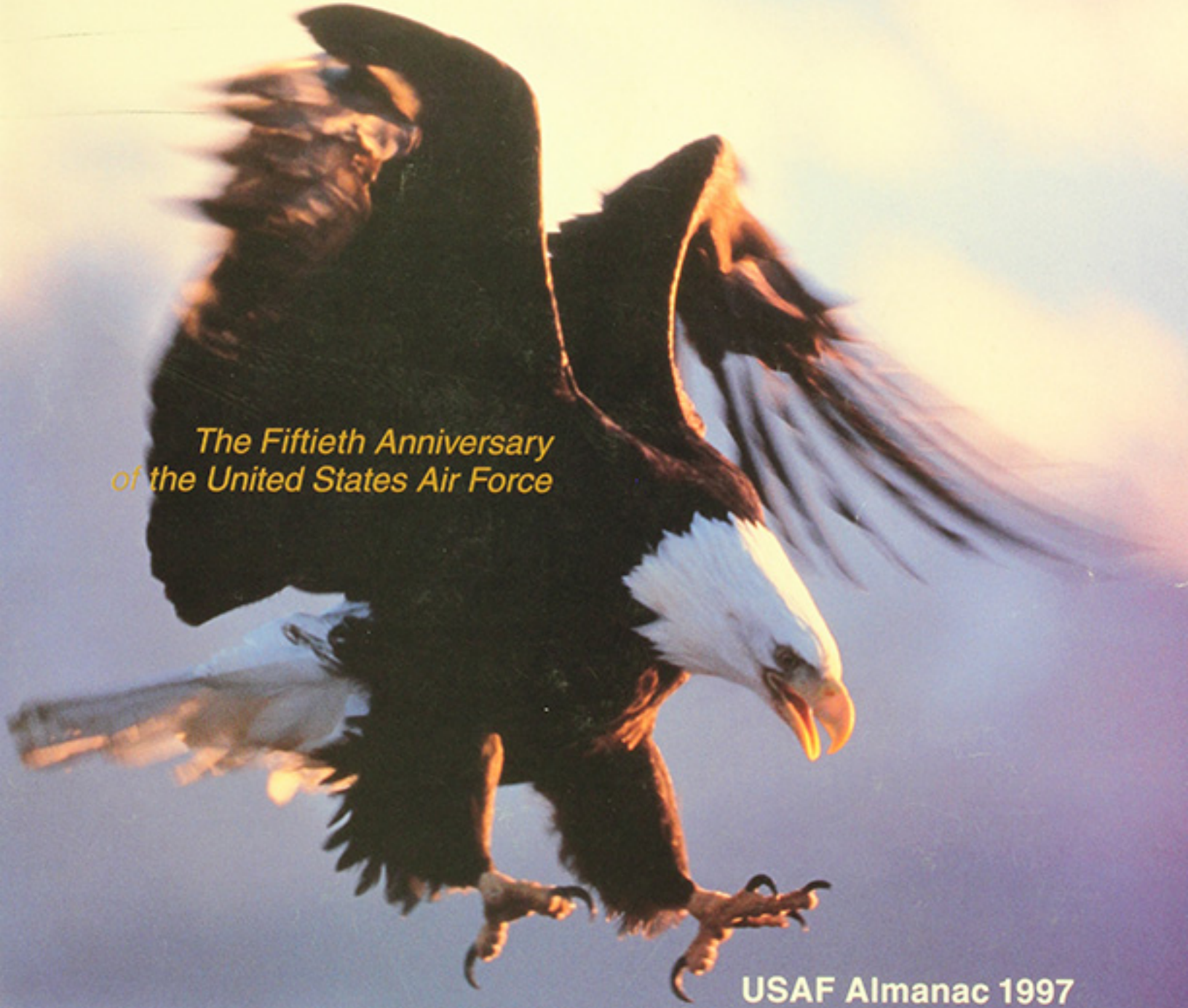
MAY 1997/$5

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE



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USAF Almanac 1997

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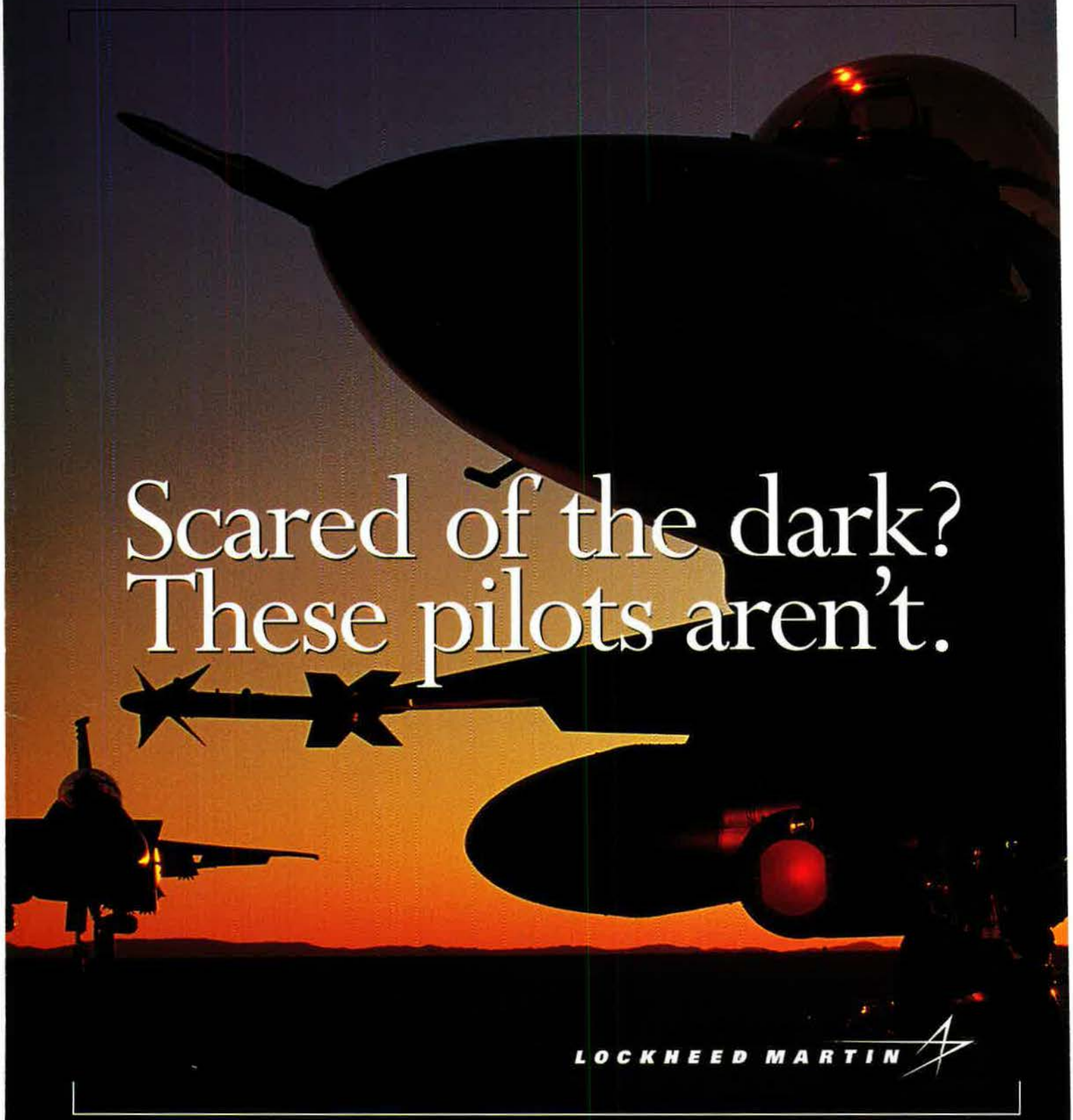

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May 1997, Vol. 80, No. 5

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

About the cover: The American bald eagle is an apt symbol of USAF's quest for air dominance. *Air Force* Magazine's special fiftieth-anniversary USAF Almanac begins on p. 28. Photo © Tom and Pat Leeson.

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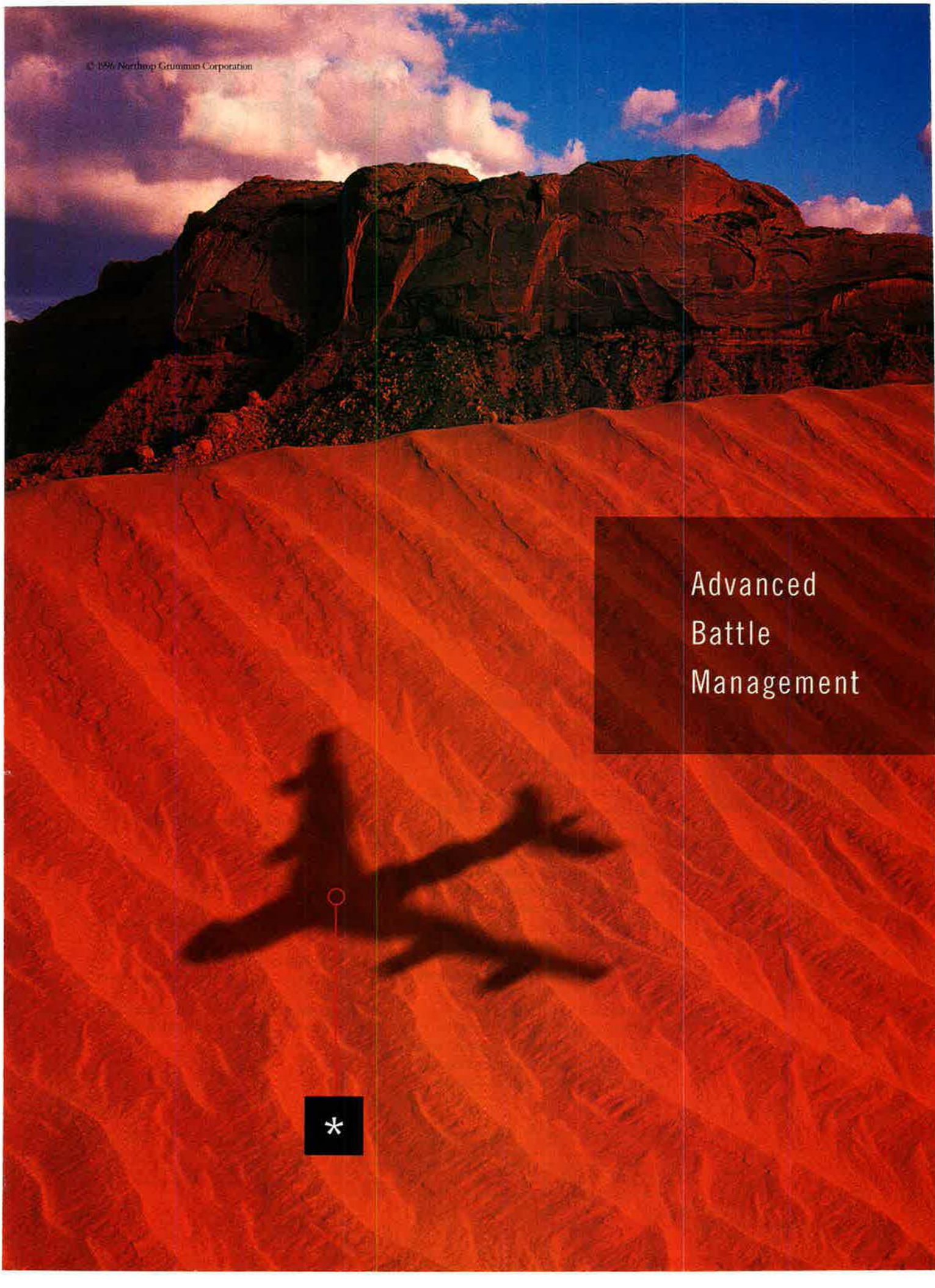
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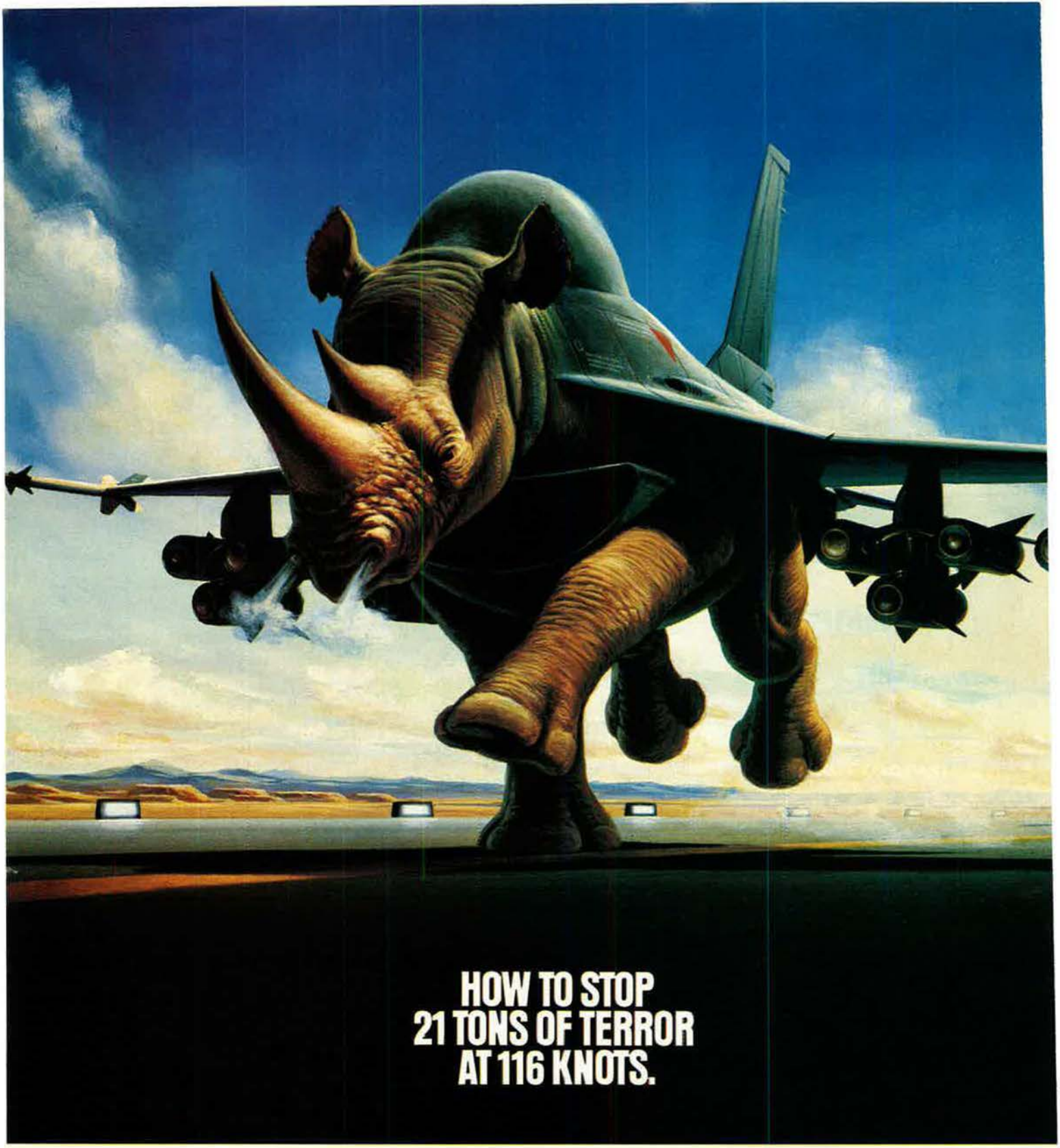

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Editorial

By John T. Correll, Editor in Chief

The Fighter Requirement Falls Due

More than 25 years ago, toward the end of the war in Vietnam, the US armed forces began introducing a new generation of tactical aircraft. The F-111 and the A-6 flew in the 1960s. Most of the fighters, including the Air Force's F-15, F-16, and A-10 and the Navy's F-14 and F-18, entered service in the 1970s. The Marine Corps AV-8B came along in the early 1980s.

The development cycle then shifted to emphasis on strategic systems through the 1980s and mobility systems in the 1990s. Meanwhile, other nations went to school on our tactical aircraft from the 1970s. Today, at least half a dozen advanced foreign fighters have begun to gain parity with—and in some instances, spot advantages over—their US counterparts.

For example, Air Force Chief of Staff Gen. Ronald R. Fogleman, a former F-15 demonstration pilot, told the Congressional Airpower Caucus in March that he flew the Russian Su-27 a few years ago and found it "the equal of any F-15 in terms of engine thrust and airplane maneuverability." The follow-on Su-35 has better avionics than the Su-27. In certain engagements, it might beat an F-15.

Initially, the services laid plans to introduce the next generation around the turn of the century with eight separate fighter modernization programs.

That was not to be. The armed forces in the 1990s were taking massive reductions, and the defense budget had gone south.

The revised plan was to replace eight types of aircraft with three: the Air Force's F-22 air-dominance fighter, the Navy's F/A-18E/F, and the Joint Strike Fighter to be operated by the Air Force, the Navy, and the Marines. Production was to be spread out over 25 years.

The time is now upon us for a funding decision, however, and a clamor has arisen about cost and need. The Pentagon is accused of building an unaffordable "bow wave" into future procurement programs and creating a funding "spike" in the outyear budgets. A January 1997 Congressional Budget Office study exploring options to terminate one of the three fighter programs or reduce quantities by as much as 50 percent was accorded great attention on Capitol Hill and elsewhere in official Washington.

These expressions of dismay seem overwrought. There is no bow wave. The cost of the three fighter programs fits well within the ceiling of the current defense budget proposal.

We have held the upper hand in tactical airpower so long that we may imagine our leadership is automatic.

All three aircraft are fully funded as far ahead as the Future Years Defense Plan reaches. Over the six years of the FYDP, these programs consume only 10 percent of the Pentagon investment account (which includes both research and development and procurement). At no point over the next 20 years do the tactical airpower programs exceed 18 percent of the investment account.

The imputed budget spike is, in actuality, the normal upturn in a procurement cycle that bottomed out in 1995 when the Air Force bought no tactical fighters at all. The combined cost for the F-22 and the Air Force share of the Joint Strike Fighter will be about four percent of the USAF budget, compared to six percent of the budget spent on the F-15, F-16, and A-10 in the previous round of fighter modernization.

In testimony to Congress, General Fogleman passed up an invitation to seek funding for Air Force aircraft at the expense of production for the other services. He said the nation needs balance in tactical airpower modernization. He left no doubt, however, that the F-22 occupies a special place on the requirements list.

Without the F-22 to ensure control of the air, it is questionable how much the F/A-18s and Joint Strike Fighters would be able to accomplish, to say nothing of the ground forces, who depend on air superiority for survival.

"You will not be able to achieve air superiority nor will you ever come close to air dominance if you are operating with equipment and weapons that are on parity with what the other guy has," General Fogleman told the Congressional Airpower Caucus.

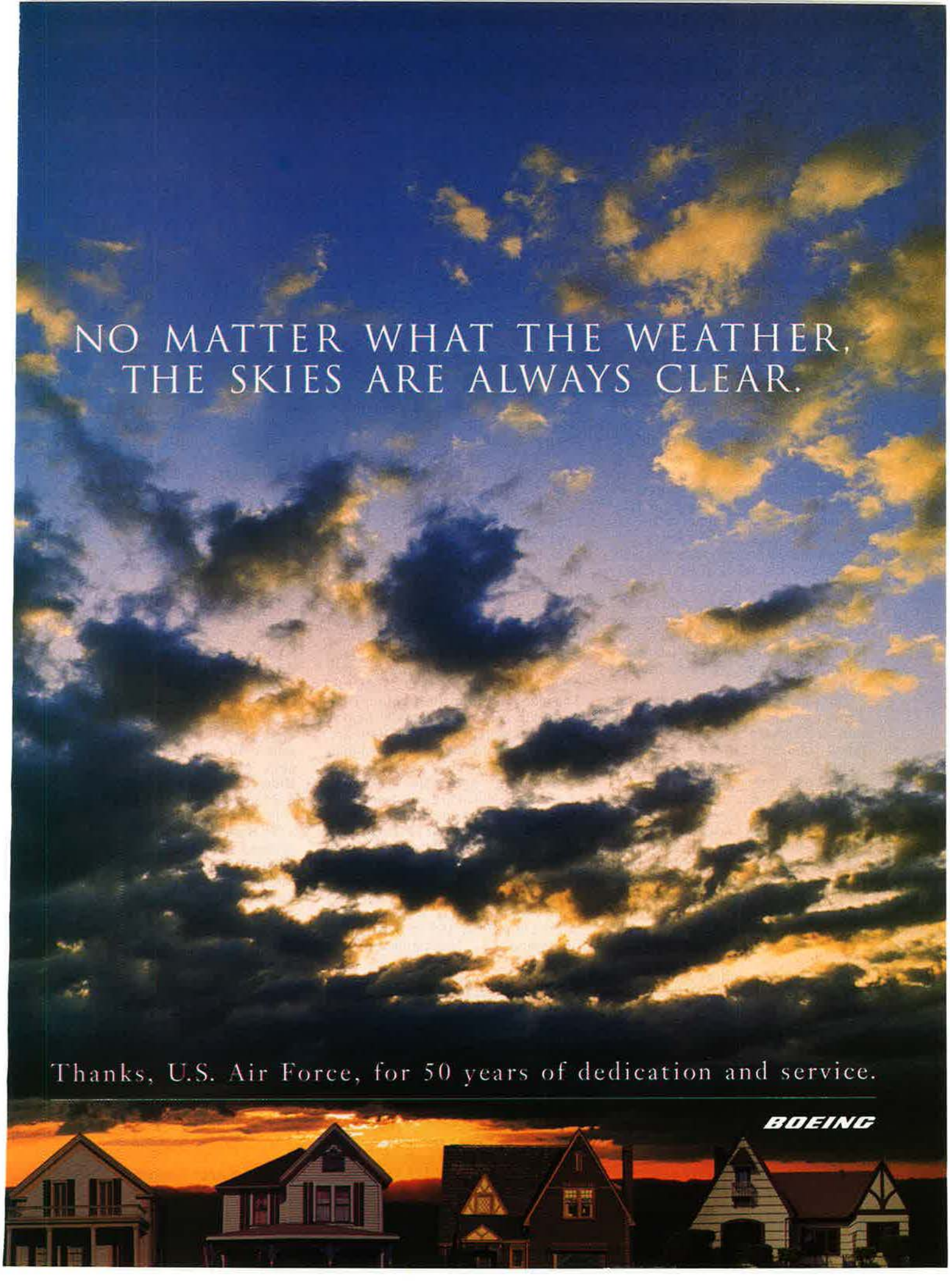
The Air Force heads into the opening decades of the twenty-first century with its tactical aircraft requirements necked down to two programs, one for air dominance and one for stealthy, precision attack. That is about as short as we can afford to cut it.

US military doctrine is predicated on "full spectrum dominance." That depends to a great extent on the quality of our airpower and its ability to control the skies, halt an invading enemy in his tracks and cut off his strategic options.

We have let more than 20 years go by since our last round of tactical aircraft modernization. As we have seen already, other nations do not stop producing new fighters just because we do. The inroads they have made during the lull in US fighter development are not insignificant.

The United States has held the upper hand in tactical airpower so long that we may imagine that our leadership is automatic. That is a dangerous misconception.

In theater conflicts of the future, somebody will control the air and, by means of airpower, dominate the battle. If we do not step up to the requirement for the next generation of fighters, it may not be us. ■


NO MATTER WHAT THE WEATHER,
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Thanks, U.S. Air Force, for 50 years of dedication and service.
BOEING

Letters

Classical Gas

I enjoyed reading "Gallery of Classics" *[February 1997, p. 45].* Because I was a pilot instructor in B-24s at Maxwell Field, Ala., before transitioning to B-29s, I was interested to read that the US built about 5,000 more B-24s than it did B-17s. I had read that more Liberators were manufactured than any other World War II aircraft, but I did not realize that the number was 40 percent higher than that of the Flying Fortress.

I noticed the omission of the AT-10 and AT-9 advanced training two-engine airplanes. I trained in the AT-10 at Columbus, Miss., before getting my wings and going to Maxwell. I also saw the AT-9 at Enid, Okla., while on a cross-country flight. The AT-9 had balsa wings, and a bad hailstorm would cause a good deal of damage—and Oklahoma was famous for its hailstorms. The AT-10 was all-metal and was an excellent training airplane.

I also flew the BT-15, which did not appear in the "Gallery." The instructors at Cochran Field, Ga., sometimes referred to it as the "Vultee Vibrator." The BT-13 was used at some basic training bases.

The other trainer I flew was the Stearman PT-17, covered in the article, and it was indeed a classic. Many of them are still flying all over the US, and the production number was about 60 percent of the total production of the classic T-6 single-engine trainer.

William R. Timmons, Jr.
Greenville, S. C.

My thanks to Jeffrey Rhodes for the superb "Gallery of Classics."

It is these classics that helped the US win the Cold War. These magnificent aircraft and their crews went beyond the call of duty in Vietnam. During my childhood, they soared and roared over my house. The memories are indelible: F-100 Super Sabres climbing during a Thunderbirds airshow; a C-124 Globemaster II slowly rising above the trees, hauling cargo for parts unknown; the huge and noisy F-4s thundering overhead during a 1972 airshow; and the C-123 Provider, its jet engines leaving a lasting, noisy footprint as it headed out on another mission.

While the Air Force flies far more capable and more advanced aircraft today, I will be forever proud of these amazingly tough and versatile airplanes—and the aircrews and maintenance folks—that kept the US strong through the turbulent Cold War years.

Andrew S. Biscoe
Post Falls, Idaho

With reference to the B-58 Hustler entry in the "Gallery of Classics," Carswell AFB, Tex., and Bunker Hill AFB, Ind., were not the only bases to host the Hustler.

As the junior captain transportation squadron commander at Little Rock AFB, Ark., in 1968–71, I distinctly recall receiving an abundance of guidance about my various logistics shortcomings from more-senior officers down on the B-58 flight line. The nice folks from the resident Titan II missile wing were equally helpful and supportive. Fresh from Vietnam, I found this an unforgettable initiation into Strategic Air Command.

We had a single sister B-58 base in Indiana, which we referred to as "Gruesome Grissom." I never found out how the troops at Grissom AFB referred to our fair base.

The "tranquil" days of SAC B-58/Titan II logistics support faded quickly in 1970, when the Hustlers were retired. Very reluctantly, SAC gave control of Little Rock AFB to Tactical Air Command. . . . The transition from "strategic" to "tactical" was a sight to see—but that's another story.

Lt. Col. James C. Threet,
USAF (Ret.)
Bartlett, Tenn.

An error occurred in the February "Gallery of Classics" when the B-24 entry stated that "the first Liberators went into action on November 16, 1943, at Bougainville in the Solomon Islands."

In reality, the 307th Bomb Group, equipped with new B-24Ds, was assigned to Seventh Air Force and arrived in Hawaii in September 1942. We performed daily sea searches of about 12 hours' duration in those blackout days of very high tension in the central Pacific.

On December 24, 1942, we flew the longest bombing mission of the war up to that time. Staging out of Midway Island, we hit Wake Island with outstanding success. Wake's defenses were completely surprised. We attacked at 30-second intervals, peeling off from formation just after midnight on low-level, high-speed runs over individually assigned targets. All of our B-24s returned to Midway, but the lone reconnaissance B-24 dispatched later was lost. . . .

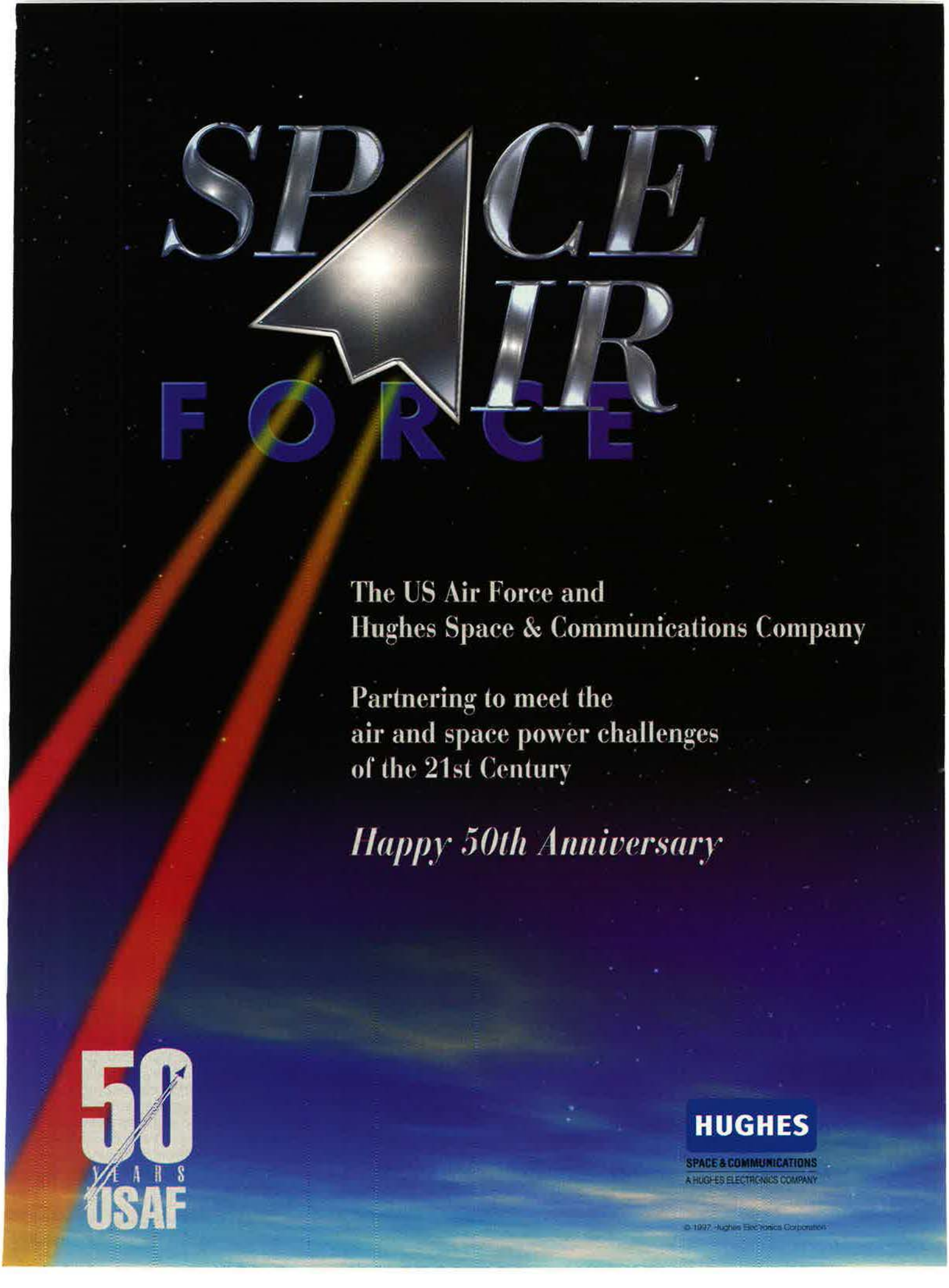
In January 1943, the 370th and 372d Bomb Squadrons were ordered to Guadalcanal and assigned to Thirteenth Air Force. The 371st and 424th Bomb Squadrons remained in Hawaii temporarily. B-24 strikes began out of old Henderson Field on Guadalcanal in January 1943. . . .

Thirteenth Air Force bomber strength was so low during those early days that historians largely overlook it. Many inaccuracies exist in the histories that do acknowledge the accomplishments of Thirteenth Air Force. Let it be known that our 307th Bomb Group B-24s flew hundreds of sorties in the central and southern Pacific before November 1943.

Lt. Col. John H. Ralph,
USAF (Ret.)
Enid, Okla.

I found your "Gallery of Classics" in the February issue to be quite

Do you have a comment about a current issue? Write to "Letters," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be concise, timely, and preferably typed. We cannot acknowledge receipt of letters. We reserve the right to condense letters as necessary. Unsigned letters are not acceptable. Photographs cannot be used or returned.—THE EDITORS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Letters

interesting, but I would like to make the following observations:

You state, "More B-24 heavy bombers were built than any other American airplane in history." The term "warplane" would be correct, but "airplane" is not, because 35,545 Cessna 172s have already been built and the type is back in production.

When you wrote, "The B-57 was the only airplane of non-US design adopted for operational service since World War II," you apparently forgot about the Marines' AV-8 Harrier, which is definitely a British design.

The P-26 was not "the last Boeing-designed fighter and the last fighter program the company was involved with until the current F-22." On November 27, 1944, the first of three XF8B-1 Boeing-designed and -built long-range carrier aircraft was flown for the Navy. Its performance was impressive enough for the Army Air Forces to request the third aircraft for evaluation. . . .

"On August 20, 1953, 17 F-84Gs, refueled from KC-97s, were flown nonstop 4,485 miles . . . the greatest distance ever flown nonstop by single-engine jet fighters," the "Gallery" stated. The 363d Tactical Fighter Wing deployed two fighter squadrons (48 F-16s) to the Persian Gulf in early August 1990, a 16-hour nonstop flight of more than 8,000 miles. . . .

I noted the absence of several significant USAF aircraft in the experimental category, perhaps in the interest of saving space. However, omission of the Bell X-2 is difficult to understand because it was the first aircraft to take a human being above 100,000 feet (on September 7, 1956) and the first to exceed Mach 3.0 (September 27, 1956).

The T-33 entry said, "The two-place T-33 was the world's first jet trainer." That is not true. In November 1944, Messerschmitt delivered the first of 15 Me-262B-la aircraft. This was a two-seat, dual-controlled, transition trainer for the Me-262A fighter.

Henry R. Kramer
St. Petersburg, Fla.

The flight test pilots of North American Aircraft Division, Boeing North American, Inc. (formerly North American Aviation, then North American Aircraft Division, Rockwell International), maintain a record of assigned pilots and first flights going back to 1935. From that record, the following were found to differ from what was stated in the "Gallery": B-25 (NA-40), first flight February 10, 1939, first pilot Paul Balfour; XP-82, June 16, 1945, Joseph Barton; XP-86, October 10, 1947, George S. Welch; and T-28A, September 24, 1949, Jean "Skip" Ziegler.

Addison S. Thompson
Boeing North American, Inc.
Palmdale, Calif.

I take exception to the P-61 entry.

I agree, of course, that this very famous night fighter contributed to the end of the war. However, it was not involved in the last aerial battle of World War II. That distinction belongs to two B-32 bombers, #532 *Hobo Queen II* and #578, which were involved in an aerial battle over Tokyo, Japan, on August 18, 1945.

John R. Blackburn, Jr.
Bedford, Pa.

I congratulate you on the "Gallery." I enjoyed reading it very much, but I think you may have left off an aircraft. What happened to the C-133?

SMSgt. Peter M. Dowds, Jr., USAF (Ret.)
Oklahoma City, Okla.

With regard to the B-57 Canberra entry in the "Gallery," I offer the following correct information for the underwing ordnance: four (not two) underwing hardpoints for up to 1,000 pounds each of ordnance, four stations for rocket pods, and a special weapon door for the Mk. 7 nuclear weapon. The latter two features were not mentioned in the entry.

John Hurley
Colorado Springs, Colo.

■ *Although we devoted 20 pages to the "Gallery of Classics," lack of space prevented the inclusion of several aircraft that some people consider classics. All of the aircraft alluded to above, plus dozens more, eventually will appear in an expanded "Gallery" slated to be set up on the* Air Force *Magazine section of AFA's web site (http://www.afa.org/). We regret the errors pointed out by readers Ralph, Thompson, and Hurley. Mr. Kramer is correct on all counts, but, although the XF8B is technically a fighter, the type was used almost exclusively as an attack aircraft. Colonel Threet is correct, but the "Gallery" was also correct: His outfit at Little Rock began B-58 operations at Carswell, as stated, and Grissom AFB was originally Bunker Hill AFB. The victory to which reader Blackburn refers falls into a gray area: It occurred after Japan announced its surrender. However, in the P-61 entry we stated that the Black Widow had four guns in a ventral turret. The guns were in a top turret.*—THE EDITORS

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Aerospace World

By Suzann Chapman, Associate Editor

USAF, Navy Face Rated Problems

USAF Chief of Staff Gen. Ronald R. Fogleman told the Senate Armed Services Committee on February 25 that the Air Force and Navy see growing problems over the next several years with rated retention.

Both services, he said, are beginning to experience problems within their fighter forces and the Air Force within its big-airplane forces. Fogleman emphasized that the situation has been brought on by a number of factors and, for the Air Force, has been compounded by deep reductions in pilot training during the drawdown.

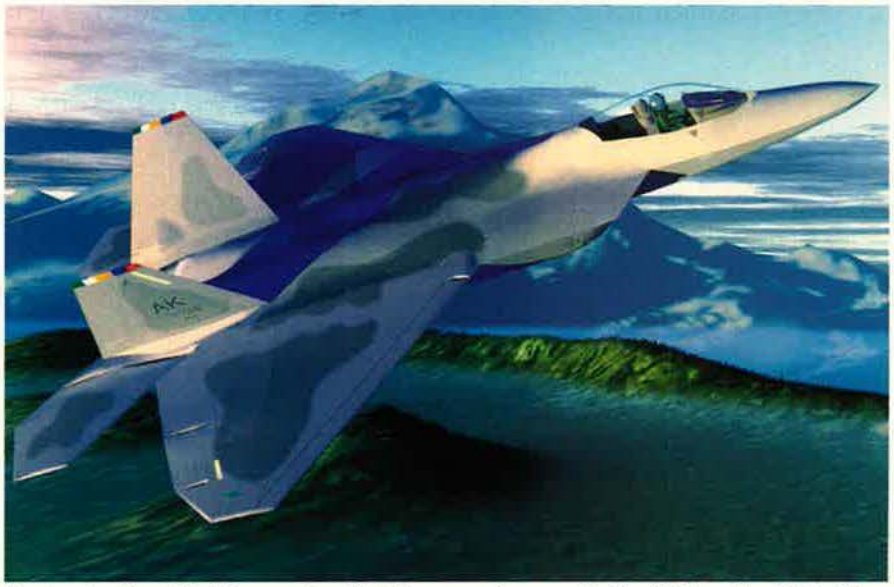
The General stated that the problem stems not only from the ongoing high operations tempo and the devaluation (by inflation) of the pilot bonus but also because the airlines are avidly hiring pilots—nearly 4,000 last year, with a forecast of 3,000 to 4,000 per year over the next several years. Fogleman noted that of the 100 pilots hired by Delta Air Lines within a four-month period, 80 were former military personnel.

According to Fogleman, two measures highlight the growing problem. First, two years ago, about 76 percent of the eligible pilots signed up for the pilot bonus. Last year only 54 percent signed up, and this year it's about 43 percent. The second measure is that this year the number of applications for separation from the rated force is running ahead of last year's applications.

Retention Initiatives Launched

The Air Force is working on several initiatives to bolster its rated force over the next few years. One will allow active-duty officers to apply for undergraduate pilot and navigator training slots. Another will open fighter cockpits to nonfighter pilots.

During the drawdown USAF reduced the number of slots for UPT and UNT, forcing many qualified candidates to go into nonrated career fields when they received their commissions. Many of those individuals will now get a second chance as the Air Force tries to beef up its rated force.



Electronic illustration by Steven Moore, Lockheed Martin Corp.

Raptor is the official name for USAF's new air-superiority fighter, the F-22. The service announced the name in March. Raptors are birds of prey, such as eagles, falcons, hawks, and owls. The Raptor was scheduled for rollout April 9.

USAF plans to offer 463 new slots reserved for active-duty officers, broadening the opportunity to compete for pilot or navigator positions over the next four years. The service will hold two undergraduate flying training boards each year. The first met in April, and the second will be in September.

The Air Force also expects to run into a shortage of fighter pilots. To help alleviate that problem over the next three years, it will open 150 fighter cockpits to pilots of other aircraft. *[See "Fighter Cockpits Open," February 1997 "Aerospace World," p. 11.]* The first of six boards met in January to select 25 pilots for fighter crossflow.

Additionally, Fogleman said the service would work with the Senate committee on the pilot bonus, which he said had been devalued about 30 to 35 percent by inflation. The pilot bonus program currently costs the Air Force more than $30 million per year, he told the committee.

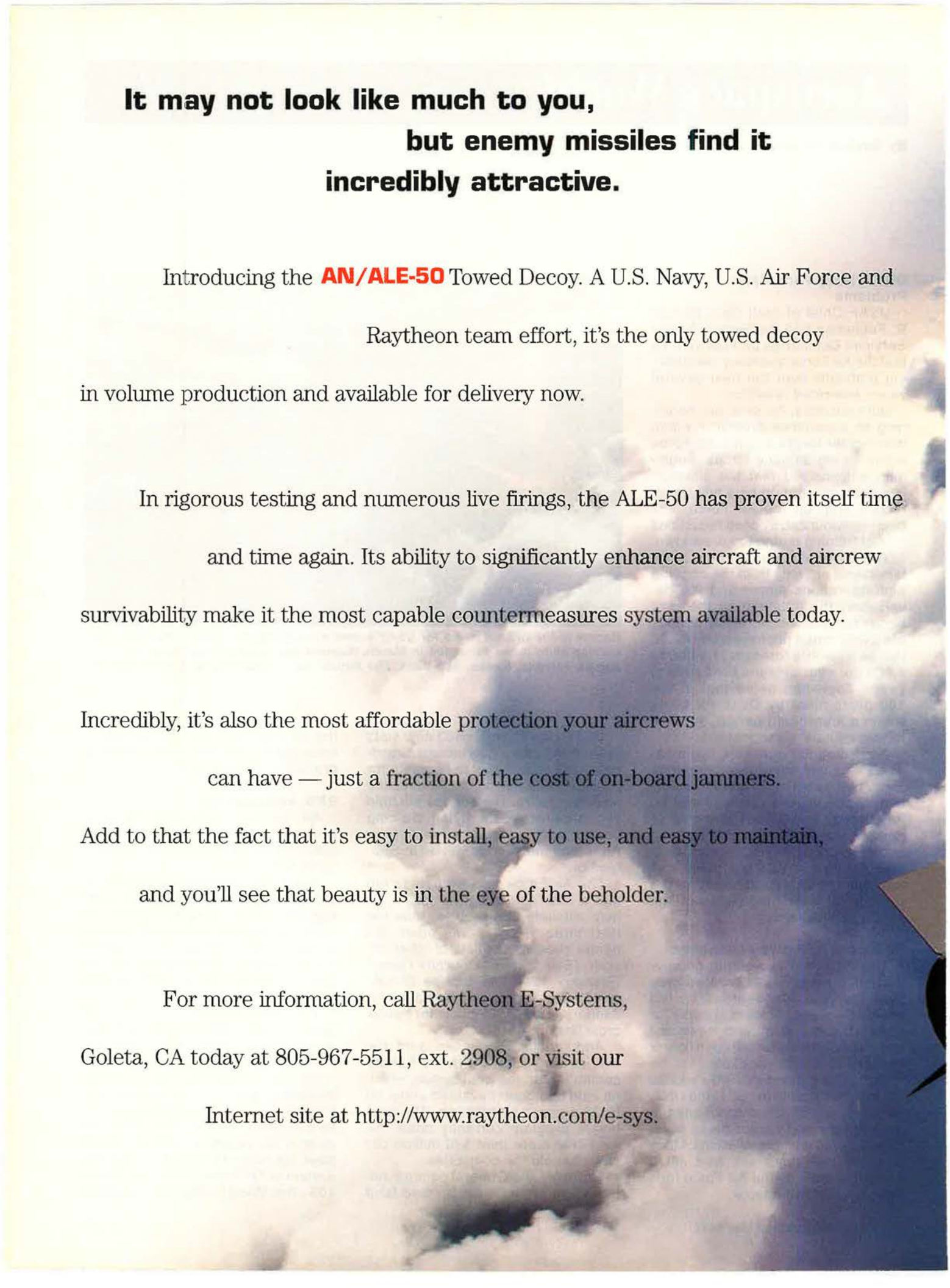
However, the General pointed out, the whole program will be paid for if the service can retain just six pilots, because it costs about $6 million to produce a mature pilot.

SFW Achieves IOC

Air Combat Command declared that the Sensor-Fuzed Weapon had reached initial operational capability in February.

According to ACC officials, the SFW is the first and only Air Force weapon that can hit more than one target per pass per weapon delivered—saving sorties and lowering risk to pilots during combat. It is designed for use with all current fighter and bomber aircraft.

The SFW includes 10 BLU-108 submunitions, which each have four sensor-fuzed "skeet" warheads in a Tactical Munition Dispenser. The skeet uses a passive infrared sensor to detect and fire an explosively formed penetrator munition against a land combat vehicle. The SFW will exist in two versions: CBU-97, which does not have an inertial navigation system or GPS capability, and CBU-105, the Wind-Corrected Munition



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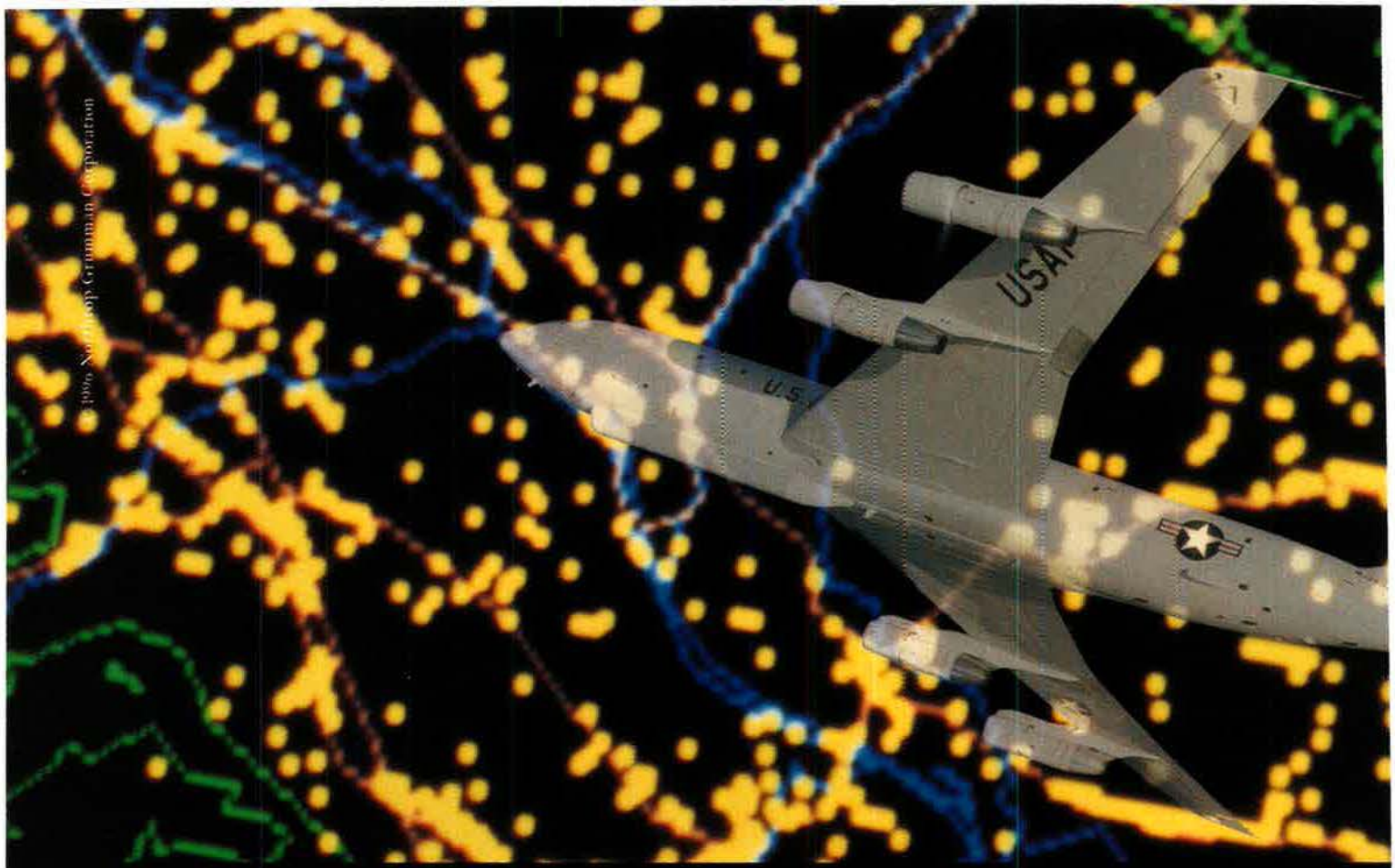

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Aerospace World

50 Years Ago in *Air Force* Magazine

May 1947

On the cover: (This one is a mystery, since there are no articles inside about tethered balloons or atomic bombs.)

- Reporting on diminishing budgets and interim tables of organization, the Magazine said that "The picture changes so fast that in recent months, Headquarters AAF has not even printed an AAF organization chart. The reason is that it would be a waste of valuable paper to publish a chart which would be obsolete in a matter of days."
- Uniform changes recently announced by the War Department: The campaign hat and cord made famous by "Vinegar Joe" Stilwell is out. So is the lyre superimposed on US brass, previously worn by bandsmen. Inverted blue tabs, which once designated certain AAF specialists, will no longer be worn on the sleeves.
- Gen. Carl A. Spaatz, Commanding General of the AAF, asks AFA members to assist recruiters: "You are the counselors to whom today's young men naturally turn. . . . That is why the recommendation you give is so important."
- The six-engine XB-36 superbomber sets an unofficial world record by taking off at a gross weight of 278,000 pounds. "That's equivalent to lifting 11 DC-3s at one fell swoop," the Magazine said.
- In an article observing the anniversary of V-E Day, author MacKinlay Kantor recalls Gen. Dwight D. Eisenhower raising a verbal toast "to the air forces, without whose great services all else would have been futile."

AFA news: At the request of AAF, the Air Force Association is official sponsor of "Air Force Day," to be celebrated August 1, 1947, the fortieth anniversary of the assignment of one officer and two enlisted men to form the Aeronautical Division of the US Signal Corps.

Dispenser *[see "Lockheed Martin Wins WCMD," April 1997 "Aerospace World," p. 14].*

USAF Rethinks Composite Wings

Evolving tactics and procedures led Air Force leadership to make changes in its composite wing structure, created during the last major force-structure reorganization in the early 1990s.

"The debate is over," Chief of Staff General Fogleman told the Senate Armed Services Committee on February 25.

Based on a "major discussion" at the Corona conference in Colorado Springs, Colo., in October, close air support composite wings, such as the ones created at Pope AFB, N. C., and Moody AFB, Ga., are out, leaving only the composite wing at Mountain Home AFB, Idaho—slated to be a key element in the development and operation of USAF air expeditionary forces.

"That's about the only composite wing that makes sense," stated Fogleman during the Air Force budget hearing.

He explained that the Air Force started constructing its latest composite wings a few years ago, based on the way the leadership thought joint warfighting would develop. "As tactics, techniques, and procedures have unfolded since the time we set those up, those [close air support composite] wings have just not proven to have their value," he stated.

"On the other hand, we have seen evolve over the last couple [of] years this idea of an air expeditionary force, which is a force-projection composite wing." The Air Force has "been building up the wing at Mountain Home

and getting it into the configuration we want."

Meanwhile, the General said, the Air Force has had to build air expeditionary forces out of pieces from different units. To do that, those forces "had to go through an extensive pretraining workup to get ready to go and build a cohesive team."

Instead, Fogleman said, "it would be my hope that in the future we would be able to take that composite wing at Mountain Home—and it's not quite configured right yet in terms of the number of spares and aircraft and things like that—[and] get the whole wing out of town quickly." It would be ready to operate as an AEF "day in and day out."

The Air Force plans to continue to refine its AEF concept, whether using the one wing at Mountain Home or a combination of units as it has done with the four AEF packages to date. One aspect that the service's AEF Battle Lab at Mountain Home will focus on is reducing the size of its AEF package. So far, deployments have required 10 to 12 C-5-equivalent loads. USAF leaders would like to reduce that to six.

F-22 Components Readied

Lockheed Martin announced February 12 that it had electronically transmitted the first complete operational flight program (OFP) software package for the F-22, USAF's newest air-superiority fighter.

The Air Force had scheduled the F-22's first flight for this month.

The OFP traveled via secure communications link from Lockheed Martin Tactical Aircraft Systems in Fort Worth, Tex., to Lockheed Martin Aeronautical Systems in Marietta, Ga., where the new fighter is undergoing final assembly.

The 275,000 lines of software code contain the computing power needed to control the major subsystems, including the hydraulics and electrical power systems, flight controls, cockpit displays, and engine controls for the F-22's first flight.

The OFP assembly and load processes, demonstrated in this initial release, provided a significant advancement in software supportability that will be used throughout the F-22 program, stated Charla K. Wise, Tactical Aircraft Systems F-22 vice president and program director. "The concept improves software reliability and maintainability, simplifies the software update process," she said, "and will reduce life-cycle costs for the customer."

Additionally, Pratt & Whitney announced February 17 that it had successfully completed an accelerated mission test (AMT) and altitude performance and operability clearance test for the F119, the F-22's powerplant. Passing these tests was the final requirement for engine flight clearance.

During the AMT, the F119 engine completed 919 total accumulated cycles, simulating more than 300 combat missions, according to company officials. It also included more than 13 hours in augmentation and more than 40 hours of hot time—at intermediate thrust or above. Altitude testing verified engine performance and operability at all extremes of the flight envelope.

Lackland Tackles Privatized Housing

The Air Force took its first step to solicit the private sector to build and operate new rental housing for military families, in a request for proposal for enlisted housing at Lackland AFB, Tex., issued February 11 by Air Education and Training Command.

For the Lackland project, AETC has requested proposals from developers to design, construct, finance, own, operate, maintain, and manage 420 units to be built on two tracts of

USAF Celebrates 50

- The 1997 Jack B. Poage Airshow, a USAF anniversary event set for June 21–22 at the Carroll County Regional Airport, about 30 miles northwest of Baltimore, Md., will feature more than 50 vintage and present-day military aircraft, including flybys of a B-2 stealth bomber and F-117 stealth fighter.

- Chicago's Air and Water show will highlight USAF's fiftieth anniversary on August 24.

- An anniversary event includes the Gathering of Space and Missile Pioneers in Colorado Springs, Colo., August 25–30.

- The 16th Special Operations Wing, Hurlburt Field, Fla., has begun painting "battle markings" on its special operations aircraft as a "virtual living museum of AFSOC history" to commemorate USAF's anniversary. The two-inch-high labels denote operation code names and dates. For example, the MC-130E tail number 0562 has five: Desert One 1980, Grenada 1983, Panama 1989, Desert Storm 1991, and Haiti 1994.

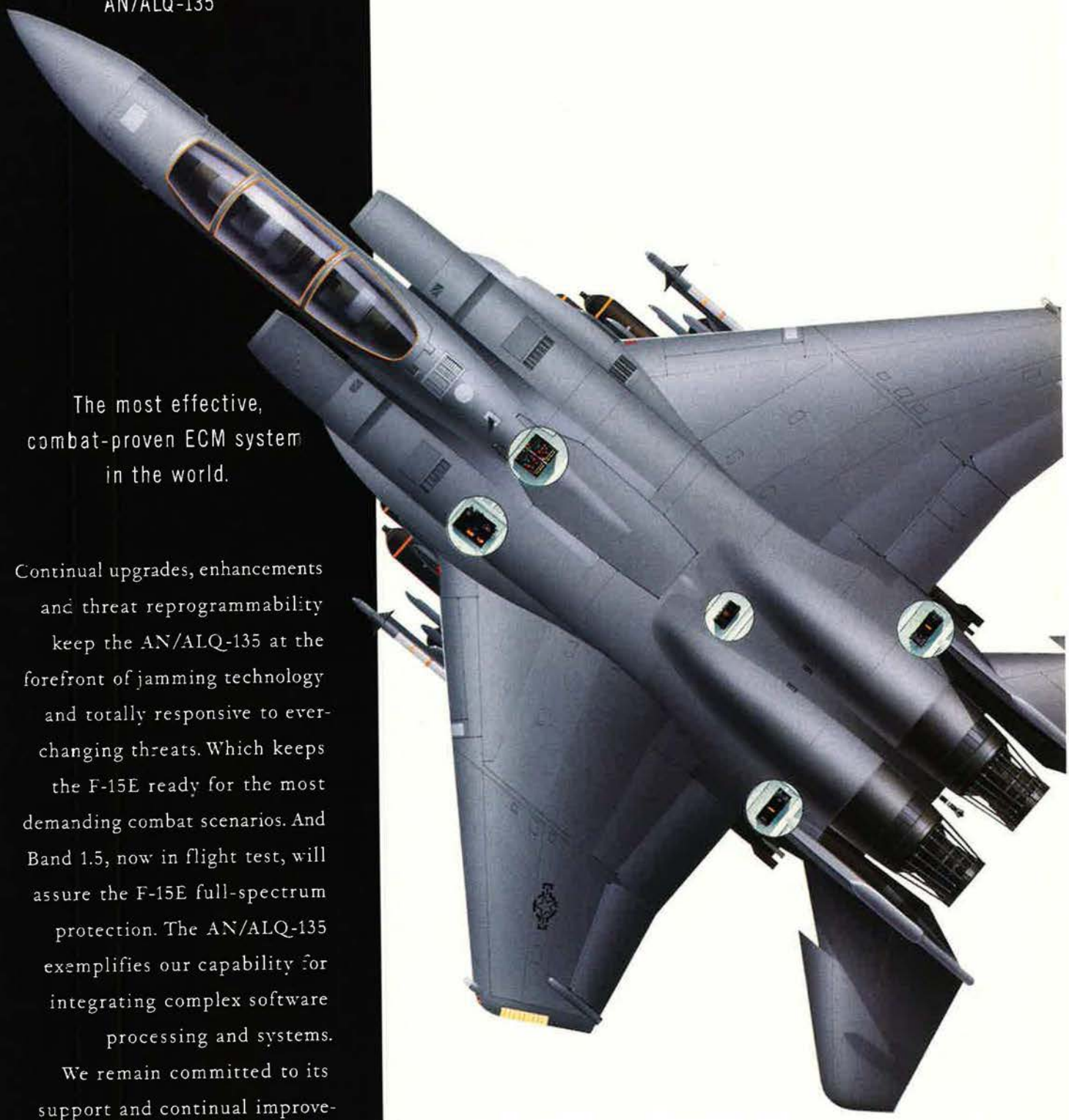
- Two DoD World War II Commemorative Communities, Farmington and Farmington Hills, Mich., have extended their participation to include honoring USAF's fiftieth anniversary. They will recognize USAF veterans within their communities through November 11, salute the Air Force on May 26 during their Memorial Day parade, and fly a special USAF fiftieth flag during the year.

- Residents of Dayton, Ohio, will remember the Air Force anniversary every time they use their telephone books throughout 1997. The Aeronautical Systems Center, Wright-Patterson AFB, Ohio, arranged to have the both the white pages and yellow pages covers feature an Air Force photo and message.

- Patrons at the Mall of Abilene, Tex., now have a year-long invitation—in the form of a mural along the mall's main concourse—from Dyess AFB to celebrate USAF's fiftieth. SrA. Sammy Latham, a graphic designer, designed the mural, which was painted over a period of six days, after the mall closed, by seven members of the base's 7th Communications Squadron. The mall donated the space, and Dyess's Chiefs Group contributed the paint.

- Wright-Patterson will host the Air Force's first marathon on September 20. The 26.2-mile run, which is open to all levels of marathoners, including those in wheelchairs, will start at Air Force Materiel Command headquarters and end at the Air Force Museum, passing historic Wright brothers sites along the way. Registration forms will appear in runners' magazines and other publications and at the Air Force Marathon web site (http://afmarathon.wpafb.af.mil/).

AN/ALQ-135



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Recruiting and Retention Woes

The difficulty in attracting and keeping first-rate military recruits is not a new problem, but it could be growing worse. Despite the services' attainment of their recruiting goals last year, many Congressmen see negative trends lurking, bolstered by testimony from service personnel chiefs.

As a result, at hearings in March, military personnel subcommittees in the House and Senate began discussing potential increases to both military compensation and educational benefits.

Rep. Steve Buyer (R-Ind.), chairman of the House National Security Committee's Military Personnel Subcommittee, noted that testimony from enlisted members and spouses of military members "was compelling and unequivocal—a pay increase was the highest priority." He emphasized that if the budgets continue as projected, the gap between military and civilian pay-increase rates will grow to 13.5 percent in Fiscal Year 1998 and ultimately to more than 15 percent in 2001.

Buyer stated that the 2.8 percent pay raise in the President's Fiscal 1998 budget request is 0.5 percent below the pay raise dictated by the Employment Cost Index and thus contributes to the gap.

The ranking Democrat on the Senate Armed Services Committee's Military Personnel Subcommittee, Sen. Max Cleland (D-Ga.), agrees that Congress needs to review "the importance of military salaries and allowances in attracting the right men and women," as well as the "impact of service members' time away from home on their families."

He also stated that service officials unanimously agree that educational benefits should increase. "Today's programs just don't offer the same clout that the GI Bill did."

Health-Care Promise

For the second time, Congress is poised to provide potential relief from the growing health-care dilemma faced by Medicare-eligible military beneficiaries. Legislation is once again on the books to establish a demonstration project for Medicare Subvention and to extend the Federal Employees Health Benefits Program (FEHBP) to cover military beneficiaries aged 65 and older.

Three Congressmen reintroduced their health-care bills in January. Rep. Joel Hefley (R-Colo.) submitted legislation (H.R. 192) to conduct a demonstration project for Medicare Subvention, or the use of Medicare funds to reimburse DoD for certain health-care services. He also introduced a bill (H.R. 414) to authorize nationwide Medicare Subvention.

Rep. James P. Moran (D-Va.) again introduced a bill (H.R. 76) to permit Medicare-eligible military beneficiaries to enroll in the FEHBP. Sen. John W. Warner (R-Va.) submitted similar legislation (S. 224) in the Senate.

Additionally, as requested in the Fiscal 1997 defense authorization bill, on February 7 the Department of Health and Human Services submitted a draft bill, Military Beneficiaries Medicare Reimbursement Model Project Act of 1997. The bill follows the guidelines agreed on by the Pentagon and HHS last year. Essentially, the project would run for three years with a potential 18-month extension, operate at a payment scale less than Medicare normally disburses to private providers, and ensure against double billing.

Both departments have assured Congress that the project will not increase the cost to Medicare. If passed, they expect to start by October 1, 1997.

New Airpower Caucus

The services have another venue to express their concerns about aircraft modernization, now that House members have formed a new bipartisan caucus to focus on airpower issues. Rep. Saxby Chambliss (R-Ga.), a member of the House National Security Committee, and Rep. Norman D. Dicks (D-Wash.), a member of the House Appropriations Committee, formed the caucus, which initially includes 21 Republicans and 19 Democrats. *[See "AFA/AEF National Report," p. 198.]*

At the group's first meeting on March 12, USAF Chief of Staff Gen. Ronald R. Fogleman talked about the Air Force's new air-superiority fighter, the F-22, which is a key feature in the Pentagon's tactical aircraft modernization program—the current hot topic as Congress deliberates the Fiscal 1998 defense budget.

Votes On the Line

A Texas county, once dominated by Democrats, changed overnight to a Republican majority as a result of 800 absentee ballots, most cast by members of the armed forces. Though centered in Texas, the effect of a federal lawsuit disputing the right of absentee military members to vote in state and local elections could be far-reaching.

Initially, a federal judge prevented the Republicans from taking office and allowed the plaintiffs in the case—who contend that the absentee voters were not valid residents—to mail military members a questionnaire that asked for detailed personal information. Since then, the questionnaire has been recalled, and the federal judge deferred his decision, pending review by the Texas state court to determine if there was a violation of state election law. To head off what could be a precedent-setting ruling, several Congressmen have initiated legislation to guarantee active-duty members their voting rights at all levels of government.

Sens. Phil Gramm (R-Tex.) and Kay Bailey Hutchison (R-Tex.) submitted the Military Voting Rights Act of 1997 (S. 278) on February 5. Reps. Henry Bonilla (R-Tex.) and Sam Johnson (R-Tex.) followed on February 12 with their bill (H.R. 699) by the same name. Both are designed to ensure that active-duty military personnel, merchant mariners, and their dependents have the right to vote in federal, state, and local elections.

government property. A 66-acre undeveloped tract and another 30-acre tract—now containing 272 units that must be demolished—will be leased to the successful bidder at a nominal fee, according a USAF release.

Following construction, the developer would lease the housing units to enlisted members at Lackland. The monthly rent would equal a member's monthly housing allowance.

"Air Force investment in private-sector housing construction has the potential to add to the few construction dollars we do receive, by a factor of three or better," stated AETC Civil Engineer Col. Dave Cannan.

Lackland is one of the Defense Department sites selected to test the Pentagon's housing privatization initiative approved by Congress in the Fiscal 1997 defense authorization bill. Defense officials hope to use private-sector construction and enterprise to help speed revitalization of its aging family housing, as well as to reduce the cost.

Congress Focuses on Tacair

At several of their defense budget hearings, House and Senate military committees questioned DoD's tactical aircraft modernization efforts. The questions stemmed largely from a Congressional Budget Office report, released in late January, asserting that the Pentagon's plan to modernize its tactical aircraft by purchasing the F-22, F/A-18F, and Joint Strike Fighter may be unaffordable and unnecessary.

The CBO estimated the total program cost over more than 20 years for the three aircraft at $350 billion.

At budget hearings on Air Force programs in February, USAF's two top leaders stated the Air Force could afford and needed both the F-22 and the JSF. *[See "Washington Watch," April 1997, p. 9.]* Moreover, Gen. Joseph W. Ralston, vice chairman of the Joint Chiefs of Staff, continued the push for the three fighters during March 5 House and Senate subcommittee hearings on the single subject of tactical aircraft modernization.

Ralston emphasized to each committee that the Joint Chiefs had agreed that a real threat exists from both missiles and aircraft. He said, "There is a whole group of fighters from foreign countries that are at least equal to, or superior to, any maneuvering fighter we have today."

He also pointed out that six years ago, the Pentagon had a development and procurement program to replace each of its eight tactical aircraft, all developed in the 1970s.

"In light of the changing situation in the world, we no longer have a development and procurement program for each of these," he said. "So instead of having eight different replacements, we have three—the F/A-18E/F, the F-22, and the Joint Strike Fighter."

Ralston further argued that using approximately 10 percent of the Pentagon's investment budget over a six-year period "is not unreasonable when you consider the fact that we have not been modernizing" during the 1980s and 1990s.

C-17 Still Targeted

Some Congressmen continue to take aim at the C-17, the Air Force's newest airlifter, despite last year's approval for 120 aircraft and rave reviews from the field. They are bolstered by a February General Accounting Office report claiming that the Pentagon could meet its needs with only 100 C-17s.

In its response to the report, the Defense Department said that it "disagrees strongly," pointing out that the Joint Chiefs of Staff Mobility Requirements Study and Bottom-Up Review Update, specified 120 C-17s as the minimum airlift required. "Decreasing that amount results in increasing risk to a higher, unacceptable level."

The DoD response also emphasized that the savings figure cited by the GAO is based on a cost analysis that projects 34 years into the future. "In reality, because the last 20 C-17s are to be fielded in 2004–05, almost no savings would be seen in the Future Years Defense Plan." The Pentagon maintains that only half or less of the GAO's advertised savings would come during the 2004–05 time period, with the remainder coming from unspent operating costs over 25 years.

DoD rejected outright the GAO notion that C-5As could augment C-17s in the Strategic Brigade Airdrop role, since the Pentagon has determined that it needs all 120 C-17s, plus 50 C-

5Bs, to accomplish the SBA mission. The Pentagon response also stated that only 11 C-5As, which are limited to large airfields, would be available to replace the 20 C-17s, and they would not meet SBA requirements.

"Operator" Takes On New Meaning

The term "operator" no longer refers solely to a rated person, USAF Chief of Staff General Fogleman said in a February 21 news release, explaining creation of the service's new operations staff officer career field.

Now, he said, the term refers to individuals "experienced in the employment and doctrine of air- and spacepower."

The Air Force plans to take 20 percent of its current pilot and navigator positions at wing or higher level to create 1,000 nonrated positions for the new Air Force Specialty Code 16G. Officers from any career field will have an opportunity to fill the new positions, which entail developing future plans, programs, and policies for the Air Force and joint services. However, it may take some time for nonrated officers to become fully competitive for the new positions.

In fact, Fogleman said that he expects the "lion's share of the positions to go to current pilots or navigators or to those serving in nonrated operations billets, such as space and missile officers." Once the service fully implements its new air and space course, he said, there should be "a gradual shift where more traditional nonrated officers fill these positions."

The Air Force plans to use the new course to give all new officers an understanding of air and space operations.

THAAD Fails Fourth Test

A Theater High-Altitude Area Defense missile failed to intercept a target ballistic missile in a March 6 test at White Sands Missile Range, N. M. The THAAD has failed four test flights in a row, which may prompt the Pentagon to consider restructuring the program.

DoD spokesman Capt. Mike Doubleday, USN, told reporters it is too early to tell if the test flight for June will be affected by this latest failure. However, Pentagon acquisition chief Paul G. Kaminski declared in February that another test failure in the near future would result in restructuring.

At a Defense Writers Group meeting February 28, Lt. Gen. Edward G. Anderson III, commander of US Army Space and Strategic Defense Command, said the upcoming March 6 test was "a very, very important shot." However, he cautioned, "I don't mean that if we miss, then we're going to cancel the program—we are not going to do that. The THAAD program is too important to the Army in particular and to our forces in general," in terms of potential missile defense.

Instead, Anderson emphasized, it is the 2004 fielding date that was at risk. He said that the THAAD program is a major engineering and technological undertaking. "We are trying to shoot a bullet with a bullet very, very rapidly."

First Titan IVB Lifts Off

The nation's newest heavy-lift expendable launch vehicle, the Titan IVB, blasted into space for the first time February 23 from Cape Canaveral AS, Fla., boosting a Defense Support Program missile-warning satellite into orbit.

The Lockheed Martin ELV features two strap-on Solid Rocket Motor Upgrade boosters designed and manu-

factured by Alliant Techsystems—providing a 25 percent increase in lift capacity. With the new SRMU motors, the Titan can put 12,700-pound payloads into geosynchronous Earth orbit and 49,000-pound payloads into low-Earth orbit.

Each booster is 112 feet long, 126 inches in diameter, weighs about 770,000 pounds, and provides 1.7 million pounds of thrust. Although larger and carrying more solid propellant than previous steel-cased boosters could, the SRMUs feature graphite epoxy composite cases, which reduce the inert weight. The upgrade program took nine years.

Lockheed Martin has contracted with Alliant for 15 SRMU flight sets of two motors each by 1999, according to Alliant officials. The second Titan IVB launch is set for October to boost NASA's Cassini probe to Saturn.

Second Civil GPS Frequency On Tap

The Department of Defense and Department of Transportation announced February 27 that they had reached agreement on the availability of a second frequency for civilian users of the satellite-based Global Positioning System.

DoD has agreed to provide civilian users uninterrupted access to a portion of its military satellite signal, known as the L2 carrier phase.

With that assurance, the Federal Aviation Administration can accelerate implementation of its Wide-Area Augmentation System, according to a DoD statement. The WAAS is a central element in the FAA's transition to a satellite-based air traffic control system, part of its Free Flight initiative. With WAAS-enhanced GPS signals, civilian pilots will be able to use the satellite system as the primary means of navigation.

DoT and DoD also agreed to plan for a second civil-use frequency with course acquisition code and navigation message capabilities. DoD officials said that this would enhance worldwide GPS capability and enable both departments to "most effectively" carry out the Clinton Administration's 1996 GPS policy.

To add the second civil frequency, called L5, DoD plans to upgrade the next generation of GPS satellites, Block IIF. The Pentagon will announce its "detailed plan" to provide the coded, second civil frequency within one year.

Survey: Tricare Prime Is OK

According to a 1996 survey of Tricare Prime enrollees, the majority of active-duty and retired military personnel and their families are "happy with their health care" under DoD's managed health-care program.

Nearly 8,000 enrollees responded to the telephone survey, which took place from October through December 1996 in regions where Tricare had been in place for at least one year. The survey measured both understanding of the health program and satisfaction with administration, medical care, access and convenience, coverage, and information about coverage and costs.

Eighty-nine percent of nonactive-duty personnel said they were likely to reenroll, as compared to seven percent who said they might not. DoD officials also noted that 75 percent of nonactive-duty enrollees and 62 percent of active-duty enrollees reported that they have a solid comprehension of Tricare Prime.

Survey results showed that 67 percent of all respondents expressed overall satisfaction with Tricare Prime, while another 22 percent said they are "very satisfied." An average of 79 percent rated satisfaction with all services "good to excellent," with 44 percent rating all services in the "very good to excellent" range. Only an average of five percent rated service "poor."

DoD commissioned a professional research organization to conduct the survey. In all, they conducted 7,728 interviews (1,935 active duty, 1,934 adult active-duty dependents, 1,922 military retirees, and 1,937 adult retiree dependents). The margin of error was plus or minus two percent.

MTFs To Extend Hours

Pentagon health-affairs officials are moving to extend the hours of operation at military treatment facilities to "ensure access to health care is convenient for our beneficiary population." According to one survey on hours of operation, only 71 out of 205 MTFs offered extended hours.

Dr. Stephen C. Joseph, assistant secretary of defense for Health Affairs, sent a February 7 memo to the services' Surgeons General requesting implementation plans by March 10 for "appropriate phasing" in of additional hours. Joseph had first broached the initiative at a Tricare conference held in the Washington, D. C., area in January.

He told conference participants that the Tricare access goal, which applies to enrollees in Tricare Prime, DoD's managed health-care option, should be to provide clinical services four nights a week and, if needed, on Saturday mornings, the current civilian benchmark.

Current Tricare policy guidelines outline the responsibility of the lead agents for each region to ensure timely access. However, Joseph noted in his memo that "extended clinic hours remain the exception rather than the norm."

Depot Privatization Studies Under Way

The Air Force has issued requests for proposal and contracts to study its aircraft maintenance operations at the San Antonio Air Logistics Center, Kelly AFB, Tex., and the Sacramento ALC, McClellan AFB, Calif., according to Secretary of the Air Force Sheila E. Widnall.

In keeping with USAF's revised depot strategy, Widnall told the Senate Armed Services Committee on February 25 that the Air Force had packaged three work loads out of the San Antonio ALC and the Sacramento ALC for public-private competitions.

She said the service expected to get a couple of bids from private industry and one from Warner Robins ALC, Robins AFB, Ga., on the first RFP, involving C-5 depot maintenance at San Antonio. USAF plans to announce a winner by mid-1997.

Because of the complexity of maintenance work conducted at the Sacramento ALC on A-10 and KC-135 aircraft, the Air Force issued three study contracts in February. Contracts went to Boeing North American, AAI Corp., and the Ogden ALC, at Hill AFB, Utah. Each organization will study the current operations, then submit bids for the work by September 1997. USAF expects to select a winner by January 1998.

The Air Force will issue an RFP on a third work load, engine repair at the San Antonio ALC, sometime this summer, according to Widnall, then award a contract next year.

AFRC Airlifters, Tankers Realign

Air Force Reserve Command, officially established as a major command in February, realigned its C-130 tactical airlift and KC-135 air refueling aircraft last month. Under the new structure, C-130s will operate under AFRC's 22d Air Force at Dobbins ARB, Ga., and KC-135s under the command's 4th Air Force at McClellan AFB, Calif.

AFRC HC-130 rescue aircraft and MC-130 special operations aircraft remain with 10th Air Force at NAS Fort Worth JRB, Carswell Field, Tex.

According to AFRC officials, the reorganization stems from last month's transfer of active-duty C-130s from

Senior Staff Changes

RETIREMENTS: Lt. Gen. Ronald W. **Iverson,** Gen. Henry **Viccellio,** Jr.

PROMOTIONS: To be **General:** George T. **Babbitt,** Jr.
To be **Lieutenant General:** David L. **Vesely.**

CHANGES: L/G (Gen. selectee) George T. Babbitt, Jr., from Dir., DLA, Under Sec'y of Defense, Acquisition and Technology, Fort Belvoir, Va., to Cmdr., Hq. AFMC, Wright-Patterson AFB, Ohio, replacing retired Gen. Henry Viccellio, Jr. . . . **B/G Robert F. Behler,** from Cmdr., 9th Recon. Wing, ACC, Beale AFB, Calif., to Dir., C^4, J-6, Hq. USSTRATCOM, Offutt AFB, Neb. . . . **B/G Roger A. Brady,** from Vice Cmdr., Ogden ALC, AFMC, Hill AFB, Utah, to Dir., Log., Hq. USAFE, Ramstein AB, Germany, replacing retiring B/G William R. Hodges . . . **B/G Richard E. Brown III,** from Cmdr., 354th FW, PACAF, Eielson AFB, Alaska, to Dir., Log., Hq. PACAF, Hickam AFB, Hawaii, replacing retired B/G Robert G. Jenkins.

B/G John H. Campbell, from Cmdr., 325th FW, AETC, Tyndall AFB, Fla., to Dir., Ops. (Current Readiness and Capabilities), J-38, Jt. Staff, Washington, D. C., replacing M/G Stephen B. Plummer . . . **M/G Thomas R. Case,** from Dir., Command and Control, DCS/Air and Space Ops., Hq. USAF, Washington, D. C., to Dir., Ops., J-3, Hq. USCENTCOM, MacDill AFB, Fla., replacing M/G (L/G selectee) Joseph E. Hurd . . . **Col. (B/G selectee) Tommy F. Crawford,** from IG, Hq. PACAF, Hickam AFB, Hawaii, to Cmdr., 354th Fighter Wing, PACAF, Eielson AFB, Alaska, replacing B/G Richard E. Brown III . . . **B/G (M/G selectee) Charles R. Henderson,** from Dep. Dir., Command and Control, DCS/Air and Space Ops., Hq. USAF, Washington, D. C., to Dir., Command and Control, DCS/Air and Space Ops., Hq. USAF, Washington, D. C., replacing M/G Thomas R. Case.

B/G Robert C. Hinson, from Cmdr., 45th Space Wing, and Dir., Eastern Range, AFSPC, and Dep. DoD Mgr., DoD Manned Space Flight Support Ops., Patrick AFB, Fla., to Dir., Ops., Hq. AFSPC, Peterson AFB, Colo., replacing B/G (M/G selectee) Gerald F. Perryman, Jr. . . . **Col. (B/G selectee) Dan L. Locker,** from Command Surgeon, Hq. USAFE, Ramstein AB, Germany, to Cmdr., 81st Med. Group, AETC, and Lead Agent, DoD Health Services Region 4, Keesler AFB, Miss., replacing retiring B/G Pedro N. Rivera . . . **Col. (B/G selectee) Thomas A. O'Riordan,** from Dep. Dir., Requirements, Hq. ACC, Langley AFB, Va., to Vice Cmdr., Ogden ALC, AFMC, Hill AFB, Utah, replacing B/G Roger A. Brady . . . **B/G (M/G selectee) Gerald F. Perryman, Jr.,** from Dir., Ops., Hq. AFSPC, Peterson AFB, Colo., to Cmdr., 14th AF, AFSPC, and Component Cmdr., USAF Space Ops., USSPACECOM, Vandenberg AFB, Calif., replacing M/G (L/G selectee) David L. Vesely.

B/G (M/G selectee) Roger R. Radcliff, from JCS Rep. for Conference on Security and Cooperation in Europe, J-5, Jt. Staff, Washington, D. C., to Cmdr., Jt. Task Force Southwest Asia, USCENTCOM, Riyadh, Saudi Arabia, replacing M/G Kurt B. Anderson . . . **B/G Gary M. Rubus,** from Dep. Dir., Int'l Negotiations, J-5, Jt. Staff, Washington, D. C., to Cmdr., 325th FW, AETC, Tyndall AFB, Fla., replacing B/G John H. Campbell . . . **B/G James E. Sandstrom,** from Dir., Command and Control Task Force, DCS/Air and Space Ops., Hq. USAF, Washington, D. C., to Dep. Dir., Command and Control, DCS/Air and Space Ops., Hq. USAF, Washington, D. C., replacing B/G (M/G selectee) Charles R. Henderson . . . **Col. (B/G selectee) Charles N. Simpson,** from Chief, Policy Div., J-5, Jt. Staff, Washington, D. C., to Cmdr., 9th Recon. Wing, ACC, Beale AFB, Calif., replacing B/G Robert F. Behler.

Col. (B/G selectee) Randall F. Starbuck, from Chief, Ops., Hq. 14th AF, AFSPC, Vandenberg AFB, Calif., to Cmdr., 45th Space Wing, and Dir., Eastern Range, AFSPC, and Dep. DoD Mgr., DoD Manned Space Flight Support Ops., Patrick AFB, Fla., replacing B/G Robert C. Hinson . . . **M/G (L/G selectee) David L. Vesely,** from Cmdr., 14th AF, AFSPC, and Component Cmdr., USAF Space Ops., USSPACECOM, Vandenberg AFB, Calif., to Ass't Vice Chief of Staff, Hq. USAF, Washington, D. C., replacing Gen. Lloyd W. Newton.

SENIOR EXECUTIVE SERVICE (SES) RETIREMENTS: Eric E. **Abell,** Jesse C. **Ryles.**

SES CHANGES: Kenneth I. Percell, to Dir., Tech. and Industrial Support, Ogden ALC, AFMC, Hill AFB, Utah, replacing Joe Black . . . **H. Lee Task,** to Sr. Scientist, Human-Systems Interface, Armstrong Lab, AFMC, Wright-Patterson AFB, Ohio . . . **John C. Wilson, Jr.,** to Exec. Dir., ESC, AFMC, Hanscom AFB, Mass., replacing retired Philip Panzarella. ■

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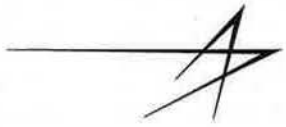

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Aerospace World

Air Combat Command to Air Mobility Command. The Reserve realignment now places all AFRC transport aircraft under AMC control in case of war or other national emergency.

Seeking Low-Cost Cruise Missile Defense

The Defense Advanced Research Projects Agency announced February 18 that it had contracted with three companies for 12-month studies to develop cruise missile defense technologies at "substantially reduced cost."

Boeing North American, Texas Instruments, and Toyon Research Corp. will each provide a concept development study for DARPA's Low-Cost Cruise Missile Defense Program.

Boeing North American will develop a gun-launched, high-speed projectile concept and precision targeting approaches using unmanned aerial vehicle–based fire-control sensors.

TI will work on a low-cost interceptor concept, which can be surface- or air-launched and has a range of more than 150 miles.

Toyon Research of Goleta, Calif., will develop a reusable UAV weapon system concept employing low-cost airframe, sensor, and kill mechanism technologies.

News Notes

■ The National Aeronautic Association presented the 1996 Collier Trophy, recognizing the top US aeronautical achievement, to Cessna and the Citation X design team for "designing, testing, certifying, and placing into service the Citation X, the first commercial aircraft in US aviation history to achieve a cruising speed of Mach .92."

■ Lt. Gen. George T. Babbitt, Jr., formerly director of the Defense Logistics Agency, was slated for a fourth star and to take command of Air Force Materiel Command upon retirement of Gen. Henry Viccellio, Jr., on May 1.

■ A DoD-owned Predator unmanned aerial vehicle, or Tier II medium-altitude endurance UAV, crashed February 25 while taking off from General Atomic's flight facility at El Mirage, Calif., for a flight check. No injuries to personnel or property were reported.

■ The 11th Reconnaissance Squadron, Nellis AFB, Nev., conducted the first official launch of a Predator UAV from Indian Springs Air Force Auxiliary Field, Nev., on January 31. The ACC unit received its first two Predators in November 1996 and expects to receive 43 more of the $3 million UAVs.

■ An Electronic Systems Center, Hanscom AFB, Mass., joint-service integrated product team is studying all-weather, precision landing system capabilities and expects to present results of its concept exploration in September. DoD wants the team, with FAA and industry representatives, to produce an architecture for the new system, which it plans to develop, acquire, and integrate within 10 to 15 years.

■ Missile launch costs and air freight fees may soon decrease due to a cooperative research agreement signed January 28 between USAF's Phillips Laboratory, Kirtland AFB, N. M., and Aerospace Consulting Corp., Albuquerque, N. M. Phillips's automated design and tooling processes, combined with Aerospace Consulting's specialized manufacturing methods, can rapidly produce cheap, lightweight, extremely strong carbonfiber composite structural panels to replace existing expensive metal components in interstage missile bodies and air cargo shipping containers. ■

Index to Advertisers

USAF Almanac

ac 1997

The Fiftieth Anniversary of the United States Air Force

The Air Force in Facts and Figures

Edited by Tamar A. Mehuron, Associate Editor

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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

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 – Aug. 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 – Mar. 9, 1942
	Commanding General, AAF	
	Gen. of the Army Henry H. Arnold	Mar. 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 – Apr. 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 September 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 September 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. 78). 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; and a **support group,** which can include such functions as Security Police and civil engineers.

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.

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	381,100[a]

[a]Programmed

Active-Duty Force Demographics

(As of September 30, 1996)

Grade	Total	Blacks	Women	Other Minorities
Officers				
General	275	9	6	2
Colonel	4,022	103	204	88
Lieutenant Colonel	10,375	621	1,095	202
Major	16,019	1,101	2,346	397
Captain	31,026	1,693	5,287	1,312
First Lieutenant	7,513	459	1,674	554
Second Lieutenant	7,158	454	1,435	514
Total	**76,388**	**4,440**	**12,047**	**3,069**
Enlisted				
Chief Master Sergeant of the Air Force	1			
Chief Master Sergeant	3,064	545	235	53
Senior Master Sergeant	6,154	1,130	619	166
Master Sergeant	32,083	6,406	3,504	1,266
Technical Sergeant	39,048	7,721	4,635	1,637
Staff Sergeant	78,269	15,045	10,578	4,268
Sergeant/Senior Airman	77,244	11,167	15,394	3,789
Airman First Class	43,324	6,377	10,107	3,598
Airman	17,682	2,780	4,273	1,781
Airman Basic	11,739	1,785	2,784	1,147
Total	**308,608**	**52,956**	**52,129**	**17,705**
Total personnel	**384,996**	**57,396**	**64,176**	**20,774**

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

Total does not include 4,005 cadets.

USAF Educational Levels

(As of September 30, 1996)

Level	Number	Percent
Enlisted		
Below high school	41	0.01
High school	71,373	23.13
Some college (< 2 years)	142,363	46.13
AA/AS degree	39,864	12.92
2–3 years college	40,104	13.00
Baccalaureate degree	13,174	4.27
Master's degree or higher	1,689	0.55
Total	**308,608**	**100.00**
Officers		
Below baccalaureate/ unknown	1,251	1.56
Cadets	4,005	4.98
Baccalaureate degree	33,455	41.63
Master's degree	34,401	42.79
Doctoral and professional degrees	7,281	9.06
Total	**80,393**	**100.00**

Numbers are rounded and may not sum to totals.

Armed Forces Manpower Trends

(End strength figures in thousands)

Fiscal Year	'91	'92	'93	'94	'95	'96	'97	'98[a]
Active-duty military								
Air Force	510	470	444	426	400	389	381	372
Army	725	611	572	541	509	491	495	495
Marine Corps	195	185	178	174	175	175	174	174
Navy	571	542	510	469	435	417	402	391
Total	**2,001**	**1,808**	**1,705**	**1,611**	**1,519**	**1,472**	**1,452**	**1,432**
Selected Reserve and Guard								
AFRC	84	82	81	80	78	74	73	73
Air National Guard	118	119	117	114	110	111	109	107
Army National Guard	441	426	410	397	375	370	367	208
Army Reserve	300	303	276	260	241	226	215	94
Marine Corps Reserve	44	42	42	41	41	42	42	42
Naval Reserve	150	142	132	108	101	98	96	94
Total	**1,137**	**1,114**	**1,058**	**998**	**946**	**921**	**902**	**618**
Direct-hire civilian[b]								
Air Force[c]	320.3	321.2	295.7	262.7	249.1	238.1	236.6	229.4
Army[c]	321.6	309.3	284.6	266.1	248.8	229.4	214.2	205.0
Navy/Marine Corps	224.2	205.9	200.3	188.2	182.0	176.0	174.6	169.8
Defense agencies	111.0	136.8	150.8	151.3	141.9	135.4	134.7	129.1
Total[c]	**977.0**	**973.2**	**931.4**	**868.3**	**821.7**	**778.9**	**760.0**	**733.2**

Numbers are rounded and may not sum to totals.

[a]Programmed manpower as of FY 1998 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.

GEICO Salutes and Congratulates The U.S. Air Force On Your 50th Anniversary Celebration

GEICO is proud to be part of your 50th anniversary celebration. Serving the men and women of the United States Air Force has been a distinct honor and privilege, and we look forward to continuing this service for the next 50 years and beyond.

Congratulations from the entire GEICO team as you commemorate your "golden legacy." Best wishes for continued excellence in service to our great nation in your "boundless future."

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USAF Personnel Strength by Commands, FOAs, and DRUs

(DoD figures as of September 30, 1996)

	Military	Civilian	Total
Major commands			
Air Combat Command (ACC)	103,169	13,167	116,336
Air Education and Training Command (AETC)	65,165	14,206	79,371
Air Force Materiel Command (AFMC)	34,034	73,393	107,427
Air Force Space Command (AFSPC)	22,232	4,760	26,992
Air Force Special Operations Command (AFSOC)	9,681	536	10,217
Air Mobility Command (AMC)	48,729	8,525	57,254
Pacific Air Forces (PACAF)	33,594	8,404	41,998
United States Air Forces in Europe (USAFE)	27,151	5,415	32,566
Total major commands	**343,755**	**128,406**	**472,161**
Field operating agencies (FOAs)			
Air Force Audit Agency	4	863	867
Air Force Base Conversion Agency	1	311	312
Air Force Center for Environmental Excellence	52	393	445
Air Force Civil Engineer Support Agency	109	114	223
Air Force Communications Agency	284	303	587
Air Force Cost Analysis Agency	36	71	107
Air Force Doctrine Center	17	4	21
Air Force Flight Standards Agency	137	22	159
Air Force Frequency Management Agency	10	21	31
Air Force Historical Research Agency	12	53	65
Air Force History Support Office	6	28	34
Air Force Inspection Agency	125	25	150
Air Force Legal Services Agency	407	128	535
Air Force Logistics Management Agency	57	17	74
Air Force Management Engineering Agency	87	80	167
Air Force Medical Operations Agency	46	106	152
Air Force Medical Support Agency	51	39	90
Air Force Personnel Center	930	681	1,611
Air Force News Agency	350	130	480
Air Force Office of Special Investigations	1,445	429	1,874
Air Force Operations Group	211	14	225
Air Force Pentagon Communications Agency	617	342	959
Air Force Personnel Operations Agency	38	25	63
Air Force Program Executive Office	38	14	52
Air Force Real Estate Agency	0	13	13
Air Force Reserve	343	14,891[a]	15,234[a]
Air Force Review Boards Agency	11	35	46
Air Force Safety Center	75	61	136
Air Force Security Police Agency	128	16	144
Air Force Services Agency	70	203	273
Air Force Studies and Analyses Agency	60	24	84
Air Force Technical Applications Center	941	0	941
Air Intelligence Agency	10,882	2,099	12,981
Air National Guard Readiness Center	51	510	561
Air Reserve Personnel Center	117	485	602
Air Weather Service	802	226	1,028
Joint Services Survival, Evasion, Resistance, and Escape Agency	34	61	95
Total FOAs	**18,584**	**22,837**	**41,421**
Direct reporting units (DRUs)			
Air Force Operational Test and Evaluation Center	570	187	757
United States Air Force Academy (excluding 4,005 cadets)	2,534	1,962	4,496
11th Wing	1,590	1,098	2,688
Total DRUs	**4,694**	**3,247**	**7,941**
Total major commands, FOAs, DRUs	**367,033** [b]	**154,490**	**521,523**

[a]Includes Air Reserve technicians.

[b]Total does not include approximately 20,000 personnel.

USAF Personnel by Geographic Area

(As of September 30, 1996)

Total military personnel	**389,001**
US territory and special locations	**325,807**
Total in foreign countries	**63,194**
Western and southern Europe	**34,689**
Germany	15,098
UK	9,775
Turkey	2,588
Italy	4,164
Spain	215
All other countries	2,849
East Asia and Pacific	**25,541**
Japan/Okinawa	14,403
South Korea	8,657
Guam	2,105
All other countries	376
Africa, Near East, south Asia	**386**
Saudi Arabia	206
Egypt	54
All other countries	126
Western hemisphere	**2,212**
Panama	2,012
Canada	88
All other countries	112
Other areas	**366**

Active-Duty Force by Grade

(As of September 30, 1996)

Grade	Number
Officers	
General	12
Lieutenant General	37
Major General	87
Brigadier General	139
Colonel	4,022
Lieutenant Colonel	10,375
Major	16,019
Captain	31,026
First Lieutenant	7,513
Second Lieutenant	7,158
Cadets	4,005
Total	**80,393**
Enlisted	
Chief Master Sergeant of the Air Force	1
Chief Master Sergeant	3,064
Senior Master Sergeant	6,154
Master Sergeant	32,083
Technical Sergeant	39,048
Staff Sergeant	78,269
Sergeant/Senior Airman	77,244
Airman First Class	43,324
Airman	17,682
Airman Basic	11,739
Total	**308,608**
Total strength	**389,001**

Air Force Installations

Fiscal Year	'93	'94	'95	'96	'97	'98
Major installations						
US and possessions	99	85	79	77	75	74
Foreign	22	17	15	13	13	13
Worldwide	121	102	94	90	88	87
Minor installations						
US and possessions	105	110	113	84	85	82
Foreign	14	12	7	4	4	4
Worldwide	119	122	120	88	89	86

Includes Air Force Reserve Command and Air National Guard.

Specialties in the Enlisted Force

(As of September 30, 1996)

Code	Career Field	Assigned	Percentage
1A	Aircrew Operations	6,859	2.2
1C	Command Control Systems Operations	11,720	3.8
1N	Intelligence	10,794	3.5
1S	Safety	392	0.1
1T	Aircrew Protection	2,617	0.8
1W	Weather	2,624	0.9
2A	Manned Aerospace Maintenance	66,804	21.6
2B	Marine	0	0.0
2E	Communications-Electronics Systems	18,008	5.8
2F	Fuels	3,954	1.3
2G	Logistics Plans	713	0.2
2M	Missile & Space Systems Maintenance	2,970	1.0
2P	Precision Measurement	1,553	0.5
2R	Maintenance Management Systems	2,016	0.7
2S	Supply	14,042	4.6
2T	Transportation & Vehicle Maintenance	13,233	4.3
2W	Munitions & Weapons	16,094	5.2
3A	Information Management	12,608	4.1
3C	Communications-Computer Systems	15,556	5.0
3E	Civil Engineering	19,116	6.2
3H	Historian	106	<0.1
3M	Morale, Welfare, Recreation, & Services	5,180	1.7
3N	Public Affairs	1,589	0.5
3P	Security Police	21,969	7.1
3R	Printing Management	251	0.1
3S	Mission Support	9,979	3.2
3U	Manpower	568	0.2
3V	Visual Information	1,687	0.5
4X	Medical	24,413	7.9
4Y	Dental	2,912	0.9
5J	Paralegal	989	0.3
5R	Chapel Service Support	474	0.2
6C	Contracting	1,299	0.4
6F	Financial	4,056	1.3
7S	Special Investigation	742	0.2
8	Special Duty Identifiers	6,163	2.0
9	Reporting Identifiers	4,555	1.5
Total		**308,605**	**100**

Total does not include three unassigned airmen. Percentages have been rounded.

Specialties in the Officer Force

(As of September 30, 1996)

Code	Utilization Field Title	Assigned	Percentage
X0	Commander & Director	920	1.2
11	Pilot	13,983	18.3
12	Navigator	4,756	6.2
13	Space, Missile, Command & Control	5,707	7.5
14	Intelligence	2,853	3.7
15	Weather	780	1.0
16	Operations Support	1,270	1.7
21	Aircraft Maintenance & Munitions	4,489	5.9
22	Space & Missile Maintenance*	—	—
23	Supply*	—	—
24	Transportation*	—	—
25	Logistics Plans & Programs*	—	—
31	Security Police	743	1.0
32	Civil Engineering	1,704	2.2
33	Communications-Computer Systems	4,466	5.8
34	Morale, Welfare, Recreation, & Services	403	0.5
35	Public Affairs	389	0.5
36	Personnel	1,370	1.8
37	Information Management	1,410	1.8
38	Manpower	265	0.3
4X	Medical	13,771	18.0
51	Law	1,303	1.7
52	Chaplain	613	0.8
61	Scientific/Research	1,155	1.5
62	Developmental Engineering	3,442	4.5
63	Acquisition	2,521	3.3
64	Contracting	1,054	1.4
65	Financial	1,032	1.4
71	Special Investigations	361	0.5
8X	Special Duty Identifiers	4,071	5.3
9X	Reporting Identifiers	1,546	2.0
Total		**76,377**	**100**

* Merged with 21.

Total does not include 4,005 cadets or 11 officers assigned to "Other" category. Percentages have been rounded.

USAF Total Force

Fiscal Year	'91	'92	'93	'94	'95	'96	'97
Air Force active duty							
Officers	96,600	90,400	84,073	81,003	78,444	76,388	74,445
Enlisted	409,400	375,700	356,126	341,317	317,938	308,608	302,655
Cadets	4,431	4,215	4,152	4,007	4,027	4,005	4,000
Total, Air Force military	**510,431**	**470,315**	**444,351**	**426,327**	**400,409**	**389,001**	**381,100**
Career reenlistments (second term)	41,500	49,100	38,300	41,000	37,200	37,200	34,600
Rate	87%	88%	90%	89%	88%	87%	88%
First-term reenlistments	22,500	21,000	17,600	13,100	13,500	12,900	12,200
Rate	59%	59%	61%	60%	65%	59%	60%
Civilian personnel							
Direct hire (excluding technicians)	188,259	170,549	158,631	155,385	146,180	143,662	138,565
Technicians: AFRC	9,527	10,467	9,827	9,398	9,432	9,436	9,704
ANG	24,703	24,741	24,958	24,063	24,174	23,931	22,881
Indirect hire—foreign nationals	10,172	8,652	8,246	7,643	6,643	6,695	6,630
Total civilian personnel	**232,661**	**214,409**	**201,662**	**196,489**	**186,429**	**183,724**	**177,780**
Total military and civilian	**743,092**	**684,724**	**646,013**	**622,816**	**586,838**	**572,725**	**558,880**
Reserve and Guard							
Air National Guard, Selected Reserve	117,786	119,083	117,162	113,587	109,826	110,471	109,178
AFRC, paid	84,539	83,396	80,562	79,621	78,706	76,138	73,311
AFRC, nonpaid	75,002	74,330	111,509	98,848	99,000	71,910	66,827
Total Ready Reserve	**277,327**	**276,809**	**309,233**	**292,056**	**287,532**	**258,519**	**249,316**
Standby	14,234	16,000	13,042	9,926	14,435	14,437	14,500
Total Reserve and Guard	**291,561**	**292,809**	**322,275**	**301,982**	**301,967**	**272,956**	**263,816**

Numbers are rounded and may not sum to totals. FYs 1991–96 are actual figures; FY 1997 is an estimate.

The Civilian Force

(As of September 30, 1996)

General Schedule/ Other

Grade	Force
1	1
2	41
3	961
4	4,933
5	12,130
6	7,249
7	9,509
8	1,380
9	12,980
10	845
11	16,594
12	20,259
13	10,447
14	3,378
15	1,237
16	0
17	0
18	0
ST[a]	23
SES[b]	154
Other	318
Total	**102,439**

Wage Grade

Grade	Force
1	4
2	305
3	304
4	173
5	1,211
6	1,211
7	1,902
8	3,502
9	3,812
10	15,240
11	4,002
12	1,738
13	237
14	103
15	1
Total	**33,745**

Wage Grade Leader

Grade	Force
1	0
2	4
3	3
4	3
5	28
6	26
7	53
8	97
9	273
10	771
11	115
12	52
13	2
14	1
15	0
Total	**1,428**

Wage Grade Supervisory

Grade	Force
1	13
2	26
3	32
4	67
5	94
6	178
7	246
8	275
9	1,013
10	1,260
11	482
12	267
13	161
14	201
15	129
16	89
17	41
18	14
Total	**4,588**

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	**46 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.

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United States Air Force

on its

F-16 with HARM and HTS

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50th Anniversary

For nearly 50 years, TI has partnered with the Air Force to build a legacy of precision guided weapons, playing a vital role in the historic battles and conflicts of a half century. That pioneering spirit still thrives as we collaborate to build the next generation of smart weapons, advanced airborne radars and FLIRS, electronic warfare systems, and technology to meet the mission requirements of the 21st century. We join the Air Force today in saluting the past and building for the future.

TEXAS INSTRUMENTS

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 January 1, 1997)

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	$12,669	$13,091	$13,512	$13,932	$14,355	$14,602	$15,017	$15,436	$15,454	$15,844
GS-2	14,243	14,583	15,055	15,454	15,628	16,088	16,548	17,008	17,468	17,928
GS-3	15,542	16,060	16,578	17,096	17,614	18,132	18,650	19,168	19,686	20,204
GS-4	17,447	18,029	18,611	19,193	19,775	20,357	20,939	21,521	22,103	22,685
GS-5	19,520	20,171	20,822	21,473	22,124	22,775	23,426	24,077	24,728	25,379
GS-6	21,758	22,483	23,208	23,933	24,658	25,383	26,108	26,833	27,558	28,283
GS-7	24,178	24,984	25,790	26,596	27,402	28,208	29,014	29,820	30,626	31,432
GS-8	26,777	27,670	28,563	29,456	30,349	31,242	32,135	33,028	33,921	34,814
GS-9	29,577	30,563	31,549	32,535	33,521	34,507	35,493	36,479	37,465	38,451
GS-10	32,571	33,657	34,743	35,829	36,915	38,001	39,087	40,173	41,259	42,345
GS-11	35,786	36,979	38,172	39,365	40,558	41,751	42,944	44,137	45,330	46,523
GS-12	42,890	44,320	45,750	47,180	48,610	50,040	51,470	52,900	54,330	55,760
GS-13	51,003	52,703	54,403	56,103	57,803	59,503	61,203	62,903	64,603	66,303
GS-14	60,270	62,279	64,288	66,297	68,306	70,315	72,324	74,333	76,342	78,351
GS-15	70,894	73,257	75,620	77,983	80,346	82,709	85,072	87,435	89,798	92,161

Senior Executive Service

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6
$97,000	$101,600	$106,200	$111,900	$115,700	$115,700

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

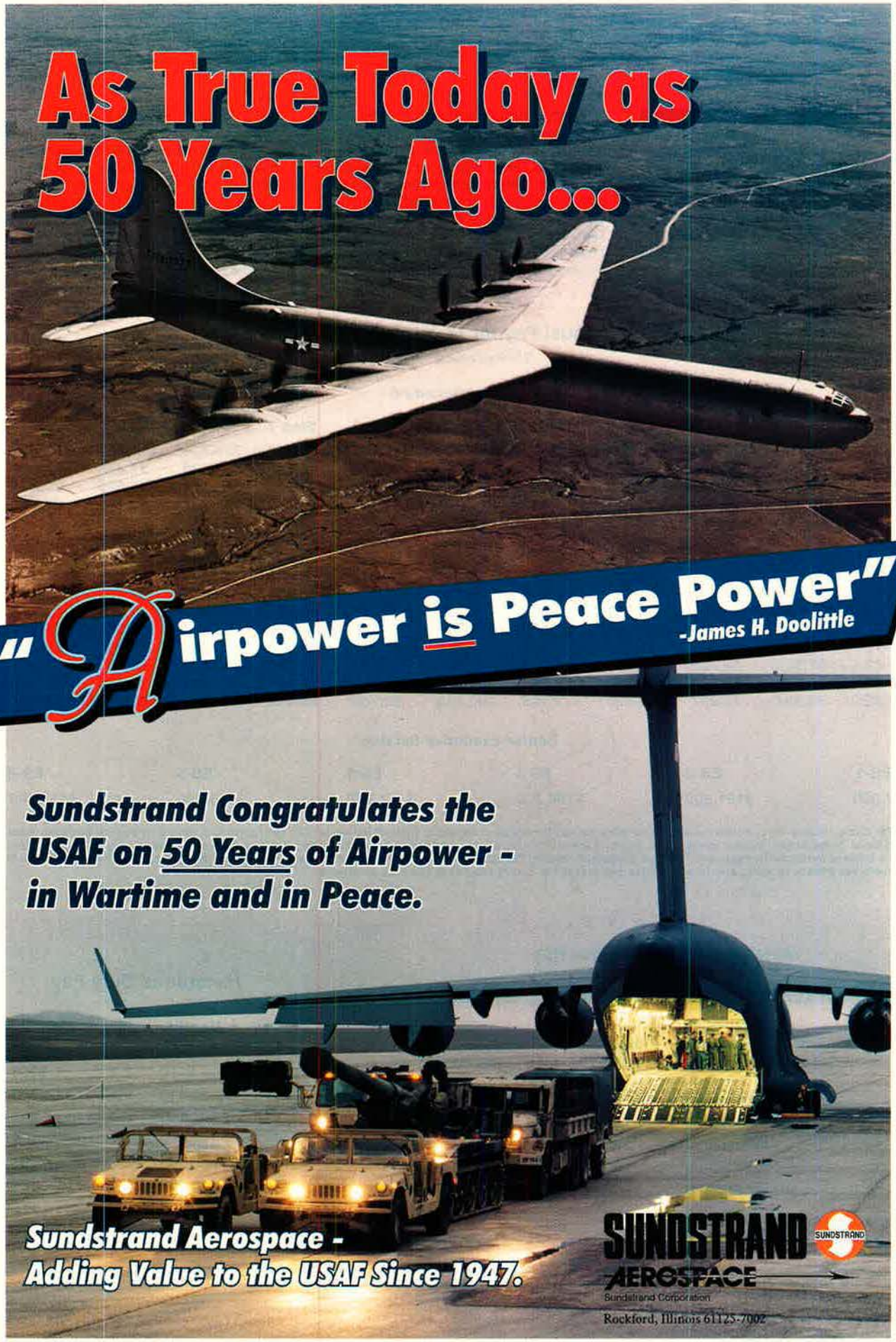
Provided to qualified rated officers and flight surgeons.

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 twenty-fifth 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

Pay Grade	Monthly Rate	Pay Grade	Monthly Rate
O-10	$110	E-9	$200
O-9	110	E-8	200
O-8	110	E-7	200
O-7	110	E-6	175
O-6	250	E-5	150
O-5	250	E-4	125
O-4	225	E-3	110
O-3	175	E-2	110
O-2	150	E-1	110
O-1	125		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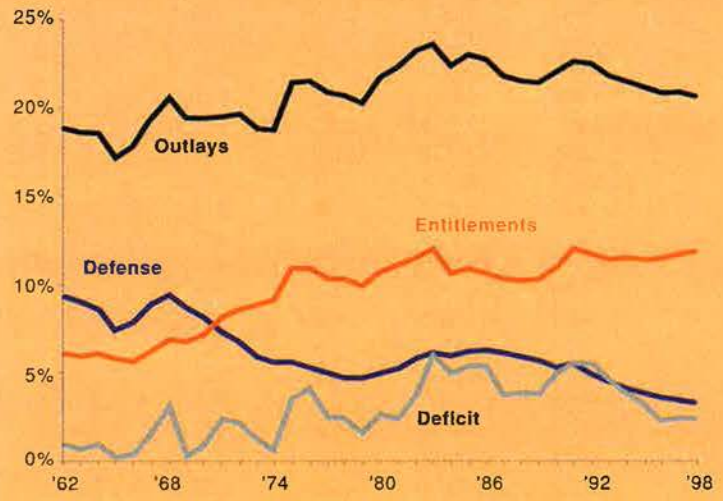
Federal Budget Categories as Percentages of GDP



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	10.3	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	21.4	3.8	11.5	4.1
1995	21.1	3.1	11.4	3.8
1996	20.8	2.3	11.5	3.6
1997	20.8	2.5	11.7	3.4
1998	20.6	2.4	11.9	3.3

Explanatory Note

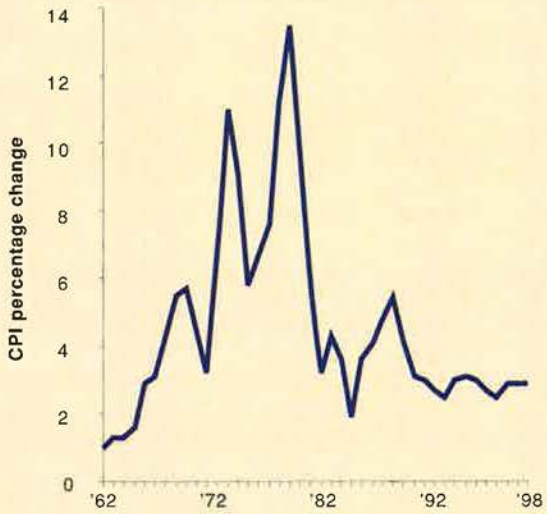
Data for 1962–96 are historical. Data for 1997–98 are projections. These four tables are based on two documents:

- "Economic and Budget Outlook; Fiscal Years 1998–2007," published by the Congressional Budget Office, January 1997.
- "Budget of the United States Government, Fiscal Year 1998," published by the Office of Management and Budget, February 1997.

OMB was the source for 1997–98 national defense outlay projections. All other figures were supplied by CBO. (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	2.9
1979	11.3	1998	2.9
1980	13.5		

Federal Budget Categories
Current $ billions

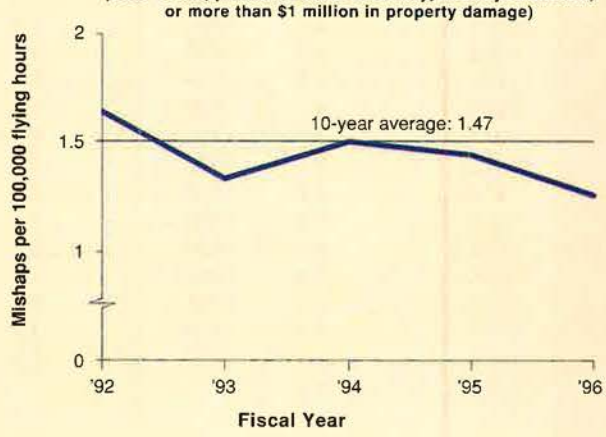
Year	Outlays	Deficit	Entitlements	Defense
1962	$106.8	$5.9	$34.7	$52.6
1963	111.3	4.0	36.2	53.7
1964	118.5	6.5	38.9	55.0
1965	118.2	1.6	39.7	51.0
1966	134.5	3.1	43.4	59.0
1967	157.5	12.6	50.9	72.0
1968	178.1	27.7	59.7	82.2
1969	183.6	0.5	64.7	82.7
1970	195.6	8.7	72.6	81.9
1971	210.2	26.1	86.9	79.0
1972	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	1,004.2	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	818.1	273.6
1996	1,560.1	174.4	858.5	266.5
1997	1,632.0	201.0	916.0	266.0
1998	1,687.0	199.0	976.0	270.0

Federal Budget Categories
Constant Fiscal 1998 $ billions

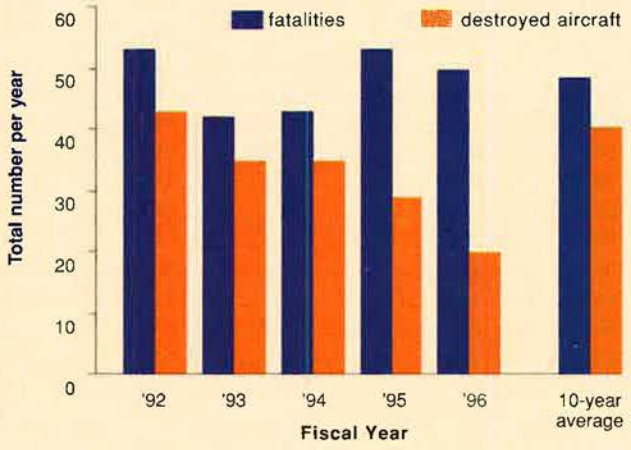
Year	Outlays	Deficit	Entitlements	Defense
1962	$586.2	$32.4	$190.5	$288.7
1963	603.1	21.7	196.1	291.0
1964	633.9	34.8	208.1	294.2
1965	622.3	8.4	209.0	268.5
1966	688.1	15.9	222.0	301.9
1967	781.6	62.5	252.6	357.3
1968	848.2	131.9	284.3	391.5
1969	828.8	2.3	292.1	373.3
1970	835.4	37.2	310.1	349.8
1971	859.9	106.8	355.5	323.2
1972	914.5	104.6	400.0	314.3
1973	917.1	57.5	433.3	287.8
1974	905.9	26.9	440.5	271.4
1975	1,024.2	170.4	522.7	270.0
1976	1,083.1	205.4	551.8	261.9
1977	1,119.3	136.2	558.0	266.7
1978	1,166.1	139.6	578.9	265.9
1979	1,151.2	88.4	564.9	266.8
1980	1,189.1	146.3	586.6	270.9
1981	1,237.4	135.0	619.6	288.3
1982	1,281.3	206.3	637.2	319.4
1983	1,345.7	346.3	683.7	349.4
1984	1,359.7	296.4	647.7	363.9
1985	1,458.2	341.6	690.8	389.9
1986	1,497.5	359.8	698.5	414.0
1987	1,465.5	247.1	692.3	412.3
1988	1,492.3	272.0	708.4	407.8
1989	1,529.9	274.5	735.2	406.6
1990	1,590.5	352.6	796.1	380.9
1991	1,613.1	391.7	855.7	389.4
1992	1,632.3	402.2	846.6	357.5
1993	1,616.5	344.5	845.1	335.4
1994	1,632.4	289.0	875.6	315.3
1995	1,651.4	246.6	891.4	298.1
1996	1,651.9	184.7	909.0	282.2
1997	1,679.3	206.8	942.6	273.7
1998	1,687.0	199.0	976.0	270.0

Class A Mishaps

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



Class A Aircraft Mishaps



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Defense Department Budget Top Line and Service Shares

($ billions)

Fiscal Year	'97	'98	'99	'00	'01	'02
Budget authority (current $)	250.0	250.7	256.3	262.8	269.6	277.5
Budget authority (constant FY 1998 $)	256.5	250.7	250.8	251.3	251.9	253.2
Outlays (current $)	254.3	247.5	249.3	255.2	256.2	261.4
Outlays (constant FY 1998 $)	260.9	247.5	243.9	244.1	239.5	238.8

Fiscal Year	'94	'95	'96	'97	'98
Service Shares (budget authority, current $ billions)					
Air Force	74.6	74.4	73.0	72.4	75.0
Army	62.5	62.7	64.5	62.4	60.1
Navy	78.1	78.2	80.0	78.9	79.1
Defense agencies, DoD-wide	36.3	37.3	37.0	36.4	36.4
Total	**251.4**	**252.6**	**254.4**	**250.0**	**250.7**
Percentages (budget authority)					
Air Force	29.6	29.5	28.7	29.0	30.0
Army	24.9	24.8	25.4	25.0	24.0
Navy	31.1	30.9	31.4	31.6	31.6
Defense agencies, DoD-wide	14.4	14.8	14.5	14.5	14.5

Fiscal 1998 figures are those contained in the Clinton Administration's budget request. Numbers have been rounded.

Pay Grade	Single Full Rate	Partial Rate	Married Full Rate
O-10	$824.70	$50.70	$1,015.20
O-9	824.70	50.70	1,015.20
O-8	824.70	50.70	1,015.20
O-7	824.70	50.70	1,015.20
O-6	756.60	39.60	914.10
O-5	728.70	33.00	881.10
O-4	675.30	26.70	776.70
O-3	541.20	22.20	642.60
O-2	429.30	17.70	548.70
O-1	361.50	13.20	490.50
O-3E	584.40	22.20	690.60
O-2E	496.80	17.70	623.10
O-1E	427.20	13.20	575.70
E-9	500.40	18.60	659.70
E-8	459.30	15.30	608.10
E-7	392.40	12.00	564.60
E-6	355.20	9.90	521.70
E-5	327.60	8.70	469.20
E-4	285.00	8.10	408.00
E-3	279.60	7.80	379.80
E-2	227.10	7.20	361.50
E-1	202.50	6.90	361.50

Air Force Budget—A 10-Year Perspective

(Budget authority in $ millions)

Fiscal Year	'88	'89	'90	'91	'92	'93	'94	'95	'96	'97
Current dollars										
Military personnel	$21,613	$21,851	$21,777	$22,755	$21,381	$20,141	$18,168	$19,602	$19,309	19,132
Operations and maintenance	23,040	24,973	25,160	29,061	22,816	22,179	24,525	24,561	23,519	21,686
Procurement	26,701	30,981	30,276	24,041	23,249	21,803	17,716	16,529	15,558	15,006
RDT&E	14,617	14,696	13,507	12,207	12,867	12,979	12,021	11,787	12,427	14,069
Military construction	1,414	1,445	1,453	1,117	1,200	1,053	1,554	816	1,285	1,579
Family housing	828	921	870	888	1,112	1,212	923	1,106	1,124	1,135
Rev. and mgmt. funds	452	187	121	1,672	n/a	n/a	n/a	n/a	n/a	n/a
Trust and receipts	–340	–369	–274	–485	–286	–221	–332	–470	–231	–249
Total	**88,324**	**94,685**	**92,890**	**91,257**	**82,340**	**79,146**	**74,575**	**73,933**	**72,992**	**72,359**
Constant FY '98 dollars										
Military personnel	28,925	27,317	27,775	27,771	25,326	22,866	20,126	21,201	20,405	19,651
Operations and maintenance	31,270	32,444	31,867	33,056	26,603	25,135	26,987	26,732	24,976	22,485
Procurement	34,091	38,079	36,013	27,815	26,283	24,144	19,231	17,588	16,218	15,321
RDT&E	19,033	18,380	16,262	14,173	14,579	14,384	13,062	12,558	12,969	14,371
Military construction	1,799	1,772	1,723	1,290	1,356	1,167	1,688	868	1,340	1,612
Family housing	1,078	1,152	1,049	1,026	1,260	1,342	1,001	1,179	1,173	1,160
Rev. and mgmt. funds	597	237	146	1,949	n/a	n/a	n/a	n/a	n/a	n/a
Trust and receipts	–449	–483	–333	–566	–324	–245	–360	–500	–241	–254
Total	**116,344**	**119,898**	**114,502**	**106,514**	**95,081**	**88,793**	**81,734**	**79,625**	**76,841**	**74,345**
Percentage real growth										
Military personnel	–1.2	–2.1	–1.9	0.0	–8.8	–9.7	–12.0	5.3	–3.8	–3.7
Operations and maintenance	4.5	3.8	–1.8	4.1	–19.5	–5.5	7.4	–0.9	–6.6	–10.0
Procurement	–19.5	11.7	–5.4	–22.9	–5.5	–8.1	–20.3	–8.5	–7.8	–5.5
RDT&E	–5.6	–3.4	–11.5	–12.9	2.9	–1.3	–9.2	–3.9	3.3	10.8
Military construction	–4.5	–1.5	–2.8	–25.2	5.1	–13.9	44.6	–48.6	54.4	20.3
Family housing	0.9	6.9	–8.9	–2.3	22.8	6.5	–25.4	17.8	–0.5	–1.1
Total	**–6.6**	**3.1**	**–4.5**	**–7.0**	**–10.7**	**–6.6**	**–7.9**	**–2.6**	**–3.5**	**–3.2**

Totals may not sum due to rounding.

Allowances for Quarters and Subsistence

	Cash/In-Kind
Officers	$154.16/month

Enlisted Members	**E-1 <4 Months**	**All Other Enlisted**
When on leave or authorized to mess separately	$6.79/day	$7.36/day
When rations in-kind are not available	$7.65/day	$8.30/day
When assigned to duty under emergency conditions where no US mess facilities are available	$10.16/day	$10.99/day

Uniformed service members without dependents are due payment of these full rates of basic allowance for quarters. Partial rate payments are due uniformed service members without dependents who do not qualify for the full rate. Service Academy cadet pay is $558.04 monthly, effective January 1, 1997.

Monthly Military Basic Rates of Pay

(Effective January 1, 1997)

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	$7,360	$7,619	$7,619	$7,619	$7,619	$7,912	$7,912	$8,350	$8,350	$8,947	$8,947	$9,017	$9,017	$9,017	$9,017
O-9	6,523	6,694	6,837	6,837	6,837	7,010	7,010	7,302	7,302	7,912	7,912	8,350	8,350	8,350	8,947
O-8	5,908	6,086	6,230	6,230	6,230	6,694	6,694	7,010	7,010	7,302	7,619	7,912	8,107	8,107	8,107
O-7	4,909	5,243	5,243	5,243	5,478	5,478	5,796	5,796	6,086	6,694	7,154	7,154	7,154	7,154	7,154
O-6	3,638	3,998	4,260	4,260	4,260	4,260	4,260	4,260	4,405	5,101	5,361	5,478	5,796	5,992	6,286
O-5	2,910	3,417	3,653	3,653	3,653	3,653	3,764	3,967	4,232	4,549	4,810	4,956	5,129	5,129	5,129
O-4	2,453	2,987	3,186	3,186	3,245	3,389	3,620	3,823	3,998	4,173	4,288	4,288	4,288	4,288	4,288
O-3[b]	2,279	2,549	2,725	3,015	3,159	3,272	3,449	3,620	3,709	3,709	3,709	3,709	3,709	3,709	3,709
O-2[b]	1,988	2,171	2,608	2,696	2,752	2,752	2,752	2,752	2,752	2,752	2,752	2,752	2,752	2,752	2,752
O-1[b]	1,726	1,796	2,171	2,171	2,171	2,171	2,171	2,171	2,171	2,171	2,171	2,171	2,171	2,171	2,171
Commissioned Officers With More Than Four Years of Active-Duty Enlisted Service															
O-3E	—	—	—	3,015	3,159	3,272	3,449	3,620	3,764	3,764	3,764	3,764	3,764	3,764	3,764
O-2E	—	—	—	2,696	2,752	2,839	2,987	3,101	3,186	3,186	3,186	3,186	3,186	3,186	3,186
O-1E	—	—	—	2,171	2,319	2,405	2,492	2,578	2,696	2,696	2,696	2,696	2,696	2,696	2,696
Enlisted Members															
E-9	—	—	—	—	—	—	2,702	2,762	2,825	2,890	2,955	3,012	3,170	3,293	3,479
E-8	—	—	—	—	—	2,266	2,331	2,392	2,454	2,519	2,576	2,640	2,795	2,919	3,107
E-7	1,582	1,708	1,771	1,833	1,895	1,956	2,018	2,081	2,175	2,237	2,299	2,329	2,486	2,609	2,795
E-6	1,361	1,484	1,545	1,611	1,671	1,731	1,795	1,887	1,947	2,009	2,040	2,040	2,040	2,040	2,040
E-5	1,194	1,300	1,363	1,422	1,516	1,578	1,640	1,700	1,731	1,731	1,731	1,731	1,731	1,731	1,731
E-4	1,114	1,176	1,246	1,342	1,395	1,395	1,395	1,395	1,395	1,395	1,395	1,395	1,395	1,395	1,395
E-3	1,050	1,107	1,151	1,197	1,197	1,197	1,197	1,197	1,197	1,197	1,197	1,197	1,197	1,197	1,197
E-2	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010	1,010
E-1[c]	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901

Amounts have been rounded to the nearest dollar. Basic pay while serving as Chairman of the Joint Chiefs of Staff is $10,340.10; as Chief of Staff of the Air Force, $9,016.80, regardless of cumulative years of service. Basic pay while serving as Chief Master Sergeant of the Air Force is $4,227.90, regardless of cumulative years of service.

[a]Basic pay is limited to $9,016.80, 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 $833.40.

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Equipment

Aircraft per Active-Duty USAF Squadron

(As of September 30, 1996)

Aircraft Type	Number
A/OA-10	18
B-1B	11, 12, 16, or 17
B-2	8
B-52	10, 12–14, 16, or 19
C-5	16
C-9A	3–11
C-17	12
C-130	8, 10, 12, 13, 14, or 16
AC-130	7 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	16
E-3	2 or 7
F-4	11
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. HC-130s, MC-130s, WC-130s, T-39s, and T-38s are counted as Total Unit Equipment, not by squadrons.

Aircraft Type, Total Active Inventory, and Primary Aircraft Authorized

(As of September 30, 1996)

Total active inventory (TAI): aircraft assigned to operating forces for mission, training, test, or maintenance. Includes primary, backup, attrition, and reconstitution reserve aircraft. **Primary aircraft authorized** (PAA): aircraft provided for the performance of the operational mission. The PAA form the basis for allocation of manpower, support equipment, and flying-hour funds. The operating command determines the PAA required to meet the assigned missions. PAA also include test and training requirements. In some cases, such as when delivery schedules are slipped, the total number of aircraft in operation might be less than the authorization.

Type	TAI	PAA
Bomber		
B-1	81	50
B-2	19	9
B-52	85	49
Total	**185**	**108**
Cargo/transport		
C-5	81	70
C-9	23	22
C-12	36	35
C-17	27	25
C-20	13	12
C-21	76	75
C-23	3	3
C-27	10	9
C-130	200	164
C-135	6	5
C-137	5	5
C-141	154	139
CT-43	1	2
NC-130	4	3
NC-141	2	2
NT-39	2	2
VC-25	2	2
Total	**645**	**575**
Electronic warfare/combat		
EF-111	37	26
Total	**37**	**26**
Fighter/attack		
A-10	131	118
OA-10	92	78
F-4E/F	12	11
F-15	620	549
F-16	809	705
F-117	54	47
YF-15	1	0
YF-117	3	3
Total	**1,722**	**1,511**
Helicopter		
HH-1	6	8
HH-60	45	35
TH-53	6	4
UH-1	64	47
Total	**121**	**94**
Reconnaissance/battle management/C³I		
E-3	32	29
E-4	4	3
E-8	1	2
E-9	0	2
EC-18	4	4
EC-130	22	16
EC-135	16	13
EC-137	1	1
OC-135	2	2
RC-135	19	15
SR-71	2	2
WC-135	3	0
U-2	31	28
Total	**137**	**117**
Special Operations Forces		
AC-130	21	19
MC-130	55	46
MH-53	40	36
MH-60	13	11
Total	**129**	**112**
Tanker		
HC-130	9	8
KC-10	59	54
KC-135	253	228
NKC-135	2	2
Total	**323**	**292**
Trainer		
T-1	156	78
T-3	112	103
AT-38	73	43
T-37	420	296
T-38	378	299
T-39	1	1
T-41	3	3
T-43	10	10
TC-18	2	0
TC-135	2	2
TG-3	3	2
TG-4	14	10
TG-7	9	8
TG-9	4	4
TG-10	1	1
TG-11	2	2
TU-2	4	4
Total	**1,194**	**866**
Other		
UV-18	2	2
Total	**2**	**2**
Total active duty	**4,495**	**3,703**

ICBMs and Spacecraft in Service

Type of system	FY '90	FY '91	FY '92	FY '93	FY '94	FY '95	FY '96
Minuteman II ICBM	450	450	375	0	0	0	0
Minuteman III ICBM	500	500	500	500	500	530	530
Peacekeeper ICBM	50	50	50	50	50	50	50
Total ICBMs	**1,000**	**1,000**	**925**	**550**	**550**	**580**	**580**
DMSP satellite	2	2	2	2	2	3	2
DSCS satellite	5	5	5	5	5	5	5
DSP satellite (data classified)	—	—	—	—	—	—	—
GPS satellite	14	16	19	24	24	25	26
Milstar	—	—	—	—	1	2	2
Total satellites	**21**	**23**	**26**	**31**	**32**	**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	FY '90	FY '91	FY '92	FY '93	FY '94	FY '95	FY '96
Bomber	366	290	248	225	178	183	185
Tanker	555	539	478	391	326	325	314
Fighter/interceptor/attack	2,798	2,497	2,000	1,848	1,781	1,750	1,637
Reconnaissance/electronic warfare	346	303	238	241	225	318	257
Cargo/transport	824	812	794	749	733	690	654
Search & rescue (fixed wing)	36	32	56	84	34	12	9
Helicopter (includes rescue)	212	213	206	203	189	123	174
Trainer	1,535	1,415	1,313	1,150	1,188	1,205	1,193
Utility/observation/other	141	88	89	95	107	104	98
Total active duty	**6,813**	**6,189**	**5,422**	**4,986**	**4,761**	**4,710**	**4,521**
Air National Guard	1,719	1,793	1,694	1,653	1,586	1,461	1,426
AFRC	500	528	524	543	468	462	447
Total active duty, AFRC, and ANG	**9,032**	**8,510**	**7,640**	**7,182**	**6,815**	**6,633**	**6,394**
Total aircraft, including foreign-government-owned	9,130	8,603	7,733	7,276	7,028	6,725	6,476
Flying hours (in thousands)							
USAF active duty	2,760	2,551	2,195	1,993	1,750	1,709	1,657
Air National Guard	442	458	441	442	412	403	380
AFRC	164	157	154	149	155	141	144
Total flying hours	**3,366**	**3,166**	**2,790**	**2,584**	**2,317**	**2,253**	**2,181**

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, Tex.
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

Fiscal Year	'92	'93	'94	'95	'96	'97 1st quarter
Active forces						
Heavy bomber	17	15	12	10	10	10
Air refueling	32	31	25	24	23	23
Strategic command & control	6	2	—	1	1	1
Intelligence	3	3	—	—	—	—
Fighter	61	61	53	54	54	54
Reconnaissance	0	0	0	4	4	4
Electronic warfare	3	3	4	3	3	3
Special Operations Forces	11	11	16	15	16	16
Tactical air command & control	9	9	5	5	5	5
Tactical air control	1	5	7	7	7	9
Weather	1	1	—	—	1	—
Rescue	8	8	6	6	7	7
Theater airlift	12	12	11	12	12	13
Long-range airlift	21	21	16	15	15	17
Special mission	2	2	2	2	2	2
Aeromedical airlift	3	3	3	3	3	3
ICBM	19	19	19	14	14	14
Space operations	8	8	6	9	10	10
Space communications	3	3	3	3	2	1
Space warning	7	7	10	11	9	8
Space surveillance	9	9	7	9	7	6
Space launch	3	3	5	5	5	5
Range	3	3	2	2	2	2
Total	**242**	**239**	**212**	**214**	**212**	**213**
Reserve forces						
ANG Selected Reserve	92	92	89	89	87	87
AFRC	59	59	59	48	48	60
Space operations	0	1	1	1	1	1
Total	**151**	**152**	**149**	**138**	**136**	**148**
Grand total	**393**	**391**	**361**	**352**	**348**	**361**

The Air National Guard Fleet

(As of September 30, 1996)

	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	—	—	—	—	33	68	—	—	—	15.8	101
B-1	—	—	4	10	—	—	—	—	—	9.3	14
C-5	—	—	—	—	—	—	—	2	11	25.4	13
C-21	—	—	—	4	—	—	—	—	—	9.0	4
C-22	—	—	—	3	—	—	—	—	—	11.7	3
C-26	11	18	11	—	—	—	—	—	—	4.4	40
C-130	44	25	22	31	14	19	—	—	87	16.6	242
C-135	—	—	—	—	—	—	—	—	224	36.4	224
C-141	—	—	—	—	—	—	—	—	18	30.2	18
F-15	—	—	—	—	—	39	76	1	—	18.6	116
F-16	18	48	155	223	153	34	—	—	—	10.0	631
H-60	5	2	11	—	—	—	—	—	—	5.9	18
T-43	—	—	—	—	—	—	—	2	—	22.3	2
Total	**78**	**93**	**203**	**271**	**200**	**160**	**76**	**5**	**340**	**16.6**	**1,426**
Percent[a]	5	7	14	19	14	11	5	—	24		

[a]Percentages have been rounded.

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What once was only a vision of a revolutionary new military aircraft has now become a reality. The first production representative Bell Boeing V-22 Osprey Tiltrotor has successfully completed its inaugural flight, and much of the credit for this remarkable achievement belongs to you, the men and women of the Air Force. We'd like to offer you our thanks and, on this, the occasion of your 50th anniversary, our sincere congratulations. And to say that we're proud to be able to provide you with an aircraft that will serve you well during your next 50 years.

BELL BOEING ALLISON
The Tiltrotor Team
A JOINT SERVICE PROGRAM

The Active-Duty Fleet

(As of September 30, 1996)

	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	—	—	—	—	118	105	—	—	—	14.8	223
B-1	—	—	27	54	—	—	—	—	—	9.3	81
B-2	13	5	1	—	—	—	—	—	—	2.5	19
B-52	—	—	—	—	—	—	—	—	85	34.8	85
C-5	—	—	31	19	—	—	—	11	20	14.8	81
C-9	—	—	—	—	—	—	—	3	20	25.5	23
C-10 (KC-10)	—	—	3	32	19	5	—	—	—	11.7	59
C-12	—	—	6	—	7	1	20	3	—	16.9	37
C-17	19	8	—	—	—	—	—	—	—	2.3	27
C-18[a]	2	—	—	—	4	—	—	—	—	10.4	6
C-20	2	—	—	8	3	—	—	—	—	8.9	13
C-21	—	—	—	51	25	—	—	—	—	11.7	76
C-23	—	—	—	3	—	—	—	—	—	11.9	3
C-25	—	1	1	—	—	—	—	—	—	5.9	2
C-27	—	10	—	—	—	—	—	—	—	4.3	10
C-130[b]	15	18	8	12	—	—	31	40	187	24.2	311
C-135[b]	—	—	—	—	—	—	—	—	303	34.7	303
C-137[b]	—	1	—	2	—	—	—	1	2	20.3	6
C-141[b]	—	—	—	—	—	—	—	—	156	30.0	156
E-3	—	—	—	—	9	10	13	—	—	16.8	32
E-4	—	—	—	—	—	—	—	4	—	22.3	4
E-8	1	—	—	—	—	—	—	—	—	0.5	1
F-4	—	—	—	—	—	—	—	—	12	26.9	12
F-15	9	95	124	111	120	153	7	2	—	10.9	621
F-16	135	247	302	104	12	9	—	—	—	6.2	809
EF-111	—	—	—	—	—	—	—	—	37	28.2	37
F-117[c]	—	57	—	—	—	—	—	—	—	5.4	57
G-3	—	2	1	—	—	—	—	—	—	5.6	3
G-4	4	1	1	—	1	3	4	—	—	11.0	14
G-7	—	—	4	—	5	—	—	—	—	11.0	9
G-9	—	—	—	4	—	—	—	—	—	9.6	4
G-10	1	—	—	—	—	—	—	—	—	1.6	1
G-11	2	—	—	—	—	—	—	—	—	1.2	2
H-1	—	—	—	—	—	—	—	5	65	25.5	70
H-53	—	—	6	—	—	—	—	3	37	23.9	46
H-60	—	25	23	—	10	—	—	—	—	7.4	58
R-71	—	—	—	—	—	—	—	—	2	30.2	2
T-1	106	50	—	—	—	—	—	—	—	2.2	156
T-3	112	—	—	—	—	—	—	—	—	1.6	112
T-37	—	—	—	—	—	—	—	—	420	33.2	420
T-38	—	—	—	—	—	—	—	—	451	29.0	451
T-39	—	—	—	—	—	—	—	—	3	35.6	3
T-41	—	—	—	—	—	—	—	—	3	26.5	3
T-43	—	—	—	—	—	—	—	11	—	22.6	11
U-2	—	—	6	15	9	1	—	—	4	12.9	35
V-18	—	—	—	—	—	—	2	—	—	19.0	2
Total	421	520	544	415	342	287	77	83	1,807	17.9	4,496
Percent[d]	**9**	**12**	**12**	**9**	**8**	**6**	**2**	**2**	**40**		

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

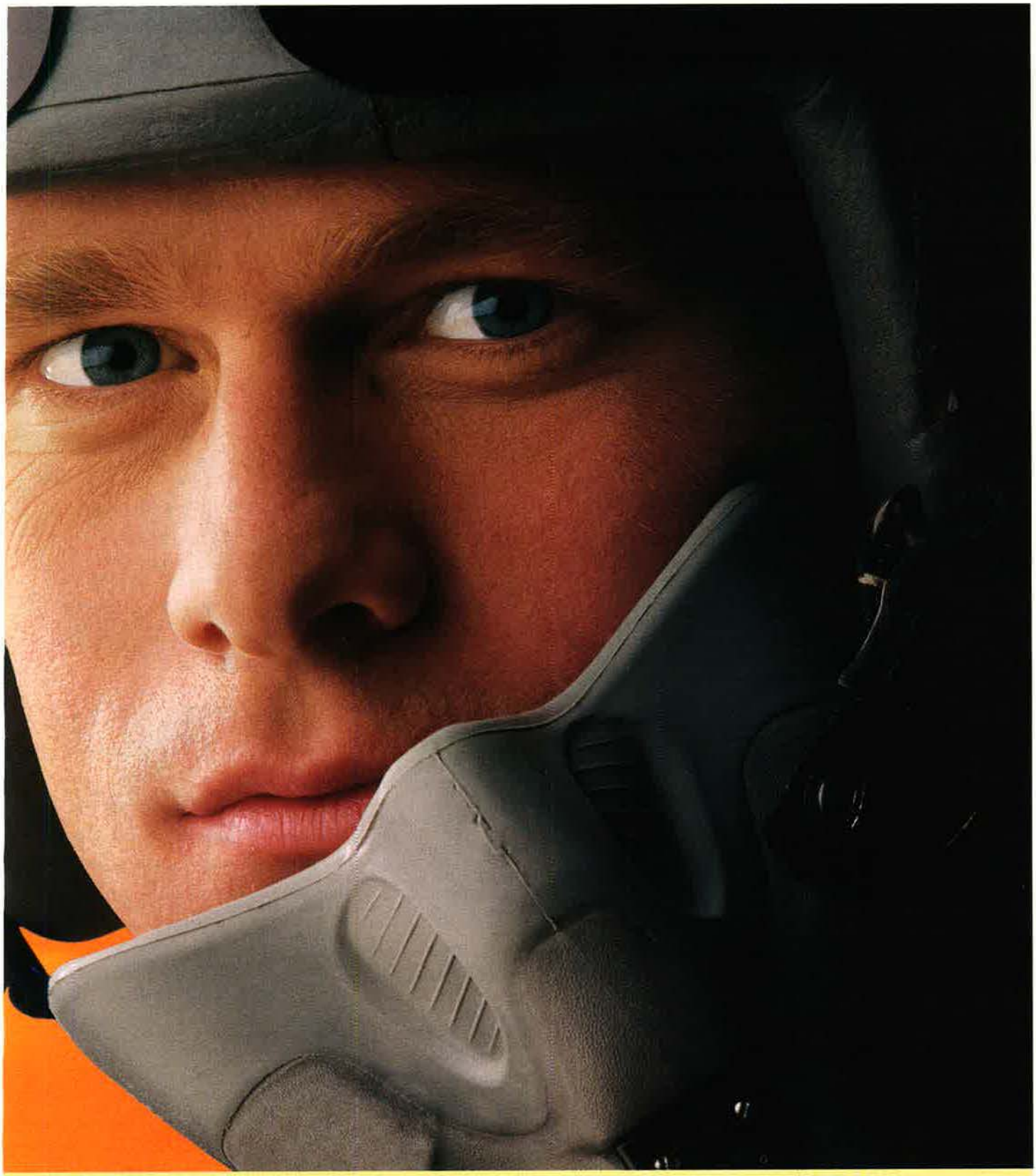
The Air Force Reserve Command Fleet

(As of September 30, 1996)

	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	—	—	—	—	4	47	—	—	—	16.0	51
B-52	—	—	—	—	—	—	—	—	9	34.5	9
C-5	—	—	—	—	—	—	1	2	29	25.3	32
C-130	24	9	19	18	6	—	—	—	65	18.0	141
C-135	—	—	—	—	—	—	—	—	72	35.8	72
C-141	—	—	—	—	—	—	—	—	46	30.0	46
F-16	—	—	37	36	—	—	—	—	—	8.8	73
H-60	—	16	7	—	—	—	—	—	—	6.1	23
Total	24	25	63	54	10	47	1	2	221	20.6	447
Percent[a]	**5**	**6**	**14**	**12**	**2**	**11**	**—**	**—**	**49**		

[a]Percentages have been rounded.

Congratulations to the USAF on your 50th Anniversary.



Pratt & Whitney
A United Technologies Company

USAF Aircraft Tail Markings

Code	Aircraft	Unit, Location, and Command
AK	F-15C/D/E, C-130H, C-12J, E-3B	3d Wing, Elmendorf AFB, Alaska (PACAF)
	C-130H	176th Wing, Anchorage, Alaska (ANG)
	F-16C/D, A/OA-10A	354th FW, Eielson AFB, Alaska (PACAF)
AL	F-16C/D	187th FW, Dannelly Field, Ala. (ANG)
AU	C-21A	42d ABW, Maxwell AFB, Ala. (AETC)
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, TU-2R/S, T-38A	9th RW, Beale AFB, Calif. (ACC)
	SR-71A	9th RW, Edwards 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, EF-111A	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)
CR	C-130H	302d AW, Peterson AFB, Colo. (AFRC)
CS	C-21A	21st SPW, Peterson AFB, Colo. (AFSPC)
CT	A/OA-10A	103d FW, Bradley IAP, Conn. (ANG)
DB	C-130H	94th AW, Dobbins ARB, Ga. (AFRC)
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 Wing, Dyess AFB, Tex. (ACC)
ED	Various	412th TW, Edwards AFB, Calif. (AFMC)
EG	F-15C/D	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, Tex. (AETC)
ET	F-15A/B/C/D/E, F-16A/B/C/D, A/OA-10A, UH-1N	46th TW, Eglin AFB, Fla. (AFMC)
FC	UH-1N	336th TRG, Fairchild AFB, Wash. (AETC)
FE	UH-1N	90th MW, F. E. Warren AFB, Wyo. (AFSPC)
FF	F-15C/D	1st FW, Langley AFB, Va. (ACC)
	HH-60G, HC-130N/P	1st FW, Patrick AFB, Fla. (ACC)
FL	C-130E, HC-130N/P, HH-60G	939th Rescue Wing, Patrick AFB, Fla. (AFRC)
FM	F-16C/D	482d FW, Homestead ARB, Fla. (AFRC)
FS	F-16A/B	188th FW, Fort Smith MAP, Ark. (ANG)
FT	A/OA-10A	23d Wing, 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, T-38A, AT-38B, HH-60G	49th FW, Holloman AFB, N. M. (ACC)
	F-4E	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)
HW	C-21A, C-27A, CT-43A, C-130E	24th Wing, Howard AFB/Albrook AFS, Panama (ACC)
ID	A/OA-10A, C-130E	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)
KS	C-21A	81st TRW, Keesler AFB, Miss. (AETC)
KT	C-130E	403d Wing, Keesler AFB, Miss. (AFRC)
LA	B-52H	2d BW, Barksdale AFB, La. (ACC)
LB	T-38A, T-1A	64th FTW, Reese AFB, Tex. (AETC) (Reese AFB closes September 1997)
LF	F-16A/B/C/D	56th FW, Luke AFB, Ariz. (AETC)
LI	HC-130P, HH-60G	106th Rescue Wing, Francis S. Gabreski IAP, N. Y. (ANG)
LK	C-130E/H	314th AW, Little Rock AFB, Ark. (AETC)
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)
MK	C-130H	440th AW, General Mitchell IAP/ARS, Wis. (AFRC)
MM	UH-1N	341st MW, Malmstrom AFB, Mont. (AFSPC)
MN	C-130E/H	133d AW, Minneapolis–St. Paul IAP/ARS, Minn. (ANG)
MO	KC-135R, F-15C/D/E, F-16C/D, B-1B	366th Wing, Mountain Home AFB, Idaho (ACC)
MS	C-130E	934th AW, Minneapolis–St. Paul IAP/ARS, Minn. (AFRC)
MT	B-52H	5th BW, Minot AFB, N. D. (ACC)
	HH-1H	91st MW, Minot AFB, N. D. (AFSPC)
MX	C-130H	908th AW, Maxwell AFB, Ala. (AFRC)
MY	F-16C/D, A/OA-10A	347th Wing, Moody AFB, Ga. (ACC)
NC	C-130H	145th AW, Charlotte/Douglas IAP, N. C. (ANG)
NF	C-130H	914th AW, Niagara Falls IAP/ARS, N. Y. (AFRC)
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	C-135	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, TC-18E	552d ACW, Tinker AFB, Okla. (ACC)
	C-130H	137th AW, Will Rogers World Airport, Okla. (ANG)
OS	A/OA-10A, F16C/D, C-12J	51st FW, Osan AB, South Korea (PACAF)
OT	F-15A/B/C/D/E, F-16B/C/D	53d Wing, Eglin AFB, Fla. (ACC)
	F-15C/D/E, F-16C/D, A/OA-10A	53d Wing, 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)
PI	C-130H	911th AW, Pittsburgh IAP/ARS, Pa. (AFRC)
PR	F-16A/B	156th FW, Puerto Rico IAP, Puerto Rico (ANG)
RA	T-3A	12th FTW, Hondo Airport, Tex. (AETC), US Air Force Academy, Colo.
	T-1A, C-21A, T-37B, T-38A, AT-38B, T-43A	12th FTW, Randolph AFB, Tex. (AETC)
RG	C-130E	Warner Robins ALC, Robins AFB, Ga. (AFMC)
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, Tex. (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)
SM	A-10A, EF-111A, T-38A	Sacramento ALC, McClellan AFB, Calif. (AFMC)
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, Tex. (ANG)
	F-16C/D	301st FW, NAS Fort Worth JRB Carswell Field, Tex. (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	Various	57th Wing, Nellis AFB, Nev. (ACC)
WE	E-9A	53d Wing, Tyndall AFB, Fla. (ACC)
WG	C-130E	913th AW, Willow Grove ARS, Pa. (AFRC)
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, Tex. (AETC)
XP	C-130H	139th AW, Rosecrans Memorial Airport, Mo. (ANG)
YJ	C-21A, C-130E/H, UH-1N	374th AW, Yokota AB, Japan (PACAF)
YO	C-130H	910th AW, Youngstown-Warren Regional Airport ARS, Ohio (AFRC)
ZZ	F-15C/D, E-3B, KC-135R, HH-60G	18th Wing, Kadena AB, Japan (PACAF)

Sources: USAF and William R. Peake.

As of April 1, 1997, CONUS-based ACC C-130E/Hs and C-21s, along with ANG and AFRC C-130E/Hs and C-21s, were returned to AMC. ANG and AFRC aircraft retain their tail codes.

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USAF Grades and Insignia

Officer

Second Lieutenant
(O-1)

Brigadier General
(O-7)

First Lieutenant
(O-2)

Major General
(O-8)

Captain
(O-3)

Lieutenant General
(O-9)

Major
(O-4)

General
(O-10)

Lieutenant Colonel
(O-5)

Colonel
(O-6)

Enlisted

Airman Basic
(E-1)
No insignia

Airman
(E-2)

Airman First Class
(E-3)

Senior Airman
(E-4)

Staff Sergeant
(E-5)

Technical Sergeant
(E-6)

Master Sergeant
(E-7)

Senior Master Sergeant
(E-8)

Chief Master Sergeant
(E-9)

Chief Master Sergeant of
the Air Force

First Sergeant

The diamond device shown on the rank of E-7 through E-9 denotes a First Sergeant who is the senior enlisted NCO in a squadron. A Senior Master Sergeant First Sergeant insignia is shown here.

Awards and Decorations

This display represents, in correct order of precedence, ribbons most likely to be worn by members of today's Air Force. For information regarding ribbons not depicted, refer to AFI 36-2903 and AFR 900-48.

*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 September 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

Navigator/Observer

Enlisted Aircrew Member

Astronaut Pilot

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.

Flight Surgeon

Flight Nurse

Officer Aircrew Member

Missile Operations

Missileer

Badges, continued

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

Acquisition and Financial Management

USAF Band

Chaplain Service Support

Civil Engineer

Command and Control

Communications and Information

Explosive Ordnance Disposal

Historian

Information Management

Intelligence

Judge Advocate

Law Enforcement

Logistics

Maintenance

Manpower and Personnel

Meteorologist

Operations Support

Paralegal

Parachutist

Public Affairs

Services

Space/Missile

Supply/Fuels

Transportation

Air Traffic Controller and Weapons Director badges to be reinstated in May 1997.

Medical

Medical Corps

Nurse Corps

Enlisted Medical

Dental Corps

Medical Service Corps

Biomedical Sciences Corps

Chaplain

Muslim

Christian

Buddhist

Jewish

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And this year, at the request of our members, AAFMAA is proud to introduce even more low-cost, comprehensive coverage, including:

- ***Whole Life Interest-Sensitive*** insurance - our added value insurance that grows in cash value and death benefit. Combined coverage now available up to $250,000.
- ***Generations Coverage*** - Up to $100,000 in Whole Life Interest-Sensitive coverage per insured child or grandchild. A nice way to fund a nestegg for the next generation.
- ***Spouse Coverage*** - Choose from: Whole Life Interest-Sensitive insurance or term coverage. Maximum $250,000 combined coverage.

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❑ Retired ❑ Air National Guard ❑ Air Force Reserve

NAME (Last Name First)_____

DOB_____ RANK_____ SOC. SEC. NO. (Optional)_____

STREET_____ CITY/STATE/ZIP_____

DAYTIME PHONE_____

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USAF Leaders Through the Years

Secretaries of the Air Force

Stuart Symington	Sept. 18, 1947	Apr. 24, 1950
Thomas K. Finletter	Apr. 24, 1950	Jan. 20, 1953
Harold E. Talbott	Feb. 4, 1953	Aug. 13, 1955
Donald A. Quarles	Aug. 15, 1955	Apr. 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	Apr. 6, 1977
John C. Stetson	Apr. 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	Apr. 7, 1986
Edward C. Aldridge, Jr. (acting)	Apr. 8, 1986	June 8, 1986
Edward C. Aldridge, Jr.	June 9, 1986	Dec. 16, 1988
James F. McGovern (acting)	Dec. 16, 1988	Apr. 29, 1989
John J. Welch, Jr. (acting)	Apr. 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	

USAF Chiefs of Staff

Gen. Carl A. Spaatz	Sept. 26, 1947	Apr. 29, 1948
Gen. Hoyt S. Vandenberg	Apr. 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 M. 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	

Chief Master Sergeants of the Air Force

CMSAF Paul W. Airey	Apr. 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	Apr. 4, 1996
Gen. Richard E. Hawley	Apr. 5, 1996	

Air (Aerospace) Defense Command

Lt. Gen. George E. Stratemeyer	Mar. 27, 1946	Nov. 30, 1948
Maj. Gen. Gordon P. Saville	Dec. 1, 1948	Sept. 1, 1949
Lt. Gen. Ennis C. Whitehead	Jan. 8, 1951	Aug. 24, 1951
Gen. Benjamin W. Childlaw	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	Mar. 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	Mar. 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	Mar. 31, 1980

Discontinued July 1, 1950. Reestablished as a major command and organized Jan. 1, 1951. Redesignated Aerospace Defense Command Jan. 15, 1968. Inactivated Mar. 31, 1980.

Air Education and Training Command

Gen. Henry Viccellio, Jr.	July 1, 1993	June 19, 1995
Gen. Billy J. Boles	June 20, 1995	Mar. 17, 1997
Gen. Lloyd W. Newton	Mar. 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	Mar. 29, 1988
Maj. Gen. James S. Cassity, Jr.	Mar. 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

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	Mar. 1, 1959	Mar. 14, 1959
Gen. Samuel E. Anderson	Mar. 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	Mar. 28, 1968
Gen. Jack G. Merrell	Mar. 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

Formerly Air Materiel Command. Redesignated Air Force Logistics Command Apr. 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	

Air Force Reserve Command

Maj. Gen. Rollin B. Moore, Jr.	Aug. 1, 1968	Jan. 26, 1972
Brig. Gen. Alfred Verhulst (acting)	Jan. 27, 1972	Mar. 15, 1972
Maj. Gen. Homer I. Lewis	Mar. 16, 1972	Apr. 8, 1975
Maj. Gen. William Lyon	Apr. 16, 1975	Apr. 16, 1979
Maj. Gen. Richard Bodycombe	Apr. 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 Mar. 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	Mar. 29, 1990
Lt. Gen. Thomas S. Moorman, Jr.	Mar. 29, 1990	Mar. 23, 1992
Gen. Donald J. Kutyna	Mar. 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	

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	Apr. 14, 1954
Lt. Gen. Thomas S. Power	Apr. 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	Mar. 9, 1959
Maj. Gen. John W. Sessums, Jr.	Mar. 10, 1959	Apr. 24, 1959
Gen. Bernard A. Schriever	Apr. 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	Mar. 13, 1978
Gen. Alton D. Slay	Mar. 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	Apr. 1, 1990
Gen. Ronald W. Yates	Apr. 1, 1990	July 1, 1992

Formerly Air Research and Development Command. Redesignated Air Force Systems Command Apr. 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	Apr. 19, 1974
Maj. Gen. John J. Pesch	Apr. 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	

AFRC and ANG primary responsibilities came under Continental Air Command 1948–68. Since Mar. 16, 1972, the director of Air National Guard has also been commander, Hq. Air National Guard (ANG).

Air Proving Ground Command

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

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

Air Training Command

Lt. Gen. Barton K. Yount	July 7, 1943	Sept. 26, 1945
Maj. Gen. James P. Hodges	Sept. 27, 1945	Apr. 12, 1946
Lt. Gen. John K. Cannon	Apr. 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	Apr. 1, 1979
Gen. Bennie L. Davis	Apr. 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

Redesignated Air Education and Training Command July 1, 1993.

Air University

Maj. Gen. Muir S. Fairchild	Mar. 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
Lt. Gen. Laurence S. Kuter	Apr. 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

Air University was part of Air Training Command between May 1978 and July 1983. Ceased to be a major command and was assigned to Air Education and Training Command 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
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	Mar. 2, 1974
Maj. Gen. Jack K. Gamble	Mar. 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	Apr. 1, 1981
Lt. Gen. Lynwood E. Clark	Apr. 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

Now 11th Air Force.

Continental Air Command

Lt. Gen. Ennis C. Whitehead	Apr. 5, 1949	Jan. 1, 1951
Maj. Gen. Willis H. Hale	Jan. 1, 1951	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

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. K. 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	Apr. 16, 1985
Maj. Gen. Paul H. Martin	Apr. 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 A. 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	Apr. 30, 1972
Maj. Gen. John L. Locke	May 1, 1972	Feb. 25, 1974
Maj. Gen. M. R. Reilly	Feb. 26, 1974	Aug. 1975
Maj. Gen. William C. Norris	Sept. 1, 1975	June 30, 1976

Established as Bolling Field; organized Dec. 15, 1946. Redesignated Headquarters Command, USAF, Mar. 17, 1958. Inactivated in 1976.

Military Airlift Command

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	Mar. 31, 1977
Gen. William G. Moore, Jr.	Apr. 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

Formerly Military Air Transport Service. Redesignated Military Airlift Command Jan. 1, 1966. Inactivated June 1, 1992.

Pacific Air Forces

Lt. Gen. Ennis C. Whitehead	Dec. 30, 1945	Apr. 25, 1949
Lt. Gen. George E. Stratemeyer	Apr. 26, 1949	May 20, 1951
Lt. Gen. Earle E. Partridge (acting)	May 21, 1951	June 9, 1951
Gen. O. P. Weyland	June 10, 1951	Mar. 25, 1954
Gen. Earle E. Partridge	Mar. 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	

Formerly Far East Air Forces. Redesignated Pacific Air Forces July 1, 1957.

Strategic Air Command

Gen. George C. Kenney	Mar. 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	Apr. 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. B. 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

Inactivated June 1, 1992.

Tactical Air Command

Lt. Gen. E. R. Quesada	Mar. 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	Mar. 31, 1954
Gen. O. P. Weyland	Apr. 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 M. Momyer	Aug. 1, 1968	Sept. 30, 1973
Gen. Robert J. Dixon	Oct. 1, 1973	Apr. 30, 1978
Gen. W. L. Creech	May 1, 1978	Nov. 1, 1984
Gen. Jerome F. O'Malley	Nov. 1, 1984	Apr. 20, 1985
Gen. Robert D. Russ	May 22, 1985	Mar. 26, 1991
Gen. John Michael Loh	Mar. 27, 1991	June 1, 1992

Inactivated June 1, 1992.

US Air Forces in Europe

Maj. Gen. William E. Kepner	Aug. 7, 1945	Aug. 13, 1945
Lt. Gen. John K. Cannon	Aug. 13, 1945	Mar. 2, 1946
Maj. Gen. Idwal H. Edwards	Mar. 2, 1946	Aug. 14, 1946
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	Apr. 12, 1989
Gen. Michael J. Dugan	Apr. 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	Apr. 4, 1996
Gen. Michael E. Ryan	Apr. 4, 1996	

US Air Forces Southern Command/Caribbean

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	Apr. 7, 1972
Maj. Gen. Arthur G. Salisbury	Apr. 7, 1972	Nov. 1, 1974
Maj. Gen. James M. Breedlove	Oct. 1974	Jan. 1, 1976

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	

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Although it was designed in 1937, the T-6 Texan remained a prevalent primary trainer in USAF well into the 1950s. More than 15,000 Texans were built, and the trainer was used extensively by both the US Navy and allied air forces. Here, students at Randolph AFB, Tex., stop for the camera before a training mission.

Maj. B. Gordon via David W. Menard

Another North American Aviation, Inc., trainer, the T-28 Trojan was also used by the Navy. During the Vietnam War, the Trojan was modified for counter-insurgency duty, armed with two .50-caliber machine guns and up to 1,800 pounds of rockets or bombs. In an odd twist, Air Training Command during the 1960s used the T-28 to give its helicopter pilot trainees 120 hours of fixed-wing experience before they moved on to helicopter training.

USAF photo by Wall Weible

Ever since it entered operational service in 1961, the T-38 Talon has been the mainstay for training USAF pilots in high-performance aircraft. The Air Force also uses the T-38 to help its pilots maintain flying proficiency when they are assigned to units that fly such aircraft as the B-2 and U-2. Ongoing modifications and structural renewals will keep this sturdy aircraft in service until 2020, a mind-stretching 61 years after its first flight. ■

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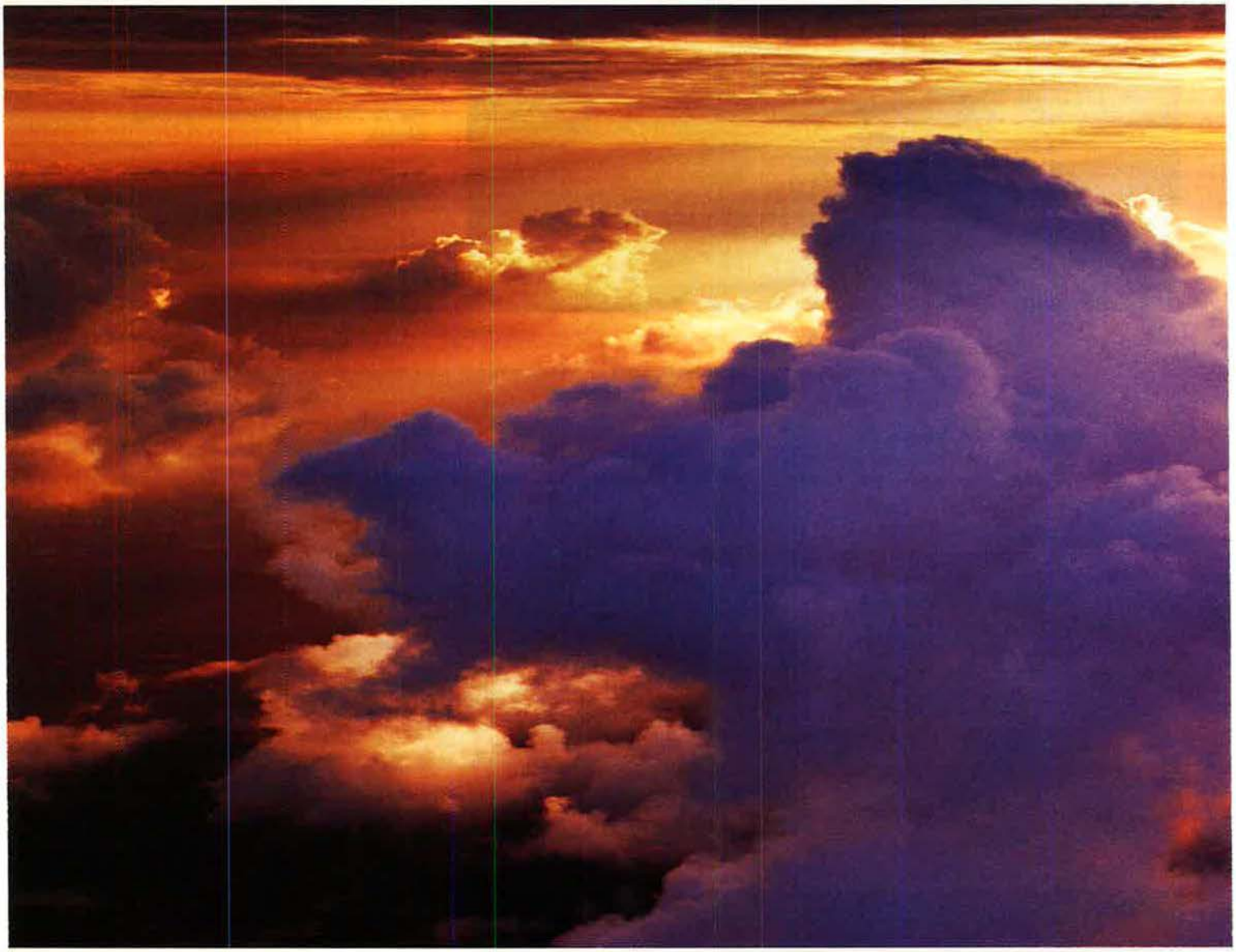

Some of the Air Force programs to which Logicon has contributed are:

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Peacekeeper
Minuteman I, II, III
Tactical Exploitation of National Capabilities
Titan II
Space-based Infrared System
Satellite Control Network
SAC & STRATCOM Mission Planning
B-1 & B-2 Bombers
Global Positioning System
I-CASE
ASATS - Anti-Satellite Control Network
MILSTAR
Defense Support Program
Airborne Laser Laboratory
Western & Eastern Space & Missile Test Ranges

Logicon congratulates all of the men and women of the United States Air Force whose commitment, sacrifices and heroics have enabled the U.S. to achieve and maintain air superiority for fifty years. We're very proud to have played a role in this historic achievement.

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Secretaries of the Air Force

Stuart Symington
1947–50

Thomas K. Finletter
1950–53

Harold E. Talbott
1953–55

Donald A. Quarles
1955–57

James H. Douglas, Jr.
1957–59

Dudley C. Sharp
1959–61

Eugene M. Zuckert
1961–65

Harold Brown
1965–69

Robert C. Seamans, Jr.
1969–73

John L. McLucas
(acting) 1973
1973–75

James W. Plummer
(acting) 1975–76

Thomas C. Reed
1976–77

John C. Stetson
1977–1979

Hans Mark
(acting) 1979
1979–81

Verne Orr
1981–85

Russell A. Rourke
1985–86

Edward C. Aldridge, Jr.
(acting) 1986
1986–88

James F. McGovern
(acting) 1988–89

John J. Welch, Jr.
(acting) 1989

Donald B. Rice
1989–93

Michael B. Donley
(acting) 1993

Gen. Merrill A. McPeak
(acting) 1993

Sheila E. Widnall
1993–

USAF Chiefs of Staff

Gen. Carl A. Spaatz
1947–48

Gen. Hoyt S. Vandenberg
1948–53

Gen. Nathan F. Twining
1953–57

Gen. Thomas D. White
1957–61

Gen. Curtis E. LeMay
1961–65

Gen. John P. McConnell
1965–69

Gen. John D. Ryan
1969–73

Gen. George S. Brown
1973–74

Gen. David C. Jones
1974–78

Gen. Lew Allen, Jr.
1978–82

Gen. Charles A. Gabriel
1982–86

Gen. Larry D. Welch
1986–90

Gen. Michael J. Dugan
1990

Gen. John M. Loh
(acting) 1990

Gen. Merrill A. McPeak
1990–1994

Gen. Ronald R. Fogleman
1994–

Chief Master Sergeants of the Air Force

CMSAF
Paul W. Airey
1967–69

CMSAF
Donald L. Harlow
1969–71

CMSAF
Richard D. Kisling
1971–73

CMSAF
Thomas N. Barnes
1973–77

CMSAF
Robert D. Gaylor
1977–79

CMSAF
James M. McCoy
1979–81

CMSAF
Arthur L. Andrews
1981–83

CMSAF
Sam E. Parish
1983–86

CMSAF
James C. Binnicker
1986–90

CMSAF
Gary R. Pfingston
1990–94

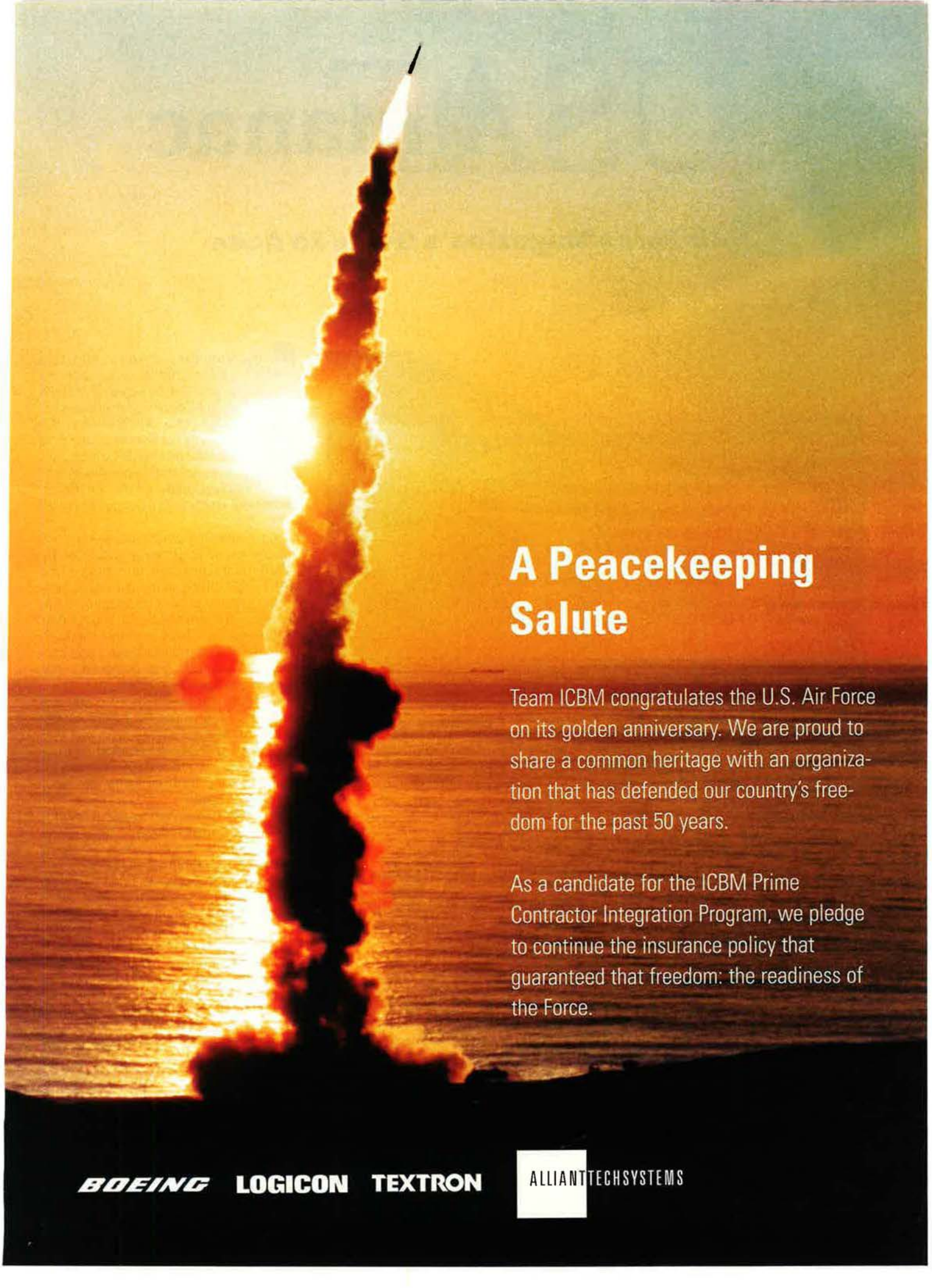
CMSAF
David J. Campanale
1994–96

CMSAF
Eric W. Benken
1996–

USAF Recipients of the Medal of Honor

Names, Alphabetically by Wars, and Rank at Time of Action	Home Town	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, Ill.	Oct. 6, 1918	Binarville, France
Luke, 2d Lt. Frank, Jr.	Phoenix, Ariz.	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, Ill.	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, Tex.	Oct. 26, 1944	South China Sea
Castle, Brig. Gen. Frederick W.	Manila, the Philippines	Dec. 24, 1944	Liège, Belgium
Cheli, Maj. Ralph	San Francisco, Calif.	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.	Apr. 18, 1942	Tokyo, Japan
Erwin, SSgt. Henry E.[1]	Adamsville, Ala.	Apr. 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.[1]	Columbia, Mo.	Aug. 1, 1943	Ploesti, Romania
Kane, Col. John R.	McGregor, Tex.	Aug. 1, 1943	Ploesti, Romania
Kearby, Col. Neel E.	Wichita Falls, Tex.	Oct. 11, 1943	Wewak, New Guinea
Kingsley, 2d Lt. David R.	Portland, Ore.	June 23, 1944	Ploesti, Romania
Knight, 1st Lt. Raymond L.	Houston, Tex.	Apr. 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, Tex.	Mar. 18, 1943	Vegesack, Germany
McGuire, Maj. Thomas B., Jr.	Ridgewood, N. J.	Dec. 25–26, 1944	Luzon, the Philippines
Metzger, 2d Lt. William E., Jr.	Lima, Ohio	Nov. 9, 1944	Saarbrücken, Germany
Michael, 1st Lt. Edward S.	Chicago, Ill.	Apr. 11, 1944	Brunswick, Germany
Morgan, 2d Lt. John C.	Vernon, Tex.	July 28, 1943	Kiel, Germany
Pease, Capt. Harl, Jr.	Plymouth, N. H.	Aug. 7, 1942	Rabaul, New Britain
Pucket, 1st Lt. Donald D.	Longmont, Colo.	July 9, 1944	Ploesti, Romania
Sarnoski, 2d Lt. Joseph R.	Simpson, Pa.	June 16, 1943	Buka, Solomon Islands
Shomo, Maj. William A.	Jeannette, Pa.	Jan. 11, 1945	Luzon, the 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, Tex.	Feb. 10, 1952	Sinuiju-Yalu River, N. Korea
Loring, Maj. Charles J., Jr.	Portland, Me.	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, Md.	Sept. 14, 1951	Yangdok, N. Korea
Vietnam			
Bennett, Capt. Steven L.	Palestine, Tex.	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	Mar. 10, 1967	Thai Nguyen, N. Vietnam
Fisher, Maj. Bernard F.[1]	San Bernardino, Calif.	Mar. 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, Wis.	Conspicuous gallantry while POW	
Thorsness, Lt. Col. Leo K.[1]	Seattle, Wash.	Apr. 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.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Air Force Magazine's Guide to Aces

Striking a pose in front of Capt. Eddie Rickenbacker's airplane are (left to right) 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
Bissell, 1st Lt. Clayton L.	5
Bair, 1st Lt. Hilbert 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

Maj. Richard I. Bong

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

Ranks are as of last victory in World War II.

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]
Westcott, 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. Major 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 H., 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
Schaeffer, Maj. William F.	2	3	5

Col. John C. Meyer

Maj. James Jabara

Col. Robin Olds

[a]Colonel Olds's 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, Captain Rickenbacker would have been credited with 24.33 victories. The change would not alter his position on this list.

Congratulations to the Air Force

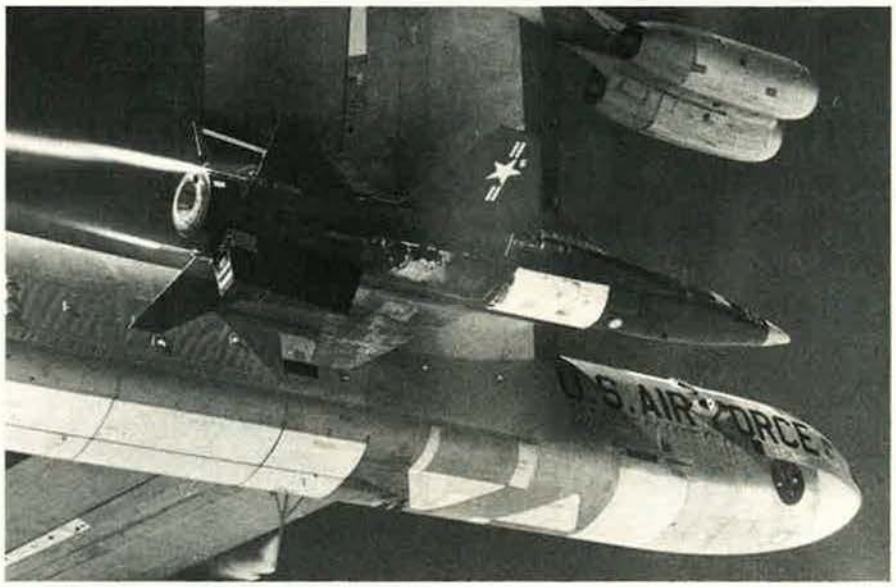
This year marks a milestone in commitment, five decades of excellence... the 50 year anniversary of the U.S. Air Force.

TRW commends the United States Air Force on its enduring legacy, maintaining and protecting the sovereignty of the United States for the past 50 years.

From its earliest days, TRW has played an integral part in this ongoing tradition of vigilance, supporting the development, deployment and sustainment of the nation's ballistic missile force. TRW pioneered the concept of systems engineering in 1954 to help develop the U.S. ballistic missile system, and has had a pivotal role supporting the Air Force, with crucial space assets, systems engineering and integration ever since.

TRW's world-class system integration and development capabilities encompass the full spectrum...real-time command and control turnkey systems modernizing the nation's integrated tactical warning and attack assessment capabilities...state-of-the-art mission planning systems...satellite systems and payloads for early warning, communications and operational missions...cockpit avionics...strategic and tactical information systems for the warfighter...command centers, both fixed

Whether it's called Air Force Research and Development Command, Air Force Systems Command, or Air Force Materiel Command, USAF's R&D structure has been at the forefront of testing the parameters of powered flight. The famed X series of aircraft sought to find the limits of mankind's tolerance for velocity and G-forces in the upper reaches of the atmosphere. Here, an X-2 readies for takeoff underneath a B-50 at the Air Force Flight Test Center, Edwards AFB, Calif.



It's a museum piece now, but the X-15 was once the sharpest of cutting-edge flight-test technologies. Capable of speeds in excess of Mach 6, the X-15 made a mockery of existing records for velocity and altitude. There was danger in being so far in front of the field, however. One X-15 pilot—Maj. Michael J. Adams—was killed and another—NASA's John B. McKay—was seriously injured during the program's 199 flights. A third test pilot, NASA's Joe Walker, survived the X-15 program only to be killed in an F-104 crash while flying chase during the testing of the XB-70.

Since its days as Muroc AAF when Chuck Yeager, Iven Kincheloe, and Scott Crossfield roamed the skies at eye-popping speeds, Edwards AFB has been the venue of choice for USAF testing and test pilot training. AFFTC not only tests the latest in aerospace technology, it also seeks to discover what aircraft in the existing inventory, such as the F-15B, F-16B, T-37, and T-38 pictured at right, are capable of. ■

Photo by Erik Simonsen

A Shared History

As the U.S. Air Force celebrates its proud history of 50 years of aviation excellence, Sverdrup commemorates our support to the Air Force since its inception.

Our shared history began in the early 1940s with the design of advanced wind tunnels at Wright Field for the Army Air Corps. Following World War II, we were selected to conduct site studies for a national test center geared to the coming supersonic jet age. We then supported the Air Force in the design, operation, and maintenance of this center – the Arnold Engineering Development Center (AEDC) – and we have remained in continuous service since that time. Today, Sverdrup provides a broad range of engineering support at Air Force installations around the country, including the development of "smart" weapons such as those successfully deployed in the Persian Gulf.

We at Sverdrup look forward to continuing to support the Air Force in meeting the challenges that the future holds.

Sverdrup

For more details on Sverdrup's shared history with the Air Force, visit our on-line museum at

www.sverdrup.com/shared/history

USAF Almanac

Guide to Air Force Installations Worldwide

Major Installations

Note: A major installation is an Air Force Base, Air Base, Air Guard Base, or Air Reserve 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. 97th Air Mobility Wing. Operates AETC's strategic airlift and aerial refueling flying training schools. Maintains and supports C-5, KC-135, C-141, and C-17 aircraft. Base activated in Jan. 1943; inactivated in May 1945; reactivated in Jan. 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 NCO, 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) 011-671-366-1110; DSN 366-1110. PACAF base. Hq. 13th Air Force. Host unit: 36th Air Base Wing. No USAF aircraft assigned. Tenant units: 634th Air Mobility Sqdn. Guam ANG; Det. 1, 13th Air Support Sqdn.; Det. 5, 750th Space Gp.; Det. 602, Air Force Office of Special Investigations (AFOSI). Helicopter Combat Support Sqdn. 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 in 1945; named for Gen. James Roy Andersen, lost at sea between Kwajalein and Hawaii in February 1945. General Andersen was chief of staff, Hq. AAF, Pacific Ocean Areas. Area: 20,270 acres. Runways (north) 10,555 ft. and (south) 11,182 ft. Altitude 612 ft. Military 2,583; civilians 957. Payroll $46.9 million. Housing: 267 officer, 1,128 enlisted, 109 VOQ, 120 VAQ, 18 TLF, 1,017 UEQ, 30 UOQ. One USAF clinic.

Andrews AFB, Md. 20762-5000; 10 mi. SE of Washington, D. C. Phone (301) 981-1110; DSN 858-1110. AMC base. Gateway to the nation's capital and home of Air Force One. Host wing: 89th Airlift Wing. Responsible for Presidential support and base operations; supports all branches of the armed services, several major commands, and federal agencies. The wing also hosts Det. 302, AFOSI; Hq. 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; Hq. Air Force Review Boards Agency. Base activated May 1943; named for Lt. Gen. Frank M. Andrews, military air pioneer and WW II 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 NCO, 414 off-base units, 974 UEQ, 325 transient (including 68 temporary living quarters for incoming personnel, 21 DV suites, 180 VOQ, 56 VAQ). 185-bed hospital.

Arnold AFB, Tenn., 37389; approx. 7 mi. SE of Manchester. Phone (615) 454-3000; DSN 340-5011. AFMC base. 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 40,118 acres. Inactive 6,000-ft. runway. Altitude 1,100 ft. Military 124; civilians 185; NAF 46; contract employees 2,900. Payroll $130.2 million. Housing: 23 officer, 17 NCO, 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. Tenant: Hq. 16th Air Force. 31st FW maintains two LANTIRN-equipped F-16 fighter squadrons, the 510th and the 555th, capable of conducting offensive and defensive air combat operations. The squadrons also have the capability to fly night vision goggles (NVGs) missions. 31st FW also houses the 603d Air Control Squadron. Geographically separated units: 31st RED HORSE Flight and 31st Munitions Sqdn., Camp Darby, Italy; Det. 1, 4190th Wing, Pisa, Italy; 31st Munitions Support Sqdn., Ghedi AB, Italy; 4190th Air Base Sqdn. (Provisional), San Vito dei Normanni, Italy; 496th Air Base Sqdn., Morón AB, Spain; 731st Munitions Support Sqdn., Araxos AB, Greece; 603d Air Control Sqdn., Jacotenente, Italy; 48th Intelligence Sqdn., Rimini, Italy. One of the oldest Italian air bases, dating to 1911. USAF began operations in 1954. Area 1,467 acres. Runway 8,596 ft. Altitude 413 ft. Military 3,367; civilians 1,102. Payroll $156.9 million, $157.3 million economic impact. Housing: 619 govt.-leased units, 34 billeting spaces, 552-bed dorm. No TLF, 20 VOQ, 14 VAQ. On-base clinic. 24-hour acute-care clinic at Sacile Hospital, 20 minutes from base. (By mid-1997, the American medical services at Sacile Hospital will be fully operational with an expanded 24-hour acute-care clinic and specialty clinics, such as OB/GYN, general surgery, and orthopedics; two inpatient nursing units. 20–22-bed hospital.)

Barksdale AFB, La. 71110-5000; in Bossier City. Phone (318) 456-1110; DSN 781-1110. ACC base. Hq. 8th Air Force; 2d Bomb Wing, B-52H operations; 49th Test Sqdn.; 917th Wing (AFRC), B-52H and A-10 operations; Det. 5, 57th Wing; Naval Mobile Construction Battalion 28 Seabees (Navy Reserve); Det. 1, 307th RED HORSE Sqdn. (AFRC); 8th Air Force Museum. Base activated Feb. 2, 1933; named for Lt. Eugene H. Barksdale, WW I airman killed in Aug. 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 1,809. Payroll $267.6 million. Housing: 105 officer, 324 enlisted, 1,650 UEQ, 411 transient (1 guest house, 24 DV suites, 48 VOQ, 314 VAQ, 24 TLF). 25-bed hospital. No emergency services.

Beale AFB, Calif. 95903-5000; 13 mi. E of Marysville. Phone (916) 634-3000; DSN 368-1110. ACC base. 9th Reconnaissance Wing; Det. 1, 612th Air Operations Gp. (ACC); 7th Space Warning Sqdn. (AFSPC). Aircraft include U-2 reconnaissance aircraft and T-38 Talon trainers. Originally US Army's Camp Beale. Became Air Force installation in Apr. 1948; became AFB in Nov. 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: 187 officer, 1,526 enlisted, 823 UEQ, 6 UOQ, 159 transient (53 VOQ, 89 VAQ, 17 TLF). 6-bed hospital.

Bolling AFB, D. C. 20332-5000; 3 mi. S of US Capitol. Phone (703) 545-6700; DSN 227-0101.

11th Wing; US Air Force Honor Guard; US Air Force Band; Air Force Office of Scientific Research (AFMC); Air Force Chief of Chaplains; Air Force Surgeon General; Hq. Air Force History Support Office; Hq. Air Force Office of Special Investigations; Hq. Air Force Real Estate Agency; Hq. Air Force Medical Operations Agency; Defense Intelligence Agency; Hq. Air Force Legal Services Agency. Activated in Oct. 1917; named for Col. Raynal C. Bolling, first high-ranking Air Service officer killed in WW I. Area 604 acres. No runway. Military 1,576; civilians 821. Payroll $108 million. (Personnel and payroll figures apply to 11th Wing only.) Housing: 240 officer, 1,094 enlisted, 208 dorm spaces, 195 transient (18 DV, 62 VOQ, 66 VAQ, 49 TLF). Clinic.

Brooks AFB, Tex. 78235; in SE San Antonio. Phone (210) 536-1110; DSN 240-1110. AFMC base. Human Systems Center; USAF School of Aerospace Medicine (AFMC); Armstrong Laboratory, Human Systems Program Office; 70th Air Base Gp. Associate units include Det. 2, Air Force Institute of Technology; Air Force Medical Support Agency; 68th Intelligence Sqdn.; 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 2,098; civilians 2,307. Payroll $128 million. Housing: 70 officer, 100 NCO. Clinic.

Cannon AFB, N. M. 88103-5000; 7 mi. W of Clovis. Phone (505) 784-3311; DSN 681-1110. ACC base. 27th Fighter Wing, F-16 operations, and the only USAF base with EF-111A fighter operations. Base activated in Aug. 1942; named for Gen. John K. Cannon, WW II 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 4,108; civilians 749. Payroll $154 million. Housing: 173 officer, 1,549 enlisted, 1,051 dorm bed spaces, 6 DVQ, 45 TLF. 20-bed hospital.

Charleston AFB, S. C. 29404-5000; in North Charleston, 10 mi. from downtown Charleston. Phone (803) 566-6000; DSN 673-2100. AMC base. Joint-use airfield. 437th Airlift Wing; 315th AW (AFRC Assoc.); Det. 1, 158th Fighter Wing (Vermont ANG); Field Training Det. 317; Det. 310, AFOSI; 1st Combat Camera Sqdn.; Det. 1, 33d Flight Test Sqdn. Base activated in Oct. 1942; inactivated in Mar. 1946; reactivated in Aug. 1953. Area 6,235 acres (including auxiliary airfield). Runway 9,000 ft. Altitude 45 ft. Military 7,300 (4,500 active duty and 2,800 AFRC); civilians 1,500. Payroll $145 million. Housing: 155 officer, 1,168 enlisted, 1,036 dorm spaces, 70 mobile home, 246 transient (7 DV suites, 76 VOQ, 4 SNCO suites, 132 VAQ, 27 TLF). Clinic.

Columbus AFB, Miss. 39710-1000; 10 mi. NW of Columbus. Phone (601) 434-7322; DSN 742-1110. AETC base. 14th Flying Training Wing, undergraduate pilot training and Introduction to Fighter Fundamentals. Base activated in 1941 for pilot training. Area 6,015 acres. Runways 6,300 ft., 8,000 ft., and 12,000 ft. Altitude 214 ft. Military 1,292; civilians 1,306. Payroll $92 million. Housing: 297 officer, 456 enlisted, 27 VAQ, 59 VOQ, 20 TLF/TLH.

Davis-Monthan AFB, Ariz. 85707-5000; within Tucson city limits. Phone (520) 750-1110; DSN 228-1110. ACC base. 355th Wing; Hq. 12th Air Force; A-10 combat crew training; OA-10 and FAC training and operations; 41st, 42d, and 43d Electronic Combat Sqdns., EC-130E/H electronic operations; 305th Rescue Sqdn. (AFRC), MH-60G Pave Hawk helicopter operations; Det. 1, 120th Fighter Wing (Montana ANG), F-16 air defense operations. Also site of AFMC's Aerospace Maintenance and Regeneration Center, storage location for excess DoD aerospace vehicles. Base activated in 1927; named for two local early aviators: 1st Lt. Samuel H. Davis, killed Dec. 28, 1921, and 2d Lt. Oscar Monthan, killed Mar. 27, 1924. Area 11,000 acres. Runway 13,645 ft. Altitude 2,620 ft. Military 6,458; civilians 1,385. Payroll $194.8 million. Housing: 133 officer, 1,106 enlisted, 336 transient (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. 436th Airlift Wing; 512th AW (AFRC Assoc.). Dover operates the largest aerial port facility on the East Coast. Base activated Dec. 1941; inactivated in 1946; reactivated Feb. 1951. Area 3,908 acres. Runway 12,900 ft. Altitude 28 ft. Military 6,409; civilians 1,059. Payroll $161 million. Housing: 107 officer, 1,441 enlisted, 641 dormitory spaces, 349 transient (220 VAQ, 115 VOQ, 14 TLF). 20-bed hospital.

Dyess AFB, Tex. 79607-1980; WSW border of Abilene. Phone (915) 696-0212; DSN 461-1110. ACC base. 7th Wing, two B-1B squadrons (one operational, one training). First base to activate an operational B-1B wing. Conducts all B-1 combat crew training for the Air Force. First B-1B arrived in June 1985; wing met initial operational capability in Oct. 1986. Base activated in Apr. 1942; deactivated in Dec. 1945; reactivated as Abilene AFB Sept. 1955. In Dec. 1956, renamed for Lt. Col. William E. Dyess, WW II fighter pilot who escaped from a Japanese prison camp, killed in P-38 crash at Burbank, Calif., in Dec. 1943. Area 6,437 acres (including off-base sites). Runway 13,500 ft. Altitude 1,789 ft. Military 4,656; civilians 411. Payroll $152 million. Housing: 142 officer, 845 enlisted, 56 VAQ, 79 VOQ, 9 DVQ, 39 TLF. 15-bed hospital.

Edwards AFB, Calif. 93524; 20 mi. E of Rosamond. Phone (805) 277-1110; DSN 527-1110. AFMC base. Site of Air Force Flight Test Center (AFFTC), which 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. Also site of Phillips Laboratory's Astronautics Directorate, NASA's Dryden Flight Research Center, and secondary landing site for space shuttle missions. Det. 2, 9th Reconnaissance Wing, SR-71 operations (ACC). Base activities began in Sept. 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 4,335 (including associate units); government and contract civilians 6,294 (not including 255 NAF employees). Payroll $843 million (including associate units and contractors). Housing: 557 officer, 1,432 enlisted (including 697 dormitory spaces, 58 UOQ, and 16 unaccompanied SNCOQ), 161 transient (49 VAQ, 42 VOQ, 9 SNCOQ, 10 VIP/VOQ, 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 (904) 882-1110; DSN 872-1110. AFMC base. Eglin is the nation's largest Air Force base in terms of acreage, covering an area roughly two-thirds the size of Rhode Island. Host unit: Air Force Development Test Center. Associate units: Aeronautical Systems Center (Eglin) and Armament Directorate of Wright Laboratory (AFMC); 33d Fighter Wing; 53d Wing (ACC); 96th Air Base Wing; 46th Test Wing; 919th Special Operations Wing (AFRC); 20th Space Surveillance Sqdn. (AFSPC); 9th Special Operations Sqdn.; 728th Tactical Control Sqdn.; a US Army Ranger training battalion; a US Navy Explosive Ordnance Disposal School; Air Force Armament Museum. Base activated in 1935; named for Lt. Col. Frederick I. Eglin, WW I flyer killed in aircraft accident Jan. 1, 1937. Area 463,452 acres. Runways 10,000 ft. and 12,000 ft. Altitude 85 ft. Military 7,312; civilians 3,728 (excluding Hurlburt Field). Payroll $470.6 million (excluding Hurlburt Field). Housing: 243 officer, 2,090 enlisted, 1,048 unaccompanied enlisted units (dorm rooms), 226 trailer spaces (officer and enlisted), 88 family transient. 85-bed USAF regional hospital. AFMC 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 unit: 354th Fighter Wing, F-16C/D, A-10, and OA-10 operations. Base hosts recurring Cope Thunder exercises, which provide realistic combat training. Associate organizations include the Arctic Survival School (AETC); 168th Air Refueling Wing (ANG); Det. 460, Air Force Technical Applications Center. Base activated Oct. 1944; named for Carl Ben Eielson, Arctic aviation pioneer who died in an Arctic rescue mission in Nov. 1929. Area 19,790 acres (including 16 remote sites, 63,195 acres). Runway 14,500 ft. Altitude 534 ft. Military 2,725; full-time civilians (NAF, AAFES, Civil Service) 882 (includes ANG Civil Service technicians) and 529 traditional and full-time ANG members. Payroll $117.5 million. Housing: 151 officer, 1,431 enlisted. Unaccompanied housing: 8 officer units, 402 rooms, 734 bed spaces (includes NCOQ), 212 VOQ, 240 bed spaces (179 rooms) VAQ, 6 enlisted and 6 officer DVQ.

Ellsworth AFB, S. D. 57706-5000; 12 mi. ENE of Rapid City. Phone (605) 385-1000; DSN 675-1000. ACC base. Host unit: 28th Bomb Wing, two B-1B squadrons. Associate unit: South Dakota Air and Space Museum. Base activated in July 1942 as Rapid City AAB; renamed June 13, 1953, for Brig. Gen. Richard E. Ellsworth, killed Mar. 18, 1953, in crash of RB-36 in Newfoundland, Canada. Area 10,632 acres. Runway 13,497 ft. Altitude 3,286 ft. Military 3,135; civilians 1,018. Payroll $114.9 million. Housing: 198 officer, 1,882 enlisted, 214 transient units (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. Largest composite wing in PACAF; hub for air traffic to and from the Far East. Hq. Alaskan Command; Hq. 11th Air Force (PACAF); Hq. Alaskan NORAD Region. Host unit: 3d Wing, F-15/F-15E fighter and C-130 and C-12 airlift operations, E-3 airborne air control operations, and 3d Medical Gp. Associate units: 11th Rescue Coordination Center (ANG); 381st Intelligence Sqdn.; 632d Air Mobility Support Sqdn. (AMC); various US Army, Navy, and Marine activities. Base activated in July 1940; named for Capt. Hugh Elmendorf, killed Jan. 13, 1933, at Wright Field, Ohio, while flight-testing a new pursuit plane. Area 13,130 acres. Runways 7,500 ft. and 10,000 ft. Altitude 213 ft. Military 6,565; civilians 997. Payroll $320 million. Housing: 230 officer, 1,376 enlisted, 117 VOQ, 355 VAQ, 1,316 UEQ, 604 contingency facilities (80 officer, 422 enlisted, 102 TLF units). 60-bed hospital.

Fairchild AFB, Wash. 99011-5000; 12 mi. WSW of Spokane. Phone (509) 247-1212; DSN 657-1212. AMC base. Air refueling hub for the western US. Host unit: 92d Air Refueling Wing (KC-135R, KC-135T). Tenant units: 336th Training Gp. (Survival School, AETC); 141st Air Refueling Wing (ANG, KC-135E); 2d Support Sqdn. (ACC). Base activated in Jan. 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 4,316; civilians 931. Payroll $122.3 million. Housing: 176 officer, 1,247 NCO, 18 TLF, 154 BAQ/VAQ, 149 VOQ. 30-bed hospital.

Falcon AFB, Colo. 80912-5000; 10 mi. E of Colorado Springs. Phone (719) 567-1110; DSN 560-1110. AFSPC base. Host unit: 50th Space

50 years of the right stuff!

and mobile...and the largest, most complex satellite ground stations and communications systems.

TRW is proud of its partnership with the Air Force, 43 years of unsurpassed excellence with the Air Force ICBM program, and hopes to take the next challenging step as the ICBM prime integration contractor. TRW has experienced personnel in place to offer the Air Force the best value, lowest risk and fastest transition to the prime contractor for the ICBM weapons systems integration, assessment and sustainment.

Air Force/TRW. 50 more years of the right stuff.

TRW

USAF Almanac

Major Commands

A major command is a subdivision of the Air Force assigned a major part of the Air Force mission and directly subordinate to Hq. USAF. In general, there are two types of major commands: operational and support.

Air Combat Command

Headquarters Langley AFB, Va.

Established June 1, 1992

Commander Gen. Richard E. Hawley

Staff photo by Guy Aceto

Though it is based in the US, ACC is not a stay-at-home command. Its aircraft travel all over the globe in exercises, in support of combatant commands, and as elements of air expeditionary forces.

MISSIONS

Operate USAF bombers

Operate USAF's CONUS-based combat-coded fighter and attack aircraft and combat-support coded 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

COROLLARY MISSIONS

Monitor and intercept illegal drug traffic

Test new combat equipment

OTHER RESPONSIBILITIES

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

Provide air defense forces to North American Aerospace Defense Command

Operate certain air mobility forces in support of US Transportation Command

EQUIPMENT

(Primary Aircraft Inventory)

Bombers (B-1B, B-2, B-52H)	104
Fighters (F-15A/C, F-16, F-4)	379
Attack aircraft (A/OA-10, F-15E, F-117A)	186
EC/EW aircraft (EF-111A)	28
Aerial refuelers (KC-135E/R)	6
Combat delivery (C-27)	9
Rescue (HC-130, HH-60)	36
Reconnaissance (U-2, RC-135, SR-71, E-8C)	45
Predator UAV	3
Other aircraft (all types)	66

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

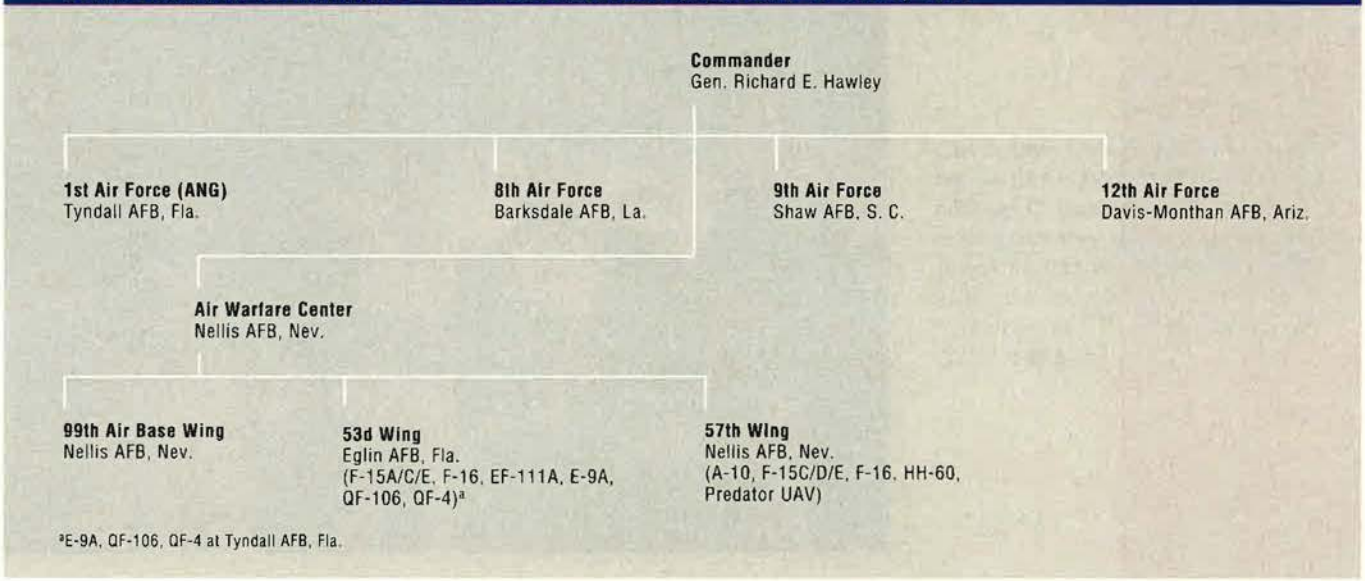
25 wings

PERSONNEL

Active-duty	113,868
Officers	14,495
Enlisted	99,373
Reserve component	94,739
ANG	72,507
AFRC	22,232
Civilian	13,148
Total	**221,755**

(Does not include transfer of C-130 and C-21 authorizations)

AIR COMBAT COMMAND • HEADQUARTERS, LANGLEY AFB, VA.



[a]E-9A, QF-106, QF-4 at Tyndall AFB, Fla.

OPERATIONAL ACTIVITY

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

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

Major CONUS JCS exercises
JTFEX (USACOM)
Roving Sands (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.
Coalition Flag, Nellis AFB, Nev.
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, Tex.	B-1B
9th Reconnaissance Wing	Beale AFB, Calif.	U-2R/S, T-38 (SR-71 at Edwards AFB, Calif.)
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	C-21A, C-27, CT-43
27th Fighter Wing	Cannon AFB, N. M.	F-16C/D, EF-111A
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
53d Wing	Eglin AFB, Fla.	F-15C/D/E, F-16A/C, EF-111A
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.	—
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-9A, 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.

Parts of ACC trace their roots to Tactical Air Command, which existed before the Air Force itself. These 69th Fighter Squadron pilots were assigned to TAC but attached to Far East Air Forces for operations in the Korean War. They are celebrating their 100th missions in September 1952.

Paul Cleland via Warren Thompson

USAF photo by Capt. John E. Ford III

By 1968, tactical airpower had changed drastically. These F-4s from the 469th Tactical Fighter Squadron could carry twice as many bombs twice as fast as the F-84. Like the F-84, they had an air refueling capability (note the KC-135 in the background).

The F-15 made the transition from TAC to ACC after a stellar performance in the Persian Gulf War, during which USAF F-15 pilots downed 36 Iraqi aircraft (including a helicopter) without losing a single F-15 to enemy fire. The F-15 will continue as USAF's main air-superiority fighter until well after the F-22 reaches initial operational capability in 2004. ■

USAF photo by MSgt. Rose S. Reynolds

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

Commander
Maj. Gen. Philip G. Killey

- **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) • HEADQUARTERS, 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, EF-111A)
- **5th Bomb Wing**
  Minot AFB, N. D.
  (B-52H)
- **28th Bomb Wing**
  Ellsworth AFB, S. D.
  (B-1B)
- **7th Wing**
  Dyess AFB, Tex.
  (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) • HEADQUARTERS, 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]
  (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)

[a]Pope AFB slated to transfer to AMC April 1997.

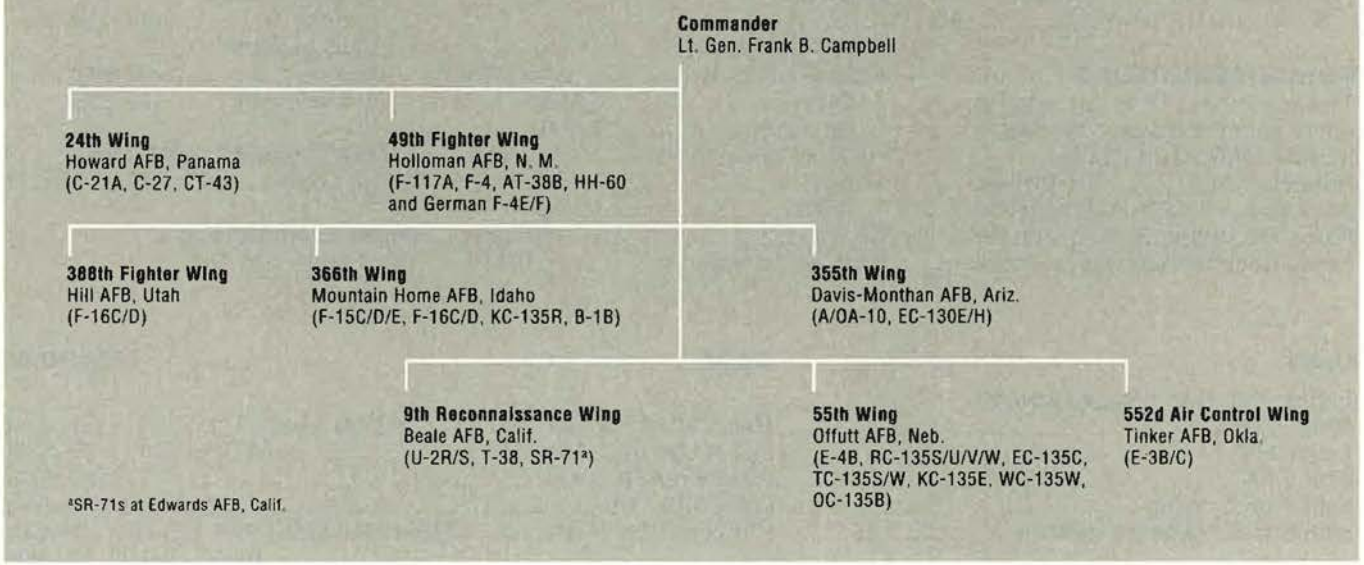
Frank Kleinwechter via Warren Thompson

Much of the old Strategic Air Command also now belongs to ACC. The B-36 Peacemaker became a symbol for the nuclear age and intercontinental delivery of atomic weapons. It was also central to a dispute between the newborn Air Force and the Navy—now known as the "Revolt of the Admirals."

When the Air Force needed a bomber capable of Mach 2 speed, the aptly named B-58 Hustler was there to answer the call. After more than three decades, the Hustler still holds some world speed records and once flew from Los Angeles to New York in two hours, 56 seconds.

Like the F-15, the B-52 is a weapon system that made the transition to ACC. This impressive load of bombs is just a portion of what the Stratofortress can—and did—carry in action against both North Vietnam and Iraq. Part of the nuclear deterrent for decades, the B-52 will soldier on into the next century in a conventional role. ■

12th AIR FORCE (ACC) • HEADQUARTERS, 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, combat delivery, battle-management, and rescue aircraft and command, control, communications, and intelligence systems.

As a force provider, ACC organizes, trains, equips, and maintains combat-ready forces for rapid deployment and employment while ensuring that strategic air defense forces are ready to meet the challenges of peacetime air sovereignty and wartime air defense.

AETC Air Education and Training Command

Headquarters Randolph AFB, Tex.

Established July 1, 1993

Commander Gen. Lloyd W. Newton

USAF photo by MSgt. Fernando Serna

AETC constantly strives to make training more efficient and cost-effective. That includes training for these firefighters and other nonflyers as well as pilots, navigators, and loadmasters.

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) 1,164
Fighters (F-15, F-16) 277
Transports and tankers (C-5, C-12, C-17, C-21, C-130,

C-141, KC-135, MC-130P, MC-130H) 109
Helicopters (MH-53J, TH-53A, UH-1, UH-1N, HH-60G) 27

FORCE STRUCTURE

Two numbered air forces and an educational headquarters: **2d,** Keesler AFB, Miss.; **19th,** Randolph AFB, Tex.; **Air University,** Maxwell AFB, Ala. Also Air Force Recruiting Service and Air Force Security Assistance Training Squadron, Randolph AFB, Tex., and 59th Medical Wing, Lackland AFB, Tex.

PERSONNEL

Active-duty 44,923
  Officers 10,335
  Enlisted 34,588
Reserve component 3,253
  ANG 2,141
  AFRC 1,112
Civilian 15,047
Contracted workers 9,443
Total **72,666**
Students 375,053
  Flying/technical training 177,418
  Basic military training 35,342
  Air University 162,293

OPERATIONAL ACTIVITY

Flying hours ..... 44,836 per month

Major competitions
Top Flight, Top Tech

UNIT	BASE	WEAPONS
Flying Training Wings (Active)		
12th FTW	Randolph AFB, Tex.	AT-38, C-21, T-1, T-37, T-38, T-43
14th FTW	Columbus AFB, Miss.	AT-38, T-1, T-37, T-38
47th FTW	Laughlin AFB, Tex.	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
64th FTW	Reese AFB, Tex. (Closes September 30, 1997)	
71st FTW	Vance AFB, Okla.	T-1, T-37, T-38
80th FTW	Sheppard AFB, Tex.	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, weapons director training and undergraduate controller and battle manager training
Other Flying/Aircrew Training Units (Active)		
3d Flying Training Squadron	Hondo Airport, Tex.	T-3
45th Airlift Squadron	Keesler AFB, Miss.	C-12, C-21
336th Training Group	Fairchild AFB, Wash.	UH-1, aircrew survival training
557th Flying Training Squadron	US Air Force Academy, Colo.	T-3
Other Flying Training Units (Air National Guard)		
162d Fighter Wing	Tucson IAP, Ariz.	F-16
173d Fighter Wing	Klamath Falls IAP, Ore.	F-16
Technical Training Units		
17th Training Wing	Goodfellow AFB, Tex.	
37th Training Wing	Lackland AFB, Tex.	
81st Training Wing	Keesler AFB, Miss.	
82d Training Wing	Sheppard AFB, Tex.	
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		
Extension Course Institute		
Ira C. Eaker College for Professional Development		
School for Advanced Airpower Studies		
School of Logistics and Acquisitions Management		
Squadron Officer School		
Major Recruiting Units		
Hq. USAF Recruiting Service	Randolph AFB, Tex.	
360th Recruiting Group	Hanscom AFB, Mass.	
367th Recruiting Group	Robins AFB, Ga.	
369th Recruiting Group	Lackland AFB, Tex.	
372d Recruiting Group	Hill AFB, Utah	
Support Units		
42d Air Base Wing	Maxwell AFB, Ala.	
602d Training Support Squadron	Edwards AFB, Calif.	
619th Training Support Squadron	Randolph AFB, Tex.	
AETC Training Support Squadron	Hill AFB, Utah	

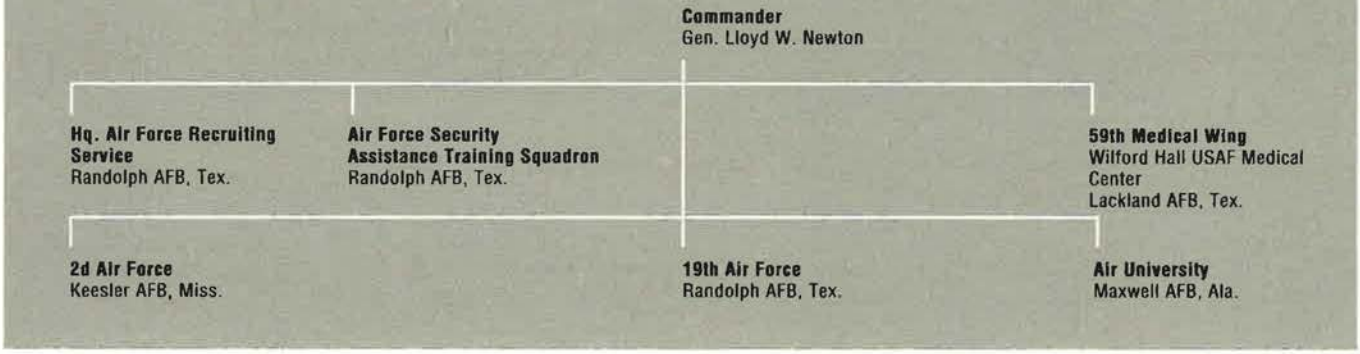
COMMAND NOTES

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

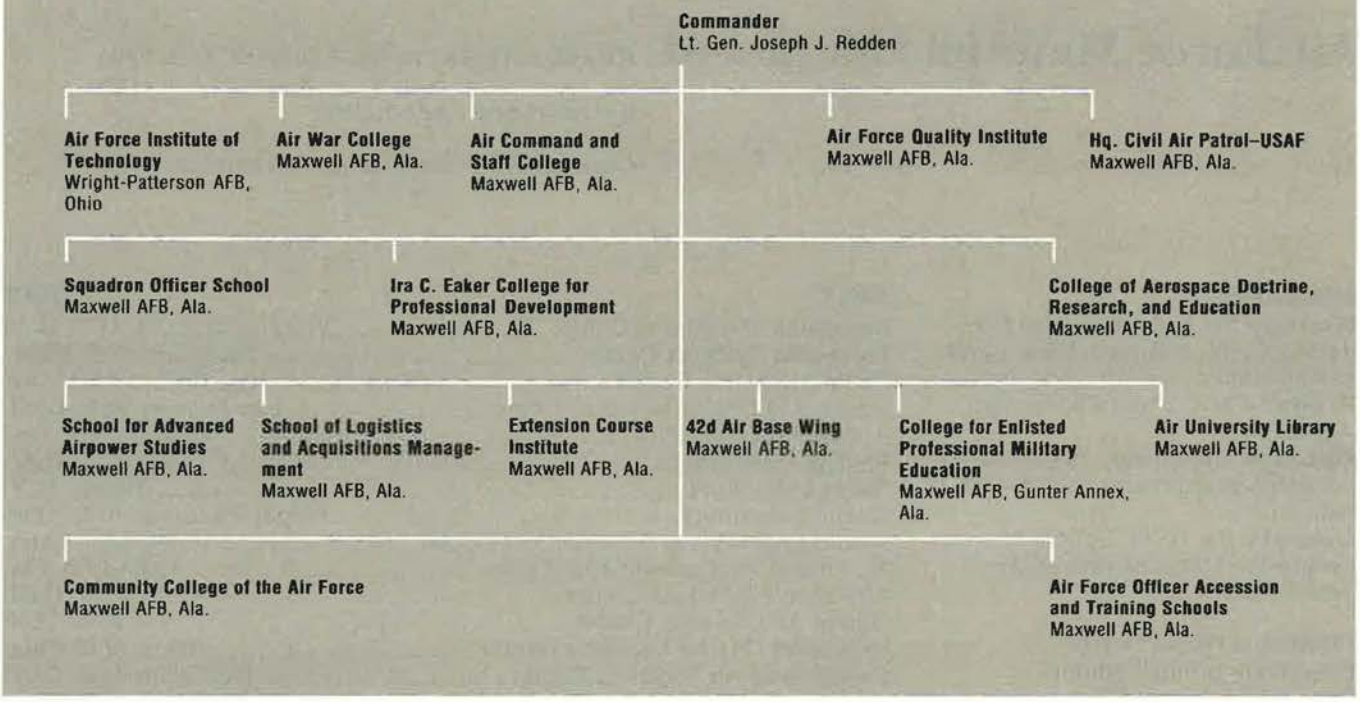
The turboprop-powered Raytheon Beech Mk. II, the Joint Primary Aircraft Training System, will replace Navy T-34s and Air Force T-37s for the primary phase of pilot training beginning in 1999.

AETC's mission expanded with the transfer of C-130 combat crew training from Air Combat Command. AETC also acquired Little Rock AFB, Ark., from ACC.

AIR EDUCATION AND TRAINING COMMAND • HEADQUARTERS, RANDOLPH AFB, TEX.



AIR UNIVERSITY (AETC) • HEADQUARTERS, MAXWELL AFB, ALA.



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

[a]Tenant unit.

19th AIR FORCE (AETC) • HEADQUARTERS, RANDOLPH AFB, TEX.

[a]Tenant unit. [b]Closes September 30, 1997.

AFMC Air Force Materiel Command

Headquarters Wright-Patterson AFB, Ohio

Established July 1, 1992

Commander Gen. Henry Viccellio, Jr.
(retires May 1, 1997)

MISSIONS

Manage the integrated research, development, test, acquisition, and sustainment of weapon systems
Produce and acquire advanced systems
Operate "superlabs," major product centers, logistics centers, and test centers
Operate the USAF School of Aerospace Medicine and USAF Test Pilot School

FORCE STRUCTURE

Four major product centers
Four superlaboratories
Three test centers
Five air logistics centers
Four specialized centers

PERSONNEL

Active-duty	33,991
Officers	10,025
Enlisted	23,966
Reserve component	5,481
ANG	2,945
AFRC	2,536
Civilian	73,395
Total	**112,867**

OPERATIONAL ACTIVITY

Flying hours ..... 2,625 per month

UNIT	BASE
Aeronautical Systems Center	Wright-Patterson AFB, Ohio
Electronic Systems Center	Hanscom AFB, Mass.
Human Systems Center	Brooks AFB, Tex.
Space and Missile Systems Center	Los Angeles AFB, Calif.
Armstrong Laboratory	Brooks AFB, Tex.
Phillips Laboratory	Kirtland AFB, N. M.
Rome Laboratory	Rome, N. Y.
Wright 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, Tex.
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
Cataloging and Standardization Center	Battle Creek, Mich.
Air Force Office of Scientific Research	Bolling AFB, D. C.

COMMAND NOTES

Air Force Materiel Command delivers systems that maintain the leading edge in research, acquisition, and sustainment of weapon systems. AFMC's four superlabs research and develop state-of-the-art technologies, while the four product centers use those technologies to acquire and develop 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 such areas as basic research, cataloging and standardization, metrology, security assistance, and "retired" weapon systems.

trainers

- 1947 Blue Box Trainer
- 1949 C-11 Jet Instument Trainer
- 1968 F-4 Weapon System Trainer
- 1982 F-16 Tactical Flight Simulator
- 1986 F-117 Weapons System Trainer
- 1987 C-130 Aircrew Training System
- 1989 B-2 Aircrew Training Devices
- 1997 F-22 Pilot/Maintenance Training Devices

sensors

- 1951 F-86D E-4 Fire Control System
- 1960 F-101, F-102, & F-106 IRST
- 1960 F-106 MA-1 Fire Control System
- 1974 B-52 Infrared System
- 1983 US ASARS-2 Radar
- 1987 F-15E APG-70
- 1989 B-2 AN/APQ-181
- 1990 F-22 CIP
- 1991 MH-60G Infrared System

missiles

- 1952 Falcon
- 1972 Maverick
- 1973 Sparrow
- 1987 ACM
- 1988 AMRAAM
- 1994 AIM-9X

Flying with you since '47.

50 YEARS USAF

HUGHES AIRCRAFT
A HUGHES ELECTRONICS COMPANY

AIR FORCE MATERIEL COMMAND • HEADQUARTERS, WRIGHT-PATTERSON AFB, OHIO

Commander
Gen. Henry Viccellio, Jr.*

Development

Space and Missile Systems Center
Los Angeles AFB, Calif.
Phillips Laboratory, Kirtland AFB, N. M.

Electronic Systems Center
Hanscom AFB, Mass.
Rome Laboratory, Rome, N. Y.

Aeronautical Systems Center
Wright-Patterson AFB, Ohio
Wright Laboratory
Wright-Patterson AFB, Ohio

Human Systems Center
Brooks AFB, Tex.
Armstrong Laboratory, Brooks AFB, Tex.

Test

Air Force Flight Test Center
Edwards AFB, Calif.

Air Force Development Test Center
Eglin AFB, Fla.

Arnold Engineering Development Center
Arnold AFB, Tenn.

*Retires May 1, 1997.

Operational Support

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, Tex.

Warner Robins Air Logistics Center
Robins AFB, Ga.

Specialized Support

Aerospace Maintenance and Regeneration Center
Davis-Monthan AFB, Ariz.

Cataloging and Standardization Center
Battle Creek, Mich.

Air Force Security Assistance Center
Wright-Patterson AFB, Ohio

Air Force Office of Scientific Research
Bolling AFB, D. C.

Air Force Space Command

AFSPC

Headquarters Peterson AFB, Colo.

Established September 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
Provide command and control for DoD satellites
Provide ballistic missile warning to NORAD and US Space Command

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

Staff photo by Guy Aceto

AFSPC has custody of one element of the nuclear deterrent as well as responsibility for US space-launch facilities. Here, SrA. Corey LaRock (left) and SrA. James Callari examine the forward component of a Minuteman III reentry vehicle.

EQUIPMENT

Intercontinental Ballistic Missiles

Peacekeeper	50
Minuteman III	530

Satellite systems (USAF spacecraft in service as of January 1, 1997):

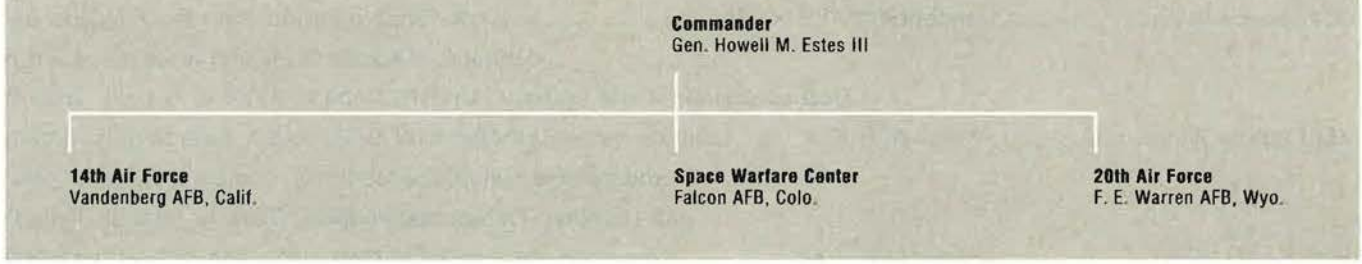
Navstar Global Positioning System (GPS):

Block II/IIA/IIR	26

Defense Satellite Communications System:

DSCS II	2
DSCS III	9
Milstar	2

AIR FORCE SPACE COMMAND • HEADQUARTERS, PETERSON AFB, COLO.



UHF Follow-on 6
Defense Meteorological Satellite Program (DMSP) 4

Communications satellites of NATO III and Fleet Satellite Communications System

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

Ballistic missile warning systems: Defense Support Program, 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 Tracking System, phased-array radars, mechanical tracking 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)

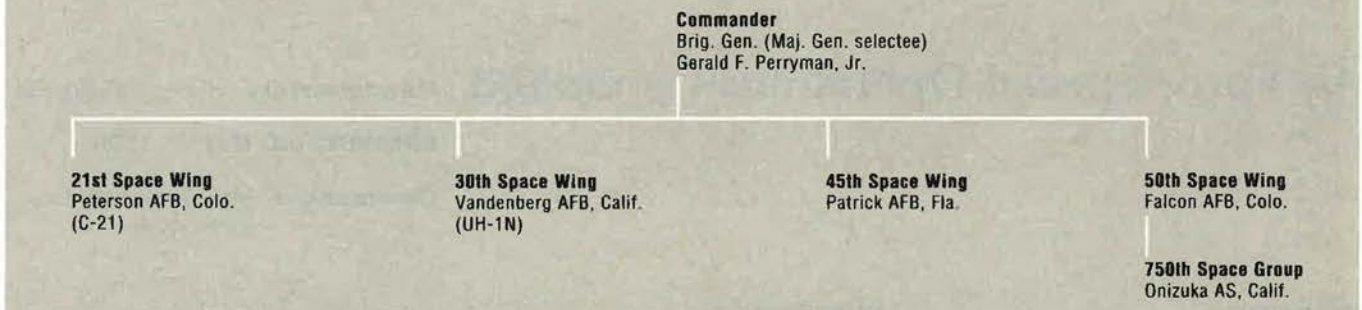
FORCE STRUCTURE

Two numbered air forces: **14th,** Vandenberg AFB, Calif.; **20th,** F. E. Warren AFB, Wyo.
One direct reporting unit: Space Warfare Center
Seven space and missile wings
Three space groups, one missile group
Six bases and seven stations
More than 50 units worldwide

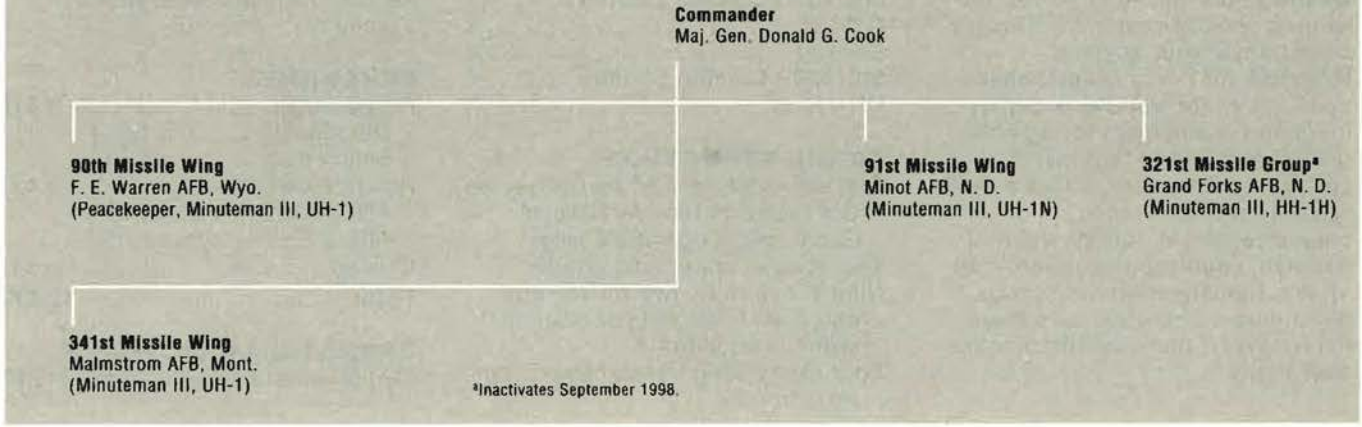
PERSONNEL

Active-duty	21,933
Officers	4,195
Enlisted	17,738
Reserve component	337
ANG	0
AFRC	337
Civilian	4,773
Contractor personnel	11,462
Total	**38,505**

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



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



[a]Inactivates September 1998.

UNIT	BASE	WEAPONS/ACTIVITIES
21st Space Wing	Peterson AFB, Colo.	Missile warning and space surveillance; C-21
30th Space Wing	Vandenberg AFB, Calif.	Launch, range operations for DoD, NASA, and commercial space launches; testing support of DoD space and ICBM systems; UH-1N, Delta II, Atlas II, Titan II, Titan IV
45th Space Wing	Patrick AFB, Fla.	Launch, range operations for DoD, NASA, foreign government, and commercial space launches; shuttle program support and US Navy Trident test support; Delta II, Atlas II, Titan IV
50th Space Wing	Falcon AFB, Colo.	Command and control of DoD and allied nations' satellites
90th Missile Wing	F. E. Warren AFB, Wyo.	UH-1, Minuteman III and Peacekeeper ICBMs
91st Missile Wing	Minot AFB, N. D.	UH-1N, Minuteman III ICBM
321st Missile Group	Grand Forks AFB, N. D. (inactivates September 1998)	HH-1H, Minuteman III ICBM
341st Missile Wing	Malmstrom AFB, Mont.	UH-1, Minuteman III ICBM
721st Support Group	Cheyenne Mountain AS, Colo.	Command and control for NORAD and USSPACECOM
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

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 USSPACECOM for space forces; 20th Air Force is a component of US Strategic Command for ICBM forces.

AFSOC Air Force Special Operations Command

Headquarters Hurlburt Field, Fla.

Established May 22, 1990

Commander Maj. Gen. James L. Hobson, Jr.

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 Spooky gunships	13
MH-53J Pave Low helicopters	36
MH-60G Pave Hawk helicopters	10
MC-130E Combat Talon I	8
MC-130H Combat Talon II	21
C-130E	5
EC-130	8
MC-130P Combat Shadow	24
UH-1N	2

FORCE STRUCTURE

One active-duty, one Air Force Reserve Command, and one Air National Guard special operations wings
Two special operations groups
Nine active-duty, two AFRC, and one ANG fixed-wing special operations squadrons
Four rotary-wing special operations squadrons
One special tactics group
Four special tactics squadrons
One special operations foreign intelligence squadron
One flight test squadron
One combat weather squadron
Air Force Special Operations School

PERSONNEL

Active-duty	9,615
Officers	1,504
Enlisted	8,111
Reserve component	2,421
ANG	1,384
AFRC	1,037
Civilian	541
Total	**12,577**

OPERATIONAL ACTIVITY

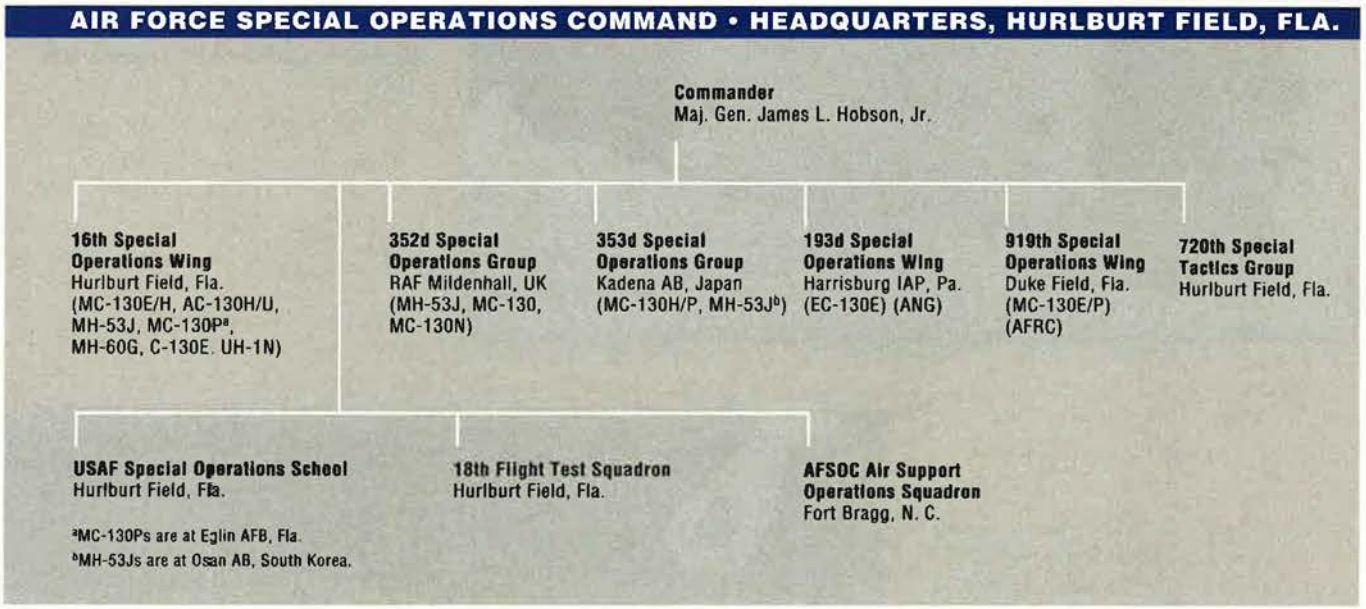
Flying hours: 4,500 per month

Staff photo by Guy Aceto

Always among the busiest major commands in terms of deployments away from home, AFSOC is often called on for Military Operations Other Than War. Here, Capt. Patrick Barnett (left) and SSgt. Boyd G. Bowling train at AFSOC's headquarters, Hurlburt Field, Fla.

COMMAND NOTES

With the growing number of Military Operations Other Than War, Air Force Special Operations Command continues to be one of the most frequently deployed of any major command. 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. Not only are AFSOC's active-duty forces on the move, but so is the 193d Special Operations Group at Harrisburg, Pa., which has the highest operations tempo of any Air National Guard unit. The 193d SOG flies the EC-130E Commando Solo aircraft, which can broadcast over radio and television bands, to conduct psychological operations.



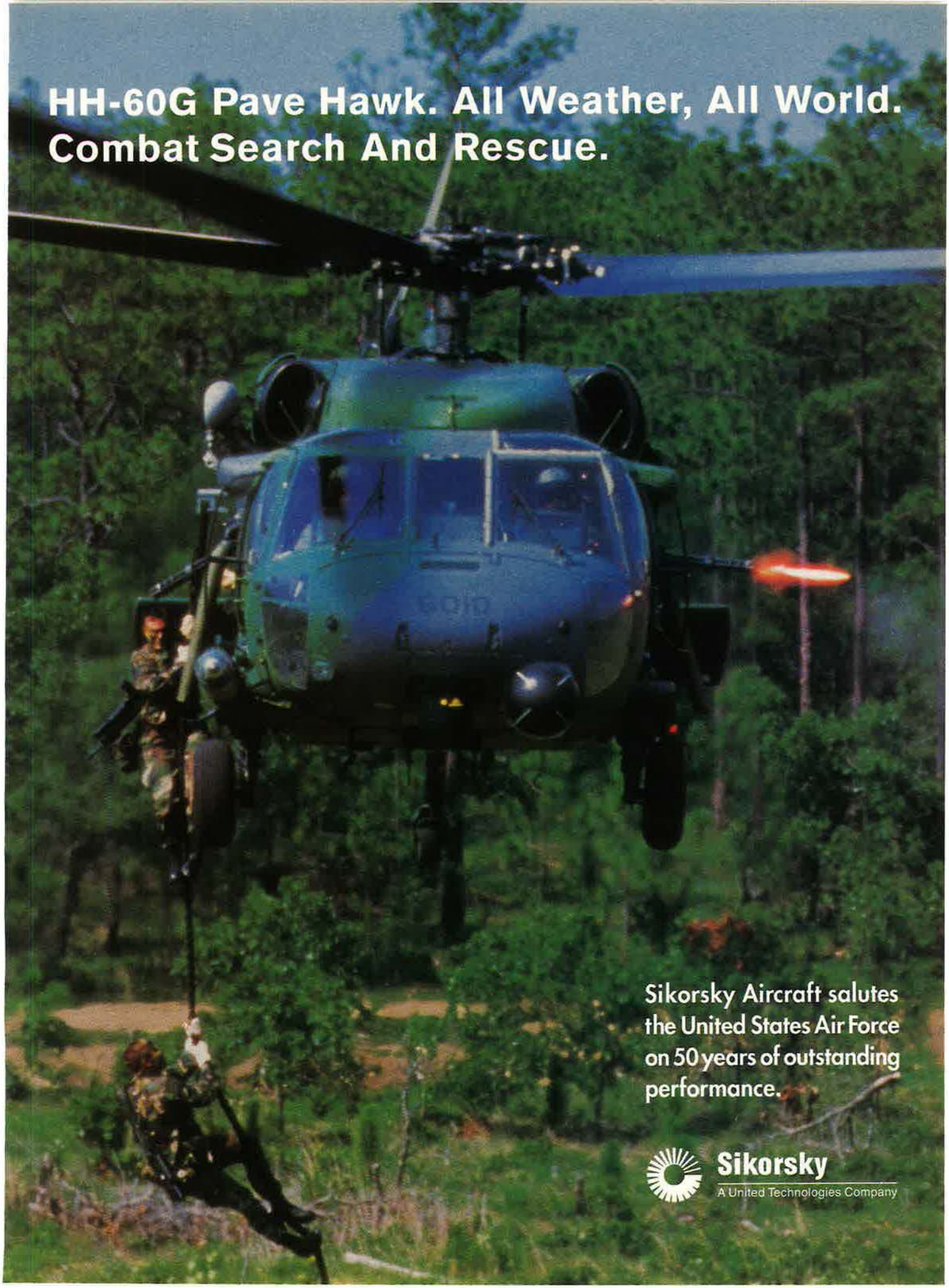
UNIT	BASE	WEAPONS
16th Special Operations Wing	Hurlburt Field, Fla.	AC-130H/U, MC-130E/H, MH-53J, C-130E, UH-1N, MH-60G
	Eglin AFB, Fla.	MC-130P
193d Special Operations Wing (ANG)	Harrisburg IAP, Pa.	EC-130E
352d Special Operations Group	RAF Mildenhall, UK	MH-53J, MC-130P, MC-130N
353d Special Operations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

Special Operations Forces have never been first in line when the Air Force is handing out new equipment. AFSOC's airmen have often had to improvise and make do, as this AC-47—a 20-year-old transport converted for the gunship mission in the Vietnam War—at Da Nang AB, South Vietnam, attests.

One of the more dangerous jobs in AFSOC is that of pararescueman. These men often took their lives in their hands to rescue downed aviators from the jungles of Vietnam. Once part of Military Airlift Command's 23d Air Force, AFSOC became a separate major command in 1990.

This MH-53J Pave Low mission during Operation Desert Storm earned the participants the 1991 Mackay Trophy. A task force of AFSOC and Army helicopters was assigned to rescue Navy Lt. Devon Jones after his F-14 Tomcat was shot down over Iraq. Here, Lieutenant Jones sprints to a waiting pararescueman and the safety of the Pave Low. ■

USAF photo by MSgt. Timothy Hadryck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Air Mobility Command

Headquarters Scott AFB, Ill.

Established June 1, 1992

Commander Gen. Walter Kross

Staff photo by Guy Aceto

The enormous C-5 is one of AMC's workhorses. These cargo pallets are a drop in the bucket of the Galaxy's 261,000-pound payload. Since the days of the Berlin Airlift, AMC and its predecessors have been indispensible in keeping US forces supplied around the world.

MISSIONS

Provide rapid, global 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) 1,413
Aeromedical evacuation (C-9) 12
Other aircraft (C-20, C-21, C-9, C-135, VC-25, VC-137, UH-1N ... 39

FORCE STRUCTURE

Two numbered air forces: **15th,** Travis AFB, Calif.; **21st,** McGuire AFB, N. J.
Two direct reporting units: Air Mobility Warfare Center, Tanker Airlift Control Center
12 wings (airlift, air mobility, air refueling)

PERSONNEL

Active-duty	48,342
Officers	8,389
Enlisted	39,953
Reserve component	54,525
ANG	20,114
AFRC	34,411
Civilian	8,701
Total	**111,568**

UNIT	BASE	WEAPONS
6th Air Refueling Wing	MacDill AFB, Fla.	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, C-141, KC-10
62d Airlift Wing	McChord AFB, Wash.	C-141
89th Airlift Wing	Andrews AFB, Md.	C-9, C-20, C-21, VC-25, 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
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
19th Air Refueling Group*	Robins AFB, Ga.	KC-135

*Tenant unit.

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)

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 aircraft and people worldwide perform airlift, air refueling, and aeromedical evacuation missions. AMC applies nonlethal combat airpower across the spectrum of conflict and plays a key role in humanitarian relief, peacekeeping operations, and a variety of other missions. In April 1997, ACC's CONUS-based C-130 and C-21 aircraft were returned to AMC oversight. AMC also acquired Pope AFB in North Carolina from ACC.

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

AIR MOBILITY COMMAND • HEADQUARTERS, SCOTT AFB, ILL.

Commander
Gen. Walter Kross

- **15th Air Force**, Travis AFB, Calif.
- **21st Air Force**, McGuire AFB, N. J.
- **Air Mobility Warfare Center**, Fort Dix, N. J.
- **Tanker Airlift Control Center**, Scott AFB, Ill.

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

Commander
Lt. Gen. Charles T. Robertson, Jr.

- **22d Air Refueling Wing**, McConnell AFB, Kan. (KC-135)
- **60th Air Mobility Wing**, Travis AFB, Calif. (C-5, C-141, KC-10)
- **62d Airlift Wing**, McChord AFB, Wash. (C-141)
- **375th Airlift Wing**, Scott AFB, Ill. (C-9, C-21)
- **615th Air Mobility Support Group**[a], Hickam AFB, Hawaii
- **615th Air Mobility Operations Group**, Travis AFB, Calif.
- **92d Air Refueling Wing**, Fairchild AFB, Wash. (KC-135)

[a]Tenant unit.

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

Commander
Lt. Gen. Edwin E. Tenoso

- **19th Air Refueling Group**[a], Robins AFB, Ga. (KC-135)
- **305th Air Mobility Wing**, McGuire AFB, N. J. (C-141, KC-10)
- **6th Air Refueling Wing**, MacDill AFB, Fla. (KC-135)
- **436th Airlift Wing**, Dover AFB, Del. (C-5)
- **437th Airlift Wing**, Charleston AFB, S. C. (C-17, C-141)
- **43d Airlift Wing**, Pope AFB, N. C. (C-130)
- **89th Airlift Wing**, Andrews AFB, Md. (C-9, C-20, C-21, VC-25, VC-137, UH-1)
- **319th Air Refueling Wing**, Grand Forks AFB, N. D. (KC-135)
- **621st Air Mobility Support Group**, Ramstein AB, Germany
- **621st Air Mobility Operations Group**, McGuire AFB, N. J.

[a]Tenant unit.

The Military Air Transport Service (forerunner of both MAC and AMC) received its baptism of fire in 1948 when the Soviet Union cut off all land access to Berlin. These C-47s are lined up at Tempelhof Airport as part of the air bridge that kept a city of three million supplied with everything from coal to vegetables for 11 months, until the blockade was lifted.

When the US embarked on a humanitarian mission in the 1950s and 1960s, MATS and MAC shouldered much of the load. Whether the problem was an earthquake in Chile or political turmoil in the Belgian Congo, C-124s would be on their way as soon as the US decided to act.

Some of the darkest days of the Vietnam War came when US Marines and South Vienamese Rangers found themselves surrounded at Khe Sanh. Vital to their resupply was the C-130 Hercules, which would offload its supplies with the engines running in order to speed departure. The Hercules is still going strong, now toiling for AMC. ■

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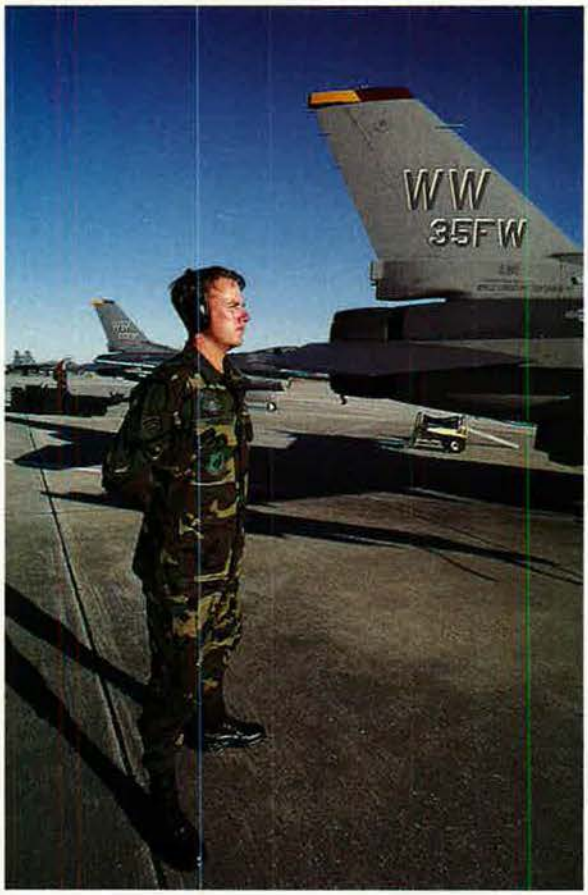
Pacific Air Forces

Headquarters Hickam AFB, Hawaii

Established July 1, 1957

Commander Gen. John G. Lorber

Photo by Lans Stout



Misawa AB, Japan, is home to the 35th Fighter Wing, whose new WW tail code is a tribute to its deep roots in the "Wild Weasel" mission. Here, SrA. Kenneth L. Magee stands guard over one of the wing's F-16s. PACAF has a vast area of responsibility, including potential flash points on the Korean peninsula.

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	32,360
Officers	3,959
Enlisted	28,401
Reserve component	3,577
ANG	2,600
AFRC	977
Civilian	8,671
Total	**44,608**

OPERATIONAL ACTIVITY

Flying hours ..... 10,243 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)

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)	246
OA-10A forward air controllers	18
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)	40
Helicopters (UH-1, HH-60)	11

UNIT	BASE	WEAPONS
3d Wing	Elmendorf AFB, Alaska	F-15C/D, C-130H, E-3B/C, F-15E, C-12J
8th Fighter Wing	Kunsan AB, South Korea	F-16C/D
15th Air Base Wing	Hickam AFB, Hawaii	C-135
18th Wing	Kadena AB, Japan	F-15C/D, E-3C, 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 • HEADQUARTERS, HICKAM AFB, HAWAII

Commander
Gen. John G. Lorber

- **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-135)
- **13th Air Force**
  Andersen AFB, Guam

5th AIR FORCE (PACAF) • HEADQUARTERS, YOKOTA AB, JAPAN

Commander
Lt. Gen. Ralph E. Eberhart

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

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

Commander
Lt. Gen. Ronald W. Iverson

- **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) • HEADQUARTERS, ELMENDORF AFB, ALASKA

Commander
Lt. Gen. Patrick K. Gamble

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

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

Commander
Maj. Gen. John R. Dallager

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

[a]Tenant unit; base owned by Singapore government.

US Air Forces in Europe

Headquarters Ramstein AB, Germany

Established August 7, 1945

Commander Gen. Michael E. Ryan

MISSIONS

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	27,115
Officers	3,288
Enlisted	23,827
Reserve component	392
ANG	0
AFRC	392
Civilian	5,233
Total	**32,740**

OPERATIONAL ACTIVITY

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

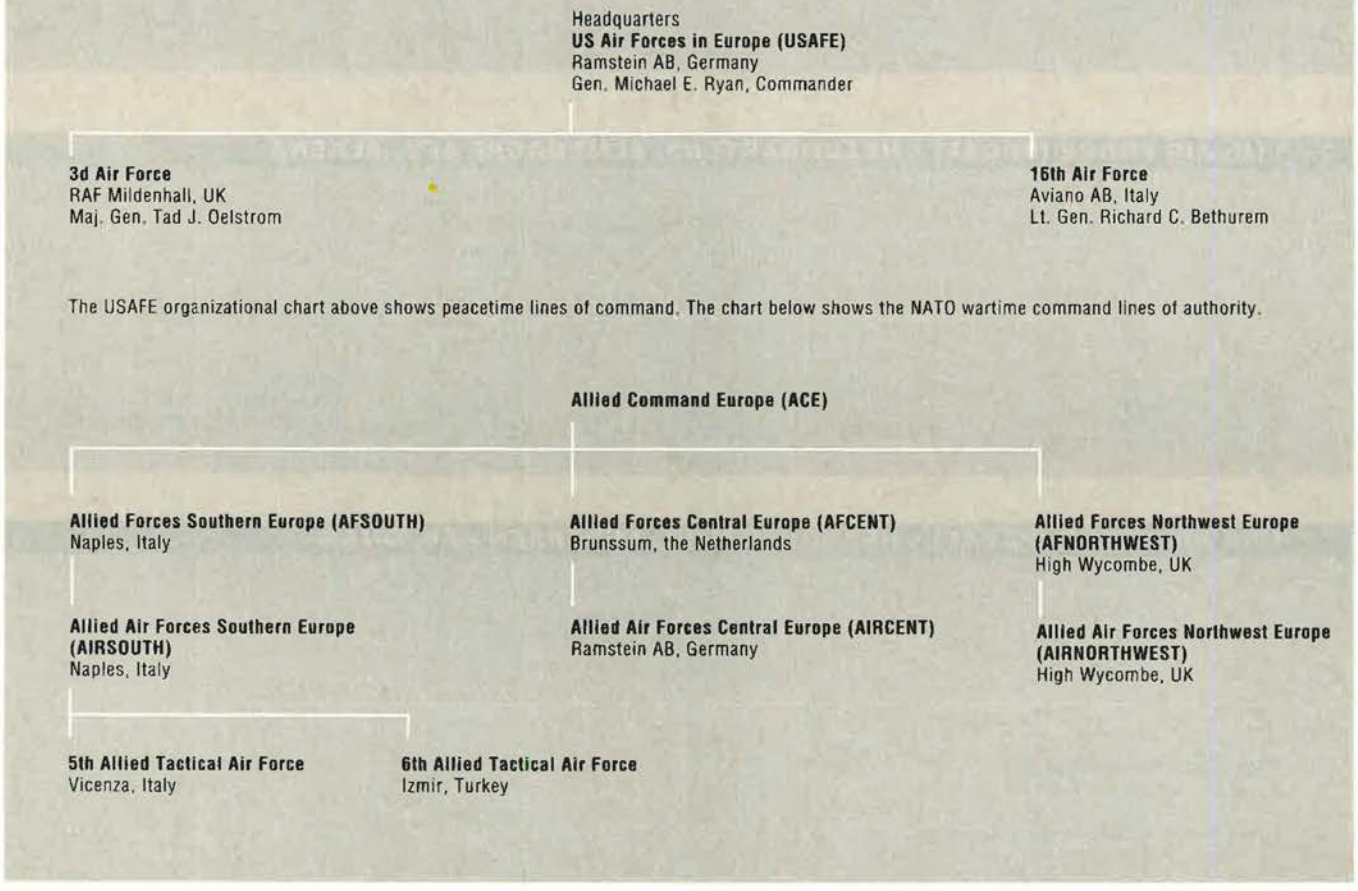
Major training exercises

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, Matador

Major contingency operations support

Decisive Edge, Joint Endeavor (Bosnia-Hercegovina); Provide Hope IV (former USSR); Provide Comfort II (northern Iraq)

US AIR FORCES IN EUROPE • HEADQUARTERS, RAMSTEIN AB, GERMANY



NATO and Warsaw Pact Forces were poised at daggers drawn for much of the Cold War in Europe. One of USAFE's sharpest daggers was the F-104 Starfighter. Here, alert crews rush to their aircraft at a base in Spain during a drill.

USAF photo by MSgt. David Nolan

As tensions with Moscow began to ease somewhat in the 1980s, a new menace was on the rise in Europe and elsewhere—state-sponsored terrorist acts. To combat the perpetrators, USAFE F-111s like these were dispatched from England to Libya in 1986 on Operation Eldorado Canyon to punish Libyan strongman Muammar Qaddafi.

USAF photo by SSgt. Louis Briscese

USAFE is much smaller now than it was at its Cold War peak, but the challenges have not disappeared. Despite its reduced numbers and smaller infrastructure, the command had a major role in keeping the peace in Bosnia-Hercegovina as part of NATO's implementation force, which has since become the stabilization force. ■

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) • HEADQUARTERS, RAF MILDENHALL, UK

Commander
Maj. Gen. Tad J. Oelstrom

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-15E, F-15C/D)

16th AIR FORCE (USAFE) • HEADQUARTERS, 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)

Staff photo by Guy Aceto

A 31st Fighter Wing F-16 bristles with armament in preparation for a sortie over Bosnia. Aviano AB, Italy, home of the 31st FW, remains a hive of activity as USAFE's participation in operations over Bosnia enters its fourth year. USAFE assets and personnel are also heavily involved in operations over Iraq.

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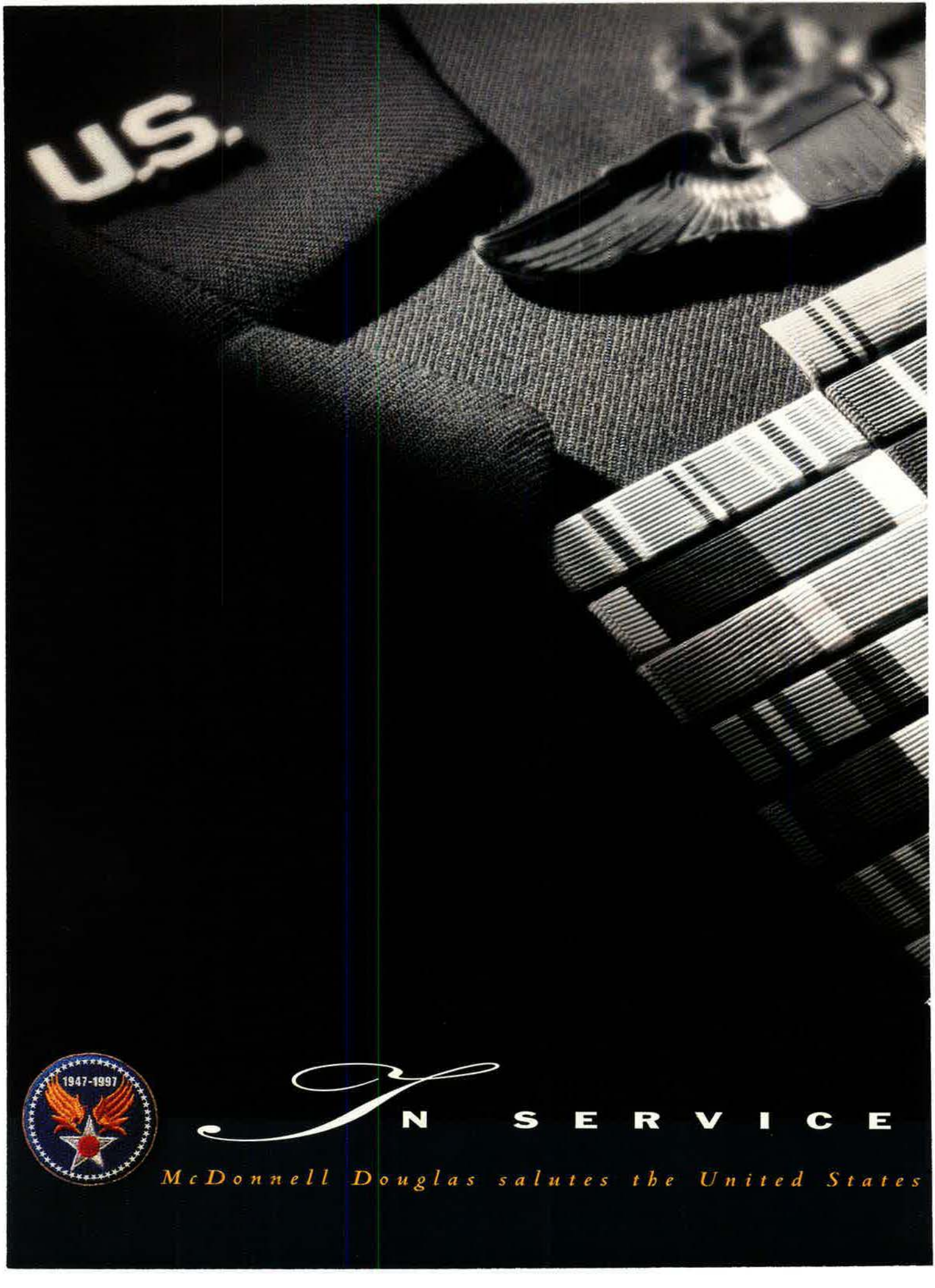
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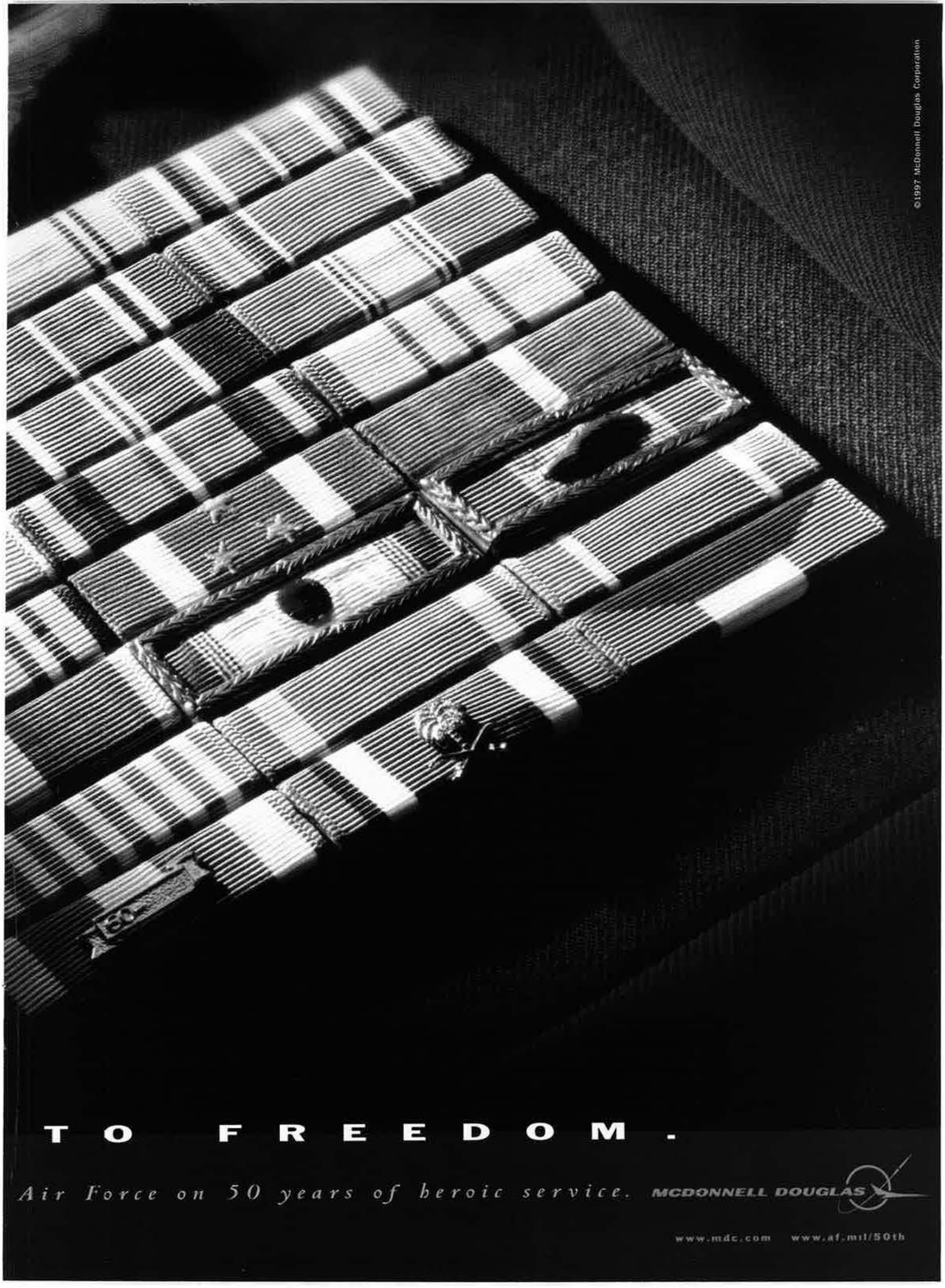
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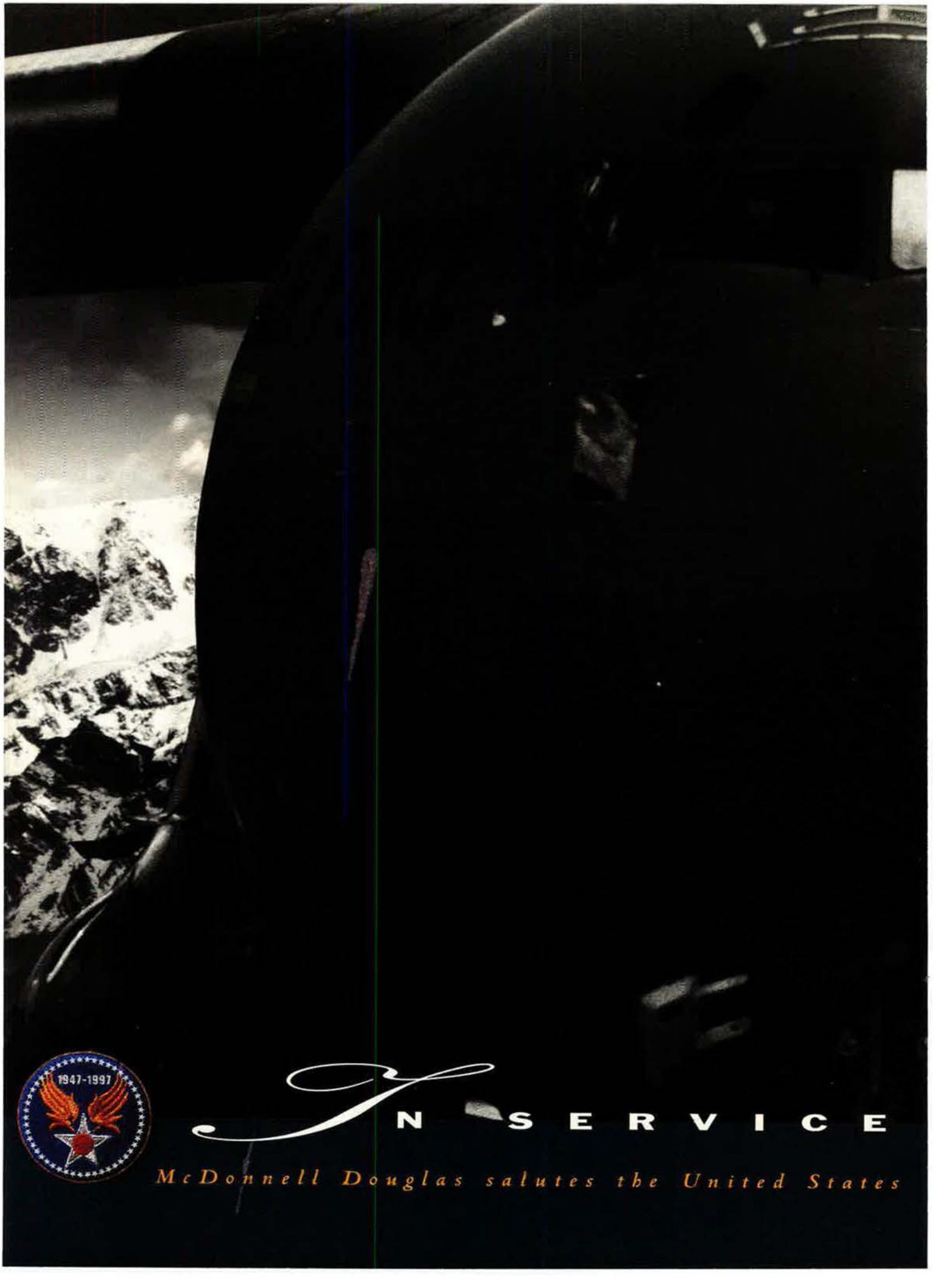
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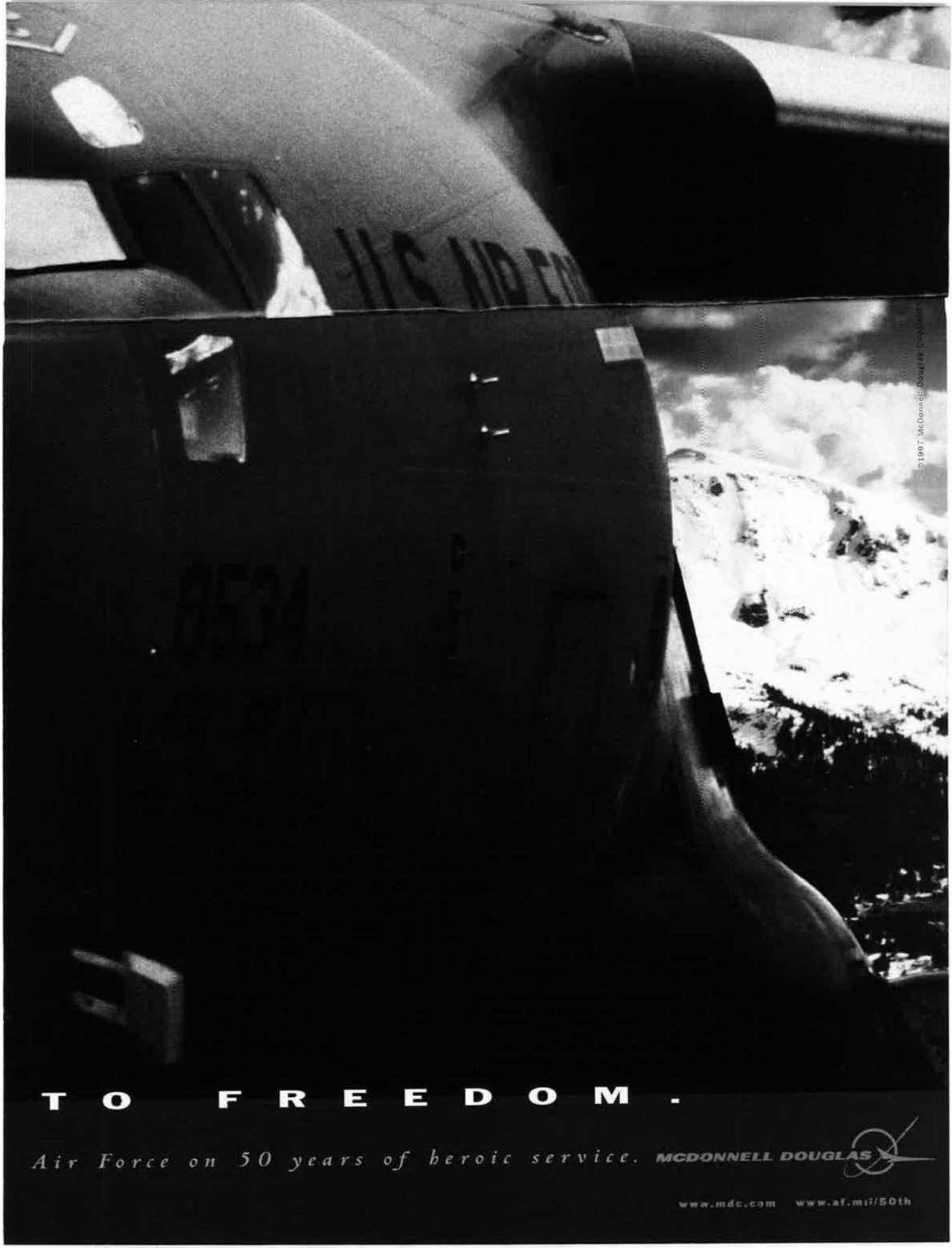
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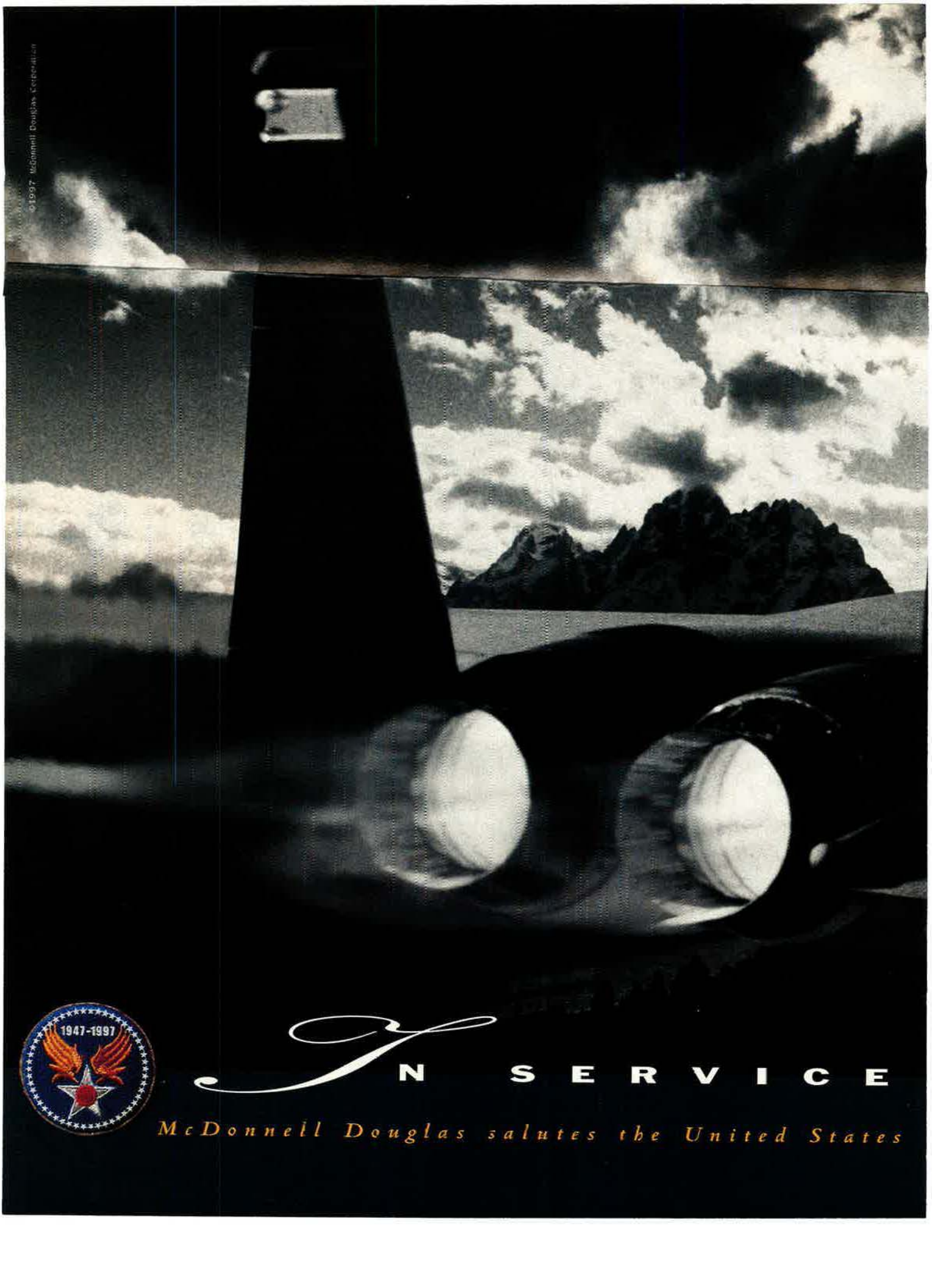
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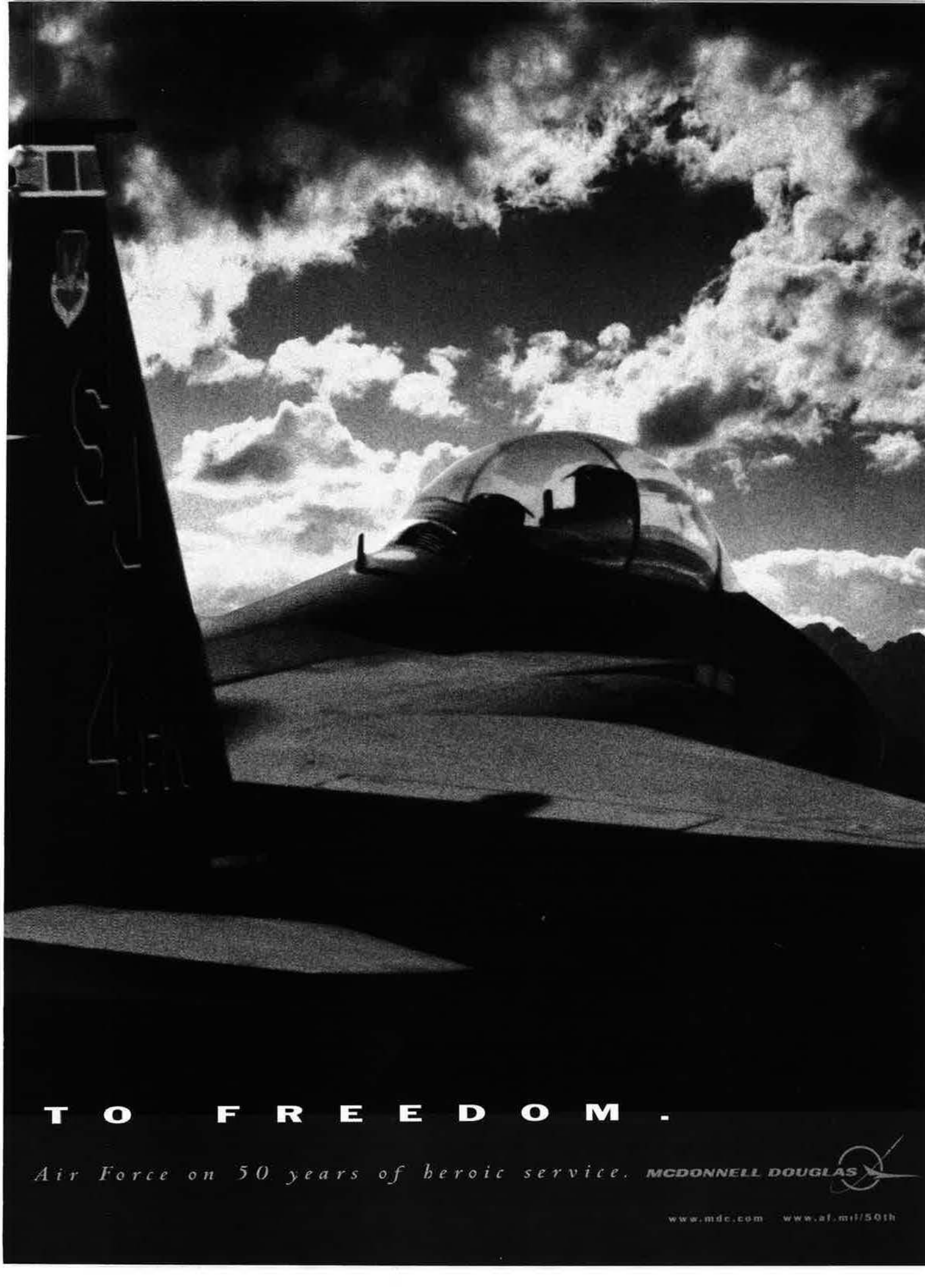
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Air Force on 50 years of heroic service.
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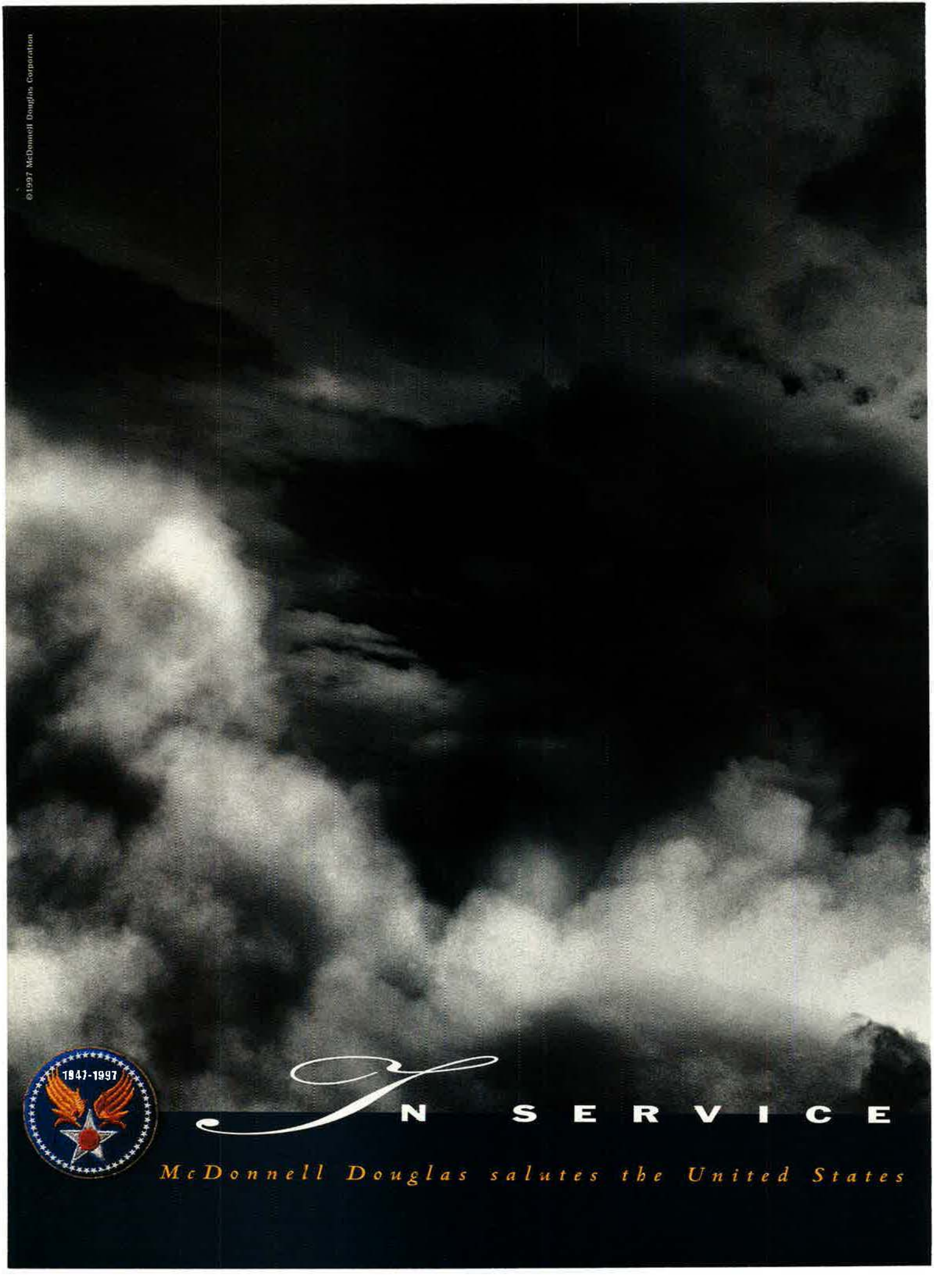

TO FREEDOM.

Air Force on 50 years of heroic service. **MCDONNELL DOUGLAS**

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USAF Almanac

Air Reserve Component

The Air Reserve Component comprises two elements, Air Force Reserve Command and the Air National Guard. Air Force Reserve Command stood up as a major command February 17, 1997. Formerly a field operating agency, AFRC became the ninth major command in the Air Force. The change in status, authorized by Congress in the Fiscal 1997 National Defense Authorization Act, is based on the experience gained from reserve component mobilization for Operations Desert Shield and Desert Storm. The Air National Guard remains an FOA.

AFRC Air Force Reserve Command

Headquarters Robins AFB, Ga.

Established February 17, 1997

Commander Maj. Gen. Robert A. McIntosh

MISSION, PURPOSE, OPERATIONS

Support the active-duty force
Serve in such missions as fighter, bomber, airlift, aerial refueling, rescue, special operations, aeromedical evacuation, aerial firefighting, weather reconnaissance, space operations, and airborne air control
Provide support and disaster relief in the US
Support national counterdrug efforts

FORCE STRUCTURE

Three numbered air forces: **4th,** McClellan AFB, Calif.; **10th,** NAS Fort Worth JRB, Carswell Field, Tex.; **22d,** Dobbins ARB, Ga.
35 flying wings
117 groups
397 squadrons
106 flights
1 air refueling group
1 air control group
3 regional support groups at NAF locations

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
C-5A/B airlifters	28
C-141B airlifters	40
C-130E/H airlifters	104
KC-135E/R tankers	63
HC-130N/P aircraft	6
HH-60G rescue helicopters	21
WC-130H weather planes	10
MC-130E special operations	12
Total primary aircraft authorized	**397**

OPERATIONAL ACTIVITY

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

NOTES

The AFRC commander also serves as chief of Air Force Reserve, Washington, D. C. 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-3B aircraft daily under the associate program.

Photo by Ted Carlson

The air mobility wing concept is embodied above by a 452d AMW KC-135 refueling a 452d AMW C-141. The Reserve has long been responsible for a significant portion of USAF's airlift and air refueling missions. In 1994, the Reserve got the call to take up the bombing mission as well, when the 93d Bomb Squadron stood up at Barksdale AFB, La., with B-52s. The 78,000 men and women of the Air Force's newest major command enable USAF to make the Total Force policy work.

Air Force Reserve Command Flying Wings and Assigned Units

Wing Hq.	Squadron	Aircraft	Location
4th Air Force (AMC) • Hq. McClellan AFB, Calif. • Brig. Gen. (Maj. Gen. selectee) Wallace W. Whaley, Commander			
931st Air Refueling Group	18th Air Refueling Squadron	KC-135R	McConnell AFB, Kan.
349th Air Mobility Wing	301st Airlift Squadron	C-5A/B	Travis AFB, Calif.
	312th Airlift Squadron	C-5A/B	Travis AFB, Calif.
	79th Air Refueling Squadron	KC-10A	Travis AFB, Calif.
	710th Airlift Squadron	C-141B	Travis AFB, Calif.
	70th Air Refueling Squadron	KC-10A	Travis AFB, Calif.
433d Airlift Wing	68th Airlift Squadron	C-5A	Kelly AFB, Tex.
434th Air Refueling Wing	72d Air Refueling Squadron	KC-135R	Grissom ARB, Ind.[1]
	74th Air Refueling Squadron	KC-135R	Grissom ARB, Ind.[1]
445th Airlift Wing	356th Airlift Squadron	C-141B	Wright-Patterson AFB, Ohio
	89th Airlift Squadron	C-141B	Wright-Patterson AFB, Ohio
446th Airlift Wing	97th Airlift Squadron	C-141B	McChord AFB, Wash.
	313th Airlift Squadron	C-141B	McChord AFB, Wash.
	728th Airlift Squadron	C-141B	McChord AFB, Wash.
452d Air Mobility Wing	336th Air Refueling Squadron	KC-135E	March ARB, Calif.
	729th Airlift Squadron	C-141B	March ARB, Calif.
	730th Airlift Squadron	C-141B	March ARB, Calif.
507th Wing	465th Air Refueling Squadron	KC-135R	Tinker AFB, Okla.
	970th Airborne Air Control Squadron	E-3B/C	Tinker AFB, Okla.
916th Air Refueling Wing	77th Air Refueling Squadron	KC-135R	Seymour Johnson AFB, N. C.
927th Air Refueling Wing	63d Air Refueling Squadron	KC-135E	Selfridge ANGB, Mich.
932d Airlift Wing	73d Airlift Squadron	C-9A	Scott AFB, Ill.
940th Air Refueling Wing	314th Air Refueling Squadron	KC-135E	McClellan AFB, Calif.
10th Air Force (ACC) • Hq. NAS Fort Worth JRB, Carswell Field, Tex. • Maj. Gen. David R. Smith, Commander			
301st Fighter Wing	457th Fighter Squadron	F-16C	NAS Fort Worth JRB, Carswell Field, Tex.[2]
419th Fighter Wing	466th Fighter Squadron	F-16C/D	Hill AFB, Utah
442d Fighter Wing	303d Fighter Squadron	A/OA-10A	Whiteman AFB, Mo.
482d Fighter Wing	93d Fighter Squadron	F-16A/B	Homestead ARS, Fla.[1]
917th Wing	47th Fighter Squadron	A/OA-10A	Barksdale AFB, La.
	93d Bomb Squadron	B-52H	Barksdale AFB, La.
919th Special Operations Wing	711th Special Operations Squadron	MC-130E	Duke Field, Fla.
	5th Special Operations Squadron	MC-130P	Duke Field, Fla.
926th Fighter Wing	706th Fighter Squadron	F-16C/D	NAS JRB New Orleans, La.[2]
939th Rescue Wing	304th Rescue Squadron	HC-130P, HH-60G	Portland IAP, Ore.
	301st Rescue Squadron	HC-130N/P, HH-60G	Patrick AFB, Fla.
	305th Rescue Squadron	HH-60G	Davis-Monthan AFB, Ariz.
944th Fighter Wing	302d Fighter Squadron	F-16C/D	Luke AFB, Ariz.
22d Air Force (AMC) • Hq. Dobbins ARB, Ga. • Brig. Gen. Michael R. Lee, Commander			
94th Airlift Wing	700th Airlift Squadron	C-130H	Dobbins ARB, Ga.[1]
302d Airlift Wing	731st Airlift Squadron	C-130H	Peterson AFB, Colo.
315th Airlift Wing	300th Airlift Squadron	C-17A	Charleston AFB, S. C.
	701st Airlift Squadron	C-141B	Charleston AFB, S. C.
	707th Airlift Squadron	C-141B	Charleston AFB, S. C.
	317th Airlift Squadron	C-17A	Charleston AFB, S. C.
403d Wing	815th Airlift Squadron	C-130E	Keesler AFB, Miss.
	53d Weather Reconnaissance Squadron	WC-130H	Keesler AFB, Miss.
439th Airlift Wing	337th Airlift Squadron	C-5A	Westover ARB, Mass.[1]
440th Airlift Wing	95th Airlift Squadron	C-130H	General Mitchell IAP/ARS, Wis.[1]
459th Airlift Wing	756th Airlift Squadron	C-141B	Andrews AFB, Md.
512th Airlift Wing	326th Airlift Squadron	C-5A/B	Dover AFB, Del.
	709th Airlift Squadron	C-5A/B	Dover AFB, Del.
514th Air Mobility Wing	702d Airlift Squadron	C-141B	McGuire AFB, N. J.
	732d Airlift Squadron	C-141B	McGuire AFB, N. J.
	76th Air Refueling Squadron	KC-10A	McGuire AFB, N. J.
	78th Air Refueling Squadron	KC-10A	McGuire AFB, N. J.
908th Airlift Wing	357th Airlift Squadron	C-130H	Maxwell AFB, Ala.
910th Airlift Wing	757th Airlift Squadron	C-130H	Youngstown-Warren Regional Airport/ARS, Ohio[1]
	773d Airlift Squadron	C-130H	Youngstown-Warren Regional Airport/ARS, Ohio[1]
911th Airlift Wing	758th Airlift Squadron	C-130H	Pittsburgh IAP/ARS, Pa.[1]
913th Airlift Wing	327th Airlift Squadron	C-130E	Willow Grove ARS, Pa.[1]
914th Airlift Wing	328th Airlift Squadron	C-130H	Niagara Falls IAP/ARS, N. Y.[1]
934th Airlift Wing	96th Airlift Squadron	C-130E	Minneapolis–St. Paul IAP/ARS, Minn.[1]

[1] AFRC installation

[2] Tenant unit on naval base

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

Air National Guard

Headquarters ..... Washington, D. C.

Established ..... September 18, 1947

Director ..... Maj. Gen. Donald W. Shepperd

MISSION, PURPOSE, OPERATIONS

Provide trained units and individuals in support of national military objectives, as a full partner in the Total Air Force

Support state governors by providing equipment and trained individuals to help preserve peace, order, and public safety

FORCE STRUCTURE

Flying units: 88 wings

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	13,326
Enlisted	97,145
Civilians	1,698
Total	**112,169**

OPERATIONAL ACTIVITY

Joint Endeavor/Decisive Edge, Deny Flight, and Provide Promise (Bosnia-Hercegovina), Provide Comfort (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 Lans Stoul

Members of the ANG regularly train with their active-duty counterparts and achieve impressive results in such meets as Gunsmoke and William Tell. Above (from left), 1st Lt. Brad Derrig, Maj. Marsh Kjelvik, 1st Lt. Jon Wutzke, and Maj. Bob Becklund of the 119th Fighter Wing prepare to defend the William Tell title in 1996 (they finished fifth). ANG units also deploy to Europe and the Pacific. At right is a 103d FW A-10 at Aviano AB, Italy.

Staff photo by Guy Aceto

The Air National Guard by Major Command Assignment

(As of April 1, 1997)

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 MAP, 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, Tex.[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.
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	Allen C. Thompson Field, Miss.

KC-135 tanker

101st Air Refueling Wing	Bangor IAP, Me.
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, Tex.
150th Fighter Wing	Kirtland AFB, N. M.
156th Fighter Wing	Puerto Rico IAP, Puerto Rico
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 Gateway Airport, 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, Tex.
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

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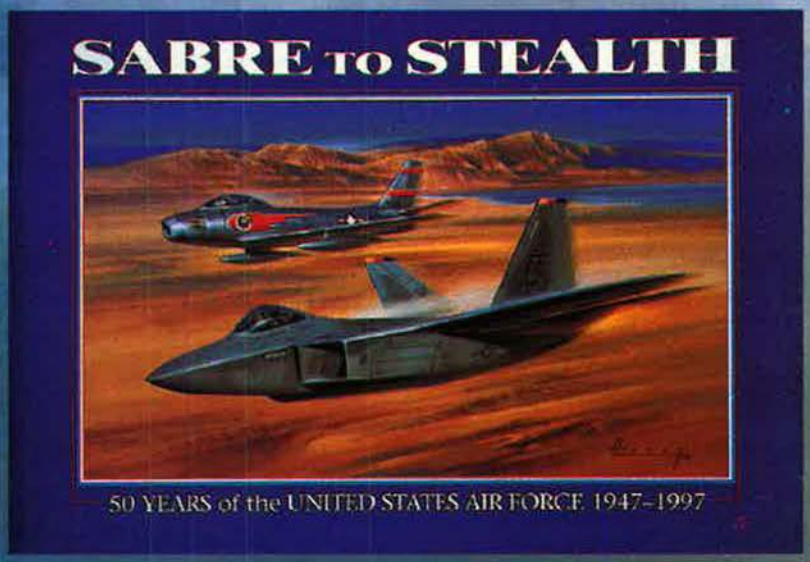

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USAF Almanac

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 Audit Agency

Headquarters ..... Washington, D. C.
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

Acquisition and Logistics Audits Directorate, Wright-Patterson AFB, Ohio
Financial and Support Audits Directorate, March ARB, Calif.
Field Activities Directorate, Arlington, Va.
Three regional offices
48 field offices

PERSONNEL

Active-duty	5
Officers	2
Enlisted	3
Reserve component	0
Civilians	885
Total	**890**

NOTE

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

Air Force Base Conversion Agency

Headquarters ..... Arlington, Va.
Established ..... November 15, 1991
Director ..... Albert F. Lowas, Jr. (acting)

MISSION, PURPOSE, OPERATIONS

Execute environmental programs and real and personal property disposal for Air Force bases being closed or realigned under the authorities of the Base Closure and Realignment Act of 1988 and the Defense Base Closure and Realignment Act of 1990
Assist communities in the conversion of closing and realigning bases from military to civilian use and ensure that property at these Air Force installations is made available for reuse as quickly and efficiently as possible

STRUCTURE

Office of the Director
Base operating locations

PERSONNEL

Active-duty	0
Reserve component	0
Civilians	366
Total	**366**

Air Force Center for Environmental Excellence

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

MISSION, PURPOSE, OPERATIONS

Provide Air Force commanders worldwide with services in environmental remediation, compliance, planning, and pollution prevention, including independent testing and application of environmental-restoration and pollution-prevention technologies

STRUCTURE

Air Force Design Group
Construction Management Directorate
Environmental Restoration Directorate
Environmental Conservation and Planning Directorate
Pollution Prevention Directorate
Three Regional Environmental Offices

PERSONNEL

Active-duty	52
Officers	50
Enlisted	2
Reserve component	13
ANG	0
AFRC	13
Civilians	387
Total	**452**

Air Force Center for Quality and Management Innovation

Headquarters ..... Randolph AFB, Tex.
Established ..... December 19, 1996
Commander ..... Brig. Gen. Hugh C. Cameron

MISSION, PURPOSE, OPERATIONS

Provide manpower/quality consultation to the Air Staff, Air Force functional communities, and major commands for systems optimization, improved resource utilization, and enhanced mission effectiveness
Research and develop innovative, future-focused manpower/quality concepts and best practices for distribution throughout 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-wide and industry manpower/quality issues
Develop and manage the USAF-level manpower/quality training architecture

STRUCTURE

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

PERSONNEL

Active-duty	126
Officers	58
Enlisted	68
Reserve component	0
Civilians	84
Total	**210**

Air Force Civil Engineer Support Agency

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

MISSION, PURPOSE, OPERATIONS

Provide 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

PERSONNEL

Active-duty	104
Officers	26
Enlisted	78
Reserve component	2
ANG	1
AFRC	1
Civilians	112
Total	**218**

Air Force Communications Agency

Headquarters ..... Scott AFB, Ill.
Established ..... May 28, 1993
Commander ..... Col. Patrick M. Ryan

MISSION, PURPOSE, OPERATIONS

Lead Air Force implementation of Defense Information Infrastructure initiatives
Develop and validate command, control, communications, and computers (C^4) architectures, technical standards, technical reference codes, policies, processes and procedures, and technical solutions
Develop and validate technology insertion policies, procedures, and solutions
Ensure integration and interoperability among Air Force C^4 systems through implementation of the Air Force Horizon concept
Ensure that Air Force C^4 policies, procedures, and applications take full advantage of C^4 capabilities to meet information-superiority and information-protection requirements
Implement tasks and duties of the Air Force Chief Communications and Information Officer

STRUCTURE

Four headquarters functional areas: Plans and Analysis, Systems and Procedures, Interoperability and Technology, and Resources
C^4 Technology Validation Office, Barksdale AFB, La.

PERSONNEL

Active-duty	292
Officers	143
Enlisted	149
Reserve component	0
Civilians	309
Total	**601**

Air Force Cost Analysis Agency

Headquarters ..... Arlington, Va.
Established ..... August 1, 1992
Commander ..... Lt. Col. (Col. selectee) 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 (AIS) Division
Command, Control, and Communications (C^3) Division
Missiles and Munitions Division
Space Systems Division
Technical Support Division
Operations Division

PERSONNEL

Active-duty	28
Officers	28
Enlisted	0
Reserve component	0
Civilians	19
Total	**47**

Air Force Flight Standards Agency

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

MISSION, PURPOSE, OPERATIONS

Develop, standardize, evaluate, and certify Air Force policy, procedures, and equipment for global flight operations and centrally manage the Air Force Air Traffic Control and Landing Systems (ATCALS)
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 the Department of Defense on issues of international airspace and air traffic control
Provide flight standards and aeronautical services to develop USAF instrument requirements and training
Certify procedures and directives for current and emerging cockpit display technologies and new navigation systems
Provide the Air Force with air traffic control and airfield procedures, functional management, operational evaluation of air traffic control systems, and airspace management procedures

Lead ATCALS planning and programming, sustainment, and coordination with FAA and military services

STRUCTURE
USAF Representative to FAA, Hq. FAA, Washington, D. C.
Flight Inspection Center, Oklahoma City, Okla.
Airfield Operations Directorate, Andrews AFB, Md.
Operations Directorate, Andrews AFB, Md.
Resources and Requirements Directorate, Andrews AFB, Md.
International Programs and Airspace Directorate, Andrews AFB, Md.

PERSONNEL
Active-duty	143
Officers	76
Enlisted	67
Reserve component	4
ANG	0
AFRC	4
Civilians	29
Total	**176**

EQUIPMENT
Two C-21 Learjets

Air Force Frequency Management Agency

Headquarters ..... Arlington, Va.
Established ..... October 1, 1991
Commander ..... Col. Kimberly J. Dalrymple

MISSION, PURPOSE, OPERATIONS
Develop USAF policy and procedures for radio frequency spectrum management in support of air and space combat operations
Represent USAF requirements and capabilities to regulatory agencies at national and international levels
Direct frequency assignments in support of global air and space operations and contingencies

STRUCTURE
Plans Division
Systems Engineering Division
Technical Services Division

PERSONNEL
Active-duty	9
Officers	4
Enlisted	5
Reserve component	0
Civilians	29
Total	**38**

Air Force Historical Research Agency

Headquarters ..... Maxwell AFB, Ala.
Established ..... September 12, 1949
Commander ..... Col. Richard S. Rauschkolb

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 component	20
ANG	0
AFRC	20
Civilians	42
Total	**71**

Air Force History Support Office

Headquarters ..... Washington, D. C.
Established ..... September 30, 1994
Commander ..... Herman S. Wolk (acting)

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
Publish books to help the Air Force formulate strategy, plans, and doctrine to conduct its 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	7
Officers	4
Enlisted	3
Reserve component	2
ANG	0
AFRC	2
Civilians	27
Total	**36**

NOTE
AFHSO was formerly the Center for Air Force History.

Air Force Inspection Agency

Headquarters ..... Kirtland AFB, N. M.
Established ..... August 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 Inspection Directorate
Management Inspection Directorate
Medical Inspection Directorate

PERSONNEL

Active-duty	111
Officers	85
Enlisted	26
Reserve component	0
Civilians	23
Total	**134**

Air Force Legal Services Agency

Headquarters Bolling AFB, D. C.
Established September 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 component	87
ANG	0
AFRC	87
Civilians	124
Total	**608**

Air Force Logistics Management Agency

Headquarters Maxwell AFB, Gunter Annex, Ala.
Established September 30, 1975
Commander Col. Clarence T. Lowry

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	62
Officers	47
Enlisted	15
Reserve component	0
Civilians	18
Total	**80**

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

PERSONNEL

Active-duty	51
Officers	44
Enlisted	7
Reserve component	3
ANG	0
AFRC	3
Civilians	32
Total	**86**

Air Force Medical Support Agency

Headquarters Brooks AFB, Tex.
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

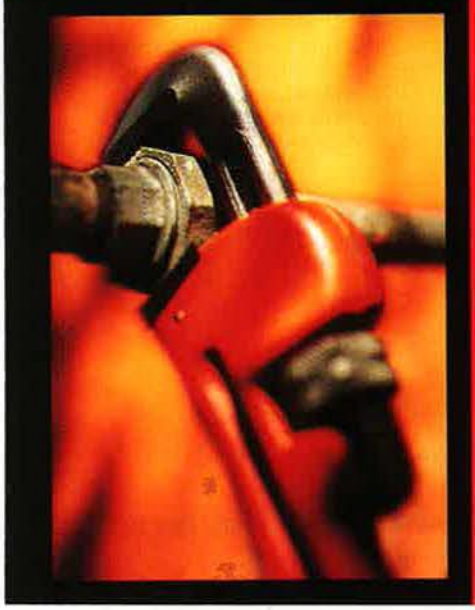
STRUCTURE

Directorate of Medical Support
- Health Facilities Division
- Medical Information Systems Division
- Medical Logistics Division
- Triservice Infrastructure Management Program Office (TIMPO)

PERSONNEL

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

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



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Air Force News Agency

Headquarters ..... Kelly AFB, Tex.
Established ..... June 1, 1978
Commander ..... Col. Joseph S. Panvini

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	348
Officers	23
Enlisted	325
Reserve component	35
ANG	0
AFRC	35
Civilians	115
Total	**498**

Air Force Office of Special Investigations

Headquarters ..... Bolling AFB, D. C.
Established ..... August 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
160 detachments and operating locations

PERSONNEL

Active-duty	1,538
Officers	465
Enlisted	1,073
Reserve component	397
ANG	0
AFRC	397
Civilians	460
Total	**2,395**

Air Force Operations Group

Headquarters ..... Washington, D. C.
Established ..... July 26, 1977
Commander ..... Col. Terry L. Simpson

MISSION, PURPOSE, OPERATIONS

Support the Air Force Chief of Staff and deputy chief of staff for Operations
Maintain a 24-hour watch on all current operations
Handle emergency actions through the Air Force Operations Center
Provide facilities, policy, procedures, and staff for the Hq. USAF Crisis Action Team during crises, contingencies, and exercises
Develop policy and monitor USAF readiness and resource allocation worldwide
Coordinate actions among USAF major commands, other field operating agencies, and direct reporting units in response to taskings from the Joint Chiefs of Staff National Military Command Center (NMCC)
Provide Air Force Chief of Staff with daily status of current Air Force operations worldwide
Assist in providing military support to civilian authorities
Prepare and provide weather data to the President, Secretary of Defense, Joint Chiefs of Staff, NMCC, Army Operations Center, and other federal agencies
Maintain the USAF portion of the Global Command and Control System (GCCS), the Air Force's Status of Resources and Training System database (SORTS), the worldwide exercise scheduling database, and the Joint Uniform Lessons Learned database

FORCE STRUCTURE

AFOG is supported by 10 Air Staff functional areas: Operations, Plans, Logistics, Manpower and Personnel, Intelligence, Civil Engineering, Security Police, Information Systems Management, Medical Readiness Division, and Chaplain Response Forces. AFOG is also supported by Air Force Reserve Command and Air National Guard.

PERSONNEL

Active-duty	225
Officers	148
Enlisted	77
Reserve component	0
Civilians	15
Total	**240**

Air Force Pentagon Communications Agency

Headquarters ..... Washington, D. C.
Established ..... October 1, 1984
Commander ..... Col. Richard H. Hange, Jr.

MISSION, PURPOSE, OPERATIONS

Work closely with the single agency manager for Pentagon Information Technology to provide command, control, communications, and computer (C^4) systems and services for the Office of the Secretary of Defense (OSD), the Joint Chiefs of Staff, the National Military Command Center (NMCC), the Secretary of the Air Force, Hq. USAF, and other command centers in Washington, D. C., as directed by Hq. USAF
Develop management information systems for OSD and Hq. USAF to prepare and submit the President's budget and create decision support tools for senior DoD officials to evaluate events worldwide and respond to crises
Serve as executive agent for the NMCC
Maintain five red (secure) communications switches and three black (nonsecure) switches, including the Washington Tactical Switch, 8,000 telephones, and 2,500 leased circuits
Handle 3,000 specialized secure telephone units, NMCC and Air Force Operations Group networks, and an extensive pager and cellular telephone network

STRUCTURE

Architecture and Engineering Directorate
Security Directorate
Air Staff Systems Directorate
OSD Systems Directorate
Logistics and Acquisitions Directorate
Mission Support Directorate
Operations Directorate
Resource Management Directorate
Services Directorate
Programs and Requirements Directorate

PERSONNEL

Active-duty	624
Officers	182
Enlisted	442
Reserve component	0
Civilians	340
Total	**964**

NOTE
AFPCA was formerly the 7th Communications Group.

Air Force Personnel Center

Headquarters ..... Randolph AFB, Tex.
Established ..... October 1, 1995
Commander ..... Brig. Gen. (Maj. Gen. selectee) 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	868
Officers	267
Enlisted	601
Reserve component	14
ANG	2
AFRC	12
Civilians	823
Total	**1,705**

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

Air Force Personnel Operations Agency

Headquarters ..... Washington, D. C.
Established ..... August 15, 1993
Director ..... Susan O'Neal

MISSION, PURPOSE, OPERATIONS
Execute personnel programs and portions of programs located in the Washington, D. C., area
Develop and operate officer, enlisted, and civilian models and databases for management information
Execute the Air Force Employee Development program and training budgets
Manage the Air Force Relocation, Employee, and Labor Relations programs

STRUCTURE
Analysis Division
Personnel Management Division
Systems Support Division
Work Force Appeals and Relations Division

PERSONNEL

Active-duty	37
Officers	21
Enlisted	16
Reserve component	0
Civilians	26
Total	**63**

Air Force Program Executive Office

Headquarters ..... Washington, D. C.
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. Berwyn A. Reiter, Command, Control, and Communications
Harry E. Schulte, Weapons
Brent R. Collins, Space Programs
Oscar Goldfarb, Joint Logistics Systems
Brig. Gen. Richard V. Reynolds, Airlift and Trainers
Maj. Gen. Robert F. Raggio, Fighter and Bomber Programs
Rear Adm. Craig E. Steidle, Joint Strike Fighter

PERSONNEL **49**

Air Force Real Estate Agency

Headquarters ..... Bolling AFB, D. C.
Established ..... August 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 component	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 component	3
ANG	1
AFRC	2
Civilians	37
Total	**49**

Air Force Safety Center

Headquarters ..... Kirtland AFB, N. M.
Established ..... January 1, 1996
Director ..... Brig. Gen. Orin L. Godsey

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 USAF aircraft mishap investigation, chief of safety, and flight safety officer courses
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	75
Officers	58
Enlisted	17
Reserve component	3
ANG	0
AFRC	3
Civilians	60
Total	**138**

NOTES

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

Air Force Security Police Agency

Headquarters ..... Kirtland AFB, N. M.
Established ..... February 1991
Commander ..... Col. Lawrence R. Mayes

MISSION, PURPOSE, OPERATIONS

Provide expertise for the security of nuclear weapons and weapon systems
Prepare guidance on air base defense operations and continuation training and guidance for law enforcement, resources protection, and antiterrorism USAF-wide
Develop and implement base-level training and combat arms training and maintenance programs
Assist in planning, allocating, and evaluating Security Police resources, equipment, and future technology requirements
Develop and maintain tables of allowance identifying Security Police equipment requirements
Manage USAF corrections activities and DoD military working dog taskings

STRUCTURE

Corrections Division
Plans and Programs Division
Operations Division

PERSONNEL

Active-duty	115
Officers	24
Enlisted	91
Reserve component	10
ANG	0
AFRC	10
Civilians	17
Total	**142**

FACILITIES

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

NOTE

AFSPA became part of Air Force Security Forces Center, a new DRU, March 17, 1997.

Air Force Services Agency

Headquarters ..... San Antonio, Tex.
Established ..... February 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	60
Officers	17
Enlisted	43
Reserve component	6
ANG	0
AFRC	6
Civilians	348
Total	**414**

Air Force Studies and Analyses Agency

Headquarters ..... Washington, D. C.
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
Assist the Air Staff in preparing responses to Congressional inquiries and requests for testimony
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 Application Division
Force Enhancement Division
Resource Management Division
Capabilities Assessment Division

PERSONNEL

Active-duty	106
Officers	89
Enlisted	17
Reserve component	2
ANG	0
AFRC	2
Civilians	26
Total	**134**

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 spacebased 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

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	882
Officers	190
Enlisted	692
Reserve component	0
Civilians	132
Total	**1,014**

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
Airborne and groundbased equipment to collect nuclear event debris
Atmospheric sampling equipment for TC-135 and U-2 aircraft
Military and civilian laboratories that perform low-level radioactive sample analysis

Air Intelligence Agency

Headquarters ..... Kelly AFB, Tex.
Established ..... October 1, 1993
Commander ..... Maj. Gen. Michael V. Hayden

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, Tex.
National Air Intelligence Center, Wright-Patterson AFB, Ohio
67th Intelligence Wing, Kelly AFB, Tex.
26th Intelligence Group, Vogelweh, Germany
67th Intelligence Group, Kelly AFB, Tex.
497th Intelligence Group, Bolling AFB, D. C.
480th Intelligence Group, Langley AFB, Va.
544th Intelligence Group, Peterson AFB, Colo.
692d Intelligence Group, Hickam AFB, Hawaii
694th Intelligence Group, Fort Meade, Md.
Intelligence Systems Group, Kelly AFB, Tex.

PERSONNEL

Active-duty	11,792
Officers	1,735
Enlisted	10,057
Reserve component	1,959
ANG	187
AFRC	1,772
Civilians	2,378
Total	**16,129**

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. General Hayden also serves as director of the Joint Command and Control Warfare Center.

Air Reserve Personnel Center

Headquarters ..... Denver, Colo.
Established ..... November 1, 1953
Commander ..... Col. Frank P. Cyr, Jr.

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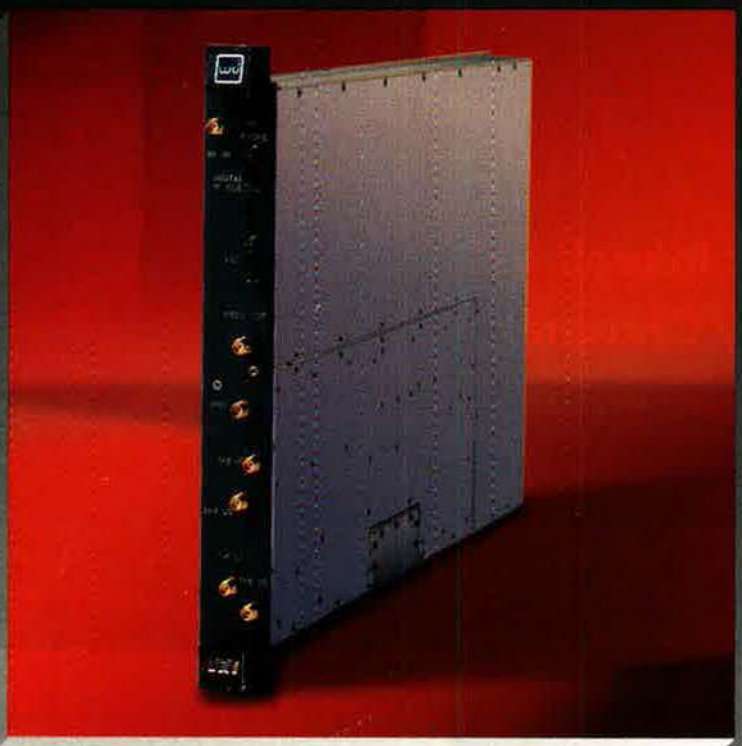

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MISSION, PURPOSE, OPERATIONS

Provide personnel services and administrative support to ANG and AFRC members, including assignments, promotions, discharges, retirements, and Presidentially activated mobilizations

STRUCTURE

Chaplain Individual Reserve Programs Directorate
Health Services Individual Reserve Programs Directorate
Individual Reserve Programs Directorate
Communications and Information Directorate
Personnel Directorate
Personnel Records Management and Services Directorate
Plans Directorate
Public Affairs Directorate
Resource Management and Support Services Directorate
Staff Judge Advocate

PERSONNEL

Active-duty	111
Officers	16
Enlisted	95
Reserve component	34
ANG	1
AFRC	33
Civilians	472
Total	**617**

Air Weather Service

Headquarters ..... Scott AFB, Ill.
Established ..... July 1, 1937
Commander ..... Col. Joseph D. Dushan

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

PERSONNEL

Active-duty	869
Officers	213
Enlisted	656
Reserve component	8
ANG	0
AFRC	8
Civilians	249
Total	**1,126**

Combat Rescue Agency

Headquarters ..... Langley AFB, Va.
Established ..... November 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 (CSAR) 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 component	1
ANG	0
AFRC	1
Civilians	0
Total	**13**

Joint Services Survival, Evasion, Resistance, and Escape (SERE) Agency

Headquarters ..... Fort Belvoir, Va.
Established ..... November 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
Training Division
Three operating locations

PERSONNEL

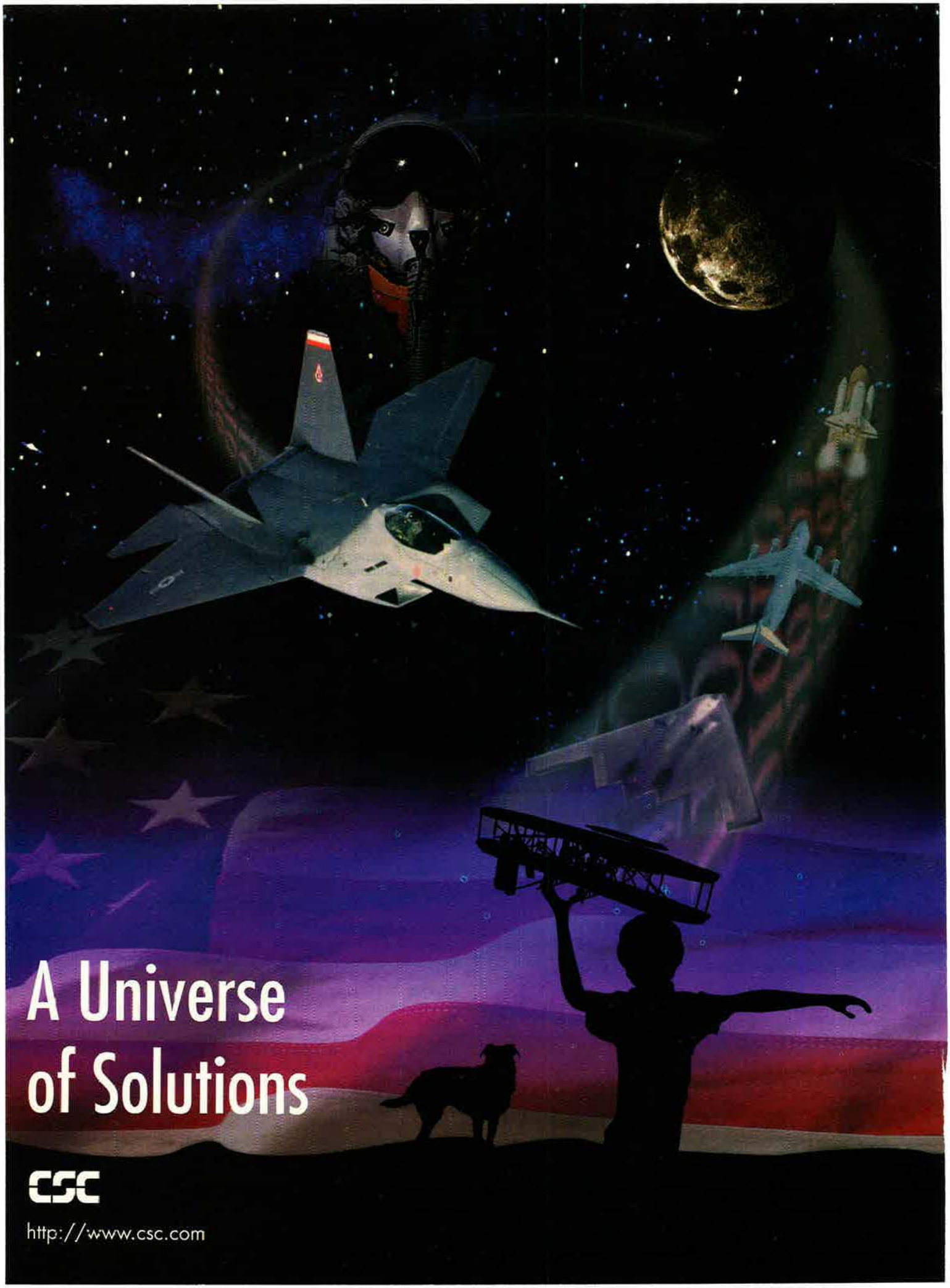
Active-duty	35
Officers	9
Enlisted	26
Reserve component	7
ANG	0
AFRC	7
Civilians	63
Total	**105**

FACILITIES

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

NOTES

In 1996, the Joint Services SERE Agency provided assistance to operational units in South Korea, Bosnia-Hercegovina, Europe, southwest Asia, and Latin 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 lessons learned from the recovery and repatriation processing of Capt. Scott F. O'Grady in 1995 and three US military attachés detained in China, in which JSSA had an important role. JSSA helped develop a future Combat Survivor/Evader Locator (CSEL) 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.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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 ..... Arlington, Va.

Established ..... April 1, 1997

Commander ..... Lt. Gen. William J. Donahue

MISSION, PURPOSE, OPERATIONS

Apply information technology to improve operations processes
Manage all Air Force information technology systems

STRUCTURE

Air Force Pentagon Communications Agency, Washington, D. C.
Air Force Communications Agency, Scott AFB, Ill.
Air Force Frequency Management Agency, Arlington, Va.

PERSONNEL

Active-duty	64
Officers	50
Enlisted	14
Reserve component	1
ANG	0
AFRC	1
Civilians	55
Total	**120**

Air Force Doctrine Center

Headquarters ..... Maxwell AFB, Ala.

Established ..... July 21, 1993

Commander ..... Brig. Gen. (Maj. Gen. selectee) Ronald E. Keys

MISSION, PURPOSE, OPERATIONS

Develop and publish basic and operational-level doctrine for the Air Force
Provide Air Force input into joint and multinational doctrine development
Ensure that Air Force doctrine is consistent with policy and joint doctrine
Serve as the Coordinating Review Authority for joint doctrine and for joint tactics, techniques, and procedures for which USAF is not the lead agent
Prepare and present coordinated Air Force comments on joint doctrine as well as joint tactics, techniques, and procedures and their development
Serve as the Air Force's primary source of expertise for Military Operations Other Than War doctrine and strategy development as well as training, education, exercises, and simulations

STRUCTURE

Det. 1, Langley AFB, Va.
OL-A, Fort Bliss, Tex.
OL-B, Fort Knox, Ky.
OL-C, Fort Sill, Okla.
OL-D, Fort Benning, Ga.
OL-E, Fort Rucker, Ala.
OL-F, Fort Leavenworth, Kan.
OL-G, Washington, D. C.

PERSONNEL

Active-duty	55
Officers	48
Enlisted	7
Reserve component	0
Civilians	4
Total	**59**

Air Force Operational Test and Evaluation Center

Headquarters ..... Kirtland AFB, N. M.

Established ..... January 1, 1974

Commander ..... Maj. Gen. George B. Harrison

MISSION, PURPOSE, OPERATIONS

Plan and conduct realistic, objective, and impartial operational tests and evaluations to determine the operational effectiveness and suitability of Air Force systems and their capacity to meet mission needs

STRUCTURE

Det. 2, Eglin AFB, Fla.
Det. 4, Peterson AFB, Colo.
Det. 5, Edwards AFB, Calif.

PERSONNEL

Active-duty	564
Officers	397
Enlisted	167
Reserve component	0

Civilians 166
Total **730**

NOTE
The center is conducting tests that involve the B-2 stealth bomber, the C-17 transport, 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 ..... Kirtland AFB, N. M.

Established ..... March 17, 1997

Commander ..... Brig. Gen. Richard A. Coleman, Jr.

MISSION, PURPOSE, OPERATIONS
Ensure quick and effective responses to protect US personnel around the world
Align the Air Force Security Police Agency, Security Forces Battle Lab, and 820th Security Forces Group

STRUCTURE
820th Security Forces Group, Lackland AFB, Tex.
Security Forces Battle Lab, Lackland AFB, Tex.

PERSONNEL
Active-duty 115
Officers 24
Enlisted 91
Reserve component 10
ANG 0
AFRC 10
Civilians 17
Total **142**

NOTE
AFSFC is scheduled to move to Lackland AFB, Tex., in October 1997.

US Air Force Academy

Headquarters ..... Colorado Springs, Colo.

Established ..... April 1, 1954

Superintendent ..... Lt. Gen. Paul E. Stein

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 2,121
Officers 1,032
Enlisted 1,089
Reserve component 0
Cadets 4,029
Civilians 2,005
Total **8,155**

EQUIPMENT
94 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

NOTE
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

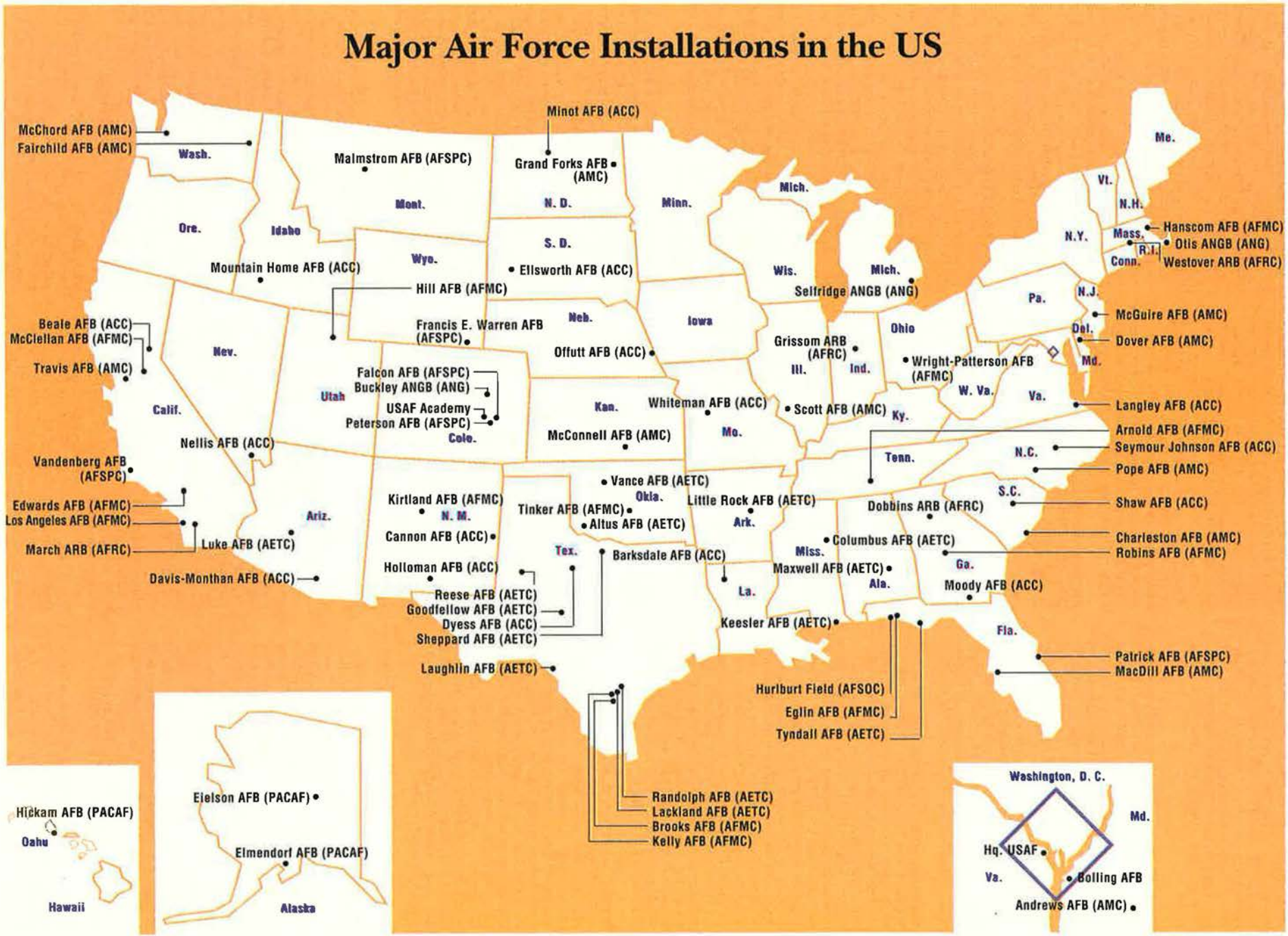
Commander ..... Col. Peter U. Sutton

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 1,576
Officers 176
Enlisted 1,400
Reserve component 0
Civilians 821
Total **2,397**

Major Air Force Installations in the US



Wing. Tenant units: 76th Space Operations Sqdn.; Ballistic Missile Defense Organization National Test Facility; Space Warfare Center. Base activated in Oct. 1985. Area 3,840 acres. No runway. Altitude 6,267 ft. Military active-duty 2,365; civilians 435; contractors 2,000. No housing or transient quarters. Medical aid station and dental clinic.

Francis E. Warren AFB, Wyo. 82005-5000; adjacent to Cheyenne. Phone (307) 775-1110; DSN 481-1110. AFSPC base. Hq. 20th Air Force. Host unit: 90th Missile Wing, 50 Peacekeeper and 150 Minuteman III missiles, UH-1 helicopters; 37th Air Rescue Flight. Base activated as Fort D. A. Russell July 4, 1867; under Army jurisdiction until 1947, when reassigned to USAF. Base 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 3,655; civilians 602. Payroll $130.7 million. Housing: 831 family units. 35-bed hospital. Air Force ICBM Museum.

Goodfellow AFB, Tex. 76908-5000; SE of San Angelo. Phone (915) 654-3217; DSN 477-3217. AETC base. The 17th Training Wing provides technical training for all Air Force members entering intelligence career fields; provides cryptologic training for all US military services, civilian intelligence agencies, and foreign military services; trains all US Air Force, Army, and Marine Corps personnel in fire protection and rescue and conducts Air Force special instruments training. Major units include Goodfellow NCO Academy; 344th Military Intelligence Battalion (US Army); Naval Technical Training Center Detachment; US Marine Corps Detachment. Base activated in Jan. 1941; named for Lt. John J. Goodfellow, Jr., WW I fighter pilot killed in combat Sept. 14, 1918. Area 1,136 acres. No runway. Altitude 1,877 ft. Military 1,519; civilians 748. Payroll $149 million. Housing: 299 NCO, 1,018 transient (876 VAQ, 113 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. 319th Air Refueling Wing (KC-135R); 321st Missile Gp. (AFSPC, Minuteman III, HH-1H), inactivates in Sept. 1998. Home of the first of AMC's core air refueling wings. Base activated in 1956; named after the 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 12,350 ft. Altitude 911 ft. Military 5,146; DoD civilians 501. Payroll $208.2 million. Housing: 332 officer, 1,886 enlisted, 1,000 dormitory, 137 transient. 15-bed hospital.

Gunter AFB, (see Maxwell AFB, Gunter Annex).

Hanscom AFB, Mass. 01731-5000; 17 mi. NW of Boston. Phone (617) 377-4441; DSN 478-5980. AFMC base. Hq. Electronic Systems Center (AFMC) manages development and acquisition of command-and-control systems; five divisions of Rome Laboratory's Directorate of Electromagnetics and Reliability; Geophysics Directorate of Phillips Laboratory (AFMC), center for research and exploratory development in the terrestrial, atmospheric, and space environments. Base has no flying mission; transient USAF aircraft use runways of Laurence G. Hanscom Field, state-operated airfield adjoining the base. Base named for Laurence G. Hanscom, a pre–WW II advocate of private aviation, killed in a lightplane accident in 1941. Area 846 acres. Runway length NA. Altitude 133 ft. Military 2,537; civilians 1,436. Payroll $153 million. Housing: 388 officer, 472 NCO, 35-unit 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. Hq. Pacific Air Forces. Host unit: 15th Air Base Wing, supporting Air Force units and installations in Hawaii and throughout the Pacific. Major tenant units include 154th Wing (ANG); 201st Combat Communications Gp.; 615th Air Mobility Support Gp. (AMC). Base activated in Sept. 1938; named for Lt. Col. Horace M. Hickam, aviation pioneer killed in crash Nov. 5, 1934, at Fort Crockett, Tex. 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 4,441; civilians 2,023. Payroll $275.1 million. Housing: 566 officer, 2,103 enlisted. Unaccompanied housing: 8 officer, 832 enlisted, 202 VOQ, 106 VAQ. Clinic.

Hill AFB, Utah 84056-5990; 25 mi. N. of Salt Lake City. Phone (801) 777-7221; DSN 777-1110. AFMC base. Hq. Ogden Air Logistics Center. Provides worldwide engineering and logistics management for the F-16, representing the world's largest fleet of fighter aircraft. Maintains the F-16 and C-130. Responsible for logistics management and maintenance for Minuteman and Peacekeeper intercontinental ballistic missiles. 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. Other units include 388th Fighter Wing (ACC); 419th Fighter Wing (AFRC); Defense Megacenter Ogden; Det. 1, 412th Test Wing (AFMC), which manages the 2,675 sq. mi. Utah Test and Training Range; Hill Aerospace Museum. Base groundbreaking in January 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 9,450. Payroll $482 million. Housing: 179 officer, 966 enlisted, 310 temporary (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. 49th Fighter Wing, F-117 operations (7th, 8th, and 9th Fighter Sqdns.); F-4F aircrew training (20th Fighter Sqdn. and 1st German Air Force Training Sqdn.); AT-38B aircrew training (435th Fighter Sqdn.); HH-60 helicopters (48th Rescue Sqdn.). Twelve German Tornado aircraft and 350 German personnel arrived in early 1996 and are permanently assigned to the wing. Associate units are the 46th Test Gp. (AFMC); 4th Space Surveillance Sqdn. (AFSPC); Det. 1, 82d Aerial Target Sqdn. (QF-106 drone operations). Base activated in 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 4,456; civilians 940. Payroll $171.8 million. Housing: 191 officer, 1,359 enlisted, 403 transient (145 VAQ, 208 VOQ, 50 TLF). 8-bed hospital.

Howard AFB, Panama, APO AA 34001-5000. DSN (313) 284-9805. ACC base. With headquarters at Howard, 24th Wing represents USAF in operations throughout Latin America. 24th Wing is an ACC unit reporting to 12th Air Force, Davis-Monthan AFB, Ariz. Major tenants: 640th Air Mobility Support Sqdn. (AMC). Established in 1928 as Bruja Point Military Reservation; later named for Maj. Charles Harold Howard. Military 2,267; civilians 400. Payroll $53.3 million. Housing: 238 officer, 933 enlisted, 680 transient (554 VAQ, 120 VOQ, 6 TLF).

Hurlburt Field, Fla. 32544-5000; 5 mi. W of Fort Walton Beach. Phone (904) 884-1110; DSN 579-1110. AFSOC base. Hq. Air Force Special Operations Command. Host unit: 16th Special Operations Wing, equipped with MC-130E Combat Talons, MC-130H Combat Talon IIs, AC-130H Spectre gunships, AC-130U Spooky gunships, MH-53J Pave Low helicopters, MH-60G Pave Hawk helicopters, MC-130P Combat Shadows (located at Eglin AFB), C-130Es, and UH-1H Huey helicopters. Major tenants include 505th Command and Control Evaluation Gp., including the Air Ground Operations School, USAF Battle Staff Training School; 720th Special Tactics Gp.; 23d Special Tactics Sqdn.; USAF Special Operations School; 18th Flight Test Sqdn.; 823d Civil Engineering Sqdn. RED HORSE; Det. 1, 335th Technical Training Sqdn.; USAF Combat Weather Center; 25th Intelligence Sqdn.; and Det. 309, AFOSI. Base activated in 1943; named for Lt. Donald W. Hurlburt, WW II 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 7,689; civilians 773. Payroll $251.6 million. Housing: 40 officer, 626 enlisted family units, 300 govt.-leased houses; 195 VOQ/VAQ, 24 TLF. Medical Group at Hurlburt, 125-bed hospital at Eglin AFB, 12 mi. away.

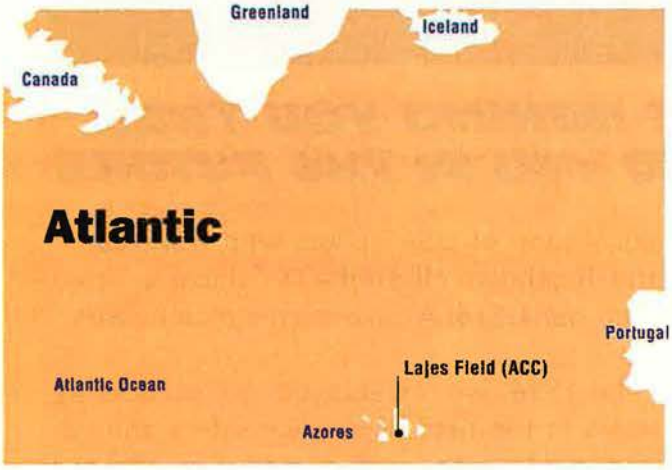
Incirlik AB, Turkey, APO AE 09824; 10 mi. E of Adana. Phone (commercial, from CONUS) 011-90-322-316-1110; DSN 676-1110. USAFE base. Host unit: 39th Wing, supports Operation Provide Comfort and rotational weapons training deployments for USAFE fighter aircraft. Combined Task Force assets include Turkish F-4Es and F-16s, French Jaguars and KC-135s, British Tornados and VC-10s, US Army C-12s and USAF UH-60As, F-16s, F-15s, E-3s, KC-135s, EF-111s, HC-130s, C-5s, and MH-60s. Also home for 628th Air Mobility Support Sqdn. (AMC), which provides a full aerial port operation. Base activated in May 1954; present unit began operations in Mar. 1966. Incirlik, in Turkish, means fig orchard. Area 3,400 acres. Runway 10,000 ft. Altitude 240 ft. Military 2,766 (including 357 geographically separated), OPC Tent City: 1,591 TDY personnel; civilians 2,572. Payroll $76 million. Housing: 950 units, 60 BOQ, 80 TLF, 592 VAQ, 259 VOQ, 628 dorm rooms. 30-bed regional hospital, expandable to 250 beds.

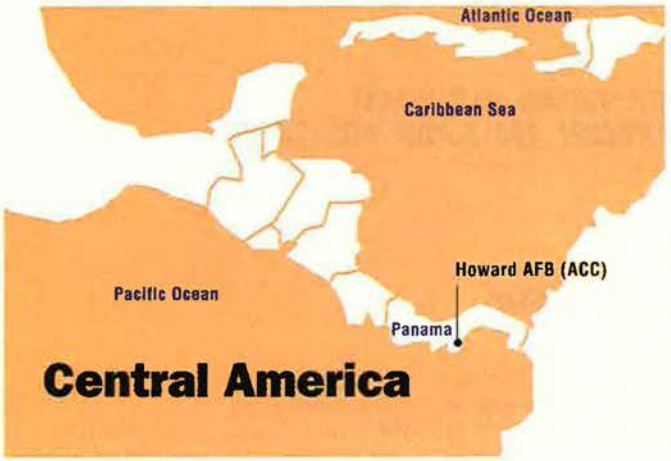
Kadena AB, Japan, APO AP 96368-5000; 15 mi. N of Naha, Okinawa, Japan. Phone (commercial, from CONUS) 011-81-98938-1111; DSN 630-1110. PACAF base. Host organization: 18th Wing (12th, 44th, and 67th Fighter Sqdns.), F-15C/D operations; 909th Air Refueling Sqdn., KC-135 operations; 961st Airborne Air Control Sqdn., E-3 operations; 33d Rescue Sqdn., HH-60 operations. Major associate units: Support Center Pacific (AFMC), 353d Special Operations Gp. (AFSOC), and Training Det. 911 (AETC). Base named for city of Kadena, Okinawa, Japan. Area 15,000 acres. Runway length 12,100 ft. Military 7,228; DoD civilians 446; local nationals 2,520. Payroll $146 million. Housing: 913 officer, 3,062 enlisted, 122 temporary lodging units. Unaccompanied housing: 139 officer/civilian, 2,473 enlisted, 276 VOQ, 276 VAQ. Clinic. US Naval Hospital at Camp Lester.

Keesler AFB, Miss. 39534-5000; located in Biloxi. Phone (601) 377-1110; DSN 597-1110. AETC base. Hq. 2d Air Force. 81st Training Wing (avionics, communications, electronics, radar systems, computer and command-and-control systems, weather, precision equipment, physician residencies, specialized nurse training, and medical technicians); 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 WW I aerial observer killed in action Oct. 9, 1918, near Verdun, France. Area 3,546 acres. Runway 5,600 ft. Altitude 26 ft. Military 9,048; civilians 4,100. Payroll $275 million. Housing: 287 officer, 1,664 NCO, 49 trailer spaces, 1,548 transient (408 VOQ, 1,140 VAQ). 250-bed hospital.

Kelly AFB, Tex. 78241-5000; 5 mi. SW of San Antonio. Phone (210) 925-1110; DSN 945-1110. AFMC base. Hq. San Antonio Air Logistics Center. Provides logistics management, procurement, and systems support for such Defense Depart-

Major Air Force Installations Overseas





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ment aircraft as the C-5A/B, C-17, T-37, and T-38 and for such foreign-operated aircraft as the OV-10, A-37, F-5, and C-47. As a specialized repair activity, San Antonio ALC modernizes and performs heavy depot maintenance on the entire fleet of C-5s. 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, and nuclear weapons. Other major units on base: Hq. Air Intelligence Agency; Air Force Information Warfare Center; Joint Command and Control Warfare Center; Hq. 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; Defense Information Systems Agency. Dating from Nov. 21, 1916, Kelly AFB 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 NCO. Clinic.

Kirtland AFB, N. M. 87117-5606; SE quadrant of Albuquerque. Phone (505) 846-0011; DSN 246-0011. AFMC base. Hq. 377th Air Base Wing. Major agencies and units include 58th Special Operations Wing (AETC); Air Force Operational Test and Evaluation Center; Phillips Laboratory; 150th Fighter Wing (ANG); Field Command's Defense Special Weapons Agency; Sandia National Laboratories; Department of Energy's Albuquerque Operations Office; Kirtland NCO Academy; 898th Munitions Sqdn.; Air Force Security Police Agency; 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. Other units: Albuquerque Seismological Laboratory; University of New Mexico Civil Engineering Research Facility. Base activated in Jan. 1941; named for Col. Roy C. Kirtland, aviation pioneer and commandant of Langley Field in the 1930s, who died May 2, 1941. Area 52,678 acres. Runway 19,375 ft. Altitude 5,352 ft. Military 5,860; civilians 13,240. Payroll $870.7 million. Housing: 2,122 homes. 130 VOQ, 180 VAQ. Air Force–Department of Veterans Affairs joint medical center located outside base gates.

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 unit: 8th Fighter Wing, F-16C/D operations, home of the "Wolf Pack." The 8th FW converted to the F-16 in Sept. 1981, making it the first active overseas F-16 wing. Associate units include the 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 2,548; US civilians 28; local nationals 354. Payroll $100.6 million. Unaccompanied housing: 247 officer, 3,940 enlisted, 9 VIP, 28 VOQ, 104 VAQ. 4-bed hospital.

Lackland AFB, Tex. 78236-5000; 8 mi. SW of downtown San Antonio. Phone (210) 671-1110; DSN 473-1110. AETC base. The 37th Training Wing is the largest training wing in the Air Force. Its four primary training functions graduate more than 70,000 students annually. The 737th Training Gp. provides basic military training for about 35,000 enlisted people entering the Air Force, Air Force Reserve, and Air National Guard annually. The 37th Training Gp. conducts more than 200 technical training courses in a wide array of base support functions for more than 36,000 people annually from all military services. The Defense Language Institute English Language Center conducts English language training for 2,400 international and US military students annually. The Inter-American Air Forces Academy conducts professional, technical, and management training in Spanish to military forces and government agencies from Latin American and Caribbean nations for about 600 students per year. The 59th Medical Wing (Wilford Hall USAF Medical Center), the Air Force's largest medical facility—with 500 beds—is a major referral medical center. Base activated in 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 7,867; civilians 5,564; students 9,801. Payroll $580.1 million. Housing: 109 officer, 611 NCO, 2,197 transient (1,665 VAQ, 374 VOQ, 158 TLF).

Lajes Field, Azores, Portugal, APO AE 09720-5000; Terceira Island, 900 mi. W of Portugal. Phone (commercial, from CONUS) 011-351-95-530100-1110; DSN from US 535-1110, from Europe 245-1110. ACC base. Host unit: 65th Air Base Wing. Tenants: US Forces Azores; Army 1324th Medium Port Command Azores; 629th Air Mobility Support Sqdn. (AMC); Det. 6, Air Force Broadcasting Service. US operations began at Lajes Field in 1946. Area 1,148 acres. Runway 10,865 ft. Altitude 180 ft. Military 947; civilians 992. 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. Hq. Air Combat Command. Host unit: 1st Fighter Wing, F-15 fighter operations. Associate units: Air Operations Sqdn. (ACC); Civil Engineering Sqdn. (ACC); Logistics Support Gp. (ACC); Requirements Sqdn. (ACC); Training Support Sqdn. (ACC); Computer Systems Sqdn. (ACC); 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 8,600; civilians 1,880. Payroll $312 million. Housing: 384 officer, 1,074 NCO, 416 transient (215 VAQ, 101 VOQ, 100 TLF). 40-bed hospital.

Laughlin AFB, Tex. 78843-5000; 6 mi. E of Del Rio. Phone (210) 298-3511; DSN 732-1110. AETC base. 47th Flying Training Wing, specialized undergraduate pilot training. Base activated in 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 1,386; civilians 1,866. Payroll $73.8 million. Housing: 600 units, 54 trailer spaces, 36 transient, 22 TLF. Clinic.

Laurence G. Hanscom AFB (see Hanscom AFB).

Little Rock AFB, Ark. 72099-5000; 17 mi. NE of Little Rock. Phone (501) 988-3131; DSN 731-1110. Transferred to AETC in April 1997. 314th Airlift Wing, only C-130 training base in DoD, training crew members from all branches of military service and 27 foreign countries. Tenants include 189th Airlift Wing (ANG); 96th Mobile Aerial Port Sqdn.; 348th USAF Recruiting Sqdn.; Det. 251, AFOSI; Det. 4, 373d Training Sqdn.; Det. 234, Air Force Audit Agency; Combat Aerial Delivery School (ACC); 22d Special Tactics Sqdn. (AFSOC); Hq. Arkansas ANG. Base activated in 1955. Area 11,373 acres. Runway 12,000 ft. Altitude 310 ft. Military 4,827; civilians 545. Payroll $169.8 million. Housing: 140 officer, 1,395 enlisted, 11 single-occupancy dormitories housing 836, 341 transient (140 VAQ, 201 VOQ). 12-bed hospital.

Los Angeles AFB, Calif. 90245-4687; 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; Internet home page at http://www.laafb.af.mil/. AFMC base. Hq. of AFMC's Space and Missile Systems Center, responsible for research, development, acquisition, on-orbit testing, and sustainment of military space and missile systems. Support unit is 61st Air Base Gp. Area 112 acres at Los Angeles AFB and 127 acres at Fort MacArthur Military Family Housing Annex. No runway. Altitude 95 ft. Military 1,540; civilians 1,046. Payroll $150 million. Housing at Fort MacArthur Annex: 574 townhouses. Clinics, base exchanges, and child development centers at main base and Fort 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. 56th Fighter Wing, F-16 operations; 944th Fighter Wing (AFRC), F-16 operations; 607th Air Control Sqdn., forward air control operations. Luke, 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 WW I 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 range at Gila Bend, Ariz. Runways 10,000 ft. and 9,910 ft. Altitude 1,090 ft. Military 6,374; civilians 1,092. Payroll $161.2 million. Housing: 95 officer, 779 enlisted, 256 transient (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. 6th Air Refueling Wing; Hq. US Special Operations Command; Hq. US Central Command; Joint Communications Support Element; NOAA Aircraft Operations Center; 610th Aeromedical Evacuation Sqdn.; 290th Joint Communications Support Sqdn. The 6th ARW provides worldwide air refueling and airlift for resident warfighting commands. Base activated Apr. 15, 1941; named for Col. Leslie MacDill, killed in aircraft accident Nov. 8, 1938, near Washington, D. C. Area 5,600 acres. Runways 11,480 ft. and 7,167 ft. Altitude 6 ft. Military 4,773; civilians 1,080. Payroll $2.6 billion. Housing: 128 officer, 547 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 unit: 341st Missile Wing (Minuteman III, UH-1). Tenant unit: 43d Air Refueling Gp. (AMC), KC-135. Base activated Dec. 15, 1942; named for Col. Einar A. Malmstrom, WW II fighter commander killed in air accident Aug. 21, 1954. Site of SAC's first Minuteman wing. Area 4,137 acres, plus about 24,000 sq. mi. of missile complex. Runway length NA. Altitude 3,525 ft. Military 3,506; civilians 405. Payroll $178 million. Housing: 258 officer, 1,148 enlisted, 105 transient. Clinic.

Maxwell AFB, Ala. 36112-5000; 1 mi. WNW of Montgomery. Phone (334) 953-1110; DSN 493-1110. AETC base. 42d Air Base Wing; Hq. Air University; Air War College; Air Command and Staff College; Air University Library; College of Aerospace Doctrine, Research, and Education; Air Force Reserve Officers Training Corps; Officer Training School; Ira C. Eaker College for Professional Development; Hq. Community College of the Air Force; Hq. Civil Air Patrol–USAF; Squadron Officer School; Air Force Institute of Technology (at Wright-Patterson AFB, Ohio). Associate units: 908th Airlift Wing (AFRC); Air Force Historical Research Agency; Hq. Air Force Doctrine Center. Air University conducts professional military, graduate, and professional continuing education for precommissioned and com-

missioned officers, enlisted personnel, and civilians to prepare them for command, staff, leadership, and management responsibilities. Base activated in 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 3,756; civilians 3,433. Payroll $371.4 million. Housing: 268 officer, 364 enlisted, 1,210 transient (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 Hq. Air University: College for Enlisted Professional Military Education (includes USAF Senior NCO Academy); Extension Course Institute; 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, 716 transient (212 VOQ, 501 VAQ, 3 TLF).

McChord AFB, Wash. 98438-5000; 10 mi. S of Tacoma. Phone (206) 984-1910; DSN 984-1110. AMC base. Host unit: 62d Airlift Wing. Major tenants include 446th Airlift Wing (AFRC); Western Air Defense Sector (ANG); 22d Special Tactics Squadron. The 62d AW operates the C-141 Starlifter but is scheduled to receive the C-17 Globemaster III as the C-141 fleet retires. The base is responsible for strategic airlift of personnel and cargo worldwide, on short notice. Base is adjacent to Fort Lewis, its primary customer. 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 4,125; civilians 1,339. Payroll $253.6 million. Housing: 88 officer, 805 NCO, 760 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. Hq. 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; 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. Other major units include Defense Distribution Region West–McClellan; Defense Information Systems Organization–McClellan; 938th Engineering Installation Sqdn.; Technical Operations Division, Air Force Technical Applications Center; 4th Air Force (AFRC); US Coast Guard Air Station, Sacramento (DoT). 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 2,792; civilians 10,100. Payroll $450 million. Housing: 100 officer, 564 enlisted, 19 transient. 77th Medical Gp. Clinic and 77th Medical Gp. 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. 22d Air Refueling Wing; 931st Air Refueling Gp. (AFRC Assoc.); 184th Bomb Wing (ANG). Base activated June 5, 1951; named for Capt. Fred J. McConnell, WW II B-24 pilot who died in a crash of a private plane Oct. 25, 1945, and for his brother, 2d Lt. Thomas L. McConnell, also a WW II B-24 pilot, killed July 10, 1943, during an attack on Bougainville. Area 3,113 acres. Two 12,000-ft. runways. Altitude 1,371 ft. Military 2,984; DoD civilians 423. Payroll $104 million. Housing: 76 officer, 437 enlisted, 95 transient (49 VOQ, 26 VAQ, 20 temporary units off base).

McGuire AFB, N. J. 08641-5000; 18 mi. SE of Trenton. Phone (609) 724-1100; DSN 440-1100. AMC base. 305th Air Mobility Wing; Hq. 21st Air Force; 621st Air Mobility Operations Gp.; Air Mobility Warfare Center, Fort Dix, N. J.; N. J. ANG; N. J. Civil Air Patrol; 108th Air Refueling Wing (ANG); 514th Air Mobility Wing (AFRC Assoc.); McGuire NCO Academy (AETC). Base adjoins Army's Fort Dix; formerly Fort Dix AAB. Activated as AFB 1949; named for Maj. Thomas B. McGuire, Jr., P-38 pilot, second leading US ace of WW II, recipient of Medal of Honor, killed in action Jan. 7, 1945, in the Philippines. Area 3,598 acres. Runways 7,124 ft. and 10,000 ft. Altitude 133 ft. Military 10,061 (including AFRC and ANG); civilians 1,529. Payroll NA. Housing: 194 officer, 1,754 NCO, 455 transient (128 VOQ/VAQ, 297 VAQ—E-1–E-4, 30 TLF).

Minot AFB, N. D. 58705-5000: 13 mi. N of Minot. Phone (701) 723-1110; DSN 453-1110. ACC base. 5th Bomb Wing (B-52H); 91st Missile Wing (AFSPC), Minuteman III operations; 23d Bomb Sqdn.; 54th Rescue Flight (UH-1N). Base activated in Jan. 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 4,100; civilians 578. Payroll $147.4 million. Housing: 394 officer, 2,047 enlisted, 22 UOQ, 1,302 dormitory spaces, 32 VAQ, 39 VOQ, 39 TLF. 25-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; joint-service base. Host unit: 35th Fighter Wing, F-16C/D fighter operations. Tenant units: 3d Space Surveillance Sqdn. (AFSPC); 301st Intelligence Sqdn. (AIA); Naval Air Facility; Naval Security Gp. Activity; US Army field station; Company E, US Marine Support Battalion. Base occupied by US forces in Sept. 1945. Area 3,865 acres. Runway 10,000 ft. Altitude 119 ft. Military 4,507 (total US forces); US civilians 118; local nationals 926. Payroll $221 million. Housing: 335 officer, 1,835 enlisted. Unaccompanied housing: 120 officer, 871 enlisted, 166 transient (40 VAQ, 80 VOQ, 46 TLF). Unaccompanied Navy housing: 108 officer, 356 enlisted (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. 347th Wing, F-13C/D (LANTIRN-equipped), A/OA-10; HC-130, HH-60, C-130E (AMC); 71st Air Control Sqdn. Tenant units: 336th USAF Recruiting Sqdn.; Det. 717, AFOSI; 322d Training Det. Base activated in 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 4,100; civilians 700. Payroll $106.5 million. Housing: 32 officer, 270 enlisted, 19 VAQ, 36 VOQ, 12 TLF, 30 trailer spaces. 10-bed hospital with acute care clinic.

Mountain Home AFB, Idaho 83648-5000; 45 mi. SE of Boise. Phone (208) 828-2111; DSN 728-2111. ACC base. 366th Wing, USAF's air expeditionary wing, providing composite combat airpower worldwide. Equipped with F-16Cs (HARM-equipped), F-15C/Ds, F-15Es, B-1Bs, and KC-135Rs, the wing is prepared to deploy rapidly worldwide. Base activated in Aug. 1943. Area 9,112 acres. Runway 13,500 ft. Altitude 3,000 ft. Military 3,789; civilians 479. Payroll $130.6 million. Housing: 180 officer, 1,521 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 unit: Air Warfare Center. Operational elements: 57th Wing; 99th Air Base Wing; 53d Wing (Eglin AFB, Fla.). Major units within 57th Wing include the USAF Weapons School, USAF Air Demonstration Sqdn. (Thunderbirds), 57th Operations Gp., 57th Test Gp. (including 422d Test and Evaluation Sqdn., under the 53d Wing, Eglin AFB, Fla.), and 57th Logistics Gp. Aircraft assigned to Nellis: A-10, F-15, F-15E, F-16, Predator UAV, and HH-60G. Other units include the 414th Combat Training Sqdn. (Red Flag), 549th Combat Training Sqdn. (Air Warrior), 547th Intelligence Sqdn., 99th Range Gp., 820th RED HORSE Civil Engineering Sqdn., 896th Munitions Sqdn. (AFMC), 11th Reconnaissance Sqdn. (UAV), and the 66th Rescue Sqdn. (Pave Hawks). Base activated in July 1941 as AAF Flexible Gunnery School; closed in 1947; reopened in 1949 and named for 1st Lt. William H. Nellis, WW II P-47 fighter pilot, killed Dec. 27, 1944, in Europe. Main base is 11,000 acres with a range restricted area of 3.5 million acres, plus 12,000 sq. mi. of airspace over the range and the military operating area. Runways 10,051 ft. and 10,119 ft. Altitude 1,868 ft. Military 7,205; civilians 1,991. Payroll $326 million. Housing: 90 officer, 1,142 enlisted, 267 VAQ, 153 VOQ, 60 TLF. 119-bed Mike O'Callaghan Federal Hospital, a joint Air Force–Veterans Affairs venture assigned to the 99th Medical Gp.

Offutt AFB, Neb. 68113-5000; 8 mi. S of Omaha. Phone (402) 294-1110; DSN 271-1110. ACC base. Hq. US Strategic Command. 55th Wing; USSTRATCOM Joint Intelligence Center; Air Force Global Weather Center; 6th Space Operations Sqdn. (AFSPC); National Airborne Operations Center (JCS); Air Combat Command Heartland of America Band. Base activated in 1896 as Army's Fort Crook; landing field named for 1st Lt. Jarvis J. Offutt, WW I pilot who died Aug. 13, 1918, from injuries received at Valheureux, France. Area 4,041 acres (including housing area and offbase sites). 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. Hq. 7th Air Force. Host unit: 51st Fighter Wing, F-16C/D, C-12J, A-10, and OA-10A operations. Tenant units: 303d Intelligence Sqdn. (AIA); 631st Air Mobility Support Sqdn. (AMC); 5th Reconnaissance Sqdn. (ACC); 31st Special Operations Sqdn. (AFSOC); Det. 1, 4th Space Surveillance Sqdn. (AFSPC). Originally designated K-55; runway opened in Dec. 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 5,538; US civilians 130; local nationals 617. Payroll NA. Housing: 75 officer, 212 enlisted. Unaccompanied housing: 602 officer and SNCO, 2,750 enlisted, 120 VOQ, 140 VAQ. 30-bed hospital.

Patrick AFB, Fla. 32925-3237; 2 mi. S of Cocoa Beach. Phone (407) 494-1110; DSN 854-1110. AFSPC base. Operated by the 45th Space Wing in support of DoD, NASA, and other agency and commercial missile and space programs. Major tenants: Defense Equal Opportunity Management Institute; Air Force Technical Applications Center; 1st Rescue Gp.; 41st Rescue Sqdn.; 71st Rescue Sqdn.; 301st Rescue Sqdn. (AFRC); 741st Consolidated Aircraft Maintenance Sqdn.; Joint Task Force for Joint STARS at Melbourne Regional Airport, Fla. Besides host responsibilities

for Patrick AFB and Cape Canaveral AS, 45th SPW 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 in 1940; named for Maj. Gen. Mason M. Patrick, Chief of AEF's Air Service in WW I and Chief of the Air Service/Air Corps, 1921–27. Area 2,341 acres. Runway 9,000 ft. Altitude 9 ft. Military 2,700; civilians 1,900. Payroll $155 million (military, civilian). Housing: 136 officer, 1,230 NCO. 15-bed hospital.

Peterson AFB, Colo. 80914-5000; at eastern edge of Colorado Springs. Phone (719) 556-7321; DSN 834-7011. AFSPC base. Hq. Air Force Space Command. Host unit: 21st Space Wing (AFSPC). Provides support to Hq. North American Aerospace Defense Command; Hq. US Space Command; Hq. Army Space Command; 302d Airlift Wing (AFRC). Edward J. Peterson Air and Space Museum. Base activated in 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 active-duty 4,194; reserves 1,260; civilians 3,484. Payroll $227.3 million. Housing: 107 officer, 384 NCO, 210 transient (72 VOQ, 98 VAQ, 40 TLF). Clinic.

Pope AFB, N. C. 28308-2391; 12 mi. NNW of Fayetteville. Phone (910) 394-0001; DSN 486-1110. Transferred to AMC April 1997. 23d Wing. 624th Air Mobility Support Gp.; 23d Aeromedical Evacuation Sqdn.; 21st Special Tactics Sqdn. (AFSOC); 3d Aerial Port Sqdn.; Combat Control School; 18th Air Support Operations Gp.; 24th Special Tactics Sqdn. (AFSOC). Base adjoins Army's Fort Bragg and provides intratheater airlift and close air support for airborne forces and other personnel, equipment, and supplies. Base activated in 1919; named after 1st Lt. Harley H. Pope, WW I flyer, killed Jan. 7, 1917, when his JN-4 "Jenny" crashed into the Cape Fear River near Fayetteville. Area 1,750 acres. Runway 7,500 ft. Altitude 218 ft. Military 4,700; civilians 512. Payroll $99.2 million. Housing: 89 officer, 370 enlisted, 1,208 dormitory spaces, 153 VOQ, 111 VAQ, 8 TLF. Clinic.

RAF Lakenheath, United Kingdom, APO AE 09464-5000; 70 mi. NE of London; 25 mi. NE of Cambridge. Phone (commercial, from CONUS) 011-44-1638-52-1110; DSN 226-1110. Royal Air Force base. 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 in 1941; 48th FW began operations at RAF Lakenheath in Jan. 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. Hq. 3d Air Force (USAFE). 100th Air Refueling Wing (USAFE), KC-135R Stratotanker and European Tanker Task Force operations, conducting air refueling, force reception, force deployment, and support operations for the US and NATO. Associate units include 352d Special Operations Gp. (AFSOC), MC-130H, MC-130N/P, and MH-53J aircraft; 95th Reconnaissance Sqdn. (ACC), RC-135 aircraft. 488th Intelligence Sqdn. (AIA); 627th Air Mobility Support Sqdn. (AMC) provides aerial port for AMC tanker airlift and aircraft; and Naval Air Facility, C-12 aircraft. Geographically separated units: 422d Air Base Sqdn., RAF Croughton; 423d Air Base Sqdn., RAF Molesworth; 424th Air Base Sqdn., RAF Fairford; 426th Air Base Sqdn., Stavanger, Norway. Base activated in 1934; US presence began in July 1950; named after nearby town. Area 1,144 acres. Runway length 9,227 ft. Altitude 33 ft. Military 5,097; civilians 796. Payroll $150.5 million. Housing: 40 officer, 79 enlisted, US govt.-leased housing shared with RAF Lakenheath. Billeting: 41 TLF, 41 VOQ, 150 VAQ. Hospital annex for flyers 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) 011-49-6371-113; DSN 480-1110. Hq. USAFE and Hq. Allied Air Forces Central Europe (NATO) base. Host unit: 86th Airlift Wing. The 86th AW has a broad mission, providing inter- and intratheater operational airlift, intratheater aeromedical evacuation, and CONUS staging and aeromedical evacuation. The flying squadrons include the 37th Airlift Sqdn. flying the C-130E Hercules, the 75th Airlift Sqdn. flying the C-9 Nightingale, and the 76th Airlift Sqdn. flying the C-20 Gulfstream and the C-21 Learjet. The 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 Army military installations. The base was activated and US presence began in 1953. Area 10,261 acres. Runway 8,015 ft. Altitude 782 ft. Military 12,800; civilians 3,200. Payroll $824 million. Housing: 1,797; 9 govt.-leased units; 1,078 billeting units. Clinic on base, and the Landstuhl Army Regional Medical Center (200 beds) is 8 mi. from Ramstein AB.

Randolph AFB, Tex. 78150-5000; 17 mi. ENE of San Antonio. Phone (210) 652-1110; DSN 487-1110. AETC base. Hq. Air Education and Training Command; Hq. 19th Air Force; 12th Flying Training Wing; T-37, T-38, AT-38, and T-1A pilot instructor training; T-43 undergraduate navigator training, C-21A airlift, and T-3 flight screening at Hondo, Tex., and the US Air Force Academy; Hq. Air Force Personnel Center; Hq. Air Force Center for Quality and Management Innovation; Hq. Air Force Services Agency; USAF Occupational Measurement Sqdn.; Hq. Air Force Recruiting Service. Base activated in June 1930; named for Capt. William M. Randolph, killed Feb. 17, 1928, when his AT-4 crashed on takeoff at Gorman, Tex. Area 5,011 acres. Two 8,350-ft. runways. Altitude 761 ft. Military 5,882; civilians 5,195. Payroll $429 million. Housing 254 officer, 765 NCO, 210 VAQ, 480 VOQ, 348 UEQ, 200 UOQ, 30 TLF. Clinic.

Reese AFB, Tex. 79489-5000; adjacent to Lubbock. Phone (806) 885-4511; DSN 838-1110. AETC base. 64th Flying Training Wing, specialized undergraduate pilot training. Base activated in 1942; named for 1st Lt. Augustus F. Reese, Jr., P-38 fighter pilot killed during a train-strafing mission at Cagliari, Sardinia, May 14, 1943. Area 3,953 acres. Runways 6,500 ft., 10,500 ft., and 10,500 ft. Altitude 3,338 ft. 64th FTW inactivated April 1997. Base scheduled to close September 30, 1997.

Robins AFB, Ga. 31098; 15 mi. SSE of Macon at Warner Robins. Phone (912) 926-1110; DSN 468-1110. AFMC base. Hq. Warner Robins Air Logistics Center provides worldwide logistics management for the F-15 air-superiority fighter, C-130 and C-141 cargo aircraft, helicopters, missiles, and remotely piloted vehicles. Other management responsibilities include the LANTIRN system, JTIDS, avionics, most Air Force airborne electronic warfare equipment, airborne communications equipment, airborne bomb- and gun-directing systems, fire-fighting equipment, general-purpose vehicles, and the USAF portion of the Global Command and Control System. 93d Air Control Wing (ACC), activated January 1996, will eventually have 2,600 personnel and 19 E-8C Joint STARS aircraft assigned. Other major units include Hq. Air Force Reserve Command (AFRC); 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 in Mar. 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 4,900; civilians 11,000. Payroll $629 million. Housing: 245 officer, 1,151 NCO, 40 TLF, 137 VOQ. 20-bed hospital.

Scott AFB, Ill. 62225-5000; 6 mi. ENE of Belleville. Phone (618) 256-1110; DSN 576-1110. AMC base. 375th Airlift Wing; Hq. Air Mobility Command; Hq. Air Force Communications Agency; Hq. US Transportation Command; Hq. 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. Runway 7,061 ft. Altitude 453 ft. Military 6,100; civilians 2,500. Payroll $466 million. Housing: 304 officer, 1,394 NCO, plus 82 spaces for privately owned trailers, 300 transient. 55-bed hospital; 82-bed aeromedical staging facility.

Seymour Johnson AFB, N. C. 27531-5000; within city limits of Goldsboro. Phone (919) 736-5400; DSN 488-1110. ACC base. 4th Fighter Wing, F-15E operations; 916th Air Refueling Wing (AFRC), KC-135 operations. Base activated June 12, 1942; named for Navy Lt. Seymour A. Johnson, Goldsboro native, killed Mar. 5, 1941, in an aircraft accident in Maryland. Area 3,233 acres. Runway 11,758 ft. Altitude 110 ft. Military 4,354; civilians 1,100. Payroll $209.1 million. Housing: 154 officer, 1,544 enlisted, 7 dorms housing 716 personnel, 8 DVQ, 5 SNCOQ, 38 VOQ, 32 VAQ, 27 TLF. 15-bed hospital.

Shaw AFB, S. C. 29152-5000; 10 mi. WNW of Sumter. Phone (803) 668-8110; DSN 965-1110. ACC base. 20th Fighter Wing, F-16 fighter operations; Hq. 9th Air Force. Base activated Aug. 30, 1941; named for 2d Lt. Ervin D. Shaw, one of the first Americans to see air action in WW I, 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 $178.9 million. Housing: 170 officer, 1,534 enlisted, 897 UEQ, 180 transient (44 VAQ, 96 VOQ, 40 TLF). 25-bed hospital.

Sheppard AFB, Tex. 76311-5000; 4 mi. N of Wichita Falls. Phone (817) 676-7441; DSN 736-7441. AETC base. The 82d Training Wing includes the 82d and 782d Training Gps., which conduct courses in financial management, communications, electronics, aircraft maintenance, munitions, aerospace ground equipment, transportation, civil engineering skills, and education/training career fields; 882d Training Gp., which provides training in biomedical sciences, dentistry, health service administration, medical readiness, medicine, nursing, and the Physician Assistant Training Program; 982d Training Gp., which provides weapon system training at training detachments and operating locations worldwide; 82d Support Gp.; 82d Medical Gp.; 82d Logistics Gp. The 80th Flying Training Wing (AETC) conducts T-37 and T-38 undergraduate pilot training and instructor pilot training in the Euro-NATO Joint Jet Pilot Training program. The 80th FTW also conducts the 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 Apr. 9, 1941. Area 6,100 acres. Runways 6,000 ft., 7,000 ft., 10,000 ft., and 13,100 ft. Altitude 1,015 ft. Military 9,541; civilians 1,520. Payroll more than $246 million. Housing: 199 officer, 1,059 NCO, 7,563 transient (1,772 VAQ, 4,698 UPH, 564 UEPH, 58 TLF, 103 UOQ, 368 VOQ). 65-bed hospital.

Spangdahlem AB, Germany, APO AE 09126-5000; 9 mi. E of Bitburg; 20 mi. NE of Trier. Phone (commercial, from CONUS) 011-49-6565-61-1110; DSN 452-1110. USAFE base. 52d Fighter Wing flies A/OA-10s, F-15s, and F-16s. Base activated and US presence began in 1953; named after local town. Area 1,282 acres. Runway 10,000 ft. Altitude 1,196 ft. Military (including geographically separated units) 6,200; civilians (including geographically separated units) 798. Payroll $165 million. Housing: 157 officer, 2,039 enlisted, 499 govt.-leased units, 157 billeting spaces. 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. Hq. 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. Tinker is home to eight major DoD, Air Force, and Navy activities, including the 552d Air Control Wing (ACC); 507th Wing (AFRC), Oklahoma's only Air Force Reserve Command flying unit; Navy Strategic Communications Wing One. Also at Tinker are the Defense Logistics Agency's Defense Distribution Depot Oklahoma City; the 3d Combat Communications Gp.; Air Force Electronic Systems Center's 38th Engineering Installation Wing; and the Oklahoma City Megacenter, which manages Tinker's computer systems and services 105 other bases in 46 states. Base activated in Mar. 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 NCO. 22-bed hospital.

Travis AFB, Calif. 94535-5000; 50 mi. NE of San Francisco at Fairfield. Phone (707) 424-5000; DSN 837-1110. AMC base. Hq. 15th Air Force; 60th Air Mobility Wing; 615th Air Mobility Operations Gp.; 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 active-duty 8,515; AFRC 4,864; civilians 3,084. Payroll $249 million. Housing: 370 officer, 2,092 enlisted, 1,259 enlisted dormitory spaces, 924 transient (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. 325th Fighter Wing, F-15 operations. The 325th FW provides training for all USAF F-15 air-to-air pilots and maintains readiness for 77 aircraft and assigned operations and support personnel for combat units worldwide. Associate units include Hq. 1st Air Force; 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, WW I 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 5,547; civilians 1,701. Payroll $193.8 million. Housing: 1,069 family units. 35-bed hospital.

US Air Force Academy, Colo. 80840-5025; N of Colorado Springs. Phone (719) 333-1818; DSN 333-3110. Direct reporting unit. Established Apr. 1, 1954. Moved to permanent location in Aug. 1958. Aircraft flown: 94, consisting of 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 units: 557th Flying Training Squadron (AETC); Air Force Band of the Rockies (AFSPC). Area 18,325 acres. Runways 2,300 ft., 3,500 ft., and 4,500 ft. Altitude 7,200 ft. Military 2,121; cadets 4,029; civilians 2,005. 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 (405) 213-2121; DSN 448-2121. AETC base. 71st Flying Training Wing, joint, specialized undergraduate pilot training. Base activated in Nov. 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; civilians 1,410 (approx. 1,200 contract employees). Payroll $69.5 million. Housing: 268 officer (118 family housing, 150 dormitory), 192 enlisted (112 family housing, 80 dormitory), 44 transient (34 VOQ, 10 TLF). Clinic.

Vandenberg AFB, Calif. 93437-5000; 8 mi. NNW of Lompoc. Phone (805) 734-8252 (ext. 6-1611); DSN 276-1110. AFSPC base. Hq. 14th Air Force. Host unit: 30th Space Wing, conducts polar-orbiting space launches and supports research and development tests for DoD, USAF, and NASA space, ballistic missile, and aeronautical systems. It also has UH-1N helicopter assets. The 30th SPW furnishes facilities and essential services to more than 60 aerospace contractors on base. Originally Army's Camp Cooke. Activated in Oct. 1941. Base 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 3,255; civilians 1,387; civilian contractors 3,835. Payroll $136 million (military and civilians). Housing: 486 officer, 1,946 enlisted, 172 trailer spaces, 287 transient. 16-bed hospital.

Warren AFB (see Francis E. Warren AFB).

Whiteman AFB, Mo. 65305-5000; 2 mi. S of Knob Noster. Phone (816) 687-1110; DSN 975-1110. ACC base. Host unit: 509th Bomb Wing, activated Apr. 1, 1993. It received its first of 21 B-2 bombers Dec. 17, 1993. 442d Fighter Wing (AFRC). Base activated in 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 869 ft. Military 3,005; civilians 754. Payroll $117.9 million. Housing: 96 officer, 893 enlisted, 77 VAQ, 49 VOQ, 31 TLF. 30-bed hospital.

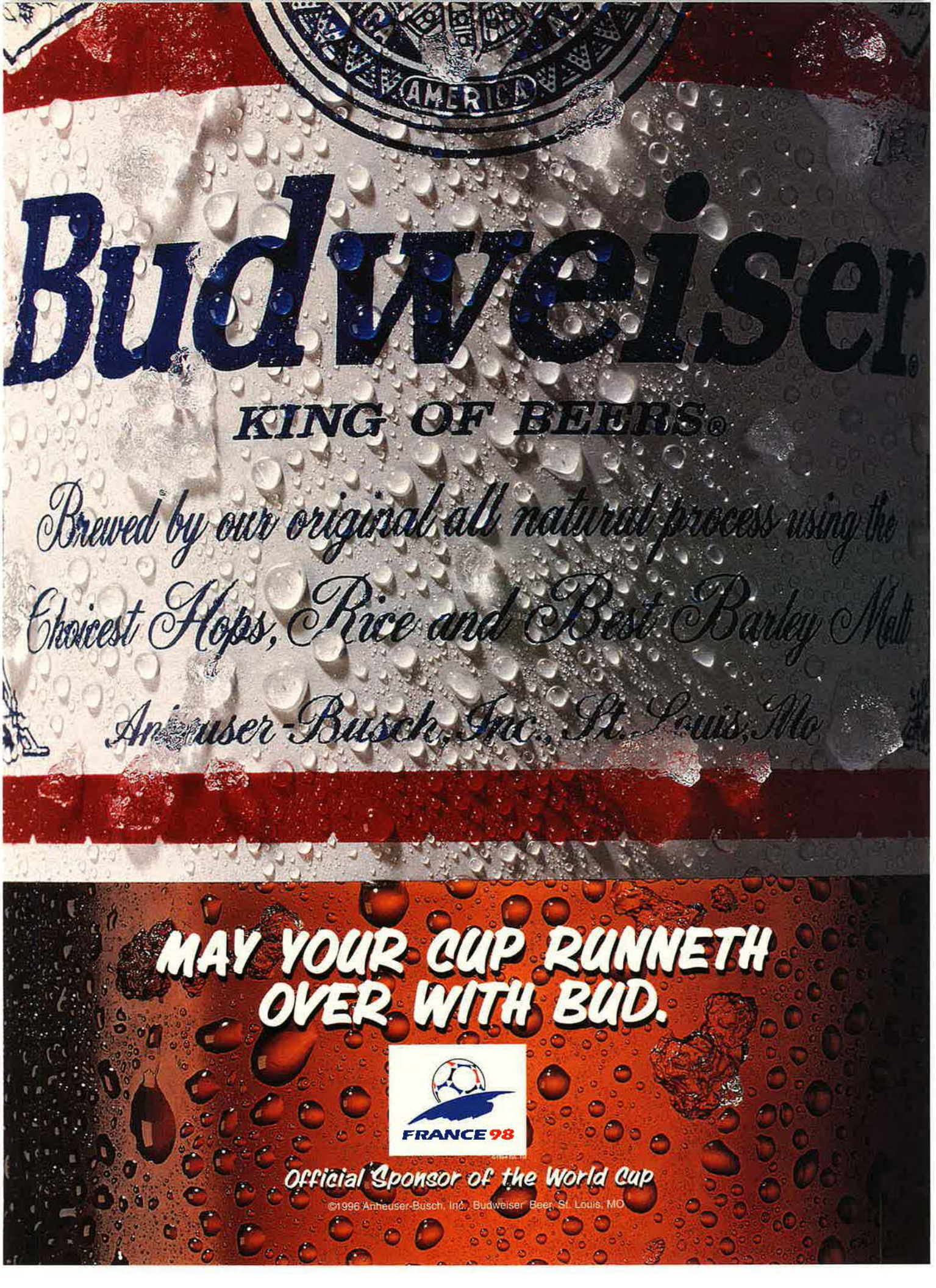
Wright-Patterson AFB, Ohio 45433; 10 mi. ENE of Dayton. Phone (937) 257-1110; DSN 787-1110. AFMC base. Hq. Air Force Materiel Command; Hq. Aeronautical Systems Center (AFMC); Wright Laboratory; Air Force Institute of Technology (AETC); Wright-Patterson Medical Center; 88th Air Base Wing (AFMC); 445th Airlift Wing (AFRC); approximately 70 other DoD activities and government agencies. 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 is open to the public. Area 8,145 acres. Runway 19,600 ft. Altitude 824 ft. Military 8,900; civilians 12,700. Payroll (FY 1995) $904 million. Housing: 796 officer, 1,537 NCO. 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. Hq. US Forces, Japan; Hq. 5th Air Force. Host unit: 374th Airlift Wing (PACAF), C-130, C-9, C-21, and UH-1N operations. Tenant units: 630th Air Mobility Support Sqdn. (AMC); Det. 1, Air Force Band of the Pacific; Far East 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; US civilians 1,553; local nationals 1,936. Payroll $110 million. Housing: 645 officer, 1,787 enlisted, 58 TLF. Unaccompanied housing: 184 officer, 900 enlisted, 43 SNCOQ, 75 VOQ, 135 VAQ, 123 aircrew rooms, 17 DV rooms. 30-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
Pirinclik AS (Turkey), APO AE 09825 (USAFE) (scheduled to close Sept. 1, 1997)	DSN 314-676-1110
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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ANG and AFRC Bases

Notes: This section of the Guide consolidates major Air National Guard and Air Force Reserve Command bases into a single listing. Most ANG locations are listed according to the airports whose facilities they share. AFRC units are listed by the names of their bases and are designated as AFRC facilities. There are, in addition, some ANG and AFRC units located on active-duty 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-duty 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-duty military. Title 32 personnel are civilians employed full time in ANG, but they wear two hats: They can go on active-duty 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.

Allen C. Thompson Field, 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 1,098, full-time personnel 329. Payroll $25.9 million.

Anchorage, Alaska (Kulis ANGB at Anchorage International Airport) 99502. Phone (907) 249-1444; DSN 317-626-1659. 176th Wing (ANG); 144th Airlift Sqdn. (ANG) and 210th Air Rescue Sqdn. (ANG). Base named for Lt. Albert Kulis, killed in training flight in 1954. Area 129 acres. Runway 10,900 ft. Altitude 124 ft. Military 1,179, full-time personnel 428. Payroll $34.5 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 910, full-time support 305. Payroll $23.8 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 1,757, full-time personnel 476. Payroll $31.3 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 Sqdn. (ACC). Area 457 acres. Runway 11,400 ft. Altitude 192 ft. Military 966, full-time personnel 391. Payroll $23.5 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 986, full-time personnel 339. Payroll $27.6 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 964, full-time personnel 323. Payroll $21.9 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 1,123, full-time personnel 423. Payroll $35.2 million. Limited transient facilities available during ARNG camps.

Bradley International Airport, Windsor Locks, Conn. 06026-5000; 15 mi. N of Hartford at East Granby. Phone (860) 292-2526; DSN 636-8310. 103d Fighter Wing (ANG); ARNG aviation battalion. Base named for Lt. Eugene M. Bradley, killed in P-40 crash in Aug. 1941. Area 126 acres. Runway 9,500 ft. Altitude 173 ft. Military 956, full-time personnel 251. Payroll $23.9 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 Apr. 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 1,165, full-time personnel 485. Payroll $42.1 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 986, full-time personnel 310. Payroll $23.6 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 1,033, full-time personnel 306. Payroll $22.1 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 1,108, full-time personnel 293. Payroll $23.1 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 1,324, full-time personnel 306. Payroll $19.4 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 974, full-time personnel 249. Payroll $14.8 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 Sqdn. Field named for Ens. Clarence Dannelly, Navy pilot killed at Pensacola, Fla., during WW II. Area 51 acres. Runway 9,000 ft. Altitude 221 ft. Military 988, full-time personnel 368. Payroll $27.1 million.

Des Moines International Airport, Iowa 50321; within city of Des Moines. Phone (515) 287-9210; DSN 939-8210. 132d Fighter Wing (ANG). Area 113 acres. Runway 9,000 ft. Altitude 957 ft. Military 958, full-time personnel 296. Payroll $25.9 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, WW II pilot killed near Sicily. Area 1,660 acres. Runway 10,000 ft. Altitude 1,068 ft. AFRC active-duty 25, civilians 678, Reservists 2,011. Payroll $52 million. Army Reserve: active duty 8, Reservists 100. 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 953, full-time personnel 326. Payroll $29.7 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 1,191, full-time personnel 282. Payroll $18.3 million.

Ellington Field, Tex. 77034-5586; a city of Houston airport 17 mi. SE of downtown Houston. Phone (713) 929-2110; DSN 954-2110. 147th Fighter Wing (ANG). Other tenants include NASA Flight Operations, US Coast Guard, ARNG, FAA. Base named for Lt. Eric L. Ellington, pilot killed in Nov. 1913. Area 216 acres. Runway 9,000 ft. Altitude 40 ft. Military 1,013, full-time personnel 349. Payroll $30.1 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 857, full-time personnel 305. Payroll $27.2 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 991, full-time personnel 298. Payroll $25.9 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 965, full-time personnel 303. Payroll $22.5 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 827, full-time personnel 278. Payroll $20.6 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 919, full-time personnel 321. Payroll $25.7 million.

General Mitchell International Airport/ARS, Wis. 53207-6299; 7 mi. S of Milwaukee. AFRC base. Runway 9,690 ft. Altitude 723 ft. AFRC phone (414) 482-5000; DSN 950-5000. 440th Airlift Wing (AFRC). AFRC area 103 acres. Reservists 1,300, full-time Air Reserve technicians and civilians 350. Payroll $23 million. ANG and AFRC have separate telephone lines and facili-

ties. ANG phone (414) 747-4410; DSN 580-8410. 128th Air Refueling Wing (ANG). ANG area 111 acres. 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 1,098, full-time personnel 282. Payroll $18.5 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 1,005, full-time personnel 303. Payroll $27.4 million.

Grissom ARB, Ind. 46971-5000; 15 mi. N of Kokomo. Phone (317) 688-5211; DSN 928-1110. AFRC base. 434th Air Refueling Wing (AFRC) and its two KC-135 Stratotanker squadrons. Activated in Jan. 1943 as Bunker Hill NAS, a training base for carrier pilots. Reactivated in 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. Training site. Host to 255th Tactical Control Sqdn. (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 406, full-time personnel 118. Payroll $6.4 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 1,094, full-time personnel 319. Payroll $12.4 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 1,029, full-time personnel 327. Payroll $54.1 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. Base was devastated by Hurricane Andrew in August 1992 and is operational but in the final phases of reconstruction.

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 1,001, full-time personnel 296. Payroll $21.4 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 1,009, full-time personnel 383. Payroll $27.1 million.

Joe Foss Field, Sioux Falls, S. D. 57104; N side of Sioux Falls. Phone (605) 333-5700; DSN 939-7700. 114th Fighter Wing (ANG). Field named for Brig. Gen. Joseph J. Foss, WW II 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 982, full-time personnel 300. Payroll $20.8 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); host to 238th Combat Communications Sqdn. (ANG). Area 117 acres. Runway 8,000 ft. Altitude 297 ft. Military 1,069, full-time personnel 329. Payroll $21.1 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 391, full-time personnel 479. Payroll $19.8 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 1,349, full-time personnel 423. Payroll $42.8 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 945, full-time personnel 303. Payroll $19.7 million.

Louisville IAP AGS (Standiford Field), Ky. 40213. Phone (502) 364-9400; DSN 989-4400. 123d Airlift Wing (ANG); 223d Communications Sqdn. (ANG). Area 69 acres. Runway 10,000 ft. Altitude 497 ft. Military 1,145, full-time personnel 319. Payroll $17.4 million.

Mansfield Lahm Airport, Ohio 44901-5000; 3 mi. N of Mansfield. Phone (419) 521-0100; DSN 696-6210. 179th Airlift Wing (ANG). Airport named for nearby city and aviation pioneer Brig. Gen. Frank P. Lahm. Area 224 acres. Runway 9,000 ft. Altitude 1,296 ft. Military 911, full-time personnel 247. Payroll $16.1 million. Coast Guard exchange.

March ARB, Calif. 92518-5000; 9 mi. SE of Riverside. Phone (909) 655-1110; DSN 947-1110. AFRC base. 452d Air Mobility Wing (AFRC host). Phone (909) 655-4520; DSN 947-4520. Also home of 163d Air Refueling Wing (Calif. ANG), 119th Fighter Group (N. D. ANG), 4th Combat Camera Sqdn., 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 Mar. 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. AFRC and ANG 4,500, civilian 1,799 (includes 515 ARTs). Payroll: $73 million. Housing: 62 VAQ (150 beds), 85 VOQ (101 beds).

McEntire ANGB, S. C. 29044; 12 mi. E of Columbia. Phone (803) 695-6300; DSN 583-8201. 169th Fighter Wing (ANG). Also host to 240th Combat Communications Sqdn. (ANG) and 1/151st Aviation Battalion (ARNG). Base 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 1,301, full-time personnel 344 (including 4 Title 5 civilians). Payroll $25.1 million.

McGhee Tyson Airport, Tenn. 37901; 10 mi. SW of Knoxville. Phone (615) 985-3200; DSN 266-8200. Host to 134th Air Refueling Wing (ANG). Tenants include 228th Combat Communications Sqdn. and ANG's I. G. Brown Professional Military Education Center. Area 271 acres. Runway 9,000 ft. Altitude 980 ft. Military 1,056, full-time personnel 371. Payroll $29.4 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 1,023, full-time personnel 280. Payroll $20.1 million.

Minneapolis–St. Paul International Airport/ARS, Minn. 55450-2000; in Minneapolis, near confluence of the Mississippi and Minnesota rivers. AFRC base. Runway 10,000 ft. Altitude 840 ft. ANG and AFRC have separate phones and facilities. ANG phone (612) 725-5631; DSN 825-5631. 133d Airlift Wing (ANG) flies C-130s. ANG area 130.5 acres. Military 1,250, full-time personnel 274. Payroll $19.3 million. AFRC phone (612) 725-5011; DSN 825-5110. 934th Airlift Wing (AFRC) also flies C-130s. AFRC area 300 acres. Full-time personnel 150, civilians 199, Reservists 1,150. Payroll $24 million. Units include 210th Engineering Installation Sqdn. (ANG); 237th Air Traffic Control Flt. (ANG); Naval Reserve Readiness Command, Region 16; USAF Civil Air Patrol, NCLR, and MNLO; Rothe Development Inc. (AFRC). Lodging and BX 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 1,101, full-time personnel 318. Payroll $20.9 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 991, full-time personnel 240. Payroll $16.8 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. 914th Airlift Wing (AFRC); 107th Air Refueling Wing (ANG). Base activated in Jan. 1952. Area 979 acres (ANG 104 acres). Runway 9,100 ft. Altitude 590 ft. AFRC Reservists 1,200, civilians 373. ANG military 811, full-time personnel 275. Total payroll $52 million. (ANG payroll $19.9 million). Lodging and BX available.

O'Hare International Airport/ARS, Ill. 60666-5023; 22 mi. NW of Chicago's Loop. Phone (312) 825-5980; DSN 930-5980. AFRC base. 126th Air Refueling Wing (ANG); Defense Contract Management Area Operations, Fort Dearborn (US Army Reserve). Base activated in Apr. 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 344 acres (ANG 36 acres). Runway 13,000 ft. Altitude 643 ft. Reservists 1,337, full-time personnel and civilians (all units) 411. AFRC base scheduled for closure June 30, 1997. ANG 1,288, full-time personnel 335. Total payroll for facility $74.5 million. (ANG payroll $22.1 million).

Otis ANGB, Mass. 02542-5001; 7 mi. NNE of Falmouth. Phone (508) 968-4667; DSN 557-4667. 102d Fighter Wing (ANG); 567th USAF Band (ANG); 101st and 202d Weather Flts. (ANG). Adjacent installations and organizations include Cape Cod AS (6th Missile Warning Sqdn., 2165th Communications Sqdn.); US Coast Guard Air Station Cape Cod; Camp Edwards ARNG Training Site; ARNG Aviation Flight Facility; 1st Battalion, 25th Marines (Reserve); Massachusetts National Cemetery (VA). 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 1,252, full-time personnel 405. Payroll $54.3 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 320. Payroll $24.1 million.

Pittsburgh International Airport/ARS, Pa. 15108-4403; 15 mi. NW of Pittsburgh. AFRC base. Runway 11,500 ft. Altitude 1,203 ft. ANG and AFRC have separate phones and facilities. 171st Air Refueling Wing (ANG). Phone (412) 474-7359; DSN 277-7359. ANG area 179 acres. ANG military 1,397, full-time personnel 421. Payroll $24.9 million. AFRC phone (412) 474-8000; DSN 277-8000. 911th Airlift Wing (host unit). AFRC area 115 acres. AFRC full-time personnel 142, civilians 222, Reservists 1,080. Payroll $32.7 million. Base activated 1943. Housing: 24 VOQ, 230 enlisted qtrs. No on-base housing. Limited BX.

Portland International Airport, Portland, Ore. 97218-2797. Phone (503) 335-4020; DSN 638-4020. 142d Fighter Wing (ANG); 244th Combat Communications Sqdn. (ANG); 272d Combat Communications Sqdn. (ANG); Oregon Wing, CAP. Also host to 939th Rescue Wing (AFRC). Area 246 acres. Runway 11,000 ft. Altitude 26 ft. Military 1,322, full-time personnel 601. Payroll $44.1 million.

Puerto Rico International Airport (Muniz ANGB), Puerto Rico 00914; E of San Juan. Phone (809) 253-5100; DSN 979-1514. 156th Fighter Wing (ANG). Base 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 1,067, full-time personnel 385. Payroll $30.9 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 1,362, full-time personnel 339. Payroll $21.4 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 from 1947 to 1967. Area 123 acres. Runway 10,000 ft. Altitude 4,411 ft. Military 1,009, full-time personnel 322. Payroll $22.6 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 1,021, full-time personnel 323. Payroll $21.7 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 Apr. 1, 1980. 121st Air Refueling Wing (ANG); Naval Air Reserve and Naval Construction (USNR). Base activated 1942. Formerly Lockbourne AFB; renamed May 7, 1974, in honor of Capt. Edward V. Rickenbacker, top US WW I ace and Medal of Honor recipient, who died July 23, 1973. Area 2,016 acres. Runway 12,100 ft. Altitude 744 ft. ANG military 1,353, full-time personnel 441. Payroll $32.9 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 905, full-time personnel 291. Payroll $21.2 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 Sqdn. (ANG). Also hosts ANG's 130th Engineering Installation Sqdn. and 109th Tactical Control Flt. Area 135 acres. Runway 12,000 ft. Altitude 4,220 ft. Military 1,371, full-time personnel 443. Payroll $27.2 million.

Savannah International Airport, Ga. 31402; 4 mi. NW of Savannah. Phone (912) 966-8201; DSN 860-8201. 165th Airlift Wing (ANG). Also field training site. Area 20 acres. Runway 9,400 ft. Altitude 50 ft. Military 988, full-time personnel 347. Payroll $22.3 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 1,136, full-time personnel 281. Payroll $22.1 million.

Selfridge ANGB, Mich. 48045-5046; 3 mi. NE of Mount Clemens. Phone (313) 307-5553; DSN 273-5553. 127th Wing (ANG); 927th Air Refueling Wing (AFRC). Also hosts Air Force, Navy Reserve, Marine Corps Reserve, Army Reserve, Army 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 Fort Myer, Va., when plane piloted by Orville Wright crashed. Area 3,070 acres. Runway 9,000 ft. Altitude 583 ft. ANG military 1,686, full-time personnel 449. Payroll $61.8 million. AFRC military 811, civilians 60, Air Reserve technicians 176. Payroll $18.8 million.

Sioux Gateway 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 980, full-time personnel 336. Payroll $25.4 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 917, full-time personnel 358. Payroll $24.2 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 Sqdn. (ANG). Area 114 acres. Runway 9,000 ft. Altitude 1,052 ft. Military 1,137, full-time personnel 336. Payroll $28.8 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 1,523, full-time personnel 624. Payroll $40.7 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 Sqdns. (ANG). Area 371 acres. Runway 9,000 ft. Altitude 421 ft. Military 1,058, full-time personnel 343. Payroll $26.2 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 1,023, full-time personnel 321. Payroll $24.9 million.

Truax Field (Dane County Regional Airport), Wis. 53704-2591; 2 mi. N of Madison. Phone (608) 242-4200; DSN 724-8200. 115th Fighter Wing (ANG). Activated June 1942 as AAF base; taken over by Wisconsin ANG in Apr. 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 949, full-time personnel 337. Payroll $23.8 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 1,542, full-time personnel 916. Payroll $67.7 million.

Tulsa International Airport, Okla. 74115. Phone (918) 832-8300; DSN 956-5210. 138th Fighter Wing (ANG); 219th Electronic Installation Sqdn. Area 82 acres. Runway 10,000 ft. Altitude 676 ft. Military 1,190, full-time personnel 321. Payroll $23.1 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 and providing training for ANG flying units. 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 205, full-time personnel 91. Payroll $7.6 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 910, full-time personnel 273. Payroll $24.1 million.

Westover ARB, Mass. 01022-5000; 10 mi. NE of Springfield. Phone (413) 557-1110; DSN 589-1110. AFRC base. 439th Airlift Wing (AFRC). Also home of Army, Navy, and Marine Corps Reserve units. Base dedicated Apr. 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 10,400 ft. Altitude 244 ft. Full-time personnel (AFRC and tenant units): 502 Air Reserve technicians, 557 civilians. Part-time Reservists: 2,676. Payroll $75 million. Housing: 356 VAQ (500 beds), 50 VOQ (80 beds).

Willow Grove ARS, Pa. 19090-5203; 14 mi. N of Philadelphia. AFRC base with ANG unit as tenant. 913th Airlift Wing (AFRC host). Phone (215) 443-1062; DSN 991-1062. Full-time civilians 170, Reservists 1,055, Air Reserve technicians 180. Reserve area 162 acres. Altitude 356 ft. Payroll $23.5 million. Reserve base activated in Aug. 1958. Tenant: 111th Fighter Wing (ANG). Phone (215) 443-1501; DSN 991-1501. ANG military 1,037, full-time personnel 268. Payroll $20.4 million. ANG area 39 acres. AFRC shares use of adjacent runway (8,000 ft.) at NAS/JRB Willow Grove.

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 2,577, full-time personnel 370. Payroll $21.3 million.

Yeager Airport, W. Va. 25311-5000; 4 mi. NE of Charleston. Phone (304) 341-6126; DSN 366-6210. 130th Airlift Wing (ANG). Airport 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 903, full-time personnel 243. Payroll $15.5 million.

Youngstown-Warren Regional Airport ARS, Ohio 44473-0910; 16 mi. N of Youngstown. Phone (330) 392-1000; DSN 346-1000. AFRC base. 910th Airlift Wing (AFRC). Host to 757th Airlift Sqdn.; 773d Airlift Sqdn.; 76th Aerial Port Sqdn.; Navy Reserve; Marine Corps Reserve; Army Corps of Engineers; and FAA. Base activated in 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. ■

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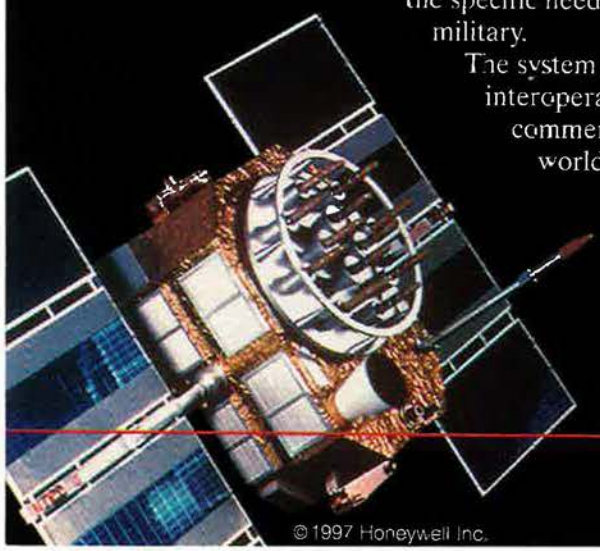

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Records, Trophies, and Competitions

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 (FAI), 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 (NAA), 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 Rutan and Jeana Yeager	*Voyager* experimental aircraft	Edwards AFB, Calif., to Edwards AFB, Calif.	December 14–23, 1986
Great circle distance without landing: 24,986.727 miles (40,212.139 kilometers)	Richard Rutan and Jeana Yeager	*Voyager* experimental aircraft	Edwards AFB, Calif., to Edwards AFB, Calif.	December 14–23, 1986
Distance in a closed circuit without landing: 24,986.727 miles (40,212.139 kilometers)	Richard Rutan and Jeana Yeager	*Voyager* experimental aircraft	Edwards AFB, Calif., to Edwards AFB, Calif.	December 14–23, 1986
Altitude: 123,523.58 feet (37,650.00 meters)	Alexander Fedotov	E-266M, a modified MiG-25 "Foxbat"	Podmoskovnoye, USSR	August 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, 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, 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., 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-airplane.
1912 **Glenn H. Curtiss.** Flying boat.
1913 **Orville Wright.** Automatic stabilizer.
1914 **Elmer A. Sperry.** Gyroscopic control.
1915 **W. Sterling Burgess.** Burgess-Dunner hydro-aeroplane.
1916 **Elmer A. Sperry.** Drift indicator.
1917–20 **No award.** (World War I).
1921 **Grover Loening.** Aerial yacht.
1922 **US Mail Service.**
1923 **US Mail Service.** Night flying.
1924 **US Army.**
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.** NACA cowling.
1930 **Harold Pitcairn and staff.** Autogiro.
1931 **Packard Motor Car Co.** Aircraft diesel 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, equipment of substratosphere airplane.
1938 **Howard Hughes and crew.** Around-the-world flight.
1939 **US airlines.** Air travel safety record.
1940 **Dr. Sanford Moss,** Army Air Corps. Supercharger.
1941 **Air Forces and airlines.** Worldwide operations.
1942 **Gen. H. H. Arnold.** Leadership of US Army Air Forces.
1943 **Capt. Luis De Flores,** USNR. Synthetic training devices.
1944 **Gen. Carl A. Spaatz.** US air campaign against Germany.
1945 **Dr. Luis W. Alvarez.** Ground-controlled 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 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.
1954 **Richard Travis Whitcomb.** Discovery, verification of area rule.
1955 **William M. Allen, Boeing Airplane Co., Gen. Nathan F. Twining, USAF.** B-52 bomber.
1956 **Charles I. 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 **US Air Force/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 **US Air Force, GD-Convair, Space Technologies 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., 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 Mach 3 aircraft.
1964 **Gen. Curtis E. LeMay.** Lifetime achievement in airpower and defense.
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., Lt. Col. William A. Anders, US spaceflight team.** 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 Co., Pratt & Whitney, 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 Seventh and Eighth Air Forces, Navy Task Force 77.** Operation Linebacker II.
1973 **Skylab Program, William C. Schneider, Skylab astronauts.** Skylab operations.
1974 **John F. Clark, NASA; Daniel J. Fink, GE; NASA-industry LANDSAT team; RCA; Hughes.** Space technology in resource and environmental management.
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 **Paul B. MacCready, Aeroenvironment, 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, Col. Joe H. Engle, Capt. Richard H. Truly.** First flights of *Columbia,* first shuttle.
1982 **T. A. Wilson, Boeing Co., supported by the FAA, industry, airlines.** 757 and 767 airliners.
1983 **US Army, Hughes Helicopters, industry team.** AH-64A Apache helicopter.

1984 **NASA, Martin Marietta Corp., Astronaut Capt. Bruce McCandless II, Charles E. Whitsett, Jr., Walter W. Bollendonk.** Manned maneuvering units, satellite rescues.
1985 **Russell W. Meyer, Cessna Aircraft Co., 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 aircraft.
1991 **Northrop-USAF industry team.** B-2 bomber.
1992 **Aerospace Corp., Rockwell International Corp., IBM Federal Systems Co., US Naval Research Laboratory, USAF.** Navstar Global Positioning System.
1993 **Hubble Space Telescope recovery team.** NASA Mission Directors: **Joseph Rothenberg, Brewster Shaw, J. Milton Heflin, Randy Brinkley,** and crew members of the space shuttle *Endeavour:* **Col. Richard O. Covey, Lt. Col. Tom D. Akers, Cmdr. Kenneth D. Bowersox, Kathryn C. Thornton, Claude Nicollier, Jeffrey Hoffman, F. Story Musgrave.**
1994 **US Air Force, McDonnell Douglas Corp., 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. Shapler W. Fitzgerald.
1915 Lt. B. W. Jones.
1916–17 Inactive.
1918 Lt. Edward V. Rickenbacker.
1919 Lt. Belvin W. Maynard, Lt. Alexander Pearson, Jr., Lt. R. S. Worthington, Capt. John O. Donaldson, Capt. Lowell H. Smith, Lt. Col. Harold E. Hartney, Lt. E. H. Manzelman (posthumously), Lt. R. G. Bagby, Lt. D. B. Gish, and Capt. F. Steinle.
1920 Capt. St. Clair Streett, Capt. Howard T. Douglas, 1st Lt. Clifford C. Nutt, 2d Lt. Erik H. Nelson, 2d Lt. C. H. Crumrine, 2d Lt. Ross C. Kirkpatrick, Sgt. Edmond Henriques, Sgt. Albert T. Vierra, and Sgt. Joseph E. English.
1921 Lt. John A. Macready.
1922 Lt. John A. Macready and Lt. Oakley G. Kelly.
1923 Lt. John A. Macready and Lt. Oakley G. Kelly.
1924 Capt. Lowell H. Smith, 1st Lt. Leigh Wade, 1st Lt. Leslie P. Arnold, 1st Lt. Erik H. Nelson, 2d Lt. John Harding, Jr., and 2d Lt. Henry H. Ogden.
1925 Lt. Cyrus Bettis and Lt. James H. Doolittle.
1926 Maj. Herbert A. Dargue, Capt. Ira C. Eaker, Capt. Arthur B. McDaniel, Capt. C. F. Wolsey (posthumously), 1st Lt. J. W. Benton (posthumously), 1st Lt. Charles McRobinson, 1st Lt. Muir S. Fairchild, 1st Lt. Bernard S. Thompson, 1st Lt. Leonard D. Weddington, and 1st Lt. Ennis C. Whitehead.
1927 Lt. Albert F. Hegenberger and Lt. Lester J. Maitland.
1928 1st Lt. Harry A. Sutton.
1929 Capt. Albert W. Stevens.
1930 Maj. Ralph Royce.
1931 Maj. Gen. Benjamin D. Foulois.
1932 1st Lt. Charles H. Howard.
1933 Capt. Westside T. Larson.
1934 Brig. Gen. Henry H. Arnold.
1935 Maj. Albert W. Stevens and Capt. Orville Anderson.
1936 Capt. Richard E. Nugent, 1st Lt. Joseph A. Miller, 1st Lt. Edwing G. Simenson, 2d Lt. William P. Ragsdale, Jr., 2d Lt. Burton W. Armstrong, 2d Lt. Herbert Morgan, Jr., TSgt. Gilbert W. Olsen, SSgt. Howard M. Miller, and Corpsman 2d Class Frank B. Conner.
1937 Capt. Carl J. Crane and Capt. George V. Holloman.
1938 2d Bombardment Group (General Headquarters Air Force). All those in the 2d Bombardment Group at the time of the "Good Will" flight to Buenos Aires, Argentina, February 15–27, 1938, should be considered recipients.
1939 Maj. Caleb V. Haynes, Maj. William D. Old, Capt. John A. Samford, Capt. Richard S. Freeman, 1st Lt. Torgils G. Wold, MSgt. Adolph Cattarius, TSgt. Henry L. Hines, TSgt. William J. Heldt, TSgt. David L. Spicer, SSgt. Russel 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 Escort 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). "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 Composite Air Strike Force, X-Ray Tango. Rapid deployment to Far East.
1959 4520th Aerial Demonstration Team. Goodwill tour of Far East.
1960 6593d Test Squadron (Special). Aerial recoveries of space capsules.
1961 Lt. Col. William R. Payne, Maj. William L. Polhemus, and Maj. Raymond R. Wagener, 43d Bomb Wing, SAC. Carswell AFB, Tex.-to-Paris nonstop flight, two speed records.
1962 Maj. Robert G. Sowers, Capt. Robert McDonald, 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/SR-71 Test Force (Col. Robert L. Stephens, Lt. Col. Daniel Andre, Lt. Col. Walter F. Daniel, Maj. Noel T. Warner, and Maj. James P. Cooney). YF-12A flight that established nine speed and altitude records.
1966 Col. Albert R. Howarth. Courage and airmanship in Southeast Asia.
1967 Maj. John J. 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 Lt. Col. 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, Mission AAM 1962-01 (Capt. David M. Sprinkel and crew). US-USSR energy research project.
1978 C-5 Aircrew, Mission AM 770021 (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 Squadron. 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 Crew E-113, 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, 68th Air Refueling Group, SAC. Emergency transatlantic refueling of Marine A-4s.
1987 Det. 15, USAF Plant Representative Office, and B-1B SPO. 72 record B-1B flights.
1988 C-5 crew, 436th Military Airlift Wing. Mission to Semipalatinsk, USSR, as part of INF accord.
1989 B-1B crew, 96th Bombardment Wing. Emergency landing of B-1B.
1990 AC-130 crew, 16th Special Operations Squadron. Panama operations.
1991 MH-53 crew, 20th Special Operations Squadron. Rescue of downed Navy F-14 pilot inside Iraq during Persian Gulf War.
1992 C-130 crew (13 Air Combat Command members and one Air Force Intelligence Command member). Emergency landing of unarmed C-130 after incurring heavy damage from two Peruvian fighters in international airspace.
1993 B-52 crew, 668th Bomb Squadron, 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 Squadron, ACC, NAS Keflavik, Iceland. Rescue of six Icelandic sailors from foundered merchant vessel *Godinn.*
1995 Aircrew BAT-01, Dyess AFB, Tex. Demonstrated the B-1B's endurance and speed by flying 36 hours, 13 minutes, 36 seconds in an around-the-world flight from Dyess AFB.

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, the Netherlands	F-102A
1967	317th FIS, Elmendorf AFB, Alaska	F-106A/B
1968	64th FIS, Clark AB, the 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 RTAFB, 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, the Netherlands	F-15A/B
1980	32d TFS, Soesterberg AB, the 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	178th FS (ANG), Hector IAP, N. D.	F-16A/B

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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. Sponsored by the National Geographic Society, the trophy is presented annually to Air Force individuals or organizations (civilian or military) who made the year's outstanding progress in the field of aerospace.

1961 **Capt. Virgil I. Grissom.** Mercury spacecraft *Liberty Bell 7* flight.
1962 **Maj. Robert M. White.** X-15 flight to 59.6 miles.
1963 **Maj. L. Gordon Cooper.** Twenty-two Earth orbits in Mercury spacecraft *Faith 7.*
1964 **Air Force Systems Command.** Reliable space-launch vehicles.
1965 **Lt. Col. Edward H. White II.** First US walk in space, Gemini 4.
1966 **Dr. Alexander H. Flax.** Direction of 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.** First manned moon orbit flight.
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 W. Hartsfield, Jr.** Skylabs 1, 2, 3, and 4 and parasol device for Skylab 1.
1974 **Col. William R. Pogue.** Third manned Skylab mission.
1975 **Maj. Gen. Thomas P. Stafford.** Apollo-Soyuz Test Project.
1976 **Gen. William J. Evans.** Development of space systems.
1977 **Fred W. Haise, Jr., Lt. Col. Charles G. Fullerton.** First test flight of space shuttle *Enterprise.*
1978 No award given.
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 Henry Engle, USAF, Capt. Richard H. Truly, USN.** Second flight of orbiter *Columbia.*
1982 **Lt. Gen. Richard Charles Henry.** Military use of payload specialists on shuttle; established Air Force Space Command.
1983 **Gen. James V. Hartinger.** Strengthening national security through space operations.
1984 **Lt. Gen. Forrest S. McCartney.** Commander of Space Division, Air Force Systems Command.
1985 **Maj. Gen. Donald W. Henderson.** Commander of Air Force Space and Missile Test Organization.
1986 **Gen. Donald J. Kutyna.** Director of Space Systems and Command, Control, and Communications for the Deputy Chief of Staff.
1987 **Col. Victor Whitehead.** Restoring launch capacity after *Challenger* disaster and Titan 34D launch failures.
1988 **Dr. Robert R. Barthelemy.** X-30 hypersonic plane project.
1989 **Launch Systems Directorate, Space Systems Division.** Expendable launch boosters and satellite systems.
1990 **Lt. Gen. Donald L. Cromer, USAF (Ret.), Gen. John L. Piotrowski, USAF (Ret.).** Strengthening USAF space systems and forces.
1991 **Lt. Gen. Thomas S. Moorman, Jr.** Vice Commander of Air Force Space Command.
1992 **Maj. Gen. Nathan J. Lindsay, USAF (Ret.).** Director of the Office of Special Projects, Office of the Secretary of the Air Force, Los Angeles AFB, Calif.
1993 **Gen. Merrill A. McPeak.** Air Force Chief of Staff.
1994 **Gen. Charles A. Horner.** Commander, Air Force Space Command.
1995 **Gen. Joseph W. Ashy.** Commander, Air Force Space Command.

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. The next competition is tentatively scheduled for May 1997.

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, Tex.	B-50D
1952	93d BMW, Castle AFB, Calif.	B-50D
	97th BMW, Biggs AFB, Tex. (tie)	B-50D
1953	92d BMW, Fairchild AFB, Wash.	B-36D
1954	11th BMW, Carswell AFB, Tex.	B-36H
1955	320th BMW, March AFB, Calif.	YRB-47B
1956	11th BMW, Carswell AFB, Tex.	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 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, recognizing the best aircrews, maintenance teams, and munitions load teams. In 1993, bomber crews participated in Gunsmoke for the first time.

Year	Individual	Aircraft	Unit, Base
1949	Lt. Calvin K. Ellis	F-80	4th FW, Langley AFB, Va.
	Lt. William Crawford	F-47	332d FW, Lockbourne Army Air Base, Ohio
1950	Lt. John W. Roberts	F-86	3525th FWS, Nellis AFB, Nev.
1951–53	No competition		
1954	Capt. Charles C. Carr	F-86	3595th TFW, Nellis AFB, Nev.
1955	Maj. Frederick C. Blesse	F-86	3596th CCTS, Nellis AFB, Nev.
1956	Capt. Asa Whitehead	F-86	3595th CCTW, Nellis AFB, Nev.
1958	Maj. Jack F. Brown	F-100	4520th CCTW, Nellis AFB, Nev.
1960	Capt. Aubrey C. Edinburgh	F-100	4520th CCTW, Nellis AFB, Nev.
1962	Capt. Charles E. Tofferi	F-104	479th TFW, George AFB, Calif.
1964–80	No competition		
1981	Lt. Col. Wayne Schultz	A-7	120th TFS (ANG), Buckley ANGB, Colo.
1983	Lt. Col. Roy Niesz	F-16	388th TFW, Hill AFB, Utah
1985	Capt. Mark Fredenburgh	F-16	50th TFW, Hahn AB, West Germany
1987	Maj. Danny Hamilton	F-16	419th TFW, Hill AFB, Utah
1989	Capt. Patrick Shay	F-16	944th TFG (AFRES), Luke AFB, Ariz.
1991	Lt. Col. Roger G. Disrud	A-10	442d TFW (AFRES), Richards-Gebaur AFB, Mo.
1993	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.
1995	Pacific Air Forces Team*		

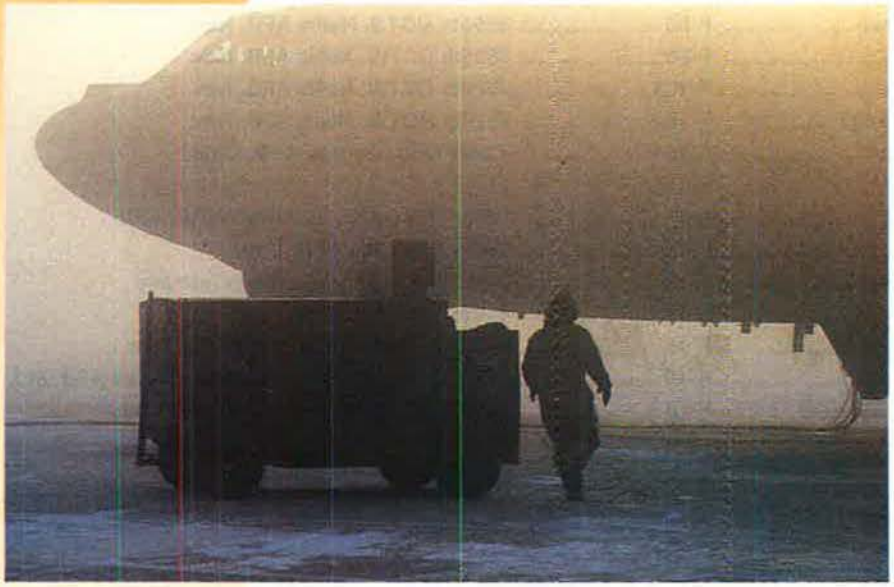
*In 1995, Gunsmoke was redesigned, and no individual trophies were awarded.

Air Force enlisted troops are critically important, performing such vital tasks as aerospace maintenance, Security Police duties, and information management. The enlisted force has been USAF's backbone since long before the days when these two mechanics worked on an early jet engine.

Women have been part of USAF's enlisted force since the beginning, but the number of Air Force Specialty Codes open to them has skyrocketed, and their numbers have been steadily increasing. In 1976, for example, women constituted just 6.7 percent of the enlisted force, while today that number is approaching 17 percent and shows no sign of shrinking.

USAF photo by MSgt. Buster Kellum

Photo by Randy Jolly



Wherever the Air Force goes, it brings its enlisted people, whether it's in freezing Minot AF3, N. D. (left), or Elmendorf AFB, Alaska, or in broiling Incirlik AB, Turkey, or Howard AFB, Panama. From chief master sergeants to airmen, the enlisted troops make it possible for today's Air Force to be anywhere in the world at a moment's notice. ■

The William Tell Weapons Meet

The Air Force's William Tell air-to-air weapons meet, held at Tyndall AFB, Fla., includes events for pilots, weapons controllers, weapons loaders, and maintainers to provide a complete test for a unit in the air-to-air business. The next meet is scheduled for October 1998.

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, the Netherlands	F-102A
	71st FIS, Selfridge AFB, Mich.	F-106A
	331st FIS, Webb AFB, Tex.	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, Me.	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, Tex.	F-101B
	86th TFW, Ramstein AB, West Germany	F-4E
	49th FIS, Griffiss AFB, N. Y.	F-106A
1980	147th FIG (ANG), Ellington AFB, Tex.	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, AFRES, 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, Tex.	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, the 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 week-long Rodeo '96 at McChord AFB, Wash., showcased the top USAF active-duty, Air National Guard, and Air Force Reserve aircraft and teams and those of allied nations. The next Rodeo is scheduled for June 1998. 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 (AFRES), 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 (AFRES Assoc.), McChord AFB, Wash.
1993	440th AW (AFRES), General Mitchell IAP, Wisc.
1994	19th ARW, Robins AFB, Ga.
1996	19th ARW, Robins AFB, Ga.

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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

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 (SOS); 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	SOS	6th SOPS Offutt AFB, Neb.	DMSP
	SPSS	17th SPSS, RAF Edzell, UK	LASS
	SWS	8th SWS, Eldorado AS, Tex.	Pave Paws
	SLS	1st SLS, Cape Canaveral AS, Fla.	Delta II
1996	SOS	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

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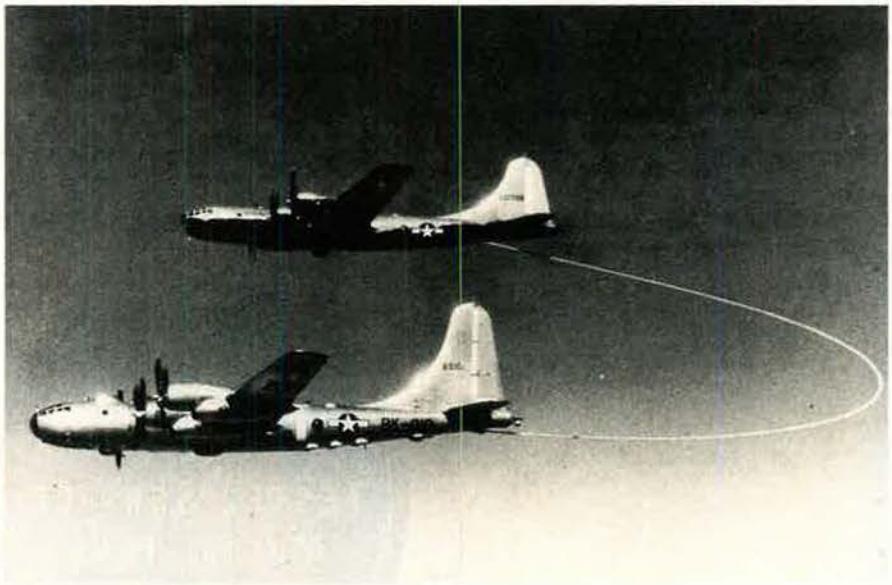
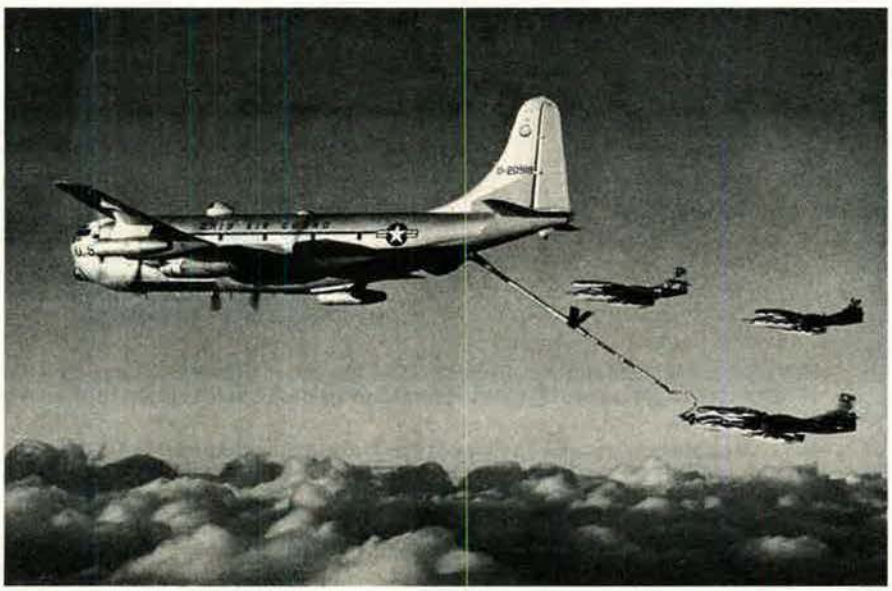
The B-50 Lucky Lady II dramatically demonstrated the efficacy of air refueling during a record-setting, nonstop, around-the-world flight in 1949. Capt. James G. Gallagher commanded the aircraft on the 94-hour flight, which began and ended in Fort Worth, Tex. The converted Superfortress was refueled four times during the flight by KB-29s, such as the top aircraft at right.



Ray Pamplin via Warren Thompson

The KB-50 did not last in the bomber force for long. The bulk of its service life was spent in the refueling and reconnaissance roles. Here, a KB-50, which could refuel three aircraft simultaneously, helps an F-104 Starfighter stay airborne over Spain in the 1960s. J47 jet pods had to be added to the tanker to boost its speed because Tactical Air Command fighters had difficulty going slowly enough to refuel from it.

Another early tanker that eventually needed a jet assist was the KC-97, originally a transport variant of the B-29. Though purpose-built KC-135s began to replace it in 1957, the KC-97 saw service in Vietnam and into the 1970s (right) with such units as the Ohio Air National Guard. This photo was taken very late in the KC-97's career—note the O before the serial number, which stands for "Obsolete." ■



USAF Almanac

Gallery of USAF Weapons

By Susan H. H. Young ■ Edited by John W. R. Taylor

Attack and Observation Aircraft

A-10/OA-10 Thunderbolt II

Large military load, long loiter, and wide combat radius combine to make the A-10 a formidable weapon for the close air support (CAS) mission. In a typical antiarmor mission, the A-10, affectionately nicknamed "Warthog," can fly 150 miles and remain on station for an hour. It can carry up to 16,000 lb of mixed ordnance with partial fuel or 12,086 lb with full internal fuel. The 30-mm GAU-8/A gun provides a cost-effective weapon with which to defeat the whole array of ground targets encountered in the CAS role, including tanks. Equipment includes an inertial navigation system (INS), head-up display (HUD), night vision goggles (NVGs), the Low-Altitude Safety and Targeting Enhancement (LASTE) system (which provides ground collision avoidance), Pave Penny laser target identification pod, electronic countermeasures (ECM), target penetration aids, self-protection systems, and associated equipment for AGM-65 Maverick missiles and AIM-9 Sidewinder air-to-air missiles.

The first operational squadron was activated at Myrtle Beach AFB, S. C., in June 1977 and achieved operational capability in October of that year. Delivery of 713 A-10s was completed in March 1984. In October 1987, the first **OA-10**s entered service for use in the forward air control (FAC) mission, providing coordination for, and control of, CAS assets. These aircraft are A-10s that have been redesignated and are intended to be used for airborne FAC of fighter aircraft, combat escort, search and rescue, and visual reconnaissance. The 30-mm GAU-8/A gun is retained, but underwing stores are normally restricted to canisters of white phosphorous rockets for target marking.

A/OA-10-equipped units include US Air Forces in Europe's 52d FW at Spangdahlem AB, Germany; Air Combat Command's 23d Wing, Pope AFB, N. C.; 347th Wing, Moody AFB, Ga.; and 355th Wing, Davis-Monthan AFB, Ariz.; and Pacific Air Forces' 354th FW, Eielson AFB, Alaska, and 51st FW, Osan AB, South Korea. The 57th Wing, Nellis AFB, Nev., has A-10s supporting the 422d TES and the USAF Weapons School. The first first-line aircraft to be assigned to the ANG, A-10s are the subject of a near-term night-capability upgrade. Together with OA-10s, they equip the 103d, 104th, 110th, 111th, and 124th FWs, and 175th Wing, at Bradley IAP, Conn., Barnes MAP, Mass., W. K. Kellogg Airport, Mich., Willow Grove ARS, Pa., Boise Air Terminal, Idaho, and Baltimore, Md., respectively. AFRC units equipped with A/OA-10s include the 47th and 303d FSs at Barksdale AFB, La., and Whiteman AFB, Mo., respectively.

A-10s were used extensively during the Persian Gulf War. They are currently deployed to Aviano AB, Italy, where they are operated by active-duty, ANG, and AFRC personnel, currently 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 in that area, supplementing Operation Southern Watch. *(Data for A-10.)*

Contractor: Fairchild Republic Company, Division of Fairchild Industries.

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.

Weights: empty 28,000 lb, max gross 52,000 lb.

Performance: combat speed at S/L, clean, 439 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 underwing hardpoints and three under fuselage for up to 16,000 lb of ordnance, incl various types of free-fall or guided bombs, Combined Effects Munition (CEM) dispensers, gun pods, up to six AGM-65 Maverick missiles, up to four AIM-9 Sidewinder missiles, and jammer pods. Chaff and flares carried internally to counter radar-directed or infrared-directed threats. The centerline pylon and the two flanking fuselage pylons cannot be occupied simultaneously.

***A-10** Thunderbolt II* (Guy Aceto)

***AC-130H** Spectre* (Randy Jolly)

AC-130H/U Spectre

Air Force Special Operations Command's 16th SOW, based at Hurlburt Field, Fla., operates two versions of the AC-130 Spectre gunship. Eight **AC-130H**s serve with the 16th SOS, each equipped with a digital fire-control computer, two fixed 20-mm Vulcan cannon, one trainable 40-mm cannon, and a trainable 105-mm howitzer. They employ electro-optical (EO) sensors and target-acquisition systems, including forward-looking infrared (FLIR) and low-light-level television (LLLTV), and are capable of in-flight refueling. Fire-control computers, navigation, communications, and sensor suites have been upgraded. AC-130Hs have been deployed to Somalia, Bosnia, and Liberia.

Thirteen new **AC-130U**-configured gunship conversions by Rockwell International have been delivered to the 16th SOW's 4th SOS. These aircraft have greater altitude capability and combine increased firepower, reliability, and superior accuracy, with the latest methods of target location. The AC-130U has the same 40-mm and 105-mm guns as the H model but replaces the two 20-mm cannon 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 true adverse weather ground-attack operations.

ECM on all versions of the gunship enhances survivability in a low-to-medium threat environment. Other equipment includes a HUD, combined INS, Navstar Global Positioning System (GPS), and Spectra ceramic armor protection. Each model is capable of providing precise surgical firepower and of performing special operations and conventional missions, including escort, surveillance, armed reconnaissance/interdiction, CAS, and air base defense. *(Data basically as for the C-130.)*

Bombers

B-1 Lancer

The B-1's speed, superior handling qualities, and large payload capability make it a key element of any composite strike force, in either a penetration or standoff role. Each of Air Combat Command's 95 B-1s possesses the flexibility to deliver Mk 82 conventional gravity general-purpose bombs, CBU-87 and -89 cluster munitions, and the CBU-97 Sensor-Fuzed Weapon, or to carry additional fuel, as required. The M117 750-lb conventional gravity bomb and Mk 62 500-lb naval mine will be added to the B-1's list of weapons this fiscal year. The B-1's conventional capability is being significantly enhanced by the ongoing Conventional Mission Upgrade Progam (CMUP). This gives the B-1 greater lethality and survivability through the integration of precision and standoff weapons and a robust ECM suite. Future phases of CMUP include installation of GPS receivers, a MIL-STD-1760 weapon

interface, secure radios, and improved computers to support precision weapons, including, initially, the Joint Direct Attack Munition (JDAM), eight each on three modified bomb bay rotary launchers, followed by the Joint Standoff Weapon (JSOW) and the Joint Air-to-Surface Standoff Missile (JASSM).

The B-1 has a blended wing/body configuration with variable-geometry wings. The unswept wing setting permits rapid takeoff from shorter runways and less sophisticated airfields. The fully swept position is used in supersonic flight and for the primary role of high-subsonic, low and medium altitude penetration. The bomber's offensive avionics include a modern forward-looking radar and terrain-following radar (TFR), an extremely accurate INS, computer-driven avionics, strategic Doppler radar, and a radar altimeter.

***B-1B** Lancer* (Randy Jolly)

***B-2A** Spirit* (Ted Carlson)

The current defensive avionics package, built around the ALQ-161 ECM system, is supplemented by chaff and flares to protect against radar-homing and heat-seeking missiles. Aircraft structure and radar-absorption materials reduce the aircraft's radar signature to approximately one percent of that of a B-52.

Initial operational capability (IOC) for the B-1 was achieved at Dyess AFB, Tex., in September 1986, and deliveries were completed in April 1988. Current active-duty unit locations are at Dyess AFB, Ellsworth AFB, S. D., and Mountain Home AFB, Idaho. Current ANG units locations include McConnell AFB, Kan., and Robins AFB, Ga.

Contractors: Rockwell International, North American Aircraft; Eaton Corporation, AIL Systems; Boeing Military Airplanes; 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 ejection seats.

Dimensions: span spread 136 ft 8½ in, fully swept 78 ft 2½ in, length 147 ft 0 in, height 34 ft 0 in.

Weights: empty equipped 192,000 lb, max operating weight 477,000 lb.

Performance: max speed at low level high subsonic (supersonic at altitude); range intercontinental.

Armament: three internal weapons bays capable of accommodating in a nuclear role 24 B61 or B83 free-fall nuclear bombs; in a nonnuclear role up to 84 Mk 82 (500-lb) bombs or Mk 62 mines; from FY 1997, up to 30 CBU-87/89/97s and up to 12 M117 bombs.

B-2 Spirit

This unique advanced-technology aircraft was conceived originally as a highly survivable strategic bomber to supplement, and ultimately replace, the B-1 in its penetration role. More recently, the focus has turned to the B-2's conventional capabilities, casting it as a lead weapon system used to bring about the early engagement and destruction of an enemy's warmaking assets and potential. The B-2 employs sophisticated technologies, notably low-observable (LO) stealth techniques and the Hughes AN/APQ-181 low-probability-of-intercept radar, to minimize the possibility of detection. This capability allows the B-2 to attack heavily defended targets and neutralize enemy defenses, allowing less stealthy systems to operate.

Procurement of 21 operational B-2s will enable the 509th Bomb Wing, Whiteman AFB, Mo., to field two squadrons, each with eight operational aircraft. IOC with the 393d Bomb Squadron is scheduled this year. Full operational capability (FOC) with the 715th BS should occur by the end of 1999.

Of flying wing configuration, the B-2 has no vertical tail surfaces. The smoothly blended "fuselage" section accommodates a two-person flight crew, with room for a third person, 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 overwing intake ducts and shielded overwing trailing-edge nozzles. The aircraft has a quadruple-redundant fly-by-wire digital flight-control system, actuating moving surfaces at the wing trailing edges that combine aileron, elevator, and rudder functions. A landing gear track of 40 ft enables the B-2 to use any runway that can handle a Boeing 727 airliner.

***B-52H** Stratofortress* (Randy Jolly)

B-2 production is in three blocks of capability. Block 10 aircraft (nos. two to 16) can carry B83 nuclear bombs or 16 Mk 84 2,000-lb conventional munitions. Block 20 aircraft (nos. 17 to 19) additionally carry the B61 nuclear bomb and the GPS-Aided Targeting System/GPS-Aided Munition (GATS/GAM) that will provide an "early, interim, near-precision" strike capability. Up to 16 GAMs can be carried on two rotary launcher assemblies. Upgrade of Block 10 aircraft to Block 20 standard began in 1996. Block 20 aircraft are currently being delivered direct from the assembly line, so the fleet at Whiteman AFB will be composed entirely of Block 20 aircraft early this year and then will begin transition to Block 30 capability. The last two aircraft (nos. 20 and 21) will be delivered in Block 30 configuration, with full PGM capability, including up to 16 JDAMs on the rotary launcher assemblies, and will carry the Mk 82 500-lb bomb, cluster munitions, including Sensor-Fuzed Weapons, the M117 750-lb bomb, and the Mk 62 air-delivered sea-mine on a bomb rack assembly. Other Block 30 enhancements will include fully operational defensive and offensive avionics, a more sophisticated mission planning system, and additional operating modes for the synthetic aperture radar (SAR). All aircraft will reach Block 30 capability by 1999. Extensions to the B-2's conventional capabilities beyond Block 30 configuration are under consideration, including the introduction of such new weapons as JSOW and upgraded communications, within a framework of reduced operation and maintenance costs.

The first B-2 made its first flight from Air Force Plant 42 in Palmdale, Calif., to Edwards AFB, Calif., in July 1989 and was eventually put in storage. The first production aircraft was delivered to Whiteman AFB on December 17, 1993. First overseas mission took place on 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. The 1996 appropriations bill provided an extra $493 million of unspecified funding for the B-2, enabling the first B-2 to be removed from storage and refurbished for service as an operational bomber by 2000, providing a total fleet of 21 aircraft.

Prime Contractor: Northrop Grumman Corporation, 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: basic crew of two, on ejection seats, with provision for a third seat.

Dimensions: span 172 ft 0 in, length 69 ft 0 in, height 17 ft 0 in.

Weights: empty 100,000–110,000 lb, gross 376,000 lb.

Performance: 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 11,000 miles.

Armament: in a nuclear role: up to 16 B61 nuclear bombs, or 16 B83 nuclear bombs, or a combination. In a conventional role: 16 Mk 84 2,000-lb bombs or 16 2,000-lb GAMs. Various other conventional weapons, incl the Mk 82 500-lb bomb, M117 750-lb bomb, Mk 62 500-lb naval mine, JDAM, JASSM, and CBU-87/89/97 cluster bombs, will be incorporated in the B-2 beginning FY 1998 and completing FY 2002.

B-52 Stratofortress

The only version of the Stratofortress still in service is the B-52H. Its still-expanding weapons capability reflects this bomber's continuing ability to perform a wide variety of missions, including show of force, maritime interdiction, precision strikes, and defense suppression. Deliveries of 106 B-52Hs began in May 1961; 94 remain operational in active and reserve units.

Improvements introduced in the early 1970s included an AN/ASQ-151 EO viewing system, using FLIR and LLLTV sensors to enhance low-level flight capability; Phase VI avionics, including ALQ-122 SNOE (Smart Noise Operation Equipment) and AN/ALQ-155(V) advanced ECM; an Air Force satellite communications kit permitting worldwide communications via satellite; a Dalmo Victor ALR-46 digital radar warning receiver; Westinghouse ALQ-153 pulse-Doppler tail warning radar; and an improved ITT Avionics ALQ-172 ECM jamming system. A digital-based solid-state offensive avionics system with inertial guidance, TERCOM (terrain comparison) guidance, and microprocessors to upgrade the navigation and weapon delivery systems was also fitted.

Deployment of the B-1 and B-2 led to a change in the primary role of the B-52 to ALCM (AGM-86) and, latterly, ACM (AGM-129) carrier. A typical profile envisaged multiple cruise missile launches at high altitude, often followed by B-52 low-level descent to attack additional targets using gravity weapons.

Currently, the conventional capabilities of the remaining B-52 fleet are being enhanced to extend 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; addition of a third AN/ALQ-172 EWS; 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. A universal bomb bay adapter will improve speed and safety in switching from nuclear to conventional weapons. A reengining option is under consideration.

On August 26, 1995, a B-52H broke the world speed record for an aircraft weighing 440,000–550,000 lb, with a payload of 11,000 lb, flying unrefueled for 6,250 miles at 549 mph.

Contractor: Boeing Military Airplanes.
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 0 in, length 160 ft 11 in, height 40 ft 8 in.
Weight: more than 488,000 lb.
Performance (approx): max level speed at high altitude 595 mph, ceiling 55,000 ft, 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, air-dropped mines, cluster bombs, and, on some aircraft, three to four AGM-142A Have Nap missiles, or eight AGM-84 Harpoons in underwing clusters.

Fighters

F-15 Eagle

USAF's primary air-superiority fighter, the basic F-15 serves with ACC, PACAF, USAFE, Air Education and Training Command (AETC), and ANG. The original single-seat **F-15A** and two-seat **F-15B** were followed in June 1979 by the **F-15C** and **F-15D**, respectively, with 2,000 lb of additional internal fuel and provision for carrying conformal fuel tanks (CFTs). Basic F-15 equipment includes a Hughes Aircraft APG-63 or APG-70 lightweight X-band pulse-Doppler radar for long-range detection and tracking of small high-speed objects down to treetop level. An ongoing F-15 Multistage Improvement Program (MSIP) was initiated in February 1983, with the first production MSIP F-15C produced in 1985. Improvements include an upgraded central computer, a Programmable Armament Control Set allowing for advanced versions of AIM-7, AIM-9, and AIM-120A, and an expanded Tactical Electronic Warfare System that provides improvements to the ALR-56C radar warning receiver and ALQ-135 countermeasures set; the final 43 included Hughes APG-70 radar. More than 350 F-15C/Ds are scheduled to have their APG-63 radar upgraded from the end of the decade. F-15C/Ds 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.

The **F-15E** is USAF's two-seat, dual-role, totally integrated fighter for all-weather air-to-air and deep interdiction missions. The rear cockpit is upgraded to include four multipurpose CRT displays for aircraft systems and weapons management, with 17 separate menu displays to choose from. Modifications to the front cockpit include redesigned controls, a wide-field-of-view HUD, and three CRT multipurpose displays. The F-15E is capable of carrying up to 24,500 lb of ordnance. The digital, triple-redundant Lear Siegler flight-control system permits coupled automatic terrain following, and navigational accuracy is improved by a Honeywell ring-laser gyro INS. 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 Hughes APG-70 radar and LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) pods, with wide-field FLIR. GPS capability was scheduled for installation from 1997.

To accommodate the new avionics, internal fuel capacity was reduced slightly, but the F-15E is fitted with CFTs, adapted to carry ordnance tangentially to reduce drag. In addition to its primary load of guided and unguided bombs and other air-to-ground weapons, the F-15E retains its air-superiority performance and weapons. Armament options include AIM-7 Sparrow, AIM-9 Sidewinder, and AIM-120 AMRAAM, as well as EO, infrared (IR), and standard bombs; AGM-65 Maverick; dispenser munitions; and nuclear weapons. AGM-130 was integrated in 1993; future options include JSOW. The 4th Wing at Seymour Johnson AFB, N. C., was the first operational F-15E wing. F-15Es now equip ACC, PACAF, and USAFE units. Forty-eight USAF F-15Es were deployed to the Persian Gulf where they operated mainly at night, hunting Scud missile launchers and artillery sites using the LANTIRN system. They also forged a successful operational partnership with the Joint Surveillance and Target Attack Radar System (Joint STARS) aircraft. Recent deployments include AEF missions to the Middle East. A total of 221 F-15Es was authorized between FY 1986 and FY 1997; 132 are in combat-ready status in 1997.

An advanced experimental version of the F-15, the **F-15 short takeoff and landing/maneuvering technology demonstrator (SMTD),** has been used for research into advanced thrust-vectoring technology at the Air Force Flight Test Center at Edwards AFB, Calif. In testing, the aircraft demonstrated high maneuverability, in-flight thrust reversing, and reductions of 35 percent in takeoff distance and 65 percent in landing distance, as well as the ability to land autonomously at night and in poor weather. Tests begun in 1994 are to assess the performance and technology benefit of Pratt & Whitney's new axisymmetric, multidirectional, thrust-vectoring nozzle. The first supersonic flight using only nozzles for flight control took place June 1996. *(Data for F-15C, except where stated.)*

Contractor: McDonnell Aircraft Company, Division of McDonnell Douglas Aerospace.
Power Plant: F-15C: two Pratt & Whitney F100-PW-220 turbofans; each approx 23,450 lb thrust, standard since 1985. F-15E: two Pratt & Whitney F100-PW-220; each approx 23,450 lb thrust, or F100-PW-229 turbofans; each approx 29,100 lb thrust.
Accommodation: pilot only in F-15A/C; two seats in F-15B/D; crew of two in F-15E on zero/zero ejection seats.
Dimensions: span 42 ft 9¾ in, length 63 ft 9 in, height 18 ft 5½ in.
Weights: empty 28,600 lb, gross 68,000 lb in F-15A/B/C/D; empty 32,000 lb, gross 81,000 lb in F-15E.
Performance: F-15C: max speed Mach 2.5, ceiling 60,000 ft, 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. F-15E: max level speed at height Mach 2.5, max range 2,762 miles.

***F-15C** Eagle* (Guy Aceto)

F-15E (Guy Aceto)

***Block 50 F-16** Fighting Falcon* (Guy Aceto)

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. Provision for carrying up to 24,500 lb of ordnance on weapon stations of F-15E.

F-16 Fighting Falcon

Since entering service with the 388th Tactical Fighter Wing at Hill AFB, Utah, in January 1979, the F-16 has deployed to units throughout the Air Force and equips the Thunderbirds team. The F-16 incorporated advanced technologies from the start, making the initial single-seat **F-16A** and two-seat **F-16B** versions 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, and most now belong to ANG. However, 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/maintainability improvements include a ring-laser gyro INS and installation of the upgraded F100-PW-220E turbofan.

A forward-looking plan for the aircraft, known as the Multinational Staged Improvement Program, was implemented by USAF in February 1980 to ensure the aircraft's ability to 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. Stage II was applicable to Block 25 improved **F-16C** (single-seat) and **F-16D** (two-seat) versions, with cockpit, airframe, core avionics changes, and Westinghouse APG-68 radar, with increased range and advanced electronic counter-countermeasures (ECCM), of which deliveries to USAF began in July 1984.

Stage III extends to Block 50/52 F-16C/Ds and includes selected retrofits back to Block 25. These aircraft have Stage II capabilities plus advanced cockpit displays including a wide-angle HUD. Weapons improvements include multitarget AMRAAM compatibility. Also introduced at Block 40/42 were systems improvements that include core avionics hardware, installation of a LANTIRN nav/attack system, GPS, enhanced-envelope gunsight, digital flight controls, automatic terrain following, increased T-O weight and maneuvering limits, an 8,000-hour airframe, and expanded envelope 9*g* capability. Block 40 fighters specialize in night attack with precision guided weapons. Follow-on systems include ALE-47 improved defensive countermeasures, ALR-56M advanced radar warning receiver, advanced programmable signal processor employing very-high-speed integrated circuit (VHSIC) technology in the APG-68(V5) fire-control radar, full HARM capability, a ring-laser gyro INS, and Increased Performance Engines (IPEs) supplied by Pratt & Whitney (F100-PW-229) and General Electric (F110-GE-129).

F-16C/Ds had earlier acquired interim HARM capability for defense suppression/destruction missions in conjunction with the now-retired F-4G "Wild Weasels." The AN/ASQ-213 HARM Targeting System (HTS) gives the F-16 Block 50/52 autonomous capability to launch

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HARMs in the range-known mode. USAF is acquiring more than 100 F-16 HTSs for use in conjunction with RC-135 Rivet Joint EW aircraft for SEAD missions. A program was begun in 1994 to equip 125 AFRES F-16C/Ds with British Aerospace Terprom (terrain profile matching) for ground collision avoidance.The 249 USAF F-16 multimission fighters deployed to the Persian Gulf theater flew more sorties than any other type during Operation Desert Storm, with 13,500 missions. F-16Cs are currently deployed to patrol the no-fly zones in southern Iraq and to Bosnia in support of NATO operations.

Of the original F-16A/Bs, 272 were modified to **F-16 ADF** (air defense fighter) standard, under a contract awarded in October 1986, to replace F-106s and F-4s in ANG continental air defense units. The F-16 ADF entered service in 1989, but most of the aircraft are now in storage.

In another program, 229 Block 50/52 USAF F-16C/Ds are to be retrofitted with a new modular mission computer (MMC) being developed under an F-16 midlife update codevelopment and coproduction program with the European participating governments of the F-16 Multinational Fighter Program.

Current proposals include the modification of 250 Block 40 F-16C/Ds as CAS/BAI aircraft in the late-1990s to early 2000s. Modifications include a new chaff and flare system and radar warning receiver, a missile warning system, night vision goggles with compatible cockpit lighting, and improved data modem. Meanwhile, ANG's 174th FW at Syracuse, N. Y., was the first unit to convert from A-10s to F-16As in the dedicated CAS/BAI role, with centerline GPU-5/A 30-mm gun pod.

No F-16s were procured for USAF in FY 1995, but $264 million was appropriated in FY 1997 for 12 new aircraft. In January 1995, Lockheed completed flight testing an F-16C fitted with mock conformal fuel tanks, an internal FLIR, two 2000-lb laser-guided bombs, two AMRAAMs, and two AIM-9 missiles to represent its new "enhanced strategic" **F-16ES** fighter. The new version would have a greatly extended range, with an unrefueled combat radius of more than 1,000 miles. Follow-on improvements to be considered as part of an MSIP Phase IV include Block 40 MMC, Joint Helmet Mounted Cuing System, AIM-9X, 600-gallon tanks, JTIDS, and improved weapons capabilities. *(Data for F-16C.)*

Contractor: Lockheed Martin Corporation.

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: span over missiles 32 ft 9¾ in, length overall 49 ft 4 in, height 16 ft 8½ in.

Weights: 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 class, ceiling more than 50,000 ft, 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 IR missiles; seven other external stores stations for fuel tanks and air-to-air and air-to-surface munitions.

F-22A

First flight of this new air-superiority fighter is expected in May this year. Designed as follow-on for the F-15, the F-22A combines a highly maneuverable airframe at both sub- and supersonic speeds with LO stealth technologies, enabling it 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. Its fully integrated avionics and weapon systems will permit simultaneous engagement of multiple targets. A Hughes Common Integrated Processor (CIP) is being developed using VHSIC technology to tie together various avionics functions. The cockpit will feature six flat-panel displays with multifunction display (MFD) bezel buttons permitting pilot information-display choice.

The F-22's $20.4 billion engineering and manufacturing development (EMD) program has included provision for ground-attack capability since 1993 as a result of the Pentagon's Bottom-Up Review. Further mission capabilities are being explored, including strategic attack/interdiction, reconnaissance and surveillance, and lethal and nonlethal Suppression of Enemy Air Defenses (SEAD) missions. Projected armament includes an 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.

Two prototype YF-22s were built for competitive evaluation with two Northrop/McDonnell Douglas YF-23s. In April 1991, the Lockheed/Boeing/General Dynamics team (General Dynamics has since sold its aircraft business to Lockheed) was selected to build the production-configured F-22, with Pratt & Whitney chosen to develop, and more recently to study improvements to, the F119 engine for the aircraft. In August 1991, the F-22 successfully passed the Defense Acquisition Board Milestone 2 and commenced the EMD phase. In this phase USAF will receive nine single-seat F-22As and use two airframes for stress testing. The preliminary design review of all aspects of the design was completed in April 1993, and 231 Critical Design Reviews of subsystems were completed before the start of the air vehicle Critical Design Review in late February 1995. First flight test engine was delivered in September 1996. The first of a planned 438 production aircraft is expected to achieve IOC in 2004. Funding of $2.0 billion was authorized for FY 1997.

Contractor: Lockheed Martin Corporation, 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, ceiling above 50,000 ft, range more than 2,000 miles.

F-117A Nighthawk

Operational with the 49th FW at Holloman AFB, N. M., since 1992, the F-117A was the first production combat type designed to exploit low-observable technology. Development and manufacture began simultaneously in November 1978 within a highly classified environment; 60 aircraft were built, and 59 deployed initially with the 37th TFW, at Tonopah Test Range Airfield, Nev., from which operations were restricted mainly to night flying in order to maintain secrecy, although three aircraft were lost in much-publicized accidents. Revealed officially in November 1988, the F-117A's first operational deployment was to Panama in support of Operation Just Cause. During the Persian Gulf War, more than 40 F-117As undertook 1,270 missions, attacking top-priority targets.

The F-117A embodies many components that were either transferred or modified from existing aircraft, in order to minimize the potential risks involved in the decision to proceed concurrently with full-scale development (FSD) and low-level production. Its designers at the Lockheed "Skunk Works" at Burbank, Calif., relied on the concept of faceting to give the aircraft its minimal radar signature. The skin panels of the arrowhead-shaped airframe (leading-edge sweep of 67.5°) are divided into many small, perfectly flat surfaces, which reflect at a variety of angles all signals from probing hostile ground or airborne radars. Much of the aircraft's external surface is made of composite radar-absorbent materials, with the trailing-edge parts now fabricated out of a newly developed resin that is not only harder to damage but can withstand higher temperatures. The F-117A's dull black finish reflects little light. The engine air intakes and exhaust nozzles are above the wings and rear fuselage, respectively, to shield them from IR seekers below.

Two General Electric F404 nonafterburning turbofans give the aircraft low noise signature and high subsonic performance. Quadruple-redundant fly-by-wire flight controls and a state-of-the-art digital avionics suite, complemented by a specially developed automated mission-planning system, are key features of the aircraft. A Pilot Activated Automatic Recovery System, which will recover a tumbling aircraft to straight and level flight, was delivered to Tactical Air Command (TAC, now ACC) in late 1990. Retractable radio antennas are located beneath the fuselage. High-precision INS is installed, with FLIR and DLIR (downward-looking infrared) housed in a steerable turret built into the underside of the aircraft, with a boresight laser designator and an autotracker, to ensure precision attack. Various major improvement programs have been under way since 1989, including installation of a "four-dimensional" flight management system and new cockpit instrumentation, featuring full-color multifunction displays and digital moving map; FLIR and DLIR upgrade (from 1994); and installation of GPS capability and ring-laser gyro INS (from 1991). A range of midlife improvements is being studied.

***Block 40 F-16** Fighting Falcon* (Guy Aceto)

YF-22 (Randy Jolly)

***F-117A** Nighthawk* (Randy Jolly)

F-117A-equipped units at ACC's 49th FW include the combat-coded 8th and 9th FSs and the 7th FS, which serves as the F-117A FTU; the 79th TEG, Det. 1, operates one F-117A OT&E aircraft.

Contractor: Lockheed Martin Skunk Works.

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.

Weights: 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.

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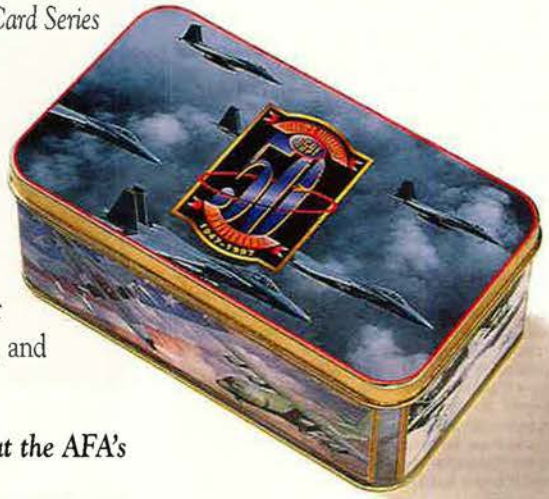

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Armament: full internal carriage of what is described as a wide variety of tactical weapons, incl laser-guided 2,000-lb munitions; alternatively, AGM-65 Maverick or AGM-88 HARM; provisions for AIM-9 Sidewinder.

Helicopters

HH-1H Iroquois

Used for missile site support duties by Air Force Space Command (AFSPC), the HH-1H is a general-purpose military version of the Bell Model 205 helicopter, first ordered by USAF in 1970.

Contractor: Bell Helicopter Textron Inc.
Power Plant: one Textron 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 0 in, height 13 ft 0 in.
Weight: gross 9,500 lb.
Performance: max speed 120 mph, ceiling at mission gross weight 13,450 ft, range with max fuel 347 miles.

UH-1N Iroquois

A twin-engine version of the UH-1 utility helicopter, 79 UH-1Ns were ordered for USAF, most of which remain in the inventory for missile site support duties with AFSPC and for administrative airlift with AMC. The UH-1N is also used by the 58th SOW at Kirtland AFB, N. M., for training purposes.

Contractor: Bell Helicopter Textron Inc.
Power Plant: Pratt & Whitney Canada T400-CP-400 Turbo "Twin-Pac," consisting of two PT6 turboshafts coupled to a combining gearbox with a single output shaft; flat-rated to 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 2¼ in, length of fuselage 42 ft 4¾ in, height 14 ft 10¼ in.
Weight: gross and mission weight 11,200 lb.
Performance: max cruising speed at S/L 115 mph, ceiling 13,000 ft, 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.

MH-53J Pave Low/TH-53A

Equipping units of the special operations forces (SOF), **MH-53J** heavy-lift helicopters are HH/CH-53B/C and MH-53Hs upgraded to Pave Low III "Enhanced" standard. These highly sophisticated aircraft are equipped with a nose-mounted FLIR, an integrated digital avionics suite that includes Texas Instruments AN/APQ-158 terrain-following and terrain-avoidance radar, GPS, INS, Doppler, secure communications, armor plating, mounts for .50-caliber machine guns and/or 7.62-mm Miniguns, and an ECM suite consisting of AN/ALQ-162 continuous wave radar missile jammers, ALQ-157 IR missile jammers, ALE-40 flare/chaff dispensers, ALR-69 radar warning receivers, and AAR-47 missile launch detectors.

Programmed upgrades include the Integrated Defense Avionics System (IDAS)/multimission advanced tactical terminal (MATT) modification. The IDAS/MATT system blends on-board EW systems with off-board, over-the-horizon intelligence derived from national systems relayed through the MATT receiver and displayed graphically via a digital map on an NVG-compatible, color, multifunction cockpit display. 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. Deliveries of 41 modified aircraft began in the summer of 1987 to the 20th SOS at Hurlburt Field, Fla., followed by the 21st SOS, now at RAF Mildenhall, UK. MH-53Js were also delivered to the 31st SOS at Osan AB, South Korea. The 542d CTW, now the 58th SOW, at Kirtland AFB, N. M., received four. This unit also uses six **TH-53As**, 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. *(Data for MH-53J.)*

Contractor: Sikorsky Aircraft, Division of United Technologies Corporation.

***UH-1N** Iroquois* (Guy Aceto)

***MH-53J** Pave Low* (Randy Jolly)

***MH-60G** Pave Hawk* (Randy Jolly)

Power Plant: two General Electric T64-GE-100 turboshafts; each 4,330 shp.
Accommodation: crew of six.
Dimensions (HH-53B): 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.

MH/HH-60G Pave Hawk

Ninety-eight Black Hawk helicopters were modified to MH/HH-60G Pave Hawk configuration to meet USAF combat search-and-rescue and SOF requirements. The 10 **MH-60Gs** operated by AFSOC's 16th SOW provide a wide variety of SOF mission capabilities, including infiltration/exfiltration and personnel recovery as a collateral SOF mission and humanitarian relief. The **HH-60Gs**, used by active-duty, AFRC, and ANG air rescue units, provide combat search and rescue and various mission-support activities worldwide. MH-60Gs are also operated by the 58th SOW for training purposes. 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. A weather/ground-mapping radar, with beacon tracking and KG-10 map reader, completes the tactical navigation suite; both have unsecure VHF and secure FM, HF, UHF, and SATCOM for communications. Further modifications include an integral rescue hoist and window-mounted 7.62-mm miniguns, with provisions for a .50-caliber machine gun and an external stores support system (ESSS) for weapons and additional fuel capability on SOF aircraft only. An air refueling system and removable long-range internal fuel tanks, combined with C-5 mobility modifications, permit rapid-response, long-range/loiter mission profiles requiring a broad scale of payload possibilities. *(Data for MH-60G.)*

Contractor: Sikorsky Aircraft, Division of United Technologies Corporation.
Power Plant: two General Electric T700-GE-700/701C turboshafts; each 1,560 shp.
Accommodation: crew of three or four; 11–14 troops, up to six litters, or internal or external cargo.
Dimensions: rotor diameter 53 ft 8 in, length of fuselage 50 ft 0¾ in, height 16 ft 10 in.
Weights: empty 10,624 lb, max gross 22,500 lb.
Performance: max speed 222 mph, ceiling 19,000 ft, max range, with reserves, 373 miles (internal fuel), 500 miles (auxiliary tank).

CV-22 Osprey

Development is continuing of this variant of the USMC MV-22, expected to fulfill Air Force SOF requirement for high-speed, long-range, V/STOL aircraft capable of low-visibility, clandestine penetration/extraction of denied areas in adverse weather. The CV-22 is a tiltrotor, multimission aircraft, based on Bell's XV-15, designed to have the maneuverability and lift capability of a helicopter and the speed of a fixed-wing aircraft. It is designed to carry 18 troops over a 575-mile combat radius at 265 mph, or 8,000 lb of internal cargo, with a capability to hover out of ground effect at 3,900 ft pressure altitude and 82° Fahrenheit. With less stringent midmission parameters, the range could exceed 865 miles. Self-deployment range will be 2,420 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.

A Bell/Boeing consortium is the prime contractor. Boeing has overall responsibility for the aircraft's tail unit, overwing fairings, and fuselage, while Bell provides the wing, nacelles, transmissions, and rotor hub assemblies. Under subcontracts, Textron Aerostructures is responsible for the design and manufacture of the V-22's tail unit and General Electric for the digital fly-by-wire flight-control system.

First flight of a V-22 Osprey was made in March 1989, and 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, leading to a significant reduction in empty weight. The aircraft have demonstrated speed in excess of 400 mph, completed initial sea trials, formation flying, and cross-country evaluations. The CDR was passed in December 1994. First flight of an EMD aircraft is imminent.

USAF is acquiring 50 CV-22s. AFSOC is scheduled to receive its first aircraft in 2003, with IOC for 12 Ospreys in 2005. In addition, USMC will receive 425 MV-22s and USN 48 HV-22s

Power Plant: two Allison T406-AD-400 turboshafts; each 6,150 shp.
Dimensions: proprotor diameter 38 ft 0 in, width, rotors turning 83 ft 10 in, fuselage length 57 ft 4 in, height over tailfins 17 ft 7¾ in.
Weights: 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, ceiling 26,000 ft, range with internal auxiliary tanks 1,700 miles.

Reconnaissance and Special-Duty Aircraft

U-2R/RT/S/ST

The **U-2R** single-seat, single-engine, high-altitude reconnaissance aircraft, flown initially in 1967, is a significantly larger and more capable version of the original U-2 aircraft produced in the late 1950s. Structurally identical to the U-2R, the TR-1A first flew in 1981 and was designed for standoff tactical reconnaissance in Europe. The last U-2 and TR-1 aircraft were delivered to USAF in October 1989. In 1992, all U-2s and TR-1s were consolidated under the designation U-2R. The entire fleet (31 single-seat U-2Rs and four **U-2RT** two-seat trainers) is being reengined with the General Electric F118-101, a derivative of the engine used in the B-2, providing improved performance and supportability. Reengined aircraft are redesignated **U-2S/ST.** Conversion is expected to be completed by 1998.

The U-2 provides critical intelligence to national decision-makers and theater commanders through all phases of conflict, including peacetime indications and warning, crisis, low-intensity conflict, and large-scale hostilities. It is capable of collecting multisensor photo, electro-optic, infrared, and radar imagery, as well as performing other types of intelligence functions. U-2s are based at Beale AFB, Calif., and support national and tactical requirements from four operational detachments throughout the world. Current upgrades to its sensors will extend the U-2's usefulness well into the next century.

Contractor: Lockheed Corporation.
Power Plant: initially, one Pratt & Whitney J75-P-13B turbojet; 17,000 lb thrust; being reengined with F118-GE-101 turbojet.
Dimensions: span 103 ft 0 in, length 63 ft 0 in, height 16 ft 0 in.
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.
Armament: none.

U-2R (Ted Carlson)

EC-130E ABCCC (Randy Jolly)

EC-130H "Compass Call" (Ted Carlson)

RC-135V Rivet Joint (Ted Carlson)

SR-71 "Blackbird"

Three multisensored supersonic SR-71 "Blackbird" aircraft were reactivated in FY 1995 to provide wide-area reconnaissance and intelligence support. The refurbished aircraft are assigned to Edwards AFB, Calif., under the command of the 9th RW, Beale AFB. The SR-71 was retired originally in 1990 after 24 years of service.

Contractor: Lockheed Corporation.
Power Plant: two Pratt & Whitney JT11D-20B (J58) turbojet engines; each 34,000 lb thrust with afterburning.
Accommodation: crew of two in tandem, on ejection seats.
Dimensions: span 55 ft 7 in, length 107 ft 5 in, height 18 ft 6 in.
Weights: empty 60,000 lb, gross 172,000 lb.
Performance: max speed at 78,750 ft more than Mach 3, operational ceiling above 80,000 ft.
Armament: none.

EC-130

Several variants of the basic C-130 have been produced for specialized missions, including the following:

The **EC-130E ABCCC,** used as an Airborne Battlefield Command and Control Center by the 42d Electronic Combat Squadron at Davis-Monthan AFB, Ariz. Seven aircraft were updated by Unisys to ABCCC III standard. EC-130s have been deployed in support of NATO operations in Bosnia.

The **EC-130E "Commando Solo"** psychological operations broadcasting version operated by ANG's 193d SOW, Harrisburg IAP, Pa. Lockheed Aircraft Service (LAS) has upgraded the unit's four EC-130 Rivet Rider aircraft to the worldwide color television (WWCTV) configuration, plus two other conversions; the sixth aircraft was scheduled for delivery in February 1997. The 193d's EC-130Es have conducted numerous missions, more recently in support of Operations Just Cause and Desert Shield/Storm and in support of Haitian operations. They also have a role in civil emergencies. Secondary mission for Commando Solo aircraft is electronic attack in the military frequency spectrum.

The **EC-130H "Compass Call"** communications jammer, which played a vital role in disrupting Iraqi military communications at strategic and tactical levels during the Persian Gulf War. EC-130Hs are operated by the 41st and 43d ECSs at Davis-Monthan AFB, Ariz. Altogether, 14 EC-130Hs are in service.

As new C-130J aircraft are procured, priority for replacement will be given to special mission aircraft. *(Data basically as for C-130.)*

EC-135, etc.

Several aircraft in the KC-135 Stratotanker series were modified for specialized missions during production or at a later date. Thirty-nine are modified for strategic airborne command-and-control missions. Five KC-135A tankers were converted for Airborne Command Post use by Strategic Air Command (SAC) in 1960. Additional aircraft were modified in 1962, and 17 new-production KC-135B turbofan aircraft entered the system in 1965. Currently, **EC-135C/Y** aircraft are assigned to ACC, PACAF, and USAFE. They are fitted with extensive communications equipment to support strategic command-and-control missions of their respective CINCs. On July 24, 1990, EC-135Cs ceased to be on continuous airborne alert, but at least one of these air refuelable aircraft flies a mission each day, accommodating a flight crew of four, a general officer, and a staff of 18. Twelve are in service and have been adapted to provide control of Minuteman ICBMs.

Five **EC-135A/E advanced range instrumentation aircraft (ARIA)** are operated by the Air Force Flight Test Center's 452d FTS, Edwards AFB, Calif., as telemetry and voice relay stations to supplement land and sea receiver stations for DoD, NASA, and NATO customers. The aircraft's distinctive bulbous nose houses the world's largest airborne steerable antenna.

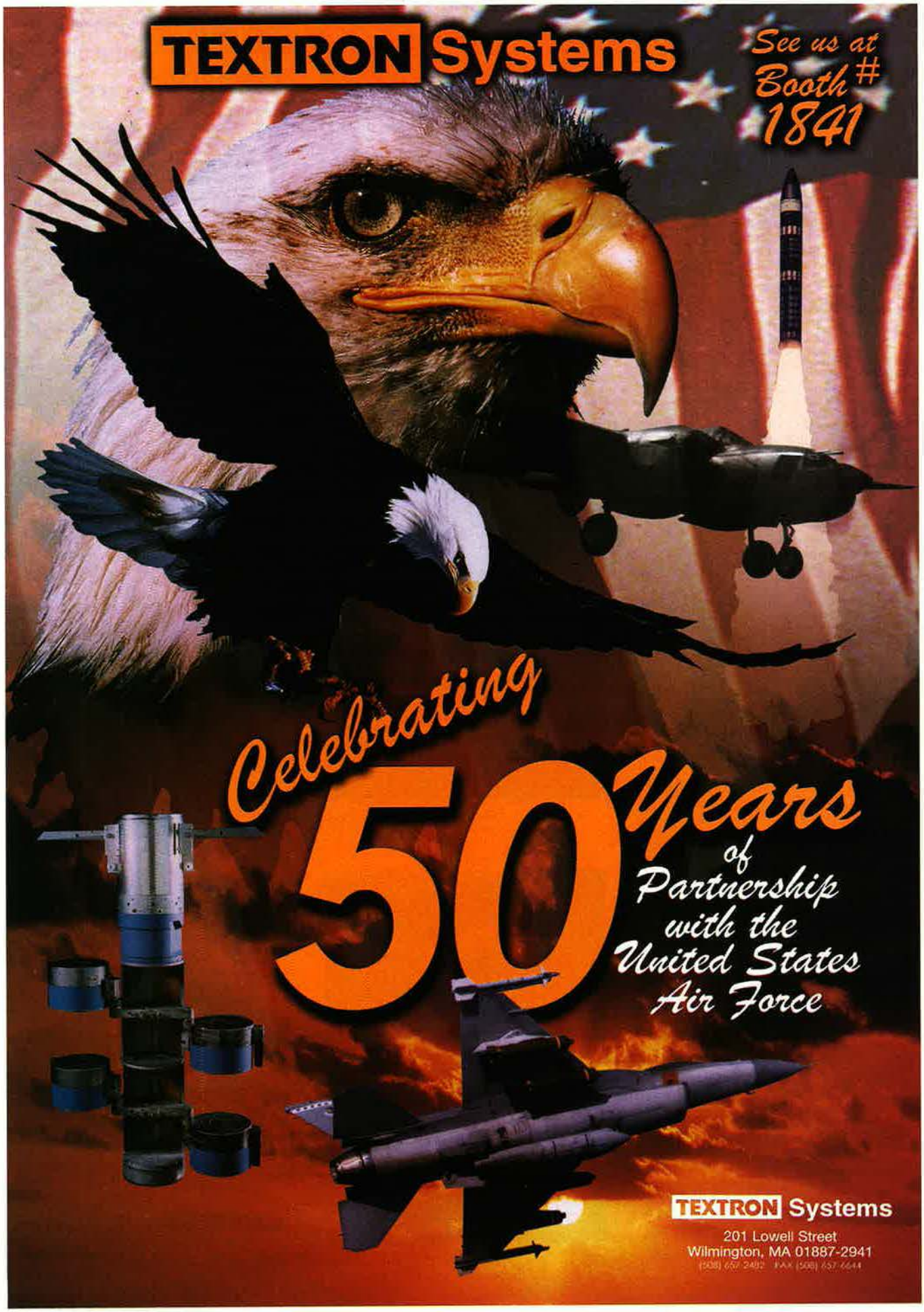
Versions of the C-135 Stratolifter series used for reconnaissance include turbofan **RC-135Ss, RC-135Us, RC-135Vs,** and **RC-135Ws,** operated by ACC's 55th Wing, Offutt AFB, Neb., for specific reconnaissance tasks. RC-135s have operated in the Persian Gulf region since 1990. RC-135 Rivet Joints will help replace now-retired F-4Gs by loitering near battlefields and providing data on enemy air defense systems to crews of F-16 HTS aircraft. Funding for further Rivet Joint aircraft was approved in the FY 1997 budget. The 55th Wing also operates a modified version of the WC-135, designated **OC-135B,** with an infrared linescanner, synthetic aperture radar, and forward- and vertical-looking video cameras, to monitor the 1992 Open Skies Treaty; program requirement is for three aircraft.

To minimize the cost of retrofitting special-purpose -135s with more efficient turbofan engines, USAF installed in some aircraft refurbished Pratt & Whitney JT3D-3Bs taken from Boeing 707-100B aircraft, purchased as surplus from commercial air carriers. Additionally, the reengining of RC-135s with fuel-efficient CFM-56 engines was funded for FY 1996 and FY 1997 (two and four engines, respectively). *(Data basically as for C-135.)*

EF-111A Raven

Developed for defense-suppression missions in worldwide support of US tactical strike forces, the EF-111A is a conversion of the basic General Dynamics F-111A airframe. Specialized equipment includes the ALQ-99E primary jammer, a derivative of the Navy ALQ-99, carried internally. This system's frequency coverage, reliability, and effective use of available jamming power enables the EF-111A to suppress extremely dense electronic defenses. Other equipment includes self-protection systems from the F-111 (ALQ-137, ALR-62). The cockpit was revised, and the ALQ-99E receivers were housed in a new vertical stabilizer. The AN/ALE-40 tactical countermeasures dispenser provides self-protection expendables. Other improvements under the avionics modernization program included upgrade of the TFR and installation of GPS equipment and a new INS.

Forty-two EF-111As were produced for missions that include barrier standoff jamming, degradation of acquisition radars during CAS operations, and close-in jamming and direct support for deep-strike missions. Flight testing began in March 1977, and the first "production" EF-111s were delivered in late 1981 to the 366th TFW at Mountain Home AFB, Idaho, where they achieved IOC with the 390th ECS in December 1983. Second operational location, from February 1984, was the 42d ECS at RAF Upper Heyford, UK, from where Libyan targets were attacked in April 1986. During the Persian Gulf War, EF-111 area jamming was crucial to the maintenance of coalition air supremacy. More recently, deployments have been made to Operations Provide Comfort and Southern Watch and to Bosnia. The EF-111A is being phased out following the decision to consolidate the standoff jamming requirement of both the Air Force and the Navy in the latter's EA-6B Prowler aircraft. Remaining aircraft have been assigned to the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429th ECS at Cannon AFB, N.M.; 24 were being retained into 1997 and 12 into 1998.
Contractor: Grumman Aerospace Corporation.
Power Plant: two Pratt & Whitney TF30-P-109 turbofans; each 19,600 lb thrust with afterburning.
Accommodation: crew of two, side by side in zero/zero escape module.
Dimensions: span spread 63 ft 0 in, fully swept 31 ft 11½ in, length 76 ft 0 in, height 20 ft 0 in.
Weights: empty 55,275 lb, gross 88,948 lb.
Performance: max combat speed 1,377 mph, ceiling with afterburning at combat weight 45,000 ft, combat radius with reserves 230–929 miles, according to mission.
Armament: none.

E-3B/C Sentry (AWACS)

The E-3 Airborne Warning and Control System (AWACS) aircraft is a mobile, flexible, survivable, and jam-resistant surveillance and command, control, and communications (C^3) system capable of all-weather, long-range, high- or low-level surveillance of all air vehicles, manned or unmanned, above all kinds of terrain. A modified Boeing 707-320B, AWACS carries an extensive complement of mission avionics, including computer, radar, IFF, communications, display, and navigation systems. The capability of AWACS is provided by its Westinghouse Electric Corp. look-down radar, which makes possible all-altitude surveillance over land or water.

The E-3 serves a dual role within USAF: as a command-and-control center to support quick-reaction deployment and tactical operations and as a survivable early warning command-and-control center for identification, surveillance, and tracking of airborne enemy forces and for the command and control of NORAD forces over the continental US.

Deliveries of the basic production version, designated **E-3A Sentry,** began in March 1977, when the first aircraft was handed over to TAC's (now ACC's) 552d ACW at Tinker AFB, Okla. Twenty-four were built. Twenty-two of them, plus two prototypes, were upgraded to **E-3B** configuration. Improvements included much-enhanced computer capabilities, antijam communications, an austere maritime surveillance capability, additional radio communications, and five additional display consoles.

A US/NATO Standard E-3A configuration was introduced starting with the twenty-fifth production USAF Sentry, delivered in December 1981. In this version, the data-processing capability was improved and a maritime detection capability included. Nine were built for USAF, and one of the original E-3As was upgraded to this standard. The 10 US Standard E-3A aircraft were subsequently upgraded to **E-3C**s, with additional command-and-control capability, in 1984–88. A further 17 Standard E-3As are operated by NATO as part of a cooperative program to upgrade the command and control of NATO's air defense forces.

The E-3 AWACS fleet is undergoing a major capabilities upgrade. All 33 USAF and 18 NATO E-3s are being equipped with the Joint Tactical Information Distribution System (JTIDS) for antijam digital communications. New passive detection systems, known as electronic support measures (ESM), will complement the active, beaming radar, enabling the aircraft to detect signals emitted by both hostile and friendly targets; trial installation was completed in 1995. Additional enhancements to US E-3s include the central computer memory upgrade and ability to employ GPS. Full-scale development (FSD) contracts for a major upgrade to the Westinghouse APY-1 and APY-2 radar, under the Radar System Improvement Program, were awarded in September 1989. This will enable the AWACS aircraft operating in the pulse-Doppler mode to detect targets with much smaller radar cross sections. IOC for these improvements is scheduled for FY 1999, with contract completion after 2000.

E-3s assumed a continental US air defense role in January 1979, when NORAD personnel began augmenting TAC E-3 flight crews on all operational NORAD missions by the 552d ACW at Tinker AFB, Okla. Overseas units include the 961st and 962d Airborne Air Control Squadrons, based at Kadena AB, Japan, and Elmendorf AFB, Alaska, respectively. The first AFRES Associate AWACS unit, the 513th ACG, was activated at Tinker AFB in March 1996. Deployments have been made to the Pacific, the Middle East, southwest Asia, the Mediterranean area, and Europe. AWACS aircraft are also used in support of the US drug enforcement program.
Contractor: Electronic Systems Division, Boeing Defense & Space Group.
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.
Performance: max speed 530 mph, ceiling above 29,000 ft, endurance six hr on station 1,000 miles from base.

E-4B

Developed in support of the National Emergency Airborne Command Post (NEACP), now the National Airborne Operations Center (NAOC), three E-4As were built, using modified Boeing 747 airframes. They provided an interim capability by utilizing existing EC-135 C^3 equipment. The first of four fully developed E-4B Airborne Command Post aircraft (three of them converted from E-4As) entered service with SAC in January 1980, and the first operational mission was flown two months later. They are hardened against the effects of nuclear explosions, including electromagnetic pulse; are equipped for in-flight refueling; contain a 1,200-kVA electrical system designed to support advanced electronics; and have a wide variety of communications equipment. This includes an LF/VLF system, improved satellite communications system, and communications processing equipment. These systems will support operations in a nuclear environment over extended ranges. The E-4B system is capable of tying into commercial telephone and radio networks and could be used for racio broadcasts to the general population. Improvements have included a data-processing capability and more survivable C^3, including initial Milstar modification. ACC is the Air Force's single-resource manager for the E-4, with the main operating base at 55th Wing, Offutt AFB, Neb.

EF-111 Raven (Guy Aceto)

E-3 Sentry (Ted Carlson)

E-4B (Ted Carlson)

E-9 (Guy Aceto)

Contractor: Boeing Aerospace Company.
Power Plant: four General Electric CF6-50E2 turbofans; each 52,500 lb thrust.
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.

E-8 Joint STARS

Delivery of the first production version of the USAF/US Army Joint Surveillance and Target Attack Radar System (Joint STARS), designated **E-8C,** took place in May 1996, to the 93d ACW at Robins AFB, Ga. Unusually, Joint STARS aircraft had aleady flown more than150 operational missions, during Operations Desert Storm (with two E-8A development aircraft) and Joint Endeavor (with one E-8A and one testbed E-8C), as part of their operational test and evaluation. As a result of their success, USAF expanded Joint STARS's original role, covering ground surveillance, targeting, and attack and battle management, to include bomb-damage assessment, Suppression of Enemy Air Defenses (SEAD), and Theater Missile Defense, with emphasis on the detection of mobile missile launchers and their decoys.

The original contract for FSD of the system was awarded to Grumman in September 1985. The company was made responsible for subsystems installation, integration, and flight testing of specialized equipment aboard two 707-300 airframes specially modified by Boeing for this purpose. The first flight of a fully Joint STARS–configured aircraft took place in December 1988. The second aircraft flew in August 1989 and became the primary test version, following the installation of additional equipment. Airborne equipment on the prototypes includes a Norden multimode side-looking radar antenna, some 25 ft long, faired into the belly of each aircraft. With a reported range in excess of 155 miles, this radar, which is integrated with GPS, operates in synthetic aperture radar 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-resisistant, high-capacity, digital data link or radio. Sensor and signal-processing systems are being upgraded. The two **E-8A** prototypes have 10 operations consoles and two communications stations. An estimated 386,100 square miles can be covered in a single eight-hour sortie, cruising at 30,000 to 40,000 ft. Because new Boeing 707 airframes are no longer available, USAF is purchasing and modifying used 707s for the E-8C production version. These carry a crew of USAF and Army specialists occupying 18 operations-and-control consoles, two of them doubling as communications stations, that display color-coded images of radar data of behind-the-lines terrain and of wheeled and tracked vehicles moving anywhere on it. The first E-8C flew in March 1994 and served as the preproduction test-bed.

Joint STARS is the US candidate to satisfy the NATO Alliance Ground Surveillance System requirement. The prototype Joint STARS was deployed to Europe for Eurostar 94. In November 1996, two E-8Cs deployed to Rhein-Main AB, Germany, again in support of Operation Joint Endeavor, to monitor withdrawal of forces from Bosnia. USAF plans to acquire 20 E-8Cs, with funding for Nos. 7 to 9 approved in the FY 1997 budget, and provision for advanced procurement for another. The two E-8A test aircraft will be upgraded to C standard and will be the last to be delivered. *(Data for E-8C.)*
Contractor: Northrop Grumman Corporation.
Power Plant: four Pratt & Whitney JT3D-3B turbojets; each 18,000 lb thrust.
Dimensions: span 145 ft 9 in, length 152 ft 11 in, height 42 ft 6 in.
Weights: empty 171,000 lb, gross 336,000 lb.
Performance: max operating speed Mach 0.84, ceiling 42,000 ft, endurance with one in-flight refueling 20 hr.

E-9A

Designated E-9A, two highly modified Boeing Canada (de Havilland) DHC-8 Dash 8M-100 aircraft are operated by the 475th Weapons Evaluation Group at Tyndall AFB, Fla., 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. This is capable of automatically detecting, tracking, and relaying data simultaneously from five pairs of distinct sources traveling at speeds of Mach 5 or more. It is 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.
Contractor: de Havilland Inc.
Power Plant: two Pratt & Whitney Canada PW120A turboprops; each 1,800 shp. (No military designation on these engines.)

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Accommodation: three: pilot, copilot, and systems operator.
Dimensions: span 85 ft 0 in, length 73 ft 0 in, height 24 ft 7 in.
Weight: gross 33,000 lb fully fueled.
Performance: max speed at 25,000 ft 245 mph, max operational altitude 25,000 ft, loiter time 5 hr.

EC-18B/D

Operational since January 1986, **EC-18B advanced range instrumentation aircraft (ARIA)** are modified former American Airlines Boeing 707-320 series transports. Four replaced some of the EC-135 ARIAs operated by the Aeronautical Systems Center's 4950th TW at Wright-Patterson AFB, Ohio (now the 452d FTS, part of the 412th TW, Edwards AFB, Calif.). In common with the EC-135 ARIAs, the 707s are converted to house the world's largest airborne steerable antenna in a bulbous nose, with a probe antenna on each wingtip and a completely new cockpit configuration. 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. The aircraft can accommodate a crew of 16 to 24.

Two Boeing 707s have been modified by Chrysler Technologies Airborne Systems, Inc., for use as dedicated Cruise Missile Mission Control Aircraft. Specialized equipment includes an AN/APG-63 surveillance radar, telemetry receiver, and weather radar. Designated **EC-18D cruise missile mission control aircraft (CMMCA),** they are operated by the 452d FTS in support of USN and USAF missile testing. They are also capable of monitoring and controlling unmanned aerial vehicles.

WC-130H

Modified C-130 Hercules transports, designated **WC-130H,** are equipped for weather reconnaissance duties, including penetration of tropical storms, to obtain data for forecasting storm movements. They are assigned to AFRC's 53d WRS at Keesler AFB, Miss. *(Data similar to those for C-130.)*

Transports and Tankers

C-5A/B/C Galaxy

The C-5 is a long-range, air refuelable, heavy logistics transport that continues to satisfy a range of global airlift requirements, whether in a combat situation or in response to the many calls for humanitarian relief worldwide. It first flew in June 1968, and USAF took delivery of 81 basic **C-5A**s between December 1969 and May 1973. Under a subsequent major modification program, Lockheed produced component kits to extend the service life of the C-5A's wings by 30,000 flight hours, without load restrictions. These kits replaced only the five main load-carrying wing boxes, to which other existing components were transferred. The use of 7175-T73511 aluminum alloy provided greater strength and resistance to corrosion. Modification of all 77 aircraft in the inventory took place between 1982 and 1987. Two AFRC squadrons and one ANG squadron are C-5A-equipped. Two C-5As, redesignated **C-5C** and assigned to Travis AFB, Calif., have been modified to carry outsize space cargo by extending the cargo bay and modifying the aft doors.

The **C-5B** is generally similar to the C-5A but embodies all the improvements introduced since completion of C-5A production. These include the strengthened wings, General Electric TF39-GE-1C turbofans, and updated avionics, including Bendix color weather radar and Delco triple INS. The original MADAR (Malfunction Detection Analysis and Recording) instrument units were replaced by the more advanced MADAR II. The first C-5B flew for the first time in 1985 and was delivered to Altus AFB, Okla., in January 1986. Deliveries of 50 aircraft were completed in April 1989. C-5 units include AMC's 60th AMW at Travis AFB, Calif., the 436th AW at Dover AFB, Del., AFRC's 301st and 312th ASs (Assoc.) at Travis AFB, 326th and 709th ASs (Assoc.) at Dover AFB, 68th AS at Kelly AFB, Tex., 337th AS at Westover ARB, Mass., ANG's 105th AW at Stewart IAP, N. Y., and AETC's 97th AMW, at Altus AFB, Okla. The reliability and maintainability of the C-5A has been the focus of numerous AMC studies. Meanwhile, a program is in hand to upgrade the C-5A fleet with the avionics subsystems developed for the C-5B, including installation of MADAR II. All of USAF's 126 Galaxys are having their flight-management systems modernized and GPS receivers installed; new, safer interior panels are also being fitted. In addition, a prototype missile defense system, incorporating Tracor AN/ALE-40 flare dispensers and a Honeywell AN/AAR-47 missile warning system, has been installed on a number of C-5s by Lockheed Martin under the Pacer Snow project. *(Data for C-5B.)*
Contractor: Lockheed Martin Corporation.
Power Plant: four General Electric TF39-GE-1C turbofans; each 43,000 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 8½ in, length 247 ft 10 in, height 65 ft 1½ in.
Weights: empty 374,000 lb, max payload 261,000 lb, gross (for 2*g*) 837,000 lb.
Performance: max speed at 25,000 ft 571 mph, ceiling (at 615,000 lb) 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.

***C-5B** Galaxy* (Nate Leong)

***C-9** Nightingale* (Guy Aceto)

C-9A/C Nightingale

In service since August 1968, the **C-9A** aeromedical airlift 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. Delivery of 21 to the former Military Airlift Command's (MAC's) 375th AAW, now redesignated (AMC's) 375th AW, was completed by February 1973; this unit is augmented by the 73d AS (Assoc.) of AFRC, collocated at Scott AFB, Ill. C-9As perform theater aeromedical evacuation in Europe and the Pacific, with four aircraft based at the 86th AW, Ramstein AB, Germany, and three at the 374th AW, Yokota AB, Japan. Because of the critical nature of its mission, the aircraft carries a flight mechanic and a small supply of spares. Three specially configured **C-9C**s were delivered to the 89th AW at Andrews AFB, Md., in 1975 for Presidential and other US governmental duties. *(Data for C-9A.)*
Contractor: Douglas Aircraft Company, Division of McDonnell Douglas Corporation.
Power Plant: two Pratt & Whitney JT8D-9 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 3 in, length 119 ft 3 in, height 27 ft 6 in.
Weight: gross 108,000 lb.
Performance: max cruising speed at 25,000 ft 565 mph, ceiling 35,000 ft, range more than 2,000 miles.

C-12C Huron

Thirty military versions of the Beechcraft Super King Air 200 were delivered to USAF under the designation C-12A in support of attaché and military assistance advisory missions worldwide. These aircraft were subsequently refitted with PT6A-41 engines and redesignated C-12C. AETC uses two C-12Cs to train aircrews. PACAF uses five C-12s for the time-sensitive movement of people and cargo. *(Data for original C-12A.)*
Contractor: Beech Aircraft Corporation.
Power Plant: two Pratt & Whitney Canada PT6A-38 turboprops; each 750 shp.
Accommodation: crew of two; up to eight passengers or 4,764 lb of cargo. Convertible to aeromedical evacuation configuration.
Dimensions: span 54 ft 6 in, length 43 ft 9 in, height 15 ft 0 in.
Weight: gross 12,500 lb.
Performance: max speed at 14,000 ft 301 mph, ceiling 31,000 ft, range at max cruising speed 1,824 miles.

C-17A Globemaster III

Developed to meet US force-projection requirements, the C-17A is a heavy-lift, air refuelable cargo transport, designed to provide inter- and intratheater airlift of all classes of military cargo, including outsize items, such as the Army's M1A2 tank. It 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. The C-17A not only enhances US airlift capability across the board but also provides much-needed force-structure modernization.

The C-17A made its first flight September 15, 1991, and completed its flight test program in June 1995. As of January, 29 production aircraft had been delivered to the Air Force. Initial operational capability of the first C-17 operational squadron was declared on January 17, 1995, at Charleston AFB, S. C., which now has two C-17 squadrons. Operational deployments have been made in support of Operation Vigilant Warrior in the Persian Gulf region and to Bosnia. The C-17 has set 22 world records for payload-to-altitude, time-to-climb, and short takeoff and landing with payload. In this last category, an Edwards AFB C-17 took off and landed in less than 1,400 ft while carrying 44,000 lb of payload.

Forty-eight production aircraft have been approved through 1997, including the first year of a historic

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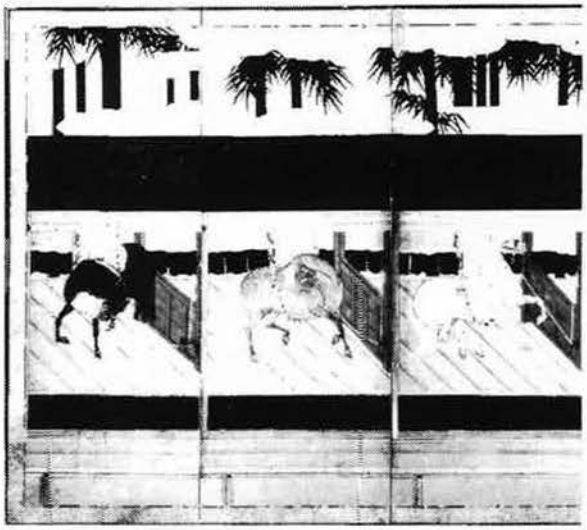

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seven-year multiyear procurement. The Defense Acquisition Board had approved an additional 80 aircraft in November 1995 after several analyses indicated that an all-C-17 fleet was more cost-effective than a mix of C-17s and commercial freighters. In January 1996, the Defense Acquisition Board endorsed, pending implementing legislation, the Air Force proposal to procure the 80 additional aircraft through a seven-year multiyear procurement. Congress approved the program in April 1996. The first C-17 with newly designed, highly cost-efficient engine nacelles is scheduled for delivery in mid-1998. 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.

The C-17 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.

Subcontractors for the C-17 program include Beech Aircraft Corp. (composite winglets), Delco Electronics Corp. (mission computer and electronic display system), Northrop Grumman Corp. (ailerons, rudder, elevators, vertical and horizontal stabilizers, and engine nacelles), GEC-Marconi (advanced HUD), Honeywell Inc. (support equipment and air data computers), and Lockheed Martin (tailcone and electronic flight-control system).

Prime Contractor: McDonnell Douglas Aerospace, Division of McDonnell Douglas Corporation.
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 154 passengers,102 paratroops, or 48 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 0 in, length 174 ft 0 in, height 55 ft 1 in.
Weights: empty 277,000 lb, max payload (2.25*g*) 170,400 lb, gross 585,000 lb.
Performance: normal cruising speed at height 518 mph (Mach 0.77), ceiling 45,000 ft, range with 130,000 lb payload 3,200 miles.

C-20A/B/H Gulfstream III/IV

Ten off-the-shelf Gulfstream III transports, each with accommodation for five crew and 14 passengers, were acquired by USAF to replace aging, fuel-inefficient C-140Bs. Three **C-20A**s and a **C-20B**, delivered to the 89th AW, Andrews AFB, Md., in FY 1983 and FY 1984 under a lease/purchase agreement, were subsequently purchased. Another six C-20Bs, with advanced mission communications equipment and revised interior, were ordered in January 1986. As these were delivered to Andrews AFB, the original three C-20As were transferred to Ramstein AB, Germany, in support of the 58th AS's special airlift mission in Europe. The C-20s provide the Special Air Mission (SAM) fleet with intercontinental range and ability to operate from short runways. 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. Designated **C-20H**, they are assigned to Andrews AFB. Two C-20B aircraft were retired. *(Data for C-20A/B.)*

Contractor: Gulfstream Aerospace Corporation.
Power Plant: two Rolls-Royce F113-RR-100 turbofans; each 11,400 lb thrust.
Accommodation: crew of five; 14–18 passengers.
Dimensions: span 77 ft 10 in, length 83 ft 1 in, height 24 ft 4½ in.
Weight: gross 69,700 lb.
Performance: max cruising speed 561 mph, ceiling 45,000 ft, range 4,050 miles.

C-21A

USAF assigns 79 C-21As for operation by active-duty and ANG units from nine US bases and four overseas locations. These 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. The first C-21A was delivered to USAF in 1984. In 1987, ANG acquired four C-21s to replace its T-39s based at Andrews AFB, Md. USAF realigned all Stateside C-21s to AMC on April 1, 1997.

Contractor: Learjet Inc.
Power Plant: two AlliedSignal TFE731-2 turbofans; each 3,500 lb thrust.
Accommodation: crew of two and up to eight passengers, or 3,153 lb cargo. Convertible to aeromedical evacuation configuration.
Dimensions: span 39 ft 6 in, length 48 ft 8 in, height 12 ft 3 in.
Weights: empty, equipped 10,119 lb, gross 18,300 lb.
Performance: max level speed at 25,000 ft 542 mph, ceiling 41,000 ft, range with max passenger load 2,420 miles, with max cargo load 1,653 miles.

***C-20B** Gulfstream III* (Ted Carlson)

C-21A (Ted Carlson)

***C-23A** Sherpa* (Ted Carlson)

C-26A

C-22B

Four Boeing 727 commercial transports were purchased and modified as C-22Bs for use by ANG on operational support airlift missions. Two of them have been further modified to accommodate an additional 1,100 gallons of fuel and landing gear rated for 170,000 lb gross landing weight.

C-23A Sherpa

Two C-23A Sherpa light transport aircraft are operated by Air Force Materiel Command (AFMC) from Edwards AFB, Calif. The Sherpa, which entered USAF service with MAC (now AMC) in 1984, is an all-freight version of the Shorts 330 regional airliner, with a 6-ft-6-in-square cabin section over an unimpeded hold length of 29 ft. Through-loading is provided via a large forward freight door, a full-width hydraulically operated rear ramp door, and removable roller conveyors.

Contractor: Short Brothers PLC.
Power Plant: two Pratt & Whitney Canada PT6A-45R turboprops; each 1,198 shp.
Accommodation: crew of three; up to 7,000 lb of freight, incl four LD3 containers, and engines the size of the F100 series.
Dimensions: span 74 ft 8 in, length 58 ft 0½ in, height 16 ft 3 in.
Weight: gross 25,500 lb.
Performance: max cruising speed at 10,000 ft 218 mph, range 770 miles with 5,000 lb payload.

VC-25A

Based on the Boeing 747-200B airframe, two VC-25A Presidential transports were delivered to the 89th AW at Andrews AFB, Md., in August and December 1990, replacing the former primary and backup "Air Force One" transports (C-137Cs). The VC-25As have a Bendix Aerospace EFIS-10 electronic flight instrument system and state-of-the-art on-board communications equipment. A pair of self-contained air-stairs are located on the left side and a built-in baggage loader on the right side. Together with a second auxiliary power unit, they allow the aircraft to be practically self-sufficient and reduce the need for ground-support equipment. Despite its long range, the VC-25A is air refuelable.

Contractor: Boeing Military Airplanes.
Power Plant: four General Electric F103-GE-102 turbofans; each 56,750 lb thrust.
Accommodation: crew of 23; up to 70 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.
Performance: high speed cruise Mach 0.88–0.91, normal cruising speed Mach 0.84, unrefueled range 7,140 miles.

C-26A/B

Eleven Fairchild Metro III commuter transport aircraft were acquired by USAF, under the designation **C-26A**, to replace ANG C-131s. The first aircraft was delivered in March 1989 and was assigned to the 147th FIG at Ellington ANGB, Tex. Serving in the Air National Guard Operational Support Transport Aircraft role, C-26As have a quick-change interior, enabling passenger seats to be replaced by a medevac or cargo-carrying configuration. In addition, 30 **C-26B**s were ordered in 1991, with deliveries from January 1992. C-26Bs have TCAS II, GPS, and microwave landing systems. *(Data for C-26A.)*

Contractor: Fairchild Aircraft Corporation.
Power Plant: two AlliedSignal TPE331-11U-612G turboprops; each 1,100 shp.
Accommodation: crew of two; 19–20 passengers.
Dimensions: span 57 ft 0 in, length 59 ft 4¼ in, height 16 ft 8 in.
Weights: empty 9,494 lb, gross 16,000 lb.
Performance: max cruising speed at midcruise weight of 12,500 lb 321 mph, ceiling 26,700 ft, range with 19 passengers 1,224 miles.

C-27A Spartan

Ten commercially available Alenia G222 medium airlifters were modified by Chrysler, under contracts awarded in August 1990 and February 1991, 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 locations accessible primarily through unimproved airfields with short, unprepared landing surfaces. They are assigned to Howard AFB, Panama.

Contractor: Chrysler Technologies Airborne Systems Inc.
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 5½ in, height 34 ft 8¼ in.
Weights: empty 35,500 lb, gross 56,878 lb.
Performance: max cruising speed 288 mph, ceiling 22,000 ft, ferry range with max fuel 1,727 miles.

C-32A

Four new Boeing 757-200s have been ordered for 1998 delivery, as C-32As, to replace C-137B/Cs.

C-130 Hercules

Still in production, the C-130 Hercules transport aircraft first flew 42 years ago and has been delivered to more than 60 countries. C-130s operate throughout USAF, serving with ACC, theater commands, AFRC, and ANG, fulfilling a wide range of operational missions in both peace and war situations. Basic and specialized versions perform a diversity of roles, 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 relief missions. In recent years, they have been used to bring humanitarian relief to many countries, including Haiti, Bosnia, Somalia, and Rwanda. Early C-130A, B, and D versions are now retired. The **C-130E** is an extended-range development of the C-130B, with large underwing fuel tanks; 389 were ordered for MAC (now AMC) and TAC (now ACC), with deliveries beginning in April 1962. A wing modification to correct fatigue and corrosion on USAF's force of

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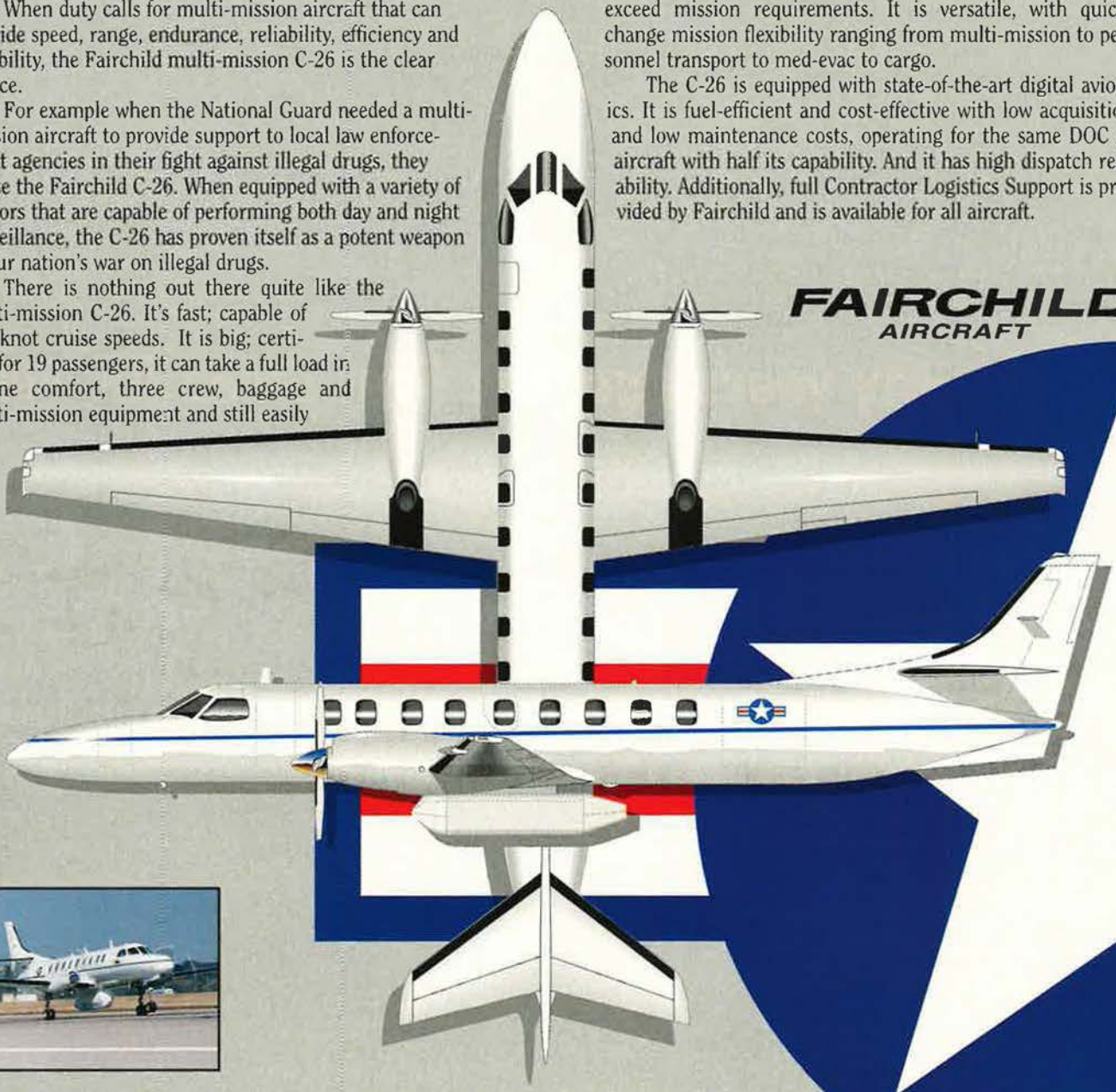

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C-130Es has extended the life of the aircraft well into the next century. Ongoing modifications include a Self-Contained Navigation System (SCNS) to enhance navigation capabilities, especially in low-level environments. The SCNS incorporates an integrated communications/navigation management system that features the USAF standard laser gyro inertial navigational unit and the 1553B data bus; installation began in 1990. Other modifications include enhanced station-keeping equipment, 50 kHz VHF Omnirange/Instrument Landing System (VOR/ILS) receivers, secure voice capability, and GPS capability. Another major modification installs a state-of-the-art autopilot that incorporates a Ground Collision Avoidance System.

The basic **C-130H** is generally similar to the E model but has updated T56-A-15 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. Production of the H has now ended. 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 the 757th AS, AFRC, based at Youngstown-Warren Regional Airport ARS, Ohio, 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. While continuing to upgrade through modification, the Air Force has budgeted to resume fleet modernization through acquisition of the **C-130J** version. This new model features a two-crew-member flight system, 6,000 shp Allison AE 2100D3 engines and all-composite Dowty R391 propellers, digital avionics and mission computers, enhanced performance, and improved reliability and maintainability. Beginning in FY 1996, the Air Force started procuring C-130Js as replacements for the older C-130Es and Hs. Priority for replacement will be combat delivery aircraft.

Other variants include **HC/MC-130, AC-130H/U,** and **WC-130H,** all described separately. Four HC-130Hs were modified as **JC-130H** with added equipment for aerial recovery of reentering space capsules, and two **DC-130Hs** are used for drone control duties, together with one **DC-130A.**

The Air Force realigned Stateside theater airlift C-130s from ACC to AMC April 1, 1997. *(Data for C-130J.)*

Contractor: Lockheed Martin Corporation.

Power Plant: four Allison AE 2100D3 turboprops; each 4,591 shp.

Accommodation: crew of two, with provision for third person, plus loadmaster; 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 10 in.

Weights: empty 75,562 lb, max payload 41,790 lb, gross 175,000 lb.

Performance: max cruising speed 400 mph, ceiling (at 147,000 lb) 30,560 ft, T-O run 1,800–3,290 ft, landing run (at 130,000 lb) 1,400 ft, range with 40,000-lb payload 3,262 miles.

MC-130E/H Combat Talon I and II

Supporting special operations forces worldwide, AFSOC's CONUS-based 8th SOS and 711th SOS (AFRC) employ 14 C-130Es, modified to **MC-130E (Combat Talon I)** standard and equipped for use in night/adverse weather, low-level, deep-penetration missions. All are modified to conduct air-to-air refueling with special operations helicopters and have explosion-suppressant fuel tanks and a modified cargo ramp area for high-speed aerial delivery. In addition, these aircraft have been modified to the Mod 90 configuration, which includes an improved APQ-122V(8) terrain-following radar; fully integrated navigation suite with dual INS, Doppler, and GPS; NVG head-up display; and new center wing. During Operation Desert Storm, the Combat Talon I proved a very adaptable and capable air delivery platform, particularly when called on to deliver the largest conventional weapon in the US arsenal, the 15,000-lb BLU-82.

Twenty-four **MC-130H (Combat Talon II)** aircraft have been acquired to supplement the Talon I. Equipment includes an in-flight refueling receptacle; explosion-suppressant fuel tanks; modified cargo ramp area for high-speed aerial delivery; AN/APQ-170 precision turning, terrain-following, and terrain-avoidance radar; dual radar altimeters; dual INS; integrated GPS receiver; flight stabilized Infrared Detection Set; extensive communications suite; fully integrated glass cockpit; and improved infrared and electronic defensive countermeasures. The 1st, 7th, and 15th SOSs employ the Combat Talon II, supporting unconventional warfare units from their bases in Japan, Europe, and CONUS, respectively. The 58th Special Operations Wing at Kirtland AFB, N. M., is responsible for MC-130H mission qualification training. *(Data similar to those for C-130.)*

***C-130H** Hercules* (Randy Jolly)

***C-130J** Hercules* (Guy Aceto)

***HC-130N** Combat Shadow* (Randy Jolly)

***MC-130H** Combat Talon II* (Randy Jolly)

***KC-135E** Stratotanker* (Ted Carlson)

***KC-135R** Stratotanker* (Ted Carlson)

MC/HC-130 Combat Shadow/Tankers

Twenty-eight active-duty **MC-130P** Combat Shadow aircraft (formerly HC-130N/P) are dedicated to special operations missions. Nine are assigned to the 9th SOS, Eglin AFB, Fla. Five each are assigned to the 17th SOS, Kadena AB, Japan, and to the 67th SOS, RAF Mildenhall, UK. The 5th SOS (AFRC), based at Duke Field, Fla., and the 58th SOW at Kirtland AFB, N. M., have five and four aircraft, respectively, the latter for training. All are modified with new secure communications, self-contained inertial navigation, and countermeasures systems, and NVG-compatible lighting. The aircraft's primary mission is to conduct single-ship or formation in-flight refueling of special operations forces helicopters in a low-threat to selected medium-threat environment. These missions involve NVG low-level flights using minimal lighting and communications-out procedures. These SOF MC-130Ps are being further modified with advanced integrated navigation equipment, including digital scan radar, ring-laser gyro INS, FLIR, GPS, and dual nav stations. They are also receiving 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.

Nine additional search-and-rescue **HC-130** tanker aircraft are located with an active-duty unit at Patrick AFB, Fla.; 20 others are assigned to various AFRC and ANG units. *(Data similar to those for C-130.)*

KC-135E/R/T Stratotanker

Backbone of the USAF tanker fleet, the long-serving KC-135 continues to meet the aerial refueling requirements of USAF bomber, fighter, cargo, and reconnaissance forces, as well as the needs of the US Navy and Marines and allied nations. First flight was in August 1956; a total of 732 were built by 1966. Although similar in size and appearance to commercial 707 aircraft, the KC-135 was designed to military specifications, incorporating different structural details and materials, and was designed to operate at high gross weights. The KC-135 fuel tankage is located in the "wet wings" and in fuel tanks below the floor in the fuselage.

Ongoing modernization programs for the 551 KC-135s remaining in operational service will enhance their capability and extend their operational utility well into the next century. The JT3D reengining program upgraded 163 AFRC and ANG KC-135As to **KC-135E** standard with JT3D turbofans removed from surplus commercial 707s. In 1980, the 22,224 lb thrust CFM International F108-CF-100 (CFM56) fuel-efficient engine was selected for retrofit of the KC-135 fleet. Reengined aircraft are designated **KC-135R** and **KC-135T,** each with a gross weight of 322,000 lb. They embody modifications to major systems and subsystems and not only carry more fuel farther but have reduced maintenance costs, are able to operate from shorter runways, and meet Stage III requirements. The first KC-135R flight was in August 1982, and first deliveries to SAC were in July 1984; KC-135T aircraft retain the KC-135Q's ability to isolate two separate fuel types in order to refuel SR-71s; the program continues. The Life Extension Structural Modification provided for the renewal of the lower wing skin, enabling the fleet of KC-135s to remain fully operational past 2020. A further program will permit operation by a two-person flight crew. Several avionics upgrades are under way that will significantly improve systems reliability and maintainability. The first Pacer CRAG–modified KC/C-135 (see below) aircraft was delivered on July 19, 1996: upgrades include an FMS-800 flight-management system, FDS 255 flight displays, color weather radar, and integrated INS/GPS. A multipoint aerial refueling system is being procured for a select number of KC-135Rs to enhance interoperability and support to the Navy, NATO, and other allied receiver aircraft. During the Persian Gulf War, KC-135 aircraft made an invaluable contribution to the success of coalition operations, flying around-the-clock missions to maintain the operability of coalition warplanes. Recent KC-135 deployments have included support for operations in Somalia, Bosnia, Rwanda, Haiti, and the Middle East. AMC controls all CONUS-based KC-135s. Others serve with ACC, AETC, PACAF, USAFE, and with AFRC and ANG units. *(Data for KC-135R.)*

Contractor: Boeing Military Airplanes.

Power Plant: four CFM International F108-CF-100 turbofans; each 22,224 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.

Weights: empty 119,231 lb, gross 322,000 lb.

Performance: max speed at 30,000 ft 610 mph, ceiling 50,000 ft, range with 120,000 lb of transfer fuel 2,128 miles, ferry mission 11,192 miles.

C-135 Stratolifter

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/cargo transports, pending delivery of C-141s. Three converted KC-135s were followed by 45 production Stratolifters in two versions: the **C-135A,** with J57-P-59W turbojets, and the **C-135B,** with Pratt & Whitney TF33-P-5 turbofans. Eleven Bs were retrofitted with revised interior for VIP transportation; others became **WC-135Bs** and **RC-135E/Ms**. ACC's 55th Wing, Offutt AFB, Neb., operates **TC-135S/W** variants. C-135s have been deployed in support of Bosnian operations. *(Data similar to KC-135, except where indicated.)*

Dimensions: length 134 ft 6 in.

Weights (C-135B): operating weight empty 102,300 lb, gross 275,500 lb.

Accommodation (C-135B): 60 passengers.

Performance (C-135B): max speed 600 mph, range with 54,000 lb payload 4,625 miles.

C-137B/C Stratoliner

Five specially modified Boeing 707 transports are operated by AMC's 89th Airlift Wing from Andrews AFB, Md., for VIP duties. Four Boeing 707-320s are designated **C-137C,** and one smaller 707-120, **C-137B.** Two of the C-137Cs were the original "Air Force One" aircraft. Replacement of these aircraft by four new Boeing 757-200s, designated C-32A, is scheduled for 1998.

Contractor: The Boeing Company.

Power Plant: four Pratt & Whitney JT3D-3 turbofans; each 17,200 lb thrust.

Dimensions: C-137B: span 130 ft 10 in, length 144 ft 6 in, height 42 ft 0 in; C-137C: span 145 ft 9 in, length 152 ft 11 in, height 42 ft 5 in.

Weights: C-137B: gross 258,000 lb; C-137C: gross 329,100 lb.

Performance (C-137C): max speed 627 mph, ceiling 42,000 ft, range 5,150 miles.

C-141A/B Starlifter

Longtime mainstay of USAF's airlift fleet, the 200-plus C-141 Starlifter aircraft are approaching the end of their projected service life and all will retire by 2006. The **C-141A** entered service with MAC in April 1965, and 285 were built, some of which were structurally modified to accommodate the 82,207-lb Minuteman ICBM. Subsequently, USAF funded modification of the entire then-available force of 270 aircraft to **C-141B** standard (except four AFMC aircraft used for test purposes) in order to realize the aircraft's full payload potential. The fuselage was lengthened by 23 ft 4 in, and an in-flight refueling capability was added. Deliveries of B aircraft took place between December 1979 and June 1982. The modification significantly increased MAC's airlift capability, giving USAF the equivalent of 90 additional C-141A aircraft. Under the Pave Center program initiated in 1987, 118 aircraft were slated for a center wing structural modification, which, coupled with other structural upgrades, was expected to extend the C-141's original flying life by 15,000 hours. A program to install a state-of-the-art autopilot and all-weather landing system with enhanced flight display instrumentation is a major modification to enhance maintenance supportability. Improved airdrop systems for the C-141 are also in production. However, further proposed C-141 service life extension programs (SLEPs) have been ruled out. 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. Modification of 13 437th AW C-141Bs is aimed at increasing their SOLL (Special Operations Low Level) capability and survivability. AETC also operates C-141 aircraft at Altus AFB, Okla.

As of January this year, approximately 212 C-141Bs were in the inventory. Most recently, Starlifters have deployed in support of UN peacekeeping missions. AMC controls Air Force C-141s. *(Data for C-141B.)*

Contractor: Lockheed-Georgia Company.

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 3½ in, height 39 ft 3 in.

Weights: 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.

KC-10A Extender

The KC-10 is basically 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. In its primary role of enhancing worldwide air mobility, the KC-10A combines the tasks of tanker and cargo aircraft in a single unit. With this capability, the Extender supports fighter deployments, strategic airlift, strategic reconnaissance, and conventional operations and, as such, played a key role in deployment for the Persian Gulf War and in later humanitarian and UN peacekeeping missions. Because it has both types of tanker refueling equipment installed, the KC-10A can service US Air Force, Navy, and Marine Corps and allied aircraft on the same mission.

In many deployment situations, the KC-10A's refueling capabilities and long range permit it to dispense with the need for forward bases, leaving vital fuel supplies in the theater of operations untouched. Aircraft maintenance is performed under the contractor logistics support concept, where flight-line maintenance is provided by USAF while intermediate- and depot-level maintenance is supported by a contractor. In addition, extensive commonality with the commercial DC-10 allows USAF to capitalize on a worldwide network of spares and maintenance facilities.

First flight of a KC-10A took place in July 1980, with first SAC service mission in March 1981. The 59 aircraft in the inventory are operated by active-duty and Associate Reserve units, under the control of AMC, with major KC-10 operational bases at McGuire AFB, N. J., and Travis AFB, Calif. AFRC's 79th ARS operates from March ARB, Calif. The final production aircraft, delivered in April 1990, was used to test wing-mounted air refueling pods designed to supplement the standard fuselage hose reel/drogue unit and refueling boom. Plans called for 20 aircraft to be modified to accept the wing-mounted pods. An additional modification introduced an on-board loader that allowed pallet handling without prepositioning wide-body cargo loading equipment and so permitted autonomous cargo operations at austere locations.

Contractor: Douglas Aircraft Company, Division of McDonnell Douglas Corporation.

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 4½ in, length 181 ft 7 in, height 58 ft 1 in.

Weight: gross 590,000 lb.

Performance: cruising speed Mach 0.825, ceiling 42,000 ft, range with max cargo 4,370 miles.

***C-141B** Starlifter* (Ted Carlson)

***KC-10A** Extender* (Ted Carlson)

***T-1A** Jayhawk* (Nate Leong)

***T-3A** Firefly* (Guy Aceto)

Trainers

T-1A Jayhawk

Acquired by AETC for specialized undergraduate pilot training (SUPT), the first T-1A was delivered to USAF in January 1992. As leader of the T-1A contractor team, McDonnell Douglas is responsible for system integration; Quintron is supplying flight simulators, Raytheon Aircraft Company the aircraft. Designated Beechjet 400T, these are similar to the Beechjet 400A corporate transport. The flight deck is configured for a student in the left seat, an instructor in the right seat, and another student to the rear. Structural enhancements provide for a large number of landings per flight hour, increased birdstrike resistance, and an additional fuselage fuel tank. A Rockwell Collins avionics package includes a five-tube EFIS, turbulence detection radar, digital autopilot, tactical air navigation with air-to-air capability, and a central diagnostics and maintenance system.

The total buy of 180 aircraft has been ordered; 160 had been delivered by January 1, 1997. Instructor pilot training at the 64th Flying Training Wing, Reese AFB, Tex., began in September 1992, with student training following in January 1993; this base is scheduled to close this year. Instructor pilot training transfered to the 12th FTW, Randolph AFB, Tex., in August 1993. Jayhawks also equip the 14th, 47th, and 71st FTWs at Columbus AFB, Miss., Laughlin AFB, Tex., and Vance AFB, Okla., respectively. Pilots trained in the T-1A progress to transports, such as the C-5 and C-17, and tankers, such as the KC-10 and KC-135.

Contractor: Raytheon Aircraft Company.

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 (400A): span 43 ft 6 in, length 48 ft 5 in, height 13 ft 11 in.

Weights: empty 5,200 lb, gross (400A) 16,100 lb.

Performance: max speed at 27,000 ft 538 mph, max operating altitude 41,000 ft, range 2,222 miles.

T-3A Firefly

Selected in April 1992 to replace the T-41 Mescalero, the fully aerobatic T-3A has been used since March 1994 by AETC's 3d FTS at Hondo Airport, Tex., and since January 1995 by the 557th FTS at 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. Delivery of 113 T-3As was completed in January 1996, with 57 aircraft for the 3d FTS and 56 for the 557th FTS.

Contractors: Slingsby Aviation Limited; Northrop Worldwide Aircraft Services Inc.

Power Plant: Textron Lycoming AEIO-540-D4A5 engine; 260 hp.

Accommodation: two, side by side.

Dimensions: span 34 ft 9 in, length 24 ft 10 in, height 7 ft 9 in.

Weights: empty 1,780 lb, gross 2,525 lb.

Performance: max level speed 175 mph, ceiling 19,000 ft, range with max fuel, 65 percent power at 8,000 ft 469 miles.

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T-37B Tweet

USAF's first purpose-built jet trainer, the T-37 is currently AETC's standard two-seat primary trainer. The original T-37A was superseded in November 1959 by the T-37B; all A models were later converted to B standard. A contract for the T-37B SLEP was awarded to Sabreliner Corp. in August 1989. This covers the design, testing, and production of kits to be installed by USAF, to modify or replace critical structural components of the entire fleet, thereby extending the capability of the T-37 into the next century. Almost 1,000 T-37s were built, and more than 450 remain in USAF's active inventory, including a number with ACC and AMC. A distinctive dark blue and white finish is intended to help formation training and ease maintenance.

AETC plans to replace the T-37B with the new Joint Primary Aircraft Training System (JPATS), to be produced by Raytheon (see below) and delivered from FY 1999.

Contractor: Cessna Aircraft Company.
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 9¼ in, length 29 ft 3 in, height 9 ft 2¼ in.
Weights: empty 3,870 lb, gross 6,575 lb.
Performance: max speed at 25,000 ft 426 mph, ceiling 35,100 ft, range at 360 mph with standard tankage 870 miles.

T-38A and AT-38B Talon

Almost identical in structure to the F-5A export tactical fighter, the **T-38A** was the world's first supersonic trainer aircraft. First flown in April 1959, it was in continuous production from 1956 to 1972 and entered operational service in March 1961. Of 1,187 T-38s built, more than 1,100 were delivered to USAF, and more than 400 remain in service throughout the Air Force. Most are used by AETC for advanced pilot training. A slightly different version, designated **AT-38B,** with a gunsight and practice bomb dispenser, is used by AETC for Introduction to Fighter Fundamentals (IFF).

An ongoing program called Pacer Classic (the T-38 SLEP) is integrating 10 modifications, including major structural renewal, into one program, and a full avionics upgrade is planned. As a result, coupled with the reduction of the T-38's work load through introduction of the T-1A, the service life of the T-38s should extend to 2020.

Contractor: Northrop Corporation.
Power Plant: two General Electric J85-GE-5A turbojets; each 2,680 lb thrust dry, 3,850 lb thrust with afterburning.
Accommodation: student and instructor, in tandem, on ejection seats.
Dimensions: span 25 ft 3 in, length 46 ft 4½ in, height 12 ft 10½ in.
Weights: empty 7,164 lb, gross 12,093 lb.
Performance: max level speed at 36,000 ft more than Mach 1.23 (812 mph), ceiling above 55,000 ft, range, with reserves, 1,093 miles.

T-43A and CT-43

A navigation trainer first flown in April 1973, 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. Deliveries of the 19 aircraft ordered for ATC (now AETC) were completed in July 1974. Most remaining aircraft are in the AETC inventory; two others are assigned to the ANG; and one, with VIP interior, is assigned to the 310th AS at Howard AFB, Panama (as **CT-43**).

Contractor: Boeing Aerospace Company.
Power Plant: two Pratt & Whitney JT8D-9 turbofans; each 14,500 lb thrust.
Accommodation: crew of two, 12 students, five advanced students, and three instructors.
Dimensions: span 93 ft 0 in, length 100 ft 0 in, height 37 ft 0 in.
Weight: gross 115,500 lb.
Performance: econ cruising speed at 35,000 ft Mach 0.7, operational range 2,995 miles.

Joint Primary Aircraft Training System (JPATS)

The Joint Primary Aircraft Training System (JPATS) contract was awarded to the Raytheon Aircraft Company in February 1996. Its not-yet-designated 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 of a planned 372 operational aircraft for the Air Force is scheduled to begin in 1999 at Randolph AFB, Tex., followed by Laughlin AFB, Tex., Vance AFB, Okla., and Columbus AFB, Miss. IOC for the Air Force is expected in August 2001; IOC for the Navy's 339 aircraft is expected in 2002.

Contractor: Raytheon Aircraft Company.
Power Plant: one Pratt & Whitney Canada PT6A-68 turboprop; 1,708 shp.
Accommodation: student and instructor, in tandem, on zero/zero ejection seats.
Dimensions: span 33 ft 5¼ in, length 33 ft 4¾ in, height 10 ft 8⅓ in.
Weight: empty (approx) 4,415 lb.
Performance: max speed 368 mph.

UV-18B Twin Otter

The UV-18B is a military version of the DHC-6 Twin Otter STOL utility transport. Two were procured in FY 1977 for use as parachute jump training aircraft at the US Air Force Academy.

Contractor: The de Havilland Aircraft of Canada Ltd.
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 0 in, length 51 ft 9 in, height 19 ft 6 in.
Weight: gross 12,500 lb.
Performance: max cruising speed 210 mph, ceiling 26,700 ft, range with 2,500 lb payload 806 miles.

The US Air Force Academy also lists the following types in its training inventory: **SGS 1-26E (TG-3A)** sailplane, **SGS 2-33A (TG-4A)** glider, **SGM 237 (TG-7A)** motorized glider, **ASK-21 (TG-9A)** sailplane, and **Stemme S-10 (TG-11A)** motorized glider.

T-37B Tweet (Randy Jolly)

AT-38 Talon (Nate Leong)

T-43 (Randy Jolly)

Joint Primary Aircraft Training System (JPATS)

Strategic Missiles

LGM-30G Minuteman

Maintaining a key role in the US strategic deterrent posture, Minuteman 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. The only version now in service, LGM-30G Minuteman III, became operational in 1970, providing improved range over earlier versions, rapid retargeting, and the capability to place three multiple independently targetable reentry vehicles (MIRVs) on three targets with a high degree of accuracy. 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. The Air Force is currently consolidating the Minuteman III fleet by removing the 150 missiles at Grand Forks AFB and emplacing them in converted Minuteman II launchers at Malmstrom AFB. This project, called Rivet Add, began in October 1995 and will be completed by October 1997.

Enhancements and modifications under way will maintain the viability of the Minuteman III force through 2020. On the missile itself, all three stages will be remanufactured. A guidance replacement program will ensure long-term supportability of the aging guidance system's electronic components. A depot-level maintenance refurbishment, known as Rivet Mile, has been in progress to correct existing, and retard future, age-related deterioration of facilities in Minuteman silos and launch control centers. Modification of the launch centers, begun in 1989 under the Rapid Execution and Combat Targeting program, has been completed, ensuring real-time status information on the weapons and communications nets, improving responsiveness to launch directives, and improving rapid retargeting capability. The possibility of deploying 20 modified Minuteman III missiles, armed with defensive kinetic-kill vehicles, to meet the requirement for an emergency response national missile defense system is under consideration.

Assembly and Checkout: Boeing Aerospace Company.
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: Autonetics Division of Rockwell International inertial guidance system.
Warheads: three Mk 12/12A MIRVs.
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.

LGM-118A Peacekeeper

Deployed initially in response to an increased Soviet strategic threat, the Peacekeeper missile marked 10 years of alert duty on October 10, 1996. Emplacement of Peacekeepers in existing Minuteman III silos near F. E. Warren AFB, Wyo., began in June 1986, reaching FOC with 50 missiles in December 1988. However, the changing international political climate led to a statutory cap on deployment of only 50 (of a funded 114) of these missiles in the FY 1990 budget, and development of a rail-garrison mode of Peacekeeper deployment was terminated.

Peacekeeper is a four-stage ICBM that carries up to 10 independently targetable reentry vehicles. It has many advantages over other strategic missile systems. In particular, 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 Peacekeeper with 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.

Basing: Boeing Aerospace and Electronics.
Assembly and Test: Martin Marietta, Denver Aerospace.
Power Plant: first three stages solid-propellant, fourth stage storable liquid; by Thiokol, Aerojet, Hercules, and Rocketdyne, respectively.
Guidance: inertial; integration by Rockwell, inertial measurement unit by Northrop and Rockwell.
Warheads: 10 Avco Mk 21 MIRVs.
Dimensions: length 71 ft 0 in, diameter 7 ft 8 in.
Weight: approx 195,000 lb.

AGM-86B/C ALCM/CALCM

Programmed for precision attack on surface targets, the **AGM-86B** Air-Launched Cruise Missile (ALCM) is a small, subsonic, unmanned, winged air vehicle, currently deployed on B-52H aircraft. 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. ALCM-equipped units are at Barksdale AFB, La., and Minot AFB, N. D.

First used operationally during the Persian Gulf War, the **AGM-86C** is a conventionally armed version (CALCM), development of which began in 1986. One was recently tested with an improved GPS. It flew for five hours before precisely impacting the target in a new steep terminal dive maneuver devised for delivering penetrator warheads. *(Data for AGM-86B, except where indicated.)*
Contractor: Boeing Aerospace Company.
Power Plant: Williams International Corporation/Teledyne CAE F107-WR-100 turbofan; 600 lb thrust.
Guidance: AGM-86B: inertial plus TERCOM, by Litton; AGM-86C: inertial plus GPS, by Litton.
Warhead: AGM-86B: W80-1 nuclear; AGM-86C: blast/fragmentation conventional.
Dimensions: length 20 ft 9 in, body diameter 2 ft 0½ in, wingspan 12 ft 0 in.
Weight: 3,200 lb.
Performance (approx): speed 500 mph, range 1,555 miles.

LGM-30G *LGM-118A*

AGM-129A (ACM) (Guy Aceto)

AGM-129A (ACM)

Embodying low-observable technology, the AGM-129A Advanced Cruise Missile has improved range, accuracy, survivability, and targeting flexibility compared with the AGM-86B. Developed by General Dynamics, the ACM first flew in July 1985; in November 1987, McDonnell Douglas was awarded a contract for technology transfer leading to second-source capability for this advanced system, which is deployed on B-52H aircraft. Delivery of production AGM-129As began in June 1990, the 410th BW at K. I. Sawyer AFB, Mich. (now closed), being the first operational unit; final delivery was in August 1993. Total acquisition of the ACM was 461 missiles.
Contractor: General Dynamics (Convair)/McDonnell Douglas Missile Systems.
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 3¾ in, wingspan 10 ft 2 in.
Weight: 3,709 lb.
Performance (approx): range 1,865 miles.

***AIM-9** Sidewinder (top), **AGM-88 HARM** (bottom)* (Guy Aceto)

Airborne Tactical and Defense Missiles

AIM-7 Sparrow

Sparrow is a radar-guided air-to-air missile with all-weather, all-altitude, and all-aspect capability. It entered service in 1958, and approximately 34,000 AIM-7C, D, and E versions were produced. The later, advanced solid-state **AIM-7F,** introduced from 1975, has a larger motor, Doppler guidance, improved ECM, and better capability over both medium and "dogfight" ranges. Approximately 5,400 were produced.

A monopulse version of Sparrow, designated **AIM-7M,** aimed at reducing cost and improving performance in the ECM and look-down clutter regions, began operational service during FY 1983; this version equips USAF and USN F-14, F-15, F-16 (ADF), and F/A-18 aircraft. **AIM-7P/RIM-7P,** in service since 1992, has improvements to the fuze and electronics, aimed at increasing lethality against sea-skimming antiship missiles and cruise missiles. AIM-7s 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. The **AIM-7R,** or missile homing improvement program, is designed to improve the missile's performance against sophisticated ECM by means of a new IR seeker added to the guidance and control section, incorporated within a multimode seeker assembly. Entry into service is planned this year. *(Data for AIM-7F.)*
Contractors: Raytheon Company/Hughes Missile Systems Company.
Power Plant: Hercules Mk 58 Mod 0 boost-sustain rocket motor.
Guidance: Raytheon semiactive Doppler radar homing system.
Warhead: high-explosive, blast fragmentation, weighing 86 lb.
Dimensions: length 11 ft 10 in, 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.

AIM-9 Sidewinder

The AIM-9 Sidewinder is a close-range, air-to-air missile using IR guidance. Versions currently in the USAF inventory:

AIM-9M: improved version of third-generation AIM-9L Sidewinder with all-aspect intercept capability. This version has increased infrared counter-countermeasures (IRCCM) capability, improved background discrimination, and reduced-smoke rocket motor. Full production began in FY 1981 with an order for approximately 1,280 missiles.

AIM-9M-9: modification to improve IRCCM capability of early missiles.

Development of the next-generation replacement for the AIM-9M continues, with the award on December 13, 1996, of a $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 from 1994. Evolved Sidewinder is an off-boresight missile that will be used, most probably, in association with a helmet-mounted sight to enhance target acquisition and tracking. It incorporates airframe improvements and thrust vector control, and combines a high-performance focal plane array sensor and a Texas Instruments advanced tracker with the existing AIM-9M rocket motor, warhead, and fuze.

AIM-9 missiles, equipped with telemetry packages in

place of warheads, are being used by the Air Warfare Center in an industry-linked program to develop passive missile warning systems for USAF's tactical aircraft. *(Data for AIM-9M.)*
Contractor: Raytheon Company/Loral Aeronutronics.
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 191 lb.
Performance: max speed above Mach 2; range more than 10 miles.

AIM-120A (AMRAAM)

Intended as a replacement for the AIM-7 Sparrow, the AIM-120A Advanced Medium-Range Air-to-Air Missile (AMRAAM) provides an all-weather, all-environment capability for USAF's F-15, F-16, and F-22 and the Navy's F-14 and F/A-18 fighters. Inertial midcourse 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.

A leader/follower program has been under way (Hughes/Raytheon), with the preproduction effort (producibility and qualification) in FY 1986 and low-rate initial production in FY 1987 (180 missiles). Subsequent lots have been competed for and, up to and including Lot 9, have been awarded to Hughes and Raytheon.

The first production **AIM-120A** was delivered by Hughes in 1988, when the 33d TFW at Eglin AFB, Fla., became the first operational unit to receive AMRAAMs. The **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. The 200,000-hour captive-carry mark was passed in November 1994 due to the frequency of air patrols over Bosnia and Iraq where the missile was combat-proven. A Preplanned Product Improvement (P^3I) program seeks to develop AMRAAM improvements, including software reprogrammability, advanced counter-countermeasures, and options for improved propulsion. The missile is in full-rate production. Funding has been approved for procurement of well over half of a proposed final total in excess of 12,000 AMRAAMs for USAF and USN.
Contractors: Hughes Missile Systems Company/Raytheon Company.
Power Plant: Gencorp Aerojet two-stage solid-propellant rocket motor.
Guidance: inertial midcourse, with active radar terminal homing.
Warhead: high-explosive directed fragmentation weighing 48 lb.
Dimensions: length 12 ft 0 in, body diameter 7 in, span of tail control fins 2 ft 1 in.
Weight: 345 lb.
Performance: cruising speed approx Mach 4, range approx 30 miles.

AGM-65 Maverick

The basic **AGM-65A** 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: has a "scene magnification" TV seeker that enables the pilot to identify and lock on to smaller or more distant targets. Orders for AGM-65A/Bs totaled 19,000.

AGM-65D: developed to overcome limitations of the TV Maverick, which can be used only in daylight clear-weather conditions, this version has an imaging-infrared (IIR) seeker as well as a lower-smoke motor. The Air Force Operational Test and Evaluation Center and TAC (now ACC) conducted operational flight testing with 25 live launches from A-7, A-10, F-4E, F-4G, and F-16 aircraft at Nellis AFB, Nev., in September 1986, resulting in 24 direct hits on a variety of vehicles. 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. First successful launch took place in November 1987.

***AIM-120** (AMRAAM)*

***AGM-65** Maverick* (Guy Aceto)

GBU-15

AGM-130

AGM-65H: upgraded TV Maverick with significant reliability, maintainability, and performance improvements over the AGM-65B.

A total of 25,397 AGM-65D/Gs were ordered for USAF through FY 1991, with the final order awarded to Raytheon in 1991.

Maverick missiles were first employed by USAF in Vietnam and were used extensively during the Persian Gulf War. They currently equip the A-10, F-15E, and F-16, singly or in three-round clusters, for use against such pinpoint targets as tanks and columns of vehicles, and in the SEAD role. *(Data for AGM-65A/B.)*
Contractor: Hughes Missile Systems Company/Raytheon Company.
Power Plant: Thiokol TX-481 solid-propellant rocket motor.
Guidance: self-homing, EO guidance system (IIR on D and G models).
Warhead: high-explosive, shaped charge.
Dimensions: length 8 ft 2 in, body diameter 1 ft 0 in, wingspan 2 ft 4½ in.
Weight: launch weight (AGM-65A) 462 lb, (AGM-65G) 662 lb.
Performance: range 0.6 to 14 miles.

AGM-84A Harpoon

Originally acquired, under a cooperative memorandum of understanding with USN, to equip two squadrons of now-retired B-52G aircraft for maritime anti-surface warfare operations, the Harpoon all-weather antiship missile now arms conventional-mission B-52Hs.
Contractor: McDonnell Douglas Missile Systems Company.
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 7½ in, body diameter 1 ft 1½ in, wingspan 3 ft 0 in.
Weight: 1,145 lb.
Performance: speed high subsonic, range more than 57 miles.

AGM-88 HARM

High speed, coupled with the 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 the missile, gives this second-generation antiradiation missile greatly improved capability over first-generation Shrikes and Standards. Equipping recently retired F-4G "Wild Weasel" aircraft, the AGM-88 High-Speed Antiradiation Missile (HARM) proved highly effective against enemy ground radar during the Persian Gulf War. HARMs now equip F-16s dedicated to the SEAD mission and have been used operationally against Iraqi defenses as part of Operation Southern Watch.

Current production version is the **AGM-88C,** with a more lethal warhead, containing tungsten alloy cubes rather than steel, and the enhanced-capability Texas Instruments AGM-88C-1 guidance head. USAF is updating older AGM-88Bs with the new guidance seeker. Erasable Electronically Programmable Read-Only Memory has been retrofitted on USAFE, PACAF, and ACC HARMs, permitting changes to missile memory in the field. Production of all versions was expected to total around 21,000 by this year. *(Data for AGM-88A.)*
Contractor: Texas Instruments, Inc.
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 8½ in, body diameter 10 in, wingspan 3 ft 8½ in.
Weight: 807 lb.
Performance: cruising speed supersonic, altitude limits S/L to 40,000 ft, range more than 10 miles.

GBU-15 and AGM-130A/C

The **GBU-15** is an air-launched, cruciform-wing, glide bomb fitted with a guidance system designed to give it pinpoint accuracy from low or medium altitudes over short standoff ranges. 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 offers 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 currently deployed with F-15E aircraft. Versions include: GBU-15(V)1/B TV-guided variant, qualified for operational service in 1983 (production complete); GBU-15(V)2/B IIR version, which entered service in 1987; GBU-15(V)3/B with a CBU-75 warhead and DME transponder guidance system; and GBU-15-I, combining the accuracy of the GBU-15 with the penetration capability of the improved 2,000-lb BLU-109/B iron bomb.

The AGM-130 is a product improvement to the GBU-15, adding a rocket motor, a radar altimeter, and a digital control system. These improvements triple the standoff range of the GBU-15. Both the **AGM-130A** (with a Mk 84 warhead) and the **AGM-130C** (with the BLU-109/B penetrating warhead) are currently in production. 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. Deliveries to USAF began in November 1992. The AGM-130 is certified for use with the F-15E. *(Data for GBU-15.)*
Contractor: Rockwell International Corporation.
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 10½ in, body diameter 1 ft 6 in, wingspan 4 ft 11 in.
Weight: 2,450 lb.
Performance: cruising speed subsonic.

GBU-24A/B

The GBU-24A/B is 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/E was highly successful in the Persian Gulf War and is in production.
Contractor: Texas Instruments, Inc.
Guidance: semiactive laser.
Dimension: length 14 ft 2 in.
Weight: 2,350 lb.

GBU-24 (Guy Aceto)

GBU-27

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.
Contractor: Texas Instruments, Inc.
Guidance: semiactive laser.
Dimension: length 13 ft 11 in.
Weight: 2,170 lb.

GBU-28

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 4,700-lb weapons were used in the war: two for testing and two by F-111Fs against a bunker complex on February 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 2¼ in. Guidance is by a modified GBU-27 system. Flight tested on the F-15E and F-111F, the GBU-28 demonstrated the capability to penetrate more than 100 ft of dirt or 20 ft of concrete. To date, 125 have been built, with funds for an additional 160 requested in the FY 1997 budget. All are to be upgraded with an improved fuze and guidance system. Advanced hard target munition concepts are being assessed under an ongoing concept exploration study leading to a follow-on to the GBU-28.
Contractor: National Forge and Texas Instruments.

Joint Direct Attack Munition (JDAM) GBU-31/32 and GPS-Aided Munition (GAM)

JDAM is currently being developed to meet USAF and USN requirements for highly accurate, autonomous, all-weather, conventional bombing capability. In **GBU-31** form it adds an INS/GPS guidance kit to the 2,000-lb general-purpose Mk 84 bomb or the 2,000-lb BLU-109 penetrator; the **GBU-32** is built around the general-purpose 1,000-lb Mk 83. 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, will guide the weapon to its target. Initial fielding is expected in 1997–98. 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, and F/A-18.

The B-2 bomber is currently equipped with a small inventory of **GPS-Aided Munitions (GAMs),** providing an interim weapon until JDAM becomes available. GAM is a Mk 84 2,000-lb conventional bomb with a GPS/inertial guidance-and-control tailkit, for exclusive deployment with the B-2. In a B-2 firepower demonstration, 16 GAMs destroyed all 16 targets.

AGM-142 Have Nap

USAF is acquiring this medium-range standoff missile derived from the Israeli-built Popeye. Initial operational test and evaluation launches were completed in May 1990, and a coproduction agreement was entered into between Rafael and Martin Marietta (now Lockheed Martin).

***AGM-142** Have Nap*

The purpose of Have Nap is to provide long-range bombers with a conventional precision strike capability in support of worldwide theater commanders. Primary carrier aircraft are conventional-mission B-52Hs.
Contractor: Rafael Armament Development Authority.
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: 3,005 lb.
Performance: range 50 miles.

***FIM-92A** Stinger*

AGM-154A Joint Standoff Weapon (JSOW)

First in a USN/USAF family of low-cost, highly lethal glide weapons with a standoff capability, the AGM-154A 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. The services are integrating JSOW with BLU-97 combined effects bomblets and BLU-108 Sensor-Fuzed Weapon submunitions for area and armored targets.

Development, under USN lead, began in 1992 on the baseline BLU-97 variant, which flew for the first time on December 13, 1994. The BLU-108 variant, under USAF lead, has undergone demonstration/validation and entered EMD in 1995. The third variant, JSOW/Unitary, also under USN lead, 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. Texas Instruments has also proposed and demonstrated a powered variant of the unitary version with an 800-lb warhead.

Testing completed to date includes F/A-18 jettison test series to the limits of the carriage envelope, free flight and live-fire dispense tests of BLU-97, captive dispense tests of BLU-108, free flight and in-flight destruct (range safety), environmental flight tests on F-15E and F-16, and fit checks on F-15E, F-16, F-117A, F/A-18, A-6E, AV-8B, B-1, B-52, Tornado, and Jaguar. IOC is planned for 1998.
Contractor: Texas Instruments.
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.

Joint Air-to-Surface Standoff Missile (JASSM)

Under development as a replacement for the canceled AGM-137 TSSAM, the Joint Air-to-Surface Standoff Missile (JASSM) is intended to be a precision, long-range weapon to hold high-value targets at risk. Lockheed Martin and McDonnell Douglas were selected in June 1996 to compete in a two-year definition and risk reduction phase. Anticipated Air Force purchase is 2,400 missiles.

Wind-Corrected Munition Dispenser (WCMD)

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. With a range of about eight miles, a WCMD will carry mines, cluster bomblets, or antiarmor 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.

Rapier

Under a decision confirmed by an initial contract for 32 fire units in February 1981, British-built Rapier missile systems were deployed at seven USAF bases then in the UK to protect Air Force installations. The last unit became operational in July 1986. Manned by RAF regiment personnel, the USAF version of Rapier is intended primarily for defense against fast (Mach 1+), maneuvering, low-flying targets by day and night. The four-round fire unit, Blindfire radar, and a trailer of reload missiles are towed by Land Rovers loaded with support equipment.

Under a similar agreement, the government of Turkey operates 14 US-owned fire units for the defense of US air bases in that country.
Contractor: British Aerospace plc, Dynamics Division.
Power Plant: IMI two-stage solid-propellant rocket motor.
Guidance: surveillance radar and command to line-of-sight guidance. Optional Marconi DN181 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.

FIM-92A Stinger

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.

Contractor: Hughes Missile Systems Company/ Raytheon Company.
Power Plant: solid-propellant rocket motor.
Guidance: IR homing guidance.
Warhead: high-explosive blast fragmentation, weighing 6.6 lb.
Dimensions: length 5 ft 0 in, body diameter 2¾ in, wingspan 5½ in.
Weight: launch weight 35.3 lb.
Performance: range 1.85 miles.

Launch Vehicles

Atlas II

April 1996 saw the 100th launch of an Atlas/Centaur vehicle. The upgraded Atlas II version 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. A new Atlas IIAR, with a Russian-designed RD-180 engine, will be used starting in 1998, enhancing payload capacity to 8,400 lb to GTO. A total of nine Atlas II vehicles are to be procured. Primary DoD payload is the Defense Satellite Communications System (DSCS). The first Atlas II/ DSCS launch took place from Cape Canaveral AFS, Fla., in February 1992; first Atlas II–Centaur configuration launched in January 1995.
Prime Contractor: Lockheed Martin Corporation.
Power Plant: uprated Boeing North American MA-5 propulsion system in Atlas stage, comprising central sustainer motor and two boosters; total thrust 488,000 lb. Latest Atlas IIAS adds four Thiokol Castor IVA solid rocket motors.
Dimensions (Atlas stage): length 81 ft 7 in, max body diameter 10 ft 0 in.
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.

Titan II

Fourteen Titan II ICBMs have been refurbished and modified to provide expendable space-launch capability. Five 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 exclusively to place Defense Meteorological Satellite Program (DMSP) and National Oceanic and Atmospheric Administration (NOAA) satellites into polar orbit through the turn of the century.
Prime Contractor: Lockheed Martin Corporation.
Power Plant: first and second stages: Aerojet liquid hypergolic propellant rocket engines; first stage 430,000 lb thrust; second stage 100,000 lb thrust. Strap-on solid rocket motors can be added to the first stage to increase payload capability.
Guidance: Delco inertial guidance system.
Dimensions: first and second stages: height 110 ft 0 in, diameter 10 ft 0 in; payload fairing heights 20, 25, and 30 ft, diameter 10 ft 0 in.
Launch Weight: 408,000 lb.
Performance: more than 4,200 lb to low-Earth polar orbit.

Titan IV

USAF's primary heavy-lift launcher, Titan IV was selected originally 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 8½ in diameter payload fairing. **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. First launch took place from Cape Canaveral, Fla., in June 1989. 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 on February 22, 1997; the first from Vandenberg AFB, Calif., will be in 1999. Forty-one Titan IVs have been ordered, and a follow-on buy of no more than six vehicles is planned. *(Data for Titan IVA.)*
Prime Contractor: Lockheed Martin Corporation.
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: Delco inertial guidance system, to be replaced by Honeywell digital avionics system on twenty-fourth vehicle and later.
Dimensions: first and second stages: height 119 ft 2½ in, diameter 10 ft 0 in.
Launch Weight: 1,900,000 lb.
Performance: see above.

Delta II

Titan IV

Pegasus

Centaur

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. 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.

The **D-2A,** used with the current Atlas II, has been stretched three feet to include more propellant and thus has increased thrust. Payload fairings of either 11-ft or 14-ft diameter can be used.

The modified **Centaur G-prime** 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. *(Data for Centaur D-1A and G-prime, except where indicated.)*
Prime Contractor: Lockheed Martin Corporation.
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.
Guidance: inertial guidance system.
Dimensions: D-2A: length 33 ft 0 in, diameter 10 ft 0 in; G-prime: length 29 ft 0 in, diameter 14 ft 2½ in.
Launch Weight: D-2A (approx) 45,000 lb; G-prime-mod (approx) 53,000 lb.

Inertial Upper Stage (IUS)

Serving as an upper stage for the Titan IV for DoD, as well as with the shuttle for NASA, the highly reliable IUS was used for the first time in October 1982. Consisting of an aft skirt, an aft-stage solid rocket motor, an interstage, a forward-stage solid rocket motor, and an equipment support structure, it has the capability of boosting 5,200 lb into GEO when used on Titan IVA or 5,350 lb with the Titan IVB.
Prime Contractor: Boeing Defense and Space Group.
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 0 in, diameter 9 ft 6 in.
Launch Weight: 32,600 lb.

Delta II

Selected by the Air Force in 1987 to launch the Navstar GPS satellites, the Delta II is slightly larger than McDonnell Douglas's earlier Delta rocket to satisfy USAF's medium-payload requirement. The first launch took place in February 1989, and, to date, 25 operational GPS satellites have been launched successfully.

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.
Prime Contractor: McDonnell Douglas Aerospace Company.
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 0 in, diameter 8 ft 0 in; bulbous payload fairing, max diameter 10 ft 0 in.
Launch Weight: 511,190 lb.
Performance: 11,100 lb to low-Earth orbit, 4,010 lb to geosynchronous transfer orbit.

Pegasus

USAF's smallest launcher, this three-stage, solid-propellant winged vehicle is air-launched from a B-52 and is designed for maximum operational flexibility in delivering 850–1,050-lb payloads to LEO. Conceived in 1987, Pegasus was developed jointly by Orbital Sciences Corp. and Hercules Aerospace Co. as a private venture. The vehicle was under contract to the Defense Advanced Research Projects Agency for its initial two flights, the first of which took place in 1990 from Vandenberg AFB, Calif. 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 on March 8, 1996, following two earlier, unsuccessful launch attempts. *(Data for basic Pegasus vehicle.)*
Prime Contractor: Orbital Sciences Corporation and Hercules Aerospace Company/Alliant Techsystems.
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 0 in, wingspan 22 ft 0 in, diameter 4 ft 2 in.
Launch Weight: 42,000 lb.

Taurus

A more powerful version of the Pegasus space-launch vehicle, using an LGM-118 Peacekeeper mis-

sile 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, on March 14, 1994, put two USAF and ARPA satellites into a 340-mile polar orbit. Capable of lifting 3,200 lb to LEO and 1,130 lb to GTO using a Star 37 perigee kick motor.

Evolved Expendable Launch Vehicle (EELV)

Program aimed at fostering the evolution of a current launcher into a family of rockets, with reduced launch costs, to replace current DoD medium and heavy launchers. The requirement is to place payloads of 2,500 to 45,000 lb into low-Earth orbit. Four contracts were awarded in August 1995, to Alliant Techsystems Inc., Boeing Defense and Space Group, Lockheed Martin Technologies Inc., and McDonnell Douglas Aerospace, covering the 15-month low-cost concept validation phase. On December 20, 1996, Lockheed Martin and McDonnell Douglas were each awarded a $60 million 17-month pre-engineering and manufacturing development contract. *[See "EELV Enters New Phase," February 1997 "Aerospace World," p. 9.]* IOC for the medium-lift version is planned for 2001 and 2002, respectively, from Vandenberg AFB, Calif., and Cape Canaveral AS, Fla.; planned IOC for the heavy-lift EELV is 2005 at Vandenberg, and 2006 at Cape Canaveral.

Unmanned Aerial Vehicles

Tier II Predator

Delivery of Tier II Predator medium-altitude endurance vehicles has begun to the 11th RS at Indian Springs, Nev., the unit that officially took over Predator operations from the US Army on September 3, 1996. This UAV has already demonstrated its capability during continuous 16-hour surveillance missions over Bosnia for US European Command. Although fully autonomous, it is capable of midflight reprogramming or remote piloting. Navigation is by GPS/INS. Equipped with 450-lb Versatron TV, IR, and SAR sensors package, with Loral Ku-band satellite data link allowing real-time transmissions of video or SAR images to a ground station. Planned enhancements include a sigint package and laser designator.

Contractor: General Atomics.
Power Plant: one Rotax 912 engine; 85 hp.
Dimensions: length 26 ft 8 in, height 7ft 3 in, span 48 ft 8½ in.
Weights: empty 773 lb, gross 1,874 lb.
Performance: 24 hr loiter on station 575 miles from base at altitude of up to 25,000 ft, ceiling 23,000 ft, cruise speed 80 mph.

Tier II Plus Global Hawk

This high-altitude endurance UAV is scheduled to be flown for the first time in spring this year. A 2,000-lb payload, incorporating a TV, IR, and SAR sensors package under development by Hughes, will permit ground commanders to switch among radar, IR, and visible wavelengths as required. Global Hawk will be capable of flying up to 40 hours at a cruise speed of nearly 400 mph and at an altitude of 65,000 ft and will loiter on station 3,450 miles from base for 24 hours. The prototype was rolled out on February 20, 1997.

Contractor: Teledyne Ryan Aeronautical.
Power Plant: one Allison AE 3007H turbofan; 7,200 lb thrust.
Dimensions: length 44 ft 4¾ in, height 15 ft 2½ in, span 116 ft 2½ in.
Weights: empty 7,648 lb, gross 25,600 lb.

Tier III Minus DarkStar

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. It will be capable of monitoring a mission area of 18,500 square miles, using a recon/optical TV camera or a Westinghouse SAR, transmitting primarily fixed-frame images while in flight. Following the loss of the prototype, flight testing will resume with DarkStar 2 at Edwards AFB, Calif., this summer.

Contractor: Boeing/Lockheed Martin.
Power Plant: one Williams International F129 (FJ44) turbofan; 1,900 lb thrust.
Dimensions: length 15 ft 0 in, height 5 ft 0 in, span 69 ft 0 in.
Weight: gross 8,600 lb.
Payload: 1,000 lb.
Performance (estimated): cruise speed 345 mph, flight endurance 12 hr.

Tier II *Predator*

Tier II Plus *Global Hawk*

Tier III Minus *DarkStar*

MQM-107D *Streaker* (Guy Aceto)

BQM-34A *Firebee* (Guy Aceto)

Aerial Targets and Decoys

MQM-107D Streaker

Third-generation version of the MQM-107 Streaker, the current MQM-107D model has been in service since 1987. It is a recoverable, variable-speed target drone used at Tyndall AFB, Fla., for research, development, test, and evaluation (RDT&E) and the Weapon System Evaluation Program.

Contractor: Raytheon Aircraft Company.
Power Plant: initially one Teledyne CAE 373-8 engine; 960 lb thrust; MQM-107Ds delivered since 1989 have 1,060 lb thrust TRI 60-5 turbojets.
Guidance and Control: analog or digital, for both ground control and preprogrammed flight. High-*g* autopilot provisions.
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.

MQM-107E Streaker

Improved performance follow-on to the MQM-107D, the E model will be the Air Force's standard subscale target. It will be operational at Tyndall AFB, Fla., by February 1998.

Contractor: Tracor Flight Systems Inc.
Power Plant: Microturbo TRI 60-5 engine; 1,061 lb thrust or TCAE 373-8B.
Guidance and Control: Digital autopilot and remote control by the Gulf Range Drone Control Upgrade System (GRDCUS), a multifunction command-and-control multilateration system.
Dimensions: as D model.
Weight: as D model.
Performance: operating speed 207–631 mph, operating height 50–40,000 ft, endurance 2 hr 15 min.

BQM-34A Firebee

More than 1,800 of these jet target vehicles have been delivered to USAF since initial development of the BQM-34A in the late 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 6*g* maneuvering capability. A new microprocessor flight-control system provides a prelaunch and in-flight self-test capability. Since 1989, these targets have been used for weapon system evaluation at Tyndall AFB, Fla.

Contractor: Teledyne Ryan Aeronautical.
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 10¾ in, body diameter 3 ft 1¼ in, span 12 ft 10¾ 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.

QF-4

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.

Contractor: Tracor Inc.
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 0 in, height 16 ft 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.

QF-106

Approximately 194 F-106s were converted to FSATs, replacing the QF-100 in USAF service from late 1991. Advantages of the QF-106 over the QF-100 include higher supersonic speeds while under remote control and increased maneuverability. Last target delivered

in December 1994. QF-106s will be operational through FY 1997.

Contractor: Honeywell Inc.

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 8¾ in, height 20 ft 8½ in, wingspan 38 ft 3½ in.

Weight: mission operational weight 40,500 lb.

Performance: max speed Mach 2, ceiling 50–55,000 ft, typical radius 575 miles.

QF-106 (Lans Stout)

Satellite Systems

Defense Support Program

Defense Support Program (DSP) satellites, a key part of North America's early warning system, detect missile launches, space launches, and nuclear detonations. Operated by AFSPC, the satellites feed warning data to NORAD and US Space Command early warning centers at Cheyenne Mountain AS, Colo.

The first launch of a DSP satellite took place in the early 1970s, and, since that time, the 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 were launched by USAF. Procurement will end with Number 23, canceling the further satellites originally planned.

An advanced satellite constellation known as the Spacebased Infrared (SBIR) system is being developed to replace the DSP satellites, employing satellites in two orbits. The contract for the demonstration/validation phase of the low-orbit component was awarded to Rockwell (now Boeing North American)/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 a month later. *[Data for DSP.]*

Prime Contractors: TRW and Aerojet.

Power Plant: solar arrays generating 1,485 watts.

Dimensions: diameter 22 ft 0 in, 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.

Defense Meteorological Satellite Program

Defense Meteorological Satellite Program (DMSP) space vehicles, operated by AFSPC's 50th Space Wing, Falcon AFB, Colo., have been collecting weather data for US military operations for about two decades. 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. This information aids military commanders in making decisions. Satellite weather systems operated by DoD, NASA, and NOAA are to be merged and managed by NOAA.

Prime Contractor: Lockheed Martin Corporation.

Power Plant: solar arrays generating 1,000 watts.

Dimensions: height 11 ft 6 in, width 4 ft 9 in, length 19 ft 3 in.

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.

Defense Satellite Communications System

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.

The Air Force began launching the DSCS Phase II satellites in 1971. These are equipped with antennas capable of providing low-gain, Earth-field-of-view coverage and steerable, high-gain area coverage. The first launch of the more advanced Phase III satellites was in 1982. 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. They are operated by the 50th Space Wing.

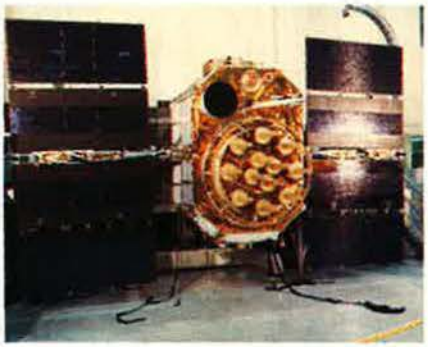
Prime Contractor: Phase II, TRW; Phase III, Lockheed Martin Corporation.

Power Plant: Phase II: solar arrays generating 531 watts, decreasing to 418 watts after five years; Phase III: solar arrays generating 1,240 watts, decreasing to 980 watts after 10 years.

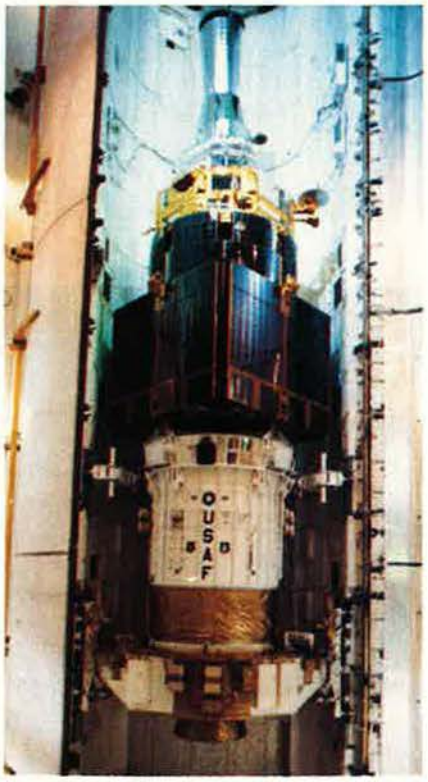
Dimensions: Phase II: cylindrical body 9 ft 0 in diameter, 6 ft high (13 ft with antennas deployed); Phase III: rectangular body 6 ft x 6 ft x 7 ft; 38-ft span with solar arrays deployed.

Weight: Phase II 1,350 lb, Phase III 2,550 lb.

Performance: two Phase II and nine Phase III DSCS satellites are currently in geosynchronous orbit.



Navstar Global Positioning System satellite



Defense Support Program satellite mounted atop an Inertial Upper Stage booster.

Navstar Global Positioning System

The Navstar Global Positioning System (GPS) is a constellation of orbiting satellites providing navigation data to military and civilian users around the world. Operated by the 50th Space Wing, Falcon AFB, Colo., the constellation achieved FOC with 24 Block II/IIA satellites in July 1995. The twenty-fifth, a replenishment satellite, was launched in March 1996. The 24 satellites 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.

Also benefiting from the GPS are such functions as mapping, aerial refueling and rendezvous, geodetic surveys, and search-and-rescue operations. Replenishment by Block IIR satellites is scheduled to begin early this year.

Prime Contractors: Boeing North American, Lockheed Martin Corporation, and Loral Fairchild Systems.

Power Plant: solar arrays generating 700 watts.

Dimensions: width 5 ft 0 in, 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.

Milstar Satellite Communications System

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. The first Milstar satellite was launched in February 1994 and is fully operational. The second satellite was launched in November 1995. 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.

Prime Contractor: Lockheed Martin Corporation.

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. The spacecraft are three-axis stabilized, with design lifetime of 10 years.

Fleet Satellite Communications

A constellation of five satellites used by the Air Force and Navy, as well as the Presidential command network. Each satellite has 23 channels (12 for Air Force, 10 for Navy, one reserved for the national command authorities). Operational since 1978 in geostationary orbit, the FLTSATCOM system carries a secure link among the three, providing UHF (and on the last two satellites EHF) communications.

UHF Follow-On Satellites

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. Ten were ordered, six of which have been launched. ■

Today they would use computers, but in the 1950s, Plexiglas and grease pencils had to suffice, even for the men and women of North American Air Defense Command (as it was known then). NORAD, which then as now was charged with defending the continent's borders, would not change "air" to "aerospace" until 1981.

In the 1960s, Titan II underground missile complexes were enormous compared to the Peacekeeper and Minuteman capsules of today. Once the order was given, launch of the nation's nuclear deterrent would have been in the hands of lieutenants and captains, just as it is today. But back then, noncommissioned officers like these were also part of the launch crews.

The launch of Sputnik in 1957 shocked the US into realizing it was behind in the "space race" with the USSR. Determined to catch up, the US redoubled its efforts in both manned and unmanned spaceflight. After some initial setbacks, the US began to overtake the Russians. One of the early triumphs was the successful spacewalk by USAF Maj. Edward H. White on the Gemini 4 mission in June 1965. Colonel White was later tragically killed with Lt. Cmdr. Roger B. Chaffee and Lt. Col. Virgil I. "Gus" Grissom in the Apollo 1 capsule fire in 1967. ■

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Going Gray

"Last June, [the Congressional Budget Office] projected that DoD's planned purchases of F-22s, F/A-18E/Fs, and [Joint Strike Fighters] should make up most of the [fighter] shortfall created as the three services retire their older aircraft. . . . The services will, however, need to keep planes in the fleet for unusually long periods to prevent shortfalls from reaching unmanageable levels. As a result, the large number of older aircraft will drive the average age of DoD's fleets to unprecedented levels. . . . The average ages of Air Force aircraft will be higher than those in the Navy and Marine Corps, exceeding 15 years by 2003. That average age will climb to about 18 years by 2010."

Cindy Williams, assistant director, National Security Division, Congressional Budget Office, in a March 5, 1997, statement to the House National Security Committee.

Sixteen Wings

"Some airpower missions demand the best technology the nation can produce. The construct that produced airpower . . . for the Vietnam War came from a conscious decision, in pursuit of cost-effectiveness, to build a force with capabilities only incrementally better than the [adversary's]. That left us unable to achieve anything like general air superiority in eight years of operation over North Vietnam. Consequently, the US Air Force alone lost 16 wings of aircraft in those eight years. Not only did we not have the capability to dominate the battlespace, [but] our freedom of action was constantly limited by enemy aircraft and other air defenses."

Gen. Larry D. Welch, USAF (Ret.), former Air Force Chief of Staff, in a February 26, 1997, speech to the Association of the US Army in Washington, D. C.

Storm Warnings

"This last year, the Air Force was able to recruit just over 30,000 enlisted folks. Over 99 percent of them have high school diplomas, and 82 percent scored in the top half of the Armed Forces Qualification Test, but it is getting very, very difficult to recruit. . . . Retention at this point is very good. . . . Our rated retention is an area, though, that is starting to give us some problems as we look out into the future—our rated force. I've talked this over with the Chief of Naval Operations, and he sees the same trends."

Gen. Ronald R. Fogleman, Air Force Chief of Staff, in February 25, 1997, testimony to the Senate Armed Services Committee.

Back in Business . . .

"[The F/A-18E/F Super Hornet] is the right plane at the right time to lead Naval Aviation into the twenty-first century. Super Hornet will help sustain operational primacy and add a great offensive punch to the forward-deployed aircraft carrier battle groups of tomorrow."

Adm. Jay L. Johnson, Chief of Naval Operations, in a January 18, 1997, statement after the F/A-18E/F's first carrier landing.

. . . Or Out of Business?

"The Clinton Administration has ordered the retirement of all Navy [A-6 Intruder] medium-attack aircraft, leaving the deep-strike mission to the Air Force long-range bombers. . . .

"After examining alternatives in the early 1980s, the Navy decided to keep the Intruder in production with a modernized A-6F model, with all-new electronics and engines. But Pentagon bureaucrats killed the program during the Bush Administration, arguing that a new stealth airplane, the A-12, would be better. A year later, the same whiz kids persuaded the Secretary of Defense to kill the A-12 on the grounds that it was too costly, and the smaller F/A-18 would have to do. The agenda all along was to get the Navy out of the deep-strike business.

"Well, as . . . [Sen.] Lloyd Bentsen might say, I know the A-6, and the F/A-18 is no A-6. The F/A-18 is a fine, versatile, reliable airplane, but when the latest E model reaches the fleet, it will still have only about half of the attack capability of the Intruder."

John F. Lehman, Jr., former Secretary of the Navy (1981–87) and Reserve A-6 bombardier-navigator, in the* Wall Street Journal, *February 28, 1997.

Goodpaster, Butler, and Perle

"I have read the joint statement by my friend Gen. [Andrew J.] Goodpaster and Gen. [George] Lee Butler. . . . In the real world, there is no serious possibility of an agreement eliminating all nuclear weapons in the foreseeable future. Generals Goodpaster and Butler seem to recognize this when they say, 'The phased withdrawal and destruction of nuclear weapons from all countries' arsenals would take many years, probably decades, to accomplish.' But elsewhere in their joint statement, the Generals acknowledge that 'No one can say today whether or when this final goal will prove feasible.'

"Nevertheless, despite uncertainty about whether the course they recommend will prove *feasible,* they urge us to undertake *now* a serious commitment to it. I should have thought that embarking on a policy, the feasibility of which cannot be shown, is a most doubtful and risky way to shape our future security."

Richard N. Perle, top Reagan Administration arms-control official, in a February 12, 1997, statement to a Senate Government Affairs Committee subcommittee concerning nuclear weapons abolition.

Premonition

"The more that I stayed awake last night thinking of [sending a major US combat force to Vietnam], . . . it just worries the hell out of me. It's damned easy to get in war, but it's going to be awfully hard to ever extricate yourself if you do get in."

President Lyndon B. Johnson, in a May 27, 1964, telephone conversation with National Security Advisor McGeorge Bundy, the tape of which was released in February by the Lyndon B. Johnson Library and Museum in Austin, Tex. ■

By John L. Frisbee, Contributing Editor

A Day of Records

A direct hit in the bomb bay could spoil a crew's entire day.

FIFTEENTH Air Force in Italy was overshadowed in size and publicity by Eighth Air Force in the UK. One reason for its anonymity, some used to say, was that war correspondents preferred life in England to the less urban areas of southeast Italy. In any event, when the Fifteenth began operations, the Eighth had been in combat and in the public eye for more than 15 months.

The Fifteenth's contribution to the defeat of Nazi Germany was very substantial and deserves more recognition than it has received. Its heavies flew nearly 150,000 sorties against enemy targets, including 19 strikes on oil refineries at Ploesti, Romania, where it lost 223 aircraft. Its fighters claimed the destruction of nearly 1,500 enemy planes.

The 483d Bomb Group began operations from Italian bases in April 1944. Before the war ended, it was to become a celebrated outfit with two Distinguished Unit Citations. On July 14, heavy bombers, including Capt. Robert Goesling's B-17 crew from the group's 816th Bomb Squadron, were sent against the Shell Oil Refinery at Budapest, Hungary, some 450 miles from their base at Sterparone Airfield. They were to return that day with one—perhaps two—distinctions not shared by another Army Air Forces crew in the European Theater of Operations.

As the Goesling crew came up on the target with bomb bay doors open, they took a direct hit in the bay. The concussion was violent, with widespread damage to the aircraft. Copilot Lt. Bud Abbott's controls appeared to have been severed. From the flight deck, they could see that the airframe was bent and the fuselage was no longer perpendicular to the wings. Control of the B-17 was regained when the automatic pilot was engaged. Abbott was then able to move to the left seat, so Goesling and flight engineer TSgt. George Freitag could survey the damage and decide if the bomber could make it home or would have to be abandoned. The odds looked favorable despite the damage and crew injuries.

Freitag then provided first aid to the injured crew members. The most severely wounded was radio operator SSgt. Tom Lewicki. When the antiaircraft shell exploded, fragments had riddled the radio room, hitting Lewicki's legs and lower body—wounds from which he would never completely recover. Navigator Lt. Bernard Garhart and both waist gunners had been hit but were able to continue their duties, painfully, after Freitag had patched them up.

Damage to the B-17 was extensive. The oxygen, electrical, and hydraulic systems were out. Leaking fuel from a punctured wing tank was burning, but the flames soon blew out. The bomb bay catwalk was warped, there was fire in the bay, and five fully armed 1,000-pound bombs were hung up in the racks. The first priority was to put out the fire and get rid of those bombs. Bombardier Lt. Robert Johnson and ball turret gunner Sgt. Richard Varner extinguished the blaze and began the sensitive job of releasing the trapped bombs. Working over an open bomb bay with only the tools at hand—a screwdriver and pliers—they released the bombs after 45 minutes of high-risk work.

With no oxygen, it had been necessary to leave the formation and descend to a lower altitude. A never-identified B-17 from another squadron dropped out of formation and flew escort for them while they were behind enemy lines.

As soon as emergency actions were completed, the crew members who were able began lightening the aircraft by throwing out everything movable. They headed for Italy at reduced speed with the bomb bay open, the fuselage bent, many holes in the plane's skin, and uncertainty about the extent of structural damage. Fortunately, no enemy fighters attacked the limping bomber.

As they approached the coast with 125 miles of Adriatic water ahead, the number three engine quit from lack of fuel. Freitag was not able to transfer fuel, but he, Goesling, and navigator Garhart were confident they could make it to Italy and try to land. They had no brakes.

The situation called for a long runway and a hospital to care for the wounded. Goesling decided to land at Foggia, which had a longer runway than their home base and better hospital facilities. Adding to their landing problems, the gear could not be lowered mechanically and had to be cranked down by hand.

To substitute for brakes, bombardier Johnson attached parachutes to the waist gun mounts, to be opened as the wheels hit the runway. A crosswind caught the chutes, forcing the bomber off the runway. It came to a stop just short of a row of parked planes.

After the wounded were taken to the hospital, a survey of the B-17 revealed many hundreds of flak holes, thought to be a record, but not one that other crews would want to break. It was remarkable that only four crewmen had been hit.

Getting the damaged bomber back to Italy was a team effort for which each member of the crew was awarded the Silver Star. The Goesling crew is believed to have earned the distinction of being the most decorated crew flying a single mission in the European theater. None of them wanted an encore. ■

Thanks to Ralph H. Simpson, former president of the 483d Bomb Group Association.

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AUTHORIZED AND WARRANTED FOR SALE TO MEMBERS OF THE AIR FORCE ASSOCIATION

AFA / AEF National Report

By Frances McKenney, Assistant Managing Editor

New Airpower Caucus Formed

Rep. Saxby Chambliss (R-Ga.) and Rep. Norman D. Dicks (D-Wash.) have organized an airpower caucus in the House of Representatives. This is a bipartisan effort to concentrate attention on airpower issues.

The coalition's first event was an Airpower Caucus breakfast, sponsored by AFA, on Capitol Hill on March 12, 1997. USAF Chief of Staff Gen. Ronald R. Fogleman was guest speaker and gave a detailed briefing on airpower modernization.

The idea to form the group came about after numerous discussions of airpower issues between Chambliss and Dicks, the coalition's co-chairmen. Chambliss has said that this is probably the first time such a caucus has been formed in Congress.

In addition to Representative Chambliss, the coalition's 21 Republican members are: Floyd Spence (S. C.), Randy "Duke" Cunningham (Calif.), Kay Granger (Tex.), Joe Scarborough (Fla.), George Nethercutt (Wash.), James V. Hansen (Utah), James Gibbons (Nev.), Howard "Buck" McKeon (Calif.), William "Mac" Thornberry (Tex.), Bob Stump (Ariz.), Herbert H. Bateman (Va.), Terry Everett (Ala.), Jerry Lewis (Calif.), Lindsey Graham (S. C.), Walter Jones, Jr. (N. C.), Jim Saxton (N. J.), Tillie Fowler (Fla.), J. C. Watts (Okla.), Sonny Bono (Calif.), Jack Quinn (N. Y.), and Todd Tiahrt (Kan.).

In addition to Representative Dicks, the 19 Democrats in the coalition are: Adam Smith (Wash.), Paul McHale (Pa.), Julian Dixon (Calif.), Del. Robert Underwood (Guam), Owen Pickett (Va.), Ike Skelton (Mo.), Vic Fazio (Calif.), Martin Frost (Tex.), Ralph M. Hall (Tex.), W. G. "Bill" Hefner (N. C.), Eddie Bernice Johnson (Tex.), Frank R. Mascara (Pa.), Earl Pomeroy (N. D.), Norman Sisisky (Va.), John M. Spratt, Jr. (S. C.), Charles W. Stenholm (Tex.), Esteban E. Torres (Calif.), Steny Hoyer (Md.), and Richard A. Gephardt (Mo.).

USAF photo by Joe Collaso

At AFA's Foreign Air Attaché Reception in March, Maj. Gen. Cornelius J. van den Burg (center), defense and air attaché, Royal Netherlands Air Force, was greeted by AFA Executive Director John Shaud, Air Force Chief of Staff Gen. Ronald Fogleman, Air Force Secretary Sheila Widnall, and AFA Board Chairman Gene Smith (l–r). As dean of the air attaché corps, General van den Burg was an honored guest among the more than 100 foreign attachés and industry representatives at the annual gathering.

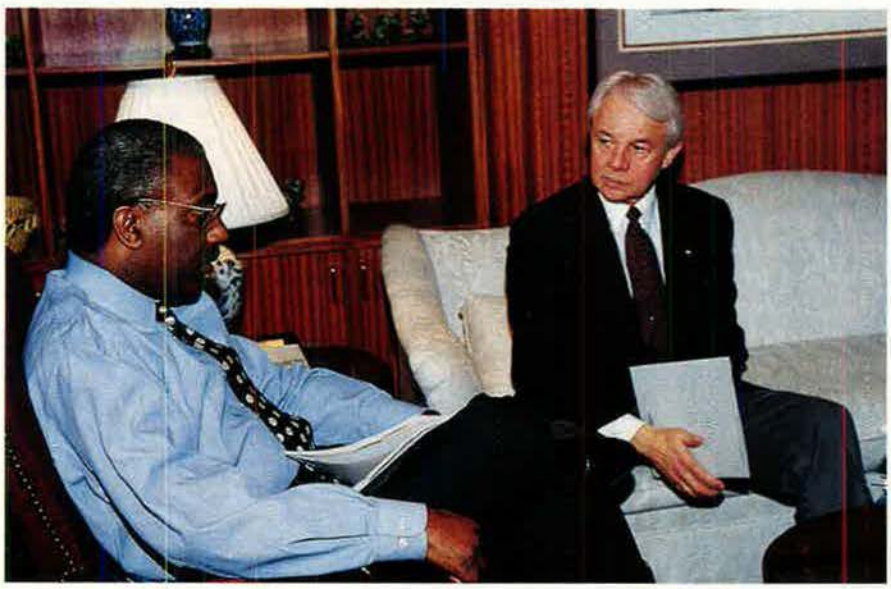


Photo by Paul Kennedy

In a March meeting at the Department of Veterans Affairs, AFA National President Doyle Larson (right) and Secretary of Veterans Affairs Jesse Brown discussed a wide range of issues affecting veterans, including several health-care initiatives under consideration for eligible military retirees.

AEF Joins Coalition

The Aerospace Education Foundation has joined the National Coalition for Aviation Education, based in the Washington, D. C., area, whose member organizations come from the industry, government, and labor sectors, as well as private associations.

The coalition promotes aviation education activities and resources from national to local levels, increases public awareness of aviation, encourages cooperative ventures among its nearly 30 member groups, and serves as a vehicle for information sharing. It also publishes a guide to aviation education resources.

By joining the coalition, AEF will be able to reach new audiences with its message on the importance of aerospace to the nation's economy and security.

On the Web

Within a week after AFA gained the ability to handle encrypted, credit card transactions on a secure server in December, it signed up the first member to "charge it" through the AFA World Wide Web site—Phillip R. Delano, who joined the **Taunton (Mass.) Chapter.**

This is just one type of interaction with Association members that AFA's web site makes possible.

"Electronic commerce is a promising area that will not be limited to memberships alone," wrote AFA Director of Communications Stephen P. Aubin. Plans are under way to offer selections from *Air Force* Magazine and other products through the web site, as debit card and credit card transactions over the Internet become more established.

AFA is working on the ability to conduct other field business through the site, and now under construction is a private area on the site that will include a member database. This will allow members to review their records and send in corrections.

Already, seven AFA state organizations have created web sites and are linked to the AFA home page: Arizona, Kansas, Nebraska, New Mexico, New York, Texas, and Virginia. The **Chicagoland-O'Hare (Ill.) Chapter, Hawaii Chapter, Highpoint (N. J.) Chapter, Montgomery (Ala.) Chapter, Razorback (Ark.) Chapter,** and **Scott Berkeley (N. C.) Chapter** are also linked to AFA's home page.

An average of 350 people visit AFA each day at http://www.afa.org/.

Anchorage's traditional Fur Rendezvous carnival honored Reserve TSgt. Roger Safarik, SrA. Jerry Blackwell, ANG, and SrA. Thomas Stella, USAF, during its Salute to the Military—an annual banquet supported by the Anchorage (Alaska) Chapter, whose president, Floyd Gori, is second from the left.

Across the Pond

They're far from home, they have a dizzying operations tempo, and their president, Capt. Patrick A. Dunn, is on four months of temporary duty for Operation Joint Endeavor. But at the urging of 52d Fighter Wing Commander Lt. Col. Gene Renuart, the 175-member **Spangdahlem (Germany) Chapter** has undergone a steady revitalization.

Chapter Vice President Capt. Larry J. Dannelley, Jr., reported that every month since last September, they have gathered for a general information meeting.

In January, a group of 10 chapter members studied the membership roster for the 105th Congress and discussed how they can bring to its attention issues important to the military. Dannelley, who votes in US elections by absentee ballot, said they also looked over the blue "Air Force Association 1997 Policy" pamphlet and were encouraged to write letters to their Congressional representatives.

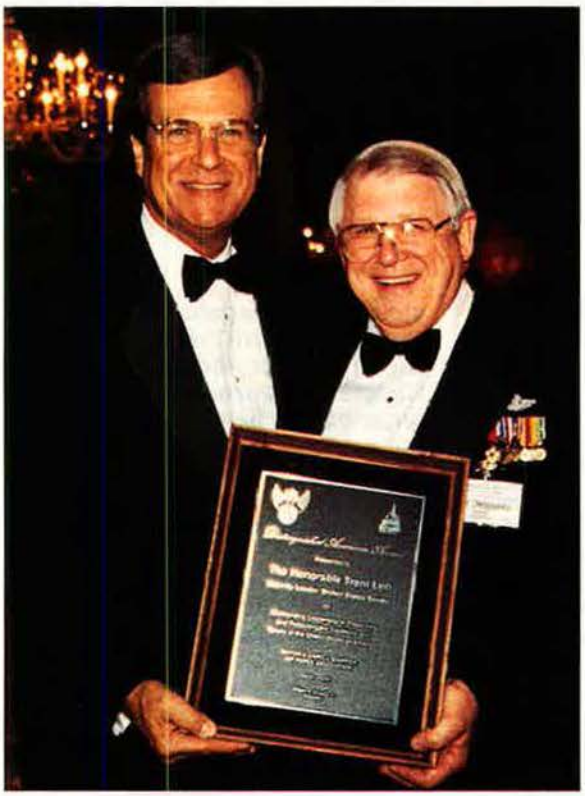
The meeting served to put the members "more in touch with what AFA is about from a policy viewpoint," Dannelley explained.

The chapter's other officers include SSgt. Tim B. Horn, secretary, and TSgt. Val F. Zabel, treasurer.

Rendezvous in Anchorage

In the old days, explained **Anchorage (Alaska) Chapter** President Floyd E. Gori, fur trappers from the frontier used to gather in Anchorage each February for a midwinter R&R break. These days, he said, the whole city celebrates the tradition. They call it "Fur Rendezvous," and it involves 10 days of events as diverse as a fashion show, dogsled race, auto race,

USAF photo by Ron Hall



Sen. Trent Lott (R-Miss.) (left) received the Nation's Capital (D. C.) Chapter's twenty-first Distinguished American Award at the chapter's black-tie dinner in March, attended by Air Force Secretary Widnall, General Fogleman, and former Rep. G. V. "Sonny" Montgomery (D-Miss.), a longtime veterans advocate. The award recognized Senate Majority Leader Lott's 25 years in Congress and support of a strong national defense.

ice sculpting, carnival rides, model railroading, and sporting events.

For chapter members, the annual Salute to the Military is a highlight of Fur Rendezvous. The chapter is a "gold table sponsor" and traditionally hosts a table at the formal dinner and invites as their guests two junior enlisted Air Force members. It also donates money to defray the cost of printing invitations.

This year, National Director Edward J. Monaghan, Chapter Vice President Gary Hoff, and Victor R. Davis helped organize the event.

Gen. Charles C. Krulak, Marine Corps Commandant, served as the salute's keynote speaker, introduced by Sen. Ted Stevens (R-Alaska).

The twentieth annual Salute to the Military honored 12 members of the armed forces, among them SrA. Thomas J. Stella, from the 3d Services Squadron at Elmendorf AFB, Alaska. He is also Airman of the Year (1996) for that base and for 11th Air Force. Other USAF honorees were SrA. Jerry W. Blackwell of the 168th Logistics Squadron, Eielson AFB, Alaska, who is the Alaska Air National Guard Guardsman of the Year (1996), and TSgt. Roger A. Safarik of the 804th Civil Engineering Squadron, who is Alaska's Air Force Reservist of the Year (1996).

Anchorage Chapter members hosted Lt. Gen. Patrick K. Gamble as guest speaker at their quarterly meeting, also held in February. He is commander of Alaskan Command, 11th Air Force, and Alaskan NORAD Region. About 300 people, including members of other military organizations in Anchorage, attended the gathering and heard the General speak about the Air Force of the future.

Historic Stripes

Thanks to the **Lubbock (Tex.) Chapter,** the historian for the 64th Flying Training Wing at Reese AFB, Tex., has been able to assemble a collection of vintage uniform insignias and pieces that document the history of US military chevrons.

The display, collected by Ruedele Turner, spans the first reference of soldiers wearing chevrons in 1821 up to today's USAF insignia. It is now exhibited in three display cases at the Enlisted/Officers' Club at Reese, but when the base closes in September, it is scheduled to become a permanent exhibition at the USAF Enlisted Heritage Hall at Maxwell AFB, Gunter Annex, Ala.

Mrs. Turner, wife of chapter member Eldon K. Turner, originally cre-

ated the collection for the last Enlisted Awards banquet at Reese, held in November 1996. It grew into a larger project involving loans of artifacts from the US Air Force Museum at Wright-Patterson AFB, Ohio. Mrs. Turner also found a source to buy old insignias from, in order to round out the collection, but then needed financial help.

"If it weren't for the Air Force Association chapter," she said, "the entire display would be nothing because there weren't any [government] funds available . . . to purchase these chevrons."

Chapter President Quentin Thomas explained that his group was especially eager to help Mrs. Turner with the project because it was a chance to highlight AFA's commitment to the enlisted force.

The display contains one example of every chevron for each rank since the Air Force became a separate service, including a set of chevrons from the first Chief Master Sergeant of the Air Force—donated by the first CMSAF, Paul W. Airey.

Mrs. Turner said she is still seeking subdued chevrons from utility uniforms that date back to when the Air Force became a separate service.

Preparing For AETC

Looking to the future, in January the **David D. Terry, Jr. (Ark.), Chapter** invited the vice commander of Air Education and Training Command, Lt. Gen. John C. Griffith, to speak to them about the transfer of Little Rock AFB from Air Combat Command to AETC.

Janet Huckabee, the wife of Arkansas Governor Mike Huckabee, was among the audience of more than 100 people. Also present were representatives of several community organizations. The civic leaders especially enjoyed chatting with General Griffith at an informal reception before his speech.

Chapter President John P. Sullivan said the meeting was part of the chapter's ongoing effort to involve the community in Air Force issues. He said residents enjoyed the opportunity to learn how they could help the transfer to AETC that took place in April.

Farewell to a Wing

In February, **Chicagoland-O'Hare (Ill.) Chapter** helped bid farewell to the 928th Airlift Wing, O'Hare IAP/ARS, Ill., which will deactivate on July 1.

The chapter cosponsored a dinner-dance and commemorative ceremony for the unit, featuring Rep. Henry J. Hyde (R-Ill.) as guest speaker. Henry B. Hufnagel, Illinois state president, also presented an award to the wing commander, Col. Michael J. McCormick, a member of the **Greater Rockford (Ill.) Chapter.** The award recognized 50 years of flying safety.

Among the Chicagoland-O'Hare Chapter members at the event were National Director Walter G. Vartan, T. W. Sorensen, and former 928th unit members Thomas A. Hilquist, state secretary, and John H. Ault, chapter treasurer.

The 928th was activated in February 1963 and participated in such activities as Operations Desert Storm and Provide Comfort and relief missions for victims of Hurricane Andrew and the 1993 floods in the Midwest.

Intervention for Subvention

As part of AFA's support for Medicare Subvention legislation, California State President Rich Taubinger asked **Bakersfield (Calif.) Chapter** President Nick Robolino to organize a local meeting with Rep. William M. Thomas (R-Calif.), who is chairman of the House Ways and Means Committee's Subcommittee on Health.

AFA / Colorado Springs/Lance Sijan Chapter

Outstanding Squadron Dinner and Associated Events

Thursday, May 22
Outstanding Squadron Dinner

AFA's thirty-eighth annual Outstanding Squadron Dinner will be held at The Broadmoor Hotel, Colorado Springs, Colo., on Thursday, May 22. The dinner honors cadets of the United States Air Force Academy for the 1996–97 school year. The price is $80 per person and $800 per table.

Wednesday, May 21
Golf Tournament and Reception

The golf tournament, open only to dinner or symposium attendees and AFA leaders, will start at 8:30 a.m. on the Broadmoor East Course. The price of $150 (only $115 if you are registered for the Acquisition Update) includes greens fees, golf cart, prizes, and reception. The fee for the reception only is $35.

Thursday, May 22
Air Force Acquisition Symposium

The seventh annual Air Force Acquisition Update, sponsored by the Colorado Springs/Lance Sijan Chapter of AFA, will focus on "Space: Expanding the Acquisition Envelope." 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 individual or Industrial Associate members. The registration fee includes a continental breakfast, coffee breaks, lunch, and a reception (Wednesday evening, May 21) in honor of the speakers. Additional individual reception tickets are $35. Overall acquisition strategy and policy will be discussed by top-level speakers.

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

Darleen A. Druyun (invited), Principal Deputy Assistant Secretary (Acquisition and Management), Office of the Assistant Secretary of the Air Force for Acquisition

Lt. Gen. Roger G. DeKok, Commander, Space and Missile Systems Center, AFMC

Lt. Gen. Lester L. Lyles, Director, Ballistic Missile Defense Organization

Brig. Gen. Robert E. Larned, Director, Special Projects, Office of the Secretary of the Air Force; and Director, Imagery Systems Acquisitions and Operations, National Reconnaissance Office

Brig. Gen. Berwyn A. Reiter, Program Executive Officer, Command, Control, and Communications, Office of the Assistant Secretary of the Air Force for Acquisition

Col. Terrence G. Crossey, Program Director, ICBM System Program Office, Hill AFB, Utah

LeRoy J. Haugh, Vice President, Procurement and Finance, Aerospace Industries Association of America (AIA)

For reservations at The Broadmoor Hotel, call (800) 634-7711 and identify yourself as an attendee of the Air Force Association symposium or dinner.

"The Department of Defense finds that the business portions of this event meet the minimum regulatory standards for official attendance by DoD employees. This finding does not constitute a blanket approval or endorsement for attendance. Individual DoD component commands or organizations are responsible for approving or disapproving official attendance of its DoD employees based on mission requirements and DoD regulations. The propriety of attendance by DoD employees in their personal capacities at incidental social portions of this event shall be determined by the individual DoD employee's Ethics Counselor based on standards of conduct and community relations requirements."

If you have any questions regarding the Acquisition Update symposium or registration, please contact **Judee Albert, (719) 594-1147, fax: (719) 594-1614.**

If you have any questions regarding the AFA golf tournament or the USAFA Outstanding Squadron Dinner, please contact **Terry Jennings, (719) 574-9300, fax: (719) 574-8176, or Barbara Coffey, (800) 727-3337, ext. 5805.**

In January, Thomas met with Robolino, Harold H. Lawler, chapter vice president; Frederick L. Powers, Kern County Veterans' Service representative; Herman Alfred, commander of the local American Legion post; and Rolf A. Shepard, a Navy retiree.

The Congressman explained to the group that he had not supported Medicare Subvention legislation last fall because the Department of Defense did not provide his committee with enough information on the program's cost.

The Bakersfield Chapter is the smallest in California, Robolino pointed out, but this experience shows that even a 94-member chapter can have an impact on legislation.

A Chapter in History

Columbus-Bakalar (Ind.) Chapter members helped preserve a part of USAF history when they participated in the dedication of a replica of a bomber flown by Tuskegee Airmen in the area during World War II.

Louis Hill, now an Indianapolis resident, received his pilot's wings in 1944 at Tuskegee AAF, Ala., and went on to train for bombing missions while stationed in Columbus, Ind., in 1944 and 1945. He was part of the 477th Composite Group (originally constituted as the 477th Bomb Group) and trained with B-25s. Today, he is a well-known speaker in Indianapolis. Because of publicity on his appearances, the Atterbury-Bakalar Air Museum, located at the Columbus Municipal Airport, learned of their area's tie to the famed Tuskegee Airmen. When it came time to dedicate a one-eighth-scale model of a B-25 at the museum, Hill and Walter Palmer, also a Tuskegee Airman from Indianapolis, were invited to perform the ceremony.

The mayor of Columbus, Fred Armstrong, attended the dedication, as did several Columbus-Bakalar Chapter members, who are reviving interest in AFA activities by aligning themselves with the museum. Interim curator Bob Henry is a chapter member.

The B-25 model—described by Henry as "museum quality"—was built by three experienced local model builders, who construct their creations in a building nicknamed the "Possum Works," after Lockheed's famous experimental aircraft laboratory, the Skunk Works.

Coming Events

May 2–3, **South Carolina State Convention,** Clemson, S. C.; May 9–11, **New Jersey State Convention,** Atlantic City, N. J.; May 9–11, **New Mexico State Convention,** Albuquerque, N. M.; May 16, **Alaska State Convention,** Elmendorf AFB, Alaska; May 16–17, **Tennessee State Convention,** Chattanooga, Tenn.; May 31, **Massachusetts State Convention,** Hanscom AFB, Mass.; June 6–7, **New York State Convention,** Niagara Falls, N. Y.; June 13–14, **North Dakota State Convention,** Fargo, N. D.; June 20–21, **Arkansas State Convention,** Hot Springs, Ark.; June 27–28, **Missouri State Convention,** Whiteman AFB, Mo.; July 11–12, **Iowa State Convention,** Des Moines, Iowa; July 18–19, **Kansas State Convention,** McConnell AFB, Kan.; July 18–20, **Alabama State Convention,** Birmingham, Ala.; July 18–20, **Texas State Convention,** Fort Worth, Tex.; July 18–20, **Virginia State Convention,** Alexandria, Va.; July 25–26, **Georgia State Convention,** Robins AFB, Ga.; July 25–26, **Mississippi State Convention,** Biloxi, Miss.; July 25–27, **Florida State Convention,** Panama City, Fla.; July 25–27, **Pennsylvania State Convention,** Pittsburgh, Pa.; August 1–2, **Colorado State Convention,** Colorado Springs, Colo.; August 14–17, **California State Convention,** Riverside, Calif.; August 15–16, **Oklahoma State Convention,** Oklahoma City, Okla.; August 16, **Connecticut State Convention,** East Hartford, Conn.; August 16, **Indiana State Convention,** Indianapolis, Ind.; September 6, **Delaware State Convention,** Dover, Del.; September 15–17, **AFA National Convention and Aerospace Technology Exposition,** Washington, D. C.

The CMSgt. David C. Noerr Scholarship, funded by National Director William Spruance (at right), was presented by AEF President Walter Scott (left) and AEF Chairman of the Board Thomas McKee (second from right) to Embry-Riddle Aeronautical University AFROTC Cadet Arnold Deasis at the AEF Board of Trustees meeting at Orlando, Fla., in January. At the same event, the William N. Webb Scholarship, in memory of the former AFA National Treasurer, and the Gene Smith Scholarship, both funded by Spruance, were awarded to Embry-Riddle AFROTC cadets Floyd English and Loren Coulter.

New Scholarship Awarded

AEF established the Janet R. (Wisemandle) Whittle Memorial Scholarship last fall, named for an Air Force spouse who died last August.

Ohio State University graduate student Stephanie L. Robison received the first $500 scholarship. She was honored at a **Wright Memorial (Ohio) Chapter** awards presentation in March, along with Amy Loch and Mary Grelk, the 1997 Air Force Spouse Scholarship winners from the Wright-Patterson AFB, Ohio, area.

Robison is the spouse of SrA. Craig S. Robison, stationed at Wright-Patterson with the Air Force Band of Flight.

An Ohio native and spouse of Wright Memorial Chapter member Alan N. Whittle, Janet Whittle valued education highly and requested that part of her estate be given to a scholarship fund to benefit the spouse of an Air Force enlisted member in the grade of senior airman or below.

More Chapter News

When the **Gen. Charles A. Horner (Iowa) Chapter** met in January, first they grilled their own steaks at a local golf course clubhouse in West Des Moines, and then they grilled their guest speaker, Army National Guard Maj. Robert Felderman. He is executive officer of the 1st Battalion, 109th Aviation Regiment (Aviation Intermediate Maintenance), Iowa ARNG, Boone, Iowa. Felderman spoke about Army aviation assets in the state, personnel strength, and the Army National Guard's missions. Because he is a helicopter pilot (UH-1Hs and OH-58s), he fielded many questions from the audience about requirements for Army pilots, including number of flight hours and sorties and additional flight training.

At the **Pease (N. H.) Chapter's** annual Salute to the Air Force Family, Purnell "Fred" Ross, Jr., chapter president, and John J. Brooks, Jr., New Hampshire state vice president, were presented with AFA Medals of Merit by Robert McChesney, former National Vice President (New England Region) and former National Director, and R. L. Devoucoux, National Director, respectively. The mayor of Portsmouth, N. H., Eileen Foley, was the keynote speaker for the event. Other special guests included Col. Kenneth R. Clark, commander of the 157th Air Refueling Wing, Pease ANGB, and Rick Fawcett, **Amoskeag (N. H.) Chapter** vice president.

Representing the **Panhandle AFA (Tex.) Chapter,** L. Ray McKee, Barry L. Smith, Elwood N. Stein, and Guy W. Leach rode in an electric-blue Mustang convertible—decorated with the AFA logo—in the Veterans Day parade at Amarillo, Tex. Chapter members Lon Atkin and Paul Jones displayed part of their vast collection of Air Force memorabilia in an exhibit that same weekend at an area shopping mall. The items included World War II Army Air Forces uniforms and more contemporary uniforms, patches, decorations, helmets, and autographed photos of famous Air Force leaders.

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. ■

Unit Reunions

A-1 Skyraider Ass'n. October 3–5, 1997, at the Holiday Inn Downtown/Market Square in San Antonio, Tex. **Contacts:** A-1 Skyraider Ass'n, P. O. Box 633, Randolph AFB, TX 78148. Rocco DeFelice. Phone: (210) 659-5965. Pete Lee. Phone: (210) 658-7804.

Bovingdon Bunch Ass'n, RAF Bovingdon, UK (1949–62), military and civilian personnel. September 11–14, 1997, at the Ramada Hctel in Woburn, Mass. **Contact:** Kenneth Holt, 201 Grove St., Reading, MA 01867-1421. Phone: (617) 944-8798.

Laredo Gang, Laredo AFB, Tex. October 2–5, 1997, at the Hilton Austin North in Austin, Tex. **Contacts:** Anthony J. or Myrtle Melli, 3201 Hatley Dr., Austin, TX 78746-4616. Phone or fax: (512) 327-1784.

Roswell Army Air Field/Walker AFB, N. M., personnel. September 12–14, 1997, at the Roswell Inn in Roswell, N. M. **Contact:** TSgt. Alfred H. Wilbur, USAF (Ret.), P. O. Box 2744, Roswell, NM 88202. Phone: (505) 622-5413.

Samfox Ass'n. October 9–12, 1997, at Andrews AFB, Md. **Contact:** Samfox Ass'n, P. O. Box 837, Clinton, MD 20735-0837. Phone: (301) 981-6355.

USAF Flight Checkers Ass'n. September 25–27, 1997, at The Shrine Motel at the National Shrine of Our Lady of the Snows in Belleville, Ill. **Contact:** Derrel L. Dempsey, 1022 Woodleaf Dr., O'Fallon, IL 62269-3148. Phone: (618) 632-6495.

USAF Rustic Forward Air Controllers. September 18–21, 1997, in Fort Walton Beach, Fla. **Contact:** Claude Newland, 4033 Indian Train Dr., Destin, FL 32541. Phone: (904) 654-2955.

1st/7th Emergency Rescue Squadron, which trained in Boca Raton, Fla., and served in Italy, Corsica, India, and Okinawa (World War II). August 21–23, 1997, in Peoria, Ill. **Contact:** Chuck Dill, 404 E. Polk St., Morton, IL 61550-1640.

4th Emergency Rescue Squadron, southwest Pacific (World War II). September 25–28, 1997, in Nashville, Tenn. **Contact:** Chet Gunn, 237 Franklin St., Reading, MA 01867-1030. Phone: (617) 944-6616.

7th Ferrying Group (World War II), Gore Field, Mont. September 11–14, 1997, at the US Air Force Museum in Dayton, Ohio. **Contact:** Willard Stohry, 1183 N. 450 E., Shelbyville, IN 46176. Phone: (317) 398-4924.

8th Fighter Group/Fighter Wing/Fighter-Bomber Wing and attached squadrons, 5th Air Force (World War II, Korea, and Vietnam). September 4–7, 1997, in San Antonio, Tex. **Contact:** Bob Davis, 8726 Elmwood Lane, Tampa, FL 33615. Phone: (813) 886-1396.

Air Force Association

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- To support the needs of the Air Force and Air Force people.
- To explain these needs to the American people.

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58th Bomb Wing Ass'n, including the 40th, 444th, 462d, and 468th Bomb Groups; 25th, 28th, 86th, and 87th Air Service Groups; and 22d Air Depot Group. May 25–June 1, 1997, at the Red Lion Inn Columbia River in Portland, Ore. **Contact:** John Roman, Jr., 106 Cassidy Ct., Cary, NC 27511. Phone: (919) 469-3456.

58th Fighter Ass'n, including the 69th, 310th, and 311th Fighter Squadrons (World War II and Korea). June 19–22, 1997, in San Diego, Calif. **Contact:** Patrick G. Keig, 5391 E. Mt. Pleasant Dr., Flagstaff, AZ 86004. Phone: (520) 527-0737.

99th Bomb Group Historical Society, Italy, 15th Air Force (World War II). September 9–14, 1997, in Baltimore, Md. **Contact:** James LaVey, 2414 Gridwood Rd., Timonium, MD 21093-2637.

100th Bomb Group (World War II). October 2–5, 1997, in Salt Lake City, Utah. **Contact:** Ralph M. Larson, 1715 E. Horne Ave., Salt Lake City, UT 84106-3733. Phone: (801) 467-1674.

325th Fighter Group "Checkertails" (World War II). September 14–18, 1997, at the Monte Carlo Resort and Casino in Las Vegas, Nev. **Contacts:** Ralph or Carol Cathcart, 113 N. Lincoln, Augusta, MI 49012-9721. Phone: (616) 731-2421.

339th Fighter Group Ass'n, 8th Air Force (World War II). September 3–7, 1997, at the Hilton Hotel in Milwaukee, Wis. **Contact:** Richard C. Penrose, 142 S. W. 17th St., Bend, OR 97702. Phone: (541) 389-0305.

339th Fighter Squadron Ass'n. October 8–11, 1997, in Orlando, Fla. **Contact:** Vernon Allison, 10732 Shaffer Rd., Versailles, OH 45380-9440. Phone: (513) 526-4344.

340th Bomb Wing and support units, Whiteman AFB, Mo. (1953–62), September 25–28, 1997, in San Antonio, Tex. **Contact:** Henry E. Whittle, 13707 Castle Grove Dr., San Antonio, TX 78231-1911. Phone: (888) 340-2662. Fax: (210) 493-5419.

340th and 341st Fighter Squadrons, all unit members stationed in the southwest Pacific (World War II), October 2–5, 1997, in Fort Walton Beach, Fla. **Contact:** James Yealy, 331 Yacht Club Dr., Fort Walton Beach, FL 32548-6437. Phone: (904) 244-3954.

356th Fighter Group Ass'n, 8th Air Force, Martlesham Heath, UK (World War II). October 2–5, 1997, at the Holiday Inn Midtown in Savannah, Ga. **Contact:** Kenneth J. Male, 8282 N. W. 47th St., Ocala, FL 34482. Phone: (352) 622-9976.

359th Fighter Group Ass'n, support units, Station 133, East Wretham, UK (World War II). September 18–20, 1997, Embassy Suites in Montgomery, Ala. **Contact:** Charles W. Staley, 2546 Austin Pl., Beloit, WI 53511-2327. Phone: (608) 362-5513.

366th Fighter Group Ass'n. September 4–7, 1997, at the Best Western Thunderbird Hotel in Minneapolis, Minn. **Contact:** John Peterson, P. O. Box 392, Harrodsburg, KY 40330. Phone: (606) 734-7912.

376th Bomb Group (World War II). October 16–19, 1997, at the Hilton Knoxville in Knoxville, Tenn. **Contact:** Tom Brown, 104 Lake Fairfield Dr., Greenville, SC 29615-1506. Phone: (864) 244-8420.

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.

386th Bomb Group, associated units, 8th and 9th Air Forces (World War II). September 17–21, 1997, at the Marriott Memphis in Memphis, Tenn. **Contact:** Barnett B. Young, 5594 Buring Ct., Fort Myers, FL 33919. Phone or fax: (941) 482-5059.

453d Bomb Squadron Ass'n, 323d Bomb Group. September 18–20, 1997, at the Ramada Kansas City Airport in Kansas City, Mo. **Contact:** C. V. Sochocki, 1314 N. Brookfield St., South Bend, IN 46628-3074. Phone: (219) 233-6044.

457th Bomb Group, Glatton, UK, and attached units (World War II). October 12–15, 1997, in Savannah, Ga. **Contact:** Homer L. Briggs, 811 N. W. B St., Bentonville, AR 72712. Phone: (501) 273-3908. Fax: (501) 271-9147.

459th Bomb Group, 15th Air Force (World War II). September 18–21, 1997, at the Marriott Hotel Sea-Tac in Seattle, Wash. **Contacts:** Elmer Hjorten, 1238 N. W. Norcross Way, Seattle, WA 98177. Phone: (206) 362-5719. John Devney, 90 Kimbark Rd., Rochester, NY 14610-2738. Phone: (716) 381-6174.

475th Fighter Group, 5th Air Force, Pacific (1943–48). October 16–19, 1997, at the Mission Inn in Riverside, Calif. **Contact:** Curt Tinker, P. O. Box 498, Intervale, NH 03845-0498. Phone: (603) 356-6099.

596th Signal Aircraft Warning Battalion Veterans Ass'n. October 15–19, 1997, in Atlanta, Ga. **Contact:** Elizabeth Bartley, 255 Crescent Dr., Decatur, IL 62526-1844. Phone: (217) 877-1417.

601st Tactical Control/Aircraft Control and Warning/Aircraft Control Squadrons and assigned units. October 2–5, 1997, in Charleston, S. C. **Contact:** Harry E. Ambrose, 18720 Dallas Lane, Little Rock, AR 72211. Phone: (501) 821-3509.

906th Air Refueling Squadron Ass'n. September 4–7, 1997, in Kansas City, Mo. **Contacts:** Kemp F. Martin, 806 Oak Valley Dr., Houston, TX 77024. Phone: (713) 464-0401. Thomas H. Shull, Jr., 8514 Cedel Dr., Houston, TX 77055-1119. Phone: (713) 932-7896.

3500th WAF Squadron, Ellington AFB, Tex. (1950s). October 1997 in Las Vegas, Nev. **Contact:** Keith L. or Bobbie (Dodd) Johnson, 21055 Providence, Lake Forest, CA 92630-7051. Phone: (714) 855-6276.

Seeking **Châteauroux AS, France,** personnel (military and civilian, 1951–66) for a reunion in September 1997. **Contact:** Barbara Bush, 2407 Rona Village Blvd., Fairborn, OH 45324. Phone: (937) 879-0562. ■

Bulletin Board

Seeking contact with or information on **Willburn Robinsson** from Baltimore, Md., who was in Filipstad, Sweden, in 1945. **Contact:** Berit Friskytt, Rådhusgatan 4A, 151 72 Södertälje, Sweden.

If you need information on an individual, unit, or aircraft, or if you want to collect, donate, or trade USAF-related items, write to "Bulletin Board," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be brief and typewritten; we reserve the right to condense them as necessary. We cannot acknowledge receipt of letters. Unsigned letters, items or services for sale or otherwise intended to bring in money, and photographs will not be used or returned.—THE EDITORS

Seeking information on the 8th Air Force **B-24H #42-95095** that crashed on June 13, 1945, near Gairloch, Scotland. **Contact:** Chandler A. Oakes, P. O. Box 649, Golf Course Rd., Lake Pleasant, NY 12108-0649.

Seeking information and memorabilia on the **305th Bomb Group,** 8th Air Force, during World War II, especially relating to the B-17G *Leading Lady*. **Contact:** Mike J. A. Guymon, c/o 17132 Lorne St., Van Nuys, CA 91406.

Seeking contact with **1st Lt. Lloyd J. Seymour,** who served in the UK and was relieved from active duty February 12, 1946. **Contact:** L. D. Jacks, Orchard House, Steverton New Road, Ludlow, Shropshire SY8 1JU, UK.

Seeking contact with members of the June–August 1946 Flight 627, SB 14 of Basic Flight Training at Lackland Field, Tex., including **Richard S. Calhoun, James R. Dawling, Herbert C. Dean, Roy C. Evans, David L. Griesemer, and Richard T. Kiger. Contact:** John A. Banasick, PSC #02, Box 1602, APO AA 34002.

Seeking Air Force **patches** from World War II, Korea, and Vietnam and books about these patches. **Contact:** George Arca, 2721 Westbrook Dr., Franklin Park, IL 60131-3273.

Seeking information about **Paul H. Dahlberg,** navigator, 7th Air Force. **Contact:** David B. Dahlberg, 4224 W. 36th St., Saint Louis Park, MN 55416.

Seeking contact with anyone who was associated with the **F-111 Aardvark** at any time. **Contact:** Peter E. Davies, 28 Claremont Rd., Bishopston, Bristol BS7 8DH, UK.

Seeking information on **Lt. Richard Hisey,** who was killed in France on November 13, 1944. **Contact:** Tom Moore, P. O. Box 873, Sandusky, OH 44871.

Seeking contact with personnel from "snooper" training at Langley Field, Va., 1944–45, including **2d Lts. Percy Dunn and Arthur Hegvalt, and 2d Lts. Broyles and Chapman, Jefferson W. Bohanon, and Cpl. Edward Chapman. Contact:** Walter H. Pierson, 717 Running Creek, Seguin, TX 78155. ■

Pieces of History

Photography by Paul Kennedy

Breaking Away

Memorabilia courtesy USAF Museum, Wright-Patterson AFB, Ohio

Almost since the day in August 1909 when the Army accepted its first aircraft, US airpower advocates had thought about a separate military air service as the most efficient method for developing and applying airpower. After many trials (both figuratively and, in the case of Billy Mitchell, literally), advocates saw their dream fulfilled on September 18, 1947, when the United States Air Force was born. Half a century later, with a record of accomplishment that distinguishes it as the preeminent air and space force in the world, USAF has borne out the convictions of its early supporters.

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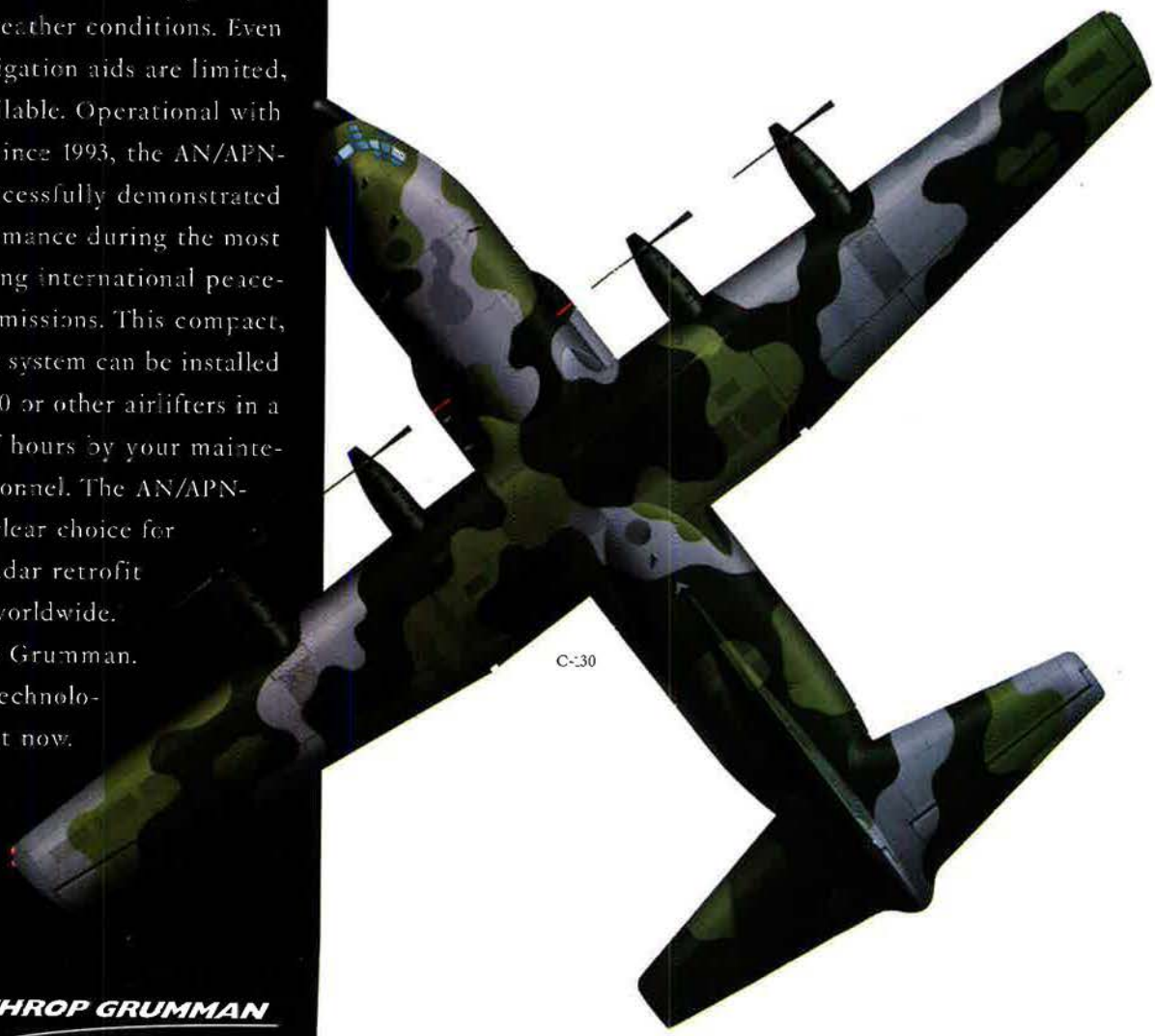

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