.K. Kellogg Airport, Battle Creek, Mich. 49015-1291. Phone (616) 963-1596; DSN 580-3210. 110th Fighter Wing (ANG). Area 315 acres. Runway 10,000 ft. Altitude 941 ft. Military 893, full-time personnel 252. Payroll $24.6 million.

Westover ARB, Mass. 01022-5000; 10 mi. NE of Springfield. Phone (413) 557-1110; DSN 589-1110. AFRC base. Host: 439th Airlift Wing. Also home of Army, Navy, and Marine Corps Reserve units. Base 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. 502 ART, 557 civilians, part-time Reservists 2,646. Payroll $75 million. Housing: 614 VAQ beds, 78 VOQ.

Willow Grove ARS, Pa. 19090-5203; 14 mi. N of Philadelphia. AFRC phone (215) 443-1062; DSN 991-1062. ANG phone (215) 443-1501; DSN 991-1501. AFRC base. Host: 913th Airlift Wing. Tenant: 111th Fighter Wing (ANG). Activated August 1958. AFRC area 162 acres (ANG, 39 acres). Altitude 356 ft. Share use of NAS/JRB Willow Grove runway (8,000 ft.). AFRC full-time civilians 170, Reservists 1,055, ART 180. (ANG military 857, full-time personnel 269.) AFRC payroll $23.5 million (ANG, $18.6 million).

Will Rogers World Airport, Okla. 73169-5000; 7 mi. SW of Oklahoma City. Phone (405) 686-5210; DSN 940-8210. 137th Airlift Wing (ANG). Area 133 acres. Runway 9,800 ft. Altitude 1,290 ft. Military 1,388, full-time personnel 260. Payroll $21.7 million.

Yeager Airport, W.Va. 25311-5000; 4 mi. NE of Charleston. Phone (304) 341-6126; DSN 366-6210. 130th Airlift Wing (ANG). 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. Military 923, full-time personnel 203. Payroll $15.8 million.

Youngstown–Warren Regional Airport ARS, Ohio 44473-0910; 16 mi. N of Youngstown. Phone (330) 609-1000; DSN 346-1000. AFRC base. Host: 910th Airlift Wing (AFRC). Tenants: Navy Reserve; Marine Corps Reserve; Army Corps of Engineers; FAA. Base activated 1953. Area 403 acres. Three runways, primary length 7,492 ft. Altitude 1,196 ft. Total Reserve 1,566, active duty 27, civilian 450. Payroll $26.5 million. ■

USAF Almanac

Records, Trophies, and Competitions

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. Several of these records are more than 10 years old. The NAA notes that, "since the performance of many government-backed airplanes . . . is wrapped in a blanket of national security, the breaking of some of these records will depend as much on political considerations as technical ones."

Record	Pilot(s)	Aircraft	Route/Location	Date(s)
Speed around the world, nonstop, nonrefueled: 115.65 mph (186.11 kph)	Richard G. Rutan and Jeana L. Yeager	*Voyager* experimental aircraft	Edwards AFB, Calif., to 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	*Voyager* experimental aircraft	Edwards AFB, Calif., to 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	*Voyager* experimental aircraft	Edwards AFB, Calif., to Edwards AFB, Calif.	Dec. 14–23, 1986
Altitude: 123,523.58 feet (37,650.00 meters)	Alexander Fedotov	E-266M, a modified MiG-25 "Foxbat"	Podmoskovnoye, USSR	Aug. 31, 1977
Altitude in an aircraft launched from a carrier airplane: 314,750.00 feet (95,935.99 meters)	Maj. Robert M. White, USAF	North American X-15 No. 3 research aircraft	Edwards AFB, Calif.	July 17, 1962
Altitude in horizontal flight: 85,068.997 feet (25,929.031 meters)	Capt. Robert C. Helt (pilot), USAF, and Maj. Larry A. Elliott (RSO), USAF	Lockheed SR-71A Blackbird reconnaissance aircraft	Beale AFB, Calif.	July 28, 1976
Speed over a straight course: 2,193.16 mph (3,529.56 kph)	Capt. Eldon W. Joersz (pilot), USAF, and Maj. George T. Morgan Jr. (RSO), USAF	Lockheed SR-71A Blackbird reconnaissance aircraft	Beale AFB, Calif.	July 28, 1976
Speed over a closed circuit: 2,092.294 mph (3,367.221 kph)	Maj. Adolphus H. Bledsoe Jr. (pilot), USAF, and Maj. John T. Fuller (RSO), USAF	Lockheed SR-71A Blackbird reconnaissance aircraft	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.** Night flying in commercial transportation.
1924 **US Army Air Service.** First aerial flight around world.
1925 **S. Albert Reed.** Metal propeller.
1926 **Maj. E.L. Hoffman.** Practical parachute.
1927 **Charles L. Lawrance.** Radial air-cooled engine.
1928 **Commerce Dept., Aeronautics Branch.** Airways, air navigation facilities.
1929 **National Advisory Committee for Aeronautics.** Cowling for radial air-cooled engines.
1930 **Harold Pitcairn and staff.** Autogiro.
1931 **Packard Motor Car Co.** Diesel aircraft engine.
1932 **Glenn L. Martin.** Two-engined, high-speed, weight-carrying airplane.
1933 **Hamilton Standard Propeller Co., Frank W. Caldwell.** Controllable-pitch propeller.
1934 **Maj. Albert F. Hegenberger.** Blind landing experiments.
1935 **Donald Douglas and staff.** DC-2.
1936 **Pan American Airways.** Transpacific 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 **John Stack, Lawrence D. Bell, 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 interceptor. **Clarence L. Johnson.** F-104 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 system.
1961 **Maj. Robert M. White, Joseph A. Walker, A. Scott Crossfield, Cmdr. Forrest Petersen.** X-15 test flights.
1962 **Lt. Cmdr. M. Scott Carpenter, Maj. L. Gordon Cooper, Lt. Col. John H. Glenn Jr. (USMC), Maj. Virgil I. Grissom, Cmdr. Walter M. Schirra Jr., Cmdr. Alan B. Shepard Jr., 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 **Neil A. Armstrong, Col. Edwin E. Aldrin Jr., Col. Michael Collins.** Apollo 11 moon landing.
1970 **Boeing with Pratt & Whitney and Pan Am.** Commercial 747 service.
1971 **Col. David R. Scott, Col. James B. Irwin, Lt. Col. Alfred M. Worden, Dr. Robert T. Gilruth.** 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.** Space technology in resource and environmental management; LANDSAT.
1975 **David S. Lewis, General Dynamics, USAF–industry team.** F-16 aviation technologies.
1976 **USAF, Rockwell, B-1 industry team.** The 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 Corp., Thiokol Corp., government–industry shuttle team,** and astronauts **John W. Young, Capt. Robert L. Crippen (USN), Col. Joe H. Engle, Capt. Richard H. Truly (USN).** 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, astronaut Capt. Bruce McCandless II (USN), Charles E. Whitsett Jr., Walter W. Bollendonk.** 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 stealth fighter.
1990 **Bell–Boeing team.** V-22 Osprey tiltrotor aircraft.
1991 **Northrop–USAF industry team.** B-2 bomber.
1992 **Global Positioning System Team: USAF, US Naval Research Lab, Aerospace Corp., Rockwell International, IBM Federal Systems.** Navstar GPS satellite system.
1993 **Hubble Space Telescope recovery team.** Successful orbital recovery and repair.
1994 **USAF, McDonnell Douglas, US Army, C-17 industry team.** C-17 airlifter.
1995 **Boeing 777 team.** Boeing 777.
1996 **Cessna Citation X design team.** Cessna Citation X.

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 Lt. Joseph E. Carberry and 2d Lt. 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. Belvin N. Maynard, Lt. Alexander Pearson Jr., Lt. R.S. Northington, Capt. John O. Donaldson, Capt. Lowell H. Smith, Lt. Col. Harold E. Hartney, Lt. E.M. Manzelman (posthumously), Lt. B.G. Bagby, Lt. D.B. Gish, and Capt. F. Steinle.
1920 Capt. St. Clair Streett, 1st Lt. Clifford C. Nutt, 2d Lt. Eric H. Nelson, 2d Lt. C.H. Crumrine, 2d Lt. Ross C. Kirkpatrick, Sgt. Edmond Henriques, Sgt. Albert T. Vierra, and Sgt. Joe E. English.
1921 Lt. John A. Macready.
1922 Lt. John A. Macready and Lt. C.G. Kelly.
1923 Lt. John A. Macready and Lt. C.G. Kelly.
1924 Capt. Lowell H. Smith, 1st Lt. Leigh Wade, 1st Lt. Leslie P. Arnold, 1st Lt. Eric H. Nelson, 2d Lt. John Harding Jr., and 2d Lt. Henry H. Ogden.
1925 Lt. Cyrus K. Bettis and Lt. Jimmy Doolittle.
1926 Pan American Goodwill Fliers: Maj. H.A. Dargue, Capt. Ira C. Eaker, Capt. A.B. McDaniel, Capt. C.F. Woolsey (posthumously), 1st Lt. J.W. Benton (posthumously), 1st Lt. C.McK. Robinson, 1st Lt. M.S. Fairchild, 1st Lt. B.S. Thompson, 1st Lt. L.D. Weddington, and 1st Lt. E.C. Whitehead.
1927 Lt. Albert F. Hegenberger and Lt. 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 Capt. A.W. Stevens and Capt. O.A. Anderson.
1936 Capt. Richard E. Nugent, 1st Lt. Joseph A. Miller, 1st Lt. Edwin G. Simenson, 2d Lt. William P. Ragsdale Jr., 2d Lt. Burton W. Armstrong, 2d Lt. Herbert Morgan Jr., TSgt. Gilbert W. Olson, SSgt. Howard M. Miller, and Cpl. Air Mechanic 2d Class Frank B. Connor.
1937 Capt. Carl J. Crane and Capt. George V. Holloman.
1938 2d Bombardment Group, Lt. Col. Robert Olds.
1939 Maj. Caleb V. Haynes, Maj. William D. Old, Capt. John A. Samford, 1st Lt. Richard S. Freeman, 1st Lt. Torgils G. Wold, MSgt. Adolph Cattarius, TSgt. Henry L. Hines, TSgt. William J. Heldt, TSgt. David L. Spicer, SSgt. Russell E. Junior, and SSgt. James E. Sands. Earthquake relief mission to Chile.
1940–46 Inactive.
1947 Capt. Charles E. Yeager. First supersonic flight.
1948 Lt. Col. Emil Beaudry. Rescue in Greenland.
1949 Capt. James G. Gallagher and crew of *Lucky Lady II*. First around-the-world, nonstop flight.
1950 27th Fighter Wing. Transatlantic movement of 180 fighters.
1951 Col. Fred J. Ascani. Speed record, 635.686 mph.
1952 Maj. Louis H. Carrington Jr., Maj. Frederick W. Shook, and Capt. Wallace D. Yancey. First nonstop, transpacific flight of RB-45 jet bomber.
1953 40th Air Division, SAC. Nonstop, refueled transatlantic movement of fighters.
1954 308th Bombardment Wing (M) and 38th Air Div., SAC. "Leapfrog" intercontinental maneuver.
1955 Col. Horace A. Hanes. Speed record, 822.135 mph.
1956 Capt. Iven C. Kincheloe Jr., Air Research and Development Command. Altitude record in Bell X-2.
1957 93d Bombardment Wing, SAC. Three B-52s, in first nonstop, around-the-world jet flight.
1958 TAC Air Strike Force, X-Ray Tango. Rapid deployment to Far East.
1959 US Air Force Thunderbirds. Goodwill tour of Far East.
1960 6593d Test Sq., Hickam AFB, Hawaii. Aerial recoveries of space capsules.
1961 Lt. Col. William R. Payne, Maj. William L. Polthemus, and Maj. Raymond R. Wagener, 43d Bomb Wing, SAC. Carswell AFB, Texas–Paris nonstop flight, two speed records.
1962 Maj. Robert G. Sowers, Capt. Robert MacDonald, and Capt. John T. Walton. Three transcontinental speed records in B-58.
1963 Capt. Warren P. Tomsett, Capt. John R. Ordemann, Capt. Donald R. Mack, TSgt. Edsol P. Inlow, SSgt. Jack E. Morgan, and SSgt. Frank C. Barrett. Nighttime, under-fire evacuation of wounded in Vietnam.
1964 464th Troop Carrier Wing, TAC. Refugee airlift in Republic of Congo.
1965 YF-12A Test Force (Col. Robert L. Stephens, Lt. Col. Daniel Andre, Maj. Walter F. Daniel, Maj. Noel T. Warner, and Capt. James P. Cooney). YF-12A flights that established nine speed and altitude records.
1966 Lt. Col. Albert R. Howarth. Courage and airmanship in Southeast Asia.

1967 Maj. John H. Casteel, Capt. Dean L. Hoar, Capt. Richard L. Trail, and MSgt. Nathan C. Campbell. First emergency multiple air refuelings.
1968 Lt. Col. Daryl D. Cole. Conspicuous gallantry as C-130 pilot in Southeast Asia.
1969 49th Tactical Fighter Wing, TAC. Deployment, with 504 air refuelings, of 72 F-4Ds from West Germany to New Mexico.
1970 Capt. Alan D. Milacek and AC-119K crew (Capt. James A. Russell, Capt. Roger E. Clancy, Capt. Ronald C. Jones, Capt. Brent C. O'Brien, TSgt. Albert A. Nash, SSgt. Adolfo Lopez Jr., SSgt. Ronald R. Wilson, Sgt. Kenneth E. Firestone, and A1C Donnell H. Cofer). Destruction of targets with a severely damaged aircraft.
1971 Lt. Col. Thomas B. Estes and Maj. Dewain C. Vick. SR-71 record-shattering flights.
1972 Capt. Richard S. "Steve" Ritchie, Capt. Charles B. DeBellevue, and Capt. Jeffrey S. Feinstein. USAF's Vietnam War aces.
1973 MAC aircrews. Operation Homecoming, POWs' return.
1974 Maj. Roger J. Smith, Maj. David W. Peterson, and Maj. Willard R. MacFarlane. Operation Streak Eagle (F-15) test pilots.
1975 Maj. Robert W. Undorf. Gallantry in *Mayaguez* incident.
1976 Capt. James A. Yule. Gallantry as instructor of B-52D flight.
1977 C-5 aircrew (Capt. David M. Sprinkel and crew). US–USSR energy research project.
1978 C-5 aircrew (Lt. Col. Robert F. Schultz and crew and Capt. Todd H. Hohberger and crew, 436th Military Airlift Wing). C-5 airlift to Zaire.
1979 Maj. James E. McArdle Jr. Rescue of 28 Taiwanese at sea.
1980 Crews S-21 and S-31, 644th Bombardment Sq. Nonstop, around-the-world mission to locate Soviet Navy operating in Arabian Sea.
1981 Capt. John J. Walters. Air rescue mission in Alaskan waters.
1982 B-52 Crew E-21, 19th Bombardment Wing. Successful emergency landing of B-52.
1983 Capt. Robert J. Goodman and his crew, 42d Bombardment Wing, SAC. Emergency refueling and towing of an F-4E.
1984 Lt. Col. James L. Hobson Jr. MC-130 assault in Grenada.
1985 Lt. Col. David E. Faught. Emergency KC-135 landing.
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. Emergency transatlantic refueling of Marine A-4s.
1987 Det. 15, USAF Plant Representative Office, and B-1B SPO. Record B-1B flights (72).
1988 C-5 crew, 436th Military Airlift Wing. Mission to Semipalatinsk, USSR, as part of INF accord.
1989 B-1B crew, 96th Bomb Wing. Emergency landing of B-1B.
1990 AC-130 crew, 16th Special Operations Sq. Panama operations.
1991 MH-53 crew, 20th Special Operations Sq. Rescue of downed Navy F-14 pilot inside Iraq during Persian Gulf War.
1992 C-130 crew, 310th Airlift Sq., ACC, Howard AFB, Panama. Emergency landing of unarmed C-130 after incurring heavy damage from two Peruvian fighters in international airspace.
1993 B-52 crew, 668th Bomb Sq., ACC. Successful emergency landing of B-52 after loss of four engines.
1994 HH-60G crew of Air Force Rescue 206 and 208, 56th Rescue Sq., ACC, NAS Keflavik, Iceland. Rescue of six Icelandic sailors from foundered merchant vessel *Godinn*.
1995 Aircrew BAT-01, Dyess AFB, Texas. Demonstrated the B-1B's endurance and speed by flying 36 hours, 13 minutes, 36 seconds in an around-the-world flight.
1996 Aircrew Duke 01, 2d Bomb Wing, Barksdale AFB, La. Conducted first combat sortie and live CALCM launch for the B-52H during Operation Desert Strike against Iraq, September 1996.

The Hughes Achievement Trophy

The Hughes Achievement Trophy is presented annually to the top Air Force squadron with an air defense mission. Hughes Aircraft Co. 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, England	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

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 who 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.** Mercury spacecraft *Liberty Bell 7* suborbital flight into space.
1962 **Maj. Robert M. White.** X-15 flight to 59.6 miles and unofficial speed of 4,000 mph.
1963 **Maj. L. Gordon Cooper.** Twenty-two Earth orbits in Mercury spacecraft *Faith 7,* manually controlled precision landing.
1964 **Air Force Systems Command.** Space technology.
1965 **Lt. Col. Edward H. White II.** First US walk in space, Gemini 4.
1966 **Alexander H. Flax.** Direction of USAF R&D programs.
1967 **Gen. John P. McConnell.** Promotion of use of aerospace vehicles.
1968 **Col. Frank Borman, Lt. Col. William A. Anders, Capt. James A. Lovell Jr. (USN).** First manned moon orbit flight, Apollo 8.
1969 **Neil A. Armstrong, Col. Edwin E. Aldrin Jr., Col. Michael Collins.** Apollo 11 lunar landing.
1970 **Brig. Gen. Robert A. Duffy.** Advanced Ballistic Missile Reentry System program.
1971 **Lt. Gen. Samuel C. Phillips.** Space and missile R&D.
1972 **Hon. Robert C. Seamans Jr.** Aeronautic and astronautic planning.
1973 **Lt. Col. Henry Hartsfield Jr.** Pilot of record breaking 84+–day mission.
1974 No presentation.
1975 **Maj. Gen. Thomas P. Stafford.** Apollo–Soyuz Test Project.
1976 **Gen. William J. Evans.** Aerospace development programs.
1977 **Fred W. Haise Jr., Lt. Col. Charles G. Fullerton.** First test flight of space shuttle *Enterprise.*
1978 No presentation.
1979 **Maj. Gen. John E. Kulpa Jr.** Direction of special projects and satellite programs.
1980 **Gen. Lew Allen Jr.** Operational military space support.
1981 **Col. Joe Engle and Capt. Richard H. Truly, USN.** Second flight of orbiter *Columbia.*
1982 **Lt. Gen. Richard C. Henry.** Leadership and development of new space communications programs.
1983 **Gen. James V. Hartinger.** Strengthening national security through space operations.
1984 **Lt. Gen. Forrest S. McCartney.** Acquisition of and advances in space systems.
1985 **Maj. Gen. Donald W. Henderson.** Support of national space and missile programs.
1986 **Gen. Donald J. Kutyna.** Air Staff director of space systems and C^3; President's Commission on *Challenger* accident.
1987 **Col. Victor W. Whitehead.** Implementing National Space Launch Strategy to restore heavy launch capability after *Challenger* accident.
1988 **Dr. Robert R. Barthelemy.** X-30 hypersonic, National Aerospace Plane project.
1989 **Launch Systems Directorate, Space Systems Division.** Restoring national expendable launch capability and launching 15 satellites in one year.
1990 **Lt. Gen. Donald L. Cromer, Gen. John L. Piotrowski, USAF (Ret.).** Strengthening USAF space systems and forces.
1991 **Lt. Gen. Thomas S. Moorman Jr.** Leadership in space support to Desert Storm and space operations.
1992 **Maj. Gen. Nathan J. Lindsay, USAF (Ret.).** Successful launch and deployment of highly complex payloads; instrumental in support to combat commanders.
1993 **Gen. Merrill A. McPeak.** As Air Force Chief of Staff demonstrated foresight in space issues.
1994 **Gen. Charles A. Horner.** Leadership in space issues and operations.
1995 **Gen. Joseph W. Ashy.** Expanding space forces in Joint military operations and normalizing space operations.
1996 **Lt. Gen. Patrick P. Caruana.** Leadership in prioritizing and normalizing spacelift and improving cooperation with civilian space programs.

Proud Shield

Proud Shield is the Air Force's biennial long-range bombing and navigation competition. Begun by Gen. George C. Kenney, the first commander in chief of SAC, the competition is run by Air Combat Command. The Gen. Muir S. Fairchild Trophy, named for the first commander of Air University, is awarded to the wing with the highest competition effectiveness.

Year	Unit(s)	Aircraft
1948	43d BG, Davis–Monthan AFB, Ariz.[a]	B-29
1949	93d BG, Castle AFB, Calif.[a]	B-29
1950	No competition	
1951	97th BMW, Biggs AFB, Texas	B-50D
1952	93d BMW, Castle AFB, Calif.	B-50D
	97th BMW, Biggs AFB, Texas (tie)	B-50D
1953	92d BMW, Fairchild AFB, Wash.	B-36D
1954	11th BMW, Carswell AFB, Texas	B-36H
1955	320th BMW, March AFB, Calif.	YRB-47B
1956	11th BMW, Carswell AFB, Texas	B-36H
1957	321st BMW, Pinecastle AFB, Fla.	B-47B
1958	306th BMW, MacDill AFB, Fla.	B-47E
1959	307th BMW, Lincoln AFB, Neb.	B-47E
1960	11th BMW, Altus AFB, Okla.	B-52E

1961	4137th SW, Robins AFB, Ga.	B-52G
1962	No competition	
1963	2d BMW, Barksdale AFB, La.[b]	B-52F
1964	70th BMW, Clinton–Sherman AFB, Okla.[b]	B-52E
1965	454th BMW, Columbus AFB, Miss.	B-52F
1966	19th BMW, Homestead AFB, Fla.	B-52H
1967–68	No competition	
1969	319th BMW, Grand Forks AFB, N.D.	B-52H
1970	93d BMW, Castle AFB, Calif.	B-52F
1971	449th BMW, Kincheloe AFB, Mich.	B-52H
1972–73	No competition	
1974	380th BMW, Plattsburgh AFB, N.Y.	FB-111A
1975	No competition	
1976	380th BMW, Plattsburgh AFB, N.Y.	FB-111A
1977	380th BMW, Plattsburgh AFB, N.Y.	FB-111A
1978	380th BMW, Plattsburgh AFB, N.Y.	FB-111A
1979	509th BMW, Pease AFB, N.H.	FB-111A
1980	320th BMW, Mather AFB, Calif.	B-52G
1981	509th BMW, Pease AFB, N.H.	FB-111A
1982	509th BMW, Pease AFB, N.H.	FB-111A
1983	509th BMW, Pease AFB, N.H.	FB-111A
1984	380th BMW, Plattsburgh AFB, N.Y.	FB-111A
1985	97th BMW, Blytheville AFB, Ark.	B-52G
1986	92d BMW, Fairchild AFB, Wash.	B-52H
1987	379th BMW, Wurtsmith AFB, Mich.	B-52G
1988	5th BMW, Minot AFB, N.D.	B-52H
1989	28th BMW, Ellsworth AFB, S.D.	B-1B
1990–91	No competition	
1992	92d BW, Fairchild AFB, Wash.	B-52H
1994	27th FW, Cannon AFB, N.M.	F-111F
1996	No competition	

[a]Overall winner; Fairchild Trophy not yet developed.

[b]Trophy given for overall annual performance, not for scores in SAC bombing and navigation competition.

Gunsmoke

Gunsmoke, which officially started in 1981, is the USAF worldwide gunnery meet, run by Air Combat Command and held biennially at Nellis AFB, Nev. It tests the conventional air-to-surface capability of the combat air forces. In 1993, bomber crews participated for the first time. In 1995, Gunsmoke was redesigned—individual trophies were eliminated.

Year	Team	Aircraft	Base
1981	140th TFW (ANG)		Buckley ANGB, Colo.
Top Fighter	Lt. Col. Wayne Schultz	A-7	120th TFS (ANG), Buckley ANGB, Colo.
1983	50th TFW (USAFE)		Hahn AB, West Germany
Top Fighter	Lt. Col. Roy Niesz	F-16	388th TFW, Hill AFB, Utah
1985	419th TFW (AFRES)		Hill AFB, Utah
Top Fighter	Capt. Mark Fredenburgh	F-16	50th TFW, Hahn AB, West Germany
1987	388th TFW (TAC)		Hill AFB, Utah
Top Fighter	Maj. Danny Hamilton	F-16	419th TFW, Hill AFB, Utah
1989	169th TFG (ANG)		McEntire ANGB, S.C.
Top Fighter	Capt. Patrick Shay	F-16	944th TFG (AFRES), Luke AFB, Ariz.
1991	175th TFG (ANG)		Martin State Airport, Md.
Top Fighter	Lt. Col. Roger G. Disrud	A-10	442d TFW (AFRES), Richards–Gebaur AFB, Mo.
1993	388th FW (ACC)		Hill AFB, Utah
Top Fighter	Maj. Gregory Brewer	F-16	140th FW (ANG), Buckley ANGB, Colo.
Top Bomber Crew	Capt. Dwayne Stich (commander), Capts. Barry Sebring, Steve Amato, David Conley, and Vernon Moore	B-52	93d BW, Castle AFB, Calif.

Year	Team	Units, Bases
1995	Pacific Air Forces Team	18th FS and 355th FS, Eielson AFB, Alaska; 19th FS, Elmendorf AFB, Alaska; 9th FS, Holloman AFB, N.M.; 23d BS/72d BS, Minot AFB, N.D.; 13th FS/14th FS, Misawa AB, Japan.

The William Tell Weapons Meet

The Air Force's William Tell air-to-air weapons meet provides a complete test for a unit in the air-to-air business. Begun in 1954, William Tell is run by Air Combat Command and held triennially at Tyndall AFB, Fla. (It was biennial until 1997.)

William Tell Winners

Year	Unit, Base	Aircraft
1954	3550th FTW (Interceptor), Moody AFB, Ga.	F-94C
1955	26th Air Division, Duluth MAP, Minn.	F-94C
	(Members of the 48th, 96th, and 332d FISs)	
1956	94th FIS, Selfridge AFB, Mich.	F-86D
1958	465th FIS, Griffiss AFB, N.Y.	F-89J
	326th FIS, Richards–Gebaur AFB, Mo.	F-102A
	125th FIG (ANG), Jacksonville IAP, Fla.	F-86D
1959	319th FIS, Bunker Hill AFB, Ind.	F-89J
	460th FIS, Portland IAP, Ore.	F-102A
	538th FIS, Larson AFB, Wash.	F-104A
1961	445th FIS, Wurtsmith AFB, Mich.	F-101B
	59th FIS, Goose Bay, Labrador, Canada	F-102A
	456th FIS, Castle AFB, Calif.	F-106A
1963	445th FIS, Wurtsmith AFB, Mich.	F-101B
	146th FIS (ANG), Greater Pittsburgh IAP, Pa.	F-102A
	318th FIS, McChord AFB, Wash.	F-106A
1965	62d FIS, K.I. Sawyer AFB, Mich.	F-101B
	32d FIS, Camp New Amsterdam, Netherlands	F-102A
	71st FIS, Selfridge AFB, Mich.	F-106A
	331st FIS, Webb AFB, Texas	F-104A
1966–69	No competition	
1970	119th TFG (ANG), Hector Field, N.D.	F-101B
	148th TFG (ANG), Duluth IAP, Minneapolis, Minn.	F-102A
	71st FIS, Malmstrom AFB, Mont.	F-106A
1972	119th TFG (ANG), Hector Field, N.D.	F-101B
	115th TFG (ANG), Truax Field, Wis.	F-102A
	460th FIS, Grand Forks AFB, N.D.	F-106A
1974	101st TFG (ANG), Bangor IAP, Maine	F-101B
	124th FIG (ANG), Boise Air Terminal, Idaho	F-102A
	120th FIG (ANG), Great Falls IAP, Mont.	F-106A
1976	142d FIG (ANG), Portland IAP, Ore.	F-101B
	4th TFW, Seymour Johnson AFB, N.C.	F-4E
	120th FIG (ANG), Great Falls IAP, Mont.	F-106A
1978	147th FIG (ANG), Ellington AFB, Texas	F-101B
	86th TFW, Ramstein AB, West Germany	F-4E
	49th FIS, Griffiss AFB, N.Y.	F-106A
1980	147th FIG (ANG), Ellington AFB, Texas	F-101B
	347th TFW, Moody AFB, Ga.	F-4E
	144th FIW (ANG), Fresno ANGB, Calif.[a]	F-106A
1982	409 Squadron, CFB Comox, British Columbia, Canada	CF-101B
	18th TFW, Kadena AB, Japan[a]	F-15C
	49th FIS, Griffiss AFB, N.Y.	F-106A
	57th FIS, NAS Keflavik, Iceland	F-4E
1984	33d TFW, Eglin AFB, Fla.[a]	F-15C
	142d FIG (ANG), Portland IAP, Ore.	F-4C
	177th FIG (ANG), Atlantic City IAP, N.J.	F-106A
1986	33d TFW, Eglin AFB, Fla.[a]	F-15C
	119th FIG (ANG), Hector Field, N.D.	F-4D
1988	49th TFW, Holloman AFB, N.M.[a]	F-15A
	33d TFW, Eglin AFB, Fla.	F-15C
	18th TFW, Kadena AB, Japan	F-15C
	57th FIS, NAS Keflavik, Iceland	F-15C
1990	No competition	
1992	18th Wing, Kadena AB, Japan	F-15C
1994	119th FG (ANG), Fargo, N.D.	F-16A
1996	Canada	CF-18

[a]Overall competition winner. The naming of an overall winner began with William Tell 1980. Beginning in 1996, teams stopped competing as units and instead represented major commands, ANG, AFRC, or foreign air forces.

William Tell Top Guns

Year	Top Gun	Aircraft
1954	Crew of Capt. Clarence W. Lewis and 1st Lt. James R. Boone, 3550th FTW (Interceptor), Moody AFB, Ga.	F-94C
1955	Crew of Col. B.H. King and Lt. F.S. Goad, 26th Air Division, Duluth MAP, Minn.	F-94C
1956	Crew of Col. Donald W. Graham and 1st Lt. Billy R. Thomson, 66th FIS, Elmendorf AFB, Alaska	F-89D
	1st Lt. Robert B. Long, 94th FIS, Selfridge AFB, Mich.	F-86D
1958	Crew piloted by Col. Frank J. Keller, 465th FIS, Griffiss AFB, N.Y.	F-89J
	Col. Roy B. Caviness, 482d FIS, Seymour Johnson AFB, N.C.	F-102A
	Col. Robert E. Dawson, 125th FIG, Jacksonville IAP, Fla.	F-86D
1959	Crew of Capt. Billy S. Linebaugh and 1st Lt. Donald M. Burke, 319th FIS, Bunker Hill AFB, Ind.	F-89J
	Capt. Frederick H. England, 460th FIS, Portland IAP, Ore.	F-102A
	Maj. John T. Guice, 152d FIS (ANG), Tucson IAP, Ariz.	F-100A
1961	Lt. Col. Frank R. Jones, 59th FIS, Goose Bay, Labrador, Canada	F-102A
1963	Lt. Col. J.W. Rogers, 317th FIS, Elmendorf AFB, Alaska	F-102A
1965	Crew of Capt. D.E. Libby and Capt. L.R. Livingston, 62d FIS, K.I. Sawyer AFB, Mich.	F-101B
	Capt. J. McMichael, 326th FIS, Richards–Gebaur AFB, Mo.	F-102A
	Lt. Col. Glendon P. Dunaway, 71st FIS, Selfridge AFB, Mich.	F-106A
	Capt. J.D. Dunn, 319th FIS, Homestead AFB, Fla.	F-104A
1966–69	No competition	
1970	Crew of Capt. James Reimers and Capt. Arthur Jacobson, 119th TFG (ANG), Hector Field, N.D.	F-101B
1972	Crew of Capt. Lowell Butters and Capt. Douglas Danko, 425th All-Weather Fighter Squadron, Bagotville, Quebec, Canada	CF-101B
1974	Maj. Ralph D. Townsend, 124th FIG (ANG), Boise Air Terminal, Idaho	F-102A
1976	Crew of Maj. Bradford A. Newell and Lt. Col. Donald R. Tonole, 142d FIG (ANG), Portland IAP, Ore.	F-101B
1978	Crew of Earl G. Robertson and Capt. Brian J. Salmon, Canadian Forces Composite Group	CF-101B
1980	Crew of Lt. Col. Maurice Udell and Maj. David S. Miller, 147th FIG (ANG), Ellington AFB, Texas	F-101B
1982	Crew of Maj. Bob Worbets and Capt. Bill Ricketts, 409 Squadron, CFB Comox, British Columbia, Canada	CF-101B
	Lt. Col. Jere Wallace, 18th TFW, Kadena AB, Japan	F-15C
	Lt. Col. Robert Boehringer, 144th FIW, Fresno ANGB, Calif.	F-106A
	Crew of Capt. Tom Watson and Capt. Dave Pfeifer, 57th FIS, NAS Keflavik, Iceland	F-4E
1984	Capt. Scott H. Turner, 32d TFS, Camp New Amsterdam, Netherlands	F-15C
	Maj. Ron M. Moore and Maj. Bill C. Dejager, 142d FIG (ANG), Portland IAP, Ore.	F-4C
	Maj. Lynn Robinson, 177th FIG (ANG), Atlantic City IAP, N.J.	F-106A
1986	Capt. John Reed (USAF Exchange Pilot), 425 Squadron, CFB Bagotville, Quebec, Canada	CF-18A
1988	Capt. Teddy Varwig, 49th TFW, Holloman AFB, N.M.	F-15A
1990	No competition	
1992	Capt. Jeffery Prichard, 18th Wing, Kadena AB, Japan	F-15C
1994	Capt. James Browne, 52d FW, Spangdahlem AB, Germany	F-15C
1996	Capt. Steve Nierlich, 4th Wing, CFB Cold Lake, Canada	CF-18

Rodeo

Rodeo is US Transportation Command's biennial airlift and air refueling competition. Formerly an Air Mobility Command competition, Rodeo is still dominated by AMC teams. The weeklong Rodeo '96 at McChord AFB, Wash., showcased the top USAF active duty, Air National Guard, and Air Force Reserve Command aircraft and teams and those of allied nations. The trophy for the best overall wing is named after Gen. William G. Moore Jr., the eighth commander in chief of Military Airlift Command, an AMC predecessor.

Year	Unit(s)
1962	1502d Air Transport Wing, Hickam AFB, Hawaii
1963	62d Air Transport Wing, McChord AFB, Wash.
1964	1608th Air Transport Wing, Charleston AFB, S.C.
1965–68	No competition
1969	21st Air Force (multiwing)
1970	21st Air Force (multiwing)
1971	22d Air Force (multiwing)
1972	21st Air Force (multiwing)
1973–78	No competition
1979	443d MAW, Altus AFB, Okla.
1980	317th TAW, Pope AFB, N.C.
1981	314th TAW, Little Rock AFB, Ark.
1982	Italian airlift wing
1983	314th TAW, Little Rock AFB, Ark.
1984	Italian airlift wing
1985	94th TAW (AFRC), Dobbins AFB, Ga.
1986	145th TAG (ANG), Charlotte, N.C.
1987	West German airlift wing
1988	No competition
1989	Australian airlift wing
1990	63d MAW, Norton AFB, Calif.
1991	No competition
1992	446th AW (AFRC Assoc.), McChord AFB, Wash.
1993	440th AW (AFRC), General Mitchell IAP, Wisc.
1994	19th ARW, Robins AFB, Ga.
1996	19th ARW, Robins AFB, Ga.

Guardian Challenge

Guardian Challenge is the Air Force Space Command competition to determine the best space operations and missile teams in the Air Force. Held at Vandenberg AFB, Calif., it replaces Olympic Arena, the winner of which received a trophy named for former USAF Vice Chief of Staff Gen. William H. Blanchard. Guardian Challenge awards the Blanchard Trophy to the best missile operations crew.

Missiles

Year	Unit(s)	System
1967	351st SMW, Whiteman AFB, Mo.	Minuteman
1968	No competition	
1969	321st SMW, Grand Forks AFB, N.D.	Minuteman
1970	44th SMW, Ellsworth AFB, S.D.	Minuteman
1971	351st SMW, Whiteman AFB, Mo.	Minuteman
1972	381st SMW, McConnell AFB, Kan.	Titan
1973	90th SMW, F.E. Warren AFB, Wyo.	Minuteman
1974	321st SMW, Grand Forks, N.D.	Minuteman
1975	381st SMW, McConnell AFB, Kan.	Titan
1976	341st SMW, Malmstrom AFB, Mont.	Minuteman
1977	351st SMW, Whiteman AFB, Mo.	Minuteman
1978	91st SMW, Minot AFB, N.D.	Minuteman
1979	390th SMW, Davis–Monthan AFB, Ariz.	Titan
1980	381st SMW, McConnell AFB, Kan.	Titan
1981	351st SMW, Whiteman AFB, Mo.	Minuteman
1982	44th SMW, Ellsworth AFB, S.D.	Minuteman
1983	381st SMW, McConnell AFB, Kan.	Titan
1984	90th SMW, F.E. Warren AFB, Wyo.	Minuteman
1985	308th SMW, Little Rock AFB, Ark.	Titan
1986	341st SMW, Malmstrom AFB, Mont.	Minuteman
1987	321st SMW, Grand Forks AFB, N.D.	Minuteman
1988	91st SMW, Minot AFB, N.D.	Minuteman
1989	351st SMW, Whiteman AFB, Mo.	Minuteman
1990	341st SMW, Malmstrom AFB, Mont.	Minuteman
1991	341st SMW, Malmstrom AFB, Mont.	Minuteman
1992	44th MW, Ellsworth AFB, S.D.	Minuteman
1993	351st MW, Whiteman AFB, Mo.	Minuteman
1994	742d MS, Minot AFB, N.D.	Minuteman
1995	10th MS, Malmstrom AFB, Mont.	Minuteman
1996	319th MS, F.E. Warren AFB, Wyo.	Minuteman
1997	32d MS, F.E. Warren AFB, Wyo.	Minuteman

AFSPC first awarded the Chennault Trophy for best space operations crew (SOC) in 1994 and replaced it in 1995 with the O'Malley, Arnold, Schriever, and Aldridge trophies. The Aldridge Trophy, named for former USAF Secretary Edward C. "Pete" Aldridge, goes to the best satellite operations squadron (SOPS); the Schriever Trophy goes to the best space launch squadron (SLS); the O'Malley Trophy goes to the best space warning squadron (SWS); and the Arnold Trophy goes to the best space surveillance squadron (SPSS).

Space

Year	Category	Unit	System
1994	SOC	3d SLS, Patrick AFB, Fla.	Atlas II
1995	SOPS	6th SOPS, Offutt AFB, Neb.	DMSP
	SPSS	17th SPSS, RAF Edzell, UK	LASS
	SWS	8th SWS, Eldorado AS, Texas	Pave Paws
	SLS	1st SLS, Cape Canaveral AS, Fla.	Delta II
1996	SOPS	22d SOPS, Falcon AFB, Colo.	AFSCN
	SPSS	20th SPSS, Eglin AFB, Fla.	AN/FPS-85
	SWS	7th SWS, Beale AFB, Calif.	Pave Paws
	SLS	5th SLS, Cape Canaveral AS, Fla.	Titan IV
1997	SOPS	1st SOPS, Falcon AFB, Colo.	DPS/GPS
	SPSS	20th SPSS, Eglin AFB, Fla.	AN/FPS-85
	SWS	821st SG, Buckley ANGB, Colo.	DSP
	SLS	5th SLS, Cape Canaveral AS, Fla.	Titan IV

Verbatim

Future Bomber Investment

"The panel found that, if the current bomber fleet [comprising B-1Bs, B-2s, and B-52s] is supported with smart, continuing investments, this force will provide high leverage in a wice range of contingencies through the remainder of its useful life. Even so, an investment plan is needed to upgrade and sustain the future force structure. Current plans do not adequately address the long-term future of the bomber force. The lead time for the next generation aircraft is likely to be long, regardless of the approach selected. The panel recommends that the Department [of Defense] develop a plan to replace the existing force over time. Alternatives for consideration are a variant of the B-2, incorporating upgrades, ... or development of more advanced technologies that might lead to a better solution for the next generation aircraft. Today, there is not yet an adequate basis for such a choice. A continuing program to demonstrate advanced technologies in support of long-range air power should be given high priority."

From the March 25, 1998, final report of the Panel to Review Long Range Airpower, created by Congress last year.

The "Backbone" Fighter

"We believe the F-22 program should remain on its current schedule. It's an important program. It's important that we get the F-22 up and flying and into the force as soon as possible. ... Our goal is to make the program work. ... At this stage we want to stay on the schedule, which is to get ... the first two production aircraft, I believe, in FY99. ... As I understand it, the GAO asked for a 12-month slip in the program. That is not something we're contemplating right now. We want to stick with the program. ... It will really be the backbone of the Air Force in the 21st century. And they would like to bring that fighter on as soon as they can to start the training and the workup that go with introducing a new weapon into the force."

Pentagon spokesman Kenneth H. Bacon in a March 26, 1998, news briefing the day after a GAO report suggested delaying F-22 production for a year to conduct more testing.

Salty Language

"Withdrawal of US troops [from the war in South Vietnam] will become like salted peanuts to the American public: The more US troops come home, the more will be demanded. ... The more troops are withdrawn, the more [North Vietnam's Communist officials in] Hanoi will be encouraged. They are the last people we will be able to fool about the ability of the South Vietnamese to take over from us. ... You will be caught between the hawks and the doves. ... It will become harder and harder to maintain the morale of those [US troops] who remain—not to speak of their mothers."

Then–National Security Adviser Henry Kissinger in a previously secret 1969 memo to President Nixon, warning about the likely outcome of "Vietnamization." The memo was released March 18, 1998, by the National Archives in Washington.

Warning Flags

"Our [Fiscal 1997] enlistee quality was the highest in DoD. Despite this success, the percent of our enlistees scoring in the top half on the Armed Forces Qualification Test dropped down to 79 percent from 88 percent in [Fiscal 1989]. We also experienced a drop in the average mechanical aptitude score of our enlistees. ...

"While we continue to meet our recruiting goals, the challenges our recruiters face also continue. Ample opportunity to attend college and a robust economy have effectively shrunk the pool of qualified and interested potential recruits. ...

"We are currently projecting a pilot shortage of 836 in [Fiscal 1998], and could have a shortage as high as 1,410 in [Fiscal 2000]. We are aggressively addressing the situation. ... However, if pilot retention worsens, it may directly impact the readiness of our combat units."

Air Force Lt. Gen. Michael D. McGinty, deputy chief of staff, personnel, in a March 18, 1998, statement to a Senate Armed Services Committee subcommittee.

Very-Long-Weekend Warriors

"The deployment rates of our Total Force have increased dramatically since the end of the Cold War. And, we've asked the reserve forces to do a larger share. During 1997 our reserve component[s] deployed during every contingency tasking. On average, Air National Guard and Air Reserve aircrews serve 110 days a year in uniform, and their support teams [serve] 80 days."

F. Whitten Peters, acting Secretary of the Air Force, Feb. 27, 1998, at the Air Force Association Air Warfare Symposium in Orlando, Fla.

Accidents at "Historic" Lows

"Overall, in fiscal years 1996 and 1997, the military achieved historically low levels of serious mishaps. The number of Class A flight mishaps across DoD in Fiscal Year 1997 was 68, an all-time low, and the rate of mishaps per 100,000 flying hours remained virtually the same for the last three fiscal years at about 1.5. While the number of fatalities rose from 85 in 1995 to 116 in 1996 due to several high-casualty mishaps, they declined in 1997 to 76, DoD's second lowest level ever. The fatality rate per 100,000 flight hours ... has been within the low end of its historic range over the last 10 years. New lows on the number of destroyed aircraft (54) and the rate of destroyed aircraft per 100,000 flight hours (1.2) were also reached in Fiscal Year 1997. Finally, the value of the aircraft lost reached its lowest level in the 1990s, $1.1 billion."

From the report "Military Aircraft Safety: Serious Accidents Remain at Historically Low Levels," prepared by the General Accounting Office and released on March 23, 1998. ■

USAF Almanac

Gallery of USAF Weapons

By Susan H.H. Young

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); October 1984 (B-1B).

Delivered: June 1985–May 1988.

IOC: Oct. 1, 1986, Dyess AFB, Texas (B-1B).

Production: 104.

Inventory: 94 (B-1B).

Ceiling: over 30,000 ft.

Unit Location: Active: Dyess AFB, Texas, Ellsworth AFB, S.D., and Mountain Home AFB, Idaho. ANG: McConnell AFB, Kan., and 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.

Weights: empty equipped 192,000 lb, max operating weight 477,000 lb.

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 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.

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 one percent of 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 Weapon (to be fitted with the Wind-Corrected Munitions Dispenser kit); or to carry additional fuel, as required. The Joint Direct Attack Munition (JDAM) GPS–guided weapon will be added to the B-1Bs list of weapons this fiscal year.

***B-1B** Lancer* (Ted Carlson)

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: 20.

Ceiling: 50,000 ft.

Unit Location: Whiteman AFB, Mo.

Contractor: Northrop Grumman, with Boeing, LTV, and General Electric as key members of the development team.

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.

Performance: minimum approach speed 161 mph, ceiling 50,000 ft, 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 (B-61, B-61 Mod II, B-83). 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, JASSM, JSOW, and up to 32 CBU-87/89/97 cluster bombs, are presently being added to B-2 Block 30 aircraft through Fiscal 2003.

***B-2** Spirit* (Ted Carlson)

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 nonafterburning 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 aile-

ron, 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 B-61/11 nuclear gravity bombs, as well as two GPS–Aided Munitions, the GBU-38B and GBU-37, 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 to 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 overseas mission took place June 10, 1995, in a 12-hour, 4,900-mile flight between Whiteman and Paris Le Bourget with a simulated bomb drop at a range in the Netherlands en route and an immediate return flight following a crew change.

B-52 Stratofortress

Brief: A long-range, heavy 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.

***B-52H** Stratofortress* (Guy Aceto)

Ceiling: 55,000 ft.
Unit Location: Barksdale AFB, La., and 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.
Performance (approx): max level speed 650 mph, range more than 10,000 miles.
Armament: eight nuclear free-fall bombs internally and 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-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.

***A-10A** Thunderbolt II* (Guy Aceto)

***AC-130U** Spectre* (Randy Jolly)

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: 371.
Ceiling: 45,000 ft.
Unit Location: Pope AFB, N.C., Moody AFB, Ga., Davis–Monthan AFB, Ariz., Nellis AFB, Nev., Eielson AFB, Alaska, Osan AB, South Korea, Spangdahlem AB, Germany, Barksdale AFB, La., Whiteman AFB, Mo.; Bradley IAP, Conn., Barnes MAP, Mass., W.K. Kellogg Airport, Mich., Willow Grove ARS, Pa., Boise Air Terminal, Idaho, Baltimore, Md., NAS JRB New Orleans, La.
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.
Performance: speed 420 mph, range with 9,500 lb of weapons and 1.7 hr loiter, 20 min reserve, 288 miles.
Armament: one 30 mm GAU-8/A gun; eight under-wing hardpoints and three under fuselage for up to 16,000 lb of ordnance, incl various types of free-fall or guided bombs, Combined Effects Munition (CEM) dis-

pensers, 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 night-vision goggles. 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), night-vision goggles (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-10As are redesignated A-10s, used for forward air control (FAC) of fighter aircraft, combat escort, search and rescue, and visual reconnaissance. The 30 mm GAU-8/A gun is retained, but under-wing stores are normally restricted to canisters of white phosphorous rockets for target marking. The first OA-10 unit reached IOC in October 1987.

AC-130 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.
Ceiling: 25,000 ft.
Unit Location: Hurlburt Field, Fla.
Contractor: Lockheed Martin.
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.
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-130U 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-15C Eagle (Ted Carlson)

F-15E Strike Eagle (Randy Jolly)

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, PACAF, USAFE, AETC, ANG.
First Flight: July 27, 1972.
Delivered: from November 1974.
IOC: September 1975.
Production: 874.
Inventory: 532.
Ceiling: 65,000 ft.
Unit Location: Active: Langley AFB, Va., Edwards AFB, Calif., Eglin AFB, Fla., Tyndall AFB, Fla., Elmendorf AFB, Alaska, Kadena AB, Japan, RAF Lakenheath, UK, Spangdahlem AB, Germany. ANG: Hickam AFB, Hawaii, Lambert–St. Louis IAP, Mo., NAS JRB New Orleans, La., Otis ANGB, Mass., Portland IAP, Ore., Jacksonville IAP, Fla.
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.
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 36 of the 39 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: 202.
Ceiling: 65,000 ft.
Unit Location: Seymour Johnson AFB, N.C., Eglin AFB, Fla., Nellis AFB, Nev., Mountain Home AFB, Idaho, Elmendorf AFB, Alaska, RAF Lakenheath, UK.
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.
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.

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 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 de-

ployed 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 and Operation Deliberate Force over Bosnia.

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, USAFE, PACAF, AETC, ANG, AFRC.

First Flight: Dec. 8, 1976 (full-scale development).

Delivered: August 1978–present.

IOC: October 1980, Hill AFB, Utah.

Production: 2,206.

Inventory: 1,480.

Ceiling: above 50,000 ft.

Unit Location: 14 active wings, 21 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.

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-16CG designated aircraft are used by ACC for the Suppression of Enemy Air Defenses (SEAD) role.

***Block 32 F-16C** Fighting Falcon* (Guy Aceto)

***Block 32 F-16D** Fighting Falcon* (Guy Aceto)

***Block 40 F-16C** Fighting Falcon* (Guy Aceto)

***Block 50 F-16C** Fighting Falcon* (Guy Aceto)

F-22 Raptor

Brief: High-technology follow-on for the F-15. 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: 2004 (anticipated).

IOC: December 2005.

Production: 339 (planned).

Inventory: one test aircraft.

Ceiling: above 50,000 ft.

Unit Location: TBD

Contractor: Lockheed Martin, with Boeing and Pratt & Whitney as key members of the development team.

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.

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 Processor (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 nonlethal 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 1981.
Delivered: 1982–summer 1990.
IOC: October 1983.
Production: 59.
Inventory: 57.
Ceiling: classified.
Unit Location: Holloman AFB, N.M.
Contractor: Lockheed Martin.
Power Plant: two General Electric F404-GE-F1D2 nonafterburning 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.
Performance: max level speed 646 mph, 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; alternatively, AGM-65 Maverick or AGM-88 HARM; provisions for AIM-9 Sidewinder.

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.

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 reflect 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 composite radar-absorbent materials. The F-117A's dull black finish reflects little light, and the engine air intakes and exhaust nozzles are above the wings and rear fuselage, respectively, to shield them from IR seekers below. The two nonafterburning turbofans give the aircraft low noise signature and high subsonic performance.

Key features include a state-of-the-art digital avionics suite integrating sophisticated navigation and attack systems, complemented by a specially developed automated mission-planning system. 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 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: not available
IOC: Fiscal 2006 (planned).
Production: seven (planned).
Inventory: seven (planned).
Ceiling: 45,000 ft.
Unit Location: TBD
Contractor: Boeing, TRW, Lockheed Martin.
Power Plant: four GE C2B5F turbofans; each 61,500 lb thrust.
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.
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 the 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.

***F-22A** Raptor*

***F-117A** Nighthawk* (Ted Carlson)

Reconnaissance and Surveillance Aircraft

E-3 Sentry

Brief: Modified Boeing 707 fitted with a rotating radar dome, 30 feet wide and six 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.
Ceiling: above 29,000 ft.
Unit Location: Tinker AFB, Okla., Kadena AB, Japan, Elmendorf AFB, Alaska.
Contractor: Boeing.
Power Plant: four Pratt & Whitney TF33-PW-100/100A turbofans; each 21,000 lb thrust.
Accommodation: basic operational crew of 24, incl 20 AWACS mission specialists.
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.
Performance: max speed 530 mph, endurance six hr on station 1,000 miles from base.

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. The 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 slung under the forward part of the fuselage, housing long-range, air-to-ground radar

***E-3C** Sentry* (Ted Carlson)

capable of locating, classifying, and tracking vehicles moving on Earth's surface out to distances in excess of 200 km. Such data is 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: 13 to be delivered to USAF by 2004.
Inventory: two.
Ceiling: 42,000 ft.
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.
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-8 aircraft, equipped with a multimode radar, and US Army mobile ground stations. The radar, which is integrated with GPS and has a range in excess of 120 miles, operates in synthetic aperture radar (SAR) mode to detect and locate stationary objects, such as parked tanks, and alternates between SAR and a Doppler-type mode to locate and track slow-moving targets. The Joint STARS then directs attack on the targets, in real time, via a jam-resistant, high-capacity, digital data link or radio.

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.

E-8A. Prototype version, with specialized equipment installed aboard two specially modified 707-300 airframes. One was converted to an in-flight pilot trainer in 1997, and the second has been placed in long-term storage.

E-8C. Production version, based on former commercial 707-300 airframes. Equipped with 18 operations-and-control consoles, two of which double as communications stations. The first E-8C flew in March 1994 and served as the preproduction test bed. The two E-8As will be upgraded to C standard and will be the last to be delivered.

***E-8C** Joint STARS* (Ted Carlson)

***RC-135W** Rivet Joint* (Ted Carlson)

***RQ-1A** Predator* (Guy Aceto)

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.
Ceiling: 50,000 ft (basic C-135).
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.
Performance: speed: 500+ mph, unrefueled range 3,900 miles.

COMMENTARY

A version of the WC-135, modified for specialized reconnaissance with an infrared linescanner, synthetic aperture radar, and forward- and vertical-looking video cameras, to monitor the 1992 Open Skies Treaty.

OC-135B modifications center around four cameras installed in the rear of the aircraft. Cameras installed include one vertical and two oblique KS-87 framing cameras used for low-altitude photography approximately 3,000 feet above the ground, and one KA-91 pan camera, which pans from side to side to provide a wide sweep for each picture, used for high-altitude photography at approximately 35,000 feet. Data is processed and recorded by the Miletus camera annotation system.

RC-135

Brief: Specially configured variants of the Boeing C-135 Stratolifter, having an elongated nose and cheeks containing highly advanced electronic signal collection systems. Used to acquire real-time electronic intelligence data for theater and tactical commanders.
Function: Electronic reconnaissance aircraft.
Operator: ACC.
First Flight: not available
Delivered: circa 1973.
IOC: circa 1969.
Production: 16, two in Fiscal 1999.
Inventory: 19.
Ceiling: 45,000 ft.
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.
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.

Tier II (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.
Function: Unmanned reconnaissance aircraft.
Operator: ACC.
First Flight: July 1994.
Delivered: November 1996–present.
IOC: Fiscal 1998.
Production: 12 systems planned (system consists of four air vehicles, one ground control station, and one Trojan Spirit II comm system).
Inventory: four partial systems (as of Dec. 18, 1997).
Ceiling: 25,000 ft.
Unit Location: Indian Springs AFAF, Nev.
Contractor: General Atomics.
Power Plant: one Rotax 912 engine; 85 hp.
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.
Performance: cruise speed 75 mph, continuous coverage on station with multiple air vehicles and relief on station (yet to be demonstrated), 400 nautical miles from base at altitude of 10,000–15,000 ft.

COMMENTARY

Delivery of Tier II Predator vehicles has begun to the 11th 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.

Tier II Plus 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
Ceiling: 65,000 ft.
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.

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.

Tier III Minus DarkStar

Brief: A stealthy, high-altitude, endurance unmanned aerial vehicle.

Function: Unmanned reconnaissance aircraft.
Operator: TBD
First Flight: March 29, 1996.
Delivered: TBD
IOC: TBD
Production: decision in Fiscal 2001.
Inventory: TBD
Ceiling: above 45,000 ft.
Unit Location: TBD
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.
Performance: cruise speed 345 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. 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 a 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 March 18.

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.
Ceiling: above 70,000 ft.
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.
Performance: max cruising speed at above 70,000 ft more than 430 mph; ceiling U-2R: more than 70,000 ft, U-2S: more than 73,500 ft; range U-2R: more than 3,000 miles, U-2S: more than 4,500 miles; max endurance U-2R: around 12 hr, U-2S: around 15 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 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 is scheduled for completion this year.

***Tier II Plus** Global Hawk* (Ted Carlson)

***Tier III Minus** DarkStar*

***U-2** Dragon Lady* (Guy Aceto)

***WC-130H** Hercules* (Ted Carlson)

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.
Ceiling: 33,000 ft at 100,000 lb gross T-O weight.
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.
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-4 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 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.
Ceiling: above 30,000 ft.
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.
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). They support operations in a nuclear environment over extended ranges.

E-4A. Three were built, using modified Boeing 747 airframes, providing an interim capability by utilizing existing EC-135 C^3 equipment.

E-4B. 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 the advanced electronics. Mission equipment includes a range of sophisticated communications and data processing equipment, including Milstar satellite capability. Tri-band radomes are currently under development.

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.
Ceiling: 25,000 ft.
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.
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.
Ceiling: 42,000 ft.
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 1 in, height 42 ft 5 in.
Weight: gross 327,000 lb.
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.

E-9 (Ted Carlson)

***EC-130E** ABCCC* (Ted Carlson)

***EC-130E** Commando Solo* (Ted Carlson)

***EC-130H** Compass Call* (Ted Carlson)

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.
Production: seven.
Inventory: seven.
Ceiling: 20,000 ft.
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.
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.
Ceiling: 20,000 ft.
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.
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 and AFMC.
First Flight: not available
Delivered: not available
IOC: Feb. 3, 1961.
Production: not available
Inventory: seven.
Ceiling: 40,600 ft.
Unit Location: Offutt AFB, Neb., Edwards AFB, Calif.
Contractor: Boeing.
Power Plant: (EC-135C) four Pratt & Whitney TF33-P-9 turbofans; each 18,000 lb thrust.
Accommodation: flight crew of four, plus 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.
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-135Ns** had specialized nose radar and tracking equipment to support the Apollo program. Other EC-135 aircraft included **J** and **Y** versions. Virtually all retired.
EC-135C aircraft, known as Looking Glass, 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 will retire by October 1998 as the USN's E-6B aircraft take 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.

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.
Ceiling: 42,000 ft.
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.
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: AMC, ACC, AETC, PACAF, USAFE, AFRC, ANG.
First Flight: August 1956.
Delivered: January 1957–66.
IOC: June 1957, Castle AFB, Calif.
Production: 732.
Inventory: 552.
Ceiling: 50,000 ft.
Unit Location: MacDill AFB, Fla., McConnell AFB, Kan., Fairchild AFB, Wash., Robins AFB, Ga., Grand Forks AFB, N.D., Offut AFB, Neb., Mountain Home AFB, Idaho, Altus AFB, Okla., Kadena AB, Japan, RAF Mildenhall, UK; and seven AFRC and 19 ANG 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 301,600lb).
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-135E** Stratotanker* (Randy Jolly)

***KC-135R** Stratotanker* (Ted Carlson)

***KC-10A** Extender* (Ted Carlson)

***MC-130P** Combat Shadow* (Ted Carlson)

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: AFSOC, AETC, ANG, AFRC.
First Flight: Dec. 8, 1964 (as HC-130H).
Delivered: from 1965.
IOC: 1986.
Production: not available
Inventory: 57.
Ceiling: 33,000 ft.
Unit Location: Active: Eglin AFB, Fla., Kadena AB, Japan, RAF Mildenhall, UK, Kirtland AFB, N.M., Moody AFB, Ga., Patrick AFB, Fla. 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.
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 psychologi-

cal 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. Nine of these 130 tankers serving with active, ANG, and AFRC search-and-rescue units still retain the HC-130 designation. Four were modified to **JC-130H** for aerial recovery of re-entering spacecraft.

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: AMC, AETC, ANG, AFRC.
First Flight: June 30, 1968.
Delivered: October 1969–April 1989.
IOC: September 1970.
Production: 131.
Inventory: 126.
Ceiling: 34,000 ft with a 605,000-lb load.
Unit Location: Altus AFB, Okla., Travis AFB, Calif., Dover AFB, Del., Kelly AFB, Texas. 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.
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 protctype 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 airlift of all classes of military cargo, including outsize items.

Function: Cargo and troop transport.
Operator: AMC, AETC, AFRC.
First Flight: Sept. 15, 1991.
Delivered: June 1993–present.
IOC: Jan. 17, 1995.
Production: 120 minimum planned.
Inventory: 37 as of January 1998.
Ceiling: 45,000 ft.
Unit Location: Charleston AFB, S.C., Altus AFB, Okla.
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.
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, Miss.; the remaining 10 aircraft will be used for backup.

C-5B Galaxy (Ken Hammond)

C-17 Globemaster III (Ted Carlson)

C-141B Starlifter (Randy Jolly)

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, AMC, PACAF, AFMC.
First Flight: May 1961.
Delivered: 1961–1962.
IOC: circa 1961.
Production: 48, plus five WC/TC-135s.
Inventory: six.
Ceiling: 10,700 ft.
Unit Location: Offutt AFB, Neb., Andrews AFB, Md., Hickam AFB, Hawaii, Edwards AFB, Calif.
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.
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.

Function: Long-range troop and cargo airlift.
Operator: AMC, AETC, AFMC, ANG, AFRC.
First Flight: Dec. 17, 1963.
Delivered: October 1964–June 1982.
IOC: May 1965.
Production: 285.
Inventory: 207.
Ceiling: 41,600 ft.
Unit Location: Active: Altus AFB, Okla., Edwards AFB, Calif. ANG: Memphis IAP, Tenn., Allen C. Thompson Field, Miss. AFRC: Wright–Patterson AFB, Ohio, March ARB, Calif., Andrews AFB, Md., McChord AFB, Wash., Charleston AFB, S.C., McGuire AFB, N.J., Travis AFB, Calif.
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.

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 airdrop systems. Modification of 13 437th AW C-141Bs is aimed at increasing their SOLL (Special Operations Low Level) capability and survivability.

C-9 Nightingale (Ted Carlson)

C-12 Huron (Ken Hammond)

C-20 Gulfstream (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.

Ceiling: 35,000 ft.

Unit Location: Andrews AFB, Md., Yokota AB, Japan, Ramstein AB, Germany, Scott AFB, Ill.

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.

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, AMC, PACAF.

First Flight: Oct. 27, 1972 (Super King Air 200).

Delivered: 1974–late 1980s.

IOC: circa 1974.

Production: 88.

Inventory: 34.

Ceiling: (C-12J) 25,000 ft.

Unit Location: Keesler AFB, Miss., Andrews AFB, Md., Elmendorf AFB, Alaska, Osan AB, South Korea, and 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.

Performance: (C-12J) max cruising speed at 16,000 ft 307 mph, range with 10 passengers 1,806 miles.

COMMENTARY

C-12A. Thirty military versions of the Beechcraft Super King Air 200 delivered to USAF. All subsequently modified.

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, under AMC control.

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.

Ceiling: 45,000 ft.

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; 14–18 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.

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 (SAM) 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 SAM requirements.

C-21

Brief: Aircraft designed to provide cargo and passenger airlift and transport litters during medical evacuations.

Function: Passenger and cargo airlift.

Operator: ACC, AETC, AFSPC, AMC, PACAF, USAFE, ANG.

First Flight: January 1973.

Delivered: April 1984–October 1985.

IOC: April 1984.

Production: 84.

Inventory: 80.

Ceiling: 45,000 ft.

Unit Location: Howard AFB, Panama, Randolph AFB, Texas, Keesler AFB, Miss., Peterson AFB, Colo., Andrews AFB, Md., Scott AFB, Ill., Langley AFB, Va., Wright–Patterson AFB, Ohio, Maxwell AFB, Ala., Offutt AFB, Neb., Yokota AB, Japan, Ramstein AB, Germany.

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.

C-32

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.
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.
Ceiling: 37,400 ft.
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.
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 1989.
Delivery: 2003 (planned).
IOC: 2005 (planned).
Production: 50 (planned).
Inventory: 50 (planned).
Ceiling: 26,000 ft.
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 tailfins 17 ft 8 in.
Weight: normal mission weight, VTO 47,500 lb; gross, STO 60,500 lb.
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 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

C-22B (J. Gaffney)

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.
Ceiling: 26,700 ft.
Unit Location: To be located at ANG units throughout the USA.
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.
Performance: max cruising speed at midcruise weight of 12,500 lb 321 mph, range with 19 passengers 1,224 miles.
COMMENTARY
C-26A. USAF acquired 13 Fairchild Metro III commuter transport aircraft, under the designation C-26A, to replace ANG C-131s. C-26As serving in the ANG Operational Support Transport Aircraft (ANGOSTA) role have a quick-change interior, enabling passenger seats to be replaced by a medevac or cargo-carrying configuration.
C-26B. Thirty **C-26Bs** were ordered in 1991, with deliveries from January 1992. C-26Bs have TCAS II, GPS, and microwave landing systems.

C-27 Spartan
Brief: A converted commercial airlifter used primarily for cargo operations on short, unimproved airstrips.
Function: Theater airlifter.
Operator: ACC.
First Flight: July 18, 1970.
Delivered: August 1991–December 1992.
IOC: October 1991.
Production: 10.
Inventory: seven.
Ceiling: 25,000 ft.
Unit Location: Howard AFB, Panama.
Contractor: Chrysler.
Power Plant: two Fiat-built General Electric T64-GE-P4D turboprops; each 3,400 shp.
Accommodation (C-27A): crew of three; various configurations, incl provision for 34 fully equipped troops or 14,850 lb cargo.
Dimensions: span 94 ft 2 in, length 74 ft 5 in, height 34 ft 8 in.
Weight: empty 35,500 lb, gross 56,878 lb.
Performance: max cruising speed 288 mph, ferry range with max fuel 1,727 miles.
COMMENTARY
C-27A. Ten commercially available Alenia G222 medium airlifters were modified to C-27A short takeoff and landing (STOL) intratheater transport standard. Modifications include new HF/VHF communications, autopilot, and INS. C-27As provide rapid-response airlift of personnel and cargo to remote location accessible primarily through unimproved airfields with short, unprepared landing surfaces.

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. It also serves as a backup for Air Force One, the Presidential aircraft.
Function: VIP air transport.
Operator: AMC.
First Flight: Feb. 19, 1982 (USAF Feb. 11, 1998).
Delivery: March–October 1998 (planned).
IOC: 1998.
Production: four.
Inventory: two (as of March).
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 May 1998 (planned).
Delivery: through October 1998 (planned).
IOC: July 1998 (planned).

Production: two in production.
Inventory: two (planned).
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 37,000 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: February–March 1998.
IOC: 1998 (planned).
Production: two in production.
Inventory: two (planned).
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 will replace 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: AMC, AETC, AFSOC, USAFE, PACAF, ANG, AFRC.
First Flight: August 1954 (C-130A).
Delivered: December 1956–present.
IOC: September 1970.
Production: more than 1,000.
Inventory: 525.
Ceiling: 33,000 ft at 100,000 lb T-O weight.
Unit Location: Active: Dyess AFB, Texas, Little Rock AFB, Ark., Pope AFB, N.C., Hurlburt Field, Fla., Ramstein AB, Germany, Elmendorf AFB, Alaska, 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.
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 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. Delivery is due to start mid-1998.

***C-130H** Hercules* (Ted Carlson)

***LC-130H** Hercules* (Guy Aceto)

***C-130J** Hercules* (Guy Aceto)

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: AFSOC, AETC, 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).
Ceiling: 33,000 ft.
Unit Location: MC-130E at Duke and Hurlburt Fields, Fla. MC-130H at Kadena AB, Japan, RAF Mildenhall, UK, Hurlburt Field, Fla., Kirtland AFB, N.M.
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.
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

***MC-130H** Combat Talon II* (Ted Carlson)

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: six.
Ceiling: 42,000 ft.
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).
Performance: max speed 627 mph, range 6,000 miles (VC-137C).

COMMENTARY

Five 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, is scheduled for 1998.

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. One remaining.

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, was retired this month. 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.
Ceiling: 45,000 ft.
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.
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.

T-1 Jayhawk (Randy Jolly)

T-3 Firefly (Guy Aceto)

T-6A Texan II

T-37 Tweet (Randy Jolly)

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 and tanker aircraft.

Function: Advanced tanker/transport training.
Operator: AETC.
First Flight: Sept. 22, 1989 (Beechcraft 400A).
Delivered: Jan. 17, 1992–July 1997.
IOC: January 1993.
Production: 180.
Inventory: 179.
Ceiling: 41,000 ft.
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.
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, and tankers, such as the KC-10 and KC-135.

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.
Ceiling: 19,000 ft.
Unit Location: Hondo Airport, Texas, and 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.
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.

The basic airframe is the Slingsby T67M260 Firefly built in the UK; Northrop Worldwide Aircraft Services is responsible for final assembly, test, delivery, and logistical support.

T-6A Texan II

Brief: A single engine 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: May 1998 (planned).
Delivery: from Fiscal 1999 (planned).
IOC: Fiscal 2001 (planned).
Production: USAF 372, USN 339 (planned).
Inventory: USAF 372 (planned).
Ceiling: 35,000 ft.
Unit Location: Laughlin, Randolph, and Sheppard AFBs, Texas; Columbus AFB, Miss.; Vance AFB, Okla. Navy: NASs Whiting and Pensacola, Fla., and NAS Corpus Christi, Texas.
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.
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, undergraduate navigator and tactical navigator students in fundamentals of aircraft handling, and instrument, navigation, formation, and night flying.
Function: Primary trainer.
Operator: AETC.
First Flight: September 1955.
Delivered: from December 1956.
IOC: 1957.
Production: 985.
Inventory: 419.
Ceiling: 35,000 ft.
Unit Location: Randolph, Laughlin, and Sheppard AFBs, Texas, Vance AFB, Okla., Columbus AFB, Miss.
Contractor: Cessna.
Power Plant: two Continental J69-T-25 turbojets; each 1,025 lb thrust.
Accommodation: two, side by side, on ejection seats.
Dimensions: span 33 ft 8 in, length 29 ft 3 in, height 9 ft 2 in.
Weight: empty 3,870 lb, gross 6,625 lb.
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
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: AETC, ACC, AFMC.
First Flight: April 1959.
Delivered: 1961–72.
IOC: March 1961.
Production: more than 1,100.
Inventory: 471.
Ceiling: above 55,000 ft.
Unit Location: Randolph, Laughlin, and Sheppard AFBs, Texas, Vance AFB, Okla., Columbus AFB, Miss., Beale and Edwards AFBs, Calif., Eglin AFB, Fla., 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.
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.

T-38 Talon (Ted Carlson)


T-43 (Ted Carlson)


UV-18 Twin Otter (Ted Carlson)

Function: Navigation trainer.
Operator: ACC, AETC.
First Flight: April 1973.
Delivered: September 1973–July 1974.
IOC: 1974.
Production: 19.
Inventory: 11.
Ceiling: 37,000 ft.
Unit Location: Randolph AFB, Texas; Howard AB, Panama.
Contractor: Boeing.
Power Plant: two Pratt & Whitney JT8D-9 turbofans; each 14,500 lb thrust.
Accommodation: crew of two; 12 students and six instructors.
Dimensions: span 93 ft, length 100 ft, height 37 ft.
Weight: gross 115,500 lb.
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 on-board 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.
Ceiling: 26,700 ft.
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.
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.
Ceiling: 13,450 ft, at mission gross weight.
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.
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: AFSPC, AMC, AETC, AFSOC, PACAF.

First Flight: Oct. 20, 1956 (UH-1).

Delivered: from September 1970.

IOC: circa 1970.

Production: 79.

Inventory: 64.

Ceiling: 13,000 ft.

Unit Location: F.E. Warren AFB, Wyo., Minot AFB, N.D., Malmstrom AFB, Mont., Vandenberg AFB, Calif., Andrews AFB, Md., Fairchild AFB, Wash., Kirtland AFB, N.M., Hurlburt Field, Fla., 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.

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 for training purposes and by the 336th TG 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.

Ceiling: 16,000 ft.

Unit Location: Hurlburt Field, Fla., Kirtland AFB, N.M., Osan AB, South Korea, RAF Mildenhall, UK.

Contractor: Sikorsky, division of United Technologies.

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.

***UH-1N** Iroquois* (Ken Hammond)

***MH-53** Pave Low* (Randy Jolly)

***MH-60G** Pave Hawk* (Randy Jolly)

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.

Ceiling: 14,200 ft.

Unit Location: MH-60G at Hurlburt Field, Fla.; HH-60G at Nellis AFB, Nev., Kirtland AFB, N.M., Moody AFB, Ga., Holloman AFB, N.M., NAS Keflavik, Iceland, Kadena AB, Japan, Francis J. Gabreski IAP (ANG), N.Y., Moffett Federal Airfield (ANG), Calif., Davis–Monthan AFB (AFRC), Ariz., Patrick AFB (AFRC), Fla., Portland IAP (AFRC), Ore.

Contractor: United Technologies' 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.

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.

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., Minot AFB, N.D., Malmstrom AFB, Mont.

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 reentry vehicles (MIRVs) on three targets with a high degree of accuracy. USAF deployed 550 in 11 squadrons.

A single reentry 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 reentry 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: 1,628.

Unit Location: Barksdale AFB, La., Minot AFB, N.D.

Contractor: Boeing.

Power Plant: Williams/Teledyne CAE F107-WR-10 turbofan; 600 lb thrust.

Guidance: AGM-86B: inertial plus 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-86B. 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.

LGM-30G

LGM-118A

AGM-86

AGM-129A (Guy Aceto)

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.

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.

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 25 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 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-15 and F-16 (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 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 more than 10 miles.

COMMENTARY

Early versions. AIM-9A was the prototype version. The AIM-9B, initial production version, entered the inventory in 1957 and was effective only at close range during day. These shortcomings were eliminated on subsequent AIM-9E/H/J/P versions. The third-generation Sidewinder, AIM-9L, added a more powerful solid-propellant rocket motor as well as tracking maneuvering ability. Production and delivery began in 1976; production ended in 1981.

AIM-9M is an improved version of AIM-9L with all-aspect intercept capability. This version has increased infrared counter-countermeasures (IRCCM) capability, improved background discrimination, and 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 for the engineering/manufacturing phase of its Evolved Sidewinder, derived 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-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 AMRAAMs 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.

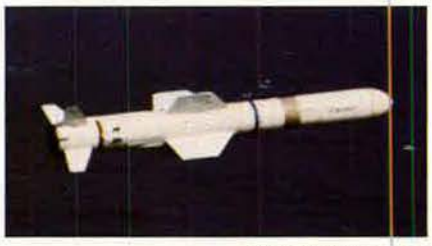
Inventory: classified.

Contractor: Raytheon.

***AIM-7** Sparrow* (Guy Aceto)

***AIM-9** Sidewinder (top), **AIM-120** AMRAAM (middle), **AGM-88** HARM (bottom)* (Ted Carlson)

***AGM-65** Maverick* (Guy Aceto)



***AGM-84** Harpoon*

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, 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, singly or in three-round clusters, for use against tanks and columns of vehicles and in the SEAD role.

AGM-65A. The basic Maverick is a launch-and-leave, TV–guided, air-to-surface missile that enables the pilot of the launch aircraft to seek other targets or leave the target area once the missile has been launched. Production was initiated in 1971, following successful test launches over distances ranging from a few thousand feet to many miles and from high altitudes to treetop level.

AGM-65B. A version with a "scene magnification" TV seeker that enables the pilot to identify and lock on to smaller or more distant targets.

AGM-65D. System developed to overcome limitations of TV Maverick, which can be used only in daylight and clear-weather conditions. This version has an imaging-infrared (IIR) seeker as well as a lower-smoke motor. IIR Maverick became operational on A-10s in February 1986.

AGM-65G. Uses the IIR seeker with an alternate 298-lb blast fragmentation warhead for use against hardened targets. Software has been modified to include options for targeting ships and large land targets as well as mobile armor. This version also has a digital autopilot and a pneumatic, rather than hydraulic, actuation system. USAF received its first G model in 1989.

AGM-65H. 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

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 from eight to 12 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–
IOC: circa 1984.
Production: not available
Inventory: not available
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 fighters 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: Rockwell.
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.

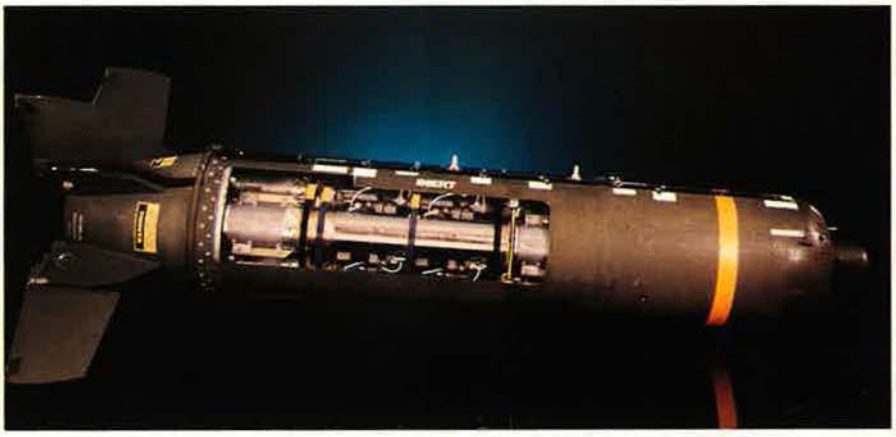
AGM-142 Have Nap
Brief: A medium-range standoff attack missile, carried by Air Force heavy bombers, that gives these long-range aircraft a conventional precision strike capability.
Function: Air-to-surface guided missile.
First Flight: not available
Delivered: not available
IOC: circa 1990.
Production: not available
Inventory: not available
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 50 miles.
COMMENTARY
This medium-range standoff missile was derived from the Israeli-built Popeye missile. Initial operational test and evaluation launches were completed in May 1990. Rafael and Martin Marietta (now part of Lockheed Martin) entered a coproduction agreement. 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.
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 with data link.
Dimensions: length 13 ft 4 in.
Weight: 1,065–1,500 lb.
Performance: range: low-altitude launch 17 miles, high-altitude launch 46 miles.
COMMENTARY
The Joint Standoff Weapon (JSOW) allows for the integration of several different submunition and unitary warheads, nonlethal 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 that entered EMD in 1995.
AGM-154C, the third variant, JSOW/Unitary entered EMD in the middle of 1995 and integrates an IIR terminal seeker, the AWW-13 data link, and a 500–800-lb unitary warhead.
A wide range of testing has been completed on the F-15E and F-16, as well as fit checks on 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 inven-

AGM-130

***AGM-142** Have Nap*



***CBU-97** Cut away to show the BLU-108 submunitions*

tory of SFWs with the WCMD 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 fighters and used to destroy high-value enemy targets from short standoff distances.
Function: Air-to-surface guided bomb.
First Flight: 1975.
Delivered: 1983–
IOC: 1983.
Production: not available

GBU-15 (Erik Simonsen)

GBU-24

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: 2,450 lb.
Performance: cruising speed subsonic.
COMMENTARY
GBU-15 is a highly maneuverable 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 HOBO 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. This profile uses a midcourse glide phase and extends standoff range. 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(V)3/B. Fitted with a CBU-75 warhead and DME transponder guidance system.
GBU-15-I. Combines accuracy of GBU-15 with the penetration capability of the improved 2,000-lb BLU-109/B iron bomb.

During Operation Desert Storm F-111F pilots used GBU-15 glide bombs with great effect to seal flaming oil pipeline manifolds.

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: not available
Delivered: circa 1986–
IOC: 1986.
Production: not available
Inventory: not available
Contractor: Raytheon.

GBU-31 JDAM (Guy Aceto)

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.

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. It is in production.

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: not available
Delivered: circa 1991–
IOC: 1991.
Production: not available
Inventory: not available
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 on 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 will provide 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.
Power Plant: not available
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.

GPS-Aided Munition (GAM)
Brief: A conventional 2,000-lb weapon, carried by B-2 bombers, which uses signal emanating from the Global Positioning System satellites to attack targets with extreme accuracy.
Function: Air-to-surface guided bomb.
First Flight: 1995.
Delivered: July 1996–
IOC: circa 1996.
Production: not available
Inventory: not available
Contractor: Northrop Grumman/Hughes.
Weight: 2,000 lb (basic bomb).
Performance: near precision capability.
COMMENTARY
The B-2 bomber is currently equipped with a small inventory of GPS-Aided Munitions (GAMs), providing an interim direct attack weapon pending JDAM availability. GAM is a Mk 84 2,000-lb conventional bomb with a tailcone with moveable fins for trajectory control and GPS/inertial navigation guidance unit, capable of achieving a 20-ft Circular Error Probable (CEP). In an October 1996 firepower demonstration, a B-2 launched 16 GAMs and destroyed all 16 targets.

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 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, and S-3B.

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 tailfins 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, surface-to-air missile 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 surface-to-air missile 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: two (FY98); one (FY99).
Unit Location: Vandenberg AFB, Calif., Patrick AFB, Fla.
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. Latest Atlas IIAS version adds four Thiokol Castor IVA solid rocket motors. Atlas IIAR 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 latest 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.

A new Atlas IIAR, with a Russian-designed RD-180 engine, will be used starting in 1998, enhancing payload capacity to 8,900 lb to GTO. Lockheed Martin announced April 8 that its newest family of launch vehicles will be called Atlas III, with Atlas IIAR to be designated Atlas IIIA.

Atlas IIAS

Atlas with Centaur upper stage

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: FY98: two Atlas; four Titan.
Unit Location: Vandenberg AFB, Calif., Patrick AFB, Fla.
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.

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 IVA, creating the greatest weight-to-altitude capability of any US launch vehicle by placing a 10,200-lb payload into GEO.

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: one (FY98); three (FY99).
Unit Location: Vandenberg AFB, Calif., Patrick AFB, Fla.
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 200 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 had been launched before an accident destroyed a launcher in January 1997. The program has since resumed.

Delta II is a three-stage booster surrounded by nine solid-propellant, graphite epoxy motors. For low Earth orbit 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 graphite epoxy motors (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 low Earth orbit.

Function: Medium/heavy space launch vehicle.
Operator: AFSPC.
IOC: 2003 (planned).
Launches Scheduled: TBD
Unit Location: Vandenberg AFB, Calif., Patrick AFB, Fla.
Contractor: pre–EMD: Lockheed Martin and Boeing.
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. Boeing and Lockheed Martin are completing the pre–EMD phase. The Air Force plans to award contracts to both contractors in June 1998 to proceed with EMD and initial launch services. 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: Vandenberg AFB, Calif., Patrick AFB, Fla.
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: nine (FY98); four (FY99).
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 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 20 launches by the end of 1997. Orbital Sciences now uses an L-1011 aircraft to launch Pegasus.

Delta II

Titan IV

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: two (FY98); two (FY99).
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 ARPA 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: not available
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.
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. Six 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.
Function: Heavy spacelift vehicle.
Operator: AFSPC.
First Launch: June 14, 1989.
IOC: June 14, 1989.
Launches Scheduled: five (FY98); four (FY99).
Unit Location: Vandenberg AFB, Calif., Cape Canaveral AS, Fla.
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: inertial guidance system, to be replaced by digital avionics system on 24th vehicle and later.
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, seven-segment solid boosters, and a 16 ft 8.5-in diameter payload fairing.

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 geosynchronous Earth orbit (GEO). With an alternative Inertial Upper Stage (IUS), it can place 5,200 lb into GEO.

Titan IVB. The latest Titan IVB version has mission-unique kits, providing a standard interface for payloads to permit launch-site processing, a new electrical system on the booster core, a new ground system, and upgraded solid-rocket motors with 25 percent improved performance. First 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 40 vehicles.

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 17 DSP satellites have been launched by USAF. Procurement will end with No. 23, canceling the further satellites originally planned.
An advanced system, the **Space-Based Infrared (SBIR)** system is being developed to replace DSP satellites from Fiscal 1999, employing satellites in two orbits. The higher will detect missile launches by the heat of their plumes, and the lower tracks the cold reentry vehicle when it separates from its booster. The contract for the demonstration–validation phase of the low-orbit component was awarded to Rockwell (now Boeing)/Lockheed Martin in October 1996; a Lockheed Martin team including Aerojet, Honeywell, and Northrop Grumman received the contract for development and delivery of seven "high" satellites.

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.
Function: Weather data satellite.
Operator: AFSPC.
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: Schriever AFB, Colo.
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 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, NASA, and NOAA are to be merged and managed by NOAA.
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).
IOC: Dec. 13, 1978 (DSCS II).
Constellation: five (III).
Design Life: five yr (II); 10 yr (III).
Launch Vehicle: Atlas II.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: 22,000+ miles in geosynchronous orbit.
Contractor: TRW (Phase II); Lockheed Martin (Phase III).
Power Plant: solar arrays generating 531 watts, decreasing to 418 watts after five yr (Phase II); solar arrays generating 1,240 watts, decreasing to 980 watts after 10 yr (Phase III).
Dimensions: cylindrical body 9 ft diameter, 6 ft, 13 ft with antennas deployed, high (Phase II); rectangular body 6 ft x 6 ft x 7 ft; 38-ft span with solar arrays deployed (Phase III).
Weight: 1,350 lb (Phase II), 2,550 lb (Phase III).
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 defense officials and battlefield commanders. The military also uses the DSCS to transmit data on space operations and early warning to various systems and users. A program has been funded to allow more tactical users access to the DSCS.
DSCS II. Two Phase II satellites are orbiting Earth, equipped with antennas capable of providing low-gain, Earth-field-of-view coverage and steerable, high-gain area coverage.
DSCS III. The first launch of the more advanced Phase III satellites was in 1982. Nine are currently in orbit, with launches continuing until 2002. These satellites are nuclear hardened and can resist jamming. Phase III spacecraft are capable of providing flexible coverage and nulling in addition to the Phase II's capabilities.

Defense Support Program satellite mounted atop an Inertial Upper Stage booster.

Navstar Global Positioning System satellite

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: 7.5 yr (II/IIA); 10 yr (IIR).
Launch Vehicle: Delta II.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: 11,000 miles.
Contractor: Boeing, Lockheed Martin, and Loral Fairchild.
Power Plant: solar arrays generating 700 watts.
Dimensions: width 5 ft, length 17 ft 6 in, incl solar array.
Weight: 1,860 lb 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 NAVWARS initiative. There are currently 28 satellites on orbit: eight Block II, 18 IIA, one IIR, and one nonoperational IIA.
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 communications for the essential wartime requirements for high-priority military users, linking command authorities to ships, submarines, and aircraft.
Function: Communications satellite.
Operator: AFSPC.
First Launch: Feb. 7, 1994.
IOC: not available
Constellation: six.
Design Life: 10 yr.
Launch Vehicle: Titan IV.
Unit Location: Schriever AFB, Colo.
Orbit Altitude: 22,400 miles.
Contractor: Lockheed Martin.
Power Plant: solar arrays generating 7,000 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 geosynchronous orbit at 4° inclination, providing coverage between 65° north and 65° south latitude; design lifetime of 10 yr.
COMMENTARY
Milstar is a Joint-service communications system that provides secure, jam-resistant EHF communications for all US armed services. 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 Milstars (to be launched between 1999 and 2002) will include medium-data-rate payloads able to transmit larger amounts of data.

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, Navy.
First Launch: Feb. 9, 1978.
IOC: 1978.
Constellation: four.
Design Life: five yr.
Launch Vehicle: Atlas E.
Unit Location: Schriever AFB, Colo.
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
A constellation of four satellites, each having 23 channels (12 for Air Force, 10 for Navy, one reserved for the national command authorities). 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 FLSATCOM.
Function: Communications satellite.
Operator: AFSPC.
User: US Navy.
First Launch: March 25, 1993.
IOC: Sept. 3, 1993.
Constellation: nine.
Design Life: 14 yr.
Launch Vehicle: Atlas II.
Unit Location: Schriever AFB, Colo.
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 antijam telemetry, command, broadcast, and fleet interconnectivity.

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.
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 one to one, 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.

***MQM-107** Streaker* (Guy Aceto)

***BQM-34** Firebee* (Guy Aceto)

QF-4 (Ted Carlson)

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)

Books

Compiled by Chanel Sartor, Editorial Associate

Bermudez Jr., Joseph S. *North Korean Special Forces.* 2d ed. Naval Institute Press, 2062 Generals Hwy., Annapolis, MD 21401. (800-233-8764). 1998. Including photos, maps, tables, appendix, notes, selected bibliography, and index, 329 pages. $39.95.

Breuer, William B. *Vendetta!: Castro and the Kennedy Brothers.* John Wiley & Sons, Inc., 605 Third Ave., New York, NY 10158-0012. (212-850-6000). 1998. Including photos, notes and sources, and index, 278 pages. $24.95.

Cantwell, Gerald T. *Citizen Airmen: A History of the Air Force Reserve 1946–1994.* Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328. (202-512-1800). 1997. Including photos, appendices, notes, bibliography, and index, 544 pages. $38.00.

Day, Dwayne A., John M. Logsdon, and Brian Latell, eds. *Eye in the Sky: The Story of the Corona Spy Satellites.* Smithsonian Institution Press, PO Box 960, Herndon, VA 20172-0960. (800-782-4612). 1998. Including photos, appendices, notes, and index, 303 pages. $29.95.

Dean, Francis H., ed. *Report of Joint Fighter Conference NAS Patuxent River, MD 16–23 October 1944.* Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310. (610-593-1777). 1998. Including photos and appendix, 356 pages. $35.00.

Hanley II, Fiske. *Accused American War Criminal.* Eakin Press, PO Drawer 90159, Austin TX 78709-0159. (512-288-1771). 1997. Including photos, maps, appendices, bibliography, and index, 280 pages. $27.95.

Harkins, Hugh. *Eurofighter 2000: Europe's Fighter for the New Millennium.* Specialty Press Publishers and Wholesalers, 11481 Kost Dam Rd., North Branch, MN 55056. (800-895-4585). 1997. Including photos, illustrations, and index, 48 pages. $14.95.

Hayward, Joel S.A. *Stopped at Stalingrad: The Luftwaffe and Hilter's Defeat in the East, 1942–1943.* University Press of Kansas, 2501 W. 15th St., Lawrence, KS 66049-3904. (913-864-4155). 1998. Including photos, maps, notes, bibliography, and index, 393 pages. $39.95.

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Huertas, Salvador Mafé. *The Israeli Air Force 1947–1960: An Illustrated History.* Schiffer Publishing, 4880 Lower Valley Rd., Atglen, PA 19310. (610-593-1777). 1998. Including photos and appendices, 174 pages. $35.00.

Jung, Philippe, ed. *History of Rocketry and Astronautics: Proceedings of the 26th History Symposium of the International Academy of Astronautics.* American Astronautical Society, PO Box 28130, San Diego, CA 92198. (760-746-4005). 1997. Including photos, charts, diagrams, and references, 356 pages. $40.00.

Kern, Tony. *Redefining Airmanship.* McGraw-Hill, 1221 Avenue of the Americas, New York, NY 10020-1001. (212-512-2000). 1997. Including photos, charts, graphs appendix, glossary, bibliography, and index, 463 pages. $29.95.

Maydew, Randall C. *America's Lost H-Bomb: Palomares, Spain, 1966.* Sunflower University Press, 1531 Yuma, PO Box 1009, Manhattan, KS 66505-1009. (800-258-1232). 1997. Including photos, appendices, notes, suggested reading, and index, 160 pages. $16.95.

McLaren, David R. *Republic F-84 Thunderjet, Thunderstreak, & Thunderflash: A Photo Chronicle.* Schiffer Publishing, 4880 Lower Valley Rd., Atglen, PA 19310. (610-593-1777). 1998. Including photos, bibliography, and appendices, 207 pages. $29.95.

Mutza, Wayne. *AH-1 Cobra in Action.* Squadron/Signal Publications, 1115 Crowley Dr., Carrol ton, TX 75011-5010 (972-242-8663). 1998. Including photos, 50 pages. $7.95.

Myhra, David. *The Horten Brothers and Their All-wing Aircraft.* Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310 (610-593-1777). 1998. Including photos, appendices, bibliography, and index, 320 pages. $59.95.

Nichols, J.A. *B-24 Bomber Crew: A True Story of the Pacific War With Japan.* Vantage Press, Inc., 516 West 34th St., New York, NY 10001 (212-736-1767). 1997. Including photos, appendix, and index, 78 pages. $9.95.

Polmar, Norman, Eric Wertheim, Andrew Bahjat, and Bruce Watson. *Chronology of the Cold War at Sea 1945–1991.* Naval Institute Press, 2062 Generals Hwy., Annapolis, MD 21401. (800-233-8764). 1998. Including glossary, sources, and indices, 243 pages. $39.95.

Prien, Jochen. *Jagdgeschwader 53: A History of the "Pik As" Geschwader Volume 2: May 1942–January 1944.* Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310 (610-593-1777). 1998. Including photos and maps, 338 pages. $89.95.

Rahn, Bob, and Zip Rausa. *Tempting Fate: An Experimental Test Pilot's Story.* Specialty Press Publishers and Wholesalers, 11481 Kost Dam Rd., North Branch, MN 55056 (800-895-4585). 1997. Including photos, 175 pages. $22.95.

Shulimson, Jack, Lt. Col. Leonard A. Blasiol, USMC, Charles R. Smith, and Capt. David A. Dawson, USMC. *U.S. Marines in Vietnam: The Defining Year, 1968.* Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328 (202-512-1800). 1997. Including photos, maps, notes, appendices, and index, 805 pages. $70.00.

Spalding Aviator's Clothing & Equipment in the 1920s–1930s. Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310 (610-593-1777). 1998. Including photos, 36 pages. $9.95.

Sundin, Claes, and Christer Bergström. *Luftwaffe Fighter Aircraft in Profile.* Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310 (610-593-1777). 1997. Including photos, sources, and index, 141 pages. $35.00.

Temkin, Gabriel. *My Just War: The Memoir of a Jewish Red Army Soldier in World War II.* Presidio Press, 505 B San Marin Dr., Ste. 300, Novato, CA 94945-1340 (415-898-1081). 1998. Including photos, maps, and appendix, 236 pages. $24.95.

Toliver, Raymond F., and Trevor J. Constable. *Fighter Aces of the U.S.A.* Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310 (610-593-1777). 1997. Including photos, appendices, and index, 400 pages. $59.95.

Wallace, Harold D., Jr. *Wallops Station and the Creation of an American Space Program.* Government Printing Office, Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7954 (202-512-1800). 1997. Including photos, maps, appendices, bibliography, and index, 167 pages. $8.50.

Wichtrich, A.R. *Mis-X: Top Secret.* Pentland Press, Inc., 5122 Bur Oak Cir., Raleigh, NC 27612. 800-948-2786. 1997. Including photos, 114 pages. $21.95.

Woodward, Ellis M. *Flying School: Combat Hell.* American Literary Press, Inc., 8019 Belair Rd., Ste. 10, Baltimore, MD 21236 (800-873-2003). 1998. Including photos, 191 pages. $14.95.

Worden, Col. Mike, USAF. *Rise of the Fighter Generals: The Problem of Air Force Leadership 1945–1982.* Air University Press, OAS/PR, 170 West Selfridge, Maxwell AFB, AL 326112-6610. (334-953-2773). 1998. Including charts, notes, appendices, bibliography, and index, 281 pages. $18.00.

Wright, Mike. *What They Didn't Teach You About World War II.* Presidio Press, 505 B San Marin Dr., Ste. 300, Novato, CA 94945-1340. (415-898-1081). 1998. Including photos, selected bibliography, and index, 345 pages. $24.95. ■

AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

AFA Honors Berlin Airlifters

The Air Force Association's commemoration of the 50th anniversary of the Berlin Airlift began in February at **Central Florida Chapter's** black-tie gala, where veterans and Allied countries that participated in the historic achievement received special honors.

Fifty years ago, beginning in June 1948, the Soviet Union blocked land, rail, and barge access to West Berlin in an attempt to force the western powers out of the city. A newly independent US Air Force and US Allies responded with the Berlin Airlift, which during more than a year of operations brought 2.3 million tons of cargo into the blockaded sector of the city.

This milestone in USAF history was celebrated by the Central Florida Chapter in conjunction with the Air Warfare symposium held in Orlando, Fla.

Acting Air Force Secretary F. Whitten Peters and USAF Chief of Staff Gen. Michael E. Ryan headed the list of distinguished guests. To highlight the evening, Ryan and Robert E. Ceruti, chapter president, presented Ira C. Eaker awards to six honorees having direct ties to the airlift.

At Central Florida Chapter's anniversary commemoration of the Berlin Airlift, Ann Tunner accepted on behalf of her husband an Ira C. Eaker award from USAF Chief of Staff Gen. Michael Ryan (left) and Chapter President Robert Ceruti. Tunner's husband, Lt. Gen. William Tunner, commanded the historic airlift that began in June 1948.

Ann Tunner accepted an award on behalf of her late husband, Lt. Gen. William H. Tunner. As commander of the 1st Airlift Task Force and of the Combined Airlift Task Force, General Tunner was in charge of the Berlin Airlift. Mrs. Tunner is a member of the **Langley (Va.) Chapter.**

Retired Col. Gail S. Halvorsen, the legendary "Candy Bomber" who used handkerchiefs to parachute candy and gum to Berlin's children during the airlift, also received an Eaker award. He is a member of the **Salt Lake (Utah) Chapter.**

A third recipient was retired Lt. Col. James R. Spatafora, who was an airman second class when he was sent on 23 days' TDY to help with the Berlin Airlift. He stayed for 42 months. Back then an aircraft mechanic and crew chief, today he is a member of the **Albuquerque (N.M.) Chapter.**

Also receiving Eaker awards were representatives of Allies that helped maintain West Berlin's freedom: Col. Christian Souleres, air attache, French Embassy in Washington; Group Capt. Robert Ivesor, assistant air attache from the British Embassy; and Lt. Col. Thomas Hoenig, assistant air attache, German Embassy.

A donation of $1000 to the Aerospace Education Foundation has been made in the name of the recipient of an Individual Ira C. Eaker award.

The Berlin Airlift's famous "Candy Bomber," retired Col. Gail S. Halvorsen (center)—who air-dropped candy and gum to the city's children—was among the airlift veterans honored at the Central Florida Chapter's gala. He also received an Eaker award from Ryan and Ceruti.

Central Florida Chapter's Ceruti and Martin H. Harris, national director emeritus and the gala's chairman, also presented $35,000 from the chapter to AEF. In addition, Joseph Coors Jr., the Air Force Memorial Foundation's chairman of the board, received a $10,000 donation for the foundation from the chapter.

AFA at Berlin Airlift Commemorations

AFA National President Doyle E. Larson and AEF President Walter E. Scott are in Germany this month, attending several events that kick off US Air Forces in Europe's year-long commemoration of the Berlin Airlift.

On May 26, USAFE will host a 50th anniversary banquet at Rhein–Main AB, followed by a wreath-laying ceremony May 27 at the Berlin Airlift Memorial near Frankfurt IAP.

Larson and Scott plan to present a copy of the Berlin Airlift painting "Staying Power," by G I Cohen, from USAF's 50th Anniversary Collection, to USAFE Commander Gen. John P. Jumper.

While in Europe, Larson will also visit with Air Force officials and local AFA leaders at Ramstein and Spangdahlem ABs, Germany, Aviano AB, Italy, and RAFs Mildenhall and Lakenheath, UK.

Frank Swords, Special Assistant Europe, also plans to attend the anniversary banquet and wreath laying ceremony.

The dean of the air attache corps, Maj. Gen. Cornelius J. van den Burg (right), Royal Netherlands Air Force, chats with William D. McGuth, general manager, military programs, Rolls-Royce North America, at AFA's annual Foreign Air Attache Reception in March.

AFA National President Doyle Larson (right) greeted Air Force and defense industry representatives at the air attache reception, including USAF Vice Chief of Staff Gen. Ralph Eberhart (center) and McGuth.

Saluting Our Allies

More than 100 foreign military, US Air Force, and defense industry representatives attended AFA's 18th annual reception for foreign air attaches.

At the March gathering, held in Arlington, Va., Maj. Gen. Cornelius J. van den Burg, defense and air attache, Royal Netherlands Air Force, was honored as dean of the foreign air attache corps. In his remarks to the gathering, he thanked AFA for organizing the Air Force Fifty celebration in Las Vegas last year and said he would "remember forever" the Global Air Chiefs Conference. He also praised *Air Force* Magazine for its coverage of defense issues and said, "The magazine is a great help to attaches."

The reception serves to recognize the importance and contributions of USAF's foreign military allies. This year, USAF Chief of Staff Ryan and Vice Chief of Staff Gen. Ralph E. Eberhart attended the event. Other USAF dignitaries included Lt. Gen. William J. Donahue, director of communications and information; Lt. Gen. Lawrence P. Farrell Jr., deputy chief

of staff for plans and programs; Maj. Gen. John P. Casciano, director of intelligence, surveillance, and reconnaissance; and Maj. Gen. Robert A. McIntosh, chief of Air Force Reserve and commander of Air Force Reserve Command.

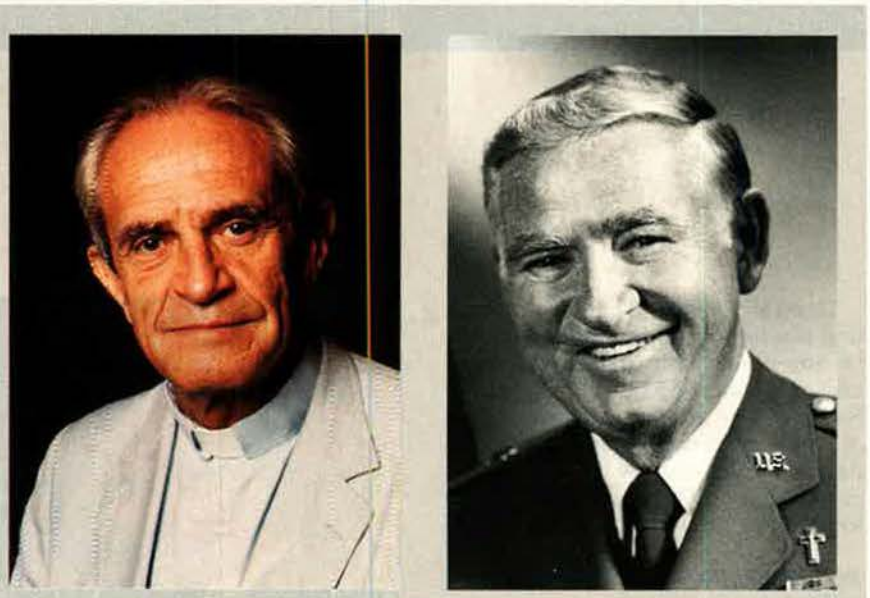
Military officers from more than 20 countries, including Brazil, Chile, China, Jordan, Poland, Romania, Russia, Slovak Republic, Tunisia, Turkey, and Ukraine, attended.

New Chaplain

After serving for 15 years as AFA national chaplain, Rev. Richard Carr has stepped down from the post and Chaplain Donald J. Harlin has been appointed in his place. Carr will remain a member of the Veterans/Retiree Council.

Carr retired from active duty in 1982 as a major general and chief of chaplains. The El Centro, Calif., native enlisted in the Army Air Corps in 1943, serving as a B-24 radio operator–gunner in the South Pacific. He was released from active duty and went on to earn a bachelor's degree from Whitworth College in Spokane, Wash. He was recalled to active duty twice during the 1950s and in between earned a graduate degree from Fuller Theological Seminary, Pasadena, Calif , and became a minister.

Harlin retired from the Air Force as a major general in August 1995. The former chief of chaplains is a native of New York City and holds a bachelor's degree and doctor of divinity degree from Nyack College, Nyack,



After 15 years of service at the association's conventions, symposiums, and many other special events, Richard Carr (left) has stepped down as AFA national chaplain. Donald Harlin (right) was appointed to the position.

N.Y., and a master's degree from Gordon–Conwell Theological Seminary, South Hamilton, Mass. He entered the service in 1965 and served as chaplain at bases around the world. He was also commandant of the Air Force Chaplain School at Maxwell AFB, Ala.

How to Rebuild a Chapter

It was AFA's first chapter, back then called Squadron No. 1.

It is now called the **Baltimore (Md.) Chapter,** and under Chapter President Julie E. Petrina it is going through an ambitious revitalization.

Petrina, an AFA under-40 national director and an ANG C-130 pilot, began her task by researching the chapter's history. She learned that at a regional conference on June 21, 1946, Jimmy Doolittle—then a retired lieutenant general and AFA's first national president—presented the chapter's charter to John R. Mitchell, squadron commander. More than 700 were in attendance, including Stuart Symington, assistant secretary of war for air; Gen. Carl A. "Tooey" Spaatz, commanding general of the Army Air Forces; and Glenn L. Martin, airplane manufacturer.

The research exercise underlined for Petrina the chapter's importance to AFA and also inspired an idea for quarterly meetings: Petrina would like to repeat important programs the chapter has held through the past 51 years—for example, recreating the June 1946 program with today's Secretary of the Air Force and the Chief of Staff as special guests. Also on the planning board: A reprise of a November 1952 Airpower Ball.

Petrina suggested that other chapters research their histories because her experience taught her that tying the chapter to the community is one way to capture the interest of local leaders.

She also wrote a comprehensive strategic action plan, detailing how the chapter will reach active duty and reserve personnel, ROTC, JROTC, and Civil Air Patrol cadets, Industrial Associates, and Community Partners.

The chapter set up a speaker's bureau aimed at the Air National Guardsmen who are based at Martin State Airport, Md. Retired Maj. Gen. Charles D. Link, a key USAF figure in recent defense reassessments and now president of the Air Force Memorial Foundation, was the first speaker. He addressed members of the 135th Airlift Squadron in January, discussing the Quadrennial Defense Review.

To reach out to AFA's Industrial Associates in the chapter's area, the chapter held a meeting of the community's business leaders in February. Organized with the help of Charles G. Durazo, national director, and hosted by chapter member Bruce F. Tuxill, it attracted more than 20 industry and community representatives. They learned about the chapter's and AFA's mission. They also met AFA leaders including John A. Shaud, executive director; R. Donald Anderson, national vice president (Central East Region); and Mary Anne Thompson, national director.

An outcome of this gathering is the establishment of a steering committee of business and community leaders who can help revitalize the chapter through their contacts and knowledge of the area.

AFA Conventions

May 2, **North Central Region State Convention,** Minneapolis; May 2, **New Jersey State Convention,** Piscataway, N.J.; May 8–9, **South Carolina State Convention,** Sumter, S.C.; May 8–10, **Louisiana State Convention,** New Orleans; May 15, **Maryland State Convention,** Andrews AFB, Md.; May 15–16, **Tennessee State Convention,** Nashville, Tenn.; June 5–7, **Iowa State Convention,** Waterloo, Iowa; June 5–7, **New York State Convention,** Ronkonkoma, N.Y.; June 6–7, **Arizona/Nevada State Convention,** Laughlin, Nev.; June 12–14, **Missouri State Convention,** St. Louis; June 13, **Illinois State Convention,** Galesburg, Ill.; June 19–20, **Arkansas State Convention,** Jacksonville, Ark.; June 19–20, **Mississippi State Convention,** Columbus, Miss.; June 19–20, **Ohio State Convention,** Columbus, Ohio; July 17–19, **Texas State Convention,** San Angelo, Texas; July 17–19, **Virginia State Convention,** Hampton, Va.; July 24–25, **Oklahoma State Convention,** Oklahoma City; July 24–26, **Pennsylvania State Convention,** Carlisle, Pa.; July 25, **Florida State Convention,** Melbourne, Fla.; Aug. 7–8, **Colorado State Convention,** Aurora, Colo.; Aug. 7–8, **North Carolina State Convention,** Goldsboro, N.C.; Aug. 14–16, **California State Convention,** Vandenberg AFB, Calif.; Aug. 15, **Georgia State Convention,** Savannah, Ga.; Aug. 22, **Indiana State Convention,** Indianapolis; Sept. 12, **Delaware State Convention,** Dover, Del.; Sept. 14–16, **AFA National Convention and Aerospace Technology Exposition,** Washington.

Paul Metz (right), pilot of the F-22's first flight, spoke about the experience to the West Palm Beach Chapter, whose president is Jack McDonald (left). Another guest at the chapter meeting was retired Maj. Gen. William Oscar Senter (center), a former commander of Oklahoma City Air Materiel Area.

Palm Beach

Lockheed Martin's F-22 chief test pilot described the Raptor's first flight, as well as the stealth fighter's features and capabilities, during an hour-long presentation to the **West Palm Beach (Fla.) Chapter** in January.

Paul Metz, who flew the aircraft at speeds up to 285 mph on its Sept. 7 first flight from Dobbins ARB, Ga., used many analogies to help the 130-member audience understand the mission and systems of USAF's first new fighter in 20 years. For example, reported Lawrence M. Danner, the chapter's vice president for communications, Metz told them to imagine they were swimming in a pool of sharks who can't tell they are there. "Imagine that if you reach out and touch one of the sharks, it dies. That is how the F-22 will be in combat," Metz said.

USAF photo by Mickey Jordan

The Nation's Capital (D.C.) Chapter honored Rep. Bob Livingston (R–La.), chairman of the House Appropriations Committee, with its Distinguished American Award. Chapter President Gerry Smith (right) presented the award in recognition of Livingston's national defense leadership and accomplishments.

He also showed a film on the first flight and described maneuvers and tests that determined handling and engine performance.

The dinner meeting included a posting of the colors and a POW/MIA remembrance ceremony, performed by the AFJROTC unit of Martin County High School, Stuart, Fla.

James M. Shipman, chapter treasurer, came up with the idea of inviting Metz. The Pratt & Whitney employee worked through company representatives to contact Lockheed Martin and Metz Shipman said Metz toured the West Palm Beach Pratt & Whitney facility as part of his visit to the area.

Palm Trees

When supertyphoon Paka slammed into Guam in December, relief supplies and help poured into the island to aid Andersen AFB and other residents with the recovery effort.

But earlier, many of Guam's businesses had shown a generosity of their own through donations for a **Guam–Arc Light Chapter** golf tournament that raised $4,200 to provide clothing, tools, and other basic supplies to sparsely populated islands in the Mariana Islands.

Under the leadership of President Dion W. Johnson, the chapter organizers of the golf tournament, which was held at Andersen's Palm Tree Golf Course, rounded up airline tickets, hotel getaways and meals, gift certificates, and door prizes that included more than 50 items of golf accessories. The chapter had so many left over donated items at the end of their two-day tournament and its culminating banquet that they gave 40 ball caps, 38 water bottles, and 25 sports bags to the Andersen AFB high school students.

Nearly 90 people—about half of them chapter members—took part in the golf tournament, and a banquet at the Hyatt Hotel attracted more than 120 guests, reported Thomas M. Churan, chapter secretary. Chapter member Ronald L. Ostern served as chairman and host for both events.

Palm Springs

AFA's newest chapter in California, the **Palm Springs (Calif.) Chapter**, welcomed National President Doyle E. Larson to a dinner celebrating its chartering in March.

More than 100 guests turned out for the event at the Palm Springs Riviera Hotel, among them Arthur F. Trost, national vice president (Far West Region); Paul A. Maye, California state president; H. B. "Buzz" Henderson, national director emeritus; and Gerald S. Chapman, national director. Chapter President John W. Lynch, Vice President Robert M. Patterson, and Treasurer John Powell also attended.

Larson spoke on information warfare and also attended a chapter meeting the next day.

Chapter President Lynch wrote that many of the out of town guests at the chapter dinner arrived early in order to visit the Palm Springs Air Museum. Lynch, a former national vice president (Far West Region), said he activated the chapter in part to be of more service to the museum.

The Palm Springs Air Museum has about 18 still-flyable aircraft, including classics such as the A-26 Invader, B-17 Flying Fortress, B-25 Mitchell, P-38 Lightning, P-40 Warhawk, and P-63 Kingcobra. It also has all the Navy "cats"—the Grumman F-4F Wildcat, F6F Hellcat, F7F Tigercat, F8F Bearcat, and F-14 Tomcat.

Happy Birthday

March 1 marked the 10th anniversary of the **Cape Fear (N.C.) Chapter,** an event the chapter celebrated with a dinner meeting later that week featuring as guest speaker Gulf War veteran Lt. Col. Daniel B. Bakke.

In 1991 Bakke was an F-15E weapon system officer with the 335th Tactical Fighter Squadron from Seymour Johnson AFB, N.C., flying out of Al Kharj AB, Saudi Arabia, during the war. He was the back-seater on Scud combat air patrol with Capt. Richard T. Bennett in northwestern Iraq on Feb. 14, 1991, when they downed an Iraqi helicopter with a laser-guided bomb, a unique event in aerial warfare.

Bakke is now operations officer for the 344th Fighter Squadron at Seymour Johnson.

For the chapter meeting he spoke about the 4th Fighter Wing's mission, as well as the more than 50 combat missions he flew during the Gulf War.

James E. "Red" Smith, national director, attended this anniversary dinner, along with five other former state presidents: Alton V. Jones, John White, Norman E. Davis Jr., William W. Michael, who is now state secretary, and Robert C. Newman Jr., who was state president when the chapter was chartered.

Gerald V. West, chapter president, said the chapter had 30 members when it was chartered and today has 149. Of the original 30 members, 18 are still with the chapter, he added.

A Room of Their Own

The **Langley (Va.) Chapter** recently helped renovate a room in the Langley AFB Officers' Club. The room now boasts AFA plaques on each of the double doors at the entrance. A brass plaque mounted on the hallway wall labels the place as the "AFA Room."

Inside the room hangs a copy of the chapter charter, photos of current officers, a roster of past presidents, and photos of recent award winners from Langley's 1st Fighter Wing. A custom-made display case

serves as the room's focal point and shows off chapter memorabilia.

The chapter had been seeking a place to display awards and mementos at a time when the O Club was preparing to renovate one of its rooms. The two parties agreed to share the cost of the renovation, and the O Club allowed the chapter to influence the room's design and to set up a display in it. George D. Golden, Virginia state president and a past chapter president, served as the chapter's chairman for this project. Lester J. Rose, past president, oversaw the construction of the display case.

Golden and Rose were joined at the room's dedication by Dale A. Green, chapter president; Barry F. Creighton, chapter vice president for programs; CMSgt. Keith A. Ebert, chapter vice president for enlisted affairs; and patron members Nikki L. Barry and Ellen Holloway Merilic.

The new AFA room will be the site of chapter receptions and executive council meetings, wrote Gary L. Shanafelt. It is, however, too small to hold a chapter quarterly meeting.

Lt. Gen. Brett M. Dula, Air Combat Command vice commander, was a guest speaker for the chapter's latest such gathering. He spoke about individual preparedness and on the importance of keeping a solid core of Air Force service members. Shanafelt reported that Dula spoke directly to the large number of junior officers in the crowd when he said, "You may go on to do other things outside of the Air Force and become successful in them, but you will never do anything more important than what you are doing today."

Mixing Young and Old

The third annual reception for AFROTC cadets at the University of Kentucky in Lexington brought together 14 members from the **Lexington Chapter** with 30 junior- and senior-year cadets—the highest turnout so far for the event.

The evening began with chapter members introducing themselves in an informal three-minute speech. Among them were a World War II B-29 pilot who served in the Pacific, a helicopter pilot from the post–Korean War era, and a Vietnam War veteran.

Chapter President Col. Steve Parker reported that the cadets were fascinated by the World War II veterans because, for them, that war is so far in the past that they have not even heard people talk about it. For them, the mixer was an oral history lesson, he added.

According to Parker, cadet wing commander Jay C. Hennette said, "This was a great chance to learn from those who have gone before us and to truly appreciate the sacrifices they have made."

Khobar Towers

Col. Rocky Lane, former director of force protection, US Transportation Command and Air Mobility Command, recently spoke to a **Charleston (S.C.) Chapter** meeting about his role in the investigation of the bombing of Khobar Towers at King Abdul-Aziz AB, Saudi Arabia.

The two-building complex housed nearly 3,000 military personnel. Terrorists detonated a truck bomb next to it June 25, 1996. Nineteen USAF service members were killed and hundreds of others were injured.

Illustrating his talk with slides, Lane spoke forthrightly about why the buildings collapsed and how much more damage could have occurred, said Robert K. Strobel, chapter vice president. Lane also covered new security procedures at gates and at airports, including the Phoenix Raven program. These volunteer Security Force personnel join AMC aircrews that fly into countries where the security risk is high.

Showing Them the Ropes

When US Southern Command left Quarry Heights, Panama, in September and moved to Miami, Chapter Presidents Stanley J. Bodner of the **Miami Chapter** and John H. Breslin of the **John W. DeMilly Jr. (Fla.) Chapter** saw an opportunity to raise the newcomers' awareness of AFA. They organized an orientation of Homestead ARB, located about 30 miles from Miami but the closest military installation for the newly arrived SOUTHCOM members.

Michael E. Richardson of the DeMilly Chapter noted that Col. Cathy Rhodes, the Air Force Element commander, and CMSgt. Charleen Carty, senior enlisted adviser, headed the SOUTHCOM contingent.

Col. Richard J. Eustace, commander of the 482d Fighter Wing (AFRC) at Homestead, got the orientation under way, followed by briefings from base support personnel.

Homestead is the site of one of two experimental BX Marts—combined commissary–exchange stores—in the US. Wayne Hansen, manager of the Homestead facility, described the goods and services the BX Mart offers. He also informed the guests about the pharmacy courier service providing weekly service from the Patrick AFB, Fla., hospital and a new Joint Military Clothing Sales store that provides uniforms for all branches of service.

Karen A. O'Shaughnessy, the wing's chief of services, told the audience about base activities available to them, such as the All Ranks Club, the Sports and Fitness Center, and its outdoor recreation department.

The guests also toured the US Customs Service facility, under the guidance of Michael G. Spitzer, DeMilly Chapter member, and Timothy L. Dybis of the Miami Chapter. The two Customs Service pilots showed videos on their drug interdiction mission and showed visitors some of the aircraft used in their work.

The visitors next toured a hangar where an F-15 and F-16 aircraft—the type of fighters stationed at Homestead—were on display.

Chapter members and eight cadets from the University of Miami AFROTC detachment manned the grill for a hot dogs–and-hamburgers lunch provided by United Airlines.

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: fmckenney@afa.org. ■

Unit Reunions

1st AACS Mobile. Sept. 17–21, 1998, at the Hope Hotel at Wright–Patterson AFB, OH. **Contact:** James Mumaw, 5748 Mallard Dr., Dayton, OH 45424 (937-236-5323).

1st Strategic Air Depot Assn, Eighth AF, UK (1942–46). Oct. 1–4, 1998, in Omaha, NE. **Contact:** Herb Kaster, 720 Society Hill, Cherry Hill, NJ 08003 (609-751-1763).

4th Emergency Rescue Sq Assn. Oct. 14–18, 1998, in Dearborn, MI. **Contact:** Chet Gunn, 237 Franklin St., Reading, MA 01867-1030 (781-944-6616).

8th Photo Recon Sq Assn. Sept. 16–20, 1998, in Anaheim, CA. **Contact:** Andy Kappel, 6406 Walnut St., Kansas City, MO 64113 (816-363-0261).

9th BG Assn. Oct. 7–11, 1998, in San Diego. **Contact:** Herb Hobler, 295 Mercer Rd., Princeton, NJ 08540 (800-244-1945 or 609-921-3800).

13th BS, Fifth AF (WWII). May 31–June 3, 1998, at the Best Western Inn on Bourbon in New Orleans. **Contact:** Vernon J. Main Jr., 1024 Harding Dr., New Orleans, LA 70119 (504-488-4848).

18th Fighter–Bomber Wg Assn (WWII, Korea, and Vietnam). Oct. 8–11, 1998, at the Ramada Beach Resort in Fort Walton Beach, FL. Members of the 12th, 39th, 44th, 67th, 70th FSs, and No. 2 Sq, South African AF, are invited. **Contact:** Ed Slown, 299 S. Bayshore Dr., Valparaiso, FL 32580 (850-678-7284) (flajvf@aol.com).

20th AF (Guam). Sept. 10–13, 1998, at the Holiday Inn Downtown Resort in Myrtle Beach, SC. **Contact:** Olan R. Thomas, PO Box 7086, Newark, DE 19714-7086 (302-731-5247).

23d Tactical Air Support Sq. Oct. 9–11, 1998, in Fort Walton Beach, FL. **Contact:** Rowdy Hetherington, 110 Rushton Ln., Tavernier, FL 33070 (305-852-6156) (BIGBAI@ix.netcom.com).

31st Fighter Officers Assn. Oct. 8–11, 1998, at the Holiday Inn South in Austin, TX. **Contact:** William D. Mol, 3601 Piute Trail, Austin, TX 78739 (512-282-3290).

38th BG (Southwest Pacific, WWII). Oct. 8–11, 1998, at the Hilton Riverfront in Little Rock, AR. **Contact:** Harlan L. Denning, 2425 Mark Ct., Richland, WA 99352-9793 (509-627-4410).

39th FS Assn, 40th and 41st Sqs (WWII and Korea). Oct. 14–18, 1998, at the Four Points Hotel in Fort Walton Beach, FL. **Contact:** John C. Dunbar, 68 Marianne Rd., Waltham, MA 02154 (617-893-7585).

43d BG Assn. Sept. 6–13, 1998, at the Marriott Hotel in Springfield, MA. **Contact:** Russ Burnett, PO Box 123, Conway, MA 01341-0126 (413-369-4325).

48th Troop Carrier Sq, 313th Troop Carrier Gp. Sept. 15–17, 1998, in Bakersfield, CA. **Contact:** Clint Douglass, 231 21st St., Bakersfield, CA 93301 (805-327-0258).

63d Station Complement Sq, Ninth AF (WWII). June 5–6, 1998, at the Radisson Suite Hotel in Ogden, UT. **Contact:** Charles E. Maughan, 19 W. 1325 S., Logan, UT 84321 (435-750-5803).

65th Troop Carrier Sq. July 29–Aug 2, 1998, in West Memphis, AR. **Contact:** Robert Wyatt, 450 S. Roselawn Dr., West Memphis, AR 72301-2518 (870-735-2930) or Bud Hawkey, 106 Union Dr., New Madison, OH 45346 (937-996-3851).

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.

66th Troop Carrier Sq. Oct. 15–17, 1998, in Nashville, TN. **Contact:** Bill Chapman, 504 Dillard Ct., Nashville, TN 37220 (615-834-6518) or Carl King (937-433-9504).

78th Troop Carrier Sq (WWII). Sept. 16–19, 1998, Boston area. **Contact:** Fred Kopatz Jr., 4315 Naneen Dr., Louisville, KY 40216-3938 (502-367-8106).

92d BG. Oct. 15–20, 1998, at the Holiday Inn Hotel and Conference Center in Hampton, VA. **Contact:** Irv Baum, 3935 Young Ave., Napa, CA 94558-2654 (707-258-1289).

98th BG/BW Veterans Assn. Sept. 4–9, 1998, at the Sheraton Cleveland City Centre in Cleveland, OH. **Contact:** Stan Flentje, 310 Sunnywood Ln., San Marcos, TX 78666-8914 (512-396-2509).

111th Tactical Recon Sq (WWII). Sept. 9–13, 1998, at the Holiday Inn Dayton Mall in Miamisburg, OH. **Contact:** John A. Kovach, 4350 Longfellow Ave., Huber Heights, OH 45424-5949 (937-233-4656).

301st BW/Gp. Oct 15–18, 1998, at the Holiday Inn City Center in Tucson, AZ. **Contact:** Martin Etler, 15-12 Elmary Pl., Fair Lawn, NJ 07410-2403 (201-797-6610).

315th Troop Carrier Gp (WWII), 34th, 43d, 309th, and 310th Troop Carrier Sqs. Sept. 9–13, 1998, at the Radisson Inn North in Colorado Springs, CO. **Contact:** Bob Cloer, 1417 Valley View Dr., Yuba City, CA 95993 (530-674-3681).

316th Troop Carrier Gp (WWII). Oct. 8–11, 1998, in Atlanta. **Contact:** Lloyd E. Drake or Steve and Bonnie Green, 3030 Black Gum Dr., Kennesaw, GA 30152-3354 (770-425-3030) (bsdg@msn.com).

317th Troop Carrier Gp, 41st Troop Carrier Sq, Fifth AF (WWII). Oct. 8–11, 1998, in Dayton, OH. **Contact:** Don Lowe, 209 Fairview Ave., Marysville, OH 43040-9705 (937-642-9314).

344th BG Assn. Aug. 28–31, 1998, in Nashville, TN. **Contact:** Lambert Austin, 5747 Darnell St., Houston, TX 77096 (713-774-3030).

344th Service Sq, Thirteenth AF, South Pacific (WWII). Sept. 28–Oct. 1, 1998, at the Treasure Island at the Mirage in Las Vegas. **Contact:** Jerome G. Peppers Jr., 245 Orville St., Apt. 17, Fairborn, OH 45324-2959 (937-754-0701) or Al Sebastian (253-850-3089).

361st FG (WWII). Sept. 9–13, 1998, at the Crowne Plaza in Nashville, TN. **Contact:** Dave Landin, 8419 Michael Rd., Richmond, VA 23229 (804-288-5889).

365th FG "Hell Hawks," 386th, 387th, and 388th FSs. Oct. 5–9, 1998, in Reno, NV. **Contact:** Gale Phillips, 7996 Vintage Way, Fair Oaks, CA 95628-3636 (916-967-6250 or, after May 15, 530-259-2872) (75210.2102@compuserve.com).

376th Air Refueling Sq (1953–66). Oct. 9–11, 1998, at Barksdale AFB, LA. **Contact:** Ray Burgess Jr., Reunion Committee, 376th AREFS, PO Box 376, Barksdale AFB, LA 71110-0376.

376th BG (WWII). Sept. 3–7, 1998, at the Hilton Minneapolis St. Paul Airport in Bloomington, MN. **Contact:** Joe Lynn, 1660 N. 200 E. Rd., Stonington, IL 62567-9602 (217-325-3327).

401st BG Assn. Oct. 1–4, 1998, at the Marriott Riverfront in Savannah, GA. **Contact:** George Menzel, PO Box 31416, Savannah, GA 31416 (912-598-0276).

402d FS, 370th FG (WWII). Oct. 13–18, 1998, at the Sheraton Four Points Hotel in Atlanta. **Contact:** J.W. Routon, 455 Jordan Dr., Tucker, GA 30084 (770-923-7856) or Paul Craig, 406 General Griffith Cir., Rutherfordton, NC 28139 (704-286-9187).

436th Military Airlift Wg. Oct. 13–14, 1998, at Dover AFB, DE. **Contact:** Ron Love, 8 Ringed Neck Ln., Wyoming, DE 19934 (302-697-7393) (rlove@state.de.us) or (ron.love@dol.net).

437th Troop Carrier Wg, 2471st ARFC. Sept. 19–21, 1998, in San Antonio. **Contact:** Jim Ray, 6015 James Ave. S., Minneapolis, MN 55419 (612-798-5958).

438th Troop Carrier Gp, 87th, 88th, 89th, and 90th Troop Carrier Sqs. Oct. 22–25, 1998, at the Ramada Beach Resort in Fort Walton Beach, FL. Members of the 17th, 82d, 101st Airborne Divisions and 438th Airlift Wg, McGuire AFB, NJ, are invited. **Contact:** Bob Gates, 254 Yacht Club Dr., Fort Walton Beach, FL 32548-5876 (850-243-7465) (waynepatton@fwb.gulf.net).

440th Signal Battalion and 465th, 467th, and 472d Signal Battalions. Sept. 25–27, 1998, in Altoona, PA. **Contact:** Richard Fluke, RD 1, Box 46, Saxton, PA 16678 (814-928-5041).

442d AFRES. June 19–20, 1998, D.A.V., in Kansas City, MO. **Contact:** Joe C. Blair, 3214 E. 104th St., Kansas City, MO 64137-1501 (816-761-5001).

459th BG Assn, Fifteenth AF (WWII). Oct. 1–4, 1998, at the Holiday Inn Hotel and Conference Center in Hampton, VA. **Contact:** Don Stevenson, PO Box 337, Somers, CT 06071 or John Devney, 90 Kimbark Rd., Rochester, NY 14610 (716-381-6174).

466th BG Assn, Eighth AF (WWII). Oct. 13–18, 1998, at the Hilton at Cherry Hill, NJ, in conjunction with the Eighth Air Force Historical Society. **Contact:** Lou Loevsky, 16 Hamilton Dr. E., North Caldwell, NJ 07006 (973-226-4624).

487th BG, Eighth AF (WWII). Sept. 22–26, 1998, in Tucson, AZ. **Contact:** Duke Doucette, 4701 W. Placita De Suerte, Tucson, AZ 85745 (520-743-7383).

502d Troop Carrier Gp, 605th, 606th, 607th, 608th, and 6147th Sqs (Korea). May 17–19, 1998, at the Harrah's St. Louis Riverport Casino and Hotel in Maryland Heights, MO. **Contact:** Len Franklin, 6 Karabair Rd., St. Peters, MO 63376 (314-441-6766).

509th BW. Sept. 23–27, 1998, in Tampa, FL. **Contact:** Jus Rose, PO Box 76278, Ocala, FL 34481 (352-873-0841) (ROSE509BN@aol.com).

511th AC&W Gp, 613th, 847th, and 848th AC&W Sqs. Sept. 16–20, 1998, in Nashville, TN. **Contact:** Don Simmons, 704 S. Grove Rd., Richardson, TX 75081 (972-231-6518) (dona7112@iadfw.net).

601st Troop Carrier/601st AC&W/601st AC Sqs, Germany (1945–95). Oct. 7–10, 1998, in Nashville, TN. **Contact:** Harry Ambrose, 18720 Dallas Ln., Little Rock, AR 72211 (501-821-3509).

735th AC&W Sq, Mechra Bel Ksiri, Morocco (1952–60). Sept. 26–29, 1998, at the Monarch Hotel and Conference Center Portland South in Clackamas, OR. **Contact:** Glenn D. Barth, 7250 S.W. 189th Ave., Beaverton, OR 97007 (503-649-6915).

793d Military Police Bn Assn (1942–61). Sept. 23–26, 1998, at the Sheraton Milwaukee Brookfield Hotel in Brookfield, WI. **Contact:** Frank De Rosa, 640 S. Kaspar Ave., Arlington Heights, IL 60005-2320 (847-255-3977).

801st/492d BG Assn "Carpetbaggers." Oct. 14–18, 1998, at the Holiday Inn Midtown in Savannah, GA. **Contact:** William Becker, 6228 Camino Del Rincon, San Diego, CA 92120-3113 (619-675-7163 or fax 619-582-4323) or Sebastian H. Corriere, 4939 N. 89th St., Milwaukee, WI 53225-4107 (phone or fax 414-464-8264).

806th Air Police Sq. Oct. 8–10, 1998, in Orlando, FL. **Contact:** Jim Gerace, 58675 Delacroix Ave., Plaquemine, LA 70764 (504-687-6490).

3389th/3512th Pilot Training Sq (instructors and students). Oct. 16–18, 1998, at the Grand Casino Hotel in Biloxi, MS. **Contact:** Chuck Davies, 4435 Monaco Dr., San Antonio, TX 78218 (210-653-1475 or 210-828-4481).

Air Force Pubic Affairs Alumni Assn. June 25–27, 1998, at the Hope Hotel, Wright–Patterson AFB, OH. **Contact:** John Terino, PO Box 540, Fairfax, VA 22030-0540 (703-978-2704).

Air Rescue Assn. Sept. 16–20, 1998, at The Pines Resort Hotel and Conference Center in South Fallsburg, NY. **Contact:** Tom Seebo, 1201 Danberry St., Burkburnett, TX 76354 (940-569-4573).

Air Resupply and Communications Assn, 580th, 581st, and 582d ARCSs. Sept. 24–27, 1998, in Andover, MA. **Contact:** Phil McChesney, 17 Saddle Ridge Rd., Dover, MA 02030 (508-785-1749).

Assn of Air Force Missileers. Oct. 21–25, 1998, at the Holiday Inn Resort in Cocoa Beach, FL. **Contact:** Charles G. Simpson, PO Box 5693, Breckenridge, CO 80424 (phone or fax 970-453-0500) (AFMISSILEERS@compuserve.com).

Aviano Reunion Assn. Oct. 7–11, 1998, in Portobuffole, Italy. **Contact:** Brice Headley, 4509 Southampton Ct., Tampa, FL 33624-4363 (813-961-1418).

Flying Cadet Class 40-F. Oct. 1–3, 1998, at The Menger Hotel in San Antonio. **Contact:** Charles A. Beckham, 6002 Winding Ridge, San Antonio, TX 78239 (210-654-7139 or 214-943-5448).

P-47 Thunderbolt Pilots Assn. May 21–25, 1998, at the Hyatt Regency in Dallas. **Contact:** Al Hagg, PO Box 2365, Lindale, TX 75771 (903-882-1497) (jdalh@juno.com).

Pilot Class 52-A. Oct. 8–11, 1998, in Colorado Springs, CO. **Contact:** Marc Reynolds, 1005 S. 9275 E., Huntsville, UT 84317 (801-745-0643).

Pilot Classes 44-H/I/J. Oct. 14–18, 1998, in San Diego. **Contact:** Stan Yost, 13671 Ovenbird Dr., Fort Myers, FL 33908 (941-462-1473).

Pilot Class 58-J. Oct. 22–24, 1998, at the Antlers Doubletree Hotel in Colorado Springs, CO. **Contact:** Fred W. Pardee, PO Box 1506, Edwards, CO 81632 (970-926-7137) (pardeefw@vail.net).

Pilot Class 56-V (Bartow AFB, FL). Oct. 23–25, 1998. **Contact:** Bob Bleier, 1169 Cromey Rd., NE, Palm Bay, FL 32905-4542 (407-727-8730 or fax 407-951-8986) (rocky@spacey.net).

ROTC Graduates, University of Northern Colorado, Greeley, CO. Oct. 8–11. 1998. **Contact:** UNC Alumni Assn, 501 20th St., Greeley, CO 80639-0008 (970-351-2551).

SAC Airborne Command Control Assn. Oct. 7–11, 1998, in Colorado Springs, CO. **Contact:** R. Doolittle, 3714 E. Mineral Pl., Littleton, CO 80122 (303-741-6087).

SAC Communicators Assn. Aug. 28–30, 1998, in Bellevue, NE. **Contact:** Mick Bloom, 1002 Day Dr., Bellevue, NE 68005 (402-733-5340).

Tuskegee Airmen. Aug. 3–9, 1998, at the JW Marriott Hotel in Washington, DC. **Contact:** Tuskegee Airmen, Inc., 1927 East West Hwy. #104, Silver Spring, MD 20910 or Alonzo Smith Jr. (703-522-8590, fax 703-522-8542) or Tess Spooner (888-875-3433).

USAF Helicopter Pilots Assn. Oct. 21–25, 1998, Orlando, FL. **Contact:** William F. Seals, 107 Lost Lake Dr., Cocoa Beach, FL 32926 (407-639-6209), Marty Donohue (407-757-0757) or Ron Ingraham (ron.Ingraham@juno.com).

Williams Field Flight Instructors (1945–51). Oct. 8–10, 1998, in Colorado Springs, CO. **Contact:** William H. Stewart, 10690 Thomas Rd., Colorado Springs, CO 80908 (719-495-4989). ■

Bulletin Board

Seeking members of **Fifteenth AF** who flew B-17s on shuttle missions from Italy to Migordo, near Kiev, Russian Ukraine. **Contact:** Henry Glaser, 20 Herencia Cir., Hot Springs, AR 71909.

Seeking **Captain Frazier,** who was in the 35th TFS during 1985–86 at Kunsan AB, Korea, and who befriended an Italian–American girl who liked to dance. **Contact:** Anna Marie Isgro, PO Box 482, Port Richey, FL 34673 (813-828-2171).

Seeking **Sabre Flight Drill Team** alumni of AFROTC Det. 820 at Texas Tech University, Lubbock, TX. **Contact:** Trevor Sthultz, 4203 48th St., Lubbock, TX 79413 (sfdt@aol.com).

Seeking information on North American **P-15D-20-NA #44-63663** that may have flown with the 27th FG, Twelfth AF, in Italy and later with the reserves during the mid-1940s–50s. **Contact:** Jim Kippen, 2212 Haider Ave., Naperville, IL 60564-4303 (630-904-5372).

Seeking **SSgt. Perry "Bud" A. Masters,** a flight mechanic aboard a C-46, 16th Combat Cargo Sq, during WWII. **Contact:** Mike Masters, 1204 Stony Creek Way, Rockford, IL 61108 (home 815-398-4259) (work 815-969-7711) (fax 815-969-7714).

Seeking **Richard Pritchard** from Cedar Rapids, IA, who served with 75th BS, 42d BG, in Salt Lake City, UT, Boise, ID, and Portland, OR. **Contact:** Bill Thomas, 1822 Fountain Ct., Eugene, OR 97402-6472 (541-688-3100).

Seeking information, aircrew, and photographs of the **XC-99,** the last example of which is at Kelly AFB, TX. **Contact:** Larry Jonas, 5503 Teak Ct., Alexandria, VA 22309 (703-799-7452) (ljonas@aol.com).

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.–THE EDITORS

Seeking **Sam Vance** of Philadelphia, MS, who was a WWII B-17 pilot with 833d BS, 486th BG, Eighth AF. **Contact:** Jack Keller Sr., 131 Bluff View Dr. #309, Belleair Bluffs, FL 33770-1332 (813-584-5096).

Seeking **Brenda Lamb,** maintenance officer whose last assignment was at Travis AFB, CA, 1985–87, and members of the **39th MSES** (AFRES), McChord AFB, WA, during 1978–80. **Contact:** Julia R. Holcomb (Hoke@aol.com).

Seeking **Lt. Herman F. Birlauf, Maj. John Sharp,** or any member of the 69th BS at Carney Field, Guadalcanal, in mid-1943. **Contact:** Fred Bremer, 80 Howard Dr., Old Tappan, NJ 07675.

Seeking information on **1st Lt. John A. Repp,** Gp. Engr. Officer, 59th FG, Thomasville AAF, GA, 1943–45. **Contact:** Samuel A. Owens, 125 Bayview Dr., San Carlos, CA 94070 (650-595-4344).

Seeking members of the **436th MAW** who participated in **Operation Nickel Grass** in October 1973. **Contact:** Ron Love, 8 Ringed Neck Ln., Wyoming, DE 19934 (302-697-7393).

Seeking **Col. Thomas Simone** and members of the **16th SOS** who flew AC-130s and **Col. Dan Parrish,** who flew cover with the 269th Night Owls, in 1969 at Ubon RTAB, Thailand. **Contact:** Robert B. Snow, 129 Tando Way, Covington, KY 41017.

Seeking members of **33d TRS,** 363d TRW, Shaw AFB, SC, December 1974–77. **Contact:** Jack Lynch, 58 Alderley St., Toowoomba, DC, Queensland, 4350 Australia. (JackLynch@130.aone.net.au).

Seeking **Sgt. Buddy Rice,** stationed at RAFs Bentwaters or Woodbridge, UK, 1963–65, and who knew Diane Moss of Ipswich, UK. **Contact:** Darren L. Moss, 10 Spinner Close, Ipswich, Suffolk, IP1 5RA UK.

Seeking **Gary,** who served at Soesterberg AB, Netherlands. **Contact:** Mario Warnaar, Rederijstraat 7, Rotterdam, 3011 XR Netherlands (warnaar@freemail.nl).

Seeking contact with AT-6 and B-25 instructor pilots of **French cadets** at Gunter Field, AL, and Turner Field, GA, 1943–45. **Contact:** Jean Mounicoux, Residence Mendy-Adour, 1 rue Ulysse Darracq, Bayonne, 64100 France.

Seeking **Sandy Ross,** daughter of CMSgt. William O. Ross, and **Robert McGihon,** who was stationed in Great Falls, MT, in 1952. **Contact:** Dennis L. Dagen, 104 Elm Dr., Warroad, MN 52763.

Seeking members of **401st BS,** 91st BG, Eighth AF, based in UK, 1944–45, and **Robert A. Smith** of Rochester, NY. **Contact:** Lyle Jones, 413 S. 4th St., Shelbyville, IL 62565.

Seeking **TSgt. Robert L. Batey,** who was based in Iran in the late 60s and early 70s and was a friend of Harry and Pauline Sulley. **Contact:** Linda M. Sulley, Bankdale, Knoll Ln., Little Hoole, Preston, Lancashire, PR4 4TB UK.

Seeking contact with or information on **Ramon P. Anastos, Weldon T. Armstrong Jr., George F. Berkey, Richard A. Brown, Jack L. Corder, and William R. Dees,** who were USAF pilots in the 1950s. **Contact:** Edwin D. Stolz, 9117 W. Kerry Ln., Peoria, AZ 85382-4624 (602-566-0693) (zonite@aol.com).

Seeking WWII veterans and civilians who worked at the **Miami Air Depot or Miami 36th Street Airport** in the 1940s–60s. **Contact:** Raven International, 965 N. Nob Hill Rd., Ste. 303, Fort Lauderdale, FL 33324 (800-719-1626).

Seeking contact with personnel from the **725th BS,** 451st BG, Fifteenth AF, Foggia, Italy, 1943–44. **Contact:** Bill Emery, 5061 40th St., SW, Montevideo, MN 56265.

Seeking information on **John Sathre,** a Norwegian pilot in France during WWI, with the 490th Aero Sq, American Expeditionary Forces. **Contact:** Kjeld Kr. Lyssand, Krillaasv. 4, N - 1392 Vettre, Norway.

Seeking **USAF personnel** who were stationed at Soesterberg AB, Netherlands, 1964–65. Also seeking **Andy,** a fighter pilot nicknamed "Red." **Contact:** Hinsje van der Klift, Dennenstraat 26, Leeuwarden, 8924 CJ Holland.

Seeking information on burial location of **MSgt. Woody Runnels and Patsy Runnels** who were stationed at Charleston AFB, SC, and Hill AFB, UT, in the 1960s. **Contact:** Sheila Carrickford, 17 Cherry Walk, Douglas, Isle of Man, IM2 5NP UK.

Seeking **WWII CBI memorabilia:** A-2, B-3 jackets with chits, German 1940s-era jackets, souvenirs, and gear. **Contact:** Christian Bailey, 31041 Robertson St., Homeland, CA 92548 (909-926-8758).

Seeking information about **Capt. Jack Douglas Craft,** copilot of B-52D #55-065 that crashed in Inver Grove Heights, MN, Sept. 16, 1958. **Contact:** Jacob G. Ebertz, 1091 Clipper Way, Woodbridge, MN 55125 (612-739-0427).

Seeking contact with **Jeff Armstrong,** daughter of the late Maj. Gen. Harry G. Armstrong, Air Force Flight Surgeon in the early 1950s. **Contact:** Duke C. Horner, 92 San Juan Dr., Ponte Vedra Beach, FL 32082. ■

On the Web

Since AFA debuted its home page on the World Wide Web at the 1995 AFA National Convention, many chapters have established a web presence. (The Hawaii Chapter's "Hawaii Calls" web page, in fact, preceded AFA's.) The following AFA state and chapter web pages are linked to AFA's home page (http://www.afa.org/). Some of the chapters also provide e-mail addresses on their web sites so they can be directly contacted.

AFA Central East Region	//mailhost.infi.net/~jfree/central.htm
Diamond State (Del.) Chapter	//members.aol.com/howgeo/AFA/dsc.html
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Tidewater (Va.) Chapter	//mailhost.infi.net/~jfree/242.htm
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AFA Arkansas	//www.uark.edu/ALADDIN/afa262/afaarst.html
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Ouachita (Ark.) Chapter	//www.uark.edu/ALADDIN/afa262/afa270.html
Razorback (Ark.) Chapter	//www.uark.edu/ALADDIN/afa262/
AFA California	//www.cafa.catalyst.net
AFA Kansas	//www2.southwind.net/~afakans
Contrails (Kan.) Chapter	//www2.southwind.net/~afakans/122.html
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Fran Parker (N.M.) Chapter	//www.nmia.com/~afanm/afaalmgr.htm
Llano Estacado (N.M.) Chapter	//www.nmia.com/~afanm/afaclovs.htm
AFA Texas	//www.geocities.com/Heartland/Plains/6652/afatexas.htm
Alamo (Texas) Chapter	//www.geocities.com/Heartland/Plains/6652/alamoassn.htm
Central Oklahoma (Gerrity) (Okla.) Chapter	//www.geocities.com/CapeCanaveral/1872
Chicagoland–O'Hare (Ill.) Chapter	//members.aol.com/ilcaplo/afa142.html
Colorado Springs/Lance Sijan (Colo.) Chapter	//shell.rmi.net/~afa125
Greater Pittsburgh (Pa.) Chapter	//www.cobweb.net/~afa/index.html
Hawaii Chapter	//www.fightertown.org/afahi.html
Highpoint (N.J.) Chapter	//www.geocities.com/CapeCanaveral/3923
Lincoln (Neb.) Chapter	//members.aol.com/lincneafa
Mile High (Colo.) Chapter	//www.geocities.com/CapeCanaveral/Hangar/5281
Montgomery (Ala.) Chapter	//www.alabama-now.com/afa/mont
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AFA Colorado Springs/Lance Sijan Chapter

Outstanding Squadron Dinner and Associated Events

Thursday, May 21
Outstanding Squadron Dinner

AFA's 39th annual Outstanding Squadron Dinner will be held at The Broadmoor Hotel, Colorado Springs, Colo., on Thursday, May 21. The dinner honors cadets of the United States Air Force Academy for the 1997–98 school year. The price is $80 per person and $800 per table. The featured speaker will be Air Force Vice Chief of Staff Gen. Ralph E. Eberhart.

Wednesday, May 20
Golf Tournament and Reception

The golf tournament will start at 8 a.m. on the USAF Academy Blue Course. The price of $105 (only $70 if you are registered for the symposium) for civilians includes greens fees, golf cart, prizes, and reception. The fee for the reception only is $35.

Thursday, May 21
Air Force Acquisition Update Symposium

The eighth annual Air Force Acquisition Update Symposium, "Meeting the Challenge," 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 20) in honor of the speakers. Additional individual reception tickets are $35.

The symposium will include the following speakers:

Gen. Howell M. Estes III, Commander in Chief, North American Aerospace Defense Command; Commander in Chief, US Space Command; and Commander, Air Force Space Command

Lt. Gen. Roger G. DeKok, Commander, Space and Missile Systems Center, AFMC

Lt. Gen. George K. Muellner, Principal Deputy Assistant Secretary of the Air Force for Acquisition

Gen. William G.T. Tuttle Jr., USA (Ret.), President, Logistics Management Institute

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: "The Department of Defense finds that, for purposes of attendance by DoD employees in their personal capacities of 5 CFR 2635.204(g), *Widely Attended Gatherings*, the Department may have a community relations interest in attending this event. Other gift acceptance exceptions under 5 CFR 2635.204 may apply. The propriety of attendance by DoD employees in their personal capacities at this event shall be determined by the individual DoD employee's Ethics Counselor based on standards of conduct and community relations requirements."

Symposium: "The Department of Defense finds this event meets the minimum regulatory standards for attendance by DoD employees. This finding does not constitute 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 **Judee Albert, (719) 594-1147, fax: (719) 594-1614.**

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

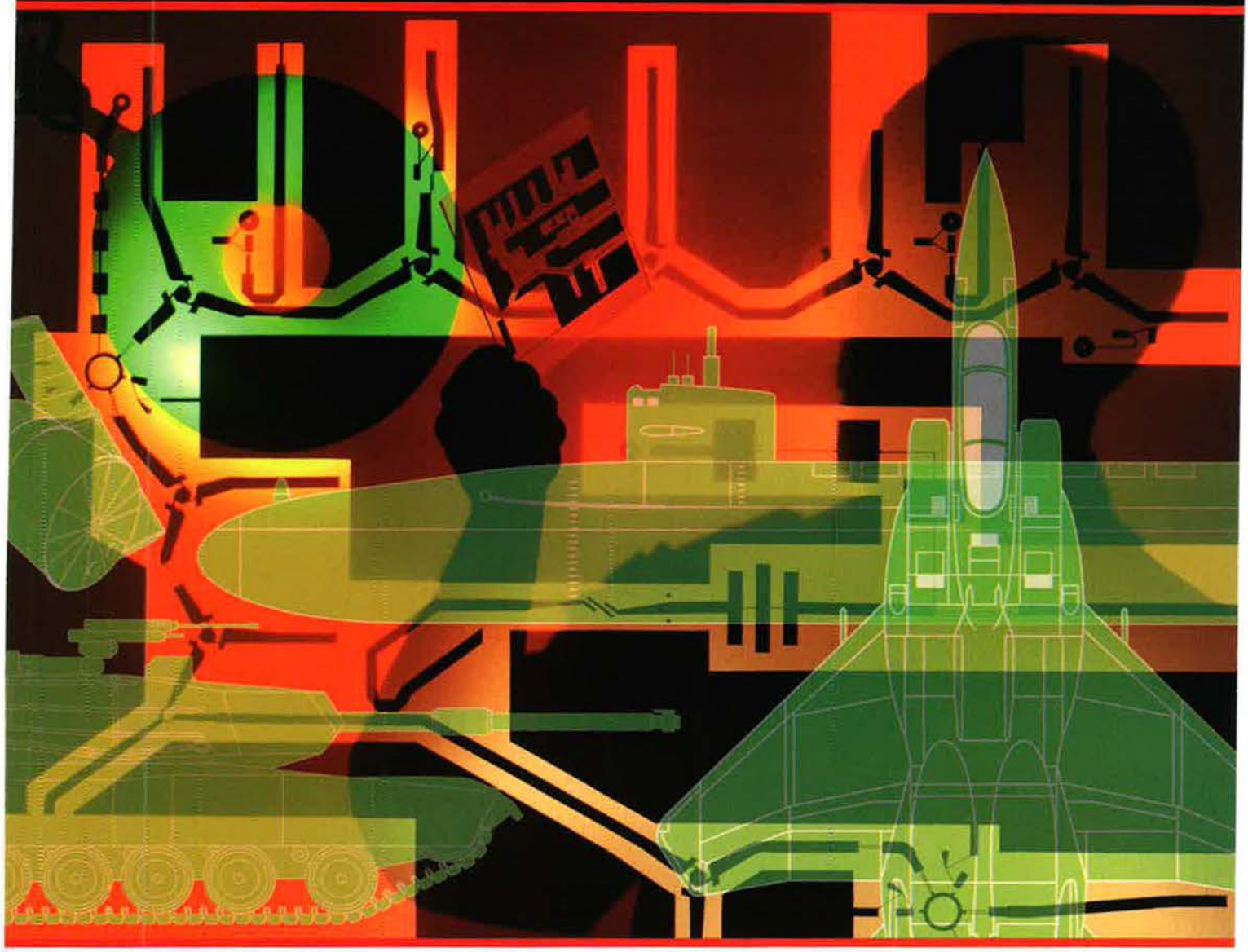
Photography by Paul Kennedy

A History of Firsts

Memorabilia courtesy 1st Fighter Wing, Langley AFB, Va.

From the wool uniform of World War I to the Desert Storm flight suit, these pieces reflect 1st Fighter Wing's eight decades of airpower history. Organized in 1918 in France at the behest of Brig. Gen. Benjamin D. Foulois, the 1st Pursuit Group, as it was then called, was parent unit of the highest scoring US aces of World War I—2d Lt. Frank Luke Jr. and 1st Lt. Eddie Rickenbacker. The unit, later renamed 1st Fighter Group, served in Europe and North Africa during World War II, earning distinguished unit citations for actions against Ploesti in Romania and Foggia airfield and Aversa railyards in Italy. Located at Langley AFB, Va., since 1975, the 1st Tactical Fighter Wing became USAF's first operational F-15 wing. Its 71st Tactical Fighter Squadron was the first USAF fighter unit deployed to Saudi Arabia in support of Desert Shield. Today, the 1st Fighter Wing calls itself America's First Team.

There's a new name in defense electronics: General Dynamics Information Systems



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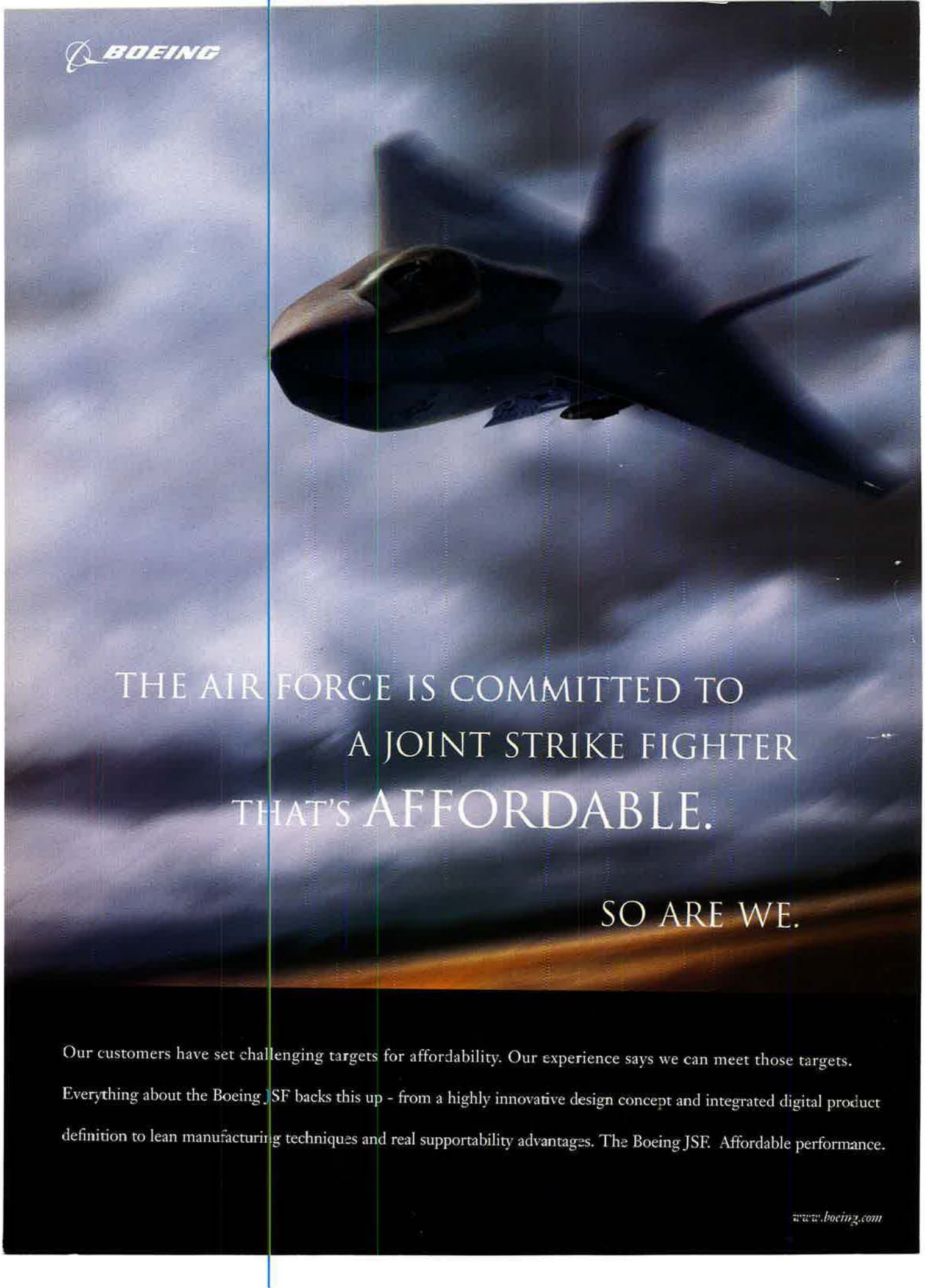
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