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AIR FORCE

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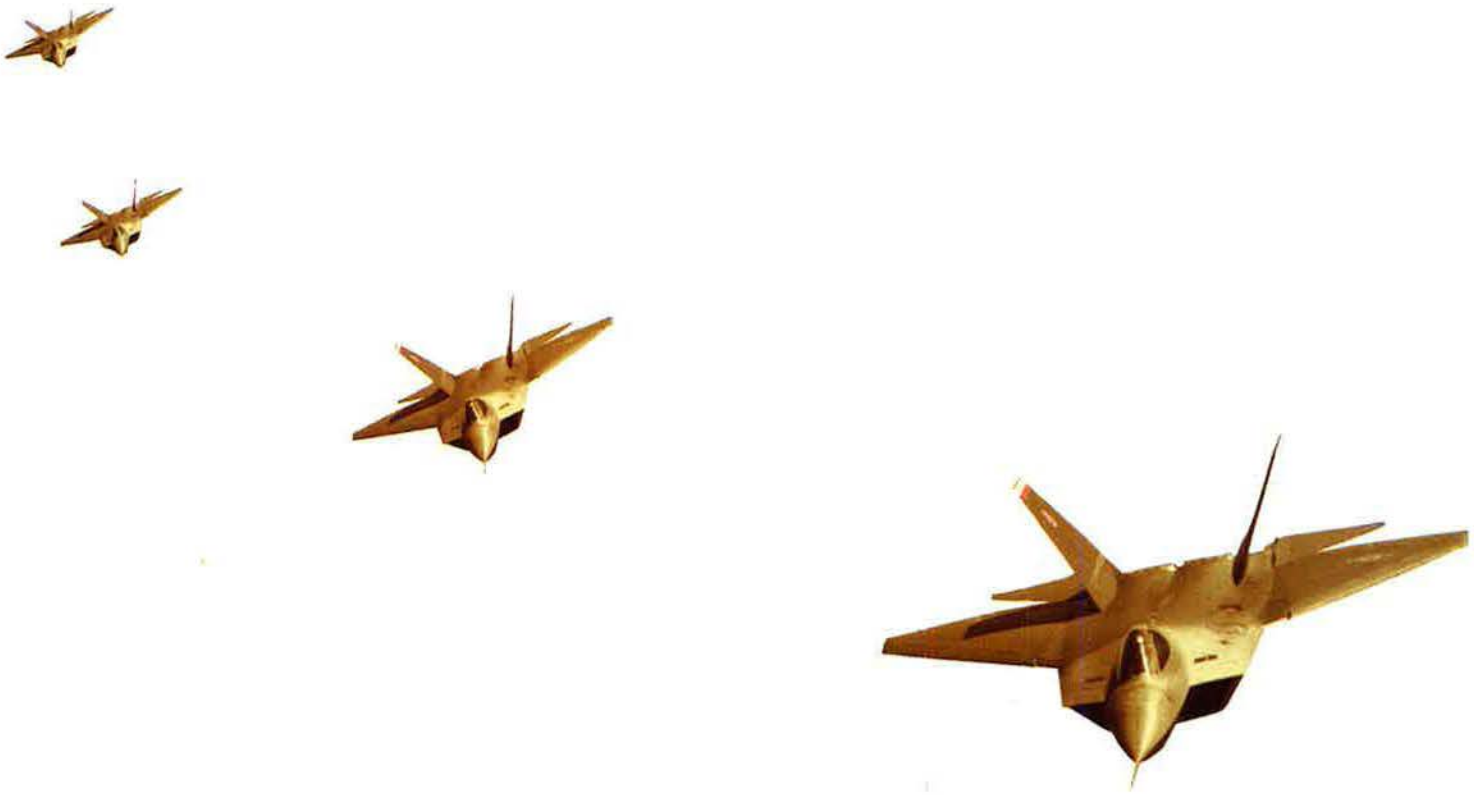

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F22
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May 1995, Vol. 78, No. 5

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

About the cover: The USAAF winged star was revived a few years ago by the Air Force Chief of Staff's office and now appears on everything from uniform buttons to hangars at history-conscious Randolph AFB, Tex. Photo by Paul Kennedy.

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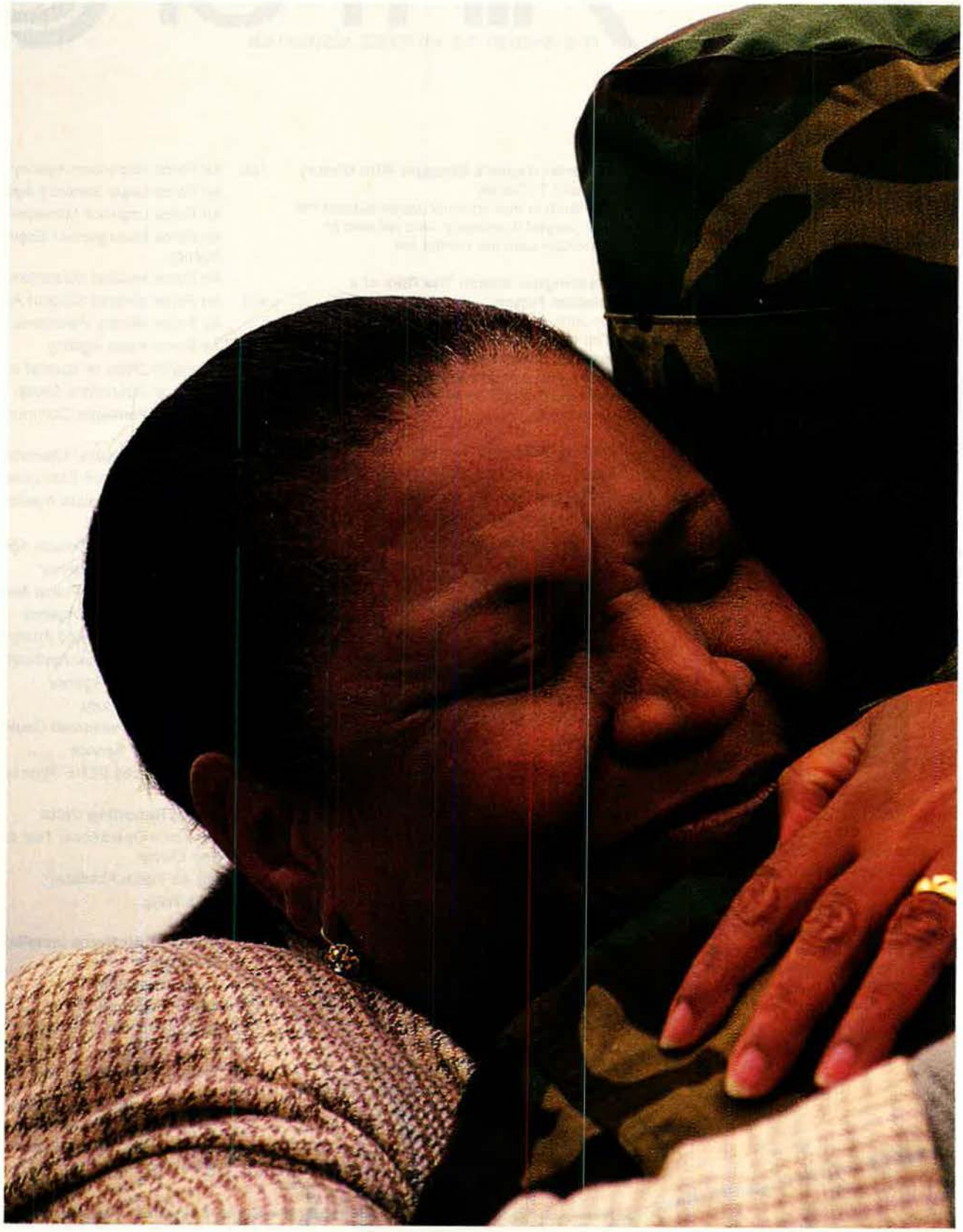

She spends her nights wondering.

Is he alive?

Is he safe?

Is he afraid?

Is he still the little boy who asked me to protect him from the monsters under his bed?

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Editorial

By John T. Correll, Editor in Chief

Japan's Struggle With History

According to Washington *Post* reports out of Tokyo, the Clinton Administration promised in March that plans for commemorating the fiftieth anniversary of the end of World War II would be toned down in deference to Japanese sensitivities. "We have assured Japan that nobody in the US government or the military will use the term 'V-J Day' this year," an unidentified official said. A neutral term like "the end of the war" would be used, avoiding any reference to victory over Japan.

Back in Washington, a damage control team swung into action. A State Department spokesman assured *Air Force* Magazine that the US government had "no policy to not use the phrase 'V-J Day.'" The effort to set the record straight, however, was conspicuously limp until complaints by veterans' groups forced the issue. Eventually, "administration underlings" were blamed.

This clumsy episode reminds us that World War II is still a sore subject in Japan and also that some people in this country are determined to make the memory of it as inoffensive as possible to the Japanese. Many in Japan believe their nation was a victim, not the aggressor. Conservative groups in the Japanese parliament, reflecting a position of considerable public popularity, are blocking a proposal by Prime Minister Tomiichi Murayama that Japan apologize for invading other Asian nations and killing millions of people.

■ In May 1994, Justice Minister Shigeto Nagano was dismissed after saying that the 1937 "Rape of Nanking"—where the death toll of civilians killed by Japanese troops exceeded the combined total from Hiroshima and Nagasaki—was a hoax. In August, another cabinet minister, Shin Sakurai, Director-General of the Environment Agency, was forced to resign for saying that the subjugated nations of Asia had benefited from the Japanese occupation.

■ In August 1994, Ryutaro Hashimoto, Minister of International Trade and Industry, declared, "I can't think that the war with the United States, England, France, and Holland was aggression."

■ In January 1995, a Tokyo news magazine, *Marco Polo*, was shut down after denying, in an article titled "There Were No Nazi Gas Chambers," that the Holocaust ever happened.

The truth is that Imperial Japan started the war, waged it savagely, and refused to surrender until the bombs fell.

■ Popular historian Noboru Kojima says that "Japan is too eager to nervously apologize when anyone complains about the war." He questions whether, for example, the "comfort women" dragged away by Japanese soldiers were not just prostitutes.

Not everyone in Japan thinks this way. Otherwise, Ministers Nagano and Sakurai would not have been driven from office and *Marco Polo* might still be publishing. Recently, textbooks used in Japanese schools have begun to acknowledge that Japan waged a war of aggression, but the sneak attack on Pearl Harbor gets only passing mention.

On this and other aspects of the war, Japan remains in denial mode. Former Cabinet Minister Seisuke Okuno, who heads a group of 161 members of parliament opposing the resolution of apology, says that if anybody owes somebody an apology for World War II conduct, it is the United States. In March 1995, Nagasaki Mayor Hitoshi Motoshima declared the US use of the atomic bomb in 1945 to have been a war crime on a par with Germany's program of genocide against the Jews. "I think that the atomic bombings were one of the two greatest crimes against humanity in the twentieth century, along with the Holocaust," he said.

Mayor Motoshima has been upset ever since the Smithsonian Institution canceled an exhibition that would have used the *Enola Gay*, the B-29 that dropped the atomic bomb on Hiroshima, as a prop in a political horror show. As originally planned, the exhibition portrayed the Japanese as defending their culture against Western imperialism in a war that culminated, needlessly, in the use of atomic weapons. Mayor Motoshima and his colleagues in Nagasaki want to bring an atomic bomb exhibit of their own to the United States to do the job that the Smithsonian has dropped. Such a program will be welcome, no doubt, as part of the "National Teach-In on Hiroshima" that academic activists are trying to organize at US colleges and universities.

The tragedy of the war did not begin when bombs fell on Japan. It started with Japan's campaign of conquest and atrocity to establish a "Greater East Asia Co-Prosperity Sphere." The US entered the war when attacked without warning at Pearl Harbor. Ultimately, the war Japan started spread devastation throughout Asia and most of the Pacific. By 1945, Japan had no hope of winning but refused to surrender. Between April 1 and June 30, the US took 48,000 casualties in the battle for Okinawa alone. To hold the home islands and preserve the imperial regime, Japan was prepared to expend a force of 3.5 million troops, thousands of *kamikaze* aircraft, and a mobilized population. In making his decision to use the atomic bomb, President Truman considered the probable losses if an invasion led to "an Okinawa from one end of Japan to the other." The mission of the *Enola Gay* on August 6 was a military action taken to bring the war to an end.

World War II does not call for neutral interpretation. There was a right side and a wrong side. The right side won. That is what we remember this anniversary year—no conciliatory adjustments are required—on V-E Day, May 9, and on V-J Day, August 15. ■

SOMETIMES IT TAKES A COMPETITION TO PROVE YOU HAVE NO COMPETITION.

Once again, the multi-role F-16 did what it does best - dominate the competition. This time, it was William Tell, the definitive USAF air superiority competition. The F-16 teams captured every major event - Overall, Operations, GCI, Maintenance, and Loading.

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1st	**F-16**	**F-16**	**F-16**	**F-16**	**F-16**
2nd	CF-18	**F-16**	**F-16**	**F-16**	CF-18
3rd	**F-16**	CF-18	F-15	F-15	F-15
4th	F-15	F-15	F-15	F-15	**F-16**
5th	F-15	F-15	F-15	CF-18	F-15
6th	F-15	F-15	CF-18	F-15	F-15
7th	F-15	F-15	F-15	F-15	F-15
8th	F-15	F-15	F-15	F-15	F-15

Demonstrating its multi-role talent, the F-16 also consistently dominates Gunsmoke, the premier worldwide air-to-ground competition, sweeping all events. The F-16 is the only aircraft ever to win both weapons competitions.

The F-16 is also undefeated where it counts most - in the real world. It has a 69-0 record in aerial combat and the world's only three combat AMRAAM kills. With this capability and a $20 million price tag, what's left to tell?

LOCKHEED MARTIN

Letters

2LM: Boon or Bust?

I have to jump on the bandwagon with Col. Richard D. Zwieg and his letter rebutting the two-level maintenance (2LM) concept *["A Truly Bad Program," March 1995 "Letters," p. 6].* As the Air Force operations and maintenance (O&M) dollar continues to shrink, shouldn't we try to maximize the taxpayer's dollar by repairing as much as we can at base level instead of paying to ship an item to a depot to be repaired there or sent to a contractor? After all, today's highly educated and trained technicians are willing and able to repair engines and avionics at base level. What I see now are bored technicians who have their hands tied by 2LM constraints.

Instead of using their talents, we are sending the work to depots, contractors, and prisoners. It seems inevitable that the reduced budget will significantly cut funding for spares, causing more holes in aircraft, increased cannibalization, and reduced mission capable rates.

I am not convinced by the purported dollar savings for two-level maintenance and would like to see a major study evaluating the savings. We have a two-headed monster looking at us—one side advocating 2LM and the other pushing Combat Oriented Repair Initiatives. While we advertise items for local vendor repair under the CORI program, our technicians wonder what we can do to use their talents. There have been some positive initiatives (*e.g.,* circuit card repair). However, this is only one step back toward self-sustainment.

While we regionalized engine and avionics repair during Operation Desert Storm, we learned that some form of blue-suit intermediate-level maintenance would be needed if the war lasted beyond thirty days—unless we wanted to rely on Federal Express or Desert Express to sustain logistical channels during extended conflicts. Remember the logistical backlog at various Stateside bases during Desert Storm and tracking item movement via a transportation control number?

What we have is the beginning of a hollow logistical force that is losing the expertise necessary to repair what we need to sustain ourselves in both peacetime and wartime. Let's give our technicians the credit they deserve and allow them the satisfaction and ingenuity to repair what we need at base level and reduce our reliance on exterior forces.

Maj. Daniel E. McCabe,
USAF
Beale AFB, Calif.

I read Colonel Zwieg's letter on two-level maintenance with a great deal of interest. I work for the Air Force Logistics Management Agency, and my division currently has twelve research projects to assess the financial impact of 2LM vs. three-level maintenance (3LM). These projects concentrate on avionics and engines.

Trying to reconstruct the analysis accomplished by RAND Corp. and other contractors years ago is difficult at best. Assumptions made during the original studies were fine, as far as they went. However, all recommendations were not fully implemented in practice, once the decision was made to restructure with 2LM. Competing programs (*e.g.,* 2LM and Gold Flag) were put into effect at about the same time with little consideration given to their mutual impact. It has caused problems. However, I'm not ready to agree that 2LM "hasn't saved a dime."

Our pilot project, Assessment of TF33-7A Two-Level Maintenance Costs, was recently completed, and we isolated a 2LM cost savings of $32 million. Part was due to 2LM implementation and part due to an increase in the work that the depot was contracted to do: Quick Engine Change (QEC) kit refurbishment. The price tag for the QEC repair, $15.2 million, was considered initially as a 2LM cost, but it is not. This represents an additional saving under 2LM that the Air Force made a conscious decision to spend, and it will manifest itself as long-term savings through reduction in future QEC repair. The impact is significant, yet this is the kind of thing that frequently is "overlooked" when analyzing 2LM costs.

Databases used for research are less than accurate and cause problems when running analytical computations. The visibility of costs associated with maintenance and repair of items at all levels of 2LM and 3LM is absolutely terrible for a variety of reasons. Most prominent is that our financial accounting system isn't designed to identify costs to the *n*th degree. That is what we need to portray maintenance costs accurately.

External factors associated with owner (wing) funding of depot-level reparable (DLR) assets, coupled with the increased repair capability associated with Gold Flag technicians, have altered the 2LM environment. Under 3LM, the local repair technicians had no real incentive to fix DLR items. Now they have every incentive to prevent "not reparable this station" actions and avoid sending the DLR asset back to the depot. Yes, the incentive is money—O&M funding.

We are also studying intermediate-level repair capability from a mobility footprint angle. . . . The issue is this: Is it more reasonable to move hundreds or thousands of parts and people to support 3LM back and forth, or does it make more sense to move the end items back and forth? The most valid rationale I was given for having the former capability (by a senior officer) was, "I don't know why, but it makes me feel good."

Yes, 2LM has a place in Air Force maintenance; it's the "how much" that's debatable. Maybe it's the how much that's the real issue with so many of our newly implemented programs. It seems we ask a contractor

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

to study an issue, and in the end we tend to accept the contractor's conclusions and recommendations lock, stock, and barrel—as the final authority on *our* subject. Before we've given it the good "two-striper" test, we rush to implement.

That doesn't mean the program is all bad. Each weapon system and subsystem needs to be analyzed from a cost and combat assessment standpoint for 2LM or 3LM. Local repair should be used to the maximum, but not when costs exceed capabilities and no increase to combat capability results. The Air Force *is* probably saving money under 2LM. However, it may not be for all the reasons that 2LM was initiated. . . .

Lt. Col. Guy R. Vanderman, USAF
Air Force Logistics Management Agency
Maxwell AFB, Ala.

Colonel Zwieg's letter regarding "disinformation" to "sell" 2LM does little to cure the problem. He adds to the confusion by linking "outlandish surcharges" to 2LM. Surcharges are a result of Defense Management Review Decision 908, not 2LM. They are intended to identify costs previously hidden and separately budgeted and pass them to the ultimate user so that the "real cost" of a program can be felt. Depots (including 2LM) pay the same surcharge as the field units whenever an item is ordered from supply. . . .

Propulsion 2LM is a fact of life at Tinker AFB, Okla. More than 600 engines have been produced in support of eight different Air Force aircraft. The E-3, KC-135R, B-52H, and F-111/EF-111 programs are wholly dependent on 2LM, as is most of the C-141 fleet. The C/KC-135E and C-18A aircraft are phasing in 2LM by the end of Fiscal 1996. Base stock levels have been maintained. The money is gone, the people are gone. Can you still meet the mission? So far, our customers have.

This does not mean I believe 2LM makes sense on every engine program. However, blanket criticism of 2LM does a disservice to the men and women of Oklahoma City Air Logistics Center's Propulsion Directorate, as well as other depots, who work hard to make 2LM a reality.

Leslie R. Courtney
Oklahoma City Air Logistics Center
Tinker AFB, Okla.

A Cruel Fraud

I am writing regarding the US Department of Labor employment data for Vietnam veterans recently published in *Air Force* Magazine *["Vietnam Vets and the Workplace," March 1995 "Chart Page," p. 8]*. The Department of Labor would have us believe that no significant discrimination in employment against Vietnam veterans has taken place. Note, however, that its database includes only those still in the work force and says nothing about those vets who long ago dropped out after abandoning hope of meaningful employment.

Note, too, that the Department of Labor is hardly an impartial reporter. It is charged by law with enforcement of the Veterans Readjustment Act of 1974, which, among other things, extends to Vietnam-era veterans and all disabled veterans affirmative action protection equivalent to that afforded women and minorities. The Department of Labor has made no meaningful attempt to enforce the law in this instance. Indeed, the vast majority of veterans are unaware of the existence of the Veterans Readjustment Act, let alone the protection it is supposed to give them.

The cruel fraud perpetrated against Vietnam-era vets by the Department of Labor is revealed in one statistic cited in your coverage, showing that the proportion of Vietnam-era vets in government jobs is twice as high as that for nonvets—twenty-two percent as opposed to 11.4 percent. Where are those twenty-two percent employed? As Senior Executive Service civil servants? As elected officials? As professors at state universities? Hardly!

As former chair of the Ohio State University Veterans Task Force, established in 1991 to investigate anti-veteran discrimination and compliance with and enforcement—or, as it turned out, nonenforcement—of the Readjustment Act, I can assure you that Vietnam vets do not predominate in these jobs. Vietnam veterans are sharply underrepresented. You will find a very high proportion of the twenty-two percent of Vietnam vets in government employment holding relatively low-paying jobs with the US Postal Service.

Though many have risen above it, discrimination against Vietnam War veterans is a reality, not "a common misconception," Bureau of Labor Statistics notwithstanding.

Lt. Col. John F. Guilmartin, Jr., USAF (Ret.)
Columbus, Ohio

A Littoral Definition

"Roles and Missions Ride Again" *["Washington Watch," February 1995,*

p. 10] refers to the role of the Naval Doctrine Command in redefining "littoral." Your commentary is based on a flawed October 1994 article in *Naval Institute Proceedings* in which the author quotes from a footnote, not the glossary, found in our recently released Naval Doctrine Publication 1, *Naval Warfare.* The Glossary of NDP-1 clearly defines littoral as "those regions relating to or existing on a shore or coastal region, *within direct control of and vulnerable to the striking power of naval expeditionary forces"* (emphasis mine).

In the *Proceedings* article you used as the basis of your own commentary, the author took his quoted passage from NDP-1 well out of the intended context by applying the term "littoral" to strategic nuclear warfare. NDP-1 uses the term "littoral" in the context of conventional warfighting—not strategic nuclear strikes by the Trident II submarine-launched ballistic missile. The footnote that the *Proceedings* article, and your own commentary, quotes was crafted to account for the Tomahawk theater-launched cruise missile—not the D5.

There is no discussion of nuclear power projection from the sea in NDP-1, and doctrine for the employment of the D5 missile would be developed by the appropriate joint commands and centers. Furthermore, any discussion of "power projection" in NDP-1 is clearly in the context of "employment of long-range, accurate cruise missiles; Marines conducting high-speed maneuver across the shore and inland aided by naval surface fire support; and a great variety of weapons released from naval strike aircraft."

In short, there is no intent to "make the entire world a littoral" by the definitions or use of the term "littoral" in NDP-1.

Rear Adm. F. L. Lewis, USN
Commander, Naval Doctrine Command
Norfolk, Va.

Air Force Magazine Revisionism

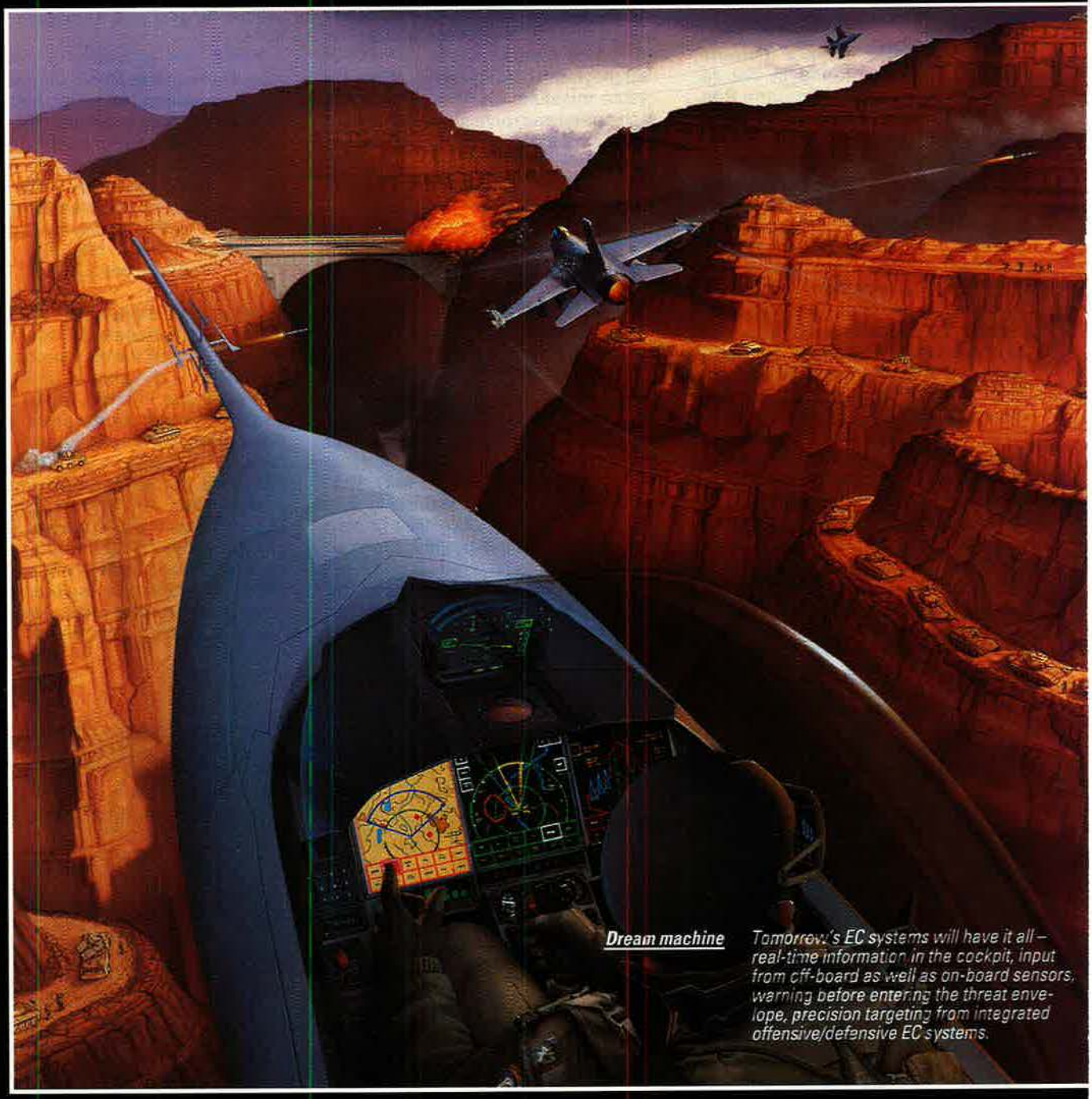
In reference to your gallant stand against the revisionist historians at the Smithsonian (which I fully support), I note that you continue to pursue one editorial policy that is also the result of revisionist historians at work.

I refer to your continued use of the term "Bf-109" for the German World War II fighter *["Valor: Operation Gunn," January 1995, p. 49].* The Bf term was indeed used in some Luftwaffe records, but the airplane was universally referred to as an Me-109 throughout the Luftwaffe, as it was among Allied nations. . . .

While this is nowhere near the magnitude of the *Enola Gay* affair, it is still an attempt to revise history by making the reader believe these aircraft were referred to as Bf-109s and Bf-110s. They were not. So in your own little way, you are doing the same thing as the Smithsonian folks.

MSgt. Merle C. Olmsted, USAF (Ret.)
Paradise, Calif.

■ *When the Bayerische Flugzeugwerke was renamed Messerschmitt in 1938, it kept the Bf type name for its -108, -109, and -110 fighters. Because the overall logic behind service aircraft designators was to use a prefix derived from each manufacturer's name, many people—including Luftwaffe personnel—assumed that all aircraft made by Messerschmitt were designated Me, but the -108s, -109s, and -110s remained Bfs and bore ID plates to that effect. A -109 can legitimately be referred to as a Messerschmitt or as a Bf-109, but not as an Me-109.*—THE EDITORS



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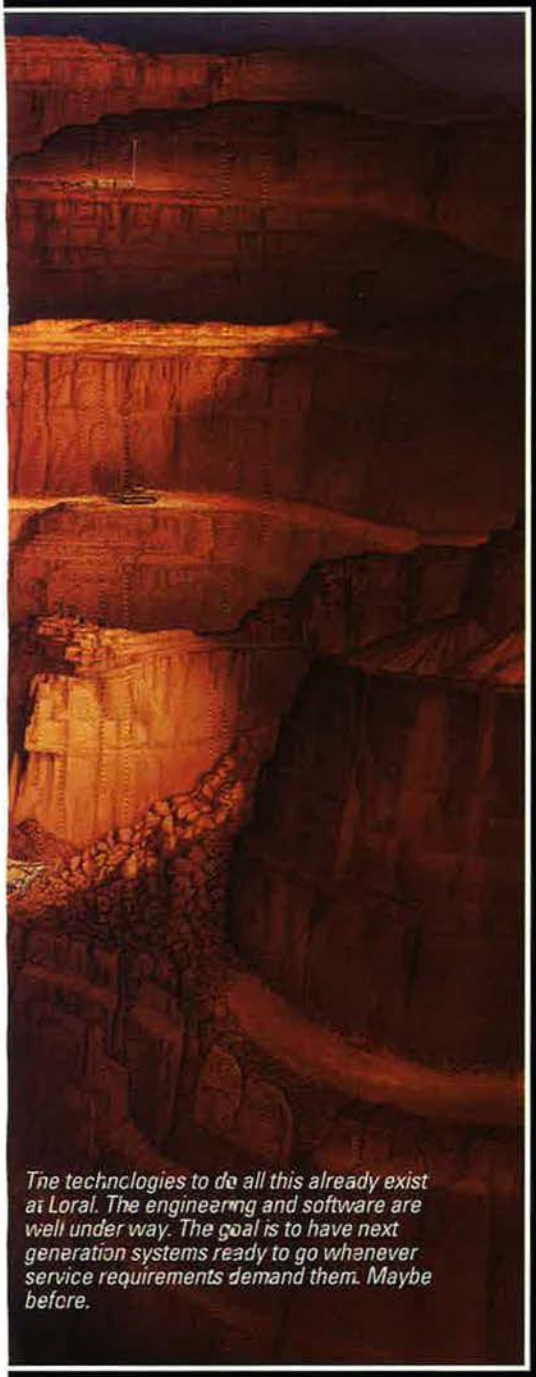

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Capitol Hill

By Brian Green, Congressional Editor

Dicks Proposes a Trade-Off

USAF is not ready to trade funding for the C-17 airlifter or other systems in order to buy more B-2 bombers.

MEMBERS of Congress heard a novel proposal for funding the acquisition of more B-2 Stealth bombers. The plan, offered by Rep. Norman D. Dicks (D-Wash.), calls for financing the bombers with funds diverted from the C-17 airlifter. The congressman's plan also would siphon away C-17 money to buy commercial cargo jets for military purposes.

In March, Mr. Dicks, a key member of the House Appropriations National Security Subcommittee, offered the trade-off idea as a way for the USAF to generate funding for additional B-2s and still have enough for airlift needs. The proposal, studied earlier by RAND Corp. and the General Accounting Office (an investigative arm of Congress), would cut acquisition of the C-17 from the 120 now planned to only seventy. The truncated C-17 fleet would be supplemented by thirty new Boeing 747 freighters.

Mr. Dicks, whose district has a major economic stake in both the B-2 and the 747, cited a GAO estimate that such a plan would save about $9 billion in airlift fleet life-cycle costs. He argues that this money, combined with funds saved by retiring a number of B-1 bombers, could purchase twenty more B-2 bombers.

B-2 contractor Northrop Grumman Corp. has offered the Air Force an additional twenty B-2s at a cost of $11.4 billion in Fiscal 1995 dollars. The Air Force believes the cost would be somewhat higher, but it still views the Northrop offer as a credible one.

The Air Force did not respond directly to the Dicks proposal. Gen. Ronald R. Fogleman, the Air Force Chief of Staff, stated at a recent hearing that he is "not prepared to trade off any procurement funds within the current Air Force program" for additional B-2 bombers.

On the record of the past, the House National Security Committee (HNSC) may not be receptive to the proposal. The committee's chairman, Rep. Floyd D. Spence (R–S. C.), didn't offer his opinion, but the first operational C-17 wing is stationed in Charleston, S. C., near Mr. Spence's home district. Rep. Jane Harman (D-Calif.), an HNSC member whose district includes C-17 facilities and workers, opposed the trade-off at a recent committee hearing.

The HNSC also has a clique of dedicated opponents to the B-2. Foremost among them: Rep. John R. Kasich (R-Ohio), a senior member of the HNSC and chairman of the House Budget Committee, and ranking committee Democrat Rep. Ron V. Dellums (D-Calif.).

Warner Sees F-22 Trouble

Sen. John Warner (R-Va.), chairman of the Senate Armed Services Airland Forces Subcommittee, expressed serious concern at reports that the Air Force's new F-22 fighter is overweight.

"You've got a problem," he told Brig. Gen. (Maj. Gen. selectee) David J. McCloud, the Air Force's director of Operational Requirements, during a recent hearing. "Historically, in the programs I've watched here for twenty-five years, that weight has . . . come up each time." Senator Warner indicated that steps designed to get weight under control have sometimes hurt aircraft performance. "We're going to have to track this thing more carefully," he said.

General McCloud conceded that although a recent Critical Design Review went very well, the aircraft weight "is higher than people wanted." He noted an aggressive effort by the Air Force and contractors to control aircraft weight and to understand what the weight gain means to operational performance. He described the problem as "seven or eight" on a one (best) to ten (worst) scale.

Neglect of the Nuclear Deterrent

Rep. Duncan Hunter (R-Calif.), chairman of the House National Security Procurement Subcommittee, has accused the Clinton Administration of "a willful neglect" of the nuclear weapons "that serve as the foundation of our national security strategy."

"I have serious concerns about this Administration's commitment to maintaining US nuclear competence over the long term," he said in delivering a comprehensive critique of Administration nuclear policy at a recent hearing. "If our very survival depends upon maintaining safe, reliable, and effective nuclear weapons, then why is the Administration willing to tolerate less than full confidence in the safety, reliability, and effectiveness of these weapons?" he asked.

The Administration is committed to negotiating a comprehensive test ban treaty, but such a ban is unverifiable, Mr. Hunter argued, and won't stop rogue states from developing nuclear capabilities. Further, he claimed, "it will . . . tie the hands of US scientists and engineers who are responsible for ensuring the safety, reliability, and performance of US nuclear weapons."

Anticipation of the treaty is part of the impetus behind the Department of Energy's "science-based stockpile stewardship" program, of which Mr. Hunter was also sharply critical. The program is intended to assure the safety, reliability, and effectiveness of nuclear weapons in the US arsenal through better understanding of nuclear weapon physics and improved computational capabilities to predict the behavior of aging nuclear weapon systems—without testing or an active weapon production program.

DoE and Department of Defense leaders admit that this program will be very challenging. The challenge itself disturbs Mr. Hunter, who indicated that the stewardship program won't be achievable for a decade—if at all. DoD and DoE leaders also concede that US nuclear weapons may be less likely to perform as predicted and remain safe if testing is not permitted. They maintain, however, that the confidence level will remain "adequate." ■

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Washington Watch

By John A. Tirpak, Senior Editor

The Risk of a "Hollow Future"

The days are well remembered when neglect of readiness led to "hollow forces." When modernization is neglected, though, the future capability of the force is threatened.

IN THE late 1970s, the alarm went out that US military readiness was failing and that the armed services were becoming a "hollow force." The funding available wasn't adequate to pay the troops properly, supply their equipment with parts, train realistically, and still buy new equipment. Faced with inadequate funds and other problems, service leaders focused for a few years on buying the next generation of systems to "put rubber on the ramp."

By the mid-1990s, the situation has been stood on its head.

Today, readiness accounts are protected and expanding—but at the expense of force structure and modernization. Emphasis is being put on the quality of troops and their lifestyles, but there may not be enough troops—or equipment—to do the job. The obvious risk is that of creating a "hollow future," as underscored by the remarks of senior Air Force leaders at the AFA's Air Warfare Symposium in Orlando, Fla., in February.

The commander of Air Combat Command, Gen. John Michael Loh, said, "We must . . . continue to insist on a balance among readiness, force structure, and modernization."

Addressing the Orlando gathering for the last time as ACC commander before he retires this summer, General Loh said, "In my view, the emphasis should be equal" among the three pillars of investment. "It's not, today. . . . Some modernization programs are suffering."

Air Force Secretary Sheila E. Widnall told symposium attendees that she's frustrated about the situation. The Air Force, she said, quickly cut itself down to the size deemed appropriate in the Pentagon's Bottom-Up Review in hopes of using the savings to keep its modernization accounts properly funded, but it is now forced to pay for the shortsightedness of the other services.

"Our modernization accounts are continually being raided to pay for other programs within DoD," she pointed out. "We must stand up to these pressures." Having made the force-structure cuts to fund modernization, "we must now stand up to the budgetary challenges to keep those modernization accounts intact."

Chief of Staff Gen. Ronald R. Fogleman asserted that if the Air Force doesn't properly invest in modernization and "revolutionary" technologies, "we may not be relevant in the next century."

In a press briefing prior to the Orlando Symposium, he said that "all the service chiefs . . . are very concerned about the modernization accounts."

The symposium speakers also cautioned that while today's Air Force is ready to fight, there are unmistakable warning signs that unless more aircraft are acquired—and more is done to bring new faces into the service—some readiness could easily evaporate over the next few years.

General Fogleman, in his press briefing, said, "We continue to see a decrease in modernization over the next year or so, and then there's about a forty percent ramp-up that starts out there in the '98–'99 time frame."

While he doesn't have "major doubts" the money is really coming, he admitted, "I have concerns," and he's cautioned his programmers "not to get too enamored" of the possibility of increases in modernization accounts.

Aircraft and Weapons

General Loh noted that the F-22 took yet another $200 million hit in the Fiscal 1996 budget. Now a full decade away from operational capability, "it could stretch out even longer. . . . We cannot afford to slip the program any further."

Because the F-22 will assure future air superiority, General Fogleman said that it is "not an Air Force program. It is a national program."

Funding for the nondevelopmental airlift aircraft (NDAA) was halved, General Loh pointed out, and the C-17 program was also stretched. Projected buys of C-130Js have been reduced, and the latest studies show that the belief that the US had enough strategic airlift to support the national security strategy "may have been an erroneous conclusion."

No fighter planes were in last year's budget or this year's, General Loh observed. "Normally we keep attrition reserve aircraft available to replace those we expect to lose one way or another each year," he said. "We're seeing our attrition reserves grow smaller and smaller."

Meanwhile, shortages of particular types of such "high-demand aircraft" as U-2s, E-3 Airborne Warning and Control System airplanes, F-15Es, RC-135s, and EF-111s are forcing the crews of these systems to bear up under extra-long deployments. While technically a modernization issue, failing to buy enough equipment to do the required job becomes a readiness issue, General Loh asserted.

"These systems are used heavily during the peacetime commitments we've seen recently," he said. "They're in heavy demand by all the CINCs around the world. Such lengthy deployments eventually affect training and quality of life—both readiness issues."

Not having enough of such systems for "peacetime" contingencies suggests there certainly would not be enough to fight two major regional conflicts (MRCs) at once, as the national security strategy demands. General Loh admitted that he's "concerned" about whether the Air Force will have "sufficient forces to prosecute this strategy effectively."

Not long after the Orlando address, General Loh was asked by the House National Security Committee what he would buy if he had another $1.5

billion to spend in each of the next four years. He responded that the Air Force should replace the $200 million taken out of the F-22 program, to avoid any further postponement of the project.

He would also acquire another thirty to forty F-15Es, both to supplement overtaxed units and to provide some attrition reserve, and buy another 100 F-16s, as well as F-16 enhancements "in order to maintain USAF's planned twenty fighter wing equivalents beyond the turn of the century," he said. The F-16 fleet was acquired in large batches of up to 300 per year; they will begin to "age out" of the inventory in similar numbers early in the next decade.

In subsequent testimony, Brig. Gen. (Maj. Gen. selectee) David J. McCloud, the Air Force's director of Operational Requirements, told a Senate Armed Services Committee panel that the Air Force will come up "short about 1.5 to 1.6 wings of combat-coded airplanes" in the first decade of the twenty-first century, unless there's a course change. He calculated a need for another eighteen to twenty F-15Es and "approximately 120" F-16s to avoid "eating into" the fighter force after 2000.

In addition, because so few F-22s will be bought relative to the demands that will be placed on them, "we must look after the needs of our entire air-to-air fighter force" with enhancements and modifications, General Loh told the AFA symposium.

The F-22 and F-16, "and, until they are replaced by the F-22, [the] F-15Cs" must be equipped "with the AIM-9X missile with a large off-boresight capability and a helmet-mounted cuing system" in order to remain competitive with increasingly sophisticated and similarly equipped foreign fighters, he said.

Beyond the fighter accounts, General Loh would want to fully fund conventional upgrades to the B-1B and B-2 bombers, complete the current E-3 AWACS upgrade program, and put more E-8 Joint Surveillance and Target Attack Radar System (Joint STARS) aircraft into the Air Force program.

General Loh told his Orlando audience that Joint STARS "will be just as popular as AWACS" among theater CINCs.

"We'll need four or so at every major joint exercise," he predicted, "and Joint STARS will also play an important role in situations short of war. It will become one of our most dependable means of projecting presence and supporting our theater commanders when regional tensions arise."

Peacetime requirements alone "will quickly overtax the twenty Joint STARS we are programmed to buy," said General Loh. When the two-MRC requirement is taken into account along with the demands of counter-drug operations, the need for aircraft to support the National Training Center and Joint Readiness Training Center, and aircraft down for depot maintenance, test, and upgrade, twenty won't do it, General Loh explained.

"We need to program for more," he said. "We just had a major summit with the Army and decided we may need up to forty Joint STARS to meet our US commitments alone." He added that "NATO has a requirement for a ground surveillance program that we think will be best supported by Joint STARS."

The AWACS upgrade is needed to replace "old 1970s electronics in the aircraft with new 1990s technology" that will permit earlier detection, at longer ranges, of much smaller targets. It will also improve target identification "to help avoid fratricide and improve our overall situational awareness of the air battle."

Gen. Robert L. Rutherford, commander in chief of US Transportation Command and head of USAF's Air Mobility Command, told the Orlando gathering that he believes the US has enough money in the airlift program to meet the needs of the two-MRC scenario. AMC has the lifting capacity of "a little less than forty million ton-miles today . . . and given the program we have on line, we can get to the forty-nine or fifty-two million ton-miles" per day necessary to meet the two-MRC strategy, General Rutherford said. "I have great assurance we can do that."

But while regional CINCs believe the plan will provide adequate lift, "there is some question about the timeliness of that lift," he continued. AMC is working with them to refine the sequence of what would go to war in what order on Air Force airlifters.

Still, "if we don't size the airlift force right, we will be taking considerable risk. The more aircraft you buy, the less risk you have."

The C-141 "has been around far too long," the General said, adding that he's anxious to have the results of the studies determining whether the C-17 or NDAA option is the best way to replace the bulk of the StarLifter fleet.

General Rutherford said that the KC-135, despite its age, is in pretty good shape because much of its life has been spent sitting alert instead of in the air. But because of a shortage of older, experienced maintainers, the Stratotanker isn't as available as it could be.

The C-5 fleet is also in good condition, but the process of bringing the entire fleet up to C-5B configuration is costly and time-consuming.

Fully "twenty percent of my C-5 fleet is currently down" for depot maintenance, said the General. He added that this process has grown from about one month per plane to 320 days per plane.

The Civil Reserve Air Fleet—which accounts for ninety percent of the passenger lift and thirty percent of the air cargo capability under TRANSCOM—is being strengthened by enticing participants with an extra $1 billion worth of government business. Another potential $400 million is on the way, with the addition of the government's small-package business, General Rutherford said.

Gen. Joseph W. Ashy, head of Space Command, noted that although the emphasis of the Air Force is shifting toward conventional forces, the nuclear force, though smaller, is still performing a vital mission and needs continued investment to be sound.

"A big challenge for our intercontinental ballistic missiles is to continue achieving the high standards of a capable and proud past with weapon systems that are aging," General Ashy said. "We're doing just that with our current and planned programs to replace booster propellants approaching the end of their effective shelf life, restoring unsupportable infrastructure, and modernizing control systems."

He also said that while existing Defense Support Program satellites "have served us well, . . . they don't give us all of the information the warfighting CINCs need to do their job, especially in light of the future threat." It's necessary that the Space-based Infrared system go forward, he added, noting that there is a "consensus on requirements" among the services for SBIR.

General Loh supports future production of additional B-2 bombers. Noting work under way to assess the future role of bombers and to decide whether the Air Force has enough on hand, General Loh said "our challenge is to find a way to protect the ability to continue production."

He advocated getting back up to the Bottom-Up Review's recommended force level of 180 bombers as

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soon as possible. His analyses indicate that at least 100 bombers will be needed in the early days of any major regional conflict.

"We are already playing with risks," he said. "Should another major conflict arise during the first MRC, we expect to have to swing a portion of our high-value assets, including bombers and stealth precision fighters, from the first conflict to support the second one."

Doing this "adds substantial risks in being able to fulfill our missions. It's an untested strategy—one that could stretch our combat forces, strategic lift, and logistics capabilities very thin."

In a later press conference, General Loh warned that the public debate on more B-2s is putting "the cart before the horse." When it was suggested that twenty might not be enough, "everybody got all nervous" about what would have to be canceled to pay for them. But "bombers are one of the cornerstones of our power-projection strategy. They must be protected."

General Fogleman said he's "not prepared to identify" a source of funding for more B-2s, which would consume "a large chunk of TOA" (total obligational authority). He admitted that "somewhere out there" between 2010 and 2020, something will have to be done to supplement the bomber force as B-1Bs and B-52s are lost to attrition. "Do we stay with an overfly system, or do we go to some . . . radically different approach that takes advantage of the information revolution?" said the Chief of Staff. "I don't know, but these are the questions we ought to be asking, and we ought to be asking them now."

Having enough bomb-droppers is one thing; having enough bombs is another.

"We must be concerned with the distribution and the quantity of our advanced munitions," General Loh insisted. "The MRC analysis that I have done sees advanced munitions growing in importance. But are we moving quickly enough to ensure the development and the fielding of such weapons, and are we buying enough of them? My analysis shows we need to get them faster; we need to buy more, and I'm talking about both the direct attack munitions as well as standoff weapons."

With the cancellation of the AGM-137 Triservice Standoff Attack Missile (TSSAM), General Loh said, an interim plan has been put together that will put near-term emphasis on conventionally armed AGM-86C air-launched cruise missiles, AGM-142 Have Nap standoff bombs, and possibly a powered version of the Joint Standoff Weapon. But a capability for a long-range, stealthy, precision conventional weapon is clearly needed, he said, and a TSSAM replacement program will be under way shortly.

To generate at least some of the money needed to buy these items, General Loh said more must be done to change the "tooth-to-tail" ratio. While fighters have been cut fifty percent and bombers seventy percent over the last six years, "we've only cut about fifteen percent of our support structure," he noted.

Gen. Ronald W. Yates, head of Air Force Materiel Command, told reporters that the transition to two-level maintenance and other forms of "lean logistics" have "provided big bucks Air Force–wide." The two-tiered system has "eliminated 6,000 maintainers," which is a considerable force-builder, since "sixty-three percent of all Air Force people in Desert Storm were maintainers."

In the Air Force, "we used to say, 'Extra inventory, extra aircraft, and we'll be safe.' We can't afford that any longer. We've got to take some risk and focus on 'just-in-time' inventory rather than 'just-in-case' inventory," said General Yates.

People

The conference's most disturbing report may have been the one issued by the head of Air Education and Training Command, Gen. Henry Viccellio, Jr., who warned that the positive trends in quality of recruits and their numbers throughout the 1980s have vanished and trendlines are headed back down again. People—the one asset the Air Force has prized and nurtured above all others—may be a weakening part of the force.

The proclivity of high-school-age people to join the military is at a post-Vietnam low, General Viccellio said.

"Word has gotten out that we aren't hiring," despite the need to bring on 30,000 new airmen and 4,000 officers a year, he said. The misperception came from the drawdown of the early 1990s, when the services were forced to ask tens of thousands to leave, offering incentives for them to do so voluntarily. Such ex–service members unfortunately take on the role of "anti-recruiters" who often have negative things to say when asked about the career potential of the military. Moreover, high school counselors are less inclined to recommend military service than ever before.

While the Air Force is "holding the line" at virtually 100 percent of its enlisted recruits having a high school diploma, it's "getting tougher," General Viccellio said.

In recruiting tests, USAF is "hovering at fifty percent" of enlistees who score in the top two categories of the Armed Forces Qualification Test. "We're facing our first potential shortfall" in meeting the fifty percent goal "in many, many years," General Viccellio reported. The Marines are down to forty-two percent. "The Army and Navy have quit giving us data, and I just have a feeling they're down to thirty percent," he added.

In the Reserve Officers Training Corps, said General Viccellio, "we have not been able to hand away four-year college scholarships." Some success has been achieved using unexpended four-year scholarship monies on two-year scholarships, but the propensity to join the service is dropping among the best-qualified college students.

"Less than ten percent of all high school students say they have any interest in an Air Force career," the General said, "and we're the highest." That continues to be the case even though each Air Force uniformed recruiter is outgunned by two and a half Marine, three and a half Navy, and five Army recruiters in any given area of the country.

While the Air Force has resisted the use of "large cash payments" such as enlistment bonuses—which the other services have resorted to more and more frequently—the Air Force "may have to go in that direction if things get much tougher."

General Viccellio said it's time to put emphasis on recruiting among the forty-five percent of students who start, but don't complete, a four-year college program. This is necessary because most of the high school students who feel qualified to go to college at least attempt it and aren't available to recruit. "We think there will be a big payoff" in going after college dropouts, he said.

It will be ever more important, General Fogleman told the Orlando symposium, to remind the nation and Congress that the Air Force is "an economy-of-force capability." To stay on the cutting edge, it will have to "develop . . . new ideas and identify the high-payoff concepts, then integrate them into the budget process." Those new ideas will be needed to do the mission with fewer people, less equipment, and at less cost. But Congress must support the service by giving it enough tools to do the job with the technology at hand. ■

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Aerospace World

By Suzann Chapman, Associate Editor

First Test F-22 in 1997

Barring further delays caused by defense budget cuts, the first F-22 test aircraft should be ready to fly in May 1997, said Lt. Gen. Richard E. Hawley, deputy assistant secretary of the Air Force for Acquisition.

General Hawley said that the F-22 development process has been a model of teamwork between the Air Force and contractors, who have kept the program on track despite budget turbulence. He said the twelve minor open items from the February Critical Design Review will be completed by June.

The estimated cost to produce each F-22 is $71 million in Fiscal 1995 dollars; its predecessor, the F-15, cost $50 million per copy in Fiscal 1995 dollars.

The Air Force will get what it is paying for, the General said. He pointed out that the new fighter provides stealth, flight at 1.5 times the speed of sound without afterburner, advanced avionics better by an "order of magnitude" than anything yet put in combat airplanes, and built-in supportability.

This artist's concept depicts the Lockheed Fort Worth Co.'s X-32 candidate for the USAF and Navy Joint Advanced Strike Technology program. Maj. Gen. George K. Muellner, the JAST program director, estimates the per-unit cost at $30 million to $40 million in 1994 dollars.

Official Status for Peace Operations

The Pentagon has officially added peacetime operations to the duties of the US military.

Under terms of the latest National Military Strategy, the armed forces have two primary objectives: to promote stability and to thwart aggression. The new strategy paper, released in March, said that these two objectives encompass three tasks: peacetime military operations, deterrence and conflict prevention, and warfighting.

In the three years since DoD released the last strategy paper, US forces have been engaged in "an unprecedented period of activity," which included longer operations and an expanding peacekeeping role, said a senior military official. The new document recognizes and reflects this reality.

The new strategy reaffirms the Pentagon's stated need to have forces capable of fighting and winning two nearly simultaneous major regional conflicts. However, it does not require a "specific base force size," said the official, who added that the new strategy emphasizes "what our capability has to be." This is done, he said, through "force-building foundations."

He described those foundations as high-quality personnel; readiness (including joint readiness); enhancements to mobility, surveillance, communications, and precision firepower; selective modernization; and a balance between capabilities and components.

C-17 Garners Praise

Amid high praise from crew members, the C-17 Globemaster III in early March completed its first foray into the Far East since becoming operational last October. TSgt. Ernie Vera, 14th Airlift Squadron, Charleston AFB, S. C., said that the aircraft's designers "actually asked loadmasters what we would need to make our jobs easier" and added, "It's designed around a three-man crew [pilot, co-pilot, and loadmaster] and works quite well."

Former C-141 pilot Lt. Col. Larry Kudelka said his transition to the C-17 was like going from a "Rambler station wagon to a 1995 Lexus." Maj. Dewey Everhart added, "It flies like a finely cut diamond—smooth and crisp. It's quieter than the C-141 [and] more maneuverable and more stable than the other cargo aircraft now in use."

New DoD Task Force Meets

Focusing on how to improve the quality of life for military personnel, their families, and Defense Department civilian employees, the new Defense Department Quality of Life Task Force established in November 1994 met for the first time in late February. The twenty-one-member task force spent two days hearing the views of members of each uniformed service and established the groundwork for its operating strategies.

Former Army Secretary John O. Marsh chairs the task force, which

Labeled "one of the twelve great professors" by People *Magazine and "a Socrates in soldier's garb" by the* Christian Science Monitor, *Col. Malham Wakin retired in April as a brigadier general after more than forty-one years of service. He began teaching philosophy at the Air Force Academy in 1959.*

also includes former Air Force Secretary Edward C. Aldridge, Jr., and former CMSAF Sam E. Parish.

DoD Releases Trade Forecast

The Department of Defense has released a stucy and forecast of international trade in conventional arms through 2000—the first forecast of its kind made by the department.

The report reflects the importance DoD places on the health of the US defense industrial base and provides a baseline from which to measure prospects and policies, said Joshua Gotbaum, assistant secretary of defense for Economic Security.

The study shows that annual worldwide arms deliveries declined sharply from 1983 to 1993, dropping from about $65 billion to about $20 billion. It attributes the decline to reduced activity by the former Soviet Union and a drop in overall demand.

Over the same ten years, annual US deliveries in international arms markets declined about fifteen percent, from approximately $13 billion to roughly $11 billion in constant 1991 dollars. The report forecasts a small increase for the US, possibly resulting in an overall market share increase from fifty-three percent to as much as fifty-nine percent over the present decade.

New Focus on Gulf War Illness

President Clinton announced the creation of a new presidential advisory committee to review government efforts to aid Persian Gulf War veterans. In a March 6 speech to the Veterans of Foreign Wars, the President said the committee will include scientists, doctors veterans, and other distinguished citizens who will work with the VA, the Department of Defense, and the Department of Health and Human Services.

He said the three departments will spend up to $13 million this year on new research to examine the possible causes of Gulf War veterans' illnesses, including the potential effects of pesticides and other environmental toxins, antitank ammunition containing depleted uranium, and drugs used to protect against chemical and biological weapons.

As of February 25, DoD's Comprehensive Clinical Evaluation Program (CCEP) had completed work on more than 2,000 Gulf War troops, twice the number reported in December, according to Assistant Secretary of Defense for Health Affairs Dr. Stephen C. Joseph.

The program now has more than 15,000 people registered, approximately 12,000 of whom are symptomatic, and more than 8,000 are undergoing medical examinations. Dr. Joseph added that the CCEP should get through about 10,000 patients by late spring.

VA to Compensate Gulf Veterans

Under new regulations, the Department of Veterans Affairs will provide monetary assistance to Gulf War veterans if they have chronic disabilities resulting from undiagnosed illnesses that surfaced either while the veterans were serving in the southwest Asia theater during the Gulf War or within two years afterward. A chronic disability is one that has existed for at least six months.

The payments would continue while government agencies continue the search for a cause or causes of the illnesses, according to VA Secretary Jesse Brown. In a letter sent to more than 39,000 veterans on the Persian Gulf Veterans Health Registry, he said that the VA will reopen previously denied compensation claims. He urged those who have not filed claims to do so if they believe they are entitled to benefits.

Rivet Joint Flies 1,000th Southern Watch

One of the RC-135 aircraft that provides Allied aircraft with airborne threat data marked the 1,000th Rivet Joint mission for Operation Southern Watch on February 22. The 55th Wing, Offutt AFB, Neb., operates all Rivet Joint aircraft and has had wing members and aircraft operating in the Persian Gulf region since 1990.

Brig. Gen. Thomas Keck, 4404th Wing (Provisional) commander, who flew the 1,000th mission, said that people depend on the Rivet Joint product for its crystal-clear picture of the threats they could encounter. That dependence has created great demands on wing members, who often have been on deployments for 180 days a year.

Fogleman Supports Mental Health Assistance

"We've come a long way in understanding the underlying causes of mental illness and stress . . . so we need to move forward and take advantage of that knowledge," said Air Force Chief of Staff Gen. Ronald R. Fogleman in a recent interview with Air Force News Service. With this comment, he addressed and at least indirectly refuted the widespread perception that, in the Air Force, use of a mental health center is a career-killer.

The armed forces experienced 2,654 suicides from January 1983 to December 1993. Of these, 723 involved Air Force personnel in grades ranging from airman basic to colonel, and one cadet. Forty-nine percent of Air Force suicides occurred among enlisted grades E-4 and E-5, people generally in their late twenties and approaching the halfway point in their careers.

As of March 6, there had been thirty-three Air Force fatalities in 1995, ten of which were suicides.

General Fogleman said the role of a leader includes providing resources to help USAF people do their jobs, and he called mental health care simply another tool. He added that an airman's decision to seek help, far from disqualifying him or her, should be viewed as a step toward becoming more fit for promotion or leadership.

DoD OKs Acquisition Reforms

The Defense Department has approved a total of sixty-three recommendations presented by two process action teams (PATs) charged with reviewing the DoD procurement and contract administration processes. The PATs were designed to reduce the time it takes to accomplish tasks, encourage risk management instead of risk avoidance, and eliminate non-value-added activities.

Recommendations from the procurement process reform PAT included two for implementation of a system to share best practices, seven for improving the sole source procurement process, and eighteen for streamlining the competitive source selection process.

The contract administration reform PAT made thirty-six recommendations. One involved exploring the potential for early involvement by field contract administrators in formulating acquisition strategy to reduce cycle times, limit resources required, and ease subsequent contract administration efforts.

Other recommendations included establishing processes to identify "quality" contractors and to ascertain how government requirements drive contractor and government staffing levels.

PAT members came from each military department, defense agencies, the Defense Acquisition University, and DoD staff elements. The PATs reported through the deputy under secretary of defense for Acquisition Reform.

AFMC Spotlights Acquisition Reform

Under one of DoD's major acquisition reform actions, Air Force Materiel Command is the lead for five PATs working ideas created at AFMC. They are clear accountability in design, Integrated Product Development (IPD), Integrated Weapon System Management (IWSM), lean aircraft initiative, and the integrated acquisition strategy process.

IWSM is a cradle-to-grave process that provides a single face to the user—the operational commands—according to Gen. Ronald W. Yates, AFMC commander. It focuses on program continuity vs. rapid transfer of function by integrating core processes across a system's life cycle.

The IPD concept forms a team with the skills, resources, and authorization to produce a product. Last year, the F-16 structural integrated product team (IPT) developed an alternative approach when a supplier could not meet delivery time for a special bolt needed to modify the aircraft. Instead of delaying the entire modification, the IPT simply took another bolt and had an Air Force depot machine shop modify it to fit.

The IPT system is the focus of AFMC's "lean production" approach, using teams and just-in-time inventory management to help reduce the cost of maintaining large inventories. However, according to an AFMC white paper, without multiyear commitment from the government, lean production is a fragile concept. Continuous changes in production commitments greatly increase a system's cost.

This rare "Razorback" P-47 is one of more than 350 vintage aircraft participating in Freedom Flight America's twelve-city tour to commemorate the fiftieth anniversary of the end of World War II. This summer, the aircraft will fly from Long Beach, Calif., to New York, N. Y., with stops at ten other cities.

EELV Program Tests Reform

AFMC's Space and Missile Systems Center, Los Angeles AFB, Calif., wants to incorporate commercial business practices for its Evolved Expendable Launch Vehicle program. The EELV idea is to take a current ELV or its components and configure a new vehicle that meets both medium- and heavy-lift launch requirements.

The center plans to provide contractors with the fundamental requirements and let them lay out how they intend to meet them, said Robert K. Steele, Sr., EELV program manager. The intent is to boost the production rate and lower costs for ELVs while retaining the current vehicles' capability, reliability, and operability. Mr. Steele added that earlier launch vehicle studies were "starting from scratch . . . developing something new. EELV is an evolution of existing vehicles." The center expects to award contracts in July.

Last Uniform Changes?

Air Force Chief of Staff Gen. Ronald R. Fogleman approved fifty-five uniform changes recommended by the Air Force Uniform Board, which met for the last time under General Fogleman in January. The board received more than 2,500 suggestions, then narrowed those down to 363 proposals.

The new guidelines allow pullover sweaters to be worn without a tie or tie tab and athletic shoes to be worn by recruits. Service members may wear a unit emblem and T-shirt with Battle Dress Uniforms and flight suits. The new standards also require some or all ribbons on the service coat. Missileer badges will not be phased out, and the board has called for the return of name and USAF tapes to BDUs by October 1, 1997.

The board also approved suggestions to design and test a blue cardigan sweater, to resize the men's trousers for a more comfortable fit, and to redesign the women's service cap in one color—blue.

Suggestions that did not make the cut included return of the white ceremonial dress uniform, designing a shorts set for summer wear, and returning the name tag to the service coat.

USAF Beefs Up Social Actions

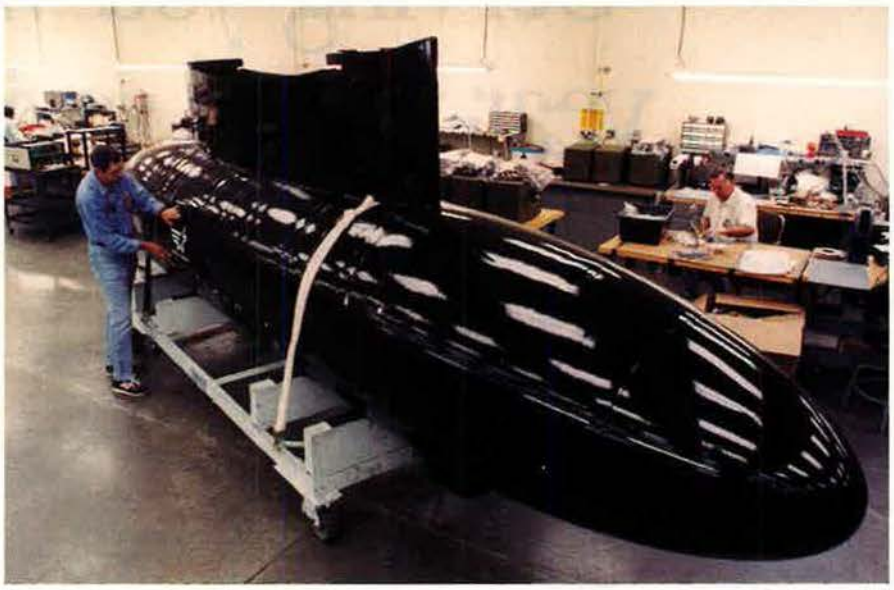
In June, social actions offices at each Air Force base will begin training all military and civilian members using a four-hour equal opportunity program to meet a new requirement levied by Air Force Secretary Sheila E. Widnall and Chief of Staff General Fogleman. Senior base officials will receive the first training.

The two leaders also added eighty-six manpower authorizations to the offices to ensure that Air Force programs "remain strong and responsive to address those issues impacting our people, their family members, and unit cohesion."

Air Force personnel officials estimated it will take about fourteen months to train everyone.

EES Review Features Checkmate Team

The seventeen-member enlisted evaluation system (EES) review group, chaired by Lt. Gen. John S. Fairfield, Pacific Air Forces vice commander, met March 6–14 to review thousands of ideas and data collected from surveys and face-to-face interviews. The



Lockheed photo by John Rossino

This high-technology camera surveillance system, Special Avionics Mission Strap-On Now, or SAMSON, produced by Lockheed Aeronautical Systems Co., will replace an external fuel tank on a C-130. Belgium and nine other countries will use it to verify compliance with disarmament agreements.

General said that the group "heard a majority of the concerns that our force has. . . . We will take those to senior leadership for decisions."

Armed with that information, the review group planned to discuss potential changes to the EES with a "checkmate team" of eleven officers and enlisted members, including the Chief Master Sergeant of the Air Force, before presenting recommendations to Secretary Widnall and General Fogleman.

During its first meeting February 13–17, the EES group's five officers and twelve NCOs reviewed how the old and new systems worked and the feedback process. CMSAF David J. Campanale told reporters at an Air Force Association Symposium in Orlando, Fla., in February that during his discussions with Air Force members around the world, he found that the feedback process either isn't being done or is not being done correctly.

START I Inspections Begin

On-site inspections mandated by the Strategic Arms Reduction Treaty (START) finally have gotten under way.

After ten years of negotiation and another three years of waiting before the START I accord entered into force December 5, the first Russian weapons inspectors arrived on March 5 at Malmstrom AFB, Mont., for a baseline inspection.

At the same time, US counterpart teams were in Russia and Ukraine. Russian and US teams have until July 1 to inspect any of thirty-six US and sixty-five former Soviet weapon sites in Russia, Belarus, Kazakhstan, and Ukraine.

These include installations at which bombers, ICBMs, and submarine-launched ballistic missiles were deployed, manufactured, stored, tested, destroyed, converted, or maintained. Each country can have five inspection teams working at the same time. The teams are compiling a full inventory of strategic nuclear delivery systems to verify data that each country provided earlier this year on existing nuclear forces.

Army Brig. Gen. Gregory G. Govan, US On-Site Inspection Agency director, said START I is the "most intrusive, most comprehensive arms-control treaty to date." It calls for elimination of 9,000 of the 21,000 warheads declared by the United States and the former Soviet Union when the countries signed the treaty on July 31, 1991.

DACOWITS Seeks Higher Profile

The head of the Defense Advisory Committee on Women in the Services (DACOWITS), Sue Ann Tempero, decided to make some changes in the forty-four-year-old committee when she realized that many junior enlisted women had never heard of it.

Ms. Tempero, who is vice president of human resources for the Des Moines *Register,* created a position on the executive board for a director of planning and communications and has asked each committee member to visit at least two installations each year.

The Secretary of Defense selects civilian men and women throughout the United States who are prominent in business, public service, or the professions to serve on the committee for three years. They are unpaid and serve as individuals, not representatives of any group.

"We serve as the eyes, ears, and legs of the Secretary of Defense," said Ms. Tempero. "He's relying on us to assist him with his efforts to improve quality of life for military members." She said DACOWITS will focus this year on child care, diversity, leadership training, and monitoring past changes.

USAF photo by Mark Anthony Songer

SSgt. Randy Trotter, a 20th Fighter Wing Gold Flag technician at Shaw AFB, S. C., uses the fault test isolation system to detect the source of a problem with an F-16's radar warning receiver. The program's success led USAF to buy the isolation system for every F-16 squadron. (See story below.)

Have Need, Will Innovate

Faced with a warranty about to run out, the Gold Flag Circuit Card Repair Shop for the 20th Fighter Wing, Shaw AFB, S. C., short-circuited a two-year process and asked Loral Corp. to let it have a software program to help diagnose problems with new radar warning receivers. The software saved the wing about $10,000 and untold man-hours on its first use.

When the 20th FW changed from Block 42 to Block 50 F-16 Fighting Falcons, its technicians noticed problems with the ALR-56M radar warning receiver. They sent the parts they believed to be faulty to Warner Robins Air Logistics Center, Ga., but the center returned nearly fifty percent without detecting a problem.

The wing's Gold Flag program director, 2d Lt. Keith Shaneman, worked with Loral to obtain the company's engineering software used for fault test isolation. Shortly after getting the software and a powerful portable computer, the wing's maintenance technicians used them to correctly diagnose the next ALR-56M problem as being in the aircraft wiring rather than in the hardware.

Air Combat Command had estimated it would take two years to repackage and document the fault test isolation system to make the program usable on the flight line.

Historically Black Schools Receive Awards

DoD announced March 14 that it will award about $46 million in grants and contracts to thirty-seven professors at thirty-one historically Black colleges and universities and minority institutions. The awards were selected competitively from eighty-one proposals submitted to the Army, Navy, Air Force, and the Advanced Research Projects Agency.

Award recipients will establish educational research consortiums or centers for aerospace studies or will purchase equipment for educational infrastructure or research needs. They represent schools in sixteen states, Washington, D. C., and Guam and include science, mathematics, and engineering disciplines.

DoD Awards Nearly $50 Million for Education

DoD plans to make 407 awards totaling $49.5 million at 132 academic institutions to support graduate student training in science and engineering fields important to national defense. Provided under the Augmentation Awards for Science and Engineering Research Training program, the awards will provide money for three years of support to 466 US citizens pursuing advanced degrees, according to a DoD release.

The program enables professors who perform research under DoD contracts or grants to award graduate research traineeships. Additionally, the awards involve more than 100 undergraduate students in DoD-sponsored university research to help stimulate interest in advanced science or engineering studies.

Space Unit Marks Second Year

The 7th Space Operations Squadron, Falcon AFB, Colo., the first and currently the only Air Force Reserve space unit, celebrated its second year in March. During its first two years, the unit's members supported more than 2,000 satellite operations without a single error, said Maj. Frank J. Casserino, 7th Space Operations Squadron commander. He added that they also helped launch seven satellites, made numerous orbital adjustments, and achieved two satellite disposals, which involved moving the satellites into a higher orbit out of the flow of space traffic.

Col. (Brig. Gen. selectee) Walter T. Hatcher III, commander of the 302d Airlift Wing, which has operational control of the squadron, said that taking a unit from scratch and attaining combat-ready status in less than a year is "phenomenal." According to Major Casserino, more than eighty percent of the mission-ready crew members have received "highly qualified" ratings on their evaluations. The unit's primary role is to assist the 50th Space Wing's 1st Space Operations Squadron in flying the Global Positioning System, Defense Support Program, and Defense Meteorological Satellite Program satellites. However, some highly qualified members of the 7th Space Operations Squadron have expanded their support by working with four other wing squadrons.

TAOS Satellite Repaired

The Technology for Autonomous Operational Survivability (TAOS) satellite, launched in March 1994 to evaluate advanced space technologies, lost its ability to maneuver in space after about four months in orbit. A team of engineers from TRW, McLean, Va., and the Air Force Space Test and Evaluation Group, Onizuka AS, Calif., took an innovative approach by developing software to enable other attitude-sensing instruments to take over control maneuvers from a failed inertial measurement unit (IMU).

Successfully tested in early March, the TAOS satellite now bypasses the IMU and uses its four attitude control thrusters to maneuver. Air Force officials from Phillips Laboratory, Kirtland AFB, N. M., which manages the TAOS experiment, expect the program to continue through the summer and to evaluate a system designed to re-

duce the number of ground stations needed to maintain a satellite.

New Process Speeds X-33 Selections

Some 200 NASA engineers at the Marshall Space Flight Center, Huntsville, Ala., completed their review on proposals for the X-33 reusable launch vehicle prototype in just nine days by using electronic forms on a computer network.

The engineers selected three companies to participate in the fifteen-month concept definition and design effort: Lockheed Advanced Development Corp., Palmdale, Calif.; McDonnell Douglas Aerospace, Huntington Beach, Calif.; and Rockwell's Space Systems Division, Downey, Calif. NASA plans for the X-33 to replace the space shuttle.

NASA also selected Orbital Sciences Corp. of Chantilly, Va., and Rockwell as a team to build the X-34 reusable launch vehicle, which will serve as a test-bed for X-33 technologies and as a low-cost launch vehicle for small payloads. Orbital Sciences and Rockwell will each put up $50 million with NASA's $70 million to build two air-launched vehicles with a liquid-fueled flyback first stage and an expendable, liquid-fueled second stage that would carry up to 2,500-pound payloads into low-Earth orbit. NASA will use one for X-33 research; the contractor team will use one to launch satellites commercially.

Tracking People and Cargo

Members of the 621st Air Mobility Operations Squadron, deployed to Mombasa, Kenya, are using a prototype Global Transportation Network (GTN) system to track passengers and equipment passing through the Kenyan aerial port. Run by US Transportation Command, Scott AFB, Ill., the GTN system accesses transportation databases from each service. It's expected to be fully operational by 1997.

The 621st team used the deployment to train on the Remote Consolidated Aerial Port System, a source system for the GTN. The team members must enter complete and accurate information into the RCAPS to ensure GTN users' ability to track people and equipment. MSgt. Bill Gill of the 621st AMOS said it takes about a month to become proficient on the menu-driven program, adding, "One person deployed has to be able to do what five guys do at home station." He said it's hard to train people on the system at their home station "because they're never there."

USAF Aids Commercial Airport

A little-known Air Force unit helped get Denver's new international airport up and running. The Air Force Flight Inspection Center, located at Will Rogers International Airport, Okla., operated FAA C-29 Hawker jets to help revise more than 25,000 square miles of airspace for low-level airway coverage, some 164,000 square miles of airspace for jet airways, and standard departure and arrival routes. With that assistance and review of 580 instrument flight procedures, the FAA gave the OK for Denver to land three jets at the same time.

The center routinely works with the FAA to test safety regulations and standards set for pilots and airports. In its wartime and contingency role, the center employs its eighteen people to perform the FAA's flight inspection role at pctential military airfields.

Hazardous Materials Baseline Due in July

To comply with a 1993 Presidential Executive Order, Air Force bases must report by July 1 the current amount of toxic materials released into the environment. Using that amount as a baseline, each installation then must reduce its toxic material release by fifty percent by 1999. Additionally, the order required bases to begin notifying the public on March 1 about all hazardous materials used and stored at a base.

The Air Force Ozone-Depleting Chemicals Information Exchange, which officially opened June 15, 1994, has expanded its operation to include other hazardous materials. AFMC established the information exchange at Brooks AFB, Tex., to provide a single, consistent data resource for answers to questions about the latest Air Force, federal, and legislative policies as well as pertinent research and suggestions for alternative chemicals and funding mechanisms. The eight-person staff includes environmental, process, and industrial engineers; logistics specialists; and computer analysts.

The information exchange may be reached at (210) 536-5118 or DSN 240-3228.

Standard Helps Reduce Cost

DoD has implemented National Aerospace Standard 411—the commercial standard to reduce or eliminate hazardous material in all phases of a weapon system's life cycle, from the manufacturing stage through the typical thirty-year life of operations and maintenance.

It will allow contractors to avoid costly program-specific requirements and save DoD money on the life-cycle costs of weapon systems. The F-22 program has eliminated all but one ozone-depleting chemical use from its production, operation, and maintenance procedures, in contrast to more than 3,000 ODC uses in the C-5 program.

Team Reviews Year of Training

It's been two years since the Air Force implemented its Year of Training initiatives, so a twenty-six-person team with representatives from each major command met in late February to review progress. Initiatives included requirements for enlisted recruits to attend formal training to receive a basic skill before being assigned to a base and for all NCOs to complete professional military education in-residence. The team also established a career field education and training plan to provide a blueprint for enlisted career progression.

The review group expected to present its recommendations to the Air Force Chief of Staff by the end of March.

Final Fiscal 1995 Reductions Announced

The Air Force exceeded its requirement to separate 16,600 enlisted and 1,700 officers from service in Fiscal 1995, according to the final numbers released February 24. A total of 16,891 enlisted voluntary separations comprised 1,579 Voluntary Separation Incentive (VSI) and 7,857 Special Separation Benefit (SSB) actions and 7,455 early retirements; 1,845 officer separations comprised 580 VSI, 376 SSB, and 889 early retirements.

Since the VSI and SSB programs began in Fiscal 1992 and the early retirement program in Fiscal 1994, the Air Force has approved more than 11,000 officers and 64,000 enlisted persons for one of these programs. The service's end strength will have dropped from 507,444 in Fiscal 1991 to approximately 400,000 by this October 1.

US Signs Air Defense Agreement

Deputy Secretary of Defense John Deutch signed a statement of intent on February 21 with Germany, France, and Italy for joint development and production of the Medium Extended Air Defense System (MEADS). According to a DoD statement, the MEADS will be designed for limited area defense and protection of ground forces against the increasing threat of tactical ballistic missiles and air-breathing targets, including cruise missiles.

The statement of intent calls for a program cost and work share of approximately fifty percent for the US, twenty percent for France and Germany, and ten percent for Italy. The MEADS should enter service in 2005.

Small Business Proposals Selected

The Defense Department identified 454 out of 3,319 proposals received under the second Fiscal 1994 solicitation for its Small Business Innovation Research (SBIR) program. Those 454 offered the greatest potential in their fields for meeting DoD research and development needs and will now undergo further evaluation and negotiations leading to contract awards, according to a DoD news release. Originally enacted by Congress in 1982 and reenacted in 1992, the SBIR program's purpose is to stimulate small businesses to conduct high-quality innovative R&D to meet defense-related scientific or engineering needs.

AFROTC Pilot Slots to Triple

Starting in Fiscal 1996, the Air Force will increase the number of pilot training slots available for Air Force ROTC

USAF photo by SrA. Christopher Thomas

When members of Britain's Royal Tornado Squadron, stationed near the Persian Gulf, needed a football goaltender, they asked their long-time allies for loan of the US Air Force's top soccer goalie. SrA. Royal Jones, then deployed to the 4404th Wing (Provisional), is a fitness specialist at Grand Forks AFB, N. D.

THIS IS HOW AN F-15E LOOKS TO ENEMY RADAR.

THE ACTION.
ENEMY RADAR SPOTS AN AIRCRAFT EQUIPPED WITH ONE OF OUR ECM SYSTEMS AND ATTEMPTS TO LOCK ONTO IT.

THE REACTION.
NORTHROP GRUMMAN'S ELECTRONIC COUNTERMEASURES PICK UP THE THREAT, DETERMINE THE BEST WAY TO REACT AND TAKE THE STEPS TO NEUTRALIZE IT.

THE RESULTS.
AN AIRCRAFT YOU CAN PUT A PRICE TAG ON IS SPARED ALONG WITH AN AIRCREW YOU CAN'T.

IT'S HARD TO TRACK DOWN AIRCREWS USING OUR ELECTRONIC COUNTERMEASURES SYSTEM. THAT'S WHY THE AN/ALQ-135 IS ON BOARD EVERY COMBAT F-15E IN THE USAF FLEET. IN FACT, AN F-15E ISN'T CONSIDERED TO BE COMBAT-READY UNTIL OUR SYSTEM IS INSTALLED AND OPERATIONAL.

OUR LEADERSHIP IN AIRCRAFT DESIGN, STEALTH TECHNOLOGY, COMPOSITES, COUNTERMEASURES AND SENSORS PUTS US IN AN ELITE GROUP OF DEFENSE COMPANIES ATTUNED TO HOW THE WORLD IS TODAY. AND WILL HELP US STAY THAT WAY FOR YEARS TO COME. **NORTHROP GRUMMAN**

cadets from 100 to 300. The number will increase to 416 for Fiscal 1997 and could climb to 560 by the year 2000. Navigator training positions will also increase, up to 189 in FY 1996 before leveling off to 175 through 2000.

Brig. Gen. Susan L. Pamerleau, AFROTC commandant, said that Air Force ROTC is on the upswing, with a significant increase in requirements for second lieutenants in every career field, "so we are definitely hiring." She said that scholarships are open to students in any academic discipline, although the majority go to science and engineering students.

Blue Flag Brings in Space

The recent Blue Flag training exercise held at Hurlburt Field, Fla., was the first time the Air Force had included events requiring space expertise in the exercise script, according to Lt. Col. Jim Mackin, 14th Air Force, Vandenberg AFB, Calif. Blue Flag provides command, control, and intelligence procedures training for combat leaders and supporting battle staffs.

An Air Force Space Support Team from 14th Air Force demonstrated the impact on operations when commanders lose space-provided capabilities and how space systems can enhance combat effectiveness. During the exercise's simulated southwest Asia air combat operation, team members relayed detection notices for tactical missile launches to simulated air defense artillery units, AWACS aircraft, and battle staffs. They also checked space environmental predictions and determined that an exercise solar flare event could degrade ultrahigh- and high-frequency communications.

Senior Staff Changes

RETIREMENTS: L/G James A. **Fain,** Jr., L/G John M. **Nowak,** B/G James C. **Roan,** Jr., M/G Garry A. **Schnelzer,** L/G Dale W. **Thompson,** Jr., B/G Sue E. **Turner.**

PROMOTIONS: To be **Lieutenant General:** George T. **Babbitt,** Jr., John C. **Griffith,** Lloyd W. **Newton.**

To be **AFRES Major General:** Louis A. **Crigler,** Terrence L. **Dake,** Robert A. **Nester,** Reese R. **Nielsen,** Ralph H. **Oates.**

To be **AFRES Brigadier General:** Louis C. **Ferraro,** Jr., Clayton T. **Gadd,** Walter T. **Hatcher** III, Robert A. **Krell,** Sharon K. **Mailey,** James L. **Martin,** Wayne L. **Pritz,** Edward F. **Rodriguez,** Jr., Dennis W. **Schulstad,** Lawrence F. **Sheehan,** Larry L. **Twitchell,** Ernest R. **Webster,** Geoffrey P **Wiedeman,** Jr.

CHANGES: M/G (L/G selectee) George T. Babbitt, Jr., from Dep. Dir., Materiel Mgmt., DLA, Cameron Station, Va., to DCS/Log., Hq. USAF, Washington, D. C., replacing retired L/G John M. Nowak . . . **B/G William J. Begert,** from Cmdr., Air Mobility Warfare Ctr., AMC, McGuire AFB, N. J., to Dir., Ops. and Log., J-3/J-4, Hq. USTRANSCOM, Scott AFB, Ill., replacing M/G John W. Handy . . . **B/G Roger E. Carleton,** from Commanding Gen., Combined Task Force, Operation Provide Comfort, USEUCOM, Incirlik AB, Turkey, to Comdt., Armed Forces Staff College, NDU, Norfolk, Va., replacing B/G Marvin R. Esmond.

M/G Shirley M. Carpenter, from Mobil zation Ass't to the Cmdr., Hq. AMC, Scott AFB, Ill., to Mil. Executive to the Reserve Forces Policy Board, Ass't Sec'y of Defense for Reserve Affairs, OSD, Washington, D. C. . . . **M/G Russell C. Davis,** from Commanding Gen., D. C. National Guard, Washington, D. C., to Vice Chief, Hq. National Guard Bureau, Washington, D. C., replacing M/G Raymond Rees . . . **B/G Marvin R. Esmond,** from Comdt., Armed Forces Staff College, NDU, Norfolk, Va., to Cmdr., 56th FW, AETC, Luke AFB, Ariz., replacing B/G Stephen E. Plummer . . . **M/G John C. Griffith,** from Cmdr., 2d Air Force, AETC, Keesler AFB, Miss., to Vice Cmdr., AETC, Hq. Randolph AFB, Tex., replacing L/G Eugene E. Habiger.

M/G John W. Handy, from Dir., Ops. and Log., J-3/J-4, Hq. USTRANSCOM, Scott AFB, Ill., to Dir., Prgms. and Eval., Hq. USAF, Washington, D. C., replacing M/G Charles R. Heflebower . . . **M/G Henry M. Hobgood,** from Cmdr., 37th TW, AETC, Lackland AFB, Tex., to Cmdr., 2d Air Force, AETC, Keesler AFB, Miss., replacing M/G John C. Griffith . . . **B/G Richard C. Marr,** from Cmdr., 62d AW, AMC, McChord AFB, Wash., to Cmdr., Air Mobility Warfare Ctr., AMC, McGuire AFB, N. J., replacing B/G William J. Begert.

B/G Robert T. Newell III, from Dep. Dir., Ops., DCS/P&O, Hq. USAF, Washington, D. C., to Cmdr., E-3A Component, NATO Early Warning Force, NATO, Geilenkirchen, Germany . . . **M/G (L/G selectee) Lloyd W. Newton,** from Dir., Ops. J-3, USSOCOM, MacDill AFB, Fla., to Ass't VCS, Hq. USAF, Washington, D. C., replacing retired L/G James A. Fain, Jr. . . . **B/G Stephen B. Plummer,** from Cmdr., 56th FW, AETC, Luke AFB, Ariz., to Dep. Dir., Ops., NMCS, J-36, Jt. Staff, Washington, D. C., replacing B/G Thomas A. Twomey. ■

News Notes

■ DoD released the first of a series of reports on US regional security strategies. The East Asia Strategy Report outlines why US national interests require approximately 100,000 troops in Asia. It reverses earlier versions that foretold a continued drawdown in the region, citing North Korea as one factor in the change, according to a senior DoD official.

■ Gen. John Michael Loh, Air Combat Command commander, received the first Order of the Sword presented by ACC NCOs.

■ TSgt. Alfredo Dominguez III, Ramstein AB, Germany, and SSgt. Dennis B. Ramsdell of Giebelstadt AB, Germany (a US Army facility), took the overall top team award for the Air Force Weather Forecasting Competition held at Hurlburt Field, Fla., in March.

■ The Attack and Launch Early Reporting to Theater (ALERT) program, under the 11th Space Warning Squadron, Falcon AFB, Colo., reached initial operational capability March 10. Although still in test and certification stage, the ALERT system, which provides theater missile warning using Defense Support Program satellite data, has already supported operations in South Korea and Saudi Arabia.

■ Because the Joint Tactical Information Distribution System (JTIDS) acquisition program was in such good shape, according to JTIDS Joint Program Office Director David J. Carstairs, DoD agreed to streamline the process and eliminate four formal meetings. The program now moves to full-rate production.

■ The 20th Civil Engineer Squadron, Shaw AFB, S. C., won the 1994 Curtin Award, which recognizes the best civil engineer squadron in the Air Force.

■ The Air Force selected 1,605 out of 22,168 eligible NCOs for promotion to senior master sergeant through March 1, 1996, a 7.24 percent selection rate. The average selectee had 5.58 years time in grade and 18.76 years time in service.

■ Using a nomination package appropriately printed on recycled paper, the Air Force nominated Seymour Johnson AFB, N. C., for the 1994 DoD Installation Recycling Award. The base increased the amount of waste it recycled from twenty-five percent to forty-three percent, in-

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creasing the volume from 1,000 tons to almost 2,500 tons and generating almost $200,000 in revenue.

■ Under the proposed Department of Defense budget, the Selected Reserve end strength—what Congress authorizes and funds—will drop from 78,706 in Fiscal 1995 to 73,969 in Fiscal 1996. It will drop to 73,160 in Fiscal 1997.

■ The 1st Fighter Wing, Langley AFB, Va., won the Secretary of the Air Force's Unit Quality Award for 1994. Evaluators singled out the wing's Quality Improvement Council, Medical Group Information Plan, and Gold Flag Program as "best practices." Gold Flag saved the Air Force $850,000 in Fiscal 1994 and has saved $530,000 so far this fiscal year.

■ Lockheed Martin Corp., Bethesda, Md., will donate $1 million over five years to train thousands of Red Cross workers in providing emergency assistance for US military members and their families.

■ ACC band members won all the 1995 Air Force Bandsmen of the year awards. Winners were SrA. Sandra Haton and MSgt. Wayne Herick, both of Hq. ACC, Langley AFB, Va.; and SSgt. Katherine Nordeen of the 55th Wing, Offutt AFB, Neb.

■ The top AFRES airmen for 1995 are MSgt. Joseph L. Russell, Hq. AFRES, Robins AFB, Ga.; SSgt. Johnny L. Foreman, 951st Reserve Support Squadron, Robins; SrA. Vickie M. Lagergren, 514th Aeromedical Evacuation Squadron, McGuire AFB, N. J.; TSgt. Rodney L. Hersom II, 349th Logistics Support Squadron, Travis AFB, Calif.; and SrA. Anthony R. Wise, 908th Airlift Wing, Maxwell AFB, Ala. They will compete for the Air Force's Outstanding Airmen of the Year award.

■ The Air Force is getting mixed signals from Congress on reactivation of the SR-71 "Blackbird." The House voted to cut $80 million of the $100 million slated for the aircraft's revival, but the Senate seems to want the project to proceed, according to Defense Airborne Reconnaissance Office officials.

■ The VA has $928.2 million to disperse in 1995 to veterans holding active, dividend-earning government life insurance policies issued between 1917 and 1956. Call the VA at (800) 669-8477 for information.

■ The 11th Mission Support Squadron Information Management Directorate, Bolling AFB, D. C., is the best unit in its category in the Air Force for 1994. Unit members will save the Air Force more than $200,000 over the next five years by purchasing photocopiers and putting them on a special copier service plan instead of renting as was done in the past. They also consolidated with the Pentagon information management support services, cutting sixteen positions without reducing service.

■ Air Force Lt. Col. Eileen M. Collins made history in February as the first woman to pilot an American spaceship. She flew the shuttle *Discovery*, which rendezvoused with the Russian space station Mir.

■ The Air Force selected forty-two officers out of 121 who applied for navigator training, a thirty-five percent selection rate. Thirty-four officers were selected from 144 applicants for test pilot school.

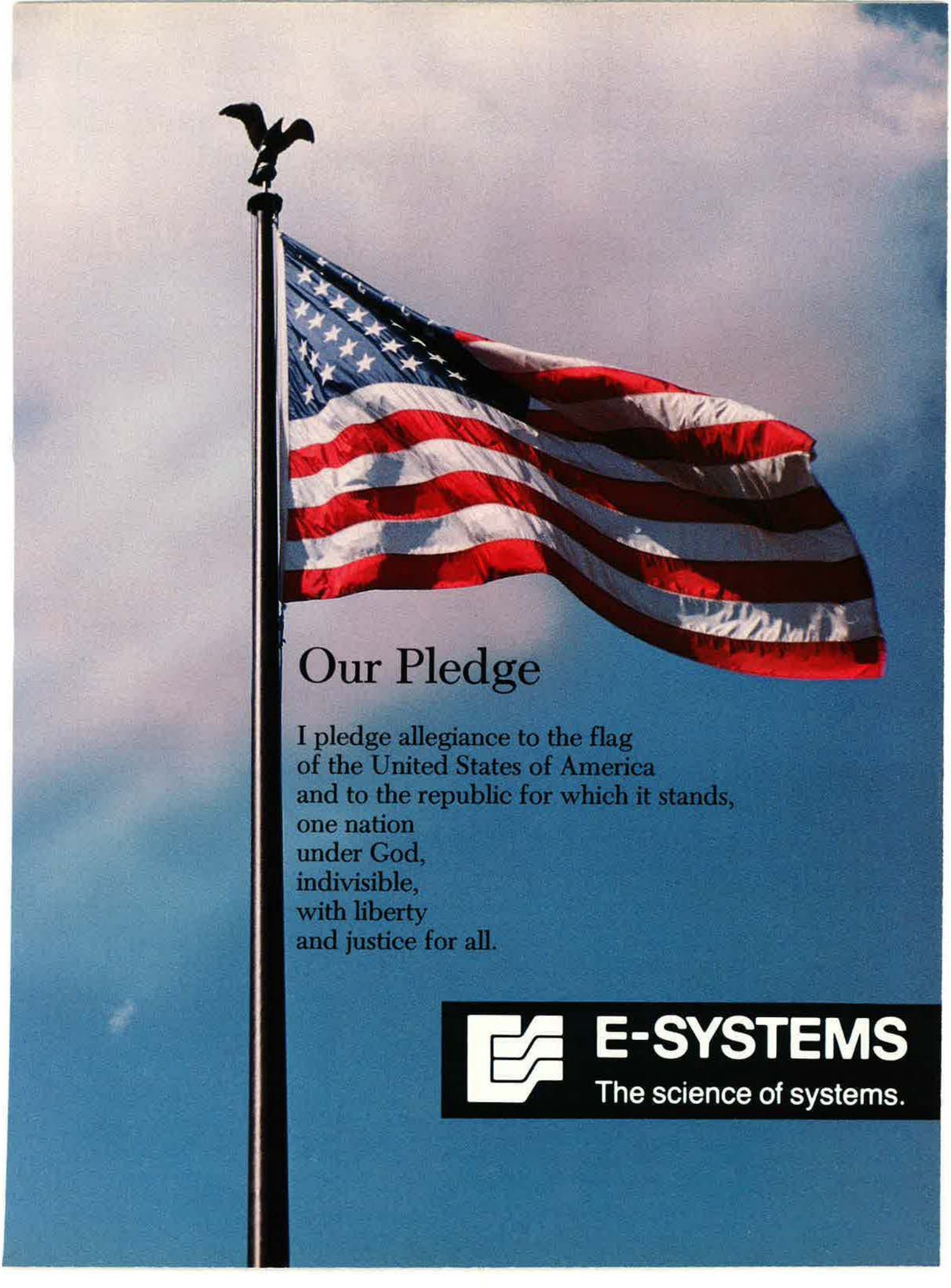
■ The Air Force Military Personnel Center, Randolph AFB, Tex., has added a hotline to the AFMPC commander to receive complaints, concerns, or compliments. To record a message, call (210) 652-5475 or DSN 487-5475.

■ Warner Robins Air Logistics Center, Robins AFB, Ga., won the Air Force's Gen. Thomas D. White Environmental Quality Award for the best overall environmental program.

■ An archaeological excavation at the Huffman Prairie Flying Field at Wright-Patterson AFB, Ohio, turned up remnants of the hangar Wilbur and Orville Wright used to operate their flying school and exhibition company from 1910 to 1916, according to base spokesmen.

■ Andrews AFB, Md., signed a memorandum of understanding with the Maryland Department of Environmental Resources to formalize their cooperation. As a result, three outstanding notices of violation at the base have been deleted; base officials noted the problems would be corrected. ■

Index to Advertisers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of the United States of America
and to the republic for which it stands,
one nation
under God,
indivisible,
with liberty
and justice for all.
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BLSM II will need the world's most skilled systems engineer and integrator; TRW fills that role. After all, we developed a systems engineering discipline as systems engineer for the Air Force's ballistic missile program. During 30 years of continuous effort the company successfully faced enormous challenges coordinating the efforts of thousands of subcontractors.

Today, those skills have been honed and refined to meet the major challenges facing organizations who see the need to modernize and re-engineer their business processes. We have become experts at moving to open systems, re-engineering architectures, reusing code and integrating legacy software while evolving newer, more robust and efficient systems.

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TRW understands the challenges of BLSM II and has established a successful process, applicable tools, and an appropriate flexible architecture, proven on a number of major DoD programs. An example is our Commercial Off The Shelf (COTS) middleware product--UNAS, Universal Network Architecture Services. UNAS will provide the mechanism and foundation to assure that a flexible, scalable architecture will be provided for the Air Force now and well into the future.

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TRW Systems Integration Group

The Air Force in Facts and Figures

Edited by Tamar A. Mehuron, Associate Editor

About the Almanac

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

A word of caution: Personnel figures that appear in this section in different forms will not 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 Service and Its Early Leaders

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

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 the Department of Defense. The chairman and vice chairman of the JCS serve full-time in their positions. The service chiefs are also the military heads of their respective services, although their 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 him.

Most units of the Air Force are assigned to one of the **major commands** (see p. 70). 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 they are increasingly under the command of generals. A USAF 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.**

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

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	400,051[a]
1936	17,233	1966	886,350		

[a]Programmed

USAF Educational Levels

(As of September 30, 1994)

Enlisted

Level	Number	Percent
Below high school	32	0.01
High school	74,019	21.69
Some college (< 2 years)	166,762	48.86
AA/AS degree	40,548	11.88
2–3 years college	44,756	13.11
Baccalaureate degree	13,337	3.91
Master's degree or higher	1,863	0.55
Total	**341,317**	**100.00**

Line Officers

Level	Number	Percent
Below baccalaureate/ unknown	111	0.17
Baccalaureate degree	31,285	48.42
Master's degree	32,063	49.63
Doctoral and professional degrees	1,148	1.78
Total	**64,607**	**100.00**

Numbers are rounded and may not sum to totals.

ICBMs and Spacecraft in Service

Type of system	FY '88	FY '89	FY '90	FY '91	FY '92	FY '93	FY '94
Minuteman II ICBM	450	450	450	450	375	0	0
Minuteman III ICBM	504	500	500	500	500	500	500
Peacekeeper ICBM	46	50	50	50	50	50	50
Total ICBMs	**1,000**	**1,000**	**1,000**	**1,000**	**925**	**550**	**550**
DMSP satellite	2	2	2	2	2	2	2
DSCS satellite	5	5	5	5	5	5	5
DSP satellite (data classified)	—	—	—	—	—	—	—
GPS satellite	6	9	14	16	19	24	24
Milstar	—	—	—	—	—	—	1
Total satellites	**13**	**16**	**21**	**23**	**26**	**31**	**32**

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.

Active-Duty Force Demographics

(As of September 30, 1994)

Grade	Total	Blacks	Women	Other Minorities
Officers				
General	295	6	4	9
Colonel	4,322	91	193	88
Lieutenant Colonel	10,988	542	995	190
Major	16,054	1,220	2,526	373
Captain	34,677	1,942	5,693	1,258
First Lieutenant	7,592	413	1,450	374
Second Lieutenant	7,075	415	1,461	529
Total	**81,003**	**4,629**	**12,322**	**2,821**
Enlisted				
Chief Master Sergeant of the Air Force	1			
Chief Master Sergeant	3,397	520	168	63
Senior Master Sergeant	6,816	1,252	581	170
Master Sergeant	35,922	6,878	3,637	1,271
Technical Sergeant	47,555	9,005	5,867	1,859
Staff Sergeant	81,597	15,110	10,470	4,109
Sergeant/Senior Airman	89,002	14,196	16,479	4,367
Airman First Class	46,958	5,792	9,772	2,169
Airman	18,646	2,638	4,012	995
Airman Basic	11,423	1,627	2,447	698
Total	**341,317**	**57,018**	**53,433**	**15,701**
Total personnel	**422,320**	**61,647**	**65,755**	**18,522**

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

Active-Duty Force by Grade

(As of September 30, 1994)

Grade	Number
Officers	
General	11
Lieutenant General	33
Major General	78
Brigadier General	173
Colonel	4,322
Lieutenant Colonel	10,988
Major	16,054
Captain	34,677
First Lieutenant	7,592
Second Lieutenant	7,075
Total	**81,003**
Enlisted	
Chief Master Sergeant of the Air Force	1
Chief Master Sergeant	3,397
Senior Master Sergeant	6,816
Master Sergeant	35,922
Technical Sergeant	47,555
Staff Sergeant	81,597
Sergeant/Senior Airman	89,002
Airman First Class	46,958
Airman	18,646
Airman Basic	11,423
Total	**341,317**
Total strength	**422,320**

Armed Forces Manpower Trends

(End strength figures in thousands)

	FY '89	FY '90	FY '91	FY '92	FY '93	FY '94	FY '95[a]	FY '96[a]
Active-duty military								
Air Force	571	539	511	470	444	426	400	388
Army	770	751	725	611	572	541	510	495
Marine Corps	197	197	195	185	178	174	174	174
Navy	593	582	571	542	510	469	439	428
Total	**2,130**	**2,069**	**2,002**	**1,808**	**1,705**	**1,611**	**1,523**	**1,485**
Selected Guard and Reserve								
Air Force Reserve	83	81	84	82	81	80	79	74
Air National Guard	116	117	118	119	117	114	116	110
Army National Guard	457	437	441	426	410	397	387	373
Army Reserve	319	299	300	303	276	260	242	230
Marine Corps Reserve	44	45	44	42	42	41	41	42
Naval Reserve	152	149	150	142	132	108	101	99
Total	**1,171**	**1,128**	**1,137**	**1,114**	**1,058**	**998**	**965**	**927**
Direct-hire civilian								
Air Force[b]	249	238	222	214	202	197	190	184
Army[b]	347	327	317	334	294	280	270	257
Navy/Marine Corps	343	331	319	309	285	269	254	241
Defense agencies	98	101	116	149	156	156	153	147
Total[b]	**1,037**	**997**	**974**	**1,006**	**937**	**901**	**867**	**829**

Numbers are rounded and may not sum to totals.

[a]Programmed manpower as of FY 1996 Clinton Administration DoD budget

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

USAF Personnel Strength by Commands, FOAs, and DRUs

(DoD figures as of September 30, 1994)

	Military	Civilian	Total
Major commands			
Air Combat Command (ACC)	118,007	15,225	133,232
Air Education and Training Command (AETC)	64,670	14,352	79,022
Air Force Materiel Command (AFMC)	37,067	80,685	117,752
Air Force Space Command (AFSPC)	24,509	5,096	29,605
Air Force Special Operations Command (AFSOC)	9,153	502	9,655
Air Mobility Command (AMC)	57,228	10,512	67,740
Pacific Air Forces (PACAF)	35,453	8,535	43,988
United States Air Forces in Europe (USAFE)	32,225	7,006	39,231
Total major commands	**378,312**	**141,913**	**520,225**
Field operating agencies (FOAs)			
Air Force Audit Agency	8	882	890
Air Force Base Conversion Agency	82	294	376
Air Force Center for Environmental Excellence	50	347	397
Air Force Civil Engineer Support Agency	136	174	310
Air Force Civilian Personnel Management Center	1	1,076	1,077
Air Force Command, Control, Communications, and Computer Agency	409	325	734
Air Force Cost Analysis Agency	33	76	109
Air Force Doctrine Center	16	3	19
Air Force Flight Standards Agency	135	18	153
Air Force Frequency Management Agency	14	18	32
Air Force Historical Research Agency	12	49	61
Air Force History Support Office	6	28	34
Air Force Inspection Agency	151	29	180
Air Force Legal Services Agency	406	149	555
Air Force Logistics Management Agency	69	22	91
Air Force Management Engineering Agency	78	72	150
Air Force Medical Operations Agency	36	309	345
Air Force Medical Support Agency	59	55	114
Air Force Military Personnel Center	982	480	1,462
Air Force News Agency	362	130	492
Air Force Office of Special Investigations	1,569	459	2,028
Air Force Operations Group	144	8	152
Air Force Pentagon Communications Agency	658	275	933
Air Force Personnel Operations Agency	40	29	69
Air Force Program Executive Office	38	13	51
Air Force Real Estate Agency	0	14	14
Air Force Reserve	375	14,979[a]	15,354[a]
Air Force Review Boards Agency	16	35	51
Air Force Safety Agency	82	69	151
Air Force Security Police Agency	236	19	255
Air Force Services Agency	46	166	212
Air Force Studies and Analyses Agency	71	25	96
Air Force Technical Applications Center	1,106	3	1,109
Air Intelligence Agency	12,305	2,103	14,408
Air National Guard Readiness Center	39	411	450
Air Reserve Personnel Center	117	561	678
Air Weather Service	958	238	1,196
Joint Services Survival, Evasion, Resistance, and Escape Agency	24	46	70
Total FOAs	**20,869**	**23,989**	**44,858**
Direct reporting units (DRUs)			
Air Force Operational Test and Evaluation Center	629	228	857
United States Air Force Academy (excluding 4,007 cadets)	2,470	1,654	4,124
11th Wing	1,807	1,129	2,936
Total DRUs	**4,906**	**3,011**	**7,917**
Total major commands, FOAs, DRUs	**404,087**	**168,913**	**573,000**

[a]Includes Air Reserve technicians

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Air Force Installations

	FY '91	FY '92	FY '93	FY '94	FY '95	FY '96
Major installations						
US and possessions[a]	102	101	99	85	79	75
Foreign	37	23	22	17	15	13
Worldwide	139	124	121	102	94	88
Minor installations						
US and possessions[a]	104	105	105	110	113	92
Foreign	14	17	14	12	7	4
Worldwide	118	122	119	122	120	96

[a]Includes Air Force Reserve and Air National Guard

Specialties in the Enlisted Force

(As of September 30, 1994)

Code	Career Field	Assigned
1A	Aircrew Operations	6,904
1C	Command Control Systems Operations	12,749
1N	Intelligence	11,021
1S	Safety	372
1T	Aircrew Protection	2,622
1W	Weather	2,738
2A	Manned Aerospace Maintenance	75,062
2B	Marine	34
2E	Communications-Electronics Systems	21,010
2F	Fuels	4,450
2G	Logistics Plans	760
2M	Missile & Space Systems Maintenance	3,336
2P	Precision Measurement	1,833
2R	Maintenance Management Systems	2,064
2S	Supply	16,640
2T	Transportation & Vehicle Maintenance	15,174
2W	Munitions & Weapons	17,046
3A	Information Management	14,916
3C	Communications-Computer Systems	16,900
3E	Civil Engineering	21,761
3H	Historian	115
3K	Commissary Services	673
3M	Morale, Welfare, Recreation, & Services	5,480
3N	Public Affairs	1,591
3P	Security Police	26,594
3R	Printing Management	323
3S	Mission Support	11,075
3U	Manpower	567
3V	Visual Information	1,936
4X	Medical	24,127
4Y	Dental	3,026
5J	Paralegal	893
5R	Chapel Service Support	525
6C	Contracting	1,291
6F	Financial	4,402
7S	Special Investigation	791
8	Special Duty Identifiers	6,310
9	Reporting Identifiers	4,168

Specialties in the Officer Force

(As of September 30, 1994)

Code	Utilization Field Title	Assigned
X0	Commander & Director	1,094
11	Pilot	14,427
12	Navigator	5,112
13	Space, Missile, Command & Control	6,444
14	Intelligence	2,832
15	Weather	898
16	Operations Support	1,175
21	Aircraft Maintenance & Munitions	2,362
22	Space & Missile Maintenance	220
23	Supply	778
24	Transportation	750
25	Logistics Plans & Programs	928
31	Security Police	830
32	Civil Engineering	1,869
33	Communications-Computer Systems	4,794
34	Morale, Welfare, Recreation, & Services	441
35	Public Affairs	411
36	Personnel	1,487
37	Information Management	1,696
38	Manpower	304
4X	Medical	14,087
51	Law	1,310
52	Chaplain	679
61	Scientific/Research	1,372
62	Developmental Engineering	4,323
63	Acquisition	2,734
64	Contracting	1,139
65	Financial	1,142
71	Special Investigations	457
8X	Special Duty Identifiers	1,713
9X	Reporting Identifiers	3,171

Budget Terms Explained

Funding levels can be expressed in several ways. **Budget authority** is the value of new obligations that the 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.

Defense Department Budget Topline and Service Shares

($ billions)

	FY '95	FY '96	FY '97	FY '98	FY '99	FY '00	FY '01
Budget authority (current $)	252.6	246.0	242.8	249.7	256.3	266.2	276.6
Budget authority (constant FY 1996 $)	259.7	246.0	235.9	235.7	235.1	237.8	240.6
Outlays (current $)	260.2	250.0	246.1	244.2	249.6	257.9	261.6
Outlays (constant FY 1996 $)	267.5	250.0	239.0	230.5	229.0	230.4	227.7

	FY '92	FY '93	FY '94	FY '95	FY '96
Service Shares (budget authority, current $ billions)					
Air Force	80.2	78.5	74.6	74.4	72.6
Army	67.0	63.6	62.5	62.7	59.3
Navy	84.8	82.6	78.1	78.2	75.6
Defense agencies, DoD-wide	38.9	34.2	36.3	37.3	38.6
Total	**270.9**	**258.9**	**251.4**	**252.6**	**246.0**
Percentages (budget authority)					
Air Force	29.6	30.3	29.6	29.5	29.5
Army	24.7	24.6	24.9	24.8	24.1
Navy	31.3	31.9	31.1	30.9	30.7
Defense agencies, DoD-wide	14.4	13.2	14.4	14.8	15.7

Fiscal 1996 figures are those contained in the Clinton Administration's budget request. Numbers have been rounded.

Air Force Budget—A Ten-Year Perspective

(Budget authority in $ millions)

	FY '86	FY '87	FY '88	FY '89	FY '90	FY '91	FY '92	FY '93	FY '94	FY '95
Current dollars										
Military personnel	$19,225	$21,054	$21,613	$21,851	$21,777	$22,755	$21,381	$20,141	$17,952	$19,233
Operations and maintenance	21,249	21,682	23,040	24,973	25,160	29,061	22,816	22,179	23,711	23,336
Procurement	38,197	31,959	26,701	30,981	30,276	24,041	23,249	21,803	17,969	18,218
RDT&E	13,109	14,903	14,617	14,696	13,507	12,207	12,867	12,979	12,152	12,349
Military construction	1,757	1,426	1,414	1,445	1,453	1,117	1,200	1,053	1,307	616
Family housing	793	798	828	921	870	888	1,112	1,212	923	1,054
Rev. and mgmt. funds	752	202	452	187	121	1,672	n/a	n/a	n/a	n/a
Trust and receipts	–214	–399	–340	–369	–274	–485	–286	–221	–310	–315
Total	**94,868**	**91,625**	**88,325**	**94,685**	**92,890**	**91,256**	**82,339**	**79,146**	**73,704**	**74,492**
Constant FY '95 dollars										
Military personnel	24,867	26,504	26,194	25,643	25,163	25,206	22,970	20,746	18,290	19,233
Operations and maintenance	27,669	27,630	28,917	30,013	29,445	30,639	24,541	23,162	24,019	23,336
Procurement	50,741	40,990	32,988	36,865	34,856	26,864	25,284	23,079	18,496	18,218
RDT&E	17,558	19,339	18,269	17,641	15,597	13,582	13,946	13,698	12,489	12,349
Military construction	2,345	1,842	1,758	1,727	1,671	1,245	1,303	1,114	1,346	616
Family housing	1,045	1,025	1,036	1,106	1,007	983	1,205	1,279	948	1,054
Rev. and mgmt. funds	1,004	262	570	226	140	1,864	n/a	n/a	n/a	n/a
Trust and receipts	–286	–519	–429	–447	–318	–541	–310	–233	–318	–315
Total	**124,943**	**117,073**	**109,303**	**112,774**	**107,561**	**99,842**	**88,939**	**82,845**	**75,268**	**74,492**
Percentage real growth										
Military personnel	–4.1	6.6	–1.2	–2.1	–1.9	0.2	–8.9	–9.7	–11.8	5.2
Operations and maintenance	–2.3	–0.1	4.7	3.8	–1.9	4.1	–19.9	–5.6	3.7	–2.9
Procurement	–11.6	–19.2	–19.5	11.8	–5.5	–22.9	–5.9	–8.7	–19.9	–1.5
RDT&E	–5.3	10.1	–5.5	–3.4	–11.6	–12.9	2.7	–1.8	–8.8	–1.1
Military construction	–2.5	–21.4	–4.6	–1.8	–3.2	–25.5	4.6	–14.5	20.8	–54.3
Family housing	–12.9	–1.9	1.0	6.8	–9.0	–2.5	22.6	6.1	–25.9	11.3
Total	**–6.9**	**–6.3**	**–6.6**	**3.2**	**–4.6**	**–7.2**	**–10.9**	**–6.9**	**–9.2**	**–1.0**

Totals may not sum due to rounding.

Allowances for Quarters and Subsistence

Pay Grade	Single Full Rate	Partial Rate	Married Full Rate
O-10	$749.40	$50.70	$922.50
O-9	749.40	50.70	922.50
O-8	749.40	50.70	922.50
O-7	749.40	50.70	922.50
O-6	687.60	39.60	830.70
O-5	662.10	33.00	800.70
O-4	613.80	26.70	705.90
O-3	492.00	22.20	584.10
O-2	390.00	17.70	498.90
O-1	328.50	13.20	445.80
O-3E	531.00	22.20	627.60
O-2E	451.50	17.70	566.40
O-1E	388.20	13.20	523.20
E-9	454.80	18.60	599.40
E-8	417.60	15.30	552.60
E-7	356.40	12.00	513.00
E-6	322.80	9.90	474.30
E-5	297.60	8.70	426.30
E-4	258.90	8.10	370.80
E-3	254.10	7.80	345.00
E-2	206.40	7.20	328.50
E-1	183.90	6.90	328.50

	Cash/In Kind
Officers	$146.16/month

Enlisted Members	E-1 <4 Months	All Other Enlisted
When on leave or authorized to mess separately	$6.44/day	$6.98/day
When rations in-kind are not available	$7.26/day	$7.87/day
When assigned to duty under emergency conditions where no US mess facilities are available	$9.63/day	$10.42/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, 1995.

Annual Pay for Federal Civilians

(Effective January 1, 1995)

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	$12,141	$12,546	$12,949	$13,352	$13,757	$13,994	$14,391	$14,793	$14,811	$15,183
GS-2	13,650	13,975	14,428	14,811	14,974	15,414	15,854	16,294	16,734	17,174
GS-3	14,895	15,392	15,889	16,386	16,883	17,380	17,877	18,374	18,871	19,368
GS-4	16,721	17,278	17,835	18,392	18,949	19,506	20,063	20,620	21,177	21,734
GS-5	18,707	19,331	19,955	20,579	21,203	21,827	22,451	23,075	23,699	24,323
GS-6	20,852	21,547	22,242	22,937	23,632	24,327	25,022	25,717	26,412	27,107
GS-7	23,171	23,943	24,715	25,487	26,259	27,031	27,803	28,575	29,347	30,119
GS-8	25,662	26,517	27,372	28,227	29,082	29,937	30,792	31,647	32,502	33,357
GS-9	28,345	29,290	30,235	31,180	32,125	33,070	34,015	34,960	35,905	36,850
GS-10	31,215	32,256	33,297	34,338	35,379	36,420	37,461	38,502	39,543	40,584
GS-11	34,295	35,438	36,581	37,724	38,867	40,010	41,153	42,296	43,439	44,582
GS-12	41,104	42,474	43,844	45,214	46,584	47,954	49,324	50,694	52,064	53,434
GS-13	48,878	50,507	52,136	53,765	55,394	57,023	58,652	60,281	61,910	63,539
GS-14	57,760	59,685	61,610	63,535	65,460	67,385	69,310	71,235	73,160	75,085
GS-15	67,941	70,206	72,471	74,736	77,001	79,266	81,531	83,796	86,061	88,326

Senior Executive Service

Level 1	Level 2	Level 3	Level 4	Level 5
$148,400	$133,600	$123,100	$115,700	$108,200

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

The SES pay scale has been revised; there are now only five levels, progressing from Level 5 to Level 1.

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The Wind Corrected Munitions Dispenser (WCMD) makes the future available today as an upgrade to the combat-proven Tactical Munitions Dispenser family. A field retrofit tail kit will provide your Combined Effects Munition, Sensor Fuzed Weapon, or Gator with the capability required for accurate delivery in adverse weather at all altitudes.

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Hazardous Duty Pay

Pay Grade	Monthly Rate
O-10	$110
O-9	110
O-8	110
O-7	110
O-6	250
O-5	250
O-4	225
O-3	175
O-2	150
O-1	125
E-9	200
E-8	200
E-7	200
E-6	175
E-5	150
E-4	125
E-3	110
E-2	110
E-1	110

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 twenty-five years of service may receive $250 per month for continued operational flying.

Monthly Military Basic Rates of Pay

(Effective January 1, 1995)

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	$6,978	$7,224	$7,224	$7,224	$7,224	$7,501	$7,501	$7,917	$7,917	$8,483	$8,483	$9,051	$9,051	$9,051	$9,615[b]
O-9	6,185	6,347	6,482	6,482	6,482	6,647	6,647	6,923	6,923	7,501	7,501	7,917	7,917	7,917	8,483
O-8	5,602	5,770	5,906	5,906	5,906	6,347	6,347	6,647	6,647	6,923	7,224	7,501	7,686	7,686	7,686
O-7	4,655	4,971	4,971	4,971	5,194	5,194	5,495	5,495	5,770	6,347	6,783	6,783	6,783	6,783	6,783
O-6	3,450	3,790	4,039	4,039	4,039	4,039	4,039	4,039	4,176	4,836	5,083	5,194	5,495	5,681	5,960
O-5	2,759	3,240	3,464	3,464	3,464	3,464	3,569	3,761	4,013	4,313	4,560	4,699	4,863	4,863	4,863
O-4	2,326	2,832	3,021	3,021	3,077	3,213	3,432	3,625	3,790	3,957	4,066	4,066	4,066	4,066	4,066
O-3[c]	2,161	2,417	2,583	2,858	2,995	3,102	3,270	3,432	3,516	3,516	3,516	3,516	3,516	3,516	3,516
O-2[c]	1,885	2,058	2,473	2,556	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609
O-1[c]	1,636	1,703	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058
Commissioned Officers With More Than Four Years of Active-Duty Enlisted Service															
O-3E	—	—	—	2,858	2,995	3,102	3,270	3,432	3,569	3,569	3,569	3,569	3,569	3,569	3,569
O-2E	—	—	—	2,556	2,609	2,692	2,832	2,941	3,021	3,021	3,021	3,021	3,021	3,021	3,021
O-1E	—	—	—	2,058	2,199	2,280	2,363	2,444	2,556	2,556	2,556	2,556	2,556	2,556	2,556
Enlisted Members															
E-9	—	—	—	—	—	—	2,562	2,619	2,678	2,740	2,801	2,856	3,005	3,122	3,298
E-8	—	—	—	—	—	2,148	2,210	2,268	2,327	2,388	2,443	2,503	2,650	2,768	2,945
E-7	1,500	1,619	1,679	1,738	1,797	1,854	1,914	1,973	2,063	2,121	2,180	2,208	2,357	2,474	2,650
E-6	1,290	1,406	1,465	1,527	1,585	1,642	1,702	1,790	1,846	1,905	1,934	1,934	1,934	1,934	1,934
E-5	1,132	1,232	1,292	1,349	1,437	1,496	1,555	1,612	1,642	1,642	1,642	1,642	1,642	1,642	1,642
E-4	1,056	1,115	1,181	1,272	1,322	1,322	1,322	1,322	1,322	1,322	1,322	1,322	1,322	1,322	1,322
E-3	995	1,050	1,091	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135
E-2	958	958	958	958	958	958	958	958	958	958	958	958	958	958	958
E-1[d]	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854

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 $4,008.60, regardless of cumulative years of service.

[a]Basic pay is limited to $9,016.80, regardless of cumulative years of service.

[b]Amount used for benefits calculation only; actual basic pay rate does not exceed legal cap of $9,016.80.

[c]Does not apply to commissioned officers who have been credited with more than four years' active service as enlisted members.

[d]Basic pay for E-1s with less than four months of service is $790.20.

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AM General modernized M35/36A3s exceeded durability goals in 60,000 miles of testing by achieving exceptional levels of reliability and maintainability. In fact, these better-than-new M35/36A3s reduce operating costs by 70%, making them cost effective in a tough budget environment. So if you want to improve your fleet, get a great deal on a trade-in – with the Extended Service Program. For more information, contact AM General Corporation.
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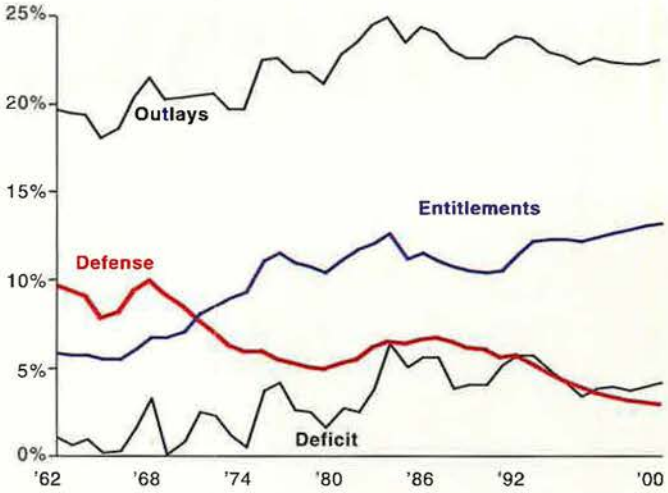
Federal Budget Categories as Percentages of GDP

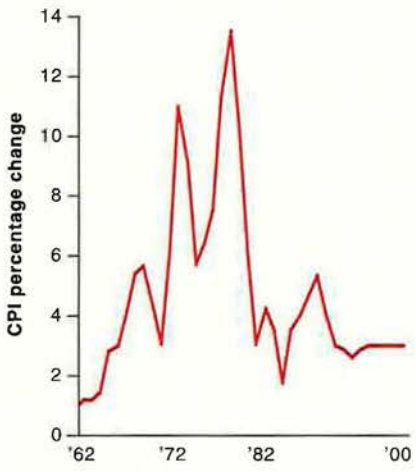


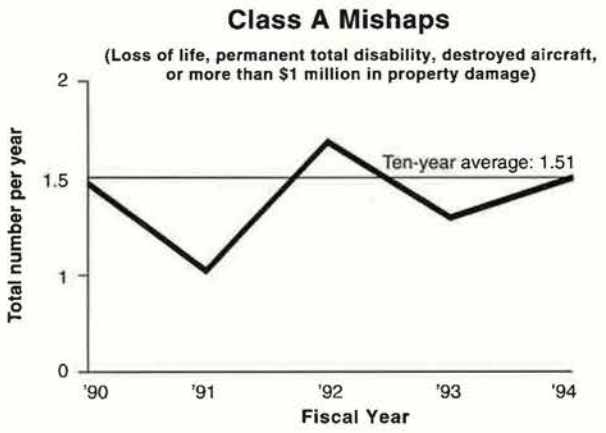
Year	Outlays	Deficit	Entitlements	Defense
1962	19.3	1.1	5.8	9.5
1963	19.0	0.7	5.7	9.2
1964	18.9	1.0	5.7	8.8
1965	17.6	0.2	5.4	7.6
1966	18.2	0.4	5.4	8.0
1967	19.9	1.6	6.0	9.1
1968	21.0	3.3	6.6	9.7
1969	19.8	0.1	6.6	8.9
1970	19.8	0.9	7.0	8.3
1971	20.0	2.5	7.9	7.5
1972	20.1	2.3	8.4	6.9
1973	19.2	1.2	8.8	6.1
1974	19.2	0.6	9.1	5.8
1975	22.0	3.7	10.9	5.8
1976	22.1	4.2	11.3	5.3
1977	21.3	2.6	10.8	5.1
1978	21.3	2.5	10.6	4.9
1979	20.7	1.6	10.2	4.8
1980	22.3	2.7	11.0	5.1
1981	22.9	2.5	11.5	5.3
1982	23.9	3.8	11.9	6.0
1983	24.4	6.3	12.4	6.3
1984	23.0	5.0	11.0	6.2
1985	23.8	5.6	11.3	6.4
1986	23.5	5.6	10.9	6.5
1987	22.5	3.8	10.6	6.3
1988	22.1	4.0	10.3	6.0
1989	22.1	4.0	10.2	5.9
1990	22.8	5.1	10.3	5.5
1991	23.3	5.7	11.2	5.6
1992	23.3	5.7	12.0	5.1
1993	22.5	4.8	12.2	4.7
1994	22.0	3.9	11.9	4.3
1995	21.8	3.4	12.0	3.8
1996	22.1	3.8	12.2	3.5
1997	21.9	3.9	12.4	3.3
1998	21.7	3.7	12.6	3.1
1999	21.8	3.9	12.8	3.0
2000	22.0	4.2	13.0	2.9

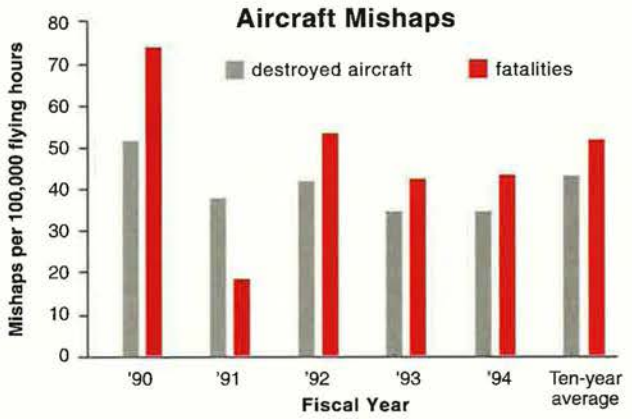
Inflation Rates

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

CPI=Consumer Price Index







Figures in the tables on p. 46 and below, left, are from the Congressional Budget Office and DoD; below, right, derived from CBO. Fiscal 1995–2000 figures are projections.

Federal Budget Categories

(Current $ billions)

Year	Outlays	Deficit	Entitlements	Defense
1962	$106.8	$5.9	$32.3	$52.6
1963	111.3	4.0	33.6	53.7
1964	118.5	6.5	35.7	55.0
1965	118.2	1.6	36.1	51.0
1966	134.5	3.1	39.9	59.0
1967	157.5	12.6	47.4	72.0
1968	178.1	27.7	56.1	82.2
1969	183.6	0.5	61.2	82.7
1970	195.6	8.7	68.7	81.9
1971	210.2	26.1	82.7	79.0
1972	230.7	26.4	96.8	79.3
1973	245.7	15.4	112.2	77.1
1974	269.4	8.0	127.1	80.7
1975	332.3	55.3	164.4	87.6
1976	371.8	70.5	189.7	89.9
1977	409.2	49.8	206.6	97.5
1978	458.7	54.9	228.4	104.6
1979	503.5	38.2	248.2	116.8
1980	590.9	72.7	291.5	134.6
1981	678.2	74.0	340.6	158.0
1982	745.8	120.1	372.7	185.9
1983	808.4	208.0	411.6	209.9
1984	851.8	185.7	406.3	228.0
1985	946.4	221.7	450.0	253.1
1986	990.3	238.0	459.7	273.8
1987	1,003.9	169.3	470.2	282.5
1988	1,064.1	194.0	494.2	290.9
1989	1,143.2	205.2	526.2	304.0
1990	1,252.7	278.0	567.4	300.1
1991	1,323.8	321.7	634.2	319.7
1992	1,380.9	340.5	711.7	302.6
1993	1,408.2	300.0	762.1	292.4
1994	1,461.0	259.0	789.0	282.4
1995	1,531.0	244.0	845.0	271.6
1996	1,625.0	280.0	899.0	261.4
1997	1,699.0	303.0	962.0	257.0
1998	1,769.0	308.0	1,026.0	254.5
1999	1,872.0	343.0	1,097.0	259.7
2000	1,981.0	381.0	1,173.0	267.8

Federal Budget Categories

(Constant Fiscal 1996 $ billions)

Year	Outlays	Deficit	Entitlements	Defense
1962	$546.1	$30.2	$165.1	$268.9
1963	563.4	20.2	170.1	271.8
1964	592.2	32.5	178.4	274.9
1965	583.1	7.9	178.1	251.6
1966	653.1	15.1	193.7	286.5
1967	743.2	59.5	223.7	339.7
1968	815.1	126.8	256.8	376.2
1969	806.4	2.2	268.8	363.2
1970	814.4	36.2	286.0	341.0
1971	828.0	102.8	325.7	311.2
1972	870.4	99.6	365.2	299.2
1973	898.3	56.3	410.2	281.9
1974	927.4	27.5	437.5	277.8
1975	1,030.6	171.5	509.9	271.7
1976	1,056.9	200.4	539.2	255.6
1977	1,099.4	133.8	555.1	262.0
1978	1,157.2	138.5	576.2	263.9
1979	1,180.5	89.6	581.9	273.9
1980	1,244.8	153.1	614.1	283.5
1981	1,258.7	137.3	632.2	293.3
1982	1,255.0	202.1	627.1	312.8
1983	1,280.9	329.6	652.2	332.6
1984	1,307.8	285.1	623.8	350.1
1985	1,393.1	326.3	662.4	372.6
1986	1,407.1	338.2	653.2	389.0
1987	1,399.8	236.1	655.6	393.9
1988	1,432.2	261.1	665.2	391.5
1989	1,478.1	265.3	680.3	393.0
1990	1,545.5	343.0	700.0	370.2
1991	1,549.5	376.5	742.3	374.2
1992	1,551.2	382.5	799.5	339.9
1993	1,534.3	326.9	830.3	318.6
1994	1,545.5	274.0	834.6	298.7
1995	1,576.9	251.3	870.4	279.7
1996	1,625.0	280.0	899.0	261.4
1997	1,646.3	293.6	932.2	249.0
1998	1,661.0	289.2	963.4	239.0
1999	1,703.2	312.1	998.1	236.3
2000	1,746.5	335.9	1,034.2	236.1

The Civilian Force

(As of September 30, 1994)

General Schedule/Other

Grade	Force
1	38
2	146
3	1,703
4	6,879
5	14,489
6	7,921
7	10,343
8	1,547
9	14,101
10	994
11	17,288
12	21,090
13	10,088
14	3,746
15	1,288
16	0
17	0
18	0
ST[a]	24
SES[b]	154
Total	**111,839**

Wage Grade Positions

Grade	Force
1	21
2	715
3	522
4	258
5	2,059
6	1,529
7	2,610
8	5,044
9	4,687
10	16,395
11	4,454
12	2,041
13	289
14	129
15	2
Total	**40,755**

Wage Grade Leader Positions

Grade	Force
1	0
2	9
3	2
4	2
5	36
6	38
7	51
8	112
9	288
10	745
11	129
12	44
13	2
14	0
15	0
Total	**1,458**

Wage Grade Supervisory Positions

Grade	Force
1	22
2	45
3	37
4	89
5	147
6	229
7	335
8	442
9	1,074
10	1,343
11	530
12	283
13	165
14	262
15	150
16	92
17	47
18	8
Total	**5,300**

Air Force Civilian Personnel: Average Age and Length of Service

Average length of service (overall)	**15 years**
General schedule	**15 years**
Federal wage system	**16 years**
Average age	**45 years**

Wage grades apply to full-time employees. Table does not include ANG technicians, local national employees, or nonappropriated-fund employees.

[a]Scientific and Technical

[b]Senior Executive Service

Aircraft per Active-Duty USAF Squadron

(As of September 30, 1994)

Aircraft Type	Number
A/OA-10	18
B-1B	11, 12, 16, or 17
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
EC-130H	5
HC-130P/N	4–11
MC-130	4–12
MH-53J	5 or 19
MH-60G	8
KC-10A	9 or 10
KC-135	8–12
C-141B	16
E-3	2 or 7
F-4	11
F-4G	24
F-15	18
F-15E	18 or 24
F-16	18 or 24
F-111	18
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.

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USAF Total Force

	FY '89	FY '90	FY '91	FY '92	FY '93	FY '94	FY '95
Air Force active-duty							
Officers	103,700	100,000	96,600	90,400	84,073	81,003	77,740
Enlisted	462,800	430,800	409,400	375,700	356,126	341,317	318,311
Total, Air Force military[1]	**566,500**	**530,800**	**506,000**	**466,100**	**440,199**	**422,320**	**396,051**
Career reenlistments (second-term)	39,400	44,600	41,500	49,100	38,300	41,000	38,900
Rate	87%	82%	87%	88%	90%	89%	90%
First-term reenlistments	18,100	23,600	22,500	21,000	17,600	13,100	14,100
Rate	59%	51%	59%	59%	61%	60%	59%
Civilian personnel							
Direct hire (excluding technicians)	214,917	204,129	188,259	170,549	158,631	155,385	148,329
Technicians: AFRES	10,061	9,596	9,527	10,467	9,827	9,398	10,425
ANG	23,688	24,119	24,703	24,741	24,958	24,063	24,218
Indirect hire—foreign nationals	11,909	11,031	10,172	8,652	8,246	7,643	7,089
Total civilian personnel	**260,575**	**248,875**	**232,661**	**214,409**	**201,662**	**196,489**	**190,061**
Total military and civilian	**827,075**	**779,675**	**738,661**	**680,509**	**641,861**	**618,809**	**586,112**
Guard and Reserve							
Air National Guard, Selected Reserve	116,061	117,786	117,786	119,083	117,162	113,587	115,581
Air Force Reserve, paid	83,214	83,814	84,539	83,396	80,562	79,621	78,706
Air Force Reserve, nonpaid	49,553	68,714	75,002	74,330	111,509	98,848	99,000
Total Ready Reserve	**248,828**	**270,314**	**277,327**	**276,809**	**309,233**	**292,056**	**293,287**
Standby	17,299	15,369	14,234	16,000	13,042	9,926	12,000
Total Guard and Reserve	**266,127**	**285,683**	**291,561**	**292,809**	**322,275**	**301,982**	**305,287**

Numbers are rounded and may not sum to totals. FYs 1989–94 are actual figures; FY 1995 is an estimate.
[1]Does not include cadets

Total Number of USAF Aircraft in Service and Flying Hours

	FY '88	FY '89	FY '90	FY '91	FY '92	FY '93	FY '94
Type of aircraft							
Bomber	422	412	366	290	248	225	178
Tanker	567	578	555	539	478	391	326
Fighter/interceptor/attack	3,027	2,896	2,798	2,497	2,000	1,848	1,781
Reconnaissance/electronic warfare	424	416	346	303	238	241	225
Cargo/transport	859	825	824	812	794	749	733
Search & rescue (fixed wing)	33	35	36	32	56	84	34
Helicopter (includes rescue)	200	205	212	213	206	203	189
Trainer	1,543	1,540	1,535	1,415	1,313	1,150	1,188
Utility/observation/other	120	140	141	88	89	95	107
Total active-duty	**7,195**	**7,047**	**6,813**	**6,189**	**5,422**	**4,986**	**4,761**
Air National Guard total	1,730	1,735	1,719	1,793	1,694	1,653	1,586
Air Force Reserve total	491	497	500	528	524	543	468
Total active-duty, ANG, and AFRES	**9,416**	**9,279**	**9,032**	**8,510**	**7,640**	**7,182**	**6,815**
Total aircraft, including foreign-government-owned	9,500	9,355	9,130	8,603	7,733	7,276	7,028
Flying hours (in thousands)							
USAF active-duty	2,752	2,830	2,760	2,551	2,195	1,993	1,750
Air National Guard	437	427	442	458	441	442	412
Air Force Reserve	151	155	164	157	154	149	155
Total flying hours	**3,340**	**3,412**	**3,366**	**3,166**	**2,790**	**2,584**	**2,317**

Aircraft Type and Total and Primary Aircraft Authorized

(As of September 30, 1994)

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	84	82
B-2	9	10
B-52	85	57
Total	**178**	**149**
Cargo/transport		
C-5	82	74
C-9	23	22
C-12	72	72
C-17	16	14
C-20	13	13
C-21	79	77
C-23	3	3
C-27	10	9
C-130	218	168
C-135	8	6
C-137	7	6
C-141	191	175
CT-43	2	2
NC-130	3	3
NC-141	3	4
NT-39	2	2
VC-25	2	2
Total	**734**	**652**
Electronic warfare/combat		
F-4G	31	26
EF-111	40	27
Total	**71**	**53**
Fighter/attack		
A-10	131	106
OA-10	101	78
F-15	645	549
F-16	777	663
F-111	104	76
F-117	55	47
YF-15	1	1
YF-117	3	3
Total	**1,817**	**1,523**
Helicopter		
HH-1	20	19
HH-60	41	30
TH-53	6	4
UH-1	66	49
NCH-53	2	0
Total	**135**	**102**

Type	TAI	PAA
Reconnaissance/battle management/C³I		
E-3	34	29
E-4	4	3
EC-18	6	6
EC-130	22	16
EC-135	17	11
EC-137	1	1
RC-135	19	15
U-2	34	34
Total	**137**	**115**
Special Operations Forces		
AC-130	12	11
HC-130	28	25
MC-130	38	34
MH-53	41	33
MH-60	13	11
Total	**132**	**114**
Tanker		
HC-130	6	7
KC-10	59	57
KC-135	264	239
NKC-135	3	3
Total	**332**	**306**
Trainer		
T-1	87	51
T-3	24	54
AT-38	49	39
T-37	494	281
T-38	457	407
T-39	4	4
T-41	50	45
T-43	10	10
TC-135	3	2
TG-3	4	2
TG-4	10	10
TG-7	9	9
TG-9	4	4
Total	**1,205**	**918**
Other		
OA-37	2	2
UV-18	2	2
Total	**4**	**4**
Total active-duty	**4,745**	**3,936**

USAF Personnel by Geographic Area

(As of September 30, 1994)

Total military personnel	**426,327**
US territory and special locations	**354,588**
Total in foreign countries	**71,739**
Western and southern Europe	**40,951**
Germany	17,453
UK	11,478
Turkey	3,760
Italy	4,685
Spain	218
All other countries	3,357
East Asia and Pacific	**26,895**
Japan/Okinawa	15,331
South Korea	8,960
Guam	2,217
All other countries	387
Africa, Near East, south Asia	**355**
Saudi Arabia	190
Egypt	53
All other countries	112
Western hemisphere	**2,713**
Panama	2,500
Canada	102
All other countries	111
Other areas	**825**

The Air National Guard Fleet

(As of September 30, 1994)

	Age in Years										
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24+	Average	Total number
A-10	—	—	—	11	67	27	—	—	—	13.8	105
B-1	—	—	11	—	—	—	—	—	—	7.3	11
C-5	—	—	—	—	—	—	1	7	4	23.5	12
C-12	—	—	6	—	—	—	—	—	—	6.7	6
C-21	—	—	4	—	—	—	—	—	—	7.0	4
C-22	—	—	—	4	—	—	—	—	—	9.7	4
C-26	22	12	—	—	—	—	—	—	—	3.0	34
C-130	33	34	24	17	15	8	—	—	84	16.1	215
KC-135	—	—	—	—	—	—	—	—	225	34.4	225
C-141	—	—	—	—	—	—	—	—	16	28.2	16
HH-60	7	14	—	—	—	—	—	—	—	4.1	21
F-4	—	—	—	—	—	—	—	13	46	26.2	59
F-15	—	—	—	—	1	130	9	—	—	16.6	140
F-16	12	129	259	209	123	10	—	—	—	8.8	742
T-43	—	—	—	—	—	—	2	—	—	20.3	2
Total	**74**	**189**	**304**	**241**	**206**	**175**	**12**	**20**	**375**	**15.1**	**1,596**
Percent[a]	**5**	**12**	**19**	**15**	**13**	**11**	**1**	**1**	**23**		**100**

[a]Percentages have been rounded.

The Air Force Reserve Fleet

(As of September 30, 1994)

	Age in Years										
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	24+	Average	Total number
B-52H	—	—	—	—	—	—	—	—	9	32.5	9
A/OA-10	—	—	—	—	41	3	—	—	—	14.1	44
AC-130A	—	—	—	—	—	—	—	—	10	38.0	10
C-130E	—	—	—	—	—	—	—	—	43	30.8	43
C-130H	17	16	24	7	1	—	—	—	1	5.8	66
HC-130N	—	—	—	—	—	—	—	—	4	24.3	4
HC-130P	—	—	—	—	—	—	—	—	6	29.0	6
WC-130H	—	—	—	—	—	—	—	—	10	28.7	10
C-141B	—	—	—	—	—	—	—	—	36	27.9	36
KC-135E	—	—	—	—	—	—	—	—	30	35	30
KC-135R	—	—	—	—	—	—	—	—	32	32.9	32
F-16A/B/C/D	—	17	69	35	—	—	—	—	—	7.9	121
C-5A	—	—	—	—	—	—	1	24	7	23.3	32
HH-60G	—	25	—	—	—	—	—	—	—	4.2	25
Total	**17**	**58**	**93**	**42**	**42**	**3**	**1**	**24**	**188**	**18.1**	**468**
Percent[a]	**4**	**12**	**20**	**9**	**9**	**—**	**—**	**5**	**40**		

[a]Percentages have been rounded.

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 FG, Hector IAP, N. D.
Dark gray bison's skull against prairie/mountain profile	F-16A/B	120th FG, Great Falls IAP, Mont.
Subdued hawk with banner in talons	F-15A/B	123d FS (142d FG), Portland IAP, Ore.
White lightning bolt on gray field	F-16A/B	125th FG, 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 FG, Ellington Field, Tex.
Stars of Little Dipper constellation and "Duluth" logo	F-16A/B	148th FG, Duluth IAP, Minn.
Black falcon with "Vermont" on subdued stripe	F-16A/B	158th FG, Burlington IAP, Vt.
Stylized "Jersey Devil" and "New Jersey" logo	F-16A/B	177th FG, Atlantic City Airport, N. J.
Air Defense Training Units (ANG)		
Subdued eagle and "Oregon" logo	F-16A/B	114th FS (142d FG), Klamath Falls IAP, Ore.
Starburst state flag and "Arizona" logo	F-16A/B	162d FG, Tucson IAP, Ariz.

USAF Flying Squadrons by Mission Type

	FY '90	FY '91	FY '92	FY '93	FY '94	FY '95 1st quarter
Active forces						
Heavy bomber	21	18	17	15	12	11
Air refueling	35	35	32	31	25	25
Strategic command & control	6	6	6	2	—	—
Intelligence	3	3	3	3	—	—
Fighter	79	70	61	61	53	53
Reconnaissance	5	1	0	0	0	0
Electronic warfare	4	2	3	3	4	4
Special Operations Forces	11	11	11	11	16	16
Tactical air command & control	3	3	9	9	5	5
Tactical air control	7	7	1	5	7	7
Weather	1	1	1	1	—	—
Rescue	7	7	8	8	6	6
Theater airlift	12	12	12	12	11	11
Long-range airlift	21	21	21	21	16	15
Special mission	2	2	2	2	2	2
Aeromedical airlift	3	3	3	3	3	3
GLCM	2	0	0	0	0	0
ICBM	20	20	19	19	19	14
Space operations	4	6	8	8	6	9
Space communications	3	3	3	3	3	3
Space warning	7	7	7	7	10	11
Surveillance	8	8	9	9	7	9
Space launch	2	2	3	3	5	5
Range	0	3	3	3	2	2
Total	**266**	**251**	**242**	**239**	**212**	**211**
Reserve forces						
ANG Selected Reserve	91	92	91	92	93	93
Air Force Reserve	58	58	59	59	59	58
Space operations	0	0	0	1	1	1
Total	**149**	**150**	**150**	**152**	**153**	**152**
Grand total	**415**	**401**	**392**	**391**	**365**	**363**

The Active-Duty Fleet

(As of September 30, 1994)

	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	—	—	—	51	177	4	—	—	—	12.9	232
OA-37	—	—	—	—	—	—	3	1	—	19.9	4
B-1	—	—	82	2	—	—	—	—	—	7.3	84
B-2	6	3	—	—	—	—	—	—	—	2.1	9
B-52	—	—	—	—	—	—	—	—	85	32.8	85
C-5	—	11	39	—	—	—	—	28	4	12.9	82
C-9	—	—	—	—	—	—	3	9	11	23.5	23
C-10 (KC-10)	—	1	23	24	11	—	—	—	—	9.7	59
C-12	—	—	—	45	—	7	20	—	—	13.1	72
C-17	15	1	—	—	—	—	—	—	—	1.2	16
C-18[a]	2	—	—	—	7	—	—	—	—	9.7	9
C-20	1	—	9	3	—	—	—	—	—	7.6	13
C-21	—	—	4	75	—	—	—	—	—	9.7	79
C-23	—	—	—	3	—	—	—	—	—	9.9	3
C-25	—	2	—	—	—	—	—	—	—	3.9	2
C-27	8	2	—	—	—	—	—	—	—	2.3	10
C-130[b]	16	14	18	2	—	8	55	25	191	22.9	329
C-131	—	—	—	—	—	—	—	—	1	39.5	1
C-135[b]	—	—	—	—	—	—	—	—	320	32.7	320
C-137	1	—	1	1	—	—	—	1	4	22.5	8
C-141	—	—	—	—	—	—	—	—	194	28.1	194
E-3	—	—	—	5	9	15	5	—	—	14.9	34
E-4	—	—	—	—	—	—	2	2	—	20.3	4
E-8	—	2	—	—	—	—	—	—	—	3.7	2
E-9	2	—	—	—	—	—	—	—	—	2.0	2
F-4[b]	—	—	—	—	—	—	1	12	33	24.2	46
F-15	72	135	99	107	173	57	5	2	—	9.2	650
F-16	231	349	118	50	24	7	—	—	—	4.6	779
F-111	—	—	—	—	—	—	19	78	47	23.3	144
F-117[c]	—	58	—	—	—	—	—	—	—	3.4	58
G-3	1	3	—	—	—	—	—	—	—	3.2	4
G-4	—	1	1	1	3	4	—	—	—	12.7	10
G-7	—	—	4	5	—	—	—	—	—	9.0	9
G-9	—	—	4	—	—	—	—	—	—	7.6	4
H-1	—	—	—	—	—	—	—	76	10	23.2	86
H-53	—	1	7	—	—	—	3	12	26	21.4	49
H-60	16	19	9	10	—	—	—	—	—	5.4	54
T-1A	87	—	—	—	—	—	—	—	—	1.2	87
T-3	24	—	—	—	—	—	—	—	—	0.3	24
T-33	—	—	—	—	—	—	—	—	1	42.9	1
T-37	—	—	—	—	—	—	—	—	494	31.7	494
T-38	—	—	—	—	—	—	—	44	462	27.2	506
T-39	—	—	—	—	—	—	—	—	6	33.5	6
T-41	—	—	—	—	—	—	—	—	50	26.4	50
T-43	—	—	—	—	—	—	10	2	—	20.6	12
U-26	—	—	—	1	—	—	—	—	—	11.0	1
V-18	—	—	—	—	—	2	—	—	—	17.0	2
Total	**482**	**602**	**418**	**385**	**404**	**104**	**126**	**292**	**1,939**	**17.7**	**4,752**
Percent[d]	**10**	**13**	**9**	**9**	**9**	**2**	**3**	**6**	**41**		**100**

[a]Includes EC-18

[b]Includes all types

[c]Includes YF-117

[d]Percentages have been rounded.

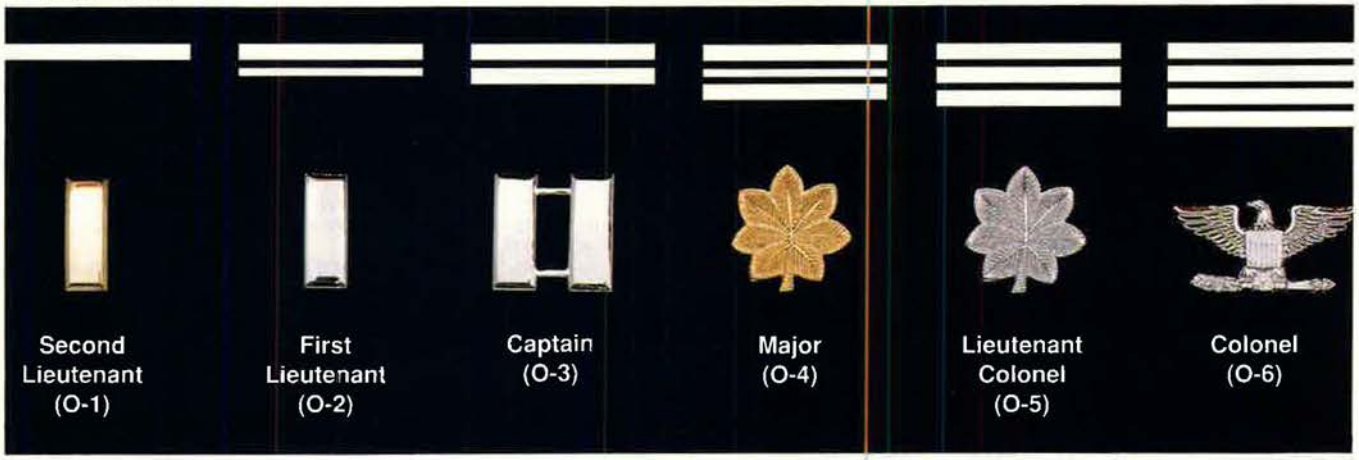
USAF Aircraft Tail Markings (As of April 1, 1995)

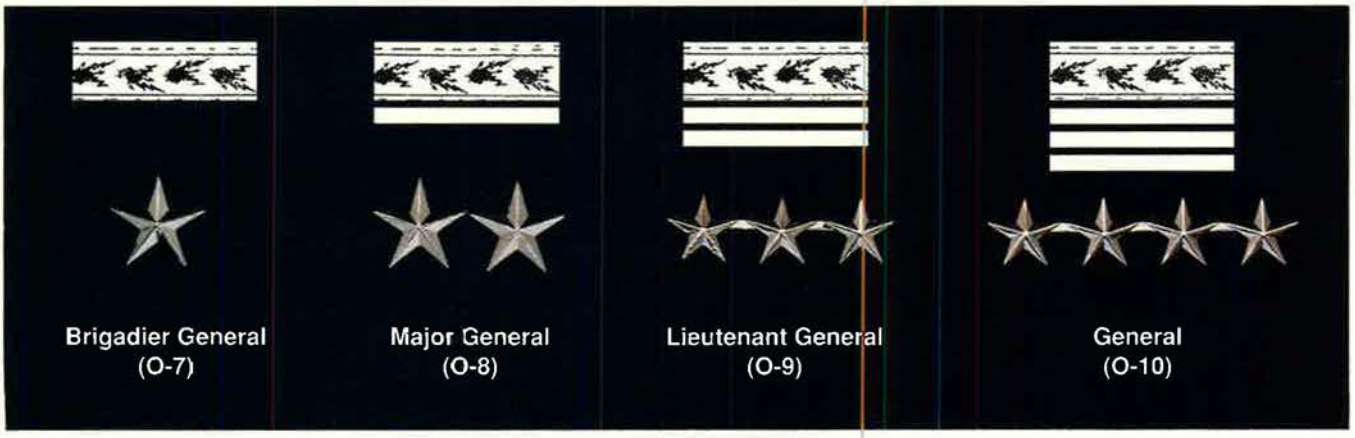
Code	Aircraft	Unit, Location, and Command
AK	F-16C/D, OA-10A	354th FW, Eielson AFB, Alaska (PACAF)
	F-15C/D/E, C-130H, C-12F, E-3B/C	3d Wing, Elmendorf AFB, Alaska (PACAF)
AL	F-16C/D	187th FG, Dannelly Field, Ala. (ANG)
AU	C-21A	502d ABW, Maxwell AFB, Ala. (AETC)
AV	F-16C/D	31st FW, Aviano AB, Italy (USAFE)
BB	T-38A, U-2R, U-2RT/U-2ST	9th RW, Beale AFB, Calif. (ACC)
BC	A/OA-10A	110th FG, W. K. Kellogg Airport, Mich. (ANG)
BD	A/OA-10A, B-52H	917th Wing, Barksdale AFB, La. (AFRES)
CA	HH-60G, MH-60, HC-130N/P, HC-130H	129th Rescue Group, NAS Moffett Field, Calif. (ANG)
CB	T-37B, AT-38B, T-38A	14th FTW, Columbus AFB, Miss. (AETC)
CC	F-111F, EF-111A	27th FW, Cannon AFB, N. M. (ACC)
CI	C-130E	146th AW, Channel Islands ANGB, Calif. (ANG)
CO	F-16C/D	140th FW, Buckley ANGB, Colo. (ANG)
CR	C-130E	302d AW, Peterson AFB, Colo. (AFRES)
CS	C-21A	21st SPW, Peterson AFB, Colo. (AFSPC)
CT	A-10A	103d FG, Bradley IAP, Conn. (ANG)
DB	C-130H	94th AW, Dobbins ARB, Ga. (AFRES)
DC	F-16C/D	113th FW, Andrews AFB, Md. (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. (ACC)
DY	B-1B, C-130H, T-38A	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, T-38A	28th BW, Ellsworth AFB, S. D. (ACC)
EN	T-37A/B, T-38A, AT-38B	80th FTW, Sheppard AFB, Tex. (AETC)
ET	F-15A/B/C/D/E, F-16A/B/C/D, F-111F, EF-111, UH-1N, T-38A	46th TW, Eglin AFB, Fla. (AFMC)
FE	UH-1N	90th MW, F. E. Warren AFB, Wyo. (AFSPC)
FF	C-21A, F-15C/D, UH-1N	1st FW, Langley AFB, Va. (ACC)
	HH-3E, HH-60G, HC-130N/P	1st FW, Patrick AFB, Fla.
FL	F-16A/B, C-130E, HC-130N, HH-60G	125th FG, Jacksonville IAP, Fla. (ANG)
		939th Rescue Wing, Patrick AFB, Fla. (AFRES)
FM	F-16A/B	482d FW, Homestead ARB, Fla. (AFRES)
FS	F-16A/B	188th FG, Fort Smith MAP, Ark. (ANG)
FT	A-10A, C-130E, F-16C/D	23d Wing, Pope AFB, N. C. (ACC)
FW	F-16C/D	122d FW, Fort Wayne IAP, Ind. (ANG)
GA	F-15A/B	116th FW, Dobbins ARB, Ga. (ANG)
	C-130H	165th AG, Savannah IAP, Ga. (ANG)
GF	HH-1H	321st MG, Grand Forks AFB, N. D. (AFSPC)
HI	F-16C/D	419th FW, Hill AFB, Utah (AFRES)
HL	F-16C/D	388th FW, Hill AFB, Utah (ACC)
HO	F-117A, T-38A, AT-38B, HH-60G, F-4E	49th FW, Holloman AFB, N. M. (ACC)
		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, C-130E/H, CT-43A, UH-1H	24th Wing, Howard AFB, Panama (ACC)
JS	E-8A/B	Code is reserved for use on Joint STARS aircraft.
JZ	F-15A/B	159th FG, NAS/JRB New Orleans, La. (ANG)
KC	A/OA-10A	442d FW, Whiteman AFB, Mo. (AFRES)
KS	C-12F, C-21A	81st TW, Keesler AFB, Miss. (AETC)
KT	WC-130H, C-130E	403d Wing, Keesler AFB, Miss. (AFRES)
LA	B-52H, T-37A, T-38A	2d BW, Barksdale AFB, La. (ACC)
LB	T-37B, T-38A, T-1A	64th FTW, Reese AFB, Tex. (AETC)
LF	F-16A/B/C/D, F-15E	56th FW, Luke AFB, Ariz. (AETC)
LK	C-130E/H	314th AW, Little Rock AFB, Ark. (ACC)
LN	F-15C/D/E	48th FW, RAF Lakenheath, UK (USAFE)
LR	F-16C/D	944th FW, Luke AFB, Ariz. (AFRES)
MA	A-10A	104th FG, Barnes MAP, Mass. (ANG)
MD	A-10A	175th FG, Baltimore, Md. (ANG)
	C-130E	135th AG, Baltimore, Md. (ANG)
MI	F-16A/B	127th FW, Selfridge ANGB, Mich. (ANG)
MJ	F-16C/D	35th FW, Misawa AB, Japan (PACAF)
MK	C-130H	440th AW, General Mitchell IAP/ARS, Wis. (AFRES)
MM	UH-1N	341st MW, Malmstrom AFB, Mont. (AFSPC)
MN	C-130E	133d AW, Minneapolis–St. Paul IAP/ARS, Minn. (ANG)
MO	KC-135R, F-15C/D/E, F-16C/D, T-38A, B-1B	366th Wing, Mountain Home AFB, Idaho (ACC)
MS	C-130E	934th AW, Minneapolis–St. Paul IAP/ARS, Minn. (AFRES)
MT	B-52H, T-38A	5th BW, Minot AFB, N. D. (ACC)
	HH-1H	91st MG, Minot AFB, N. D. (AFSPC)
MX	C-130H	403d AW, Maxwell AFB, Ala. (AFRES)
MY	F-16C/D, A/OA-10A, C-130E	347th Wing, Moody AFB, Ga. (ACC)
NF	C-130H	914th AW, Niagara Falls IAP/ARS, N. Y. (AFRES)
NM	F-16C/D	150th FG, Kirtland AFB, N. M. (ANG)
NO	F-16C/D	926th FW, NAS/JRB New Orleans, La. (AFRES)
NY	F-16C/D	174th FW, Hancock Field, N. Y. (ANG)
OF	C-135 (all variations except OC-135B), C-21A, T-37B	55th Wing, Offutt AFB, Neb. (ACC)
OK	F-16C/D	138th FG, Tulsa IAP, Okla. (ANG)
	EC-135K, C-135E, E-3B/C, TC-18E, T-37	552d ACW, Tinker AFB, Okla. (ACC)
OS	OA-10A, F16C/D, HH-60G, C-12F	51st FW, Osan AB, South Korea (PACAF)
OT	F-15A/B/C/E, F-16A/C/D, EF-111A	USAF Air Warfare Center, Eglin AFB, Fla. (ACC)
	F-15A/B/C/D/E, F-16A/B/C/D	79th TEG, Eglin AFB, Fla. (AFMC)
PA	OA-10A	111th FG, Willow Grove ARS, Pa. (ANG)
PD	HC-130P, HH-60G	939th Rescue Wing, Portland IAP, Ore. (AFRES)
PF	C-130E/H	302d AW, Peterson AFB, Colo. (AFRES)
PI	C-130H	911th AW, Pittsburgh IAP/ARS, Pa. (AFRES)
PR	F-16A/B	156th FG, Puerto Rico IAP, Puerto Rico (ANG)
PX	C-130H	139th AG, Rosecrans Memorial Airport, Mo. (ANG)
RA	T-3A	12th FTW, Hondo MAP, Tex. (AETC)
	T-1A, C-21A, T-37B, T-38A, AT-38B, T-43A	12th FTW, Randolph AFB, Tex. (AETC)
RG	C-130E/H	Warner Robins ALC, Robins AFB, Ga. (AFMC)
RI	C-130E	143d AG, Quonset State Airport, R. I. (ANG)
RS	C-20, C-21, T-43, C-9, C-130	86th AW, Ramstein AB, Germany (USAFE)
SA	F-16A/B/C/D	149th FG, Kelly AFB, Tex. (ANG)
SH	KC-135R	507th ARW, Tinker AFB, Okla. (AFRES)
SI	F-16C/D	183d FG, Capital MAP, Ill. (ANG)
SJ	F-15E, KC-10A, T-38A	4th Wing, Seymour Johnson AFB, N. C. (ACC)
SL	F-15A/B	131st FW, Lambert–St. Louis IAP, Mo. (ANG)
SM	A-10A, EF-111A, F-111F, YF-117A, 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	OA-10A, F-16C/D	20th FW, Shaw AFB, S. C. (ACC)
TF	F-16C/D	301st FW, Carswell Field, Tex. (AFRES)
TH	F-16C	181st FG, Hulman Regional Airport, Ind. (ANG)
TX	F-16C/D	924th FW, Bergstrom ARS, Tex. (AFRES)
TY	F-15C/D	325th FW, Tyndall AFB, Fla. (AETC)
VA	F-16C/D	192d FG, Richmond IAP, Va. (ANG)
VN	T-37B, T-38A	71st FTW, Vance AFB, Okla. (AETC)
VO	C-130H	928th AW, O'Hare IAP/ARS, Ill. (AFRES)
WA	Various	57th Wing, Nellis AFB, Nev. (ACC)
WE	E-9A	475th Weapons Evaluation Group, Tyndall AFB, Fla. (ACC)
WG	C-130E	913th AW, Willow Grove ARS, Pa. (AFRES)
WI	F-16C/D	128th FW, Truax Field, Wis. (ANG)
WM	B-2A, T-38A	509th BW, Whiteman AFB, Mo. (ACC)
	HH-1H	351st MW, Whiteman AFB, Mo. (AFSPC)
WP	F-16C/D	8th FW, Kunsan AB, South Korea (PACAF)
WV	C-130H	167th AG, Eastern West Virginia Regional Airport/Shepherd Field, W. Va. (ANG)
XL	T-37B, T-1A, T-38A	47th FTW, Laughlin AFB, Tex. (AETC)
YJ	C-21A, C-130E/H, UH-1N, C-9A	374th AW, Yokota AB, Japan (PACAF)
YO	C-130H	910th AW, Youngstown MAP/ARS, Ohio (AFRES)
ZZ	F-15C/D, HH-3E, E-3B/C, KC-135R, HH-60G	18th Wing, Kadena AB, Japan (PACAF)

Sources: USAF; Maj. Wally Van Winkle, AFRES; and William R. Peake.

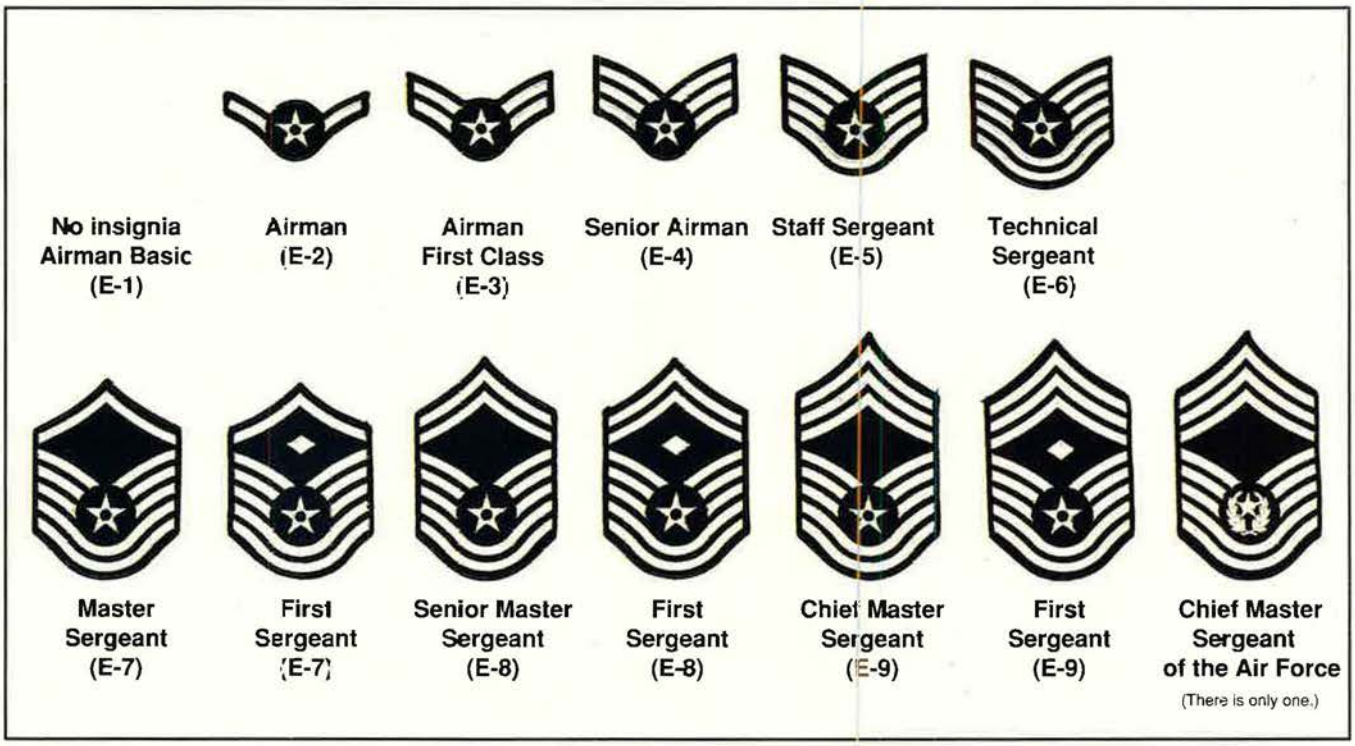
USAF Grades and Insignia

Officer



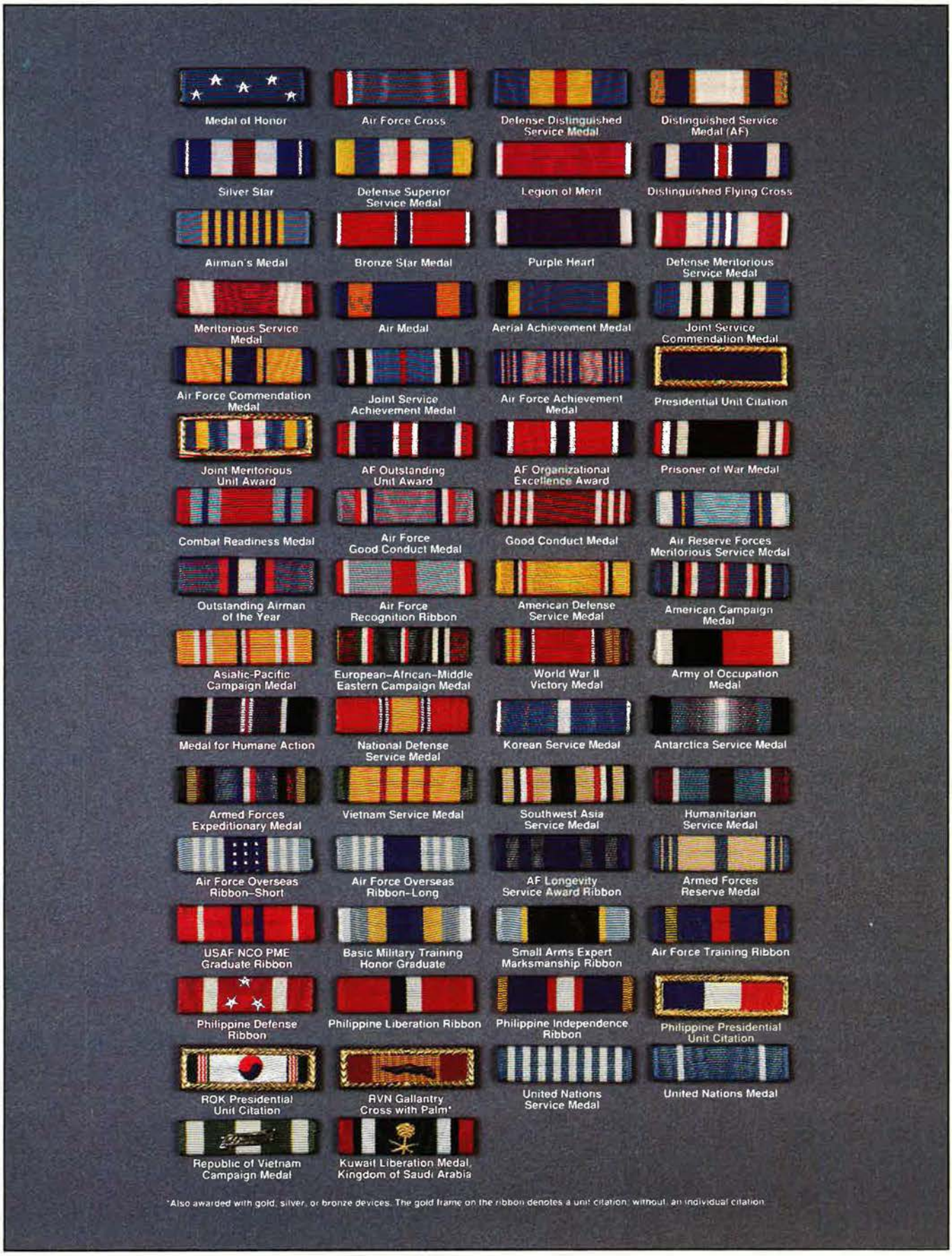


Enlisted



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.

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	

Air Combat Command

Gen. John Michael Loh	June 1, 1992

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.

Air Education and Training Command

Gen. Henry Viccellio, Jr.	July 1, 1993

Air Force Communications Command

Maj. Gen. Harold W. Grant	July 1, 1961	Feb. 15, 1962
Maj. Gen. Kenneth P. Bergquist	Feb. 16, 1962	June 30, 1965
Maj. Gen. J. Francis Taylor, 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. Now Air Force Command, Control, Communications, and Computer Agency, an FOA.

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.

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

Air Force Reserve

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	

AFRES and ANG primary responsibilities came under Continental Air Command 1948–68. Since Mar. 16, 1972, the Chief of Air Force Reserve has 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.

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	

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. H. 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	

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	

AFRES and ANG primary responsibilities came under Continental Air Command 1948–68. Since Mar. 16, 1972, the Chief 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
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

Merged with Air University to form 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. Merged with Air Training Command to form 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.

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. H. 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

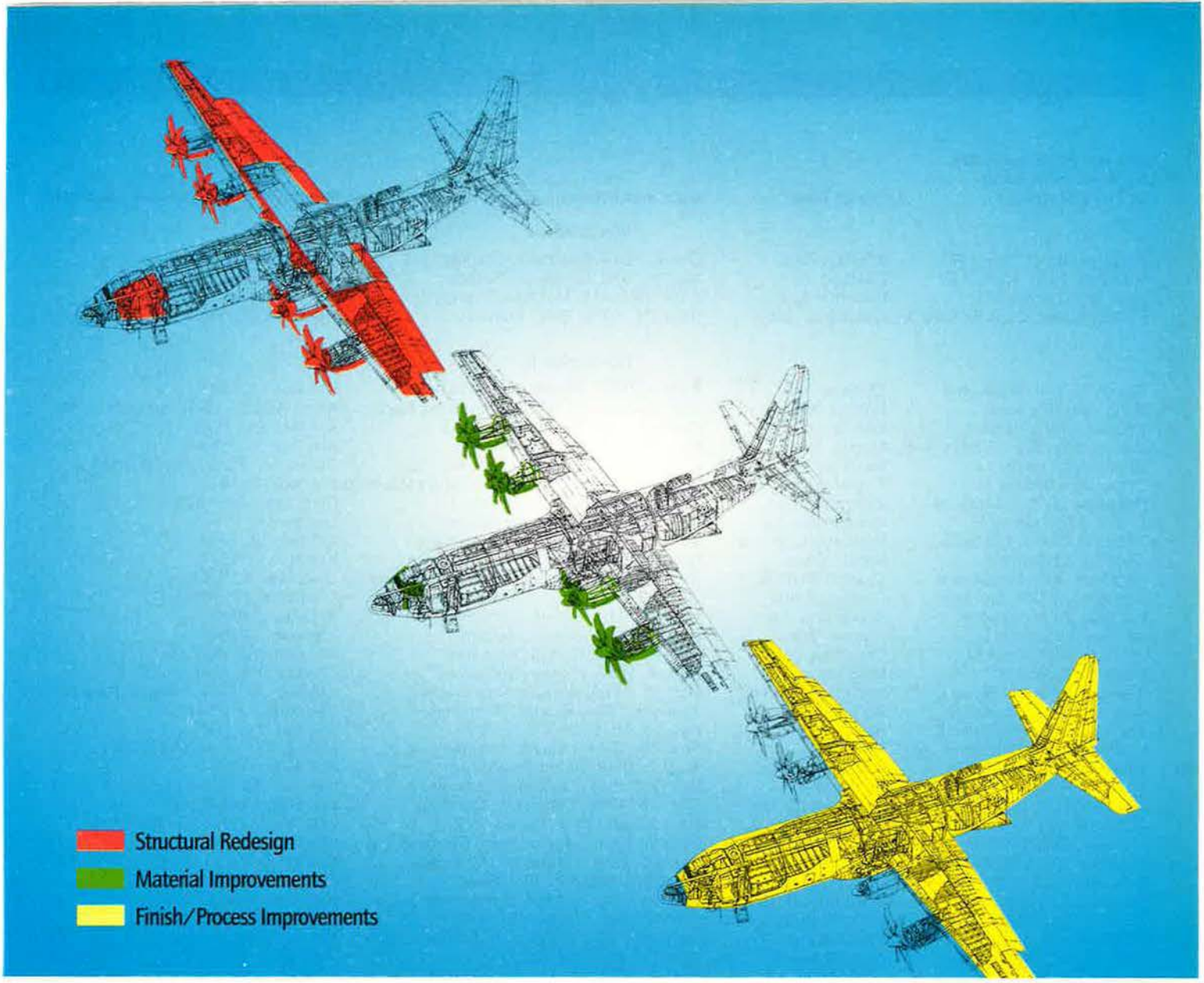
Brig. Gen. John F. McBain	Aug. 15, 1947	Oct. 20, 1947
Lt. Gen. Curtis E. LeMay	Oct. 20, 1947	Oct. 15, 1948
Lt. Gen. John K. Cannon	Oct. 16, 1948	Jan. 20, 1951
Gen. Lauris Norstad	Jan. 21, 1951	July 26, 1953
Lt. Gen. William H. Tunner	July 27, 1953	June 30, 1957
Gen. Frank F. Everest	July 1, 1957	July 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	

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

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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LOCKHEED MARTIN

Names, Alphabetically by Wars, and Rank at Time of Action	Home Town	Date and Place of Action	Present Address or Date of Death
		World War I	
Bleckley, 2d Lt. Erwin R.	Wichita, Kan.	Oct. 6, 1918, Binarville, France	KIA Oct. 6, 1918
Goettler, 2d Lt. Harold E.	Chicago, Ill.	Oct. 6, 1918, Binarville, France	KIA Oct. 6, 1918
Luke, 2d Lt. Frank, Jr.	Phoenix, Ariz.	Sept. 29, 1918, Murvaux, France	KIA Sept. 29, 1918
Rickenbacker, Capt. Edward V.	Columbus, Ohio	Sept. 25, 1918, Billy, France	Died July 23, 1973
		World War II	
Baker, Lt. Col. Addison E.	Chicago, Ill.	Aug. 1, 1943, Ploesti, Romania	KIA Aug. 1, 1943
Bong, Maj. Richard I.	Poplar, Wis.	Oct. 10–Nov. 15, 1944, Southwest Pacific	Killed Aug. 6, 1945, Burbank, Calif.
Carswell, Maj. Horace S., Jr.	Fort Worth, Tex.	Oct. 26, 1944, South China Sea	KIA Oct. 26, 1944
Castle, Brig. Gen. Frederick W.	Manila, P. I.	Dec. 24, 1944, Liège, Belgium	KIA Dec. 24, 1944
Cheli, Maj. Ralph	San Francisco, Calif.	Aug. 18, 1943, Wewak, New Guinea	Died while POW, Mar. 6, 1944
Craw, Col. Demas T.	Traverse City, Mich.	Nov. 8, 1942, Port Lyautey, French Morocco	KIA Nov. 8, 1942
Doolittle, Lt. Col. James H.	Alameda, Calif.	Apr. 18, 1942, Tokyo, Japan	Died Sept. 27, 1993
Erwin, SSgt. Henry E.	Adamsville, Ala.	Apr. 12, 1945, Koriyama, Japan	Leeds, Ala.
Femoyer, 2d Lt. Robert E.	Huntington, W. Va.	Nov. 2, 1944, Merseburg, Germany	KIA Nov. 2, 1944
Gott, 1st Lt. Donald J.	Arnett, Okla.	Nov. 9, 1944, Saarbrücken, Germany	KIA Nov. 9, 1944
Hamilton, Maj. Pierpont M.	Tuxedo Park, N. Y.	Nov. 8, 1942, Port Lyautey, French Morocco	Died Mar. 4, 1982
Howard, Lt. Col. James H.	Canton, China	Jan. 11, 1944, Oschersleben, Germany	Died Mar. 18, 1995
Hughes, 2d Lt. Lloyd H.	Alexandria, La.	Aug. 1, 1943, Ploesti, Romania	KIA Aug. 1, 1943
Jerstad, Maj. John L.	Racine, Wis.	Aug. 1, 1943, Ploesti, Romania	KIA Aug. 1, 1943
Johnson, Col. Leon W.	Columbia, Mo.	Aug. 1, 1943, Ploesti, Romania	McLean, Va. (Ret. Gen.)
Kane, Col. John R.	McGregor, Tex.	Aug. 1, 1943, Ploesti, Romania	Chester, Pa. (Ret. Col.)
Kearby, Col. Neel E.	Wichita Falls, Tex.	Oct. 11, 1943, Wewak, New Guinea	KIA Mar. 5, 1944, Wewak, New Guinea
Kingsley, 2d Lt. David R.	Portland, Ore.	June 23, 1944, Ploesti, Romania	KIA June 23, 1944
Knight, 1st Lt. Raymond L.	Houston, Tex.	Apr. 25, 1945, Po Valley, Italy	KIA Apr. 25, 1945
Lawley, 1st Lt. William R., Jr.	Leeds, Ala.	Feb. 20, 1944, Leipzig, Germany	Montgomery, Ala. (Ret. Col.)
Lindsey, Capt. Darrell R.	Jefferson, Iowa	Aug. 9, 1944, Pontoise, France	KIA Aug. 9, 1944
Mathies, SSgt. Archibald	Scotland	Feb. 20, 1944, Leipzig, Germany	KIA Feb. 20, 1944
Mathis, 1st Lt. Jack W.	San Angelo, Tex.	Mar. 18, 1943, Vegesack, Germany	KIA Mar. 18, 1943
McGuire, Maj. Thomas B., Jr.	Ridgewood, N. J.	Dec. 25–26, 1944, Luzon, P. I.	KIA Jan. 7, 1945, Negros, P. I.
Metzger, 2d Lt. William E., Jr.	Lima, Ohio	Nov. 9, 1944, Saarbrücken, Germany	KIA Nov. 9, 1944
Michael, 1st Lt. Edward S.	Chicago, Ill.	Apr. 11, 1944, Brunswick, Germany	Died May 10, 1994
Morgan, 2d Lt. John C.	Vernon, Tex.	July 28, 1943, Kiel, Germany	Died Jan. 17, 1991
Pease, Capt. Harl, Jr.	Plymouth, N. H.	Aug. 7, 1942, Rabaul, New Britain	KIA Aug. 7, 1942
Pucket, 1st Lt. Donald D.	Longmont, Colo.	July 9, 1944, Ploesti, Romania	KIA July 9, 1944
Sarnoski, 2d Lt. Joseph R.	Simpson, Pa.	June 16, 1943, Buka, Solomon Is.	KIA June 16, 1943
Shomo, Maj. William A.	Jeannette, Pa.	Jan. 11, 1945, Luzon, P. I.	Died June 25, 1990
Smith, Sgt. Maynard H.	Caro, Mich.	May 1, 1943, St. Nazaire, France	Died May 11, 1984
Truemper, 2d Lt. Walter E.	Aurora, Ill.	Feb. 20, 1944, Leipzig, Germany	KIA Feb. 20, 1944
Vance, Lt. Col. Leon R., Jr.	Enid, Okla.	June 5, 1944, Wimereaux, France	Killed July 26, 1944, near Iceland
Vosler, TSgt. Forrest L.	Lyndonville, N. Y.	Dec. 20, 1943, Bremen, Germany	Died Feb. 27, 1992
Walker, Brig. Gen. Kenneth N.	Cerrillos, N. M.	Jan. 5, 1943, Rabaul, New Britain	KIA Jan. 5, 1943
Wilkins, Maj. Raymond H.	Portsmouth, Va.	Nov. 2, 1943, Rabaul, New Britain	KIA Nov. 2, 1943
Zeamer, Maj. Jay, Jr.	Carlisle, Pa.	June 16, 1943, Buka, Solomon Is.	Stoneham, Mass. (Ret. Lt. Col.)
		Korea	
Davis, Maj. George A., Jr.	Dublin, Tex.	Feb. 10, 1952, Sinuiju-Yalu River, N. Korea	KIA Feb. 10, 1952
Loring, Maj. Charles J., Jr.	Portland, Me.	Nov. 22, 1952, Sniper Ridge, N. Korea	KIA Nov. 22, 1952
Sebille, Maj. Louis J.	Harbor Beach, Mich.	Aug. 5, 1950, Hamch'ang, S. Korea	KIA Aug. 5, 1950
Walmsley, Capt. John S., Jr.	Baltimore, Md.	Sept. 14, 1951, Yangdok, N. Korea	KIA Sept. 14, 1951
		Vietnam	
Bennett, Capt. Steven L.	Palestine, Tex.	June 29, 1972, Quang Tri, S. Vietnam	KIA June 29, 1972
Day, Col. George E.	Sioux City, Iowa	Conspicuous gallantry while POW	Shalimar, Fla. (Ret. Col.)
Dethlefsen, Maj. Merlyn H.	Greenville, Iowa	Mar. 10, 1967, Thai Nguyen, N. Vietnam	Died Dec. 14, 1987
Fisher, Maj. Bernard F.	San Bernardino, Calif.	Mar. 10, 1966, A Shau Valley, S. Vietnam	Kuna, Idaho (Ret. Col.)
Fleming, 1st Lt. James P.	Sedalia, Mo.	Nov. 26, 1968, Duc Co, S. Vietnam	Active-duty Col., NAS Dallas, Tex.
Jackson, Lt. Col. Joe M.	Newnan, Ga.	May 12, 1968, Kham Duc, S. Vietnam	Kent, Wash. (Ret. Col.)
Jones, Col. William A. III	Warsaw, Va.	Sept. 1, 1968, Dong Hoi, N. Vietnam	Killed Nov. 15, 1969, Woodbridge, Va.
Levitow, A1C John L.	South Windsor, Conn.	Feb. 24, 1969, Long Binh, S. Vietnam	South Windsor, Conn.
Sijan, Capt. Lance P.	Milwaukee, Wis.	Conspicuous gallantry while POW	Died while POW, Jan. 1968
Thorsness, Lt. Col. Leo K.	Seattle, Wash.	Apr. 19, 1967, N. Vietnam	Seattle, Wash. (Ret. Col.)
Wilbanks, Capt. Hilliard A.	Cornelia, Ga.	Feb. 24, 1967, Dalat, S. Vietnam	KIA Feb. 24, 1967
Young, Capt. Gerald O.	Anacortes, Wash.	Nov. 9, 1967, Da Nang area, S. Vietnam	Died June 6, 1990

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NORTHROP GRUMMAN

Air Force Magazine's Guide to Aces

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

Air Force historians have kept the official records of aerial victories by USAF pilots and crew members since 1957. A few foreign pilots are also listed. Most aerial victory credits have been earned by fighter pilots who have destroyed enemy aircraft in the air. The Office of the Air Force Historian had previously published four separate listings—one for each of the major wars (World War I, World War II, Korea, and Vietnam). The four volumes have been corrected, updated, and combined into one comprehensive volume.

The Air Force Historical Research Agency is not authorized, nor has it ever attempted, to verify aerial victories claimed by Americans who flew with the air forces of other nations. Therefore, this list no longer contains World War I victory credits for Americans serving in the Lafayette Escadrille, French Flying Corps, Royal Flying Corps, or Royal Navy. Similarly, it no longer contains World War II victory credits for Americans in the Eagle Squadrons or the Flying Tigers (American Volunteer Group). However, victories were awarded to members of the Army Air Service if they were flying with British or French units when they shot down enemy aircraft. Some World War I pilots (notably Frank Luke) were credited with victories for destroying balloons.

American Aces of World War I

Capt. Edward V. Rickenbacker

Rickenbacker, Capt. Edward V.	24.33	Wright, 1st Lt. Chester E.	6.33
Luke, 2d Lt. Frank, Jr.	15.83	Jones, 2d Lt. Clinton	6.16
Kindley, 1st Lt. Field E.	11.00	Burdick, 2d Lt. Howard	6.00
Springs, 1st Lt. Elliott W.	10.75	Chambers, 1st Lt. Reed M.	6.00
Landis, 1st Lt. Reed G.	10.00	Creech, 1st Lt. Jesse O.	6.00
Vaughn, 1st Lt. George A.	9.50	Putnam, 1st Lt. David E.	6.00
Swaab, 1st Lt. Jacques M.	8.50	Cook, 1st Lt. Harvey W.	5.66
Donaldson, 2d Lt. John O.	8.00	Meissner, Capt. James A.	5.66
Baer, 1st Lt. Paul P.	7.75	Coolidge, Capt. Hamilton	5.58
Clay, 1st Lt. Henry R., Jr.	7.00	Campbell, 1st Lt. Douglas	5.50
Hamilton, 1st Lt. Lloyd A.	6.83	Knotts, 2d Lt. Howard C.	5.50
White, 2d Lt. Wilbert W.	6.66	Rummell, 1st Lt. Leslie J.	5.16
Cassady, 1st Lt. Thomas G.	6.63	Bissell, 1st Lt. Clayton L.	5.00
Holden, 1st Lt. Lansing C.	6.50	Luff, 1st Lt. Frederick E.	5.00
Hunter, 1st Lt. Frank O'D.	6.50	Ponder, 2d Lt. William T.	5.00
Stenseth, 1st Lt. Martinus	6.47		

Some Famous US Fighter Firsts

Col. Robin Olds

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)

Leading Army Air Forces Aces of World War II

(Fourteen and a half or more victories)

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

Maj. Richard I. Bong

Ranks are as of last victory in World War II.

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

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.	24.33	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. Donald S.	19.83	WW II

Col. Francis S. Gabreski

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

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

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

Maj. James Jabara

USAF Aces of the Korean War

McConnell, Capt. Joseph, 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]
Buttelmann, 1st Lt. Henry	7
Jolley, Capt. Clifford D.	7
Lilley, Capt. Leonard W.	7
Adams, Maj. Donald E.	6.50
Gabreski, Col. Francis S.	6.50[a]
Jones, Lt. Col. George L.	6.50
Marshal, 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

UHF SATCOM

The smallest airborne DAMA-compatible modem/transceiver set for satellite or line-of-sight communications is available *now*, only from E-Systems ECI Division.

The Joint Chiefs have mandated DAMA (Demand-Assigned Multiple Access) compatibility for UHF satellite communications by 1996. You can have it now, with the Multi-mission UHF SATCOM Terminal (MUST) system from E-Systems.

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- Select full or half duplex operation
- Transmit power adjustable 1 to 100 W
- Navy DAMA now/USAF DAMA 1994

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(813) 343-0747, FAX (813) 343-9605.

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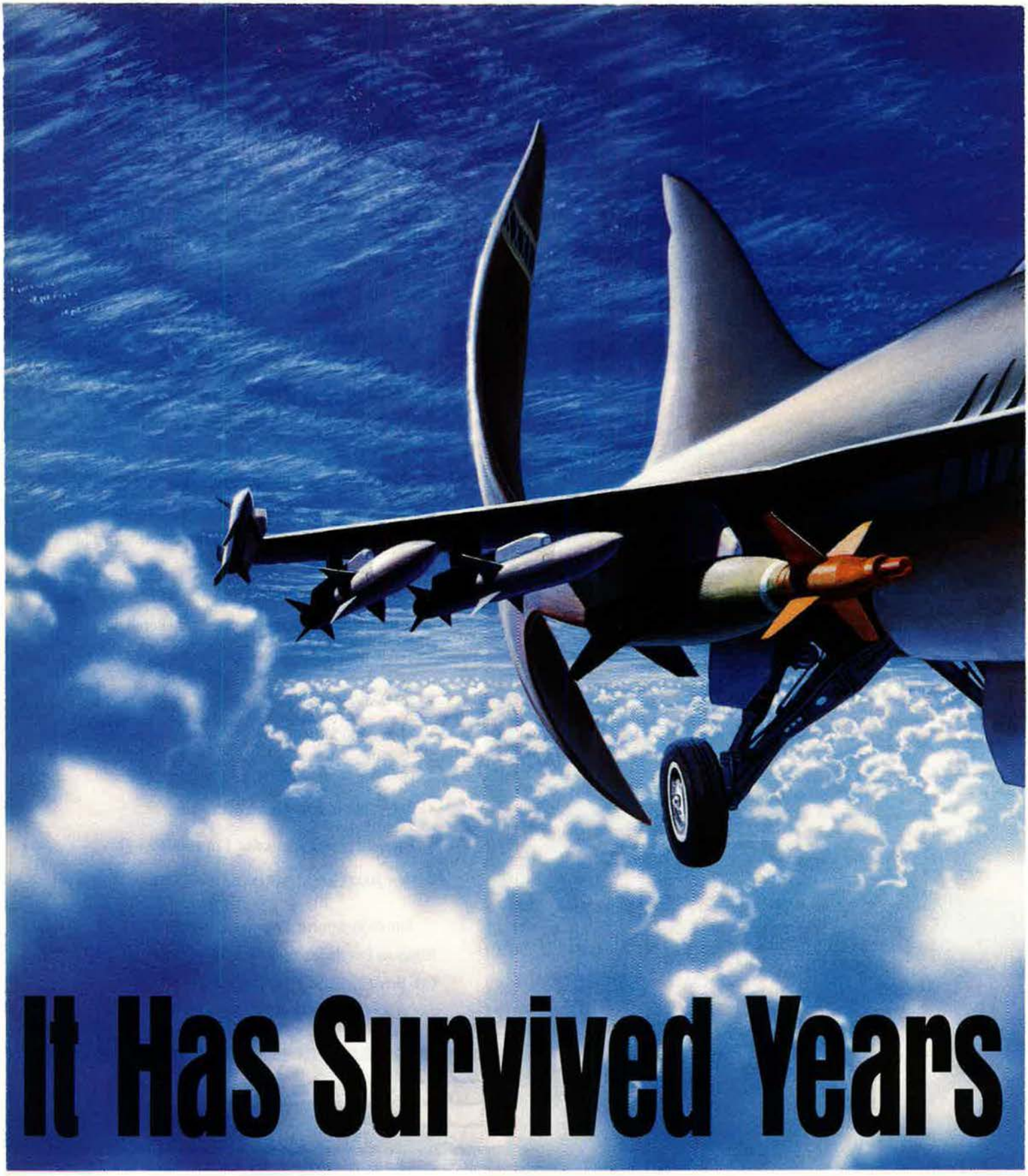
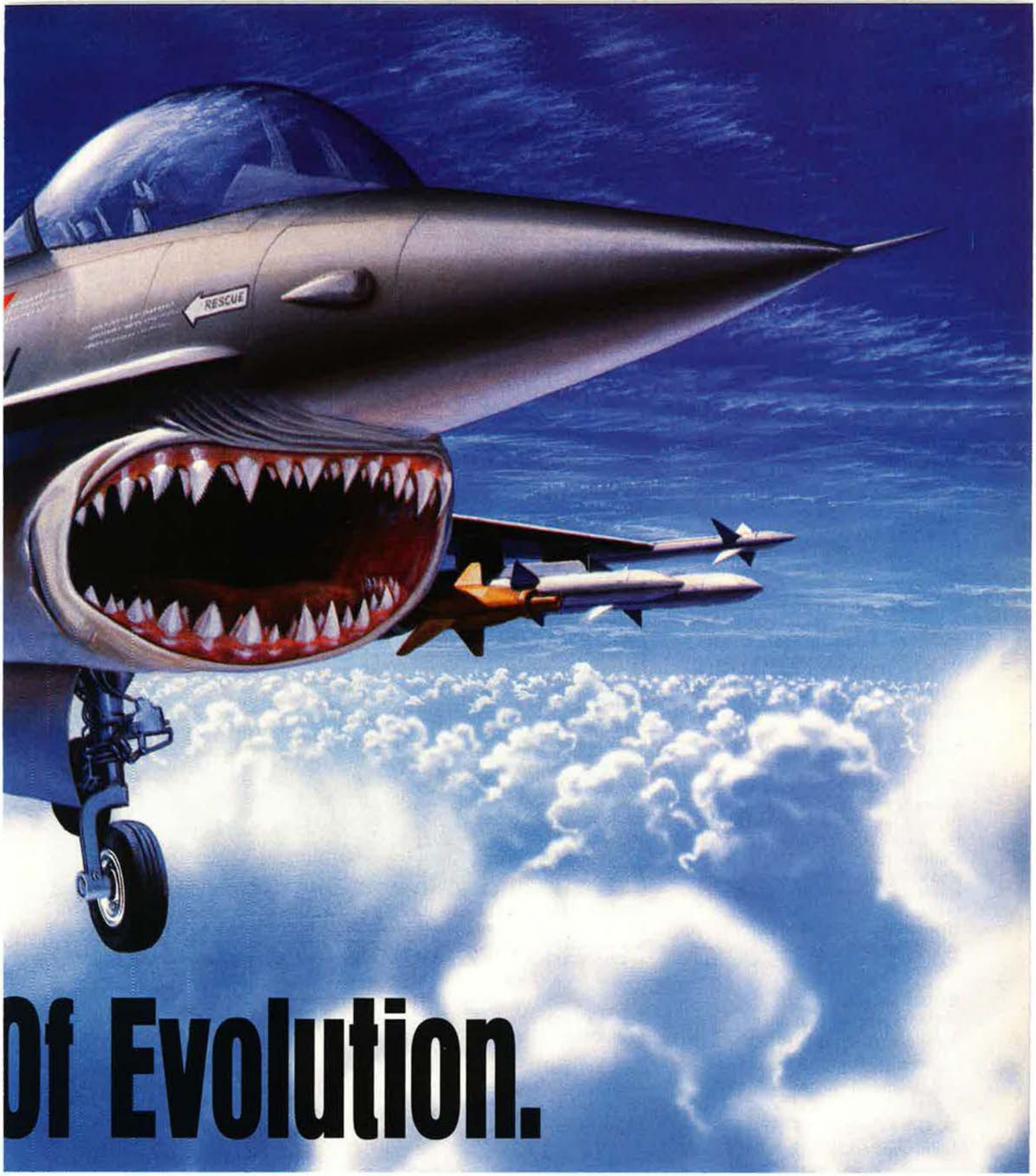


It Has Survived Years

The F-16. First it was a lightweight fighter. Then it became the premier multi-role fighter. It keeps evolving, becoming a stronger and more versatile weapon system. □ BFGoodrich is part of that evolution. BFG Block 50 wheels and brakes are the production standard at Lockheed Martin and are now approved by the USAF for the Block 40 aircraft. □ Our wheels and brakes are tough. In field service with the USAF, the BFGoodrich carbon brake demonstrated over three years of service capability without maintenance on Block 40/50 aircraft and over four years of service capability without maintenance on the Block 32 and prior



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aircraft.... a clear demonstration of our brakes' unsurpassed reliability and wear life. ☐ In addition, **our wheels are fully qualified for long-wearing radial tires.** Together the BFGoodrich system helps you minimize life cycle cost and reduce your logistics footprint. ☐ BFGoodrich wheels and brakes: longer wear life, higher reliability and lower operating cost. For more information, call us at 513-339-3811. Help your fighters evolve to a higher life form.

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USAF ALMANAC

Major Commands

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

ACC Air Combat Command

Headquarters Langley AFB, Va.

Established June 1, 1992

Commander Gen. John Michael Loh

MISSIONS

Operate USAF bombers
Operate USAF's CONUS-based, combat-coded fighter and attack aircraft
Organize, train, equip, and maintain combat-ready forces
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

Staff photo by Guy Aceto

With headquarters at Langley AFB, Va., Air Combat Command operates the Air Force's bombers, fighters, and attack aircraft. The C-130, A-10, and F-16 aircraft shown here equip one of the Air Force's newest units, the 347th Wing at Moody AFB, Ga. This composite wing is one of twenty-nine wings in ACC.

EQUIPMENT

(Primary Aircraft Authorized)

Bombers (B-1B, B-2, B-52)	121
Fighters (F-15A/C, F-16)	324
Attack aircraft (A/OA-10, F-15E, F-111, F-117)	231
EC/EW aircraft (F-4G, EF-111)	48
Aerial refuelers (KC-10, KC-135)	12
Combat delivery (C-130, C-27)	135
Other aircraft (all types)	175

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.

Two direct reporting units: USAF Air Warfare Center, USAF Weapons and Tactics Center

Twenty-nine wings

PERSONNEL

Active-duty	112,166
Officers	15,918
Enlisted	96,248
Reserve component	107,521
ANG	81,192
AFRES	26,329
Civilian	16,412
Total	**236,099**

OPERATIONAL ACTIVITY

Flying hours ..... 45,000 per month

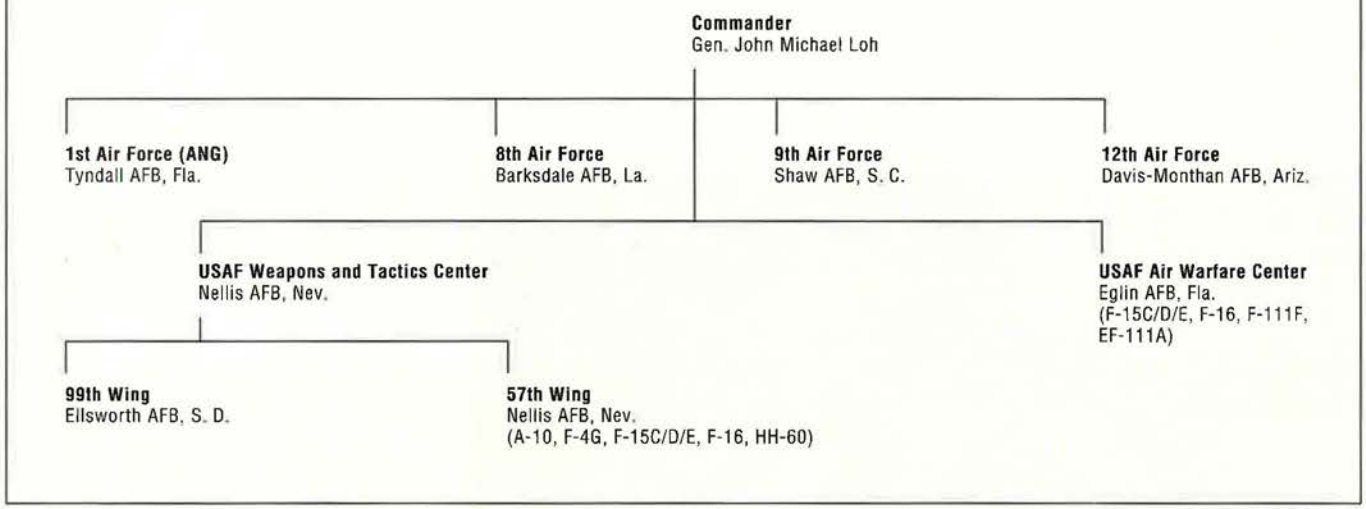
Major overseas deployments
Bright Star (Central Command), Central Enterprise, Crested Cap (European Command), Cobra Gold (Pacific Command), Northern Viking, Strong Resolve (Atlantic Command)

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.

AIR COMBAT COMMAND • HEADQUARTERS, LANGLEY AFB, VA.



UNIT	BASE	WEAPONS
1st Fighter Wing	Langley AFB, Va.	C-21A, F-15C/D, UH-1N (also HH-60, HC-130N/P at Patrick AFB, Fla.)
2d Bomb Wing	Barksdale AFB, La.	B-52H, T-38
4th Wing	Seymour Johnson AFB, N. C.	F-15E, KC-10A
5th Bomb Wing	Minot AFB, N. D.	B-52H, T-38
6th Air Base Wing	MacDill AFB, Fla.	—
7th Wing	Dyess AFB, Tex.	B-1B, C-130H, T-38
9th Reconnaissance Wing	Beale AFB, Calif.	U-2, T-38
20th Fighter Wing	Shaw AFB, S. C.	A-10, F-16
23d Wing	Pope AFB, N. C.	A-10, F-16, C-130E
24th Wing	Howard AFB, Panama	C-21A, C-27, CT-43
27th Fighter Wing	Cannon AFB, N. M.	F-111F, EF-111A
28th Bomb Wing	Ellsworth AFB, S. D.	B-1B, T-38
33d Fighter Wing	Eglin AFB, Fla.	F-15C/D
49th Fighter Wing	Holloman AFB, N. M.	F-117A, F-4E, T-38, HH-60
55th Wing	Offutt AFB, Neb.	C-21A, E-4B, RC-135S/U/V/W/X, EC-135C, TC-135S/W, C-135, WC-135, OC-135B, T-37
57th Wing	Nellis AFB, Nev.	A-10, F-4G, F-15C/D/E, F-16, HH-60
65th Air Base Wing	Lajes Field, the Azores (support)	—
85th Wing	NAS Keflavik, Iceland (becomes 85th Group July 1, 1995)	HH-60
93d Bomb Wing	Castle AFB, Calif. (base closes Sept. 30, 1995)	—
99th Wing	Ellsworth AFB, S. D.	—
314th Airlift Wing	Little Rock AFB, Ark.	C-130E/H
347th Wing	Moody AFB, Ga.	F-16, C-130E, A-10
355th Wing	Davis-Monthan AFB, Ariz.	A-10, EC-130E/H
366th Wing	Mountain Home AFB, Idaho	F-15C/D/E, F-16, T-37, KC-135R (also B-1B at Ellsworth AFB, S. D.)
388th Fighter Wing	Hill AFB, Utah	F-16
410th Bomb Wing	K. I. Sawyer AFB, Mich. (base closes Sept. 30, 1995)	—
416th Bomb Wing	Griffiss AFB, N. Y. (base closes Sept. 30, 1995)	—
509th Bomb Wing	Whiteman AFB, Mo.	B-2, T-38
552d Air Control Wing	Tinker AFB, Okla.	E-3B/C, EC-135K, T-37
79th Test & Evaluation Group	Eglin AFB, Fla.	F-15C/D/E, F-16, F-111F, EF-111A

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

Commander
Maj. Gen. Philip G. Killey

- **Southeast Air Defense Sector**, Tyndall AFB, Fla.
- **Northeast Air Defense Sector**[a], Griffiss AFB, N. Y.
- **Western Air Defense Sector**, McChord AFB, Wash.

[a]Transfers to ANG October 1, 1995

Photo by Randy Jolly

In 1994, ACC took part in sixty-seven overseas deployments. ACC personnel, such as these maintainers checking information on an F-15, handle tremendous responsibilities in helping the Air Force's largest operational command organize, train, equip, and maintain the combat-ready forces.

COMMAND NOTES

Air Combat Command, with headquarters at Langley AFB, Va., acts as 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.

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

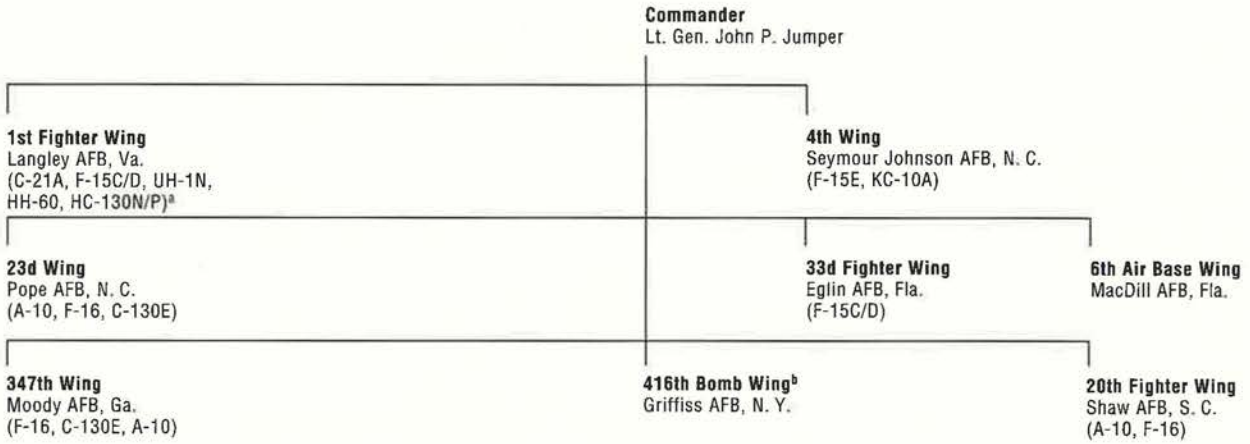
Commander
Lt. Gen. Stephen B. Croker

- **509th Bomb Wing**, Whiteman AFB, Mo. (B-2, T-38)
- **27th Fighter Wing**, Cannon AFB, N. M. (F-111F, EF-111A)
- **5th Bomb Wing**, Minot AFB, N. D. (B-52H, T-38)
- **28th Bomb Wing**, Ellsworth AFB, S. D. (B-1B, T-38)
- **7th Wing**, Dyess AFB, Tex. (B-1B, C-130H, T-38)
- **410th Bomb Wing**, K. I. Sawyer AFB, Mich.[a]
- **2d Bomb Wing**, Barksdale AFB, La. (B-52H, T-38)
- **314th Airlift Wing**, Little Rock AFB, Ark. (C-130E/H)
- **65th Air Base Wing**, Lajes Field, the Azores
- **85th Wing**[b], NAS Keflavik, Iceland (HH-60)

[a]Closes September 30, 1995

[b]Becomes 85th Group July 1, 1995

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



[a]HH-60s and HC-130N/Ps are at Patrick AFB, Fla. [b]Closes September 30, 1995

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

[a]B-1Bs are at Ellsworth AFB, S. D.
[b]Closes September 30, 1995

AETC Air Education and Training Command

Headquarters Randolph AFB, Tex.

Established July 1, 1993

Commander Gen. Henry Viccellio, Jr.[a]

[a]Gen. Billy J. Boles as of June 20, 1995

MISSIONS

Recruit, access, commission, train, and educate USAF enlisted and officer personnel

Provide basic military training; technical training; officer training; flying training; and military graduate and professional continuing education for officers, enlisted, and civilians

Maintain combat readiness for support specialties (more than 8,000 AETC personnel on mobility status for wartime deployment)

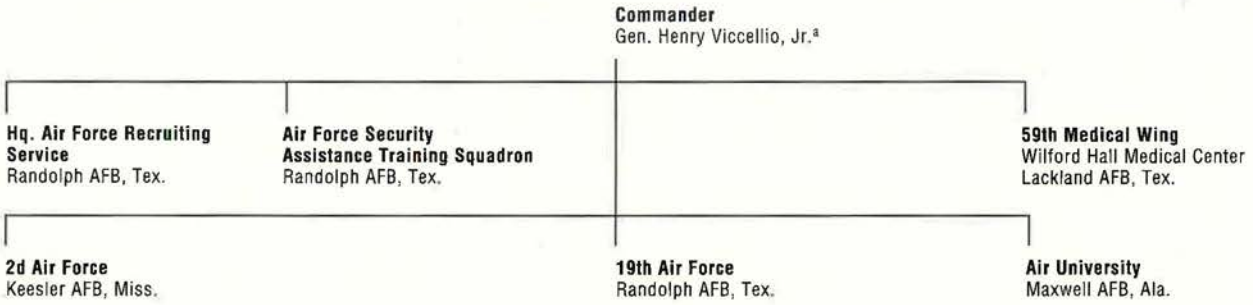
COROLLARY MISSIONS

Conduct training for medical service; administer training and education for USAF-sponsored international security assistance for allied and friendly foreign nations

OTHER RESPONSIBILITIES

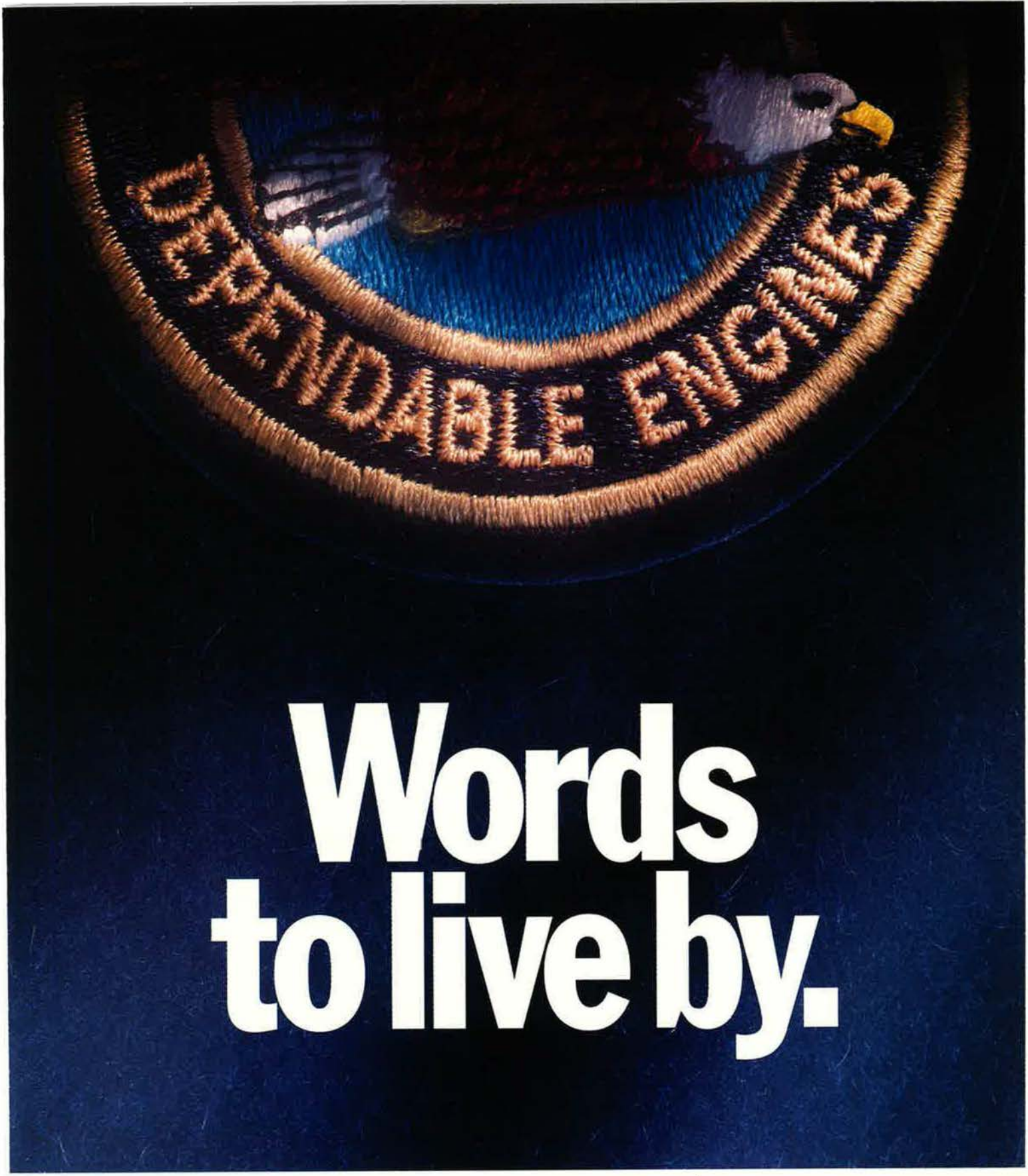
Recall Individual Ready Reservists and mobility and contingency tasking support to combatant commands

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



[a]Gen. Billy J. Boles as of June 20, 1995

UNIT	BASE	WEAPONS
Flying Training Wings (Active)		
12th FTW	Randolph AFB, Tex.	AT-38, C-21, T-1, T-3, T-37, T-38, T-43
14th FTW	Columbus AFB, Miss.	AT-38, 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.	HC-130, MC-130, MH-53J, TH-53A, UH-1, MH-60G
64th FTW	Reese AFB, Tex.	T-1, T-37, T-38
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-141, KC-135
325th Fighter Wing	Tyndall AFB, Fla.	F-15 (weapons director training)
Other Flying Training Units (Active)		
336th Training Group	Fairchild AFB, Wash.	UH-1 (aircrew survival training)
Other Flying Training Units (Air National Guard)		
162d Fighter Group	Tucson IAP, Ariz.	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 Training Group	Vandenberg AFB, Calif.	
Major Educational Units		
Hq. Air University	Maxwell AFB, Ala.; units at Maxwell AFB, Gunter Annex, Ala.; Wright-Patterson AFB, Ohio; Lackland AFB, Tex.; Robins AFB, Ga; McGuire AFB, N. J.; Tyndall AFB, Fla.; Keesler AFB, Miss.; Barksdale AFB, La.; Goodfellow AFB, Tex.; Peterson AFB, Colo.; Kirtland AFB, N. M.; and March AFB, Calif.	
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.	



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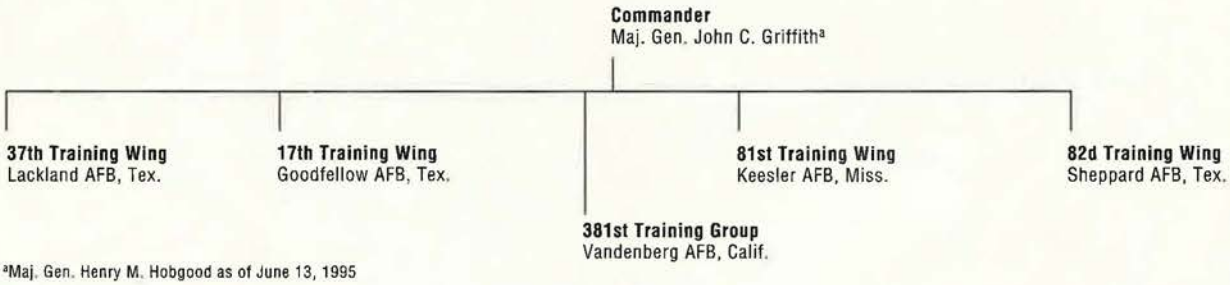
2d AIR FORCE (AETC) •HEADQUARTERS, KEESLER AFB, MISS.



[a]Maj. Gen. Henry M. Hobgood as of June 13, 1995

EQUIPMENT

Trainers (T-1, T-3, T-37, T-38, T-43, AT-38) 1,120
Fighters (F-15, F-16) 278
Transports and tankers (C-5, C-12, C-21, C-141, KC-135, HC/MC-130) 80
Helicopters (MH-53J, CH/NCH/TH-53A, UH-1, HH/MH-60G) 26

FORCE STRUCTURE

Two numbered air forces: **2d,** Keesler AFB, Miss., and **19th,** Randolph AFB, Tex.; plus an educational headquarters: **Air University,** Maxwell AFB, Ala.

PERSONNEL

Active-duty 43,879
  Officers 9,386
  Enlisted 34,493
Reserve component 2,741
  ANG 1,868
  AFRES 873
Civilian 13,866
Total 60,486

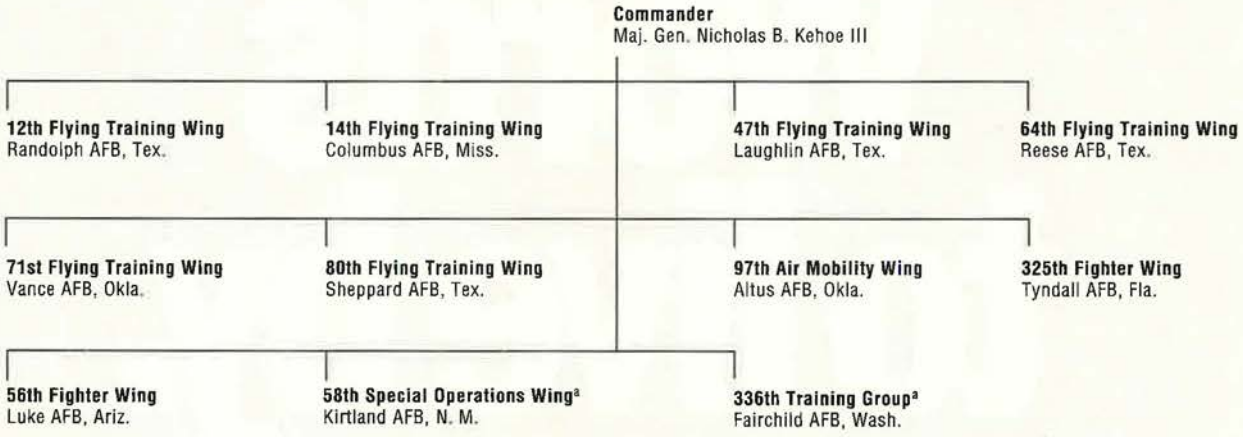
Students 307,988
  Flying/technical training 168,327
  Air University 139,661

OPERATIONAL ACTIVITY

Flying hours ..... 38,913 per month

Major competitions
Top Flight, Top Tech

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



[a]Tenant unit

COMMAND NOTES

As Air Education and Training Command completes its second year, change continues apace. Several units and missions transfer to other commands, and other missions arrive, all against a backdrop of AETC's highest level of deployment activity since Operations Desert Shield and Desert Storm. The 184th Fighter Group (ANG) transferred to ACC and acquired the B-1B. F-15E training conducted at Luke AFB, Ariz., is transferring to ACC. New missions included joint fire training at Goodfellow AFB, Tex. Air base ground defense training will transfer to AETC in 1995. In 1994, AETC's role in contingency operations increased with USAF's increased operations tempo. AETC deployed almost 2,000 people in support of ongoing operations. That figure represents an increase of 167 percent from 1993.

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

Commander
Lt. Gen. Jay W. Kelley

- **Air Force Institute of Technology**, Wright-Patterson AFB, Ohio
- **Air War College**, Maxwell AFB, Ala.
- **Air Command and Staff College**, Maxwell AFB, Ala.
- **Air Force Quality Center**, Maxwell AFB, Ala.
- **Hq. Civil Air Patrol–USAF**, Maxwell AFB, Ala.
- **Squadron Officer School**, Maxwell AFB, Ala.
- **Ira C. Eaker College for Professional Development**, Maxwell AFB, Ala.
- **College of Aerospace Doctrine, Research, and Education**, Maxwell AFB, Ala.
- **Extension Course Institute**, Maxwell AFB, Gunter Annex, Ala.
- **42d Air Base Wing**, Maxwell AFB, Ala.
- **College for Enlisted Professional Military Education**, Maxwell AFB, Gunter Annex, Ala.
- **Air University Library**, Maxwell AFB, Ala.
- **Community College of the Air Force**, Maxwell AFB, Ala.
- **Air Force Reserve Officers Training Corps**, Maxwell AFB, Ala.
- **Officer Training School**, Maxwell AFB, Ala.

AFMC
Air Force Materiel Command

Headquarters Wright-Patterson AFB, Ohio

Established July 1, 1992

Commander Gen. Ronald W. Yates[a]

[a]Gen. Henry Viccellio, Jr., as of June 30, 1995

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
Five specialized centers

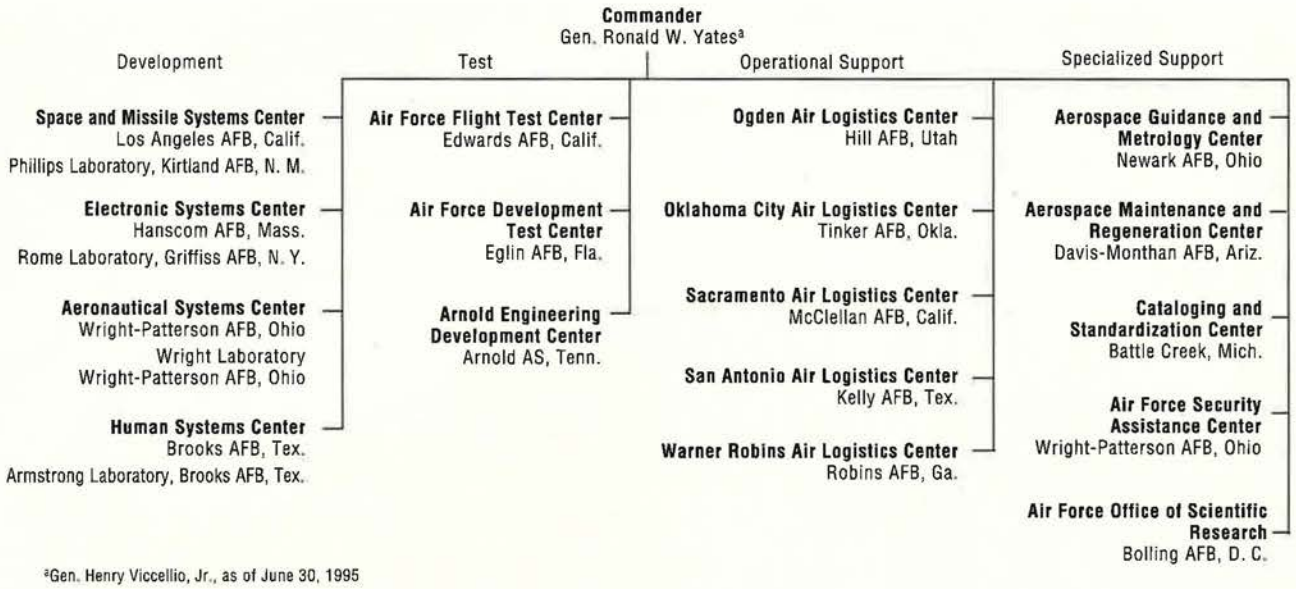
PERSONNEL

Active-duty	38,561
Officers	11,788
Enlisted	26,773

Staff photo by Guy Aceto

At Sacramento Air Logistics Center, McClellan AFB, Calif., Milton Vierow checks settings on a flow grinding system at the Pneudraulics Components Division. Air Force Materiel Command operates superlaboratories, air logistics centers, and product, test, and specialized centers across the US.

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



[a]Gen. Henry Viccellio, Jr., as of June 30, 1995

Reserve component	6,919
ANG	3,111
AFRES	3,808
Civilian	79,951
Total	**125,431**

OPERATIONAL ACTIVITY

Flying hours ..... 3,300 per month

COMMAND NOTES

Air Force Materiel Command delivers warfighting capability to the Air Force, providing resources and people to research, acquire, and sustain weapon systems. Four superlabs further develop technologies for four product centers that develop and acquire the weapon systems. AFMC evaluates the systems in three test centers. Five Air Logistics Centers provide life-cycle weapon system sustainment, maintenance, and repair. Specialized centers handle other development and sustainment tasks. The Air Force Office of Scientific Research directs the service's basic science and engineering research program. Aircraft and missiles are retired and recycled at AFMC's Aerospace Maintenance and Regeneration Center.

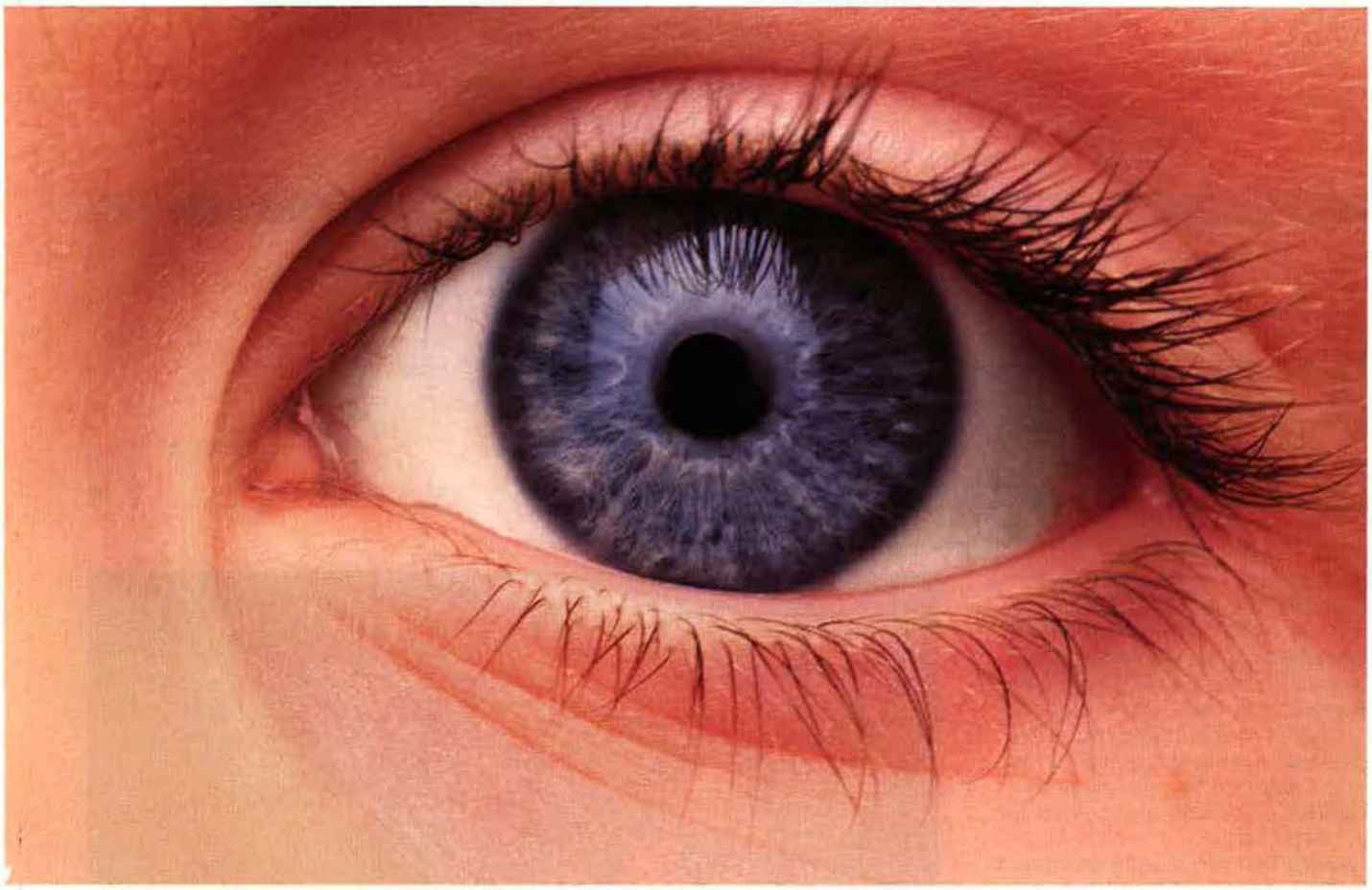
AFMC operates forty-two types of aircraft. It supports USAF's 10,100 aircraft and approximately 32,000 engines. The command's investment in research, test, and manufacturing capability would cost more than $33.7 billion to replace.

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	Griffiss AFB, N. Y.
Wright Laboratory	Wright-Patterson AFB, Ohio
Arnold Engineering Development Center	Arnold AS, 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 Guidance and Metrology Center	Newark AFB, Ohio
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.

THE TITAN. BECAUSE THERE ARE WORLDS TO EXPLORE.

Eye of Jupiter photographed by NASA.

Few Americans have heard of it. But all Americans benefit. Because the Titan IV launches our most critical payloads into earth orbit and beyond. Today, the U.S. Air Force relies on the Titan IV to place national security payloads into orbit, helping America keep an eye on threats around the world. And in 1997, the Titan Team will assist NASA with the launch of the Cassini spacecraft on its mission to Venus, Jupiter and Saturn. America's investment is paying off because the Titan IV is a highly cost-effective launch vehicle. Beginning with the Gemini flights in the 1960s, nearly 200 successful space launch missions have been completed by the Titan family of



AND WORLDS TO PROTECT.

launch vehicles – Titan II, III and IV. So even though few may realize it, the benefits are clear. Titan makes a world of difference.

THE TITAN

America's Silent Hero

A message from Lockheed Martin, proud member of the Titan Team.

AFSPC

Air Force Space Command

Headquarters Peterson AFB, Colo.

Established September 1, 1982

Commander Gen. Joseph W. Ashy

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

Commander
Gen. Joseph W. Ashy

- **14th Air Force**, Vandenberg AFB, Calif.
- **Air Force Space Warfare Center**, Falcon AFB, Colo.
- **20th Air Force**, F. E. Warren AFB, Wyo.

MISSIONS

Operate and test USAF ICBM forces for US Strategic Command
Operate groundbased 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
Manage USAF helicopter resources

OTHER RESPONSIBILITIES

Provide communications, computer, and base support to NORAD
Supply range and launch facilities for military, civil, and commercial space launch

EQUIPMENT

Intercontinental Ballistic Missiles

Peacekeeper	50
Minuteman III	480

Satellite systems (USAF spacecraft in service as of January 1, 1995):

Navstar Global Positioning System (GPS):	
Block I	1
Block II/IIA	24
Defense Satellite Communications System:	
DSCS II	3
DSCS III	7
Defense Meteorological Satellite Program (DMSP)	4

Staff photo by Guy Aceto

Not all of Air Force Space Command's activities take place in space. Ninety feet below ground, in a Launch Control Center at Malmstrom AFB, Mont., 1st Lt. Paula Hamilton and 2d Lt. Phil Danielson keep watch over nuclear missiles, silos, systems, computers, and security.

Communications satellites of NATO III and Fleet Satellite Communications System

Boosters: Delta II, Atlas E, Atlas II, Atlas IIA, 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, Cobra Dane radar, conventional radars

Space surveillance systems: Maui Optical Tracking Identification Facility, Groundbased Electro-Optical Deep Space Surveillance System, phased-array radars, mechanical tracking radars

Satellite command-and-control system: Air Force Satellite Control Network (worldwide system of nine 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: Air Force Space Warfare Center
Seven space and missile wings
Two space groups, two missile groups
Six bases and seven stations
More than fifty units worldwide

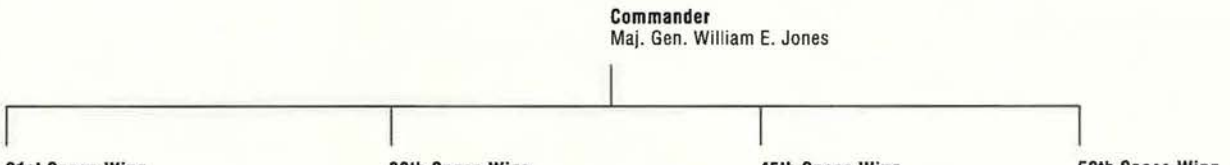
PERSONNEL

Active-duty	23,940
Officers	5,159
Enlisted	18,781
Reserve component	0
Civilian	5,161
Contractor personnel	14,500
Total	**43,601**

COMMAND NOTES

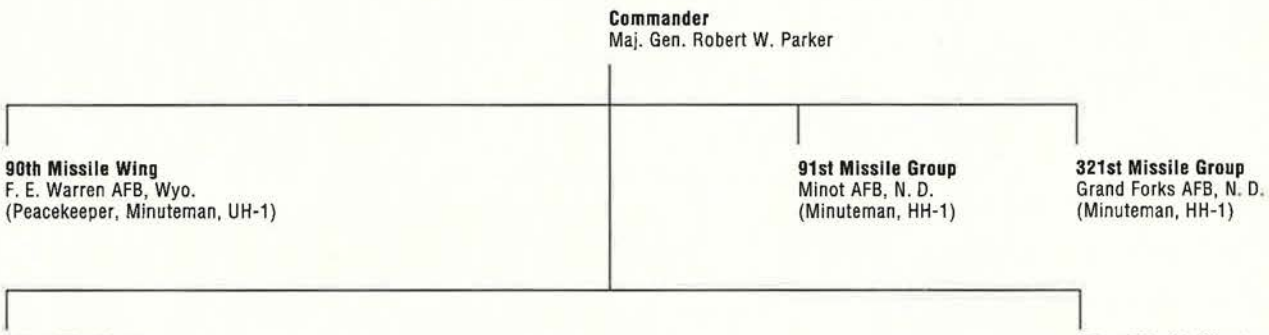
The commander of Air Force Space Command is also commander in chief of NORAD and US Space Command. 14th Air Force is a component of USSPACECOM for space forces; 20th Air Force is a component of US Strategic Command for ICBM forces.

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



UNIT	BASE	WEAPONS/ACTIVITIES
21st Space Wing	Peterson AFB, Colo.	Missile warning and space surveillance; C-21
30th Space Wing	Vandenberg AFB, Calif.	Launch, tracking facilities for DoD, NASA, and commercial space launches; testing support of DoD space and missile systems
45th Space Wing	Patrick AFB, Fla.	Launch, tracking facilities for DoD, NASA, foreign government, and commercial space launches; shuttle program and US Navy Trident tests support
50th Space Wing	Falcon AFB, Colo.	Command and control of DoD satellites
90th Missile Wing	F. E. Warren AFB, Wyo.	UH-1, Minuteman and Peacekeeper ICBMs
341st Missile Wing	Malmstrom AFB, Mont.	UH-1, Minuteman ICBM
351st Missile Wing	Whiteman AFB, Mo. (inactivates in July 1995)	HH-1, Minuteman ICBM
91st Missile Group	Minot AFB, N. D.	HH-1, Minuteman ICBM
321st Missile Group	Grand Forks AFB, N. D.	HH-1, Minuteman ICBM

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



[a]Inactivates in July 1995

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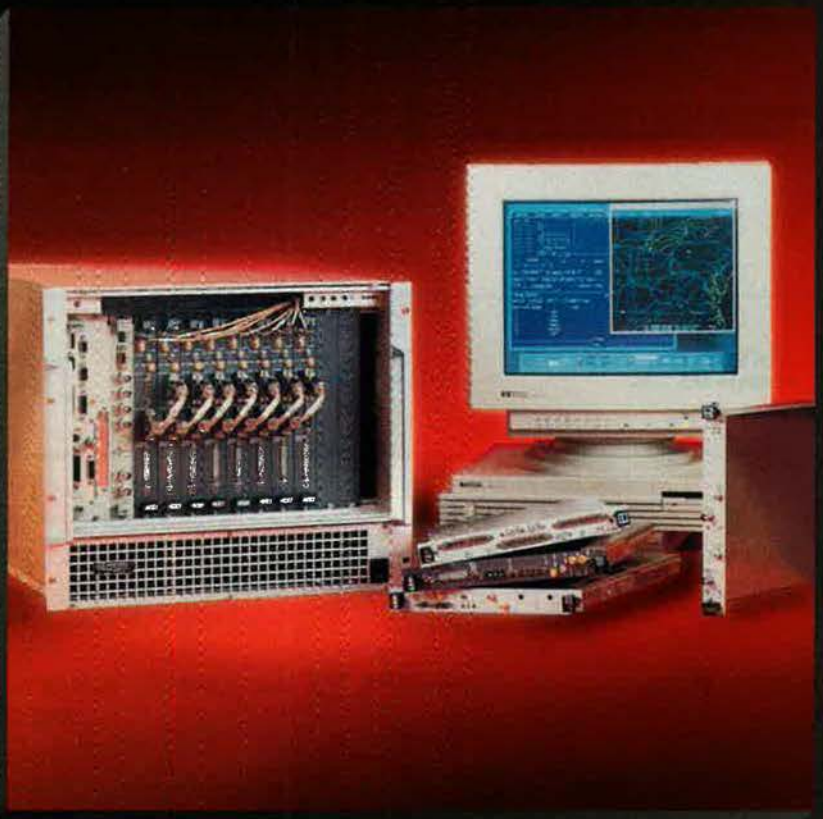

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- WJ-9128 – Digital Wideband HF Tuner

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Fax: (301) 921-9479

WATKINS-JOHNSON

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, a unified command
Deploy specialized airpower, delivering special operations combat power anywhere, anytime
Provide unconventional warfare, direct action, special reconnaissance, counterterrorism, and foreign internal defense support to the unified commands

COROLLARY MISSIONS

Provide humanitarian assistance and personnel recovery
Conduct psychological and counternarcotics operations

EQUIPMENT

AC-130A/H/U Spectre gunships	20
MH-53J Pave Low helicopters	37
MH-60G Pave Hawk helicopters	10
NCH-53A	2
MC-130E Combat Talon I	14
MC-130H Combat Talon II	24
C-130E/H	9
EC-130	6
HC-130N/P Combat Shadow	22

FORCE STRUCTURE

One special operations wing
Two special operations groups
Special Operations School
One flight test squadron
One special tactics group
One Reserve special operations wing
One Guard special operations group

Photo by Randy Jolly

The MH-60G Pave Hawk helicopter is one aircraft that allows the 16th Special Operations Wing of Air Force Special Operations Command to get its troops out of difficult situations. AFSOC's missions include everything from humanitarian assistance to unconventional warfare.

PERSONNEL

Active-duty	8,964
Officers	1,325
Enlisted	7,639
Reserve component	3,267
ANG	1,889
AFRES	1,378
Civilian	758
Total	**12,989**

OPERATIONAL ACTIVITY

Flying hours: 5,017 per month
Many training exercises

AIR FORCE SPECIAL OPERATIONS COMMAND • HEADQUARTERS, HURLBURT FIELD, FLA.

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

16th Special Operations Wing
Hurlburt Field, Fla.
(MC-130E/H, AC-130H/U, MH-53J, HC-130N/P,[a] MH-60G)

352d Special Operations Group
RAF Mildenhall, UK
(MH-53J, HC-130N/P, MC-130H, C-130E)

353d Special Operations Group
Kadena AB, Japan
(C-130, MC-130E, MH-53J,[b] HC-130N/P)

720th Special Tactics Group
Hurlburt Field, Fla.

USAF Special Operations School
Hurlburt Field, Fla.

18th Flight Test Squadron
Hurlburt Field, Fla.

[a]HC-130N/Ps are at Eglin AFB, Fla.
[b]MH-53Js are at Osan AB, South Korea.

UNIT	BASE	WEAPONS
16th Special Operations Wing	Hurlburt Field/Eglin AFB, Fla.	NCH-53A, MC-130E/H, AC-130H/U, MH-53J, C-130E, HC-130N/P, MH-60G
352d Special Operations Group	RAF Mildenhall, UK	C-130E, MH-53J, HC-130N/P, MC-130H
353d Special Operations Group	Kadena AB, Japan	C-130E, MC-130E, HC-130N/P (also MH-53J at Osan AB, South Korea)

COMMAND NOTES

In November 1994, Air Force Special Operations Command formally accepted the AC-130U gunship, its newest weapon system. In February 1995, the 352d Special Operations Group completed its move to RAF Mildenhall, UK.

Force-structure changes in 1994 included renaming the Special Missions Operational Test and Evaluation Center the 18th Flight Test Squadron, moving some HC-130 tankers to the Guard and Reserve, taking final delivery of MC-130H Combat Talon IIs, and preparing for the arrival of additional AC-130U gunships.

AFSOC direct reporting units include the USAF Special Operations School, the 18th FTS, and the 720th Special Tactics Group, all based at Hurlburt.

AFSOC's Guard and Reserve components have undergone changes as well. The 919th Special Operations Wing (AFRES), Duke Field, Fla., is making the transition from gunships to tankers. It stood up the 5th Special Operations Squadron, an HC-130N/P Combat Shadow squadron, in December 1994. The AC-130A Spectre gunship continues to fly with the Reserve's 711th SOS but is scheduled to be replaced by another special operations aircraft beginning late this year. AFSOC's ANG component, the 193d SOG, Harrisburg IAP, Pa., continues to fly the EC-130.

AMC Air Mobility Command

Headquarters Scott AFB, Ill.

Established June 1, 1992

Commander Gen. Robert L. Rutherford

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
Provide Stateside aeromedical evacuation missions
Provide visual documentation support

EQUIPMENT

Mobility aircraft (C-5, C-17, C-141, KC-10, KC-135)..... 909
Aeromedical evacuation (C-9).... 12
Other aircraft (C-12, C-20 C-21,VC-9, VC-25, VC-137, UH-1N..... 88

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

Twelve wings (airlift, air refueling)

Staff photo by Guy Aceto

Air Mobility Command's tanker and transport missions increased from 2,819 per month in October 1993 to 3,273 a month in October 1994. USAF's newest transports, the C-17s, shown here on the tarmac at Charleston AFB, S. C., have become key players in AMC's ability to keep up with such a high operations tempo.

AIR MOBILITY COMMAND • HEADQUARTERS, SCOTT AFB, ILL.

Commander
Gen. Robert L. Rutherford

- **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.

PERSONNEL

Active-duty	54,135
Officers	8,326
Enlisted	45,809
Reserve component	56,436
ANG	20,434
AFRES	36,002
Civilian	11,265
Total	**121,836**

OPERATIONAL ACTIVITY

Flying hours ..... 27,000+ per month

Major overseas deployments
Provide Comfort (Iraq), Provide Promise (Bosnia-Hercegovina), Restore Hope (Somalia), Safe Haven (Panama), Southern Watch and Vigilant Warrior (southwest Asia), Support Hope (Rwanda), Uphold Democracy (Haiti)

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)

Staff photo by Guy Aceto

It's still the heavyweight in heavy lift. The C-5 prototype first flew in June 1968. Today the huge transport remains a major AMC asset. SrA. Jake Fairburn, 3d Airlift Squadron, Dover AFB, Del., stands in the doorway of a Galaxy whose huge capacity allows it to haul two tanks or three helicopters.

UNIT	BASE	WEAPONS
19th Air Refueling Wing*	Robins AFB, Ga.	KC-135
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
89th Airlift Wing	Andrews AFB, Md.	C-9, C-12, C-20, C-21, VC-25, C-135, VC-137, UH-1N, VC-9
92d Air Refueling Wing	Fairchild AFB, Wash	KC-135, C-12F
305th Air Mobility Wing	McGuire AFB, N. J.	C-141, KC-10
319th Air Refueling Wing	Grand Forks AFB, N. D.	KC-135, C-12F
375th Airlift Wing	Scott AFB, Ill.	C-9, C-21
380th Air Refueling Wing	Plattsburgh AFB, N. Y. (closes Sept. 30, 1995)	
436th Airlift Wing	Dover AFB, Del.	C-5
437th Airlift Wing	Charleston AFB, S. C.	C-17, C-141
722d Air Refueling Wing	March AFB, Calif.	KC-10
43d Air Refueling Group*	Malmstrom AFB, Mont.	KC-135

*tenant units

COMMAND NOTES

As Air Mobility Command prepares to enter its fourth year of providing the nation with "Global Reach," the command is focusing on three key areas: people, infrastructure, and equipment. 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.

As US forces return home and defense budgets shrink, America's security will rely on US-based forces and their ability to deploy rapidly. The command's Tanker Airlift Control Center schedules and controls all tanker and airlift operations worldwide for both DoD and USAF.

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

THE POWER OF MODERNIZATION

When you're out of gas
or a long way from home –
there's no match
for the KC-135R.

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A joint company of SNECMA, France and GE U.S.A.

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

Commander
Lt. Gen. Bruce L. Fister

- **22d Air Refueling Wing**, McConnell AFB, Kan. (KC-135)
- **43d Air Refueling Group**[a], Malmstrom AFB, Mont. (KC-135)
- **60th Air Mobility Wing**, Travis AFB, Calif. (C-5, C-141, KC-10)
  - **615th Air Mobility Support Group**[a], Hickam AFB, Hawaii
- **62d Airlift Wing**, McChord AFB, Wash. (C-141)
  - **615th Air Mobility Operations Group**, Travis AFB, Calif.
- **375th Airlift Wing**, Scott AFB, Ill. (C-9, C-21)
- **722d Air Refueling Wing**, March AFB, Calif. (KC-10)
  - **92d Air Refueling Wing**, Fairchild AFB, Wash. (KC-135)

[a]Tenant unit

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

Commander
Lt. Gen. Malcolm B. Armstrong

- **19th Air Refueling Wing**[a], Robins AFB, Ga. (KC-135)
  - **624th Air Mobility Support Group**, Pope AFB, N. C.
- **305th Air Mobility Wing**, McGuire AFB, N. J. (C-141, KC-10)
  - **89th Airlift Wing**, Andrews AFB, Md. (C-9, C-12, C-20, C-21, VC-25, VC-137, UH-1N, C-135, VC-9)
- **380th Air Refueling Wing**, Plattsburgh AFB, N. Y.[b]
  - **319th Air Refueling Wing**, Grand Forks AFB, N. D. (KC-135, C-12F)
- **436th Airlift Wing**, Dover AFB, Del. (C-5)
  - **621st Air Mobility Support Group**, Ramstein AB, Germany
- **437th Airlift Wing**, Charleston AFB, S. C. (C-141, C-17)
  - **621st Air Mobility Operations Group**, McGuire AFB, N. J.

[a]Tenant unit
[b]Closes September 30, 1995

A star in the AMC fleet since it entered service with Military Airlift Command in 1965, the C-141 faces retirement from active duty by 2003. Meanwhile, it helps AMC shoulder the burden of worldwide deployments.

SatoTravel
Vacations

Air Force Locations

Alaska Corps of Engineers	(907) 753-9223
Alaska Service Center	(800) 344-7286
Altus AFB	(405) 477-0733
Andrews AFB	(202) 610-5108
Andrews MWR	(202) 610-5120
Barksdale AFB	(318) 746-7554
Bolling AFB	(202) 610-5116
Brooks AFB	(210) 536-3230
Camp Denali	(907) 428-2092
Cannon AFB	(505) 784-2304
Columbus AFB	(601) 434-6866
Davis-Monthan AFB	(602) 748-1942
Delta Junction	(907) 895-4495
Dyess AFB	(915) 691-5030
Edwards AFB	(805) 277-3623
Eielson AFB	(907) 372-2288
Ellington AFB	(713) 484-6700
Ellsworth AFB	(605) 923-1466
Elmendorf AFB	(907) 753-0509
Ft. Richardson	(907) 428-2075
Ft. Wainwright	(907) 356-2555
Goodfellow AFB	(915) 654-5139
Grand Forks AFB	(701) 594-5141
Griffiss AFB	(315) 339-8944
Gunter AFB	(334) 270-5545
Hickam AFB	(808) 422-2729
Hill AFB	(801) 776-3419
Holloman AFB	(505) 479-2779
Iowa/Illinois Res. Ctr.	(800) 788-7286
Keesler AFB Spaatz Plaza	(601) 377-0738
Kelly AFB	(210) 925-3652
Kirtland AFB	(505) 846-2914
Kirtland AFB-Phillips Lab	(505) 846-0831
Kulis ANG	(907) 248-1438
Lackland AFB	(210) 673-9057
Lackland AFB Wilford Hall	(210) 674-0442
Laughlin AFB	(210) 298-2078
Little Rock AFB	(501) 988-2771
Los Angeles AFB	(310) 363-1130
Luke AFB	(602) 935-1014
Maxwell AFB	(334) 263-5500
McClellan AFB Main	(916) 922-1333
McClellan AFB Leisure	(916) 922-8321
Medina	(210) 673-1033
Minot AFB	(701) 727-5575
Mountain Home AFB ASA	(800) 331-7286
NAS Ft. Worth JRB	(817) 737-5799
Nellis AFB	(702) 644-0480
Nellis AFB Community Ctr.	(702) 644-3637
Randolph AFB	(210) 625-0250
Randolph AFB AFMPC	(210) 625-4500
Randolph AFSVA	(210) 340-2711
Reese AFB	(806) 885-6145
Robins AFB Base Exchange	(912) 926-7442
Robins AFB Base Restaurant	(912) 926-7444
Sheppard AFB	(817) 855-6581
Tinker AFB	(405) 732-1796
Tinker AFB Leisure	(405) 732-2916
USCG Base Honolulu	(808) 841-8811
Vance AFB	(405) 237-9661

No SatoTravel office nearby?
Call (800) 347-6338.

★ -- Offer good through June 30, 1995. Customers are entered in the Vision "Test Drive" Sweepstakes when they complete a Dollar Rent A Car product evaluation card. No purchase necessary. Void where prohibited. Entry may also be made by sending a 3"x5" card to: "VISION TEST DRIVE" Sweepstakes, P.O. Box 639, Gibbstown, NJ 08027.

Unless otherwise noted, all rates are per person, land or cruise only, based on double occupancy, and are subject to change and availability. Certain restrictions and the Terms and Conditions of the supplier's general brochure apply. RCCL cruise rates are based on select sailings—summer dates are higher. Blackouts apply. Branson rates good June 1–Aug.30, 1995.

MKT SOURCE CODE:
N*-Y9Z1- S*MKT/ AF501 2027AIRF

Dear Mom and Dad

Harrison and Maria were right! This Royal Caribbean cruise is incredible! Jerry and I are having a great time—I'm so relaxed!

Know what I like most about cruising? You can do it all or do nothing at all. While Jerry gets involved in every activity on board, I like to just curl up with a good book from the library and watch the ocean pass by from my deck chair. Ah, this is the life!

We got a great deal from SatoTravel just like you told us. 3 and 4-night cruises from $279. And they have other great specials, too. So we can afford to cruise again and again with RCCL!

Gotta go. Love you! Cole

Royal Caribbean Cruise Line
3 & 4 nights Baja Mexico from $279
3 & 4 nights Bahamas from $349
7 nights Caribbean from $699

Branson, Missouri
Music Show Capital
4 days/3 nights from $257

Your father and I are having a wonderful time in Branson. There's music everywhere—our music. Songs you'd remember from our record collection growing up.

Last night we saw Andy Williams, and when he sang *Moon River* I almost melted! Your father and I used to dance to that song! We've also seen Tony Orlando, Jim Stafford and your dad's favorite, Roy Clark. He was so excited!

We got a great deal from SatoTravel. 4-day vacations start at only $257 and include hotel, breakfast, 1-day pass to Silver Dollar City or White Water theme park, plus a choice of 4 shows. Other stars we could have chosen to see include Charley Pride, Bobby Vinton, the New Stars of Lawrence Welk and many others. We love them all!

Miss you. Love, Mom

Dollar Rent A Car
Eagle Vision "Test Drive" Sweepstakes*
Win an Eagle Vision TSi!
All Vision renters get a free calling card and $5 off next Vision rental

This driving trip has been so much fun! Keesha and I have been everywhere. And this car is great—you'd love it!

We rented an Eagle Vision ESi from Dollar. Just listen to these stats: 214-horsepower, V-6 engine, touring suspension, 16-inch wheels. It really moves! Plus it has power windows and locks and stereo and cassette. Which, as you know, are very important for me!

We were even entered to win a Vision TSi. Wouldn't that be great? And we got a free 15-minute long-distance calling card and $5 off our next Eagle Vision rental. What a deal!

The open road awaits! Take care! Ellen

You've Got Some ROYAL CARIBBEAN Coming.℠

DAY BY DAY TOURS
From The People Who Own Onyx Inn and Howard Johnson

DOLLAR RENT A CAR

Low rates on the cars you want.℠

Pacific Air Forces PACAF

Headquarters Hickam AFB, Hawaii

Established July 1, 1957

Commander Gen. John G. Lorber

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-10) 240
OA-10 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) 41
Helicopters (UH-1, HH-60) 11

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 33,321
Officers 4,031
Enlisted 29,290
Reserve component 4,520
ANG 4,300
AFRES 220
Civilian 8,077
Total **45,918**

OPERATIONAL ACTIVITY

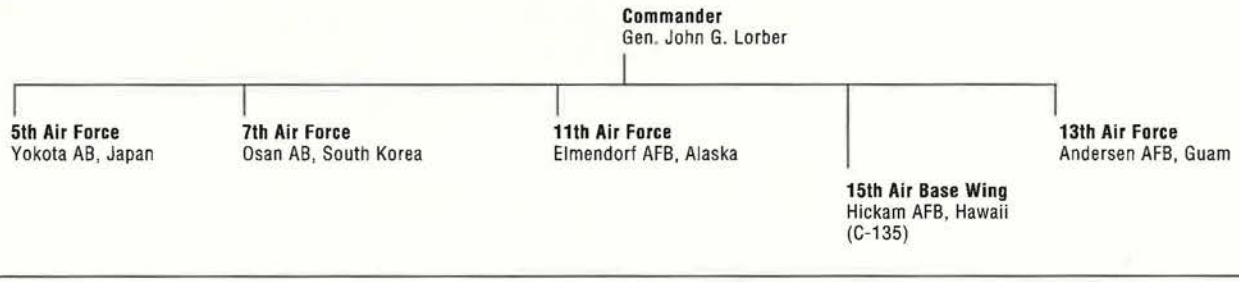
Flying hours ..... 11,211 per month

Major overseas deployments
Cobra Gold (Thailand), Commando Sling (Singapore), Cope Tiger (Thailand), Cope West (southeast Asia), Kangaroo (Australia), Team Spirit (South Korea)

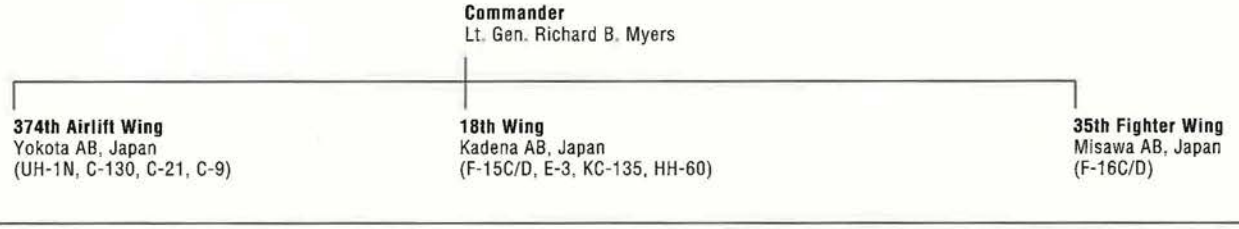
Major training exercises
Cope North (Japan), Cope Thunder (Alaska), RSOI (Reception Staging Onward Movement and Integration, South Korea), Tandem Thrust (Guam)

UNIT	BASE	WEAPONS
3d Wing	Elmendorf AFB, Alaska	F-15C/D, C-130, E-3, F-15E, C-12
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-3, KC-135, HH-60
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-10, C-12
354th Fighter Wing	Eielson AFB, Alaska	F-16C/D, A/OA-10
374th Airlift Wing	Yokota AB, Japan	UH-1N, C-130, C-21, C-9

PACIFIC AIR FORCES • HEADQUARTERS, HICKAM AFB, HAWAII



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



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-10, C-12)

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

Commander
Lt. Gen. Lawrence E. Boese

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

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

COMMAND NOTES

In January 1995, Pacific Air Forces units teamed up with Thailand and Singapore air forces at Korat RTAFB for Cope Tiger '95. Though US forces have participated in many bilateral exercises in the Asia/Pacific region, this year's Cope Tiger was the first major exercise to bring together three regional partners. This annual fighter exercise enables participants to sharpen air combat skills, exchange tactics and techniques, and foster closer relations.

Photo by Dana Bell

An F-16D from the 18th Fighter Squadron, 354th Fighter Wing, Eielson AFB, Alaska, flies past Mount McKinley. PACAF includes air assets in Japan, South Korea, Alaska, and Guam. Its forward-deployed airpower is critical to the balance of power in the Pacific region.

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

Commander
Maj. Gen. Richard T. Swope

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

36th Air Base Wing
Andersen AFB, Guam

[a]Tenant unit; base owned by Singapore government

USAFE

US Air Forces in Europe

Headquarters Ramstein AB, Germany

Established August 15, 1947

Commander in Chief Gen. James L. Jamerson

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

US European Command
(USEUCOM)

US Air Force
(USAF)

Headquarters
US Air Forces in Europe (USAFE)
Ramstein AB, Germany
Gen. James L. Jamerson, Commander in Chief

3d Air Force
RAF Mildenhall, UK
Maj. Gen. James G. Andrus

16th Air Force
Aviano AB, Italy
Lt. Gen. Michael E. Ryan

17th Air Force
Sembach AB, Germany
Maj. Gen. Charles R. Heflebower

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

Allied Command Europe (ACE)

Allied Forces Southern Europe (AFSOUTH)
Naples, Italy

Allied Forces Central Europe (AFCENT)
Brunssum, the Netherlands

Allied Forces Northwest Europe (AFNORTHWEST)
High Wycombe, UK

Allied Air Forces Southern Europe (AIRSOUTH)
Naples, Italy

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

5th Allied Tactical Air Force
Vicenza, Italy

6th Allied Tactical Air Force
Izmir, Turkey

USAF photo by SrA. Janel Schroeder

US Air Forces in Europe units have supported many contingency operations since the end of the Persian Gulf War. Here, a maintenance technician performs a preflight inspection on a C-130 before the lifter departs on a humanitarian mission.

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) 47

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

FORCE STRUCTURE

Three numbered air forces: **3d,** RAF Mildenhall, UK; **16th,** Aviano AB, Italy; **17th,** Sembach AB, Germany

Seven wings (one air base, one air refueling, one airlift, three fighter, and one "other")

Three regional support groups

USAF photo by SrA. Andy Dunaway

USAFE has evolved from the massive, fight-in-place command of the Cold War to a lean, mobile operation. The command has had to adjust its positioning and support of forces to carry out far-flung air combat operations from fewer European bases. It has also called on the Air National Guard and Air Force Reserve to augment its force.

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

Commander
Maj. Gen. James G. Andrus

710th Air Base Wing[a]
RAF Alconbury, UK
(Special Operations MC-130, MH-53, HC-130)

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

603d Regional Support Group
RAF Mildenhall, UK

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

[a]Inactivates in July 1995

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

Commander
Lt. Gen. Michael E. Ryan

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

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

616th Regional Support Group
Aviano AB, Italy

17th AIR FORCE (USAFE) • HEADQUARTERS, SEMBACH AB, GERMANY

Commander
Maj. Gen. Charles R. Heflebower

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

617th Regional Support Group
Sembach AB, Germany
(Ramstein AB Annex)

86th Airlift Wing
Ramstein AB, Germany
(C-20, C-21, T-43, C-9, C-130)

PERSONNEL

Active-duty	26,943
Officers	3,201
Enlisted	23,742
Reserve component	353
ANG	0
AFRES	353
Civilian	5,233
Total	**32,529**

OPERATIONAL ACTIVITY

Flying hours ..... 11,029 per month

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

Major contingency operations support
Deny Flight, Provide Promise (Bosnia-Hercegovina); Provide Hope IV (former USSR), Provide Comfort II (northern Iraq)

Staff photo by Guy Aceto

Aircrews from the 53d Fighter Squadron, 52d Fighter Wing, Spangdahlem AB, Germany, head out to their F-15Cs at a William Tell competition. The 52d FW flies intercept missions as part of Operation Deny Flight, the patrolling of the no-fly zone over Bosnia-Hercegovina that began in 1993. Established in 1947, USAFE is now the oldest Air Force major command.

UNIT	BASE	WEAPONS
31st Fighter Wing	Aviano AB, Italy	F-16C/D
39th Wing	Incirlik AB, Turkey (rotational)	—
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, T-43
100th Air Refueling Wing	RAF Mildenhall, UK	KC-135R
710th Air Base Wing	RAF Alconbury, UK (inactivates in July 1995)	MC-130, HC-130, MH-53
603d Regional Support Group	RAF Mildenhall, UK	
616th Regional Support Group	Aviano AB, Italy	
617th Regional Support Group	Sembach AB, Germany	

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 (AAFCE), which operationally controls Immediate Reaction Forces, Rapid Reaction Forces, and Main Defense Forces of NATO nation air forces during wartime.

Designed for aircrew survivability and lethality, the stand-off provided by JSOW makes it unnecessary to "Go Downtown" anymore!

Survivability is always a vital issue when U.S. aircrews are called upon to protect our nation's interest. JSOW, the Joint Standoff Weapon system being developed for the U.S. Air Force and U.S. Navy by Texas Instruments, increases aircrew survivability by allowing them significantly longer stand-off ranges to accurately attack area and point targets.

JSOW is an adverse weather, day/night weapon system, capable of delivering a variety of submunitions and unitary warheads against a wide spectrum of targets. The selection of warheads can extend to other payloads as appropriate. All of this is accomplished through pre-planned modularity.

The JSOW design provides a direct path for growth from the Baseline, AGM-154A, with the BLU-97 Combined Effects Bomblets to the JSOW/BLU-108 Sensor Fused Weapon submunitions for armored targets, to the JSOW/Unitary with a terminal precision sensor, data link, and a 500 pound unitary warhead.

By working closely with our customer – the pilots, weapons systems operators and ordnance loading crews, TI will continue to provide U.S. Armed Forces with the highest quality systems in the world.

TEXAS INSTRUMENTS

Malcolm Baldrige National Quality Award 1992 Winner

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 internal audit evaluations for all levels of Air Force management
Produce audit reports that evaluate the efficiency, effectiveness, and economy of Air Force programs and activities

STRUCTURE

Acquisition and Logistics Audit Directorate, Wright-Patterson AFB, Ohio
Financial and Support Audit Directorate, March AFB, Calif.
Field Activities Directorate, Washington, D. C.
Four regional offices
Fifty-four field offices

PERSONNEL

Active-duty	6
Officers	3
Enlisted	3
Reserve component	0
Civilians	916
Total	**922**

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 ..... Alan K. Olsen

MISSION, PURPOSE, OPERATIONS

Provide integrated execution management for Air Force bases in the US as they are closed under the Base Closure and Realignment Act of 1988 and the Defense Base Closure and Realignment Act of 1990

STRUCTURE

Office of the Director
Base operating locations

PERSONNEL

Active-duty	2
Officers	2
Enlisted	0
Reserve component	0
Civilians	340
Total (authorized)	**342**

Air Force Center for Environmental Excellence

Headquarters ..... Brooks AFB, Tex.
Established ..... July 23, 1991
Commander ..... Col. Thomas W. Gorges

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 compliance offices

PERSONNEL

Active-duty	55
Officers	53
Enlisted	2
Reserve component	40
ANG	0
AFRES	40
Civilians	358
Total	**453**

Air Force Civil Engineer Support Agency

Headquarters ..... Tyndall AFB, Fla.
Established ..... August 1, 1991
Commander ..... Col. Paul W. Hains III

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
Civil Engineer Maintenance, Inspection, and Repair Team Field Support

PERSONNEL

Active-duty	92
Officers	22
Enlisted	70

Reserve component 3
ANG 1
AFRES 2
Civilians 119
Total 214

Air Force Civilian Personnel Management Center

Headquarters ..... Randolph AFB, Tex.
Established ..... January 1, 1986
Director ..... John R. Graham

MISSION, PURPOSE, OPERATIONS

Manage, operate, and support Air Force civilian career management programs and systems

STRUCTURE

Career Management Division
Integrated Systems Management Division
Operations Support Division

PERSONNEL

Active-duty 1
Officers 1
Enlisted 0
Reserve component 0
Civilians 170
Total 171

Air Force Command, Control, Communications, and Computer Agency

Headquarters ..... Scott AFB, Ill.
Established ..... May 28, 1993
Commander ... Col. (Brig. Gen. selectee) Harry D. Raduege, Jr.

MISSION, PURPOSE, OPERATIONS

Support the Air Force deputy chief of staff for Command, Control, Communications, and Computers (C^4)
Develop and validate C^4 architectures, technical standards, requirements, policies, procedures, and solutions
Ensure integration and interoperability among Air Force C^4 systems
Ensure that policies, procedures, and applications take full advantage of C^4 capabilities to meet future information requirements
Serve as the technical arm and extension of Hq. USAF/Deputy Chief of Staff, C^4

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 297
Officers 138
Enlisted 159
Reserve component 2
ANG 0
AFRES 2
Civilians 288
Total 587

NOTE

Air Force Communications Command became the Air Force C^4 Agency May 28, 1993.

Air Force Cost Analysis Agency

Headquarters ..... Arlington, Va.
Established ..... August 1, 1992
Commander ..... Col. Gordon D. Kage II

MISSION, PURPOSE, OPERATIONS

Conduct Component Cost Analyses (CCAs) for major weapon system acquisition programs and automated information systems as required by public law and DoD directives
Develop independent estimates for the Secretary of Defense, the Secretary of the Air Force, the Air Force Acquisition Executive, Program Executive Officers, and other senior executives
Perform cost research on emerging technologies, software, operating costs, and subsystems to support CCAs

STRUCTURE

Aircraft Programs Division
Command, Control, Communications Programs Division
Management Information Systems Programs Division
Program Control/Research Division
Small Missiles and Munitions Programs Division
Space Systems and Boosters Programs Division

PERSONNEL

Active-duty 30
Officers 30
Enlisted 0
Reserve component 0
Civilians 23
Total 53

Air Force Doctrine Center

Headquarters ..... Langley AFB, Va.
Established ..... July 21, 1993
Commander ..... Col. Robert D. Coffman

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 the Air Force is not the lead agent
Prepare and present coordinated Air Force comments on joint doctrine, tactics, techniques, and procedures and their development

PERSONNEL

Active-duty 16
Officers 16
Enlisted 0
Reserve component 0
Civilians 4
Total 20

Air Force Flight Standards Agency

Headquarters ..... Andrews AFB, Md.
Established ..... October 1, 1991
Commander ..... Col. Dennis W. Traynor III

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 Federal Aviation Administration (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
Maintain the USAF ATCALS database

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.

PERSONNEL

Active-duty	143
Officers	76
Enlisted	67
Reserve component	4
ANG	0
AFRES	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	19
Officers	11
Enlisted	8
Reserve component	0
Civilians	20
Total	**39**

Air Force Historical Research Agency

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

MISSION, PURPOSE, OPERATIONS

Serve as the repository for more than sixty-five million pages of historical documents, ranging from the Civil War to the Persian Gulf War
Maintain the largest specialized collection of documents on US military aviation in the world
Provide manpower and historical support to preserve documents during contingency operations
Preserve Air Force history and provide data and analyses to support the Air Staff and major commands
Operate research facilities for professional military education students, faculty, visiting scholars, and the general public

STRUCTURE

Information Systems Division
Research Division

PERSONNEL

Active-duty	10
Officers	4
Enlisted	6
Reserve component	20
ANG	0
AFRES	20
Civilians	44
Total	**74**

Air Force History Support Office

Headquarters ..... Washington, D. C.
Established ..... September 30, 1994
Commander ..... Col. George K. Williams

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

Histories Division
Research Division
Special Projects Division

PERSONNEL

Active-duty	5
Officers	3
Enlisted	2
Reserve component	4
ANG	0
AFRES	4
Civilians	25
Total	**34**

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. Robert M. Murdock

MISSION, PURPOSE, OPERATIONS

Provide Air Force leadership with objective and independent assessments of Air Force readiness, discipline, and management efficiency and effectiveness
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 125
  Officers 97
  Enlisted 28
Reserve component 1
  ANG 1
  AFRES 0
Civilians 21
Total **147**

Air Force Legal Services Agency

Headquarters ..... Bolling AFB, D. C.
Established ..... September 1, 1991
Commander ..... Col. (Brig. Gen. selectee) Olan G. Waldrop, Jr.

MISSION, PURPOSE, OPERATIONS

Provide civil and military legal services to the Air Force and Air Force personnel
Handle Air Force patent and copyright matters
Provide judges and counsel for courts-martial and review trial results
Provide computer support and database management for the Office of The Judge Advocate General

STRUCTURE

Air Force Court of Military Review
Civil Law and Litigation Directorate
  Contract Litigation Division
  Environmental Law and Litigation Division
  General Claims Division
  General Litigation Division
  Legal Assistance Division
  Patent Law 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 414
  Officers 287
  Enlisted 127
Reserve component 87
  ANG 0
  AFRES 87
Civilians 137
Total **638**

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 69
  Officers 53
  Enlisted 16
Reserve component 0
Civilians 22
Total **91**

Air Force Management Engineering Agency

Headquarters ..... Randolph AFB, Tex.
Established ..... November 1, 1975
Commander ..... Col. Charles F. Dibrell, Jr.

MISSION, PURPOSE, OPERATIONS

Work with Air Staff and major commands to achieve significant improvement through process reengineering
Determine manpower requirements and manage manpower resources
Provide commanders and functional managers with technical expertise and process improvement techniques
Oversee the implementation of technical and procedural guidance for Air Force Management Engineering and Productivity Programs
Serve as the executive agent for the Navy, Army, and Air Force for the development of DoD medical manpower determinants through the Joint Health-Care Management Engineering Team

PERSONNEL

Active-duty 87
  Officers 26
  Enlisted 61
Reserve component 0
Civilians 64
Total **151**

Air Force Medical Operations Agency

Headquarters ..... Bolling AFB, D. C.
Established ..... July 1, 1992
Commander ..... Maj. Gen. Charles H. Roadman II

MISSION, PURPOSE, OPERATIONS

Formulate plans, practices, and procedures and direct pro-

grams for the Air Force Medical Service in aerospace medicine, family advocacy, clinical investigations, clinical quality management, radiation protection, and health promotion

STRUCTURE
Aerospace Medicine Division
Clinical Investigations and Life Sciences Division
Clinical Quality Management Division
Family Advocacy Division, Brooks AFB, Tex.
Health Promotion Division
USAF Radioisotope Committee Secretariat, Brooks AFB, Tex.

PERSONNEL
Active-duty 40
  Officers 33
  Enlisted 7
Reserve component 4
  ANG 0
  AFRES 4
Civilians 18
Total 62

Air Force Medical Support Agency

Headquarters ..... Brooks AFB, Tex.
Established ..... July 1, 1992
Commander ..... Col. Richard W. Rushmore

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, strategy, plans, consultant services, and requirements for facilities, supplies, equipment, acquisition, information systems and resources, and patient administration

STRUCTURE
Directorate of Medical Support
  Health Facilities Division
  Medical Information Systems Division
  Medical Logistics Division
  Patient Administration Division

PERSONNEL
Active-duty 41
  Officers 35
  Enlisted 6
Reserve component 0
Civilians 33
Total 74

Air Force Military Personnel Center

Headquarters ..... Randolph AFB, Tex.
Established ..... July 25, 1963
Commander ..... Maj. Gen. William B. Davitte

MISSION, PURPOSE, OPERATIONS
Provide personnel operations service

STRUCTURE
Assignments
Mission Support
Personnel Accountability
Personnel Data Systems
Personnel Operations
Personnel Programs Management

PERSONNEL
Active-duty 867
  Officers 268
  Enlisted 599
Reserve component 8
  ANG 3
  AFRES 5
Civilians 448
Total 1,323

NOTE
In 1995, AFMPC will reorganize to allow the center to group similar processes and improve customer support.

Air Force News Agency

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

MISSION, PURPOSE, OPERATIONS
Support public affairs offices by creating and delivering timely and credible products and services
Communicate and broadcast news, information, and entertainment through print and electronic media, keeping the Total Force and the American public informed during peace and war

STRUCTURE
Air Force Broadcasting Service
Air Force Internal Information Directorate
Army and Air Force Hometown News Service
Resource Management Directorate

PERSONNEL
Active-duty 352
  Officers 22
  Enlisted 330
Reserve component 0
Civilians 136
Total 488

NOTES
Air Force Internal Information Directorate news products include *Airman* Magazine, the *Air Force Policy Letter,* Air Force Television News, and Air Force Radio News. The Air Force Broadcasting Service operates all USAF-managed Armed Forces Radio and Television Service outlets.

Air Force Office of Special Investigations

Headquarters ..... Bolling AFB, D. C.
Established ..... August 1, 1948
Commander ..... Brig. Gen. Robert A. Hoffman

MISSION, PURPOSE, OPERATIONS
Provide criminal investigative and counterintelligence information and services to commanders
Identify and prevent criminal activity, including homicide, drug abuse, espionage, terrorism, sabotage, economic (major defense contractor fraud and local fraud), environmental, and other crimes that threaten Air Force and DoD resources
Provide force protection to deployed wings and units

STRUCTURE
USAF Special Investigations Academy
Seven regional offices
Seven overseas squadrons
160 detachments and operating locations

PERSONNEL

Active-duty	1,480
Officers	378
Enlisted	1,102
Reserve component	420
ANG	0
AFRES	420
Civilians	487
Foreign nationals	37
Total	**2,424**

Air Force Operations Group

Headquarters ..... Washington, D. C.
Established ..... July 26, 1977
Commander ..... Col. Robert W. Tapaszi, Jr.

MISSION, PURPOSE, OPERATIONS

Support the Air Force Chief of Staff and deputy chief of staff for Plans and Operations
Maintain a twenty-four-hour watch on all current operations
Handle emergency actions through the Air Force Operations Support 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 between 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 operational oversight of USAF counterdrug operations
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 Worldwide Military Command and Control System Intercomputer Network, the Air Force's resources and training system database and worldwide exercise scheduling database, and the Joint Uniform Lessons Learned database

FORCE STRUCTURE

AFOG is supported by ten 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.

PERSONNEL

Active-duty	225
Officers	149
Enlisted	76
Reserve component	0
Civilians	15
Total	**240**

NOTE

AFRES and ANG are also integrated into AFOG, which was formerly the Air Force Combat Operations Staff.

Air Force Pentagon Communications Agency

Headquarters ..... Washington, D. C.
Established ..... October 1, 1984
Commander ..... Col. Stephen E. Anno

MISSION, PURPOSE, OPERATIONS

Provide twenty-four-hour-a-day communications and computer support to the Office of the Secretary of Defense, the Joint Staff, the Office of the Secretary of the Air Force, National Military Command Center (NMCC), the Air Staff, and the Air Force Operations Center
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 AFOC networks, and an extensive pager and cellular telephone network

STRUCTURE

Air Staff Systems Directorate
Mission Support Directorate
OSD Systems Directorate
Security Directorate
Systems Management Directorate
Plans and Programs Directorate

PERSONNEL

Active-duty	635
Officers	196
Enlisted	439
Reserve component	2
ANG	0
AFRES	2
Civilians	277
Total	**914**

NOTE

AFPCA was formerly the 7th Communications Group.

Air Force Personnel Operations Agency

Headquarters ..... Washington, D. C.
Established ..... August 15, 1993
Commander ..... Steve N Smith

MISSION, PURPOSE, OPERATIONS

Execute personnel programs and portions of programs located in the Washington, D. C., area in proximity to the policy- and decision-making personnel organizations
Develop and operate officer, enlisted, and civilian models and databases for management information
Handle small computer acquisition, technical support, and network management for the deputy chief of staff for Personnel and for local users of the Personnel Data System
Process congressional inquiries and third-party civilian complaints and actions
Execute the Air Force Employee Development Program and training budgets
Manage the Air Force Relocation, Employee, and Labor Relations Programs
Conduct Air Force Quality Assessments and the quality awards program

STRUCTURE

Analysis Division
Performance Management Division
Systems Support Division
Work Force Appeals and Relations Division

PERSONNEL

Active-duty	38
Officers	27
Enlisted	11
Reserve component	0
Civilians	31
Total	**69**

Air Force Program Executive Office

Headquarters ..... Washington, D. C.
Established ..... November 1990
Service Acquisition Executive ..... Clark G. Fiester

MISSION, PURPOSE, OPERATIONS

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

STRUCTURE

Service Acquisition Executive
Program Executive Officers:
Brig. Gen. William F. Moore, Bombers, Missiles, and Trainers
Harry E. Shulte, Conventional Strike Systems
Brig. Gen. (Maj. Gen. selectee) James S. Childress, Tactical and Airlift Programs
John M. Gilligan, Combat Support Systems
Maj. Gen. Garry A. Schnelzer, Space Systems
Brig. Gen. Berwyn A. Reiter, Command, Control, and Communications Systems
Kathy L. Boockholdt, Acquisition Career Management Programs

PERSONNEL 49

Air Force Real Estate Agency

Headquarters ..... Bolling AFB, D. C.
Established ..... August 1, 1991
Director ..... Anthony R. Jonkers

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 instructions to assist USAF in complying with public laws and federal and DoD guidance

PERSONNEL

Active-duty 0
Reserve component 0
Civilians 13
Total **13**

Air Force Reserve

Headquarters ..... Robins AFB, Ga.
Established ..... April 14, 1948
Commander ..... Maj. Gen. Robert A. McIntosh

MISSION, PURPOSE, OPERATIONS

Support the active-duty force
Serve in missions including fighter, bomber, airlift, aerial refueling, rescue, special operations, aeromedical evacuation, aerial fire-fighting, weather reconnaissance, and space operations
Provide support and disaster relief in the US
Support national counterdrug efforts

FORCE STRUCTURE

Three numbered air forces: **4th,** McClellan AFB, Calif.; **10th,** Bergstrom ARS, Tex.; **22d,** Dobbins ARB, Ga.
Thirty-seven flying wings
128 groups
392 squadrons
111 flights

PERSONNEL

Officers 16,015
Enlisted 61,919
Civilians (non-ART) 5,235
Total **83,169**

EQUIPMENT

B-52H bombers 9
F-16 fighters 121
A/OA-10 attack aircraft 44
C-5A airlifters 32
C-141B airlifters 36
C-130E/H airlifters 109
KC-135E/R tankers 62
HC-130N/P rescue aircraft 10
HH-60G rescue helicopters 25
AC-130A gunships 10
WC-130H weather planes 10
Total primary aircraft authorized **468**

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), Restore Hope (Somalia), Support Hope (Rwanda), Uphold Democracy (Haiti)
Relief effort for victims of the 1994 Georgia floods; support in 1994 storm relief

NOTES

The AFRES commander also serves as chief, Air Force Reserve, Washington, D. C. AFRES 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, and C-9 aircraft daily under the associate program.

Air Force Review Boards Agency

Headquarters ..... Andrews AFB, Md.
Established ..... June 1, 1980
Deputy ..... 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 11
- Officers 4
- Enlisted 7

Air Force Reserve Flying Wings and Assigned Units

Wing Hq.	Squadron	Aircraft	Location
4th Air Force (AMC) • Hq. McClellan AFB, Calif. • Brig. Gen. Wallace W. Whaley, Commander			
349th Air Mobility Wing	301st Airlift Squadron	C-5A/B	Travis AFB, Calif.
	312th Airlift Squadron	C-5A/B	Travis AFB, Calif.
	708th Airlift Squadron	C-141B	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.
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 AFB, Calif.
	79th Air Refueling Squadron	KC-10A	March AFB, Calif.
	729th Airlift Squadron	C-141B	March AFB, Calif.
	730th Airlift Squadron	C-141B	March AFB, Calif.
507th Air Refueling Wing	465th Air Refueling Squadron	KC-135R	Tinker AFB, Okla.
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. Bergstrom ARS, Tex. • Maj. Gen. David R. Smith, Commander			
94th Airlift Wing	700th Airlift Squadron	C-130H	Dobbins ARB, Ga.[1]
301st Fighter Wing	457th Fighter Squadron	F-16C/D	Carswell Field, Tex.
302d Airlift Wing	731st Airlift Squadron	C-130E/H	Peterson AFB, Colo.
403d Wing	815th Airlift Squadron	C-130E	Keesler AFB, Miss.
	53d Weather Reconnaissance Squadron	WC-130H	Keesler AFB, Miss.
419th Fighter Wing	466th Fighter Squadron	F-16C/D	Hill AFB, Utah
440th Airlift Wing	95th Airlift Squadron	C-130H	General Mitchell IAP/ARS, Wis.[1]
442d Fighter Wing	303d Fighter Squadron	A/OA-10A	Whiteman AFB, Mo.
482d Fighter Wing	93d Fighter Squadron	F-16A/B	Homestead ARB, Fla.[1]
908th Airlift Wing	357th Airlift Squadron	C-130H	Maxwell AFB, Ala.
910th Airlift Wing	757th Airlift Squadron	C-130H	Youngstown-Warren 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]
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	C-130E/H, AC-130A	Duke Field, Fla.
	5th Special Operations Squadron	HC-130N/P	Eglin AFB, Fla.
924th Fighter Wing	704th Fighter Squadron	F-16C/D	Bergstrom ARS, Tex.[1]
926th Fighter Wing	706th Fighter Squadron	F-16C/D	NAS/JRB New Orleans, La.
928th Airlift Wing	64th Airlift Squadron	C-130H	O'Hare IAP/ARS, Ill.[1]
934th Airlift Wing	96th Airlift Squadron	C-130E	Minneapolis–St. Paul IAP/ARS, Minn.[1]
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. • Maj. Gen. Joseph A. McNeil, Commander			
315th Airlift Wing	300th Airlift Squadron	C-141B	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.
434th Air Refueling Wing	72d Air Refueling Squadron	KC-135R	Grissom ARB, Ind.[1]
	74th Air Refueling Squadron	KC-135R	Grissom ARB, Ind.[1]
439th Airlift Wing	337th Airlift Squadron	C-5A	Westover ARB, Mass.[1]
445th Airlift Wing	356th Airlift Squadron	C-141B	Wright-Patterson AFB, Ohio
	89th Airlift Squadron	C-141B	Wright-Patterson AFB, Ohio
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	335th Airlift Squadron	C-141B	McGuire AFB, N. J.
	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.
916th Air Refueling Wing	77th Air Refueling Squadron	KC-10A[2]	Seymour Johnson AFB, N. C.
927th Air Refueling Wing	63d Air Refueling Squadron	KC-135E	Selfridge ANGB, Mich.

[1] AFRES Installation

[2] ACC gained

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

Reserve component 3
ANG 1
AFRES 2
Civilians 33
Total 47

Air Force Safety Agency

Headquarters ..... Kirtland AFB, N. M.
Established ..... August 1, 1991
Commander ..... Col. Bernard B. Burklund, Jr.

MISSION, PURPOSE, OPERATIONS

Execute Air Force safety and nuclear surety policies, plans, and programs
Oversee all USAF mishap-prevention programs, including nuclear weapons surety, 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 directorates
Flight Safety
Ground Safety
Nuclear Surety
Weapons and Space Safety
Support directorates
Data Operations and Analysis
Life Sciences
Engineering and Technical Services

PERSONNEL

Active-duty 73
Officers 55
Enlisted 18
Reserve component 1
ANG 0
AFRES 1
Civilians 69
Total 143

NOTE

AFSA publishes *Flying Safety* Magazine, *Road and Rec* Magazine, and *USAF Nuclear Surety Journal.*

Air Force Security Police Agency

Headquarters ..... Kirtland AFB, N. M.
Established ..... February 1991
Commander ..... Col. John E. Killeen

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 Air Force corrections activities

STRUCTURE

Directorate of Corrections
Directorate of Law Enforcement and Training
Directorate of Physical Security
Directorate of Resources and Equipment

PERSONNEL

Active-duty 117
Officers 25
Enlisted 92
Reserve component 11
ANG 0
AFRES 11
Civilians 20
Total 148

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 publishes *SP Digest.*

Air Force Services Agency

Headquarters ..... San Antonio, Tex.
Established ..... February 5, 1991
Commander ..... Col. Stephen R. Wingfield

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 services 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 71
Officers 22
Enlisted 49
Reserve component 9
Civilians 339
Total 419

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 assistant secretaries of the Air Force and the Air Staff
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 within the Air Force by other DoD agencies and by civilian contractors

STRUCTURE
Force Application Division
Force Enhancement Division
Resource Management Division

PERSONNEL
Active-duty 54
  Officers 46
  Enlisted 8
Reserve component 3
  ANG 0
  AFRES 3
Civilians 25
Total 82

Air Force Technical Applications Center

Headquarters ..... Patrick AFB, Fla.
Established ..... May 1, 1960
Commander ..... Col. Glen D. Shaffer

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 activity
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 942
  Officers 188
  Enlisted 754
Reserve component 0
Civilians 104
Total 1,046

EQUIPMENT
Eighteen seismic arrays consisting of seismometers and associated central terminals and workstations
Six hydroacoustic recording locations
More than 130 sensors on thirty-six 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 .. Brig. Gen. (Maj. Gen. selectee) John P. Casciano

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 dominance 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 human and 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, counterdrug, and special operations
Provide nuclear intelligence production and support (including data collection, analysis, and exploitation)

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 12,667
  Officers 1,870
  Enlisted 10,797
Reserve component 1,883
  ANG 187
  AFRES 1,696
Civilians 2,378
Total 16,928

OPERATIONAL ACTIVITY
Provide Comfort (northern Iraq), Southern Watch (southern Iraq), Support/Uphold Democracy (Haiti)

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 assistant chief of staff for Intelligence. In 1994, the agency supported more than fifty worldwide, joint, unified, and specified command–sponsored exercises. General Casciano also serves as director of the Joint Command and Control Warfare Center.

Air National Guard

Headquarters ..... Washington, D. C.
Established ..... September 18, 1947
Director ..... Maj. Gen. Donald W. Shepperd

MISSION, PURPOSE, OPERATIONS
Provide air defense of continental US
In emergencies, under federal government jurisdiction, enforce federal authority, suppress insurrection, and serve in the national defense

FORCE STRUCTURE
Major command assignments
  Air Combat Command
  Air Education and Training Command
  Air Force Special Operations Command
  Air Mobility Command
  Pacific Air Forces

The Air National Guard by Major Command Assignment

(As of April 1, 1995)

Air Mobility Command

C-5A transport

105th Airlift Group	Stewart IAP, N. Y.

C-141B transport

164th Airlift Group	Memphis IAP, Tenn.
172d Airlift Group	Allen C. Thompson Field, Miss.

KC-135 tanker

101st Air Refueling Wing	Bangor IAP, Me.
108th Air Refueling Wing	McGuire AFB, N. J.
117th Air Refueling Wing	Birmingham Airport, Ala.
121st Air Refueling Wing	Rickenbacker ANGB, Ohio
126th Air Refueling Wing	O'Hare IAP/ARS, Ill.
128th Air Refueling Group	General Mitchell IAP/ARS, Wis.
134th Air Refueling Group	McGhee Tyson Airport, Tenn.
141st Air Refueling Wing	Fairchild AFB, Wash.
151st Air Refueling Group	Salt Lake City IAP, Utah
155th Air Refueling Group	Lincoln MAP, Neb.
157th Air Refueling Group	Pease ANGB, N. H.
161st Air Refueling Group	Sky Harbor IAP, Ariz.
163d Air Refueling Group	March AFB, Calif.
171st Air Refueling Wing	Pittsburgh IAP/ARS, Pa.
186th Air Refueling Group	Key Field, Miss.
190th Air Refueling Group	Forbes Field, Kan.

Air Combat Command

A/OA-10A attack aircraft

103d Fighter Group	Bradley IAP, Conn.
104th Fighter Group	Barnes MAP, Mass.
110th Fighter Group	W. K. Kellogg Airport, Mich.
175th Fighter Group	Baltimore, Md.

B-1 bomber

184th Bomb Group	McConnell AFB, Kan.

C-130 transport

109th Airlift Group	Schenectady Airport, N. Y.
118th Airlift Wing	Nashville MAP, Tenn.
123d Airlift Wing	Standiford Field, Ky.
130th Airlift Group	Yeager Airport, W. Va.
133d Airlift Wing	Minneapolis–St. Paul IAP/ARS, Minn.
135th Airlift Group	Baltimore, Md.
136th Airlift Wing	NAS Dallas, Tex.
137th Airlift Wing	Will Rogers World Airport, Okla.
139th Airlift Group	Rosecrans Memorial Airport, Mo.
143d Airlift Group	Quonset State Airport, R. I.
145th Airlift Group	Charlotte/Douglas IAP, N. C.
146th Airlift Wing	Channel Islands ANGB, Calif.
153d Airlift Group	Cheyenne MAP, Wyo.
165th Airlift Group	Savannah IAP, Ga.
166th Airlift Group	New Castle County Airport, Del.
167th Airlift Group	Eastern West Virginia Regional Airport/Shepherd Field, W. Va.
179th Airlift Group	Mansfield Lahm Airport, Ohio
182d Airlift Group	Greater Peoria Airport, Ill.
189th Airlift Group[a]	Little Rock AFB, Ark.

F-4G "Wild Weasel"

124th Fighter Group	Boise Air Terminal, Idaho

F-15A/B fighter

116th Fighter Wing	Dobbins ARB, Ga.
131st Fighter Wing	Lambert–St. Louis IAP, Mo.
159th Fighter Group	NAS/JRB New Orleans, La.

F-15A/B fighter–air defense

102d Fighter Wing	Otis ANGB, Mass.
142d Fighter Group	Portland IAP, Ore.

F-16A/B/C/D fighter

113th Fighter Wing	Andrews AFB, Md.
114th Fighter Group	Joe Foss Field, S. D.
122d Fighter Wing	Fort Wayne IAP, Ind.
127th Fighter Wing	Selfridge ANGB, Mich.
128th Fighter Wing	Truax Field, Wis.
132d Fighter Wing	Des Moines IAP, Iowa
138th Fighter Group	Tulsa IAP, Okla.
140th Fighter Wing	Buckley ANGB, Colo.
149th Fighter Group	Kelly AFB, Tex.
150th Fighter Group	Kirtland AFB, N. M.
156th Fighter Group	Puerto Rico IAP, Puerto Rico
169th Fighter Group	McEntire ANGB, S. C.
174th Fighter Wing	Hancock Field, N. Y.
178th Fighter Group	Springfield-Beckley MAP, Ohio
180th Fighter Group	Toledo Express Airport, Ohio
181st Fighter Group	Hulman Regional Airport, Ind.
183d Fighter Group	Capital MAP, Ill.
185th Fighter Group	Sioux Gateway Airport, Iowa
187th Fighter Group	Dannelly Field, Ala.
188th Fighter Group	Fort Smith MAP, Ark.
192d Fighter Group	Richmond IAP, Va.

F-16A/B fighter–air defense

107th Fighter Group	Niagara Falls IAP/ARS, N. Y.
119th Fighter Group	Hector IAP, N. D.
120th Fighter Group	Great Falls IAP, Mont.
125th Fighter Group	Homestead ARB, Fla.
144th Fighter Wing	Fresno Air Terminal, Calif.
147th Fighter Group	Ellington Field, Tex.
148th Fighter Group	Duluth IAP, Minn.
158th Fighter Group	Burlington IAP, Vt.
177th Fighter Group	Atlantic City Airport, N. J.
191st Fighter Group	Selfridge ANGB, Mich.

HC-130/HH-60G rescue aircraft

106th Rescue Group	Francis S. Gabreski IAP, N. Y.
129th Rescue Group	NAS Moffett Field, Calif.

A/OA-10A observation aircraft

111th Fighter Group	Willow Grove ARS, Pa.

RF-4C reconnaissance aircraft

152d Reconnaissance Group	Reno-Cannon IAP, Nev.

Air Education and Training Command

F-16A/B/C/D fighter

162d Fighter Group	Tucson IAP, Ariz.

Pacific Air Forces

C-130 transport

154th Group (204th Airlift Sqdn.)	Hickam AFB, Hawaii
176th Group[b]	Anchorage, Alaska

F-15A/B fighter

154th Group[c]	Hickam AFB, Hawaii

KC-135 tanker

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

Special Operations Command

EC-130E special operations aircraft

193d Special Operations Group	Harrisburg IAP, Pa.

[a] Aircrew CCTU

[b] Includes 210th Air Rescue Squadron with HC-130 and HH-60G aircraft

[c] Includes 203d Air Refueling Squadron with KC-135 aircraft

Twenty-four wings
Sixty-five groups

PERSONNEL

Officers	13,678
Enlisted	97,850
Civilians	1,731
Total	**113,259**

OPERATIONAL ACTIVITY

Deny Flight and Provide Promise (Bosnia-Hercegovina), Provide Comfort II (Turkey and Middle East), Southern Watch (Middle East), Support Hope (Rwanda), Uphold/Maintain Democracy (Haiti)
Relief effort for victims of the 1994 Georgia floods, fire-fighting support in western US

NOTES

ANG serves under state government jurisdiction except in emergencies. It provides 100 percent of USAF's fighter-interceptor force, 100 percent of the RF-4C force, twenty-six percent of the tactical air support, forty-three percent of the tactical airlift, twenty-nine percent of the air-rescue capability, thirty-three percent of the tactical fighters, forty-three percent of the KC-135 air refueling capability, and eight percent of the strategic airlift capability.

Air Reserve Personnel Center

Headquarters ..... Denver, Colo.
Established ..... November 1, 1953
Commander ..... Col. James H. White, Jr.

MISSION, PURPOSE, OPERATIONS

Provide personnel services and administrative support to members of the Air Force Reserve and Air National Guard, including assignments, promotions, discharges, retirements, veterans' entitlements, and presidentially activated mobilizations

STRUCTURE

Chaplain Individual Reserve Programs Directorate
Health Services Individual Reserve Programs Directorate
Individual Reserve Programs Directorate
Information Systems Support 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	145
Officers	33
Enlisted	112
Reserve component	39
ANG	1
AFRES	38
Civilians	510
Total	**694**

Air Weather Service

Headquarters ..... Scott AFB, Ill.
Established ..... July 1, 1937
Commander ..... Col. Frank J. Misciasci, Jr.

MISSION, PURPOSE, OPERATIONS

Provide centralized weather, climatological, and space 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 Central, Offutt AFB, Neb.
Air Force Environmental Technical Applications Center, Scott AFB, Ill.
Combat Weather Facility, Hurlburt Field, Fla.

PERSONNEL

Active-duty	905
Officers	261
Enlisted	644
Reserve component	8
ANG	0
AFRES	8
Civilians	245
Total	**1,158**

NOTE

Colonel Misciasci retires May 18, 1995. His successor as AWS commander is Col. Joseph Dushan.

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 Combat/SERE-related training and DoD POW/MIA programs
Serve as Chairman of the Joint Chiefs of Staff executive agent office of primary responsibility for Joint Evasion and Escape and POW/MIA matters
Develop area contingency guides, training programs, and SERE products for use in joint commands' regional and counterdrug operations

STRUCTURE

Operations Support Division
Training Division
Three operating locations

PERSONNEL

Active-duty	24
Officers	8
Enlisted	16
Reserve component	7
ANG	0
AFRES	7
Civilians	49
Total	**80**

FACILITIES

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

NOTES

In 1994, the Joint Services SERE Agency provided SERE information updates, through messages and mobile training teams, to all current areas of operation, including South Korea, Bosnia-Hercegovina, Haiti, and Iraq. JSSA advised DoD agencies on technical matters related to Korean War and Vietnam War MIA accountability. JSSA's Desert Storm POW Study was published by the Defense Intelligence Agency in December. A stockpile of SERE products and capabilities is available for use by the warfighting CINCs to meet contingency requirements.

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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 Operational Test and Evaluation Center

Headquarters ..... Kirtland AFB, N. M.
Established ..... January 1, 1974
Commander ..... Maj. Gen. George B. Harrison

MISSION, PURPOSE, OPERATIONS

Conduct operational testing and evaluation of new or modified weapon systems and components for Air Force and multiservice use

STRUCTURE

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

PERSONNEL

Active-duty 586
  Officers 444
  Enlisted 142
Reserve component 1
  ANG 1
  AFRES 0
Civilians 176
Total **763**

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, nondevelopmental airlift aircraft, and numerous command-and-control systems

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 for the future
Produce dedicated Air Force officers and leaders
Instill leadership through academics, military training, athletic conditioning, and spiritual and ethical development

STRUCTURE

The entire group of cadets is designated the Cadet Wing. The wing is composed of four groups consisting of ten squadrons each, with about 100 cadets assigned to a squadron. Each squadron consists of members of all four classes.

PERSONNEL

Active-duty 1,993
  Officers 1,021
  Enlisted 972
Reserve component 0
Cadets 4,000
Civilians 1,818
Total **7,811**

EQUIPMENT

90 trainers (T-3A aerobatics trainers; T-41C basic trainers; UV-18 jump planes; 126E and ASK-21 sailplanes; Cessna 150s; SGS-2-33A, TG-3, and TG-4 gliders; and TG-7A motorized gliders)

FACILITIES

18,325-acre site
Three runways
One grass airstrip

NOTE

Cadets complete four years of study for a bachelor of science degree. Four primary areas of military development are stressed: professional military studies, 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. Steven A. Roser

MISSION, PURPOSE, OPERATIONS

Manage support of Air Force and other Air Force activities supporting Hq. USAF and other Air Force units in the National Capital Region
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
Plan, direct, and execute USAF Band and Honor Guard support to ceremonies and activities of the Air Force Chief of Staff, Secretary of the Air Force, the White House, Arlington National Cemetery, and joint organizations

STRUCTURE

Objective wing with Staff, Operations, Support, Logistics, and Medical Groups

PERSONNEL

Active-duty 1,595
  Officers 171
  Enlisted 1,424
Reserve component 0
Civilians 819
Total **2,414**

Pilots in the Swiss Air Force can hone their skills in take-offs and landings, realistic air-to-air and air-to-ground combat environments, electronic countermeasures, and emergency procedures, with the help of a dual-seat dome simulator. Hughes Electronics will build a 40-foot dome F/A-18D Weapons Tactics Trainer (WTT) simulator, which will provide pilots with a fully functional replica of the F/A-18D cockpit and a 360 degree field-of-view. The out-the-window visual system will encompass the entire country of Switzerland and will be coupled with threat aircraft, in-flight missiles, and gun fire. A day/night head tracked area-of-interest display system and high resolution target imagery will be provided by Hughes' laser target projector system. Training will be further enhanced by the simulation of sustained aerodynamic g-forces to the pilot by using a g-seat/buffet system and an active g-suit.

U. S. Army National Guard helicopter crews will be able to see and attack enemy targets in darkness, smoke, and haze, with a proven night targeting system. Produced by Hughes, Cobra-Nite (C-NITE) enables gunners to accurately direct all versions of the TOW missile, and provides AH-1F Cobras with a 24-hour combat capability. It can also defeat electro-optical countermeasures. In addition to the C-NITE system modification kits to be integrated into the Cobras, Hughes will provide field test sets, training, and program support. This is the first acquisition of C-NITE systems for the National Guard.

U.S. Navy surface ships can monitor threats and fight battles with a Hughes-built display considered the standard in its field. These UYQ-21 displays consist of various display consoles, large-screen displays, automated status boards, and associated equipment and firmware required to permit the integrated operation of the system in a shipboard environment. Providing a wide range of information vital to a ship's commanders, captains, and their staffs, the system is the human-machine interface between the ship's radar and sonar sensors and its weapon systems. Hughes has produced the UYQ-21 display system for the Navy since the late 1970s.

Hughes has developed a vital tool to help electronics companies meet their greatest packaging challenge—achieving the highest density of semiconductor device performance in the smallest package, at a low cost. It is called low-temperature cofired ceramic (LTCC) packaging. LTCC is an electronic packaging technology based on the use of a ceramic tape that can be printed with conductor patterns and then fired to form a rigid body, which can interconnect semiconductors mounted on its surface in a subsequent process. Hughes' LTCC Flexline has the ability to switch rapidly from one product to another. It will be used to fabricate a variety of defense and commercial products on the same line, including multichip modules for Hughes' radars, modules for satellites and General Motors cars, and medical electronics for use in products such as pacemakers or ear implants.

Meeting the demands for high-quality thermosonic wire bonding of high pin count semiconductor devices, fine pitch hybrid microcircuits, and complex multichip modules, Hughes has built a new Automatic Wire Bonder. This Automatic Wire Bonder uses a menu-based operating system to decrease programming time and provide faster and simpler program set up. Its on-board mini-host computer provides high-speed image processing, information storage, and data retrieval for fast access to high wire count bonding programs. Incorporating the field-proven dependable design of previous Hughes-built versions, this new model is equipped with new and improved tools for increased productivity, flexibility, and reliability.

For more information write to: P.O. Box 80032, Los Angeles, CA 90080-0032

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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, or Air Force Reserve 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. Base activated in Jan. 1943; inactivated in May 1945; reactivated in Jan. 1953. Area 4,095 acres, plus 818 leased and 1,069 easement/right of way. Runway 13,440 ft., with an additional 9,000 ft. for a parallel runway and 3,500 ft. for an assault strip, both under construction. Altitude 1,376 ft. Military 3,500; civilians 550; approx. 400 TDY students (officer and enlisted) in training per month. Payroll $137.7 million. Housing: 148 officer, 652 NCO, 368 VAQ, 166 VOQ, 14 TLF. 15-bed hospital.

Andersen AFB, Guam, APO AP 96542-5000; 2 mi. N of Yigo. DSN 366-1110. PACAF base. Hq. 13th Air Force. Host unit: 36th Air Base Wing. No aircraft assigned. Associate organizations: 634th Air Mobility Support Sqdn. (AMC); 44th Aerial Port Sqdn. (AFRES); 254th Air Base Gp. (ANG); Det. 5, 750th Space Gp.; Det. 602, Air Force Office of Special Investigations (AFOSI). Navy HC-5 Helicopter Combat Support Sqdn., H-46D Sea Knight operations. Andersen serves as a logistic support and staging base for aircraft operating in the Pacific and Indian Oceans. Base activated in late 1944; named for Gen. James Roy Andersen, lost at sea between Kwajalein and Hawaii Feb. 26, 1946. General Andersen was the Chief of Staff, Hq. AAF, Pacific Ocean Areas. Area: 20,504 acres. Runways (north) 10,555 ft. and (south) 11,182 ft. Altitude 612 ft. Military 2,180; civilians 634. Payroll $104 million. Housing: 248 officer, 1,508 enlisted. Unaccompanied housing: 39 officer, 1,056 enlisted. Transient housing: 60 VOQ, 100 VAQ, 18 TLF. One USAF clinic and one Navy hospital on island.

Andrews AFB, Md. 20331-5000; 11 mi. SE of Washington, D. C. Phone (301) 981-1110; DSN 858-1110. AMC base. Home of Air Force One and gateway to the nation's capital. Host wing: 89th Airlift Wing. Responsible for presidential support and base operations; supports all branches of service, several major commands, and federal agencies. The wing also hosts Det. 302, AFOSI; Air Force Flight Standards Agency; AFOSI Academy; Air National Guard Readiness Center; 113th Fighter Wing (D. C. ANG); 459th Airlift Wing (AFRES); Det. 9, Combat Camera (1st CTCS); Naval Air Facility; Marine Aircraft Gp. 49, Det. A. 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 7,400; civilians 3,060. Payroll NA. Housing: 325 officer, 1,755 NCO, 414 off-base units, 974 UEQ, 325 transient (including 68 temporary living quarters for incoming personnel, 21 DV suites, 180 VOQ, 56 VAQ). 235-bed hospital.

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. Hq. 16th Air Force and 31st Fighter Wing. The wing maintains two LANTIRN-capable F-16 fighter squadrons, the 555th and the 510th, capable of conducting offensive and defensive air combat operations, and the 603d Air Control Sqdn. The 31st FW is the only permanent US NATO fighter wing in southern Europe. One of the oldest Italian air bases, dating to 1911; USAF began operations in 1954. Area 1,140 acres. Runway 8,596 ft. Altitude 413 ft. Military 3,000; civilians 551. Payroll $160.5 million. 647 govt.-leased housing units. 490 billeting spaces (including contracted spaces), 496 dorm bed spaces. Clinic.

Barksdale AFB, La. 71110-5000; in Bossier City. Phone (318) 456-2252; DSN 781-1110. ACC base. Hq. 8th Air Force; 2d Bomb Wing, B-52H and T-38 operations; 99th Electronic Combat Range Gp.; 49th Test Sqdn. 917th Wing (AFRES), B-52 and A-10 operations; Det. 1, 307th Civil Engineering Sqdn. RED HORSE; 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 5,876; civilians 1,144. Payroll $160 million. Housing: 105 officer, 324 enlisted, 1,488 UEQ, 226 transient, 24 TLF, 97 VOQ, 105 VAQ. 40-bed hospital.

Beale AFB, Calif. 95903-5000; 13 mi. E of Marysville. Phone (916) 634-3000; DSN 368-1110. ACC base. 9th Reconnaissance Wing; Det. 1, 12th 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 3,231; civilians 602. Payroll $113.2 million. Housing: 206 officer, 1,502 enlisted, 823 UEQ, 17 transient. 9-bed hospital.

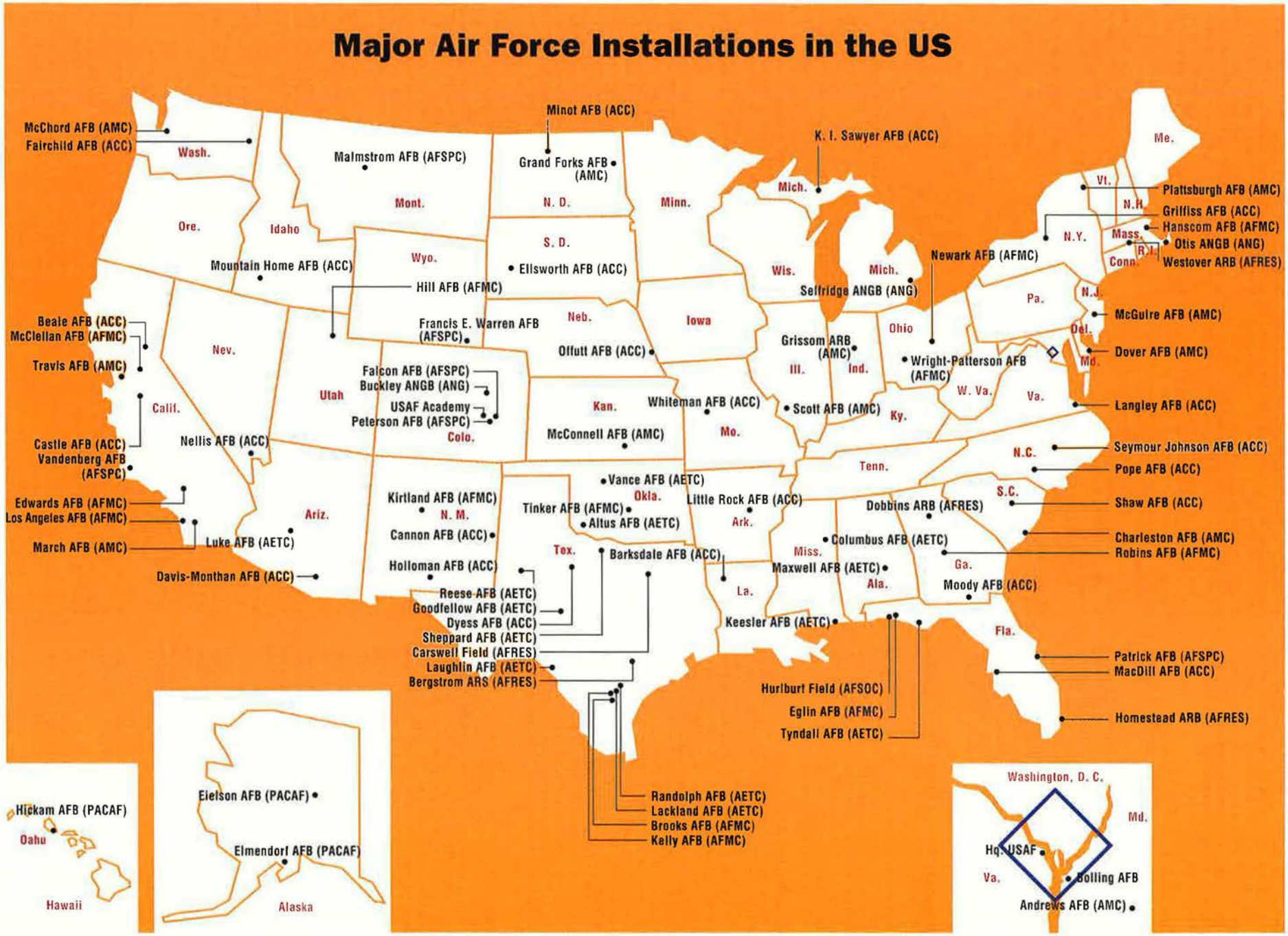
Bolling AFB, D. C. 20332-5000; 3 mi. S of US Capitol. Phone (202) 545-6700; DSN 227-0101. 11th Wing; US Air Force Honor Guard; US Air Force Band; Air Force Office of Scientific Research (AFMC); Air Force Chief of Chaplains; Air Force Surgeon General; Air Force History Support Office; Hq. Air Force Office of Special Investigations; Air Force Real Estate Agency; Air Force Medical Operations Agency; Defense Intelligence 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 1,355; civilians 925. Payroll $50 million. (Personnel and payroll apply to 11th Wing only.) Housing: 285 officer, 1,100 NCO, 220 transient. 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 70th School Sqdn. (Systems Acquisition School); 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. Runway length NA. Altitude 600 ft. Military 2,104; civilians 1,885. 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, only USAF base with EF-111A and F-111F 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 5,199; civilians 760. Payroll $173 million. Housing: 143 officer, 1,579 enlisted, 90 transient (20 VAQ, 20 VOQ, 6 DVQ, 44 TLF). 20-bed hospital.

Castle AFB, Calif. 95342-5000; 7 mi. NW of Merced. Phone (209) 726-2011; DSN 347-1110. ACC base. 93d Bomb Wing. Former training base for B-52 and KC-135 aircrews. Last B-52G departed in May 1994; last KC-135R departed in Feb. 1995. Current mission: facilitating base reuse/environmental cleanup in preparation for base's Sept. 30, 1995, closing. Castle Air Museum will remain open after base closes. Base activated in Sept. 1941; named for Brig. Gen.

Major Air Force Installations in the US



Frederick W. Castle, WW II B-17 pilot and Medal of Honor recipient. Area 3,200 acres. Runway 11,800 ft. Altitude 186 ft. Military 1,800; civilians 800. Payroll $125 million. Housing: 98 officer, 895 enlisted, 392 transient (includes 60 VAQ, 272 VOQ, 12 family quarters, 24 DVQ). Hospital closes in June 1995.

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 (AFRES Assoc.); Det. 1, 158th Fighter Gp. (Vermont ANG); Det. 17, Site Activation Task Force; Field Training Det. 317; Det. 719, AFOSI; 1st Combat Camera Sqdn. Base activated in Oct. 1942; inactivated in March 1946; reactivated in Aug. 1953. Area 6,235 acres (including auxiliary airfield). Runway 9,000 ft. Altitude 45 ft. Military 7,846 (including AFRES); civilians 1,701. Payroll $279 million. Housing: 127 officer, 850 NCO, 1,636 dormitory spaces, 75 trailer spaces, 535 transient (7 DV suites, 128 VOQ, 400 VAQ). Clinic.

Columbus AFB, Miss. 39701-1000; 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 1,415; civilians 1,366. Payroll $83 million. Housing: 246 officer, 497 NCO, 27 VAQ; 56 VOQ; 26 TLF/TLH. 7-bed hospital.

Davis-Monthan AFB, Ariz. 85707-5000; within Tucson city limits. Phone (602) 750-3900; DSN 361-1110. 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-130H electronic operations; 305th Rescue Sqdn. (AFRES), MH-60G Pave Hawk helicopter operations; Det. 1, 120th Fighter Gp. (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 6,016; civilians 1,751. Payroll $199 million. Housing: 133 officer, 1,106 enlisted, 518 transient (334 VAQ, 168 VOQ, 16 TLF). 35-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 (AFRES 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 7,115; civilians 1,302. Payroll $140 million. Housing: 108 officer, 1,448 enlisted, 686 transient (512 VAQ, 160 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); two C-130 squadrons; six T-33s. 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 4,876; civilians 352. Payroll $13.5 million. Housing: 142 officer, 846 enlisted, 122 VAQ/VOQ, 10 DVQ. 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, US Army Aviation Engineering Flight Activity, NASA's Ames Dryden Flight Research Facility, a portion of the Jet Propulsion Laboratory's test facility, and secondary landing site for space shuttle missions. 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 4,667 (including associate units); government and contract civilians 10,490. Payroll $260 million (including associate units and contractors). Housing: 629 officer (including BOQ), 2,384 enlisted (including 765 dormitory spaces and 191 BNCOQ), 161 transient (49 VAQ, 42 VOQ, 9 SNCOQ, 10 VIP/VOQ, 51 TLF), 188 trailer spaces. 15-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; USAF Air Warfare Center; 96th Air Base Wing; 46th Test Wing; 919th Special Operations Wing (AFRES); 20th Space Surveillance Sqdn.; 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 8,484; civilians 4,303 (excluding Hurlburt Field). Payroll $444.2 million (excluding Hurlburt Field). Housing: 263 officer, 2,071 enlisted, 1,200 unaccompanied enlisted units (dorm rooms), 226 trailer spaces (officer and enlisted), 88 family transient. 125-bed USAF regional hospital. AFMC clinic at Hurlburt Field.

Eielson AFB, Alaska 99702-5000; 26 mi. SE of Fairbanks. Phone (907) 377-1178; DSN (317) 377-1110. PACAF base. Host unit: 354th Fighter Wing, F-16, A-10, and OA-10 operations. Base hosts recurring Cope Thunder exercises that provide realistic combat training. Associate organizations include the Arctic Survival School (AETC); 168th Air Refueling Gp. (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 22,035 acres. Runway 14,500 ft. Altitude 534 ft. Military 2,764; full-time civilians (NAF, AAFES, Civil Service) 622 (includes ANG employees) and 399 part-time ANG members. Payroll $129 million. Housing: 102 officer, 1,188 enlisted. Unaccompanied housing: 8 officer units, 738 enlisted bed spaces (414 rooms), 206 VOQ, 240 bed spaces (179 rooms) VAQ, 6 DVQ, 2 chief suites.

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, one B-1B squadron. Associate units: 99th Wing, Air Force's focal point for strategic tactics development and bomber crew training; 366th Wing's (Mountain Home AFB, Idaho) geographically separated 34th Bomb Sqdn., B-1B; 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 4,600; civilians 525. Payroll $99 million. Housing: 301 officer, 1,783 enlisted, 232 transient units (6 DVQ, 78 VOQ, 57 VAQ, 48 crew quarters, 43 TLF). 15-bed hospital.

Elmendorf AFB, Alaska 99506-5000; bordering Anchorage. Phone (907) 552-1110; DSN (317) 552-1110. PACAF base. Hq. Alaskan Command; Hq. 11th Air Force (PACAF); Hq. Alaskan NORAD Region. Host unit: 3d Wing, F-15/F-15E fighter and C-130, C-12 airlift operations, E-3 airborne warning and control operations, and 3d Medical Center. Tenant units: Alaskan NORAD Region Operations Control Center; 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 6,772; civilians 1,153. Payroll $316.5 million. Housing: 1,644 family units, 94 VOQ, 1,301 VAQ, 1,316 UEQ. 110-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. Tenant units: 366th Crew Training Gp. (Survival School, AETC); 141st Air Refueling Wing (ANG); Det. 1, 6th Space Operations Sqdn. (AFSPC); 2d Bomb 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 2,462 ft. Military 4,246; civilians 1,853. Payroll $149.1 million. Housing: 176 officer, 1,247 NCO, 18 TLF, 1,280 BAQ, 50 VOQ, 55 VAQ. 30-bed hospital.

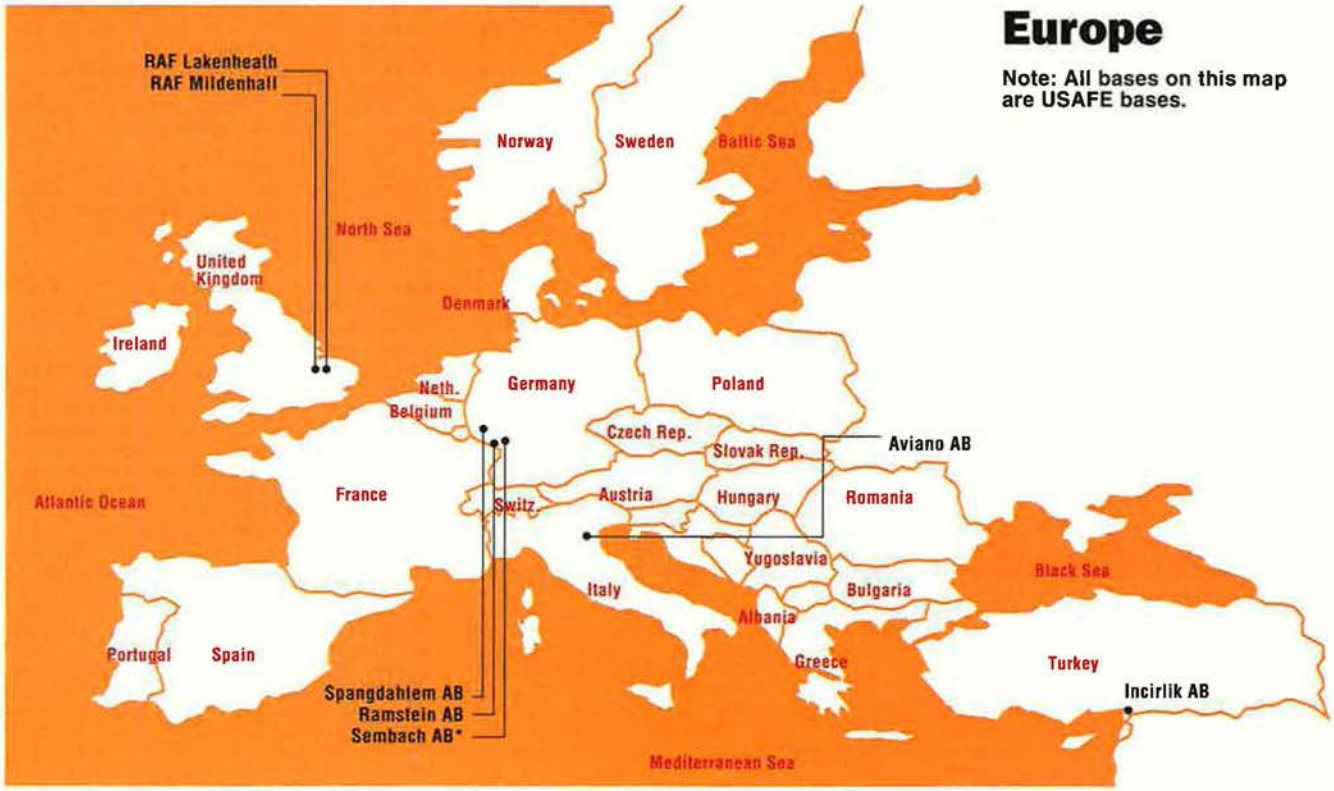
Falcon AFB, Colo. 80912-5000; 10 mi. E of Colorado Springs. Phone (719) 550-4113; DSN 560-1110. AFSPC base. Host unit: 50th Space Wing. Tenant units: 73d Space Gp.; Ballistic Missile Defense Organization National Test Facility; Air Force Space Warfare Center. Base activated in Oct. 1985. Area 3,840 acres. Runway length NA. 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 Peacekeepers 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 3,591; civilians 602. Payroll $170 million. Housing: 831 family units. 35-bed hospital.

Goodfellow AFB, Tex. 76908-5000; 2 mi. 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 members of the other military services, civilian intelligence agencies, and foreign military services; and trains all US Air Force, Army, and Marine Corps personnel in fire protection and rescue. Major units include 8th Space Warning Sqdn. (AFSPC) at Eldorado AS, the location of Southwest Pave Paws radar site; 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 3,047; civilians 756. Payroll $135 million. Housing: 19 officer, 280 NCO, 1,097 transient (950 VAQ, 117 VOQ, 30 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 Group (Minuteman III, HH-1). 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 5,422 acres. Missile complex covers an additional 7,500 sq. mi. Runway 12,350 ft. Altitude 911 ft. Military 4,992; DoD civilians 436. Payroll NA. Housing:

Major Air Force Installations Overseas



*Scheduled for partial return to host country government in Sept. 1995; USAF portion of Sembach becomes an annex of Ramstein AB.

332 officer, 1,886 enlisted, 1,139 dormitory, 137 transient. 15-bed hospital.

Griffiss AFB, N. Y. 13441-5000; 1 mi. NE of Rome. Phone (315) 330-1110; DSN 587-1110. ACC base. 416th Bomb Wing (slated for inactivation in Sept. 1995); Rome Laboratory (AFMC), Northeast Air Defense Sector (ACC, scheduled to transfer to ANG), and Defense Finance Accounting Service–Rome will remain. ANG will maintain and operate the runway after the bomb wing inactivates. Base activated Feb. 1, 1942; named for Lt. Col. Townsend E. Griffiss, killed in aircraft accident Feb. 15, 1942 (the first US airman to lose his life in Europe during WW II in the line of duty). Area 3,896 acres. Runway 11,820 ft. Altitude 504 ft.

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 C^4 systems; Geophysics Directorate of Phillips Laboratory (AFMC), center for research and exploratory development in the terrestrial, atmospheric, and space environments; five divisions of Rome Laboratory's Directorate of Electromagnetics and Reliability. 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 2,161; civilians 1,917. Payroll $263 million. Housing: 386 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 Gp. (ANG); 201st Combat Communications Gp.; 615th Air Mobility Support Gp. (AMC). Base activated in Sept. 1938; named for Lt. Col. Horace M. Hickam, air pioneer killed in crash Nov. 5, 1934, at Fort Crockett, Tex. Area 2,761 acres. Runway 12,300 ft. (joint use with Honolulu Int'l Airport). Altitude sea level. Military 3,341; civilians 1,389. Payroll $118.3 million. Housing: 566 officer, 2,103 enlisted. Unaccompanied housing: 24 officer, 1,016 enlisted, 266 VOQ, 234 VAQ. Clinic.

Hill AFB, Utah 84056-5990; 8 mi. S of Ogden. Phone (801) 777-7221; DSN 458-1110. AFMC base. Hq. Ogden Air Logistics Center. Provides Integrated Weapon System Management and logistics support for silo-based ICBMs (Minuteman and Peacekeeper); F-16 and C-130 aircraft; conventional munitions, including Maverick air-to-ground missiles and laser, infrared, and electro-optical guided bombs; and other aerospace components, such as landing gear, photographic and reconnaissance equipment, and training devices. Technology center for software and photonics. Other units include 545th Test Gp. (AFMC), which manages the Utah Test and Training Range; 388th Fighter Wing (ACC); 419th Fighter Wing (AFRES); Defense Megacenter Ogden (DISA); Hill Aerospace Museum. Base activated in Nov. 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 4,728; civilians 10,603. Payroll $510.3 million. Housing: 179 officer, 966 NCO, 40 transient. 25-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-4E 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 will arrive in early 1996 and be permanently assigned to the wing. Associate units are the 46th Test Gp. (AFMC); 4th Space Warning 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 4,800; civilians 1,290. Payroll $160 million. Housing: 191 officer, 1,360 enlisted, 310 transient (70 VAQ, 190 VOQ, 50 TLF). 8-bed hospital.

Howard AFB/Albrook AFS, Panama, APO AA 34001-5000. DSN 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); 33d Intelligence Sqdn. Established in 1928 as Bruja Point Military Reservation; later named for Maj. Charles Harold Howard. Military 2,256; civilians 734. Payroll $40.1 million. Housing: 256 officer, 918 enlisted.

Hurlburt Field, Fla. 32544-5000; 5 mi. W of Fort Walton Beach. Phone (904) 882-1110; DSN 579-1110. AFSOC base. Hq. Air Force Special Operations Command. Major tenant: 16th Special Operations Wing, equipped with MC-130E (Combat Talon I), MC-130H (Combat Talon II), AC-130H/U (Spectre Gunship), MH-53J (Pave Low), MH-60G (Pave Hawk), and HC-130N/P (Combat Shadow, located at Eglin AFB). Other tenants include 505th Command and Control Evaluation Gp., including the USAF Air Ground Operations School, USAF Battle Staff Training School (Blue Flag), and the 727th Aircraft Control Sqdn. (T); 720th Special Tactics Gp.; 23d Special Tactics Scdn.; Joint Warfare Center; USAF Special Operations School; 18th Flight Test Sqdn.; 823d Civil Engineering Sqdn. RED HORSE; Det. 1, 335th Technical Training Sqdn.; Det. 4, Air Weather Service; Field Training Det. 327; 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 7,292; civilians 758. Payroll $411.1 million. Housing: 48 officer, 632 enlisted, 258 VOQ/VAQ, 24 TLF. Medical clinic 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 rotational weapons training deployments for USAFE fighter aircraft. 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 2,094; civilians 2,055. Payroll $31.2 million. Housing: 950 units, 205 govt.-leased, 60 BOQ, 80 TLF, 592 VAQ, 259 VOQ, 628 dorm rooms. Regional hospital.

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, 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; 353d Special Operations Gp. (AFSOC), MC-130 and HC-130 operations; 82d Reconnaissance Sqdn. (ACC); 390th Intelligence Sqdn.; 633d Air Mobility Support Sqdn. (AMC). Base named for city of Kadena, Okinawa, Japan. Area 15,000 acres. Runway length NA. Military 7,300; appropriated fund civilians 5,100; nonappropriated fund civilians 800 US citizens and 545 local nationals. There are also 10,000 contractors. Payroll $210 million. Housing: 913 officer, 3,062 enlisted, 125 temporary lodging units. Unaccompanied housing: 139 officer, 2,473 enlisted, 275 VOQ, 275 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 (AFRES); AFMC engineering installation group; 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 9,491; civilians 4,236. Payroll $184 million. Housing: 287 officer, 1,666 NCO, 49 trailer spaces, 2,122 transient (366 VOQ, 1,756 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 Department aircraft as the C-5A/B, C-17, C-9, 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 and performs significant work on the T-38 fleet. The ALC also overhauls F100, TF39, and T58 engines and manages more than seventy-five percent of the USAF engine inventory, fuel and lubricants used by the Air Force and NASA, and nuclear weapons. Other major units on base: Air Intelligence Agency; Air Force Electronic Warfare Center; Joint Electronic Warfare Center; Air Force News Agency; Defense Commissary Agency; 433d Airlift Wing (AFRES); 149th Fighter Gp. (ANG); Defense Reutilization and Marketing Office; Air Force Audit Agency Office; Defense Distribution Depot; Defense Information Services Organization. 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 in a military aircraft, killed May 10, 1911. Area 4,660 acres. Runway 11,550 ft. Altitude 689 ft. Military 4,998; civilians 15,397. Payroll $691.5 million. Housing: 45 officer, 368 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 Gp. (ANG); Field Command's Defense Nuclear Agency; Sandia National Laboratories; Lovelace Biomedical and Environmental Research Institute; Department of Energy's Albuquerque Operations Office; Kirtland NCO Academy; 898th Aviation Depot Sqdn.; Air Force Security Police Agency; Interservice Nuclear Weapons School; Air Force Inspection Agency; Air Force Safety Agency. These agencies furnish nuclear, advanced weapons, and space research, development, and testing; advanced helicopter training and search-and-rescue operations; para-rescue training; and operational test and evaluation. Other major units: Albuquerque Seismological Laboratory; University of New Mexico Civil Engineering Research Facility. Base activated in Jan. 1941; named for Col. Roy C. Kirtland, air 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 5,875; civilians 13,946. Payroll $764 million. Housing: 2,122 homes. VAQ/VOQ: 130 officer, 180 enlisted. Air Force/Veterans Administration joint medical center located outside base gates.

K. I. Sawyer AFB, Mich. 49843-5000; 21 mi. S of Marquette. Phone (906) 372-6511; DSN 472-6511. ACC base. 410th Bomb Wing; Defense Reutilization and Marketing Office; Det. 205, AFOSI. Base activated in 1956; named for Kenneth Ingalls Sawyer, former county commissioner of Marquette who proposed site for county airport, who died in 1944. Area 5,214 acres. Runway 12,370 ft. Altitude 1,220 ft. Scheduled to close Sept. 30, 1995.

Kunsan AB, Republic of Korea, APO AP 96264-5000; 8 mi. SW of Kunsan City. Phone (commer-

cial, 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 Fighting Falcon in Sept. 1981, making it the first active overseas F-16 wing. Associate units include the US Army's 43d Air Defense Artillery, 1st Battalion, Echo and Foxtrot Batteries; US Army Contracting Commmand Korea. Base built by Japanese in 1938. Area 2,174 acres. Runway length NA. Altitude 29 ft. Military 2,761; US civilians 28; local nationals 361. Payroll $31.4 million. Unaccompanied housing: 263 officer, 3,697 enlisted, 46 VOQ, 120 VAQ. 6-bed hospital.

Lackland AFB, Tex. 78235-5000; 8 mi. SW of San Antonio. Phone (210) 671-1110; DSN 473-1110. AETC base. The 37th Training Wing provides basic military training and skills training for all enlisted Air Force and Air Reserve Component members. Joint service training for Air Force, Navy, and Marine personnel. Primary and advanced training in transportation. Air Force recruiters are also trained at Lackland. The base is the home of the Inter-American Air Forces Academy and Defense Language Institute English Language Center. Wilford Hall Medical Center, the Air Force's largest medical facility, with 1,009 beds, handles patient care and conducts medical training and clinical research. Base activated in 1941; named for Brig. Gen. Frank D. Lackland, early commandant of Kelly Field flying school, who died in 1943. Area 6,716 acres (including 3,973 acres at Lackland Training Annex). No runway. Altitude 745 ft. Military 6,357; civilians 4,667; students 8,433. Payroll $444.7 million. Housing: 103 officer, 617 NCO, 3,726 transient, plus 158 TLF units.

Lajes Field, Azores, Portugal, APO AE 09720-5000; Terceira Island, 900 mi. W of Portugal. 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 1,178; civilians 1,092. Payroll $39.9 million. Housing: 99 officer, 390 enlisted, 30 TLF, 178 VOQ, 701 VAQ, 6 DVQ, 4 senior NCO. 7-bed hospital.

Langley AFB, Va. 23665-5000; 3 mi. N of Hampton. Phone (804) 764-1110; DSN 574-1110. ACC base. Hq. Air Combat Command. Host unit: 1st Fighter Wing, F-15 fighter operations. Associate units: Air Operations Squadron (ACC); 480th Intelligence Gp.; Computer Systems Sqdn. (ACC); Air Combat Command Heritage of America Band; US Army TRADOC Flight Det.; Army/USAF Center for Low-Intensity Conflict; Air Force Doctrine Center. 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 10 ft. Military 8,800; civilians 2,600. Payroll $382 million. Housing: 384 officer, 1,250 NCO, 374 transient (173 VAQ, 101 VOQ, 100 TLF). 50-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 Oct. 1942; named for 1st Lt. Jack T. Laughlin, Del Rio native, B-17 pilot killed over Java Jan. 29, 1942. Area 5,239 acres. Runways 6,300 ft., 8,310 ft., and 8,850 ft. Altitude 1,080 ft. Military 1,326; civilians 987. Payroll $71.2 million. Housing: 599 units, 54 trailer spaces, 62 transient, 24 TLF. Hospital.

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. ACC base. 314th Airlift Wing, only C-130 training base in DoD, training crew members from all branches of military service and some foreign countries. Tenants include 189th Airlift Gp. (ANG); 96th Mobile Aerial Port Sqdn.; 348th USAF Recruiting Sqdn.; Det. 251, AFOSI; Det. 310, 373d Field Training Sqdn.; Det. 234, Air Force Audit Agency; Combat Aerial Delivery School; Hq. Arkansas ANG. Base activated in 1955. Area 11,373 acres. Runway 12,000 ft. Altitude 310 ft. Military 4,405; civilians 764. Payroll $133 million. Housing: 140 officer, 1,395 enlisted, 17 single-occupancy dormitories house 960 people, 348 transient (148 VAQ, 200 VOQ). 25-bed hospital.

Los Angeles AFB, Calif. 90245-4687; in South Bay Los Angeles, city of El Segundo, 3 mi. S of Los Angeles IAP. Phone (310) 363-1110; DSN 833-1110. AFMC base. Hq. of AFMC's Space and Missile Systems Center, which manages the design, development, acquisition, launch, and on-orbit checkout of DoD's space program and shares rocket booster launch with Air Force Space Command. Support unit is 61st Air Base Gp. Area 96 acres at Los Angeles AFB and 96 acres at Fort MacArthur Annex and Pacific Crest/Heights housing areas. No runway. Altitude 95 ft. Military 1,812; civilians 1,258. Payroll $150 million. Housing at Fort MacArthur Annex: 574 townhouses, 56 senior enlisted quarters, 29 VOQ, 4 DVQ, 22 TLF. Clinic, commissary, child-care center, and Air Force Family Support Center.

Luke AFB, Ariz. 85309-5000; 20 mi. WNW of downtown Phoenix. Phone (602) 856-7411; DSN 896-1110. AETC base. 56th Fighter Wing, F-15E and F-16 operations; 944th Fighter Wing (AFRES), F-16 operations; 607th Air Control Sqdn., forward air control operations. Luke, the largest fighter training base in the world, conducts USAF and allied aircrew training in the F-15E and F-16. 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 7,049; civilians 1,123. Payroll $172.9 million. Housing: 95 officer, 779 enlisted, 301 transient (137 VOQ, 124 VAQ, 40 TLF). 50-bed hospital.

MacDill AFB, Fla. 33621-5000; located on the Interbay Peninsula in southern Tampa. Phone (813) 828-1110; DSN 968-1110. ACC base. 6th Air Base 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 ABW's mission is to operate the air base for the United States' warfighting commands. Base activated Apr. 15, 1941; named for Col. Leslie MacDill, killed in an aircraft accident Nov. 8, 1938, near Washington, D. C. Area 5,600 acres. Runways 11,480 ft. (active) and 7,167 ft. (inactive). Altitude 6 ft. Military 4,593; civilians 2,185. Payroll $184 million. Housing: 130 officer, 674 enlisted. 323 transient (139 VAQ, 137 VOQ, 24 TLF, 23 DVQ). 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. Tenant unit: 43d Air Refueling Wing (AMC). 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 4,350; civilians 428. Payroll $178 million. Housing: 258 officer, 1,148 enlisted, 105 transient. Clinic.

March AFB, Calif. 92518-5000; 9 mi. SE of Riverside. Phone (909) 655-1110; DSN 947-1110. AMC base. 722d Air Refueling Wing, KC-10 operations. Associate units: 452d Air Mobility Wing (AFRES); 163d Air Refueling Gp. (California ANG); 119th Fighter Gp. (North Dakota ANG); 2d Combat Camera Sqdn.; Air Force Audit Agency Office; 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 6,810 acres. Runway 13,300 ft. Altitude 1,530 ft. Military 7,519; civilians 1,745. Payroll $191.8 million. Housing: 163 officer, 1,011 NCO, 309 transient. 90-bed hospital. Scheduled to realign to an AFRES/ANG base April 1, 1996, at which time the 452d AMW becomes the host unit.

Maxwell AFB, Ala. 36112-5000; 1 mi. WNW of Montgomery. Phone (205) 953-1110; DSN 493-1110. AETC base. 42d Air Base Wing. Hq. Air University. Air War College; Air Command and Staff College; Air Force Quality Center; 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. Civil Air Patrol–USAF; Squadron Officer School; Air Force Institute of Technology (at Wright-Patterson AFB, Ohio). Associate units: 908th Airlift Wing (AFRES); Air Force Historical Research Agency. Air University conducts professional military, graduate, and professional continuing education for precommissioned and commissioned 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 2,524 acres. Runway 7,000 ft. Altitude 168 ft. Military 3,729; civilians 4,737. Payroll $383.7 million. Housing: 265 officer, 63 senior enlisted, 313 junior enlisted, 1,212 transient (1,116 VOQ, 66 VAQ, 30 TLF). 30-bed hospital.

Maxwell AFB, Gunter Annex, Ala. 36114; 4 mi. NE of Montgomery. Phone (205) 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 Center (AFMC); Air Force Logistics Management Agency; Officer Training School. Activated Aug. 27, 1940; named for William A. Gunter, longtime mayor of Montgomery and airpower advocate who died in 1940. Area 368 acres. No runway. Altitude 220 ft. Military and civilian populations and payroll data included in Maxwell entry. Housing: 104 officer, 90 senior enlisted, 130 junior enlisted, 713 transient (209 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 (AFRES); Western Air Defense Sector. The 62d AW operates the C-141 StarLifter and is responsible for strategic airlift of personnel and cargo worldwide, on short notice, in support of national objectives. 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 4,661; civilians 1,708. Payroll $200.2 million. Housing: 117 officer, 722 NCO, 744 transient. Dispensary. Madigan Army Medical Center is the nearest regional DoD hospital, located 4 mi. SE, with 414 beds.

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 F/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 will be the support center for the F-22 (Advanced Tactical Fighter). 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 unique capability for robotic nondestructive inspection using X-ray and neutron radiography on F-111-sized aircraft. Other major units include Defense Depot–McClellan; Defense Information Systems Organization–McClellan; 1849th Electronics Installation Sqdn.; Technical Operations Division, Air Force Technical Applications Center; 4th Air Force (AFRES); US Coast

Guard Air Station, Sacramento (DoT). Named for Maj. Hezekiah McClellan, pioneer in Arctic aeronautical experiments, killed in crash May 25, 1936. Area 3,763 acres. Runway 10,600 ft. Military 3,000; civilians 10,600. Payroll $516 million. Housing: 100 officer, 564 enlisted, 19 transient. 77th Medical Gp. clinic and 77th Medical Gp. Hospital located at Mather AFB.

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. (AFRES Assoc.); 184th Bomb Gp. (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 3,334; DoD civilians 323. Payroll $111 million. Housing: 123 officer, 364 NCO, 97 transient (45 VOQ, 31 VAQ, 21 TLF).

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 (AFRES 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 3,597 acres. Runways 7,124 ft. and 10,000 ft. Altitude 133 ft. Military 10,310 (including AFRES and ANG); civilians 1,588. Payroll NA. Housing: 186 officer, 1,568 NCO, 421 transient (144 VOQ, 229 VAQ, 48 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 Gp., Minuteman III operations (AFSPC); CPT Flight/23d Bomb Sqdn. (T-38A); 54th Rescue Flight (HH-1H). 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 19,371 acres for missile sites. Runway 13,200 ft. Altitude 1,668 ft. Military 4,823; civilians 1,036. Payroll $109 million (military only). Housing: 458 officer, 1,967 enlisted, 1,495-person capacity dormitories. 45-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: 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 5,441 (total US forces); US civilians 267; local nationals 836. Payroll $188 million. Housing: 11 senior officer, 233 company/field grade officer, 1,838 enlisted. Unaccompanied housing: 120 officer, 1,207 enlisted, 176 transient (34 VAQ, 94 VOQ, 48 TLF). Unaccompanied Navy housing: 108 officer (transient), 356 enlisted (196 permanent party, 160 transient). 25-bed hospital.

Moody AFB, Ga. 31699-5000; 10 mi. NNE of Valdosta. Phone (912) 333-4211; DSN 460-1110. ACC base. 347th Wing, F-16C/D (LANTIRN-equipped), C-130E, A/OA-10; 71st Air Control Sqdn. Tenant units: 336th USAF Recruiting Sqdn.; Det. 717, AFOSI; 322d Training Detachment. 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 4,000; civilians 800. Payroll $116.2 million. Housing: 34 officer, 268 enlisted, 67 transient (19 VAQ, 36 VOQ, 12 TLF), 39 trailer spaces. 10-bed hospital with Acute Care Clinic.

Mountain Home AFB, Idaho 83648-5000; 10 mi. SW of Mountain Home. Phone (208) 828-2111; DSN 728-2111. ACC base. 366th Wing, USAF's first and only air intervention composite wing, with F-16C attack, F-15E interdiction, F-15C air-superiority, and KC-135R air refueling aircraft prepared to deploy rapidly worldwide and perform composite air intervention operations. Base activated in Aug. 1943. Area 9,112 acres. Runway 13,500 ft. Altitude 3,000 ft. Military 4,335; civilians 670. Payroll $115 million. Housing: 180 officer, 1,341 enlisted, 165 transient (102 VAQ, 43 VOQ, 20 TLF). 50-bed hospital.

Nellis AFB, Nev. 89191-5000; 8 mi. NE of Las Vegas. Phone (702) 652-1110; DSN 682-1110. ACC base. Host unit: USAF Weapons and Tactics Center. Operational elements: 57th Wing, 99th Wing (at Ellsworth AFB, S. D.). Major units within 57th Wing include the USAF Weapons School, USAF Combat Rescue School, USAF Air Demonstration Sqdn. (Thunderbirds), 57th Operations Gp., 57th Test Gp. (including 422d Test and Evaluation Sqdn.), and 57th Logistics Gp. Aircraft assigned to Nellis: A-10, F-15, F-15E, F-16, F-4G, and HH-60G. Other Nellis units include the 414th Combat Training Sqdn. (Red Flag), 549th Combat Training Sqdn. (Air Warrior), 547th Intelligence Sqdn., 554th Range Sqdn., 820th Civil Engineering Sqdn. RED HORSE, 896th Munitions Sqdn., 561st Fighter Sqdn. (F-4G "Wild Weasels"), 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 7,200; civilians 2,000. Payroll $280 million. Housing: 70 officer, 1,356 enlisted, 100 trailer spaces, 773 transient (193 VOQ, 520 VAQ, 60 TLF). 119-bed Nellis Federal Hospital, a joint Air Force–Veterans Administration venture assigned to the 554th Medical Gp.

Newark AFB, Ohio 43057-5990; 1 mi. SW of Newark. Phone (614) 522-2171; DSN 346-7000. AFMC base. Aerospace Guidance and Metrology Center repairs inertial guidance and navigation systems for most Air Force missiles and aircraft as well as a variety of inertial systems for other branches of the armed forces. Also manages the Air Force's worldwide measurement and calibration program, providing the link between the National Institutes of Science and Technology and the Air Force's 180 precision measurement equipment laboratories at bases around the world. Four tenant units. Activated as an Air Force station Nov. 7, 1962. Area 70 acres. No runway. Military 80; civilians 1,500. Payroll $70 million. Base is scheduled for closure Oct. 1, 1996.

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; Strategic Joint Intelligence Center; Hq. Strategic Communications-Computer Center; Air Force Global Weather Central; 6th Space Operations Sqdn. (AFSPC); National Airborne Operations Center (NAOC); 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 4,044 acres (including housing area and off-base sites). Runway 11,700 ft. Altitude 1,048 ft. Military 9,500; civilians 2,800. Payroll $474 million. Housing: 513 officer, 2,117 enlisted, 171 VAQ/VOQ, 60 TLF. 60-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-12F, A-10, and OA-10A operations. Tenant units: 303d Intelligence Sqdn.; 631st Air Mobility Support Sqdn. (AMC); 5th Reconnaissance Sqdn.; 31st Special Operations Sqdn. 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 senior NCO, 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; 41st Rescue Sqdn.; 71st Rescue Sqdn.; 301st Rescue Sqdn. (AFRES); 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 Space Wing 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, Civil Service). 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 (AFRES). Edward J. Peterson Air & 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 length NA. Altitude 6,200 ft. Military active-duty 4,189; reserves 1,260; civilians 1,897. Payroll $227.3 million. Housing: 107 officer, 384 NCO, 210 transient (72 VOQ, 98 VAQ, 40 TLF). Clinic.

Plattsburgh AFB, N. Y. 12903-5000; adjacent to Plattsburgh. Phone (518) 565-5000; DSN 689-5000. AMC base. 380th Air Refueling Wing. One of the oldest active military installations in the US, established 1812; AFB since 1955. Area 4,879 acres. Runway 11,758 ft. Altitude 235 ft. Military 1,539; civilians 452. Payroll $54.6 million. Housing: 218 officer, 1,421 NCO, 132 transient (60 VAQ, 49 VOQ, 23 TLF). 8-bed hospital. Scheduled to close Sept. 30, 1995.

Pope AFB, N. C. 28308-5000; 12 mi. NNW of Fayetteville. Phone (910) 394-0001; DSN 486-1110. ACC base. 23d Wing. 624th Air Mobility Support Gp. (AMC); 23d Aeromedical Evacuation Sqdn.; 23d Combat Control Sqdn.; 3d Aerial Port Sqdn. (AMC); Det. 3, MACOS (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 5,202; civilians 360. Payroll $206 million. Housing: 459 units, 1,208 dormitory spaces, 268 transient (144 officer, 116 enlisted, 8 TLF). Clinic.

RAF Lakenheath, United Kingdom, APO AE 09464-5000; 70 mi. NE of London; 25 mi. from Cambridge. Phone (commercial, from CONUS) 011-44-638-52-3000; 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 4,800; civilians 2,025. Payroll

$172 million. Housing: 1,024 units, 1,065 govt.-leased housing, 161 billeting spaces. Regional medical center.

RAF Mildenhall, United Kingdom, APO AE 09459-5000; 30 mi. NE of Cambridge. Phone (commercial, from CONUS) 011-44-638-54-3000; DSN 238-3000. Royal Air Force base. Hq. 3d Air Force (USAFE). 100th Air Refueling Wing (USAFE), KC-135R and European Tanker Task Force operations, regional logistics support. Associate units include 352d Special Operations Gp. (AFSOC); 627th Air Mobility Support Sqdn. (AMC); 95th Reconnaissance Sqdn.; 488th Intelligence Sqdn. (AIA); Naval Air Facility. Base activated in 1934; US presence began in July 1950; named after nearby town. Area 1,121 acres. Runway length NA. Altitude 33 ft. Military 4,282; civilians 1,082. Payroll $88.9 million. Housing: 43 officer, 137 enlisted; US govt.-leased housing shared with RAF Lakenheath; 421 transient (40 TLF, 212 VOQ, 169 VAQ). Medical annex.

Ramstein AB, Germany, APO AE 09094-5000: adjacent to Ramstein; 10 miles west of Kaiserslautern. Phone (commercial, from CONUS) 011-6371-113; DSN 480-1110. Hq. USAFE and Hq. Allied Air Forces Central Europe (NATO) base. Host unit: 86th Airlift Wing, C-130, C-20, C-21, T-43, and C-9. Tenant units: 621st Air Mobility Support Gp. (AMC); 623d Air Mobility Support Sqdn. (AMC). The wing commander also serves as commander of the Kaiserslautern Military Community, the largest concentration of US citizens outside the US. Base activated and US presence began in 1953. Area 10,261 acres. Runway 8,030 ft. Altitude 782 ft. Military 7,726; civilians 14,480. Payroll $325.9 million. Housing: 1,797; govt.-leased units 9; billeting units 1,078.

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.; Hq. Air Force Military Personnel Center; Hq. Air Force Management Engineering Agency; Hq. Air Force Services Agency; USAF Occupational Measurement Sqdn.; Air Force Civilian Personnel Management Center; 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 5,607; civilians 2,929. Payroll $375 million. Housing 254 officer, 765 NCO, 1,107 transient (172 VAQ, 357 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. Military 1,326; civilians 446. Payroll $45.2 million. Housing: 153 officer, 243 NCO, 83 transient (8 suites, 25 TLF, 34 VOQ, 16 VAQ). Clinic.

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, E-3 AWACS 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 Worldwide Military Command and Control System. Warner Robins is the lead ALC for the National Aerospace Plane technology and demonstration program. In Apr. 1991, Robins AFB was selected as the US main operating base for the E-8 Joint STARS aircraft. Other major units include Hq. Air Force Reserve (AFRES); 78th Air Base Wing (AFMC); 19th Air Refueling Wing (AMC); 5th Combat Communications Gp. (ACC); 78th Communications-Computer Systems Gp. (AFMC); 9th Space Warning Sqdn. (AFSPC). 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 4,760; civilians 13,260. Payroll $768 million. Housing: 245 officer, 1,149 NCO, 40 TLF, 137 VOQ. 20-bed hospital.

Sawyer AFB (see K. I. Sawyer AFB).

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 C^4 Agency; Hq. US Transportation Command; Hq. Air Weather Service; Environmental Technical Applications Center; USAF Medical Center, Scott; 932d Airlift Wing (AFRES 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 3,000 acres. Runway 7,061 ft. Altitude 453 ft. Military 6,600; civilians 3,550. Payroll $466 million. Housing: 306 officer, 1,392 NCO, plus 104 spaces for privately owned trailers, 300 transient. 83-bed hospital; 100-bed aeromedical staging facility.

Sembach AB, Germany, APO AE 09130-5000; 9 mi. NE of Kaiserslautern. Phone (commercial, from CONUS) 011-49-6302-67-113; DSN 496-1110. USAFE base. Hq. 17th Air Force (USAFE). Major associate units include USAFE Air Ground Operations School; 617th Regional Support Gp.; Defense Commercial Communications Office; 1st Combat Communications Sqdn. Base activated in 1930; US presence began in July 1953. Named after a nearby farming community. Area 862 acres. Runway length NA. Altitude 1,037 ft. Military 2,617; civilians 600. Payroll $72.8 million. Housing: 74 officer, 420 enlisted. Billeting: 73 officers, 330 enlisted, 4 chief master sergeant suites. Clinic. Base scheduled for partial return to host government in Sept. 1995, when the USAF portion of Sembach becomes an annex of Ramstein AB.

Seymour Johnson AFB, N. C. 27531-5000; within city limits of Goldsboro. Phone (919) 736-5400; DSN 488-1110. ACC base. 4th Wing, F-15E fighter and KC-10 tanker operations; 916th Air Refueling Wing (AFRES), KC-10 operations. Base activated June 12, 1942; named for Navy Lt. Seymour A. Johnson, Goldsboro native, killed Mar. 5, 1941, in aircraft accident in Maryland. Area 3,233 acres. Runway 11,758 ft. Altitude 110 ft. Military 4,775; civilians 1,223. Payroll $160.7 million. Housing: 154 officer, 1,544 enlisted, 8 dorms, 46 VOQ, 66 VAQ, 7 DV, 8 Senior NCO, 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 and A/OA-10 close air support/forward air control 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 6,000; civilians 1,100. Payroll $140 million. Housing: 170 officer, 1,534 enlisted, 294 transient (164 VAQ, 90 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; the 882d Training Gp., which provides training in biomedical sciences, dentistry, health service administration, medical readiness, medicine, nursing, and the Physician Assistant Training Program; the 982d Training Gp., which provides weapon systems 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 April 9, 1941. Area 6,100 acres. Runways 7,100 ft., 8,800 ft., and 13,100 ft. Altitude 1,015 ft. Military 8,256; civilians 3,655. Payroll $234 million. Housing: 171 officer, 1,058 NCO, 6,245 transient (1,427 VAQ, 3,666 UPH, 664 UEPH, 52 TLF, 92 UOQ, 344 VOQ). 90-bed hospital.

Spangdahlem AB, Germany, APO AE 09126-5000; 8 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 F-16s, F-15s, and A-10s. 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 4,650; civilians 750. Payroll $168 million. Housing: 157 officer, 2,079 enlisted, 500 govt.-leased units, 172 billeting spaces.

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 furnishes logistics support for bombers, jet engines, instruments, and electronics. Tinker is home to eight major DoD, Air Force, and Navy activities, including the 552d Air Control Wing (ACC); 507th Air Refueling Wing (AFRES), Oklahoma's only Air Force Reserve 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 (DISA), which manages Tinker's computer systems and services 110 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 8,357; civilians 13,407. Payroll $765 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 (AFRES 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 12,082; civilians 3,517. Payroll $407 million. Housing: 372 officer, 2,092 enlisted, 3,546 enlisted dormitory spaces, 823 transient (79 TLF, 203 VOQ, 541 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; 475th Weapons Evaluation Gp.; Air Force Civil Engineer Support Agency; 325th Training Sqdn.; 17th Crew Training Sqdn. (USAF Water Survival School). 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 4,875; civilians 1,369. Payroll $181 million. Housing: 1,069 family units. 35-bed hospital.

US Air Force Academy, Colo. 80840-5025; N of Coloraco Springs. Phone (719) 472-1818; DSN 259-3110. Direct Reporting Unit. Established Apr. 1, 1954. Moved to permanent location in Aug. 1958. Aircraft flown: 90 trainers consisting of T-3A aerobatics trainers, T-41C basic trainers; TG-3 and TG-4 gliders, TG-7A motorized gliders, SGS-2-33A gliders; ASK-21 and 126E sailplanes; UV-18 jump planes, Cessna 150s. Area 18,500 acres. Runways 2,300 ft., 3,500 ft., and 4,500 ft. Altitude 7,280 ft. Military 1,993; cadets 4,000; civilians 1,818. Payroll $198 million. Housing: 619 officer, 609 enlisted, 70 transient, 27 temporary family quarters. 55-bed hospital.

Vance AFB, Okla. 73705-5000; 3 mi. SSW of Enid. Phone (405) 237-2121; DSN 940-2121. AETC base. 71st Flying Training Wing, 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 831; civilians 1,404 (approx. 1,200 contract employees). Payroll $71.3 million. Housing: 132 officer, 98 enlisted, 36 transient, 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. 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. 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 length NA. Altitude 400 ft. Military 3,255; civilians 1,387; civilian contractors 3,835. Payroll $103 million (military and civilians). Housing: 494 officer, 1,499 NCO, 172 trailer spaces, 400 transient. 45-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 975-6123. ACC base. Host unit: 509th Bomb Wing, activated Apr. 1, 1993. It received its first of 20 B-2 bombers Dec. 17, 1993. The 351st Missile Wing is a tenant unit and is deactivating its 150 Minuteman II ICBMs. The wing will inactivate in June 1995. 442d Fighter Wing (AFRES). 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 3,793; civilians 440. Payroll data NA. Housing: 195 officer, 775 enlisted, 137 transient (12 three-bdrm. guest houses, 53 VAQ, 68 VOQ, 4 DVQ). 30-bed hospital.

Wright-Patterson AFB, Ohio 45433; 10 mi. ENE of Dayton. Phone (513) 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 (AFRES); 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 recently became part of the Aviation Heritage National Historic Park and is open to the public. Area 8,145 acres. Runway 19,600 ft. Altitude 824 ft. Military 8,505; civilians 14,628. Payroll (FY 1993) $948 million. Housing: 732 officer, 1,629 NCO. 301-bed hospital.

Yokota AB, Japan, APO AP 96328-5000; approx. 28 mi. W of Tokyo. Phone (commercial, from CONUS) 011-81-0425-2511, ext. 7020; DSN 225-7020. PACAF base. Hq. US Forces, Japan; Hq. 5th Air Force, 630th Air Mobility Support Sqdn. (AMC). Host unit: 374th Airlift Wing (PACAF), C-130, UH-1N, C-9, and C-21 operations. Primary aerial port in Japan. Base opened as Tama AAF by Japanese in 1940. Area 1,750 acres. Runway 11,000 ft. Altitude 457 ft. Military 4,509; US civilians 2,149; local nationals 1,406. Payroll $160 million. Housing: 581 officer, 1,901 enlisted, 53 TLF. Unaccompanied housing: 232 officer, 1,387 enlisted, 57 SNCOQ, 211 VOQ, 193 VAQ. 30-bed hospital.

Minor Installations

In addition to the installations listed above, the Air Force has a number of minor installations. These Air Force stations (AFS) and air stations (AS) 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.

Arnold AS, Tenn. 37389 (AFMC)	DSN 340-5011
Avon Park AS, Fla. 33825 (ACC)	DSN 968-1110
Cape Canaveral AS, Fla. 32925-5000 (AFSPC)	DSN 467-1110
Cape Cod AS, Mass. 02561-9314 (AFSPC)	DSN 557-2202
Cavalier AS, N. D. 58220-5000 (AFSPC)	DSN 330-3292
Cheyenne Mountain AS, Colo. 80914-5515 (AFSPC)	DSN 268-1011
Clear AS, Alaska APO AP 99704 (AFSPC)	DSN 585-6416
Duke Field AS, Fla. 32542-6005 (AFMC)	DSN 875-1110
Eareckson AS, Alaska APO AP 96512-5000 (PACAF)	DSN 317-392-3000
Eldorado AS, Tex. 76936-5000 (AFSPC)	DSN 477-4220
Gila Bend AS, Ariz. 85337-5000 (ACC)	DSN 853-5220
Lowry AS, Colo. 80230-5000 (AETC)	DSN 926-1110
New Boston AS, N. H. 03031-5000 (AFSPC)	DSN 881-1550
Onizuka AS, Calif. 94088-3430 (AFSPC)	DSN 561-3110
Pirinclik AS (Turkey), APO AE 09825 (USAFE)	DSN 679-1110
RAF Alconbury (UK), APO AE 09470 (USAFE)	DSN 223-1110
RAF Chicksands (UK), APO AE 09465-5000 (USAFE)	DSN 234-1110[a]
RAF Croughton (UK), APO AE 09494 (USAFE)	DSN 236-1110
Thule AB (Greenland), APO AE 09704-5000 (AFSPC) (ask for Thule operator)	DSN 834-1211
Woomera AS (Australia), APO AP 96552 (AFSPC)	DSN 626-1636

[a]Returns to UK in late 1995

ANG and AFRES Bases

Notes: This section of the Guide consolidates major Air National Guard and Air Force Reserve bases into a single listing. Most ANG locations are listed according to the airports whose facilities they share. AFRES units are listed by the names of their bases and are designated as AFRES facilities. There are, in addition, some ANG and AFRES 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 Gp. (ANG). ANG area 116 acres. Runway length NA. Altitude 346 ft. Military 850, full-time personnel 291. Payroll $18.5 million. 6-bed dispensary.

Anchorage, Alaska (Kulis ANGB at Anchorage International Airport) 99502. Phone (907) 249-1444; DSN 317-626-1659. 176th Gp. (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 length NA. Altitude 124 ft. Military 702, full-time personnel 418. Payroll $30.0 million. 6-bed hospital.

Atlantic City Airport, N. J. 08232-9500; 10 mi. W of Atlantic City. Phone (609) 645-6000; DSN 455-6000. 177th Fighter Gp. (ANG). Area 286 acres. Runway length NA. Altitude 76 ft. Military 644, full-time support 331. Payroll $19.9 million.

Baltimore, Md. (Martin State Airport) 21220-2899; 8 mi. E of Baltimore. Phone (410) 780-8270; DSN 243-6210. 175th Fighter Gp. (ANG); 135th Airlift Gp. (ANG). Area 175 acres. Runway length NA. Altitude 24 ft. Military 1,420, full-time personnel 483. Payroll $31.2 million. Clinic.

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 length NA. Altitude 192 ft. Military 929, full-time personnel 377. Payroll $22.0 million. Small BX.

Barnes Municipal Airport, Mass. 01085; 3 mi. N of Westfield. Phone (413) 568-9151; DSN 636-9210. 104th Fighter Gp. (ANG). Area 134 acres. Runway length NA. Altitude 270 ft. Military 1,069, full-time personnel 314. Payroll $21.0 million.

Bergstrom ARS, Tex. 78719-2557; 7 mi. SE of Austin. Phone (512) 389-0444; DSN 685-1110. AFRES base. 924th Fighter Wing, F-16 operations; Hq. 10th Air Force (AFRES); Ground Combat Readiness Center (AFRES). Area 450 acres. Runway 12,250 ft. Altitude 541 ft. Reservists 1,200, civilians 350. Activated as a base Sept. 22, 1942. Named for Capt. John A. E. Bergstrom, first Austin serviceman killed in WW II, who died Dec. 8, 1941, at Clark Field, the Philippines. Deactivated as an active-duty base Sept. 30, 1993. City of Austin converting base to new airport, due to open in 1998. Housing: 6 Chief suites, 6 DV suites, 94 rooms. No BX or commissary facilities.

Birmingham Airport, Ala. 35217. Phone (205) 841-9200; DSN 778-2210. 117th Air Refueling Wing (ANG). Area 86 acres. Runway length NA. Altitude 650 ft. Military 1,020, full-time personnel 309. Payroll $21.8 million.

Boise Air Terminal, Idaho (Gowen Field) 83707; 6 mi. S of Boise. Phone (208) 389-5011; DSN 941-5011. 124th Fighter Gp. (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 length NA. Altitude 2,858 ft. Military 777, full-time personnel 508. Payroll $28.2 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 (203) 292-2526; DSN 636-8310. 103d Fighter Gp. (ANG); ARNG aviation battalion. Base named for Lt. Eugene M. Bradley, killed in P-40 crash in Aug. 1941. Area 126 acres. Runway length NA. Altitude 173 ft. Military 894, full-time personnel 326. Payroll $20.4 million.

Buckley ANGB, Colo. 80011; 8 mi. E of Denver. Phone (303) 340-9555; DSN 877-9011. 140th Fighter Wing (ANG); 154th Tactical Control Gp.; 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 length NA. Altitude 5,663 ft. Military 1,081, full-time personnel 657 (including 219 Title 5 civilians). Payroll $36.0 million. Dispensary.

Burlington International Airport, Vt. 05401; 3 mi. E of Burlington. Phone (802) 660-5215; DSN 220-5210. 158th Fighter Gp. (ANG). Area 241 acres. Runway length NA. Altitude 371 ft. Military 657, full-time personnel 375. Payroll $21.2 million.

Capital Municipal Airport, Ill. 63707-5000; 2 mi. NW of Springfield. Phone (217) 753-8850; DSN 892-8210. 183d Fighter Gp. (ANG). Area 206 acres. Runway length NA. Altitude 592 ft. Military 816, full-time personnel 289. Payroll $18.0 million. Dispensary.

Carswell Field, Tex. 76127-6200; 7 mi. WNW of downtown Fort Worth. Phone (817) 782-5000; DSN 739-1110. AFRES base. 301st Fighter Wing (AFRES), F-16 operations. Base activated Aug. 1942; named Jan. 30, 1948, for Maj. Horace S. Carswell, Jr., native of Fort Worth, WW II B-24 pilot and posthumous Medal of Honor recipient. Area approximately 322 acres. Runway 12,000 ft. Altitude 650 ft. Military 8, civilians 575, Reservists 1,400. Payroll $24.7 million. Carswell will pass to Navy control in late FY 1995 and become NAS/JRB Fort Worth.

Channel Islands ANGB, Point Mugu, Calif. 93041-4001. Phone (805) 986-8000; DSN 893-7000. 146th Airlift Wing (ANG). Area 86 acres. Runway length NA. Altitude 12 ft. Military 1,111, full-time personnel 316. Payroll $22.4 million.

Charlotte/Douglas International Airport, Charlotte, N. C. 28208. Phone (704) 391-4100; DSN 583-9210. 145th Airlift Gp. (ANG). Area 79 acres. Runway length NA. Altitude 749 ft. Military 1,257, full-time personnel 327. Payroll $21.9 million. Clinic.

Cheyenne Municipal Airport, Cheyenne, Wyo. 82001. Phone (307) 772-6201; DSN 943-6201. 153d Airlift Gp. (ANG). Area 71 acres. Runway length NA. Altitude 6,156 ft. Military 744, full-time personnel 251. Payroll $16.3 million.

Dannelly Field, Ala. 36196; 7 mi. SW of Montgomery. Phone (205) 284-7100; DSN 385-7200. 187th Fighter Gp. (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 length NA. Altitude 221 ft. Military 1,231, full-time personnel 370. Payroll $23.7 million. Dispensary.

Des Moines International Airport, Iowa 50321; in city of Des Moines. Phone (515) 287-9210; DSN 939-8210. 132d Fighter Wing (ANG). Area 113 acres. Runway length NA. Altitude 957 ft. Military 712, full-time personnel 304. Payroll $18.4 million.

Dobbins ARB, Ga. (Marietta) 30069-5010; 16 mi. NW of Atlanta. Phone (404) 421-4623; DSN 925-4623. AFRES base. Hq. 22d Air Force (AFRES); 94th Airlift Wing (AFRES); 116th Fighter Wing (ANG); 151st Military Intelligence Battalion (ARNG); 345th Medical Company (USAR). Base activated 1943. Named for Capt. Charles Dobbins, WW II pilot killed in action near Sicily. Area 1,660 acres. Runway 10,000 ft. Altitude 1,068 ft. AFRES active-duty 50, civilians 628, Reservists 2,011. Payroll $45 million. ANG military 1,212, full-time personnel 414. Payroll $27.8 million. USAR: active-duty 16, Reservists 69. NAS Atlanta and Lockheed Aeronautical Systems Co./Defense Plant 6 adjoin Dobbins ARB and use airfield facilities. Dispensary.

Duluth International Airport, Minn. 55811-5000; 5 mi. NW of Duluth. Phone (218) 727-6886; DSN 825-7210. 148th Fighter Gp. (ANG). Area 329 acres. Runway length NA. Altitude 1,429 ft. Military 645, full-time personnel 380 (including 19 Title 5 civilians). Payroll $23.5 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 Gp. (ANG). Area 349 acres. Runway length NA. Altitude 556 ft. Military 878, full-time personnel 257. Payroll $17.2 million. Dispensary.

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 Gp. (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 213 acres. Runway length NA. Altitude 40 ft. Military 896, full-time personnel 379. Payroll $24.7 million.

Forbes Field, Kan. 66619-5000; 2 mi. S of Topeka. Phone (913) 231-4210; DSN 720-4210. 190th Air Refueling Gp. (ANG). Area 200 acres. Runway length NA. Altitude 1,079 ft. Military 641, full-time personnel 334 (including 32 Title 5 civilians). Payroll $18.8 million.

Fort Smith Municipal Airport, Ark. 72906. Phone (501) 648-5210; DSN 962-8210. 188th Fighter Gp. (ANG). Area 98 acres. Runway length NA. Altitude 468 ft. Military 763, full-time personnel 276. Payroll $17.2 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 139 acres. Runway length NA. Altitude 800 ft. Military 773, full-time personnel 329. Payroll $19.9 million.

Francis S. Gabreski International Airport, Westhampton Beach, N. Y. 11978-1294. Phone (516) 288-7300; DSN 456-7300. 106th Rescue Gp. (ANG). Named for Col. Francis S. Gabreski, third leading USAAF/USAF ace of all time. Area 70 acres. Runway length NA. Altitude 67 ft. Military 863, full-time personnel 261. Payroll $18.5 million.

Fresno Air Terminal, Calif. 93727-2199; 5 mi. NE of Fresno. Phone (209) 454-5100; DSN 949-5100. 144th Fighter Wing (ANG). Area 127 acres. Runway length NA. Altitude 332 ft. Military 622, full-time personnel 346. Payroll $20.8 million.

General Mitchell International Airport/ARS, Wis. 53207-6299; 3 mi. S of Milwaukee. AFRES base. Runway 9,690 ft. Altitude 723 ft. ANG and AFRES have separate telephone lines and facilities. ANG (414) 747-4410; DSN 580-8410. 128th Air Refueling Gp. (ANG). ANG area 111 acres. ANG military 668, full-time personnel 276. Payroll $17.4 million. AFRES phone (414) 482-5000; DSN 950-5000. 440th Airlift Wing (AFRES). AFRES area 103 acres. AFRES full-time personnel and civilians 350, Reservists 1,183. Payroll $18.9 million.

Greater Peoria Airport, Ill. 61607-1498; 7 mi. SW of Peoria. Phone (309) 791-2282; DSN 724-2282. 182d Airlift Gp. (ANG). Area 386 acres. Runway length NA. Altitude 624 ft. Military 854, full-time personnel 303. Payroll $20.1 million. Dispensary.

Great Falls International Airport, Mont. 59401-5000; 5 mi. SW of Great Falls. Phone (406) 791-2282; DSN 279-2282. 120th Fighter Gp. (ANG). Area 139 acres. Runway length NA. Altitude 3,674 ft. Military 676, full-time

personnel 353. Payroll $21.7 million. Dispensary.

Grissom ARB, Ind. 46971-5000; 15 mi. N of Kokomo. Phone (317) 688-5211; DSN 928-1110. AFRES base. 434th Air Refueling Wing (AFRES) and its two KC-135 Stratotanker squadrons. Activated in Jan. 1943 as Bunker Hill Naval Air Station, 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 AFRES base Oct. 1, 1994. Area 1,126.5 acres. Runway 12,500 ft. Altitude 800 ft. Military 1,281, civilians 797. Payroll $27.4 million. Housing: 198 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); ARNG Transportation Repair Shop; 173d Civil Engineering Flt. An air-to-ground gunnery range is located 70 mi. N of site. Area 214 acres. Runway length NA. Altitude 28 ft. Military 295, full-time personnel 116. Payroll $7.2 million. 2-bed dispensary.

Hancock Field, 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 376 acres. Runway length NA. Altitude 421 ft. Military 935, full-time personnel 365. Payroll $22.3 million. Dispensary.

Harrisburg International Airport, Pa. 17057; 10 mi. E of Harrisburg. Phone (717) 948-2200; DSN 430-9200. 193d Special Operations Gp. (ANG). ANG area 39 acres. Runway length NA. Altitude 310 ft. Military 1,414, full-time personnel 477 (including 4 Title 5 civilians). Payroll $20.1 million.

Hector International Airport, Fargo, N. D. 58105-5536. Phone (701) 237-6030; DSN 362-8110. 119th Fighter Gp. (ANG). Area 209 acres. Runway length NA. Altitude 900 ft. Military 719, full-time personnel 362. Payroll $22.9 million.

Homestead ARB, Fla. 33039; 5 mi. NNE of Homestead. Phone (305) 224-7303; DSN 791-7303. AFRES base. 482d Fighter Wing (AFRES); 301st Rescue Sqdn. (AFRES); Det. 1, 125th Fighter Gp. (Fla. ANG, NORAD). Limited billeting. No medical facilities. 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 still under reconstruction.

Hulman Regional Airport, Ind. 47803-5000; 5 mi. E of Terre Haute. Phone (812) 877-5210; DSN 724-1210. 181st Fighter Gp. (ANG). Area 279 acres. Runway length NA. Altitude 585 ft. Military 809, full-time personnel 309. Payroll $20 million. 5-bed dispensary.

Jacksonville International Airport, Fla. 32229; 15 mi. NW of Jacksonville. Phone (904) 741-7100; DSN 460-7100. 125th Fighter Gp. (ANG). Area 332 acres. Runway length NA. Altitude 26 ft. Military 1,137, full-time personnel 436. Payroll $28.8 million. 5-bed dispensary.

Joe Foss Field, Sioux Falls, S. D. 57104; N side of Sioux Falls. Phone (605) 333-5700; DSN 939-7700. 114th Fighter Gp. (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 South Dakota ANG. Area 166 acres. Runway length NA. Altitude 1,428 ft. Military 697, full-time personnel 301. Payroll $16.8 million.

Key Field, Meridian, Miss. 39302-1825; located at municipal airport near Hwys. 20 and 59. Phone (601) 484-9000; DSN 778-9210. 186th Air Refueling Gp. (ANG); host to 238th Combat Communications Sqdn. (ANG). Area 116 acres. Runway length NA. Altitude 297 ft. Military 787, full-time personnel 320. Payroll $20.6 million. Dispensary.

Klamath Falls International Airport (Kingsley Field), Ore. 97603-0400; 5 mi. SE of Klamath Falls. Phone (503) 883-6350; DSN 830-6350. 114th Fighter Training Sqdn. (ANG); 142d OLAD (ANG). Area 425 acres. Runway length NA. Altitude 4,000 ft. Military 59, full-time personnel 329 (includes 10 Title 5 civilians). Payroll $17.1 million. Clinic.

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 length NA. Altitude 589 ft. Military 1,353, full-time personnel 451. Payroll $31.1 million.

Lincoln Municipal Airport, Neb. 68524-1897; 1 mi. NW of Lincoln. Phone (402) 473-1233; DSN 926-1210. 155th Air Refueling Gp. (ANG). Also hosts ARNG unit. Area 175 acres. Runway length NA. Altitude 1,207 ft. Military 695, full-time personnel 310. Payroll $17.8 million. Tactical clinic.

Mansfield Lahm Airport, Ohio 44901-5000; 3 mi. N of Mansfield. Phone (419) 521-0100; DSN 696-6210. 179th Airlift Gp. (ANG). Airport named for nearby city and aviation pioneer Brig. Gen. Frank P. Lahm. Area 224 acres. Runway length NA. Altitude 1,296 ft. Military 688, full-time personnel 215. Payroll $14.6 million. Clinic. Coast Guard exchange.

McEntire ANGB, S. C. 29044; 12 mi. E of Columbia. Phone (803) 695-6201; DSN 583-8201. 169th Fighter Gp. (ANG). Also host to 240th Combat Communications Sqdn. (ANG) and Army Guard aviation unit. Base named for ANG Brig. Gen. B. B. McEntire, Jr., killed in F-104 accident in 1961. Area 2,473 acres. Runway length NA. Altitude 250 ft. Military 997, full-time personnel 343 (including 4 Title 5 civilians). Payroll $21.6 million. Dispensary.

McGhee Tyson Airport, Tenn. 37901; 10 mi. SW of Knoxville. Phone (615) 985-3200; DSN 266-8200. Host to 134th Air Refueling Gp. (ANG). Tenants include 228th Combat Communications Sqdn. and ANG's I. G. Brown Professional Military Education Center. Area 271 acres. Runway length NA. Altitude 980 ft. Military 927, full-time personnel 376. Payroll $16.3 million. Dispensary.

Memphis International Airport, Tenn. 38181-0026; within Memphis city limits. Phone (901) 369-4111; DSN 966-8210. 164th Airlift Gp. (ANG). ANG occupies 99 acres. Runway length NA. Altitude 332 ft. Military 787, full-time personnel 240. Payroll $16.3 million. Clinic.

Minneapolis–St. Paul International Airport/ARS, Minn. 55450-2000; in Minneapolis, near confluence of the Mississippi and Minnesota rivers. AFRES station. Runway length NA. Altitude 840 ft. ANG and AFRES have separate phones and facilities. ANG phone (612) 725-5631; DSN 825-5631. 133d Airlift Wing (ANG) flies C-130s. ANG area 128 acres. Military 1,089, full-time personnel 273. Payroll $19.9 million. AFRES phone (612) 725-5011; DSN 825-5110. 934th Airlift Wing (AFRES) flies C-130s. AFRES area 300 acres. Full-time personnel 141, civilians 199, Reservists 1,100. Payroll $24.3 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. (AFRES). Lodging and BX available.

Nashville Metropolitan Airport, Tenn. 37217-0267; 6 mi. SE of Nashville. Phone (615) 361-4600; DSN 788-6210. 118th Airlift Wing (ANG). Area 85 acres. Runway length NA. Altitude 597 ft. Military 1,089, full-time personnel 339. Payroll $22.1 million.

Naval Air Station Dallas (Hensley Field), Tex. 75211. Phone (214) 269-3200; DSN 874-3200. 136th Airlift Wing (ANG). Area 49 acres. Runway length NA. Altitude 495 ft. Military 918, full-time personnel 263. Payroll $17.5 million.

Naval Air Station Moffett Field, Calif. 94035; 2 mi. N of Mountain View. ANG phone (415) 404-9129; DSN 494-9129. 129th Rescue Gp. (ANG). Area 13 acres. Runway length NA. Altitude 34 ft. Military 1,053, full-time personnel 360. Payroll $22.8 million.

Naval Air Station/Joint Reserve Base New Orleans (Alvin Callender Field), La. 70143-5012; 15 mi. S of New Orleans. Area 3,245 acres. Runway 8,000 ft. Altitude 3 ft. ANG and AFRES have separate phones and facilities. ANG phone (504) 391-7046; DSN 457-8300. 159th Fighter Gp. (ANG). ANG military 1,146, full-time personnel 428. Payroll $26.8 million. AFRES phone (504) 393-3011; DSN 363-3011. 926th Fighter Wing (AFRES). Military 980, full-time personnel 245. Payroll $17 million. NAS/JRB New Orleans opened in 1958 and was the first joint Air Reserve training facility. Field named for Alvin A. Callender, who served with the British Royal Flying Corps during WW I and was shot down over France in 1918. Dispensary.

New Castle County Airport, Del. 19720; 5 mi. S of Wilmington. Phone (302) 323-3500; DSN 445-7500. 166th Airlift Gp. (ANG); ARNG aviation company. Area 57 acres. Runway length NA. Altitude 80 ft. Military 762, full-time personnel 237. Payroll $15.7 million. 2-bed dispensary.

Niagara Falls International Airport/ARS, N. Y. 14304-5000; 6 mi. E of Niagara Falls. Phone (716) 236-2000; DSN 238-2000. AFRES base. 914th Airlift Wing (AFRES); 107th Fighter Gp. (ANG). Base activated in Jan. 1952. Area 979 acres (ANG 104 acres). Runway length NA. Altitude 590 ft. AFRES: Reservists 1,200, civilians 367. ANG: military 572, full-time personnel 339. Total payroll $57 million. (ANG payroll $19.7 million).

O'Hare International Airport/ARS, Ill. 60666-5023; 22 mi. NW of Chicago's Loop. Phone (312) 694-6917; DSN 930-6917. AFRES base. 928th Airlift Wing (AFRES); 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 349 acres (ANG 36 acres). Runway length NA. Altitude 643 ft. Reservists 1,550, full-time personnel and civilians (all units) 419, Illinois ANG 955, full-time personnel 325. Total payroll for facility $74.5 million. (ANG payroll $20.6 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 Army National Guard Training Site; 26th Aviation Brigade (ARNG); 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 length NA. Altitude 132 ft. ANG military 956, full-time personnel 689 (including 246 Title 5 civilians). Payroll $37.9 million.

Pease ANGB, Portsmouth, N. H. 03803-6505. Phone (603) 430-2453; DSN 852-2453. 157th Air Refueling Gp. (ANG). Area 229 acres. Runway length NA. Altitude 101 ft. Military 658, full-time personnel 277 (including 2 Title 5 civilians). Payroll $17.2 million.

Pittsburgh International Airport/ARS, Pa. 15108-4403; 15 mi. NW of Pittsburgh. AFRES

base. Runway length NA. Altitude 1,203 ft. ANG and AFRES have separate phones and facilities. 171st Air Refueling Wing (ANG); phone (412) 269-8359; DSN 277-8359. ANG area 179 acres. ANG military 1,122, full-time personnel 457. Payroll $29.3 million. AFRES phone (412) 474-8000; DSN 277-8000. 911th Airlift Wing (host unit). AFRES area 176 acres. AFRES military 26, full-time personnel 142, civilians 222, Reservists 1,166. Payroll $23.3 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) 335-4000; DSN 638-4000. 142d Fighter Gp. (ANG); 244th Combat Communications Sqdn. (ANG); 272d Combat Communications Sqdn. (ANG); 12th Special Forces Gp. (USAR); Oregon Wing, CAP. Also host to 939th Rescue Wing (AFRES). Area 246 acres. Runway length NA. Altitude 26 ft. Military 1,060, full-time personnel 544 (including 51 Title 5 civilians). Payroll $33.3 million.

Puerto Rico International Airport (Muniz ANGB), Puerto Rico 00914; E of San Juan. Phone (809) 253-5100; DSN 860-9210. 156th Fighter Gp. (ANG). Base named for Lt. Col. José A. Muniz, killed in aircraft accident July 4, 1960. Area 86 acres. Runway length NA. Altitude 9 ft. Military 1,073, full-time personnel 346. Payroll $22.9 million.

Quonset State Airport, R. I. 02852; 20 mi. S of Providence. Phone (401) 885-3960; DSN 476-3210. 143d Airlift Gp. (ANG). Area 79 acres. Runway length NA. Altitude 9 ft. Military 1,139, full-time personnel 324. Payroll $21.2 million.

Reno-Cannon International Airport (May ANGB), Nev. 89502; 5 mi. SE of Reno at 1776 ANG Way. Phone (702) 788-4500; DSN 830-4500. 152d Reconnaissance Gp. (ANG). Base named for Maj. Gen. James A. May, Nevada Adjutant General. Area 123 acres. Runway length NA. Altitude 4,411 ft. Military 730, full-time personnel 332. Payroll $20.0 million. Dispensary.

Richmond International Airport (Byrd Field), Va. 23150; 4 mi. SE of downtown Richmond. Phone (804) 236-6429; DSN 864-6129. 192d Fighter Gp. (ANG). Field named for Adm. Richard E. Byrd, Arctic and Antarctic explorer. Area 143 acres. Runway length NA. Altitude 167 ft. Military 936, full-time personnel 325. Payroll $21.0 million.

Rickenbacker ANGB, 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 length NA. Altitude 744 ft. ANG military 1,228, full-time personnel 515 (including 26 Title 5 civilians). Payroll $37.1 million. AFRES 1,176, full-time personnel 238. Payroll $11.1 million.

Rosecrans Memorial Airport, Mo. 64503; 4 mi. W of St. Joseph. Phone (816) 271-3299; DSN 720-9299. 139th Airlift Gp. (ANG). Area 207 acres. Runway length NA. Altitude 724 ft. Military 642, full-time personnel 263. Payroll $16.9 million.

Salt Lake City International Airport, Utah 84116; 3 mi. W of Salt Lake City. Phone (801) 595-2200; DSN 790-9210. 151st Air Refueling Gp. (ANG); 169th Electronic Security Sqdn. (ANG). Also hosts ANG's 130th Engineering Installation Sqdn. and 106th and 109th Tactical Control Flts. Area 135 acres. Runway length NA. Altitude 4,220 ft. Military 1,198, full-time personnel 376. Payroll $28.3 million. Dispensary.

Savannah International Airport, Ga. 31402; 4 mi. NW of Savannah. Phone (912) 966-8201; DSN 860-8201. 165th Airlift Gp. (ANG). Also field training site. Area 20 acres. Runway length NA. Altitude 50 ft. Military 1,300, full-time personnel 425. Payroll $27.0 million. Housing: 156 officer, 736 enlisted. 3-bed dispensary.

Schenectady Airport, Scotia, N. Y. 12302-9752; 2 mi. N of Schenectady. Phone (518) 381-7300; DSN 974-9221. 109th Airlift Gp. (ANG). Area 106 acres. Runway length NA. Altitude 378 ft. Military 778, full-time personnel 250. Payroll $15.9 million. Dispensary.

Selfridge ANGB, Mich. 48045-5046; 3 mi. NE of Mount Clemens. Phone (313) 307-4521; DSN 273-0111. 127th Fighter Wing (ANG); 191st Fighter Gp. (ANG); 927th Air Refueling Wing (AFRES). 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 length NA. Altitude 583 ft. ANG military 1,288, full-time personnel 995 (includes 507 Title 5 civilians). Payroll $56.4 million. Dispensary.

Sioux Gateway Airport, Iowa 51110; 7 mi. S of Sioux City. Phone (712) 279-7500; DSN 939-6500. 185th Fighter Gp. (ANG). Area 106 acres. Runway length NA. Altitude 1,098 ft. Military 767, full-time personnel 319. Payroll $18.9 million. Dispensary.

Sky Harbor International Airport, Phoenix, Ariz. 85034. Phone (602) 231-8200; DSN 853-9000. 161st Air Refueling Gp. (ANG). Area 58 acres. Runway length NA. Altitude 1,230 ft. Military 926, full-time personnel 351. Payroll $21.8 million.

Springfield-Beckley Municipal Airport, Ohio 45501-1780; 5 mi. S of Springfield. Phone (513) 327-2311; DSN 346-2311. 178th Fighter Gp. (ANG); 251st Combat Communications Gp. (ANG); 269th Combat Communications Sqdn. (ANG). Area 114 acres. Runway length NA. Altitude 1,052 ft. Military 1,072, full-time personnel 353 (includes 9 Title 5 civilians). Payroll $23.5 million. 6-bed dispensary.

Standiford Field, Louisville, Ky. 40213. Phone (502) 364-9400; DSN 989-4400. 123d Airlift Wing (ANG); 223d Communications Sqdn. (ANG). Area 65 acres. Runway length NA. Altitude 497 ft. Military 875, full-time personnel 269. Payroll $18.6 million.

Stewart International Airport, Newburgh, N. Y. 12550-0031; 15 mi. N of USMA (West Point). Phone (914) 563-2001; DSN 636-2001. Hq. New York ANG; 105th Airlift Gp. (ANG); USMA subpost airport. Stewart AFB until 1969; acquired by state of New York in 1970. ANG area 272 acres. Runway length NA. Altitude 491 ft. ANG military 1,007, full-time personnel 612. Payroll $35.4 million. Dispensary. Most military services available through West Point or subpost.

Toledo Express Airport, Swanton, Ohio 43558; 14 mi. W of Toledo. Phone (419) 866-4078; DSN 580-4078. 180th Fighter Gp. (ANG). Area 84 acres. Runway length NA. Altitude 684 ft. Military 947, full-time personnel 303. Payroll $20.5 million. 4-bed clinic.

Truax Field (Dane County Regional Airport), Wis. 53704-2591; 2 mi. N of Madison. Phone (608) 242-4200; DSN 724-8210. 128th 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 155 acres. Runway length NA. Altitude 862 ft. Military 756, full-time personnel 294. Payroll $18.2 million. Housing: 7 transient. Dispensary.

Tucson International Airport, Ariz. 85734; within Tucson city limits. Phone (602) 573-2210; DSN 853-4210. 162d Fighter Gp. (ANG). Area 86 acres. Runway length NA. Altitude 2,650 ft. Military 644, full-time personnel 821. Payroll $46.2 million.

Tulsa International Airport, Okla. 74115. Phone (918) 832-8300; DSN 956-5210. 138th Fighter Gp. (ANG); 219th Electronic Installation Sqdn. Area 82 acres. Runway length NA. Altitude 676 ft. Military 786, full-time personnel 298. Payroll $18.1 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 length NA. Altitude 910 ft. Military 73, full-time personnel 117 (including 2 Title 5 civilians). Payroll $6.0 million. 6-bed dispensary.

W. K. Kellogg Airport, Battle Creek, Mich. 49015-1291. Phone (616) 963-1596; DSN 580-3210. 110th Fighter Gp. (ANG). Area 315 acres. Runway length NA. Altitude 941 ft. Military 668, full-time personnel 276. Payroll $17.4 million.

Westover ARB, Mass. 01022-5000; 5 mi. NE of Chicopee. Phone (413) 557-1110; DSN 589-1110. AFRES base. 439th Airlift Wing (AFRES). Also home of Army, Navy, and Marine Corps Reserve and Massachusetts ARNG. 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 length NA. Altitude 244 ft. Full-time personnel (AFRES and tenant units): 480 Air Reserve technicians, 576 civilians. Part-time Reservists: 3,377. Payroll $66.9 million. Housing: 356 VAQ (500 beds), 50 VOQ (80 beds).

Willow Grove ARS, Pa. 19090-5203; 14 mi. N of Philadelphia. AFRES base with ANG unit as tenant. 913th Airlift Wing (AFRES host); phone (215) 443-1062; DSN 991-1062. Full-time civilians 152, Reservists 995, Air Reserve technicians 189. Payroll $28 million. Reserve base activated in Aug. 1958. 111th Fighter Gp. (ANG); phone (215) 443-1501; DSN 991-1501. ANG military 786, full-time personnel 274. Payroll $17.8 million. Area 162 acres. ANG area 39 acres. AFRES shares use of adjacent runway (8,000 ft.) at NAS/JRB Willow Grove. Altitude 356 ft. Navy transient quarters available but limited.

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 134 acres. Runway length NA. Altitude 1,290 ft. Military 972, full-time personnel 269. Payroll $17.9 million.

Yeager Airport, W. Va. 25311-5000; 4 mi. NE of Charleston. Phone (304) 357-5100; DSN 366-6210. 130th Airlift Gp. (ANG). Airport named for Brig. Gen. Charles "Chuck" Yeager, first man to break the sound barrier. Area 236 acres. Runway length NA. Altitude 981 ft. Military 684, full-time personnel 232. Payroll $15.2 million. Dispensary, clinic.

Youngstown/Warren Regional Airport/ARS, Ohio 44473-0910; 16 mi. N of Youngstown. Phone (216) 392-1000; DSN 346-1000. AFRES base. 910th Airlift Wing (AFRES). Host to 757th Airlift Sqdn.; 773d Airlift Sqdn., 76th Aerial Port Sqdn.; Navy Reserve; Marine Corps Reserve; Army Corps of Engineers; 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 400. Payroll $24.6 million. ■

Valor

By John L. Frisbee, Contributing Editor

On-Scene Commander

Near Mu Gia Pass, Maj. Larry Mehr directed a rescue that old hands called "a classic."

THERE were few safe or simple missions in the air war over southeast Asia. Many who were there will tell you that at the top of the difficulty scale was the job of on-scene commander in a large rescue operation. That job demanded extraordinary concentration and ability to divide one's attention among many demands: locating the downed airman, deliberately exposing oneself to ground fire to locate enemy guns, controlling all the participants in the rescue effort (the helicopters and their A-1 Sandy escorts as well as the supporting jet fighters), acting as a forward air controller, and making the crucial judgment when to call in the choppers.

One of the best at this task was Maj. Richard L. "Larry" Mehr, a one-time F-100 pilot who volunteered to fly A-1s with the 602d Fighter Squadron (Commando), based at Udorn RTAFB, Thailand. The rescue operation on July 2–3, 1967, for which he was on-scene commander, has been called a classic among the hundreds of such missions in southeast Asia.

It all began on July 2 at 4:45 p.m. when Capt. Dale Pichard, call sign "Pintail 2," bailed out of his damaged F-105 about twenty miles northeast of Mu Gia Pass, near the Laotian border. Pichard's flight reported his approximate location to *Crown,* the HC-130 that coordinated rescue operations. *Crown,* in turn, passed the word to the alert force of A-1 Sandys at Udorn and the HH-3E Jolly Green Giant rescue helicopters at Nakhon Phanom RTAFB.

At 5:00 p.m., four Sandys took off from Udorn, led by Major Mehr. He and his wingman, Capt. P. K. Kimminau, went directly to the reported location of the downed pilot while the other two Sandys escorted two Jolly Greens to a relatively safe area nearby. One of the helicopters turned back with mechanical problems, leaving the HH-3E flown by Capt. Gregory Etzel without a backup in the event he was shot down. Etzel was on his first rescue mission but elected to stay with the team.

The rescue scene was a ridge line between two heavily populated valleys. The initial search for Pichard by Mehr and Kimminau was not successful. Under sporadic ground fire, Mehr saw a chute on the ground but could not make radio contact with Pichard, who was hiding in heavy undergrowth.

As darkness approached, Mehr called in Etzel to look over the chute. The Jolly Green made voice contact with Pichard. Major Mehr and the other Sandys covered Etzel as they flew north toward Pichard's apparent position. Ground fire now was the heaviest Mehr had seen in his 180 missions, eighty-two of them over the North. Darkness forced them to suspend the mission until first light the next day.

Back at Udorn, Larry Mehr laid out the next day's rescue mission and coordinated these plans with the Tactical Air Support Center. The Sandys and HH-3Es would be supported by twenty F-105s from Pichard's wing, the 388th Tactical Fighter Wing at Korat RTAFB. The plan was completed near midnight, with takeoff set for 3:00 a.m.

A-1 Sandy pilot Maj. Larry Mehr

Arriving at the rescue area at first light, Mehr instructed the jet fighters to hold "high and dry" while he verified Pichard's position, assessed the intensity of ground fire, and silenced some of the most menacing guns. When he had Pichard pinpointed, he began marking targets with white phosphorus rockets. As soon as the F-105s had expended their general-purpose and cluster bombs on these targets, he directed them to refuel at an orbiting tanker and return to strafe the area. Satisfied that ground fire had been contained, Mehr told two of his Sandys to use their rockets on trails leading to Pichard's position and his wingman to escort Etzel's Jolly Green into position for a pickup. After a high-speed approach through continuing ground fire, the HH-3E, hovering at seventy-five feet, picked up the downed pilot.

Major Mehr's fuel was getting dangerously low, probably from a hit in one of his tanks. Nevertheless, he decided to stay with the mission as long as possible. He directed the Sandys to strafe on both sides of the HH-3E's exit route. When the rescue helicopter was over reasonably safe terrain, Mehr declared a fuel emergency, turned over control of the search-and-rescue force to Sandy 3, and headed for Nakhon Phanom. Thirty miles east of that base, his fuel gauge showed zero pounds remaining. With his engine running on fumes, he penetrated an undercast and landed safely, exactly four hours after taking off from Udorn. Both his centerline external and internal tanks had been punctured by flak.

For his extraordinary performance directing these two missions in a high-threat area and with no losses, Maj. Larry Mehr was awarded the Air Force Cross, as was Capt. Greg Etzel. Before completing his southeast Asia tour in August 1967, Major Mehr also was awarded the Silver Star. He retired as a colonel in 1972 and now lives in Oregon, Ill. Nothing in his Air Force career is more satisfying to him than having been a key player in several successful rescue operations. ■

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 seventy 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 ten 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 28, 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. Mr. 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 flight 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., US Army, C-17 industry team.** C-17 airlifter.

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 '94 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 1996. 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.

Moore Trophy Recipients

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.

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

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, 56th Rescue Squadron, ACC, NAS Keflavik, Iceland. Rescue of six Icelandic sailors from foundered merchant vessel *Godinn*.

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 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 scheduled for spring 1996.

Fairchild Trophy Recipients

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

[a]Overall winner; Fairchild Trophy not yet developed.

[b]Trophy given for overall annual performance, not for scores in SAC bombing and navigation competition.

Guardian Challenge

Guardian Challenge is a new competition developed by Air Force Space Command to determine the best space operations and missile teams in the Air Force. Held at Vandenberg AFB, Calif., the competition replaces Olympic Arena, the winner of which received a trophy named for former Air Force Vice Chief of Staff Gen. William H. Blanchard. Guardian Challenge now awards the Blanchard Trophy to the best missile operations crew. The best space operations crew receives the Chennault Trophy, named for the commander of the Flying Tigers of World War II, Lt. Gen. Claire L. Chennault.

Blanchard Trophy Recipients

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

Chennault Trophy Recipients

Year, Unit(s)	System
1994 3d Space Launch Squadron, Patrick AFB, Fla.	Atlas II

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 1996.

William Tell Winners

Year	Unit, Base	Aircraft
1954	3550th FTW (Interceptor), Moody AFB, Ga.	F-94C
1955	26th Air Division, Duluth MAP, Minn. (Members of the 48th, 96th, and 332d FISs)	F-94C
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

[a]Overall competition winner. The naming of an overall winner began with William Tell 1980.

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, 125th FIG, Jacksonville IAP, Fla.	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

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.

Gunsmoke Top Guns and Top Bomber Crews

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 Stitch (commander), Capts. Barry Sebring, Steve Amato, David Conley, and Vernon Moore	B-52	93d BW, Castle AFB, Calif.
1995	To be announced midyear		

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 To be announced midyear

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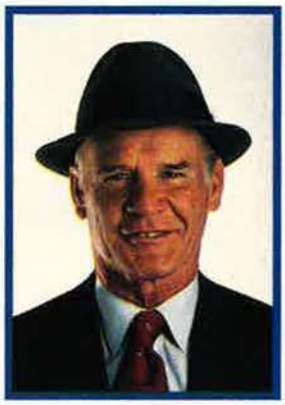

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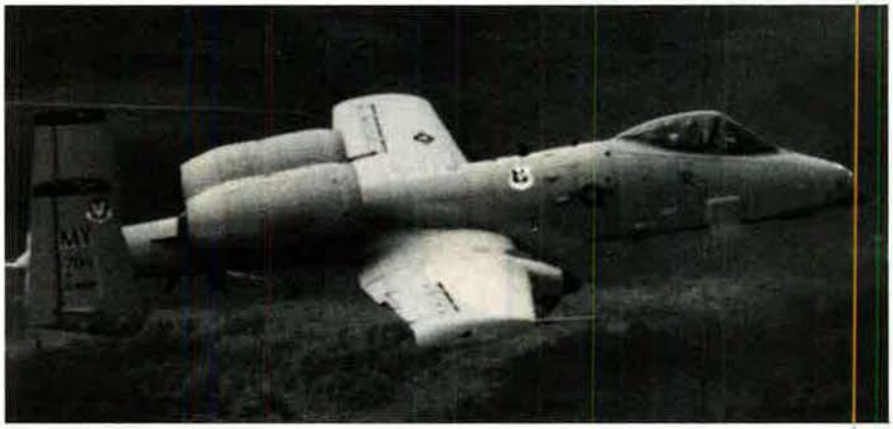
Compensation was made for Coach Landry's appearance.

Gallery of USAF Weapons

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



A-10A Thunderbolt II (Guy Aceto)

Attack and Observation Aircraft

A-10/OA-10 Thunderbolt II

With regional conflict showing no sign of abating, the Thunderbolt II has proved an effective weapon in support of allied action. Designed specifically for the close air support (CAS) mission, the **A-10A**'s capabilities were exemplified during the Persian Gulf War when its ability to combine large military load, long loiter, and wide combat radius proved a vital asset in Operation Desert Storm. A-10s flew 8,100 sorties, with a mission capable rate of 95.7 percent; they launched 90 percent of the Maverick missiles used and achieved the only two air-to-air gun kills in the war. Five aircraft were lost. In a typical antiarmor CAS 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), 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.

Delivery of 713 A-10s was completed in March 1984. The first operational squadron was activated at Myrtle Beach AFB, S. C., in June 1977 and achieved operational capability in October of that year. In October 1987, the first **OA-10**s entered service for use in the forward air control 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 forward air control 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 81st FS at Spangdahlem AB, Germany; Air Combat Command's 20th FW, Shaw AFB, S. C.; 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 some A-10s. A-10s were the first first-line aircraft to be assigned to ANG and now equip the 103d, 104th, 110th, and 175th FGs, at Bradley IAP, Conn., Barnes MAP, Mass., W. K. Kellogg Airport, Mich., and Baltimore, Md., respectively. The latter two also have OA-10 aircraft, as has the 111th FG at Willow Grove ARS, Pa. AFRES units equipped with A/OA-10s include the 47th and 303d FSs at Barksdale AFB, La., and Whiteman AFB, Mo., respectively.

A/OA-10s are deployed to Aviano AB, Italy, where they are operated by active-duty, ANG, and AFRES personnel in support of Operation Deny Flight over Bosnia-Hercegovina and UN forces in the region. In addition, a squadron of 24 A-10s is based permanently at Al Jaber AB in southern Kuwait as part of an expansion of on-call air power 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, including 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.

AC-130H Spectre

AC-130A/H/U Spectre

Three versions of the AC-130 Spectre gunship are currently in service with USAF. Six **AC-130A**s are operated by Air Force Reserve's 711th SOS at Duke Field, Fla., each equipped with an analog fire-control computer, two fixed 20-mm cannon, and two fixed 40-mm cannon and capable of employing two 7.62-mm Miniguns; the aircraft are due to retire this year. Eight **AC-130H** aircraft are operated by Air Force Special Operations Command's 16th SOS, 16th SOW, at Hurlburt Field, Fla., 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. Both models use electro-optical (EO) sensors and target-acquisition systems, including forward-looking infrared (FLIR) and low-light-level television (LLLTV). The H model is capable of in-flight refueling and has undergone modification and modernization of its fire-control computer, navigation, communications, and sensor suites.

The first of 13 new **AC-130U**-configured gunship conversions by Rockwell International was delivered to the 16th SOW in July 1994. This model combines 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 APQ-180 digital fire-control radar, FLIR, or all-light-level television (ALLTV) for true adverse weather ground-attack operations. Delivery to the 16th SOW is scheduled for completion this year.

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-1B Lancer

With its speed, superior handling qualities, and large payload capability, the B-1B is seen as the backbone of the long-range bomber fleet, constituting an essential element of a composite strike force, in either a penetration or standoff role. Each of Air Combat Command's 95 B-1Bs possesses the flexibility to deliver a variety of nuclear munitions and Mk 82 conventional gravity bombs, mines, or other weapons, or to carry additional fuel, as required. The conventional lethality of the B-1B is being enhanced by the ongoing Conventional Mission Upgrade Program (CMUP). Under the 1995 budget, $74 million has been allocated for R&D, with a further $10 million for procurement. CMUP includes B-1B certification to deliver cluster bomb unit (CBU) munitions. In 1994, a series of CBUs was successfully dropped during flight tests at Edwards AFB, Calif. 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 the Joint Direct Attack Munition (JDAM) and the Joint Standoff Weapon (JSOW).

The B-1B 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-level 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.

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. CMUP includes an upgrade to the ECM system to enhance the survivability of the B-1B in the conventional environment.

Initial operational capability (IOC) for the B-1B was achieved at Dyess AFB, Tex., in September 1986, and deliveries were completed in April 1988. Current active-duty unit locations are at Ellsworth AFB, S. D., and Dyess AFB. Recent reductions in the number of B-1Bs funded for flying at these two wings, with two aircraft at Dyess and 12 at Ellsworth converted to reconstitution reserve status, will help fund the B-1B CMUP. The Kansas ANG accepted its first aircraft in July 1994 at McConnell AFB, Kan.. Future plans include basing ANG B-1Bs at Robins AFB, Ga.

In 1987, a series of international speed and distance with payload records was set by the B-1B. On July 4, a 2,000-km closed circuit was covered at a speed of 669.96 mph with a payload of 30,000 kg (66,140 lb). On September 17, a similar payload was carried around a 5,000-km circuit at 655.05 mph. In addition, the B-1B broke 12 world time-to-climb records in 1992, and set 11 world speed records over a 10,000-km course in April 1994.

In 1994, Congress directed an operational readiness assessment (ORA) to determine if the B-1B can attain a sustained 75 percent mission capable (MC) rate as specified to meet the high readiness required in future conflicts. The six-month ORA, conducted by the 28th Bomb Wing at Ellsworth AFB, included a deployment to a simulated bare base location. It met or exceeded all requirements.

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 operators (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 x B61 or B83 free-fall nuclear bombs; in a nonnuclear role up to 84 Mk 82 (500-lb) bombs or Mk 62 mines.

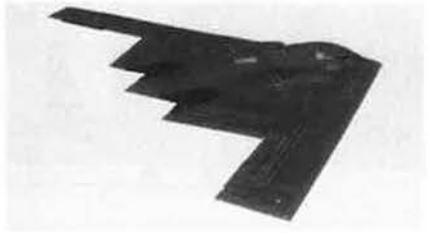
B-2A Spirit

This wholly unique advanced technology aircraft was conceived as a highly survivable strategic bomber to supplement, and ultimately replace, the B-1B in its penetration role. However, current USAF operational planning for the bomber force reflects the changing world order by focusing on 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/APG-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 the final four aircraft, of a total of 20 operational B-2As, was authorized in the FY 1994 budget. This 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 for 1997. Full operational capability (FOC) with the 715th BS should occur early in the next decade.

Of flying wing configuration, the B-2A 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 over 35,000 lb; however, about 25,000 lb of 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-2A to use any runway that can handle a Boeing 727 airliner.

B-1B Lancer (Randy Jolly)



B-2A Spirit (Randy Jolly)

B-52H Stratofortress (Randy Jolly)

The B-2 will be produced in three blocks of capability. Block 10 aircraft will carry the B83 nuclear bomb and the Mk 84 2,000-lb conventional munition. Block 20 aircraft will additionally carry the B61, as well as CBU-87, -89, and -97 cluster bomb munitions, and will have a limited precision guided munition (PGM) capability from mid-1997. The last two aircraft will be Block 30 standard, with full PGM capability, including JDAM, and will carry the Mk 82 500-lb bomb, the M117 750-lb bomb, and the Mk 62 aerial mine. 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 be brought up to Block 30 capability.

The first (now retired) B-2 made its first flight from Air Force Plant 42 in Palmdale, Calif., to Edwards AFB, Calif., in July 1989. The second, which flew for the first time in October 1990, is instrumented for dynamic loads testing and is assigned to envelope expansion activities. The third and fourth B-2s, which flew in June 1991 and April 1992, respectively, are equipped with full mission avionics and are assigned to avionics and weapons testing. The fifth aircraft, which flew in October 1992, was used for climatic lab tests in 1994 and is undergoing LO trials. The sixth aircraft (and final developmental vehicle) flew in February 1993 and is assigned to operational, weapons, and terrain-following evaluation. Northrop delivered the first production aircraft to Whiteman AFB on December 17, 1993, with four more delivered during 1994.

Prime Contractor: Northrop Corporation, with Boeing, LTV, and General Electric as key members of the development team.

Power Plant: four General Electric F118-GE-100 turbofans; each estimated at 19,000 lb thrust.

Accommodation: basic crew of two, on ejection seats, with provision for a third person.

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

Weights: empty more than 100,000 lb, gross more than 300,000 lb.

Performance: approach speed 150 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 20 B61 nuclear bombs, or 16 B83 nuclear bombs, or a combination. In a conventional role: 80 x 500-lb bombs or various other conventional weapons, including sea mines and PGMs.

B-52H Stratofortress

Plans for USAF's remaining fleet of B-52 aircraft emphasize the bomber's conventional capability and reflect its ability to perform a wide variety of missions, including show of force, maritime interdiction, precision strikes, and defense suppression. One version remains in service: the B-52H, which introduced several improvements over the earlier versions, including TF33 turbofans, providing increased unrefueled range. It has improved defensive armament; a total of 102 were built, with deliveries beginning in May 1961; 94 remain operational in active and reserve units.

During the early 1970s, all B-52Hs were equipped with an AN/ASQ-151 EO viewing system, using FLIR and LLLTV sensors to improve their low-level flight capability, and were updated with 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 that includes inertial guidance, TERCOM (terrain comparison) guidance, and microprocessors to upgrade their navigation and weapon delivery systems was also fitted.

Deployment of the B-1B and development of the B-2A led to a change in the primary role of the B-52 to ALCM (AGM-86) carrier, with 12 cruise missiles carried externally. A typical profile envisaged multiple ALCM launches at high altitude, often followed by B-52 low-level descent to attack additional targets using gravity weapons. Introduction of the Common Strategic Rotary Launcher (CSRL) allows internal carriage of an additional eight ALCMs. B-52Hs are also equipped with the AGM-129A ACM, which offers greater range and employs LO technology. Some B-52Hs can also carry a conventional variant of the ALCM, the AGM-86C CALCM.

Under current plans, remaining B-52s are having their conventional capability enhanced. A total combat-coded, ANG, AFRES, and training force of 56 B-52Hs is envisaged under FY 1996 proposals. The bomber's ability to provide massive firepower in low-threat environments will be supplemented by a stand-off attack capability. Upgrades include the installation of GPS terminals, secure radios, and MIL-STD-1760 interfaces; weapons capability to include naval mines; precision guided weapons, such as the Harpoon; and a version of the AGM-142 Have Nap, as well as the new JDAM in 2000.

Contractor: Boeing Military Airplanes.

Power Plant: eight Pratt & Whitney T33-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 externally, with provision for eight more ALCMs or gravity weapons internally; AGM-129A ACM being introduced. Conventional weapons include bombs up to 2,000 lb, air-dropped mines, cluster bombs, and, on some aircraft, AGM-142A Have Nap missiles or eight AGM-84 Harpoons in underwing clusters.

Fighters

F-15 Eagle

In service with ACC, PACAF, USAFE, Air Education and Training Command (AETC), and ANG, the basic F-15 continues as USAF's primary air-superiority fighter. 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. Under ongoing contracts, first funded in February 1983, the F-15 is undergoing a Multistage Improvement Program (MSIP). 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 Advanced Medium-Range Air-to-Air Missile (AMRAAM), 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 include a major upgrade to the Hughes APG-63 radar to APG-70 standard. More than 350 F-15C/Ds are scheduled to have their APG-63 radar updated 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 and to Bosnia as part of Operation Deny Flight.

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 is scheduled for installation this year.

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-120A AMRAAM, as well as EO, infrared (IR), and standard bombs; AGM-65 Maverick; dispenser munitions; and nuclear weapons; AGM-130 was integrated in 1993. A new engine bay was developed by McDonnell Douglas to permit installation of improved turbofans. The 4th Wing at Seymour Johnson AFB, N. C., was the first operational F-15E wing. Forty-eight USAF F-15Es were deployed to the Persian Gulf, where they made a significant contribution to the realization of allied air supremacy. Operating mainly at night, they hunted 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. A total of 209 F-15Es were authorized between FY 1986 and FY 1992; $65 million was authorized for F-15 R&D in FY 1994; 138 are on active duty in 1995.

F-15C Eagle (Guy Aceto)

F-15E

F-16C Fighting Falcon (Guy Aceto)

F-16D (Guy Aceto)

F-16 ADF (Guy Aceto)

An advanced one-off experimental version of the F-15, the **F-15 short takeoff, landing, and 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. *(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.

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.

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

F-16 Fighting Falcon

Equipping units throughout ACC, USAFE, PACAF, AETC, AFRES, and ANG, as well as 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-round 20-mm internal gun.

The F-16 entered operational service with the 388th Tactical Fighter Wing at Hill AFB, Utah, in January 1979. Production of the F-16A and B for USAF ended in 1985, and most now belong to AFRES and 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. In addition, a program began last year to equip 125 AFRES F-16A/Bs with BAe Terprom (terrain profile matching) for ground collision avoidance.

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, and core avionics changes, of which deliveries to USAF began in July 1984.

Stage III extends to Block 50/52 F-16C/Ds, delivered from October 1991, and includes selected retrofits back to Block 25. These aircraft have a Westinghouse APG-68 multimode radar, with increased range and advanced electronic counter-countermeasures (ECCM), and advanced cockpit displays including a wide-angle HUD. Weapons improvements include multitarget AMRAAM compatibility. Also introduced were systems improvements that include installation of a LANTIRN nav/attack system, GPS, enhanced-envelope gunsight, digital flight controls, automatic terrain following, advanced identification friend or foe (IFF), increased T-O weight and maneuvering limits, an 8,000-hour airframe, and 9*g* capability. 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, with interim HARM/Shrike capability, have been used for defense suppression/destruction missions in conjunction with

F-4G "Wild Weasels"; IOC with the AN/ASQ-213 HARM targeting system that gives the F-16 the autonomous capability to launch HARMs in the range-known mode was achieved last year. Flight testing to verify avionics system integration of the AGM-84 Harpoon antiship missile and the F-16 began in March of last year. 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 deployed to patrol the no-fly zones in southern Iraq and over Bosnia.

Of the original F-16A/Bs, 272 have been modified to **F-16 ADF** (air defense fighter) standard, under a contract awarded in October 1986, to replace F-106s and F-4s in 11 (now 10) ANG continental air defense units. Modifications include upgrade of APG-66 radar with AMRAAM data link, provisions for AIM-7 Sparrows, improved ECCM, and improved capability against cruise missiles. New equipment includes HF radio, an IFF interrogator, an ID light, a crash-survivable flight data recorder, and provisions for GPS. Armament includes the M61 gun and up to six missiles, including combinations of Sparrows, AMRAAMs, and Sidewinders. The F-16 ADF entered service in 1989; the program is now completed.

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

Current proposals include the modification of 400 F-16C/Ds as CAS/BAI aircraft in the mid- to late-1990s. Modified Block 30 F-16s will be equipped with improved data modem, VHF antijam radio, Pave Penny laser spot tracker, and a 30-mm gun pod; Block 40 F-16 modifications include a new chaff and flare system and radar warning receiver, a missile warning system, night vision goggles with compatible cockpit lighting, improved data modem, VHF antijam radio, and a LANTIRN laser spot tracker. 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 are being procured for USAF in FY 1995; but Lockheed has recently 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.

The total F-16 program involves the US Air Force and Navy, as well as 17 foreign nations, more than 50 distinct aircraft configurations, and extensive foreign coproduction. *(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, ferry range more than 2,000 miles.

Armament: one M61A1 20-mm multibarrel cannon, with 511 rounds, 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/B

Now at an advanced stage of development, the **F-22A** air-superiority fighter will penetrate high-threat enemy airspace and achieve air superiority with a first-look, first-kill capability against multiple targets. Designed as follow-on for the F-15, the F-22's planned $16 billion engineering and manufacturing development (EMD) program was modified to include provision for ground-attack capability as a result of the Pentagon's Bottom-Up Review. The F-22 combines a highly maneuverable airframe at both sub- and supersonic speeds with LO stealth technologies. The F-22A 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. Projected armament includes an internal 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 JDAMs will be carried internally, and two advanced air-to-ground weapons or fuel tanks can be carried on underwing pylons. Program emphasis from the outset has been on achieving a proper balance of reliability, supportability, affordability, survivability, and performance.

F-111F (Guy Aceto)

F-117A (Eric Schulzinger)

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 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 is receiving nine aircraft, construction of which began December 1993, comprising two two-seat **F-22B**s and seven single-seaters for flight testing, plus two airframes for stress testing; 27 engines are being built. The preliminary design review of all aspects of the design was completed in April 1993. Two hundred thirty-one Critical Design Reviews of subsystems and software were scheduled for completion before the start of air vehicle Critical Design Review early this year; it passed in late February. Subassembly and assembly of the first F-22 has begun. First flight of a development aircraft is due in 1997, and the F-22 should enter operational service in 2004. Funding totaling $2.46 billion was authorized for FY 1995, with $2.35 billion appropriated; a further $2.35 billion has been requested for FY 1996. *(Data for F-22A.)*

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 5 in.

Weight: gross approx 60,000 lb.

Performance (F-22A design target): max level speed at S/L 900+ mph.

F-111

The first variable-geometry aircraft to enter operational service, the F-111 was designed to maintain USAF's around-the-clock, long-range interdiction mission. Terrain-following radar (TFR) and high wing loading when its wings are fully swept contribute to its sophisticated low-altitude capability.

Two of the four versions built remain in service. The **F-111E** superseded the F-111A, with modified air intakes that improved engine performance above Mach 2.2; 94 were built; replacement of their analog bombing and navigation systems with digital equipment, begun in 1989, was completed last year, enabling F-111E aircraft to handle the latest munitions and advanced sensors, as well as such systems as GPS; F-111Es currently fulfill a training role. The **F-111F,** of which 106 were built, has uprated turbofans; a Pave Tack system carried in its weapons bay provides a day/night capability to acquire, track, and designate ground targets for laser, IR, and electro-optically guided weapons; it can employ GBU-12 and -15, as well as TV and IR precision guided weapons. An F-111F avionics modernization under the Pacer Strike program is designed to improve the aircraft's reliability, giving it 80 percent avionics commonality with the F-111E. The program involves the removal of outdated subsystems and the installation of a ring-laser gyro INS, GPS receiver, and new cockpit displays. It includes new computer software, integration and test of prototype models, and production of conversion kits. Delivery of the first F-111Fs with Pacer Strike took place at Cannon AFB last year. The F-111's electronic warfare (EW) capabilities are being updated with the ALQ-131/184 ECM pod system; AIM-9M missiles will provide self-defense capability.

In addition to its nuclear and conventional bombing capability, the F-111 can carry up to 12 French Durandal parachute-retarded, rocket-boosted, runway attack bombs for low-altitude, high-speed delivery and Gator, USAF's first air-delivered mine system.

The **EF-111A** is an ECM conversion of the F-111A (see p. 140).

Contractor: General Dynamics Corporation.

Power Plant: F-111E: two Pratt & Whitney TF30-P-109 turbofans; each 19,600 lb thrust with afterburning. F-111F: two TF30-P-111 turbofans; each approx 25,100 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 73 ft 6 in, height 17 ft 1½ in.

Weights (F-111F): empty 47,481 lb, gross 100,000 lb.

Performance (F-111F): max speed at S/L Mach 1.2, max speed at altitude Mach 2.5, ceiling more than 49,000 ft, range with max internal fuel more than 2,925 miles.

Armament: up to four nuclear bombs, on four pivoting wing pylons, and two in internal weapons bay. Wing pylons carry total external load of up to 25,000 lb of bombs, rockets, missiles, or fuel tanks.

F-117A

Operational with the 49th FW at Holloman AFB, N. M., since 1992, the F-117A was the first production combat type designed to exploit LO technology. Development and manufacture began simultaneously in November 1978; 60 aircraft were built and deployed initially with the 37th TFW, at Tonopah Test Range Airfield, Nev. The F-117A was not officially revealed until November 1988, previous operations being restricted mainly to night flying in order to maintain secrecy, although three aircraft were lost in much-publicized accidents. Their 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, flying undetected and unmolested while 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 about

67.5 degrees) 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 which 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 part of 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. Computer replacement began in 1984. 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. Further improvements include FLIR and DLIR upgrade (from 1994), installation of GPS capability, and ring-laser gyro INS (from 1991).

Contractor: Lockheed Advanced Development Company.
Power Plant: two General Electric F404-GE-F1D2 nonafterburning turbojets; each 10,800 lb thrust.
Accommodation: pilot only, on zero/zero ejection seat.
Dimensions: span 43 ft 4 in, length 65 ft 11 in, height 12 ft 5 in.
Weight: max gross 52,500 lb.
Performance: max level speed 646 mph, mission radius, unrefueled (5,000-lb weapon load) 691 miles.
Armament: full internal carriage of what is described as a wide variety of tactical weapons, including laser-guided 2,000-lb munitions; alternatively, AGM-65 Maverick or AGM-88 HARM; provisions for AIM-9 Sidewinder.

UH-1N Iroquois

MH-53J Pave Low

HH-60G Pave Hawk (Dana Bell)

Helicopters

HH-1H Iroquois

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

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 administrative airlift. 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

In a program initiated in 1986 to upgrade the special operations forces (SOF), Sikorsky modified the 41 remaining HH/CH-53B/C and MH-53H helicopters to **MH-53J** Pave Low III "Enhanced" standard. These 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/ECCM 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 plume detectors.

Programmed upgrades include the Integrated Defense Avionics System (IDAS)/multimission advanced tactical terminal (MATT) modification. The IDAS/MATT system will blend on-board E/W 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 a night vision compatible color multifunction cockpit display. Additionally, a Service Life Extension Program (SLEP) will be completed this August, upgrading 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. Deliveries began in the summer of 1987 to the 20th SOS at Hurlburt Field, Fla., followed by the 21st SOS, now at RAF Alconbury, UK, in 1988. (The 21st is scheduled to transfer to RAF Mildenhall in mid-1995.) Aircraft were also delivered to the 31st SOS at Osan AB, South Korea. Another four were delivered to the 542d CTW, now the 58th SOW, at Kirtland AFB, N. M. This unit also uses six **TH-53A**s, 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.
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

To meet combat search-and-rescue and SOF requirements, USAF modified 98 Black Hawk helicopters to MH/HH-60G Pave Hawk configuration. The 10 **MH-60G**s 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-60G**s, used by active-duty, AFRES, and ANG Air Rescue Service units, provide combat search and rescue and various mission support activities worldwide. MH-60Gs are also operated by the 58th SOW for training purposes. Both aircraft are equipped with an integrated navigation system using GPS, INS, and Doppler. Additionally, the SOF aircraft's navigation suite provides 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 for both aircraft. Both are equipped with unsecure VHF and secure FM, HF, UHF, and SATCOM for communications. Further modifications to the basic Black Hawk include an integral rescue hoist and window-mounted 7.62-mm miniguns, with provisions for a .50-caliber machine gun on SOF aircraft only. An air refueling system and removable long-range internal fuel tanks, combined with C-5 mobility modifications, make the MH/HH-60G extremely well suited for 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

USAF's newest aircraft acquisition program, the CV-22 is a special operations variant of the USMC MV-22. The CV-22 will fulfill Air Force special operations forces' requirement for high-speed, long-range, V/STOL aircraft capable of low-visibility, clandestine penetration/extraction of denied areas in adverse weather. It is designed to carry 18 troops or 8,000 lb of internal cargo over a 500-nm combat radius at 230 knots, with a capability to hover out of ground effect at 3,900 ft pressure altitude and 82° Fahrenheit. With less stringent mid-mission parameters, the range could exceed 750 nm. Self-deployment range will be 2,100 nm 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 night vision goggle (NVG) compatible cockpit displays. 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), HF, and SATCOM radios.

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. 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. Allison is supplying the aircraft's two 6,000-shp T406-AD-400 turboshaft engines.

First flight of the V-22 Osprey was made in March 1989, and four full-scale development aircraft had flown by the end of 1991. Flight testing resumed in April 1993, following the incorporation of numerous design changes. The aircraft have demonstrated speed in excess of 400 mph, completed initial sea trials, formation flying, and cross country evaluations. First flight of an EMD aircraft is expected late in 1996.

USAF has an initial requirement for 50 CV-22s. AFSOC is scheduled to receive its first aircraft in 2003, with IOC in 2005. In addition, USMC will receive 425 MV-22s and USN 48.

Dimensions: proprotor diameter 38 ft 0 in, width, rotors turning 84 ft 7 in, fuselage length 57 ft 4 in, height over tailfins 17 ft 4 in.

Weights: normal mission weight: VTO 47,500 lb, STO 55,000 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

Derived from the original U-2 high-altitude reconnaissance aircraft that were produced in various forms from the late 1950s, the **U-2R** is a version with much-increased span and length, first flown in 1967. U-2s are essentially powered gliders, with high-aspect-ratio wings and lightweight structure, designed to perform strategic reconnaissance for long periods at very high altitudes. "Superpods" can be fitted to the wings, containing specialized equipment appropriate to individual mission demands, including photo intelligence, radar intelligence, electro-optical signal analysis, and electronic intelligence gathering. A single-seat tactical reconnaissance version, originally designated TR-1A, and structurally identical to the U-2R, was designed for high-altitude standoff surveillance missions. First flight was in 1981. The last U-2R and TR-1 aircraft were delivered to USAF in October 1989. U-2R and TR-1 programs were subsequently consolidated and the TR-1 designation deleted in 1992, with all aircraft designated as U-2s. During the Persian Gulf War they were central in providing information regarding the exact location of Iraqi communications and early warning radar antennas. Sensors include an advanced ASARS II system in side-looking airborne radar form, housed in an extended nose section, and modern ECM. GPS aids navigational accuracy. Their inherent versatility enables Air Force U-2s to perform important nonmilitary missions, including flights for the Department of Agriculture land management and crop estimate programs; photographic work in connection with flood, hurricane, and tornado damage; data gathering for a geothermal energy program; and search missions for missing boats and aircraft.

U-2Rs and **U-2RT** trainers are based at Beale AFB, Calif., with four flying detachments at Osan AB, South Korea, Taif AB, Saudi Arabia, and RAF Akrotiri, Cyprus.

Reengining of the entire 34-aircraft U-2 fleet with the General Electric F118-GE-101 engine is under way. A derivative of the F118 engine used in the Northrop B-2A, the new engine is in the 19,000-lb-thrust class and has the dual benefit of enhancing all-around performance of the aircraft while providing much-improved supportability over the current engine, which is used in no other USAF operational aircraft. Delivery of revamped aircraft, redesignated **U-2S** (operational aircraft) and **U-2ST** (trainers), began last October and is expected to be completed by the end of 1998. *(Data for U-2R, except where indicated.)*
Contractor: Lockheed Corporation.
Power Plant: one Pratt & Whitney J75-P-13B turbojet; 17,000 lb thrust (being reengined).
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 over 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.

SR-71 "Blackbird"

Three supersonic SR-71 "Blackbird" aircraft are to be reactivated this year to provide wide-area reconnaissance and intelligence support; $100 million has been authorized in FY 1995 for this purpose. The first refurbished aircraft is expected to be operational in late spring or early summer, with the second and third aircraft following within six months. It is likely they will be assigned to Edwards AFB, Calif. The SR-71 was retired originally in 1990.
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.

RF-4C

A multisensor version of the F-4C Phantom II, the RF-4C was designed for day/night, all-weather reconnaissance operations and was the first tactical aircraft equipped with a forward-looking radar capable of simultaneous terrain-following and low-altitude navigation. The basic aircraft is configured with conventional optical cameras for day operations and IR sensors for night. Both the radar and the camera systems are housed in a modified nose, which increases the length of the aircraft by 33 inches compared with the fighter version. Other equipment includes the ARN-101 digital avionics system for improved navigation accuracy and greater reconnaissance capability, supplemented by a new navigation and weapons delivery system and improved-accuracy ring-laser gyro. The flexibility and responsiveness of the RF-4Cs proved vital assets during Operation Desert Storm, when bad weather and oil fires hampered tactical intelligence gathering. RF-4Cs equip two units of the ANG: the 117th RW and the 152d RG. *(Data similar to those for F-4G.)*

F-4G Phantom II

The F-4G "Advanced Wild Weasel" is a version of the now-retired F-4E with its gun replaced by AN/APR-47 EW equipment, capable of passing real-time target information to the aircraft's missiles prior to launch. Working in "hunter-killer" teams of two aircraft, such as F-4G and F-16C, the F-4G "hunter" can detect, identify, and locate enemy radars and then direct against them weapons for their destruction or suppression. The F-4G's effectiveness during the Gulf War, against enemy surface-to-air missile batteries, led the Air Force to retain a single squadron of F-4Gs, the 561st FS at Nellis AFB, Nev., pending deployment of a successor aircraft. They also equip ANG's 124th FG at Boise, Idaho. Primary armament includes HARM (AGM-88). F-4Gs deployed to Saudi Arabia were also equipped with ALQ-131 and ALQ-184 ECM pods. F-4Gs have been assigned to Operation Southern Watch. *(Data for unmodified F-4E; F-4G similar.)*
Contractor: McDonnell Aircraft Company, Division of McDonnell Douglas Corporation.
Power Plant: two General Electric J79-GE-17A turbojets; each 17,900 lb thrust with afterburning.
Accommodation: pilot and electronic warfare operator in tandem, on ejection seats.
Dimensions: span 38 ft 7½ in, length 63 ft 0 in, height 16 ft 5½ in.
Weights: empty 30,328 lb, gross 61,795 lb.
Performance: max speed at 40,000 ft Mach 2.0 class, range with typical tactical load 700 miles.

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 7th ACCS at Keesler AFB, Miss., a geographically separated unit of the 552d ACW, Tinker AFB, Okla. Eight aircraft have been updated by Unisys to ABCCC III standard. EC-130s have been deployed in support of the UN peacekeeping mission in Bosnia.

The **EC-130E "Commando Solo"** psychological operations broadcasting version operated by ANG's 193d SOG, Harrisburg, Pa. Lockheed Aircraft Service (LAS) is upgrading six Commando Solo aircraft to the world-wide color television (WWCTV) configuration. The 193d's EC-130Es conducted numerous "Radio Democracy" missions in support of Haitian operations.

The **EC-130H "Compass Call"** communications jammer, which played a vital role in disrupting Iraqi military communications at strategic and tactical levels during the Gulf War. EC-130Hs are operated by the 41st, 42d, and 43d ECSs at Davis-Monthan AFB, Ariz. Altogether, 14 EC-130Hs are in service. *(Data basically as for C-130.)*

U-2R (Guy Aceto)

EC-130E "Commando Solo" (Dana Bell)

EC-130H "Compass Call" (Dana Bell)

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/E/J/P/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. ACC provides overseas deployment control of

fighters with the **EC-135K.** Modifications to the EC-135 aircraft include continuation of the UHF line-of-sight system replacement, the initial Milstar transition satellite communications terminals, and the Peacekeeper upgrades to Airborne Launch Control Aircraft. Future enhancements include full Milstar capability and improved low-frequency and very-low-frequency (LF/VLF) radios and antennas.

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**, **RC-135Ws**, and **RC-135Xs**, operated by ACC's 55th Wing, Offutt AFB, Neb., for specific reconnaissance tasks. RC-135s were stationed in Saudi Arabia in support of military operations in that theater. 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; second aircraft expected this spring, with a third to follow. Under the Milstar program, an **NKC-135** is assigned to collect data to assist airworthiness certification of the radome installation on the EC-135. A modified **NC-135E** is used as an airborne optical data collection system to support a variety of testing, including space-related events.

To minimize the cost of retrofitting the 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. *(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. Specialist 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 housed in a new vertical stabilizer. A joint USAF/USN program is providing an improved AN/ALE-47 tactical countermeasures dispenser. Other improvements under the avionics modernization program include 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. During the Gulf War, EF-111 area jamming was crucial to the maintenance of coalition air supremacy, pouring electrons into Iraqi target-acquisition radars and rendering them useless. 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. Most EF-111As are now consolidated in the 429th ECS at Cannon AFB, N. M.; a few are with the 79th Test & Evaluation Group at Eglin AFB, Fla.

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 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

RC-135V Rivet Joint

OC-135B

E-3C Sentry (Dana Bell)

E-8C Joint STARS

Electric Corp. look-down radar, which makes possible all-altitude surveillance over land or water, thus correcting a serious deficiency in earlier surveillance systems.

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-3Cs**, with additional command-and-control capability, in 1984–88. A further 18 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 34 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 begins this year. Additional enhancements to US E-3s include upgrading of JTIDS to TADIL-J (Tactical Data Information Link–Joint) capability, 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 much smaller radar cross section targets. 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. Overseas units include the 961st and 962d Airborne Air Control Squadrons, based at Kadena AB, Japan, and Elmendorf AFB, Alaska, respectively. Deployments have been made to the Pacific, the Middle East, southwest Asia, the Mediterranean area, the Balkans, and Europe and in support of Operations Desert Storm, Provide Comfort, and Southern Watch. 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 23, including 19 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

Three E-4As were built initially to support the National Emergency Airborne Command Post (NEACP), now the National Airborne Operations Center (NAOC). Each had a modified Boeing 747 airframe and provided an interim capability by utilizing existing EC-135 C^3 equipment. Four fully developed E-4B Airborne Command Post aircraft (three of them converted from E-4As) now support the NAOC mission. 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 radio broadcasts to the general population. Improvements have included a data-processing capability and more survivable C^3, including initial Milstar modification. The first E-4B entered service with SAC in January 1980, and the first operational mission was flown in March of that year. ACC is now the Air Force's single-resource manager for the E-4 airborne command post aircraft, with the main operating base at Offutt AFB, Neb.

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

The USAF/US Army Joint Surveillance and Target Attack Radar System (Joint STARS) was developed to undertake ground surveillance, targeting, and battle management missions. However, USAF is expanding its role 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, following the unexpected, but highly successful, demonstration of the Joint STARS prototype capabilities during Operation Desert Storm.

The original contract for FSD of the system was awarded to Grumman in September 1985. The com-

pany 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 modified airframe was delivered to Grumman in August 1987, followed by the second in November 1988. 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 system then directs attack on the targets, in real time, via a jam-resistant, 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 30,000–40,000 ft. Because new Boeing 707 airframes are no longer available, USAF is purchasing and modifying used 707s, rather than qualify another type of aircraft. Designated **E-8C**, these will be the production version and will carry a crew of USAF and Army specialists to man 18 operations-and-control consoles, two of them doubling as communications stations, that display color-coded images of behind-the-lines terrain and of wheeled and tracked vehicles moving anywhere on it. The first E-8C flew in March 1994 and serves as the preproduction test-bed. The two E-8A test aircraft will be upgraded to C standard and will be the last to be delivered.

The prototype system was deployed to Europe in 1990, where it successfully demonstrated its capabilities in a NATO environment before being sent to Saudi Arabia, where the two E-8As served as USAF's 4411th Joint STARS Squadron. They logged 535 combat hours and flew 49 missions, with great success, linking with such aircraft as the E-3 AWACS and the F-15E; one E-8A was airborne every night of the war. USAF plans to acquire 20 E-8s, with delivery beginning in 1996 and IOC scheduled for 1997. *(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 6in.
Weights: empty 171,000 lb, gross 336,000 lb.
Performance: ceiling 42,000 ft, endurance with one inflight refueling 20 hr.

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. Designated E-9A, 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.)
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

The **EC-18B advanced range instrumentation aircraft (ARIA)** is a modified former American Airlines Boeing 707-320 series transport, of which 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 16–24. Following conversion, the first EC-18B was flown for the first time in February 1985 and entered operational service in January 1986.

E-9A (Guy Aceto)

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.

Contractor: Boeing Military Airplanes.

WC-130E/H

Modified C-130 Hercules transports, designated **WC-130E** and **H,** are equipped for weather reconnaissance duties, including penetration of tropical storms, to obtain data for forecasting storm movements. They are assigned to the 53d WRS of AFRES. *(Data similar to those for C-130.)*

C-5B Galaxy (Dana Bell)

C-9A Nightingale (Dana Bell)

Transports and Tankers

C-5A/B/C Galaxy

The huge capacity of this long-range, air refuelable, heavy logistics transport is a major asset to global airlift requirements, whether in a combat situation, as with the massive airlift of US forces to the Persian Gulf in the early stages of Operation Desert Shield, or in response to the many calls for humanitarian relief worldwide.

The prototype 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. Six AFRES squadrons and one ANG squadron are C-5A-equipped. Two C-5As, redesignated **C-5C**s, have been modified to carry outsize space cargo by extending the cargo bay and modifying the aft doors.

To meet an urgent need for additional heavy airlift capacity, USAF acquired 50 **C-5B**s, generally similar to the C-5A but embodying 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 were completed in April 1989. C-5B units include AMC's 60th AMW at Travis AFB, Calif., the 436th AW at Dover AFB, Del., AFRES's 301st and 312th ASs (Assoc.) at Travis AFB and 326th and 709th ASs (Assoc.) at Dover AFB, and AETC's 97th AMW, at Altus AFB, Okla. The reliability and maintainability of the C-5A has been the focus of a recent AMC study. 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 C-5s are being fitted with new, safer interior panels. 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 under the Pacer Snow project. All USAF C-5s are being painted flat gray. A new C-5D version, with enhanced avionics and subsystems, has been proposed for the Nondevelopmental Airlift Aircraft (NDAA) project. *(Data for C-5B.)*

Contractor: Lockheed Martin Corp.

C-17A Globemaster III

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-9A/C Nightingale

An aeromedical airlift transport, derived from the DC-9 Series 30 commercial airliner, the **C-9A** has been in service since August 1968. Modifications 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 AAS (Assoc.) of AFRES, collocated at Scott AFB, Ill. These also perform overseas theater aeromedical evacuation missions in Europe, with four C-9As based at Ramstein AB, Germany, and in the Pacific, with three C-9As based at 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-9Cs** 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-12 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 have subsequently been refitted with PT6A-41 engines and are redesignated **C-12C.** AMC uses two C-12Cs to train aircrews and to supplement support airlift. Six **C-12D** versions, with cargo door, high flotation landing gear, and provision for tiptanks, were delivered to USAF.

USAF uses 33 Super King Air B200Cs (**C-12Fs**) at eight bases throughout the continental US for tanker copilot seasoning training. PACAF uses six 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. (C-12F: 850 shp PT6A-42s.)
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

On January 17 this year, AMC declared IOC of the first C-17 operational squadron of the 437th AW, based at Charleston AFB, S. C. AFRES's 315th AW (Assoc.) at Charleston is also operational. 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. 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; as of this January, the 18 C-17s then flying in the test program at Edwards AFB, Calif., and in the 437th AW had flown 8,875 hours. The test program has included the prototype aircraft ("T-1"), production models, and two ground test articles (for static and durability testing). The program, which has completed initial operational testing, has established 18 new world records for payloads-to-altitude, three in the time-to-climb category, and one in the short-takeoff-and-landing class (takeoff and landing in 500 meters—1,640 ft—with 44,000 lb of payload). The C-17 saw its first contingency deployment last fall during Operation Vigilant Warrior in the Persian Gulf.

McDonnell Douglas was announced as the selected prime contractor in August 1981 and received a low-level R&D contract the following July. This was intended to cover C-17 technologies that would also benefit other airlift programs, while preserving the option to proceed to FSD work on the C-17. FSD was approved in February 1985. Initial procurement funding was authorized in the FY 1987 budget, together with continued R&D. Twenty-six production aircraft were funded between FYs 1988 and 1994, and a further six were authorized in FY 1995. Advance procurement of components was also approved for a further eight aircraft in FY 1996, which will bring the total approved buy to 40 C-17s. The Air Force's planned buy of 120 aircraft is dependent on a decision by the Defense Acquisition Board this November.

The C-17 is the first military transport to feature a full digital fly-by-wire control system and two-crew 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 Corp.
Power Plant: four Pratt & Whitney F117-PW-100 turbofans; each 40,700 lb thrust.
Accommodation: normal flight crew of two, plus loadmaster. Provisions for the full range of military airlift missions.
Dimensions: span between winglet tips 169 ft 10 in, length 174 ft 0 in, height 55 ft 1 in.
Weights: max payload (2.25*g*) 169,000 lb, gross 585,000 lb.
Performance: normal cruising speed at height 498 mph (Mach 0.74), range with 100,000 lb payload 3,635 miles.

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

The Air Force acquired 10 off-the-shelf Gulfstream III transports, each with accommodation for five crew and 14 passengers, for VIP duties, to replace aging, fuel-inefficient C-140Bs. Three **C-20As** and one **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 Airlift Mission (SAM) fleet with intercontinental range and ability to operate from short runways. Gulfstream IV 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 allocated to Andrews AFB. *(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

VC-25A

C-21A

Eighty-one C-21As are operated by active-duty and ANG units from nine US bases and four overseas locations. These aircraft are used to 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.
Contractor: Learjet Inc.
Power Plant: two Allied Signal 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.
Weight: 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-22B

Under the designation C-22B, three Boeing 727 commercial transports were purchased and modified 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

Air Force Materiel Command (AFMC) operates three C-23A Sherpa light transport aircraft, previously assigned to MAC (now AMC), from Edwards AFB, Calif. The Sherpa, which entered the USAF inventory in 1984, is an all-freight version of the Shorts 330 regional airliner, with a 6-ft-6-inch-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, including 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

The first Boeing VC-25A presidential transport was delivered to the 89th AW at Andrews AFB, Md., in August 1990, followed by a second four months later. Based on Boeing 747-200B airframes, they replaced 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 is 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. The C-26As serve in the Air National Guard Operational Support Transport Aircraft role. They have a quick-change interior, enabling passenger seats to be replaced by a medevac or cargo-carrying configuration. In addition, 30 **C-26Bs**, with options for a further 23, were ordered in 1991 for the National Guard Bureau. Delivered from January 1992, the C-26Bs have TCAS II, GPS, and microwave landing systems. *(Data for C-26A.)*

Contractor: Fairchild Aircraft Corporation.

Power Plant: two Allied Signal 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

Under contracts awarded in August 1990 and February 1991, Chrysler Technologies Airborne Systems delivered 10 **C-27A** short takeoff and landing (**STOL**) intratheater transports for use by US Southern Command, with options for a further eight aircraft. The C-27As are commercially available Alenia G222 medium airlifters, modified by Chrysler to include new HF/VHF communications, autopilot, and INS. The aircraft provide rapid-response airlift of personnel and cargo to remote locations accessible primarily through unimproved airfields with short, unprepared landing surfaces. Initial C-27As 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, including 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-130 Hercules

Since the initial C-130A production model made its first flight in April 1955, Lockheed has delivered more than 2,000 Hercules to 64 nations, with production continuing. C-130s operate throughout USAF, serving with ACC, theater commands, and the 23d Wing at Pope AFB, N. C., demonstrating wide operational capabilities in both peace and war. Basic and specialized versions perform a diversity of roles, including airlift support, DEW Line and Arctic ice cap resupply, aeromedical missions, natural disaster relief missions, aerial spray missions, and fire-fighting duties for the US Forest Service. Recently, they have been used to bring relief to stricken communities worldwide, including Bosnia, Somalia, and Rwanda. The C-130A is now retired. Two **DC-130As** (originally GC-130As) were built as drone launchers/directors for Air Research and Development Command (now AFMC), carrying up to four drones on underwing pylons. All special equipment was removable, permitting the aircraft to be used as freighters, assault transports, or ambulances, as required. The **C-130B** introduced 4,050 ehp Allison T56-A-7 turboprops; the first of 134 entered USAF service in April 1959; they are used in aerial fire-fighting missions by ANG units. Six C-130Bs were modified in 1961 for air-snatch recovery of classified USAF satellites by the 6593d Test Squadron at Hickam AFB, Hawaii. Twelve **C-130Ds** were modified C-130As for use in the Arctic, with wheel-ski landing gear, increased fuel capacity, and provision for Jet-Assisted Takeoff rockets. 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 C-130B/Es 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 the low-level environment. 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.

Generally similar to the E model, the basic **C-130H** has uprated 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 have been ordered for active and reserve units of the US services. ANG and AFRES C-130Hs are used in fire-fighting missions. Specifically modified aircraft are used by the 757th AS, AFRES, based at Youngstown/Warren Regional Airport/ARS, Ohio, for aerial spraying, typically to suppress mosquito-spread epidemics. Four **LC-130Hs**, modified with wheel-ski gear, are operated by ANG's 109th AG in support of Arctic operations. While continuing to modernize through modification, the Air Force has budgeted to resume active-duty fleet enhancement through acquisition of the **C-130J** version, beginning in FY 1996. This new model features a two-crew-member flight system, upgraded Allison AE 2100 engines and all-composite Dowty R391 propellers, enhanced performance, and improved reliability and maintainability.

Other variants include **HC-130N/P, MC-130E/H, AC-130A/H/U,** and **WC-130E/H,** all described separately. Four HC-130Hs were modified as **JC-130H** with added equipment for aerial recovery of reentering space capsules, and the **DC-130H** is used for drone control duties. ANG C-130s acquired a new role in 1987 when about 10 aircraft were assigned to ANG fighter wings and groups to provide support for jet fighter units on deployments. Authority for 354 C-130 aircraft passed from AMC to ACC, together with air rescue units, in 1993. *(Data for C-130H.)*

Contractor: Lockheed Martin Corp.

Power Plant: four Allison T56-A-15 turboprops; each 4,508 ehp.

Accommodation: crew of five; up to 92 troops, 64 paratroops, 74 litter patients, or up to five 463L standard freight pallets, etc.

Dimensions: span 132 ft 7 in, length 97 ft 9 in, height 38 ft 3 in.

Weights: empty 76,469 lb, max payload 42,673 lb, gross 175,000 lb.

Performance: max cruising speed at 20,000 ft 374 mph, ceiling (at 130,000 lb) 33,000 ft, T-O run 3,580 ft, landing run (at 130,000 lb) 1,700 ft, range with max payload 2,354 miles.

C-26A

C-27A Spartan (Wally Van Winkle)

C-130H Hercules

MC-130E Combat Talon I

MC-130E/H Combat Talon I and II

Fourteen C-130Es were modified to **MC-130E (Combat Talon I)** standard and equipped for use in night/adverse weather, low-level, deep-penetration tactical missions. AFSOC's 1st and 8th SOSs, based in the Pacific and North America, respectively, employ the Talon I in support of special operations forces worldwide. Nine of these aircraft are modified with the Fulton Recovery System. Eleven are modified to conduct air-to-air refueling with special operations helicopters, with the remaining three undergoing modification. All have explosion-suppressant fuel tanks and a modified cargo ramp area for high-speed aerial delivery. In addition, 11 of the 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 upon 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. These are equipped with an in-flight refueling receptacle; explosion-suppressant fuel tanks; modified cargo ramp area for high-speed aerial delivery; Electronics & Space Co. 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 7th and 15th SOSs employ the Combat Talon II, supporting unconventional warfare units from their bases in Europe and North America, respectively. The 1st SOS, in the Pacific, will convert to Talon IIs this fall. The 58th SOW at Kirtland AFB, N. M., is responsible for operational aircrew training. *(Data similar to those for C-130.)*

HC-130N/P Combat Shadow/Tankers

Twenty-eight active-duty **HC-130N/P** Combat Shadow aircraft are now dedicated to special operations missions. Eleven primary aircraft are assigned to the 9th SOS, Eglin AFB, Fla. Five further aircraft are assigned to the 17th SOS, Kadena AB, Japan, and four to the 67th SOS, RAF Mildenhall, UK. Others are assigned to the 58th SOW at Kirtland AFB, N. M. 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 helicopters in a no- to low-threat environment. These missions involve NVG low-level flights using minimum lighting and communications-out procedures. These SOF HC-130s 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 of these aircraft have also recently been fitted with an in-flight refueling receptacle to extend their range indefinitely.

Air Rescue Service maintains additional search-and-rescue HC-130 tanker aircraft. Seven rescue aircraft are located with an active-duty unit at Patrick AFB, Fla.; 20 others are assigned to various AFRES and ANG units. *(Data similar to those for C-130.)*

KC-135E/R/T Stratotanker

Forming the backbone of the USAF tanker fleet, the long-serving KC-135 meets 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. 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. Subsequent deployments have included support for operations in Somalia, Bosnia, Rwanda, and Haiti. AMC controls all CONUS-based KC-135s. Others serve with AETC, PACAF, USAFE, and with

AFRES and ANG units. 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. First flight of the KC-135A was in August 1956, and by 1966 a total of 732 had been built.

Many of the 551 remaining in operational service have been modified to later standards in three programs initiated to enhance the KC-135's capability and extend its operational utility well into the next century. First, the JT3D reengining program upgraded 163 AFRES and ANG KC-135As to **KC-135E** standard with JT3D turbofans removed from surplus commercial 707s. Second, the 22,000-lb-thrust General Electric/SNECMA F108-CF-100 (CFM56) fuel-efficient engine was selected for retrofit of the KC-135 fleet in 1980. 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; the program continues. Finally, 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. Several avionics upgrades are planned that will significantly improve systems reliability and maintainability. A multipoint aerial refueling system is under development. Also, a companion receptacle modification permits the KC-135 to be air refueled to increase offloads at extended ranges and enhance flexibility. Both of these modifications enhance interoperability and support to the Navy, NATO, and other allied receiver aircraft. *(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 Operation Deny Flight. *(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

Seven 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 three smaller 707-120s, **C-137B**. Two of the C-137Cs were the original "Air Force One" aircraft.

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

The C-141 StarLifter forms the backbone of USAF's airlift fleet. Heavily relied on during Operations Desert Shield and Desert Storm, it has since been deployed in support of UN peacekeeping missions. However, the 220-plus aircraft are now nearing the end of their projected service life, and structural problems, most notably stress fractures in the wings and at the cockpit posts, grounded a quarter of the fleet last year and put flight restrictions on the rest. Although repairs were made, the long-term operational future of the aircraft is yet to be determined. 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. Other planned C-141 modifications include installation of 50 kHz VOR/ILS receivers, secure voice capability on UHF and HF radios, permanently mounted SATCOM antennas, and a digital display fuel-quantity-indicating system. 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 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 thirteen 437th AW C-141Bs is aimed at increasing their SOLL (Special Operations Low Level) capability and survivability. AETC also operates C-141 aircraft.

Since 1986, AFRES and ANG have received C-141s transferred from the active force; 64 aircraft are scheduled for transfer by 1997. These C-141s play a major role in intertheater medevac missions and are used frequently for humanitarian missions, transporting vital supplies to the many areas that, in recent years, have been devastated by natural disasters or civil conflict. AMC controls Air Force C-141s, all of which are due to be painted flat gray. *(Data for C-141B.)*

Contractor: Lockheed-Georgia Company.

Power Plant: four Pratt & Whitney TF33-P-7 turbofans; each 21,000 lb thrust.

KC-135R Stratotanker

KC-10A Extender (Dana Bell)

C-141B StarLifter (Dana Bell)

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

Based on the commercial DC-10 Series 30CF, the KC-10 was conceived to meet USAF requirements for an advanced tanker/cargo aircraft. Modifications 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 crucial 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.

The KC-10A made its first flight in July 1980, and the first service usage by SAC took place in March 1981. Fifty-nine KC-10As are in the USAF inventory, under the control of AMC, and are operated by active and Associate Reserve units. Major AMC KC-10 operations were recently relocated to McGuire AFB, N. J., and Travis AFB, 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.

Trainers

T-1A Jayhawk

Employed 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, Beech 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; 98 had been delivered by January 1, 1995. Instructor pilot training at the 64th Flying Training Wing, Reese AFB, Tex., began in September 1992, with student training following in January 1993. Jayhawks also equip the

12th, 47th, and 71st FTWs at Randolph AFB, Tex., Laughlin AFB, Tex., and Vance AFB, Okla., respectively. Deliveries to the 14th FTW at Columbus AFB, Miss., are expected in 1996. Pilots trained on the T-1A will 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 use as a personnel transport.
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 meet USAF's Enhanced Flight Screener requirement, replacing the T-41 Mescalero, the fully aerobatic T-3A is used by AETC's 3d FTS at Hondo Municipal Airport, Tex., to screen prospective pilots prior to SUPT. Pilot training began in March 1994. 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 is expected to be completed by the end of this year, with 57 aircraft for AETC, and 56 for the US Air Force Academy's 557th FTS, where training was due to begin in January.

Contractors: Slingsby Aviation Limited; Northrop Worldwide Aircraft Services Inc.
Power Plant: development of 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.

T-37B Tweet

USAF's first purpose-built jet trainer, the T-37 is 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 was awarded in August 1989 to Sabreliner Corp. for the T-37B SLEP. The contract included the design, testing, and production of kits, to be installed by USAF as they are delivered, to modify or replace critical structural components for the entire fleet, extending the capability of the T-37 into the next century. Almost 1,000 T-37s were built, and 488 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 selected from six candidates submitted by five contractors, Beechcraft, Cessna, Lockheed Martin, Northrop Grumman, and Rockwell (Northrop Grumman having taken over the proposals previously offered separately by Northrop and Grumman). Three JPATS aircraft have been requested in the FY 1996 budget proposals.

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** lightweight twin-jet advanced trainer is capable of flying well above supersonic speed in level flight. 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 high-performance pilot training. A slightly different version, designated **AT-38B,** with a gunsight and practice bomb dispensers, 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. Further planned modifications include a full avionics upgrade. As a result, the service life of the T-38s should extend to 2020. Additionally, introduction of the T-1A is significantly relieving the T-38's training work load.

T-3A Firefly (Guy Aceto)

T-1A Jayhawk

T-38A Talon (Guy Aceto)

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 remain in the AETC inventory; two others are assigned to the ANG; and two aircraft with VIP interior are assigned to the 58th AS at Ramstein AB, Germany, and the 310th AS at Howard AFB, Panama (as **CT-43**). The aircraft are being repainted white.

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.

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 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 within its training inventory: **SGS 1-26E** sailplane; **ASK-21** sailplane; **SGS 2-33A** glider; and **SGM 237** TG-7A motorized glider.

Strategic Missiles

LGM-30F/G Minuteman

A key element of the US strategic deterrent posture for over three decades, 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. 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. Current versions:

LGM-30F Minuteman II: Operationally deployed in 1965. As part of the nuclear strategic force reductions, President Bush removed all 450 Minuteman II missiles from alert status in 1991. Since that time, all 150 have been removed from Ellsworth AFB, S. D., 125 of 150 have been removed from Whiteman AFB, Mo., and 120 of 150 have been removed from Malmstrom AFB, Mont. The 150 Malmstrom AFB Minuteman II silos are being converted to carry the Minuteman III, and the 300 Minuteman II silos at Whiteman and Ellsworth AFBs are to be destroyed in accordance with Strategic Arms Reduction Treaty (START) protocols. To date, 52 silos have been destroyed, with the remainder projected to be destroyed by early 1998.

LGM-30G Minuteman III: Operational since 1970, the Minuteman III provides improved range, rapid retargeting, and the capability to place three multiple independently targetable reentry vehicles (MIRVs) on three targets with a high degree of accuracy. Minuteman III is based at Minot AFB, N. D.; F. E. Warren AFB, Wyo.; Grand Forks AFB, N. D.; and Malmstrom AFB, Mont. A single reentry vehicle configuration has been demonstrated and planned for in accordance with strategic arms control negotiations.

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. The Rapid Execution and Combat Targeting Program is modifying the launch control center, enabling real-time status information on the weapons and communications nets, improving responsiveness to launch directives, and improving rapid retargeting capability. *(Data for LGM-30G.)*

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

Deployment of 50 Peacekeeper missiles in existing Minuteman III silos near F. E. Warren AFB, Wyo., began in June 1986 and reached FOC with 50 missiles in December 1988. Initial deployment was made in response to the improved hardness of Soviet strategic forces, but political initiatives and changes within the former Soviet Union altered US strategic imperatives. A statutory cap on deployment of only 50 (of a funded 114) of these missiles was approved in the FY 1990 budget, and development of the 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 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. Under provisions of START II, Peacekeeper will be scheduled for retirement starting in 2000, with completion by 2003.
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, diameter 7 ft 8 in.
Weight: approx 195,000 lb.

AGM-86B/C ALCM

The **AGM-86B** air-launched cruise missile is a small, unmanned, winged air vehicle capable of sustained subsonic flight following launch from a carrier aircraft. It has a turbofan engine and a nuclear warhead and is programmed for precision attack on surface targets. When launched in large numbers, each of the missiles would have to be countered, making defense against them both costly and complicated. Additionally, by diluting defenses, AGM-86Bs improve the ability 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 were delivered in October 1986. AGM-86Bs currently arm B-52Hs, with 12 missiles fitted externally and eight on a bomb-bay CSRL. ALCM-equipped units are at Barksdale AFB, La., and Minot AFB, N. D.

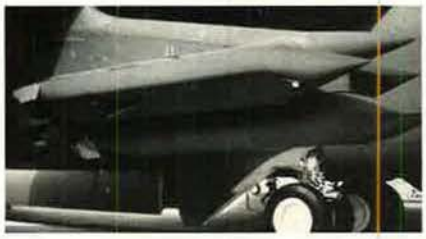
A conventionally armed version, designated **AGM-86C,** development of which began in 1986, has a high-explosive blast fragmentation warhead, and an inertial navigation unit as in the B model, but uses GPS for guidance. Range is reportedly less than that of the B. AGM-86C was first used operationally during the Persian Gulf War, when seven B-52Gs of the 2d BW, Barksdale AFB, La., launched 35 missiles against eight high-priority Iraqi targets from standoff ranges. *(Data for AGM-86B.)*
Contractor: Boeing Aerospace Company.
Power Plant: Williams International Corporation/Teledyne CAE F107-WR-100 turbofan; 600 lb thrust.
Guidance: inertial plus TERCCM, by Litton.
Warhead: W80-1 nuclear.
Dimensions: length 20 ft 9 in, body diameter 2 ft 0½ in, wingspan 12 ft.
Weight: 3,200 lb.
Performance (approx): speed 500 mph, range 1,555 miles.

AGM-129A (ACM)

Developed by the Convair Division of General Dynamics (now Hughes Missile Systems Co.), the AGM-129A Advanced Cruise Missile first flew in July 1985. McDonnell Douglas was awarded a contract in November 1987 for technology transfer leading to second-source capability for this advanced system. The ACM has improved range, accuracy, survivability, and targeting flexibility compared with the AGM-86B, notably through embodiment of LO technology. Delivery of production AGM-129As began in June 1990, the 410th BW at K. I. Sawyer AFB, Mich., being the first operational unit, and final delivery was in August 1993. Total acquisition of the ACM was 461 missiles. The ACM is deployed on the B-52H.
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.

LGM-30G

LGM-118A



AGM-129A (ACM) (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. Approximately 34,000 AIM-7C, D, and E versions were produced. A later version, the advanced solid-state **AIM-7F,** 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, entered production in FY 1980 and 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** 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 at Eglin AFB, Fla., 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. *(Data for AIM-7F.)*
Contractors: Raytheon Company/General Dynamics Pomona Division.
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 AIM-9 missile is continuing. The Navy and Air Force jointly allocated $49.3 million in FY 1995 for development of the **AIM-9X,** a Sidewinder for 2000 and beyond. Features of the AIM-9X will include seeker, airframe, and warhead/fuze improvements; the shape will be modified to reduce drag and to permit internal and external carriage.

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 Hercules 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 Advanced Medium-Range Air-to-Air Missile has been developed to provide 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. Development began in December 1981.

Designated AIM-120A, AMRAAM has inertial midcourse guidance and active radar terminal homing that provide launch-and-maneuver capability. There are significant improvements in operational effectiveness over the AIM-7 Sparrow, including 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 VIII, 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** is also in production. The missile is operational on F-15, F-16, and F/A-18 aircraft, and a version is projected armament for 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 southwest Asia. 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 6,430 missiles, with a further 291 requested in the FY 1996 budget. Proposed final total is in excess of 12,000 AMRAAMs for USAF and USN.

Contractors: Hughes Aircraft Company/Raytheon Company.
Guidance: inertial midcourse, with active radar terminal homing.
Dimensions: length 12 ft, 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. Maverick missiles were first employed by USAF in Vietnam. They currently equip the A-10, F-4G, F-111F, F-16, and F-15E, singly or in three-round underwing clusters, for use against such pinpoint targets as tanks and columns of vehicles. Maverick air-to-surface missiles were used extensively during Operation Desert Storm, with approximately 100 fired per day, 90 percent of them from A-10 CAS aircraft.

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.

To overcome limitations of the TV Maverick, which can be used only in daylight clear-weather conditions, the following versions have been developed:

AGM-65D: with 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, then based at RAF Bentwaters, UK, in February 1986; this version is in production.

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; this version is in production.

A total of 25,397 AGM-65D/Gs were ordered for USAF through FY 1991, with the final order awarded to Raytheon in 1991.

Hughes has proposed a new, longer-range version of the Maverick, featuring an off-the-shelf turbine engine that would triple the current AGM-65's range. The **Longhorn Maverick** could arm both fighters and helicopters and would be equipped with INS/GPS. *(Data for AGM-65A/B.)*
Contractor: Hughes Missile Systems Group/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

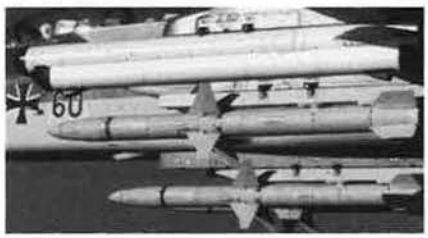
Originally acquired, under a cooperative memorandum of understanding with USN, to equip two squadrons of now-retired B-52G aircraft for maritime antisurface warfare operations, the Harpoon all-weather antiship missile will now arm conventional-mission B-52Hs.
Contractor: McDonnell Douglas Missile Systems 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.
Weight: 1,145 lb.
Performance: speed high subsonic, range more than 57 miles.

AGM-88 HARM

The availability of the AGM-88 High-Speed Antiradiation Missile greatly enhanced the lethality of USAF's F-4G "Wild Weasel" against enemy ground radar. IOC was achieved in July 1990. The emphasis on high speed reflects experience gained in Vietnam, where Soviet-built surface-to-air missile radar systems sometimes detected the approach of first-generation Shrikes and ceased operation before the missiles could lock on to them. HARM can cover a wide range of frequency spectrums through the use of programmable digital processors in both the aircraft's avionics equipment and the missile. An integration program is ongoing to equip F-16s in the defense suppression role with HARM. The missile is also suitable for adaptation to the F-15E. 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, a facility that proved invaluable against Iraqi radar and missiles during Desert Storm. Nearly 6,000 HARMs were delivered before the end of 1990. Texas Instruments' FY 1991 production contract was raised from 1,400 missiles to 3,481 to replenish the USAF/USN AGM-88 inventory, depleted by the Persian Gulf War. *(Data for AGM-88A.)*
Contractor: Texas Instruments, Inc.
Power Plant: Thiokol smokeless, dual-thrust, solid-propellant rocket motor. Hercules second source.

AIM-9 Sidewinder (top), AIM-120A (AMRAAM) (Guy Aceto)

AGM-65 Maverick



AGM-88 HARM

GBU-15

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. This capability was exemplified in January 1991 when an F-111-launched GBU-15 attacked the pipelines leading to the Sea Island terminal in the Persian Gulf in an effort to minimize the environmental impact of oil flowing into the sea from the war-damaged plant.

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. The GBU-15 is deployed with F-111 and F-15E aircraft.The GBU-15(V)1/B TV-guided variant qualified for operational service in 1983; production is complete. The GBU-15(V)2/B IIR version entered service in 1987. An improved version, the GBU-15-I, combines 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 rocket-powered version of the GBU-15. **AGM-130A** is in production with the Mk 84 warhead; **AGM-130C** is under development with the BLU-109/B penetrating warhead. Upgrades include a new solid-state TV seeker, an improved IR seeker, and INS/GPS guidance. These enhancements will enable the weapon to operate in adverse weather while improving target acquisition. The AGM-130 is certified for use with the F-111 and is undergoing certification on the F-15E. *(Data for GBU-15.)*
Contractor: Rockwell International Corporation.
Guidance: TV or IIR seeker.
Warhead: Mk 84 bomb (2,000-lb unitary), or BLU-109.
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-111F, F-15E, and F-16. The GBU-24A/B was highly successful in the Gulf War and is in production.
Contractor: Texas Instruments Inc.
Guidance: semiactive laser.
Dimension: length 14 ft 2 in.
Weight: 2,350 lb.

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 Gulf War and 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. Thirty were built, and an additional 100 planned. Advanced versions to improve operational flexibility are being studied.
Contractor: Lockheed Missiles and Space Systems.

Joint Direct Attack Munition (JDAM)

A weapon system currently being developed to meet USAF and USN requirements for highly accurate, autonomous, all-weather, conventional bombing capability, the JDAM program is composed of two parts: JDAM and JDAM Product Improvement Program (PIP). The JDAM adds an INS/GPS guidance kit to the 2,000-lb general-purpose Mk 84, the 2,000-lb BLU-109 penetrator, and the general-purpose 1,000-lb Mk 83. While still aboard the launch aircraft, JDAM will be continually updated with target information through the aircraft's avionics system. Once released, the inertial guidance kit will take over, guiding the weapon to its target. JDAM PIP will add a precision adverse-weather capability. 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. Martin Marietta (now Lockheed Martin) and McDonnell Douglas were selected in April 1994 as competitors in an 18-month EMD program.

AGM-142 Have Nap

USAF is acquiring the Israeli-built Popeye medium-range, standoff missile under the Have Nap program. 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).

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 will be 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.

AGM-154A Joint Standoff Weapon (JSOW)

The AGM-154A Joint Standoff Weapon (JSOW) is the first in a USN/USAF family of low-cost, highly lethal glide weapons with a standoff capability. JSOW's modularity 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 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 enters EMD this year. The third variant, JSOW/Unitary, under USN lead, enters EMD in the middle of this year and integrates an IIR terminal seeker, the AWW-13 data link, and a 500–800-lb unitary warhead. Texas Instruments has also proposed 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, static 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-111, F-117A, F/A-18, A-6E, AV-8B, B-1B, B-52, Tornado, and Jaguar.
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.

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.

AGM-142 Have Nap

Joint Direct Attack Munition (JDAM)

Carrier aircraft are expected to include B-1Bs, B-2s, B-52Hs, F-15Es, and F-16s.

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 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: Racal-Decca 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.

Titan IV

Delta II

FIM-92A Stinger

Stinger was developed originally as a man-portable, tube-launched surface-to-air missile for the US Army, as a much-superior successor to the pioneer Redeye. It has been employed since 1984 by air personnel in South Korea to provide base defense against high-speed, low-level, ground-attack aircraft.
Contractor: General Dynamics, Pomona Division/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 E

A modified ICBM, Atlas E has been used to launch various USAF and NOAA satellites. Launch of the last vehicle in the USAF inventory was scheduled for FY 1995 from Vandenberg AFB, Calif.
Prime Contractor: Lockheed Martin Corporation (formerly Martin Marietta Space Launch Systems).
Power Plant: Rocketdyne MA-3 propulsion system, comprising central sustainer motor and two boosters; total thrust 387,000 lb.
Dimensions (Atlas stage): length 61 ft 8 in, body diameter 10 ft 0 in.
Launch Weight: 275,000 lb.
Performance: capable of putting 1,750 lb into a 100 nm polar orbit.

Atlas II

An upgraded version of the Atlas/Centaur vehicle, Atlas II has been developed to meet USAF's continuing medium launch vehicle (MLV II) requirement. The familiar "stage-and-a-half" configuration of the original ICBM is retained for the basic Atlas. Changes include lower-cost advanced avionics, an improved flight computer, booster engines with greater thrust, and longer propellant tanks. The engine and tank changes have been made to both the Atlas and Centaur stages. A total of 10 Atlas II vehicles is 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; one launch is planned for FY 1995.

Since their initial operation in 1957, Atlas and Atlas/Centaur vehicles have achieved a 90th percentile success rate for more than 500 launches of military and commercial satellites, as well as manned spacecraft.
Prime Contractor: Lockheed Martin Corporation (formerly Martin Marietta Space Launch Systems).
Power Plant: uprated Rocketdyne MA-5 propulsion system in Atlas stage, comprising central sustainer motor and two boosters; total thrust 488,000 lb.
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 16,100 lb into a low-Earth orbit (if launched from Vandenberg AFB) and 8,150 lb into a geosynchronous Earth orbit.

Centaur

Centaur was the first US high-energy upper stage and the first to utilize 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 widely 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 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 IV, creating the greatest weight-to-altitude capability of any US launch vehicle by placing a 10,200-lb payload into geosynchronous orbit. *(Data for Centaur D-1A and G-prime, except where indicated.)*
Prime Contractor: Lockheed Martin Corporation (formerly Martin Marietta Space Launch Systems).

Power Plant: two Pratt & Whitney RL10A-4 liquid oxygen/liquid hydrogen rocket engines; each 20,500 lb thrust.
Guidance: inertial guidance system.
Dimensions (Centaur D-2A only): length 33 ft 0 in, diameter 10 ft 0 in.
Launch Weight: (D-2A, approx) 45,000 lb; (G-prime-mod, approx) 53,000 lb.

Titan II

Five modified Titan II ICBMs are being used to provide additional expendable launch capability. Three successful launches by May 1993 were followed by the launch of the space probe Clementine 1 towards the moon in January 1994, marking the first US lunar mission since Apollo 17 in December 1972.
Prime Contractor: Lockheed Martin Corporation (formerly Martin Marietta Space Launch Systems).
Power Plant: first and second stages: Aerojet liquid hypergolic propellants: 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 to allow greater flexibility in launching 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, a 16 ft 8½ in diameter payload fairing, and a modified Centaur G-prime upper stage, enabling it to place a 10,200-lb payload into geosynchronous orbit, 31,000 lb into low polar orbit, or 39,000 lb into low equatorial orbit. With an alternative Inertial Upper Stage (IUS), it can place 5,200 lb into geosynchronous orbit. It may also be flown with no upper stage. The scheduled addition of upgraded solid rocket motors in 1993 was expected to enhance performance by approximately 25 percent. More than 40 Titan IVs were ordered by 1990. First launch took place from Cape Canaveral, Fla., in June 1989. A follow-on buy of no more than six vehicles is planned.
Prime Contractor: Lockheed Martin Corporation (formerly Martin Marietta Space Launch Systems).
Power Plant: first and second stages: Aerojet liquid hypergolic propellants; first stage 551,200 lb thrust; second stage 106,150 lb thrust; initially two United Technologies solid rocket boosters, each 1,394,000 lb thrust; later two Hercules solid rocket boosters, each 1,700,000 lb thrust.
Guidance: Delco inertial guidance system, to be replaced by Honeywell digital avionics system on 24th vehicle and later.
Dimensions: first and second stages: height 119 ft 2½ in, diameter 10 ft.
Launch Weight: approx 1.9 million 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 geosynchronous orbit when used on Titan IV or 6,000 lb with the Titan IV SRMU.
Prime Contractor: Boeing Aerospace Company.
Power Plant: aft-stage solid rocket motor 41,611 lb thrust, forward-stage solid rocket motor 17,629 lb thrust.
Guidance: inertial, plus star tracker.
Dimensions: length 17 ft, diameter 9 ft 2¼ in.
Launch Weight: 32,500 lb.

Delta II

A medium launcher 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 in order to satisfy USAF's medium-payload requirement. The first launch took place in February 1989, and, to date, 24 operational GPS satellites have been launched successfully. This full Navstar constellation provides US and allied forces with worldwide, three-dimensional position and velocity information.

Delta II is a three-stage booster surrounded by nine solid-propellant, graphite epoxy motors. The GEMs were not available for the first nine GPS flights, which employed a modified version of the original Delta's Castor IV engine, the Castor IVA. Delta II differs from the earlier version in having a 12-ft stretch in the first-stage tanks and, from flight number 10, an increased expansion ratio on the first-stage engine.
Prime Contractor: McDonnell Douglas Aerospace Company.
Power Plant: first stage: Rocketdyne RS-27A liquid-propellant engine, 237,000 lb thrust; second stage: Aerojet IT1P liquid-propellant engine, 9,400 lb thrust; third stage: Morton Thiokol SGS II derivative, 15,400 lb thrust; strap-on GEM solid rocket motors, 143,235 lb thrust.
Dimensions: length 130 ft, diameter 8 ft; bulbous payload fairing, max diameter 10 ft.
Liftoff Weight: 509,000 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 600–900-lb payloads to low-Earth orbit. 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. Management of the Pegasus program has transferred to USAF. It will support the USAF space test program and the Ballistic Missile Defense Organization. First flight, in June 1994, of the enhanced-performance Pegasus XL, launched from a Lockheed L-1011 carrier aircraft, was unsuccessful. *(Data for basic Pegasus vehicle.)*
Prime Contractor: Orbital Sciences Corporation and Hercules Aerospace Company/Alliant Techsystems.
Power Plant: three Hercules 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 missile first-stage addition and with the Pegasus wings removed. Taurus is ground-launched from regular launch complexes and will be used to test a quick-readiness, mobile launch facility. The first launch, on March 14, 1994, put two USAF and ARPA satellites into a 340-mile polar orbit. Capable of lifting 3,000 lb to low-Earth orbit and 985 lb to geosynchronous transfer orbit.

MQM-107D Streaker (Guy Aceto)

Aerial Targets and Decoys

MQM-107D Streaker

The Air Force originally procured the MQM-107A in 1975. The third-generation D model is now in use. 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: Beech Aircraft Corporation.
Power Plant: one Teledyne CAE 373-8 engine; 960 lb thrust.
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: launch weight (incl booster) 1,090 lb.
Performance: operating speed 230–594 mph, operating height 50–40,000 ft, endurance 2 hr 18 min.

MQM-107E Streaker

Follow-on to the MQM-107D, the improved-performance 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.
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 6,000 of these jet target vehicles have been delivered since initial development of the BQM-34A in the late 1950s. They are used to support weapon system and target RDT&E, quality assurance, training, and annual service practices by all three US services and by foreign governments.

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.
Contractor: Teledyne Ryan Aeronautical.
Power Plant: one General Electric J85-GE-100 turbojet.
Guidance and Control: remote-control methods include 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.

BQM-34A Firebee (Guy Aceto)

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.

BQM-74C

Built by Northrop Corp., BQM-74C target drones were used as decoys during the Persian Gulf War to draw the attention of Iraqi air defense radar, revealing locations of missile and gun sites.

QF-4

The QF-4 is replacing the QF-106 as a joint-service full-scale aerial target (FSAT). Advantages of the QF-4 over the QF-106 are an improved flight-control system and greater payload. Approximately 300 F-4s will be converted to FSATs.

Contractor: Tracor Inc.
Power Plant: two Pratt & Whitney J79-GE-17 turbojets; each with approximately 17,000 lb thrust with afterburning.
Guidance and Control: remote control methods include 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

The QF-106 replaced the QF-100 as USAF's FSAT. Advantages of the QF-106 over the QF-100 include higher supersonic speeds while under remote control and increased maneuverability. Approximately 194 F-106s were converted to FSATs, with the 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 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 phaseout).
Dimensions: length 70 ft 8 in, height 20 ft 3 in, wingspan 38 ft 5 in.
Weight: mission operational weight 40,500 lb.
Performance: max speed Mach 2, ceiling 50–55,000 ft, range (approx) 400 miles.

QF-4

QF-106 (Guy Aceto)

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, they have provided an uninterrupted early warning capability to the United States. The system's capability was demonstrated during the Persian Gulf War when the satellites detected the launch of Iraqi Scud missiles and provided warning to civilian populations and coalition forces in Israel and Saudi Arabia. A total of 16 DSP satellites were launched by USAF. Procurement will end with Number 24, cancelling the final two satellites originally planned.

Prime Contractor: TRW.
Power Plant: solar arrays generating 1,485 watts.
Dimensions: diameter 22 ft, height 32 ft 8 in, with solar paddles deployed.
Weight: 5,000 lb (approx).
Performance: orbits at approx 22,000 miles altitude; uses IR sensors to sense heat from missile and booster plumes against the 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 some 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. During the Persian Gulf War, DMSP satellites helped coalition planners provide efficient and safe air operations. Weather tracking 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 the Earth at about 500 miles altitude and scan an area 1,800 miles wide. Each system covers the Earth in about 12 hr.

Defense Support Program

Defense Satellite Communications System

Defense Satellite Communications System (DSCS) satellites are superhigh-frequency systems capable of providing worldwide secure voice and data transmission. They provide an important part of the comprehensive plan to meet military communications needs. 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.

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 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 eight Phase III DSCS satellites are currently in geosynchronous orbit.

Navstar Global Positioning System

The Navstar Global Positioning System (GPS), a constellation of orbiting satellites providing navigation data to military and civilian users around the world, is operated by the 50th Space Wing. The constellation achieved IOC in December 1993. It consists of 24 satellites providing 24-hour navigation services. These include accurate, three-dimensional (latitude, longitude, and altitude) velocity and precise time; passive, all-weather operations; continuous real-time information; support to an unlimited number of users and areas; and support to civilian users at a slightly less accurate level.

Also benefiting from the GPS are such functions as mapping, aerial refueling and rendezvous, geodetic surveys, and search-and-rescue operations. Such capabilities were put to the test during Operations Desert Shield and Desert Storm. Coalition troops relied heavily on GPS to navigate the featureless Saudi Arabian desert. Forward air controllers, pilots, and tank drivers used the system.

Prime Contractor: Rockwell International Corporation.
Power Plant: solar arrays generating 700 watts.
Dimensions: width 5 ft, length 17 ft 6 in, including 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 S-band, EHF, and SHF communications for all US armed services. 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 undergoing initial operational test and evaluation.

Although still in testing, Milstar provided communications support to operations in Haiti and Operation Vigilant Warrior.

Prime Contractor: Lockheed Martin Corporation.
Power Plant: solar arrays generating 8,000 watts.
Dimensions: antenna array 52 ft deployed; solar array 108 ft deployed.
Weight: 10,000 lb.
Performance: The constellation will consist of four satellites in geosynchronous orbit at five degrees 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). The FLTSATCOM system carries fleet-wide high-priority broadcasts and ship-to-ship and ship-to-shore communications. ■

AFA / Colorado Springs / Lance Sijan Chapter

Outstanding Squadron Dinner

and Associated Events

Saturday, May 27
Outstanding Squadron Dinner

AFA's 36th annual Outstanding Squadron Dinner will be held at The Broadmoor Hotel, Colorado Springs, Colo., on Saturday, May 27. The dinner honors cadets of the United States Air Force Academy for the 1994–95 school year. Our featured speaker is an Academy graduate from the Class of 1960, Gen. Ronald W. Yates, commander, Air Force Materiel Command.

Thursday, May 25
Golf Tournament and Reception

The golf tournament, open only to dinner or symposium attendees, will be held at 10 a.m. on the Broadmoor East Course. The price is $120 per person ($90 for symposium attendees). This includes golf, greens fees, golf cart, and reception. The fee for the reception only is $30. For more information on both the dinner and the golf tournament, call (800) 727-3337 ext. 2020.

Friday, May 26
Air Force Acquisition Symposium

The fifth annual Air Force Acquisition Update, sponsored by the Colorado Springs/Lance Sijan Chapter of AFA, will focus on "Acquisition Reform: Where Are We?" The program is aimed at industry executives and government leaders. Overall acquisition strategy and policy will be discussed by top-level speakers.

The following speakers have been invited:

Gen. Joseph W. Ashy, Commander in Chief, North American Aerospace Defense Command; Commander in Chief, US Space Command; and Commander, Air Force Space Command

Daniel M. Tellep, CEO, Lockheed Martin Corporation

Gen. Lawrence A. Skantze, USAF (Ret.), former commander, Air Force Systems Command

Colleen A. Preston, Deputy Under Secretary of Defense (Acquisition Reform)

Lt. Gen. Richard E. Hawley, Principal Deputy to the Assistant Secretary of the Air Force (Acquisition)

Maj. Gen. Kenneth R. Israel, Director, Defense Airborne Reconnaissance Office, and Assistant Deputy Under Secretary of Defense (Airborne Reconnaissance)

Brig. Gen. Donald R. Walker, Director, Special Projects, Office of the Secretary of the Air Force

Col. Brent Collins, Deputy Director for Space Programs, Office of the Assistant Secretary of the Air Force for Acquisition

Howard Vasina, President, Lance Sijan Chapter, AFA

The 1995 Air Force Acquisition Update will be held at The Broadmoor and will be unclassified. The cost for the symposium is $250 for AFA individual or Industrial Associate members. The registration fee includes coffee and doughnuts, lunch, and a reception (Thursday evening, May 25) in honor of the speakers. Additional individual reception tickets are $30 (spouses and individuals not registered for the Acquisition Update.) For more information, call Joan Sell at (719) 574-1502. Fax: (719) 574-0872.

For hotel reservations at The Broadmoor, call (800) 634-7711 and identify yourself as an attendee of the Air Force Association symposium.

"The Department of Defense finds this event meets the minimum regulatory standards for attendance by DoD employees. This finding does not constitute a blanket approval or endorsement for attendance. Individual DoD component commands or organizations are responsible for approving attendance of DoD employees based on mission requirements and DoD regulations."

Registration Form

AFA's 36th Annual Outstanding Squadron Dinner • Saturday, May 27, 1995

Please mail this form to:

ATTN: Barbara Coffey
Air Force Association
1501 Lee Highway
Arlington VA 22209-1198
or call: (703) 247-5805
Fax: (703) 247-5853

Advance registration closes Friday, May 19.

Refunds must be requested in writing and postmarked no later than Wednesday, May 17.

Make checks payable to the Air Force Association

___ Enclosed is $80 covering the Outstanding Squadron Dinner.
___ Enclosed is $120 for the golf tournament and reception.
___ Enclosed is $30 for a guest golf reception ticket.
___ Send information on the Acquisition Update and reception.

name (please type or print) | title | affiliation

address | city

state | zip | area code and telephone

Air Force Association - Working for its National Membership. May 1995

National Report

AFA President R. E. Smith visits with freshman Sen. James M. Inhofe (R-OK), a member of the Senate Armed Services Committee. First elected to Congress in 1986, Inhofe served in the House of Representatives from Oklahoma's First Congressional District.

AFA Chairman of the Board Jim McCoy visits with Rep. Bob Filner (D-CA). Filner serves on the Compensation, Pension, Insurance, and Memorial Affairs subcommittee of the House Veterans' Affairs Committee

104th Congress
Getting to Know New Members

The 104th Congress brought many changes to Capitol Hill, including a new majority party, more than 100 new members, a revamped committee structure, and many new agendas. AFA leaders have met with every freshman member of the House National Security Committee and continue to meet with other members during every visit to Washington. These visits serve to introduce the association to new members and to bring returning members up to date on AFA policy and issues.

During every visit, AFA officers draw attention to AFA chapter and state organizations in the members' districts and invite them to become involved in AFA activities.

At the grass-roots level, AFA President R. E. Smith has encouraged AFA state and chapter presidents to make contact with new and returning members of Congress. Members spend a lot of time in their home districts, so there are numerous opportunities to invite them to appear at special AFA events. Members may find a combined function organized by AFA and other military-oriented groups in the community to be particularly attractive. Combined functions also reinforce our national work with the Military Coalition and can lead to highly effective coalitions on the local level.

VFW Honors AFA for Work on *Enola Gay*

In March, the Veterans of Foreign Wars presented the Air Force Association with its Gold Medal of Merit, one of its highest awards. VFW cited AFA for its "untiring efforts . . . to identify and correct the Smithsonian Institution's plan to exhibit the *Enola Gay* . . . in a revisionist historical context unfavorable to the United States."

AFA Executive Director Monroe W. Hatch, Jr., accepted the award during the VFW convention's opening ceremonies, and AFA President R. E. Smith represented the association at the VFW's congressional dinner.

Throughout the *Enola Gay* controversy, the VFW played a key role with AFA, both individually and in conjunction with the Military Coalition. Many thanks to the VFW for its own efforts and for this meaningful recognition.

AFA appreciates the work of all veterans' groups in this endeavor, especially the individual members who took the time to write their congressmen and the Smithsonian Institution.

AFA/AEF Report

By Daniel M. Sheehan, Assistant Managing Editor

Meeting the Challenge

Acknowledging the abundance of challenges facing the Air Force in the next century, a full slate of speakers from around the Air Force addressed the annual Air Warfare Symposium in Orlando, Fla. An audience of more than 700 from industry, the US Air Force, allied air forces, and AFA heard civilian and uniformed Air Force leaders describe their concerns about the present and prescriptions for the future *[see "Washington Watch," p. 15].*

Air Combat Command Commander Gen. John M. Loh delivered the keynote address of the two-day event, "Keeping America's Airpower Edge: Balancing Future Needs with Today's Realities," a hard look at USAF capabilities in an era of smaller forces and tighter budgets. On the second day, both Chief of Staff Gen. Ronald R. Fogleman and Air Force Secretary Sheila E. Widnall looked to the twenty-first century, a mere five years down the road, and delivered an assessment of what the Air Force must do to avoid the pitfalls and meet the challenges of an increasingly multipolar world.

From left, National President R. E. Smith, ACC Commander Gen. John M. Loh, and Executive Director Monroe Hatch, Jr., enjoyed an informal talk during AFA's Air Warfare Symposium in Orlando, Fla. Air Force Secretary Sheila E. Widnall and Chief of Staff Gen. Ronald R. Fogleman also addressed the symposium.

Other speakers outlined the concerns of their various commands. Gen. James L. Jamerson, USAFE commander in chief, reported from the front lines with his address, "USAFE—Forward Deployed and Ready." The audience received a briefing on the increasing role of space on the modern battlefield from Gen. Joseph W. Ashy, commander in chief of US Space Command. With "Lean, Linked, and Listening," Air Force Materiel Command Commander Gen. Ronald W. Yates gave the audience a rundown on AFMC's efforts to improve its responsiveness in the rapidly changing world of computer automation.

In his address, Gen. Henry Viccellio, Jr., sought to put to rest the notion that the Air Force has stopped recruiting—a pernicious myth that has made his work as commander of Air Education and Training Command more difficult. Air Mobility Command Commander Gen. Robert L. Rutherford closed the symposium with a frank discussion of future mobility needs and the nation's willingness to fund them.

Air Force Development Test Center Commander Maj. Gen. Stewart E. Cranston, Air Force Special Opera-

Board Chairman James M. McCoy (left) discussed key defense issues with freshman Rep. Patrick J. Kennedy (D–R. I.) during a recent visit to the congressman's office. Mr. Kennedy, son of Sen. Edward M. Kennedy (D-Mass.), is a member of the House National Security Committee.

The Cape Canaveral (Fla.) Chapter's annual Aerospace Tribute Night was an unqualified success, raising more than $2,000 for the chapter's scholarship and education fund. Here, Chapter President Kenneth E. Frey presents an Ira Eaker Fellowship to Maj. Gen. Robert S. Dickman, commander of the 45th Space Wing.

tions Command Commander Maj. Gen. James L. Hobson, Jr., Air Force Reserve Chief Maj. Gen. Robert A. McIntosh, and Air National Guard Director Maj. Gen. Donald W. Shepperd were among the many active-duty, Guard, Reserve, and retired officers in attendance.

Industry leaders present included Micky Blackwell, president of Lockheed Aeronautical Systems Co.; Gregory H. Bradford, president of Aerospatiale, Inc.; R. A. K. Mitchell, president of Teledyne Ryan Aeronautical; and C. Gerald King, president of Boeing Defense and Space Group.

National President R. E. Smith welcomed the symposium audience, which held a strong contingent of AFA and AEF leaders, including AEF President Thomas J. McKee, AEF Board Chairman Walter E. Scott, AFA National Board Chairman James M. McCoy, National Vice President (Central East Region) George H. Chabbot, Under-40 National Director Capt. Gilbert E. Petrina, Jr., National Director William W. Spruance, National Secretary Mary Anne Thompson, and a host of others.

In a ceremony held in conjunction with the symposium, former Chief of Staff Gen. Merrill A. McPeak, USAF (Ret.), and former CMSAF Gary R. Pfingston, USAF (Ret.), were named to the National Board of Directors.

National President R. E. Smith (right) met with Rep. G. V. "Sonny" Montgomery (D-Miss.), ranking minority member of the House Veterans' Affairs Committee, to give him AFA's perspective on legislation affecting the nation's twenty-six million veterans.

Chapter News

Twenty members of the **L. D. Bell–Niagara Frontier (N. Y.) Chapter** got the inside story on one of the most important flight technology programs in the Air Force—the Variable Stability In-Flight Simulator Test Aircraft—from one of the program's contractors, Calspan Advanced Technology Center. The VISTA is a modified F-16D whose cockpit environment, stability, and flying characteristics can be altered in flight to mimic those of other aircraft, making it a valuable research tool. Calspan Chief Test Pilot Jeff Peer conducted a walk-around of the aircraft, delivered a briefing, and narrated a video of the aircraft's development test flights at Edwards AFB, Calif.

The in-depth look at the VISTA was made possible by former Chapter President Arno Schelhorn, who heads Calspan's Flight Research Department. National Director Bill Rapp, New York State President James Callahan, and Chapter President Hugh Neeson, Vice President Bob Bienvenue, Secretary Bill Hoak, and Treasurer Ron Rochevot also participated in the tour of the Calspan facility. Calspan Corp. received an award from N. Y. AFA in 1994 for its strong support of state and chapter activities.

Though the **Danville (Va.) Chapter** is small, its contribution to AFA's mission is large. The local Civil Air Patrol Squadron has tangible evidence of the chapter's support: a new squadron flag, presented to CAP Squadron Commander Otis Leonard, Deputy Commander for Cadets Justin Hendrix, and Flight Officer Jason Clay by Chapter President Lloyd R. Mills during a recent chapter meeting. National Secretary Mary Anne Thompson, Virginia President John E. Craig II, and Virginia Vice President (West) John Ree also attended the meeting to give former Chapter President Frank Huppert his Exceptional Service Award.

Coming Events

May 5–6, **Mississippi State Convention,** Columbus, Miss.; May 12–13, **Louisiana State Convention,** Baton Rouge, La.; May 12–13, **South Carolina State Convention,** Columbia, S. C.; May 19–20, **Alabama State Convention,** Prattville, Ala.; May 19–21, **New Jersey State Convention,** Absecon, N. J.; June 9–10, **Missouri State Convention,** Branson, Mo.; June 16–18, **New York State Convention,** Melville, N. Y.; June 23–25, **Ohio State Convention,** Wright-Patterson AFB, Ohio; July 7–8, **Arkansas State Convention,** Jacksonville, Ark.; July 7–9, **Washington/Oregon State Convention,** Tacoma, Wash.; July 21–23, **Kansas State Convention,** Wichita, Kan.; July 21–23, **Pennsylvania State Convention,** Harrisburg, Pa.; July 21–23, **Texas State Convention,** Wichita Falls, Tex.; July 28–30, **Florida State Convention,** Tampa, Fla.; July 28–30, **Iowa State Convention,** Sioux City, Iowa; August 4–5, **New Mexico State Convention,** Alamogordo, N. M.; August 10–12, **California State Convention,** Santa Clara, Calif.; August 12, **North Carolina State Convention,** Greenville, N. C.; August 18–19, **Colorado State Convention,** Colorado Springs, Colo.; August 25–27, **Michigan State Convention,** Petoskey, Mich.; September 18–20, **AFA National Convention and Aerospace Technology Exhibition,** Washington, D. C.

The emphasis was on Community Partners at a recent meeting of the **Longs Peak (Colo.) Chapter** on the campus of Colorado State University. The chapter, which won a Community Partner Achievement Award in 1994, now has thirty and is aggressively seeking more. Also at the meeting, Maj. Gen. Robert W. Parker, commander of Air Force Space Command's 20th Air Force, gave a talk on "Life and Travel in Russia" and participated in an enthusiastic question-and-answer session afterward. General Parker went to Russia in 1994 as part of a US Strategic Command delegation inspecting airfields, missile bases, and test sites. Chapter President Jim Strickland presented an engraved AFA tankard to General Parker as a token of appreciation.

Have AFA/AEF News?

Contributions to "AFA/AEF Report" should be sent to the Director of Volunteer and Regional Activities, AFA National Headquarters, 1501 Lee Highway, Arlington, VA 22209-1198. ■

Unit Reunions

Air Force Public Affairs Alumni Ass'n. Air Force public affairs personnel who served in World War II will be honored June 15–18, 1995, at the annual meeting in Colorado Springs, Colo. **Contact:** Air Force Public Affairs Alumni Ass'n, P. O. Box 540, Fairfax, VA 22030-0540. Fax: (703) 978-2704.

Air Rescue Ass'n. Twentieth-anniversary reunion, August 30–September 2, 1995, in Nashville, Tenn. **Contact:** Roy E. Jacobsen, P. O. Box 14225, Scottsdale, AZ 85267. Phone: (602) 948-6660.

Burtonwood Ass'n. September 12–16, 1995, in Omaha, Neb. **Contact:** Howard Polesky, 12435 Ohern St., Omaha, NE 68137-2119. Phone: (402) 895-4909.

CBI Veterans Ass'n (World War II). August 16–19, 1995, in Salt Lake City, Utah. **Contact:** Homer C. Cooper, 145 Pendleton Dr., Athens, GA 30606.

Dyersburg Army Air Base (Tenn.) Memorial Ass'n. August 25–27, 1995. **Contact:** Patricia M. Higdon, 719 W. Main, Halls, TN 38040. Phone: (901) 836-7400.

Nha Trang AB, Vietnam, personnel. September 22–25, 1995, at the Holiday Inn in Hampton, Va. **Contact:** MSgt. Charles R. Timms, USAF (Ret.), 615 Chickasaw Dr., Westminster, SC 29693.

1st Strategic Air Depot Ass'n, 8th Air Force, Honington-Troston, England (1942–46). October 12–15, 1995, in Louisville, Ky. **Contact:** Herb Kaster, 720 Society Hill Blvd., Cherry Hill, NJ 08003.

2d Airdrome Squadron. June 6–8, 1995, at the Holiday Inn in Alamogordo, N. M. **Contact:** Earl Lively, 301 S. Cockrell, Alpine, TX 79830. Phone: (915) 837-3172.

2d Bomb Group/Wing. September 7–10, 1995, in Kansas City, Mo. **Contact:** Kemp F. Martin, 806 Oak Valley Dr., Houston, TX 77024. Phone: (713) 467-5435.

19th Bomb Group Ass'n. August 10–12, 1995, in Dayton, Ohio. **Contact:** Robert E. Ley, 3574 Wellston Ct., Simi Valley, CA 93063-1145. Phone: (818) 703-7717.

22d Fighter-Day Squadron, Bitburg AB, West Germany (1956–59). September 15–17, 1995, at the Chanute Air Museum in Rantoul, Ill. **Contact:** Donald O. Weckhorst, P. O. Box 949, Rantoul, IL 61866-0949. Phone: (217) 379-3253.

27th Air Transport Group (including the 310th, 311th, 312th, and 325th Ferrying Squadrons; 86th, 87th, 320th, and 321st Transport Squadrons; and 519th and 520th Service Squadrons). October 25–29, 1995, in Cocoa Beach, Fla. **Contact:** Fred Garcia, 11903 N. 77th Dr., Peoria, AZ 85345. Phone: (602) 878-7007.

Unit Reunions

30th Bomb Group Ass'n. October 20–21, 1995, in Riverside, Calif. **Contact:** John S. Allison, P. O. Box 485, Charleston, SC 29402.

33d Air Depot Group (World War II). August 24–27, 1995, in Chattanooga, Tenn. **Contact:** Robert W. Gochoel, 10280 Pendery Dr., Cincinnati, OH 45242. Phone: (513) 891-7742.

35th Air Police Squadron, Johnson AB, Japan. September 1995, in Dover, Del. **Contact:** William C. Watson, 200 Meadow Ave., Mannington, WV 26582. Phone: (304) 986-2764.

39th Bomb Group, Guam (1945). August 10–13, 1995, in Dayton, Ohio. **Contacts:** James W. Wyckoff, 2714 E. Hayt's Corners Rd., Ovid, NY 14521-9768. Phone: (607) 869-2574. Robert E. Weiler, 516 Canal Rd., Sarasota, FL 34242-1901. Phone: (813) 346-0188.

40th Fighter Squadron, 35th Fighter Group (1939–54). August 14, 1995, at the US Air Force Museum in Dayton, Ohio. **Contact:** C. E. Dannacher, 12225 Kingshill Dr., St. Louis, MO 63141. Phone: (314) 434-1354.

Pilot Class 41-H. October 31–November 3, 1995, in San Antonio, Tex. **Contact:** Bob Sheeks, 145-A Treasure Way, San Antonio, TX 78209. Phone: (210) 826–8842.

Aviation Cadet Class 43-G, Brooks Field, Tex. October 6–8, 1995, at the Ramada Hotel in Fort Worth, Tex. **Contact:** Don Massey, 1009 Fox Hollow Farm, Little Elm, TX 75068. Phone: (214) 294-2556.

Pilot Classes 44-G, H, I, J. August 31–September 3, 1995, in Cleveland, Ohio. **Contact:** W. G. Sherwood, 31142 Georgetown Rd., Salem, OH 44460. Phone: (216) 337-6081.

51st Fighter-Interceptor Wing. September 14–17, 1995, in Eugene, Ore. **Contact:** Bill Rogers, P. O. Box A, Vida, OR 97488-0501. Phone: (503) 896-3749.

Pilot Class 53-B. October 8–10, 1995, in Myrtle Beach, S. C. **Contact:** Ray Schnabel, 4535 W. Rancho Dr., Glendale, AZ 85301. Phone: (602) 934-4313.

55th Troop Carrier Squadron "Tokyo Trolley," 5th Air Force. September 28–October 1, 1995, at the Embassy Suites in Phoenix, Ariz. **Contact:** Jack Potter, 10406 Tropicana Cir., Sun City, AZ 85351.

64th Troop Carrier Group. September 1995, in Savannah, Ga. **Contact:** Vern Montgomery, 6744 Carlsen Ave., Indianapolis, IN 46214. Phone: (317) 241-5264.

69th Bomb Squadron, 38th Bomb Group, and 42d Bomb Group, 13th Air Force (South Pacific). October 12–14, 1995, at the Green Oaks Inn in Fort Worth, Tex. **Contact:** Col. Frank E. Marek, USAF (Ret.), 440 Flora's Rd. N., Aledo, TX 76008-9998.

75th Troop Carrier Squadron. September 15–17, 1995, in Appleton, Wis. **Contact:** Robert C. Richards, 266 Woodlawn Dr., Tipp City, OH 45371. Phone: (513) 339-7508.

81st Fighter Group/Wing. October 11–14, 1995, on the *Queen Mary* in Long Beach, Calif. **Contacts:** Lt. Col. Lern Krisle, USAF (Ret.), 914 Via Presa, San Clemente, CA 92672. Phone: (714) 498-0446. Lt. Col. Ron Moeller, USAF (Ret.), 2230-0 Via Puerta, Laguna Hills, CA 92653. Phone: (714) 588–7143.

81st Fighter Squadron Ass'n, 50th Fighter Group (World War II). Fiftieth-anniversary reunion, September 7–9, 1995, at the Sheraton Hotel in Colorado Springs, Colo. **Contact:** George Johnson, 1310 Wynkoop Dr., Colorado Springs, CO 80909. Phone: (719) 597-6462.

81st Troop Carrier Squadron, 436th Troop Carrier Group (World War II). October 5–7, 1995, at the Henry VIII Hotel in St. Louis, Mo. **Contact:** Harold N. Read, 17 Belton Dr., Barrington, RI 02806. Phone: (401) 246-0521.

82d Fighter Group (including the 95th, 96th, and 97th Fighter Squadrons). October 4–8, 1995, in Fort Walton Beach, Fla. **Contact:** Hank Phillips, 3 Idlewild Cir., Fort Walton Beach, FL 32547. Phone: (904) 862-3024.

94th Bomb Group, 8th Air Force. October 3–8, 1995, at the Wyndham Hotel in San Antonio, Tex. **Contact:** Wade C. Wilson, 1941 Harris Ave., San Jose, CA 95124-1017. Phone: (408) 377-4787.

96th Bomb Group Ass'n, 8th Air Force (World War II). May 31–June 4, 1995, in Milwaukee, Wis. **Contact:** Thomas L. Thomas, 1607 E. Willow Ave., Wheaton, IL 60187-5950. Phone: (708) 668-0215.

111th Tactical Reconnaissance Squadron (World War II). September 14–17, 1995, at the Allerton Hotel in Chicago, Ill. **Contact:** Lt. Col. Roy D. Simmons, Jr., USAF (Ret.), 3730 Edgewater Dr., Nashville, TN 37217. Phone: (615) 366-1191.

312th Bomb Group. September 7–10, 1995, at the Weston Plaza Hotel in Twin Falls, Idaho. **Contact:** Paul M. Stickel, 1136 Gray Ave., Greenville, OH 45331-1127.

320th Bomb Group (World War II). October 12–24, 1995, at the Hilton Hotel in Salt Lake City, Utah. **Contact:** Stu Rowan, 108 Aspen, Hereford City, TX 79045. Phone: (806) 364-4015.

339th Fighter Group Ass'n, 8th Air Force (World War II). June 14–18, 1995, in Buffalo, N. Y. **Contact:** Chet Malarz, 2405 Kings Point Dr., Atlanta, GA 30338.

348th Fighter Group, 5th Air Force (World War II). September 25–28, 1995, in Las Vegas, Nev. **Contact:** James C. Curran, 9712 Buckhorn Dr., Las Vegas, Nev. 89134-7836. Phone: (702) 256-2559.

367th Fighter Group, 9th Air Force (World War II). August 10–13, 1995, at the Radisson Hotel in Fargo, N. D. **Contact:** Col. Allen Diefendorf, USAF (Ret.), 25985 Holly Vista Blvd., San Bernardino, CA 92404-3514.

376th Bomb Group (World War II). August 30–September 3, 1995, in Kansas City, Mo. **Contact:** William V. Barnes, 4304 Denton Cir., Waco, TX 76710-2125. Phone: (817) 776-4847.

380th Bomb Group. July 17–23, 1995, at the Hilton Hotel in Oshkosh, Wis. **Contact:** Helen Thompson, 2401 Lakeview Dr., Heber Springs, AR 72543. Phone: (501) 362-2891.

388th Fighter-Bomber Wing, Clovis, N. M., and Etain, France. October 19–22, 1995, in Arlington, Va. **Contact:** Brig. Gen. Thomas H. Dinwiddie, USAF (Ret.), 11000 S. Glen Rd., Potomac, MD 20854. Phone: (301) 983-3152.

390th Bomb Squadron. October 5–8, 1995, at the Red Lion Hotel in Colorado Springs, Colo. **Contact:** Lorin N. Trubschenck, 442 St. Andrews Way, Lompoc, CA 93436. Phone: (805) 733-2765.

398th Bomb Group, Nuthampstead, England (World War II). October 11–14, 1995, in Charleston, S. C. **Contact:** George R. Hilliard, 7841 Quartermaine Ave., Cincinnati, OH 45236-2313.

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Unit Reunions

405th Fighter Squadron (World War II). September 28–October 1, 1995, at the Hilton Riverside Hotel in New Orleans, La. **Contact:** Lt. Col. Montie A. Davis, USAF (Ret.), 3610 Lang St., New Orleans, LA 70131. Phone: (504) 393-1273.

454th Bomb Group (World War II). October 15–20, 1995, in Las Vegas, Nev. **Contact:** Ralph Branstetter, P. O. Box 678, Wheat Ridge, CO 80034-0678. Phone: (303) 422-6740.

459th Bomb Group, 15th Air Force (World War II). September 28–October 1, 1995, at the Radisson Hotel in St. Paul, Minn. **Contacts:** W. Homer Eggen, 8549 Irwin Rd., #327, Bloomington, MN 55437. Phone: (612) 832-5306. John Devney, 90 Kimbark Rd., Rochester, NY 14610. Phone: (716) 381-6174.

485th Bomb Group, 15th Air Force. September 12–18, 1995, at the Wyndham Paradise Valley Resort in Scottsdale, Ariz. **Contact:** Earl L. Bundy, 5773 Middlefield Dr., Columbus, OH 43235.

485th Tactical Missile Wing, Florennes AB, Belgium. July 21–23, 1995, at Offutt AFB, Neb. **Contacts:** Lt. Col. Tom Deppe, 17904 Nicholas Dr., Plattsmouth, NE 68048. Phone: (402) 298-7408 or (402) 294-2019. Boomer Crowley, 11806 S. 30th Ave., Omaha, NE 68123. Phone: (402) 294-6291 (work) or (402) 292-8353 (home).

500th Bomb Squadron, 345th Bomb Group (World War II). September 9–13, 1995, in San Diego, Calif. **Contacts:** William J. Cavoli, 2320 Encino Cliff, San Antonio, TX 78259. Phone: (210) 497-3580. Bob Scudder, 2549 Holly Valley Dr., Vista, CA 92084. Phone: (619) 724-6119.

557th Bomb Squadron, 387th Bomb Group (World War II). October 11–15, 1995, at the Menger Hotel in San Antonio, Tex. **Contact:** Joe Meckoll, 291 Quinhill Ave., Los Altos, CA 94022. Phone: (415) 941-1212.

780th Bomb Squadron (World War II). September 13–17, 1995, at the Grand Ramada Inn in Branson, Mo. **Contact:** John A. Fleisher, 16056 Tortuga St., Bokeelia, FL 33922. Phone: (813) 283-7495.

2038th LS Company, 108th LS Center, Istres, France (1946). June 23–25, 1995, in Gettysburg, Pa. **Contact:** Robert Kinner, 7641 Montgomery Rd., #1, Cincinnati, OH 45236. Phone: (513) 791-0844.

6147th Tactical Control Group "Mosquitos." September 5–10, 1995, at the Antlers-Doubletree Hotel in Colorado Springs, Colo. **Contacts:** James V. Merritt, 2440 S. Ammons St., Lakewood, CO 80227. Phone: (303) 986-2692. Sidney F. Johnston, 6909 Rosewood Rd. N. E., Albuquerque, NM 87111. Phone: (505) 823-2927.

7505th USAF Hospital, Burderop Park, Swindon, England. September 15–18, 1995, in Madison, Wis. **Contact:** Robert W. Blasey, 311 Garden Ave., Bellevue, NE 68005. Phone: (402) 291-5019. ■

Mail unit reunion notices well in advance of the event to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.

Bulletin Board

Seeking contact with **16th Special Operations Squadron** AC-130 veterans for their stories and photos from southeast Asia, Grenada, Panama, Operation Desert Storm, and Somalia. **Contact:** Gregory T. Davis, P. O. Box 42, Peru, ME 04276.

Seeking contact with anyone from **Pilot Class 45-B,** Aloe Field, Tex. Also seeking **2d Lt. Clifford McGilvery. Contact:** Capt. Tommy P. Melton, USAF (Ret.), 1729 Red Pine Ave., Kissimmee, FL 34758.

Seeking contact with **Capt. Hubert E. Allen, Lt. Donald M. Scruton, SSgt. Stanley Olson, A2C Louis Rizzo,** and **A1C Alexander Wilson,** WB-26 crew of the 6166th Air Weather Reconnaissance Flight, Kimpo, Korea, in 1953. **Contact:** CMSgt. Richard H. Langill, USAF (Ret.), P. O. 162, Plainfield, NH 03781.

Seeking contact with American servicemen, including **Lt. Reeves H. Byrd, C. S. Wright, E. J. Walsh,** and **Ens. F. Shaughnessey,** who dropped supplies and greetings to **prisoners of war** held captive by the Japanese in World War II. **Contact:** Patrick J. Cully, Defense Attaché Office, American Embassy, PSC 801 Box 54, FPO AE 09498-4054.

Seeking information on the **7407th Support Squadron,** once located at Rhein-Main AB, Germany. **Contact:** Thomas A. Dionis, 138 Washington St., Hudson, MA 01749-2730.

For a museum, seeking **uniforms, medals, and memorabilia** from all wars. **Contact:** Lt. Col. James Burkholder, Jr., USAF (Ret.), HCR 61, Box 80, Bonners Ferry, ID 83805.

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 contact with aircrew and ground crew for the 839th Bomb Squadron B-17G #43-37987 ***Mean Widdle Kid,*** at Station 137, Lavenham, UK, in 1945. Also seeking information on and nose art for the aircraft. **Contact:** Lt. Col. Richard L. Althouse, USAF (Ret.), 380 W. Cedar St., Palmyra, PA 17078.

Seeking the whereabouts of **Roy Adams, John Henderson, Joseph Quinn, Glenn Thompson,** and **Lewis Wisdom** of the 430th Bomb Squadron, 502d Bomb Group, 315th Bomb Wing, Guam. **Contact:** Byron W. Kinney, 2028 Hollywood Ct., Wilmette, IL 60091. ■

Pieces of History

Photography by Paul Kennedy

V-E Day: Halfway Home

World War II ended in Europe on May 9, 1945. Weary but victorious, US soldiers, sailors, Marines, and airmen returned to their anxiously waiting families and a grateful nation. But not everyone was celebrating a homecoming. Thousands were still missing in action or imprisoned. Others were headed to the Pacific to finish the war with Japan, which was not to end until three months later, on August 14.

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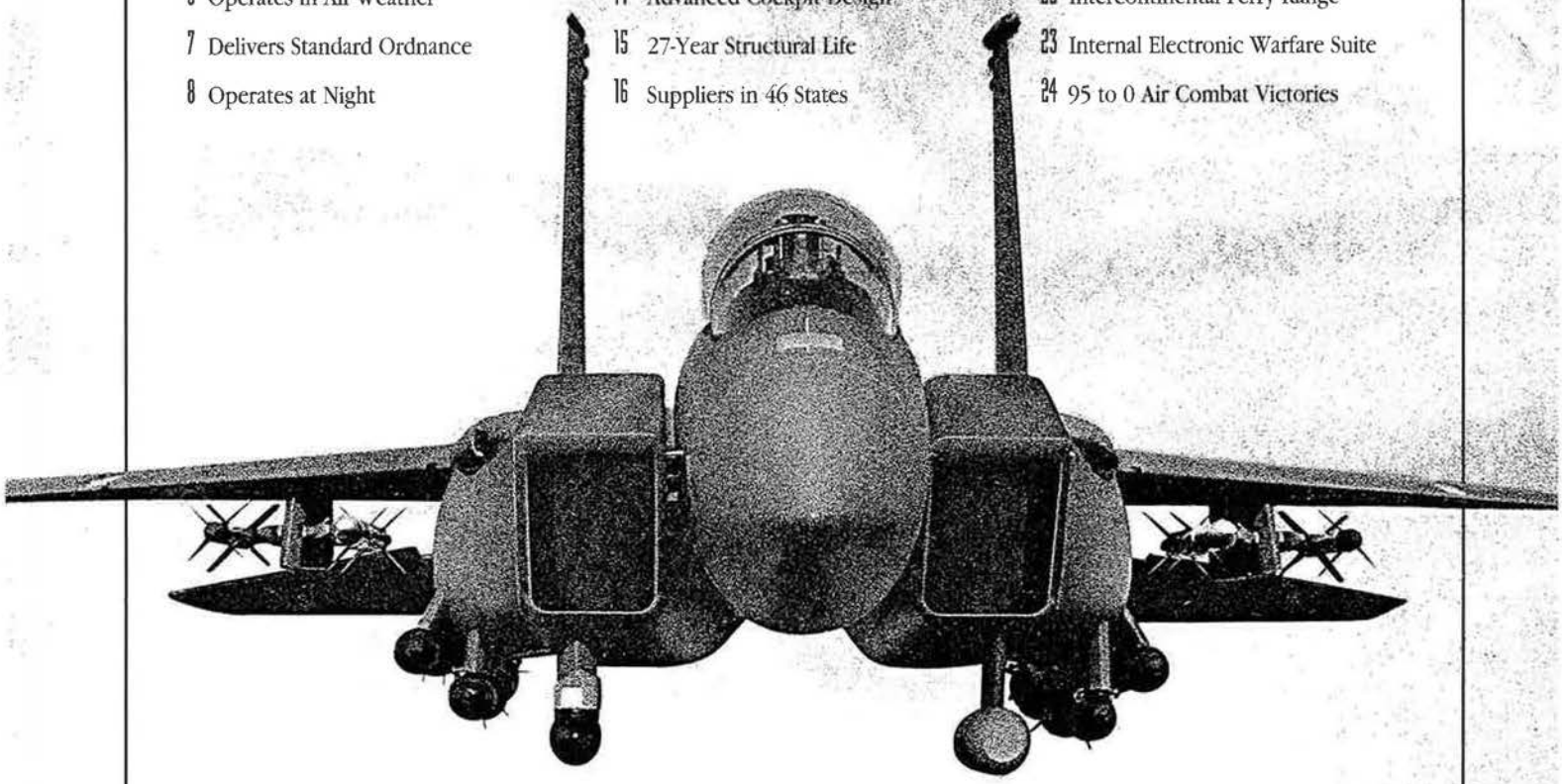

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