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1939

Aptly nicknamed Lightning, the Lockheed P-38 was the first to cross the U.S. in just 7 hours.



1944

The Republic P-47 Thunderholt was the first propeller-driven aircraft to exceed 500 mph in level flight.



1944

Originally built for the RAF, the North American P-51 Mustang could outrun all its contemporaries.



1949

The Republic XF-91 Thunderceptor used 4 rocket motors to pass the "century mark"—1000 mph.



1953

The North American F-86 Sabre captured three world speed records between 1948 and 1953.



1955

First U.S. supersonic fighter, the North American F-100 Super Sabre pushed the world record past 800 mph.



1958

Called the "missile with a man in it," Lockheed's F-104 set records for altitude (91,000') and speed (1403 mph).



1959

A new world record of 1525 mph was set in December by the Convair F-106 Delta Dart.



1961

Still in service after 30 years, McDonnell Douglass' F-4 Phantom II moved the world record to 1600 mph.

atters another speed record.



Boeing's P-26 'Peashooter,' America's first all-metal monoplane, topped speeds of 230 mph.



Never put into service, the Northrop XP-56 flew above 400 mph, powered by a 2000-hp radial engine.



1938

The Curtiss P-36 test-dove at 500+ mph, and later downed several attackers at Pearl Harbor.



1947

The Lockheed P-80 Shooting Star set a world speed record of 623 mph, and was a great success in Korea.



The turbo-charged Bell P-39, prototype of the Airacobra, achieved flying speeds of 400 mph.



Two Mustang fuselages sharing one wing, the North American F-82 was the first to fly Hawaii to NYC nonstop.



1950

At its debut, the Convair B-58 Hustler topped 1300 mph, unprecedented for a plane of its size.

> 1975 Lockheed's SR-71A Blackbird

spy plane set 12 world records, routinely

exceeding 2000 mph.



1957

Heaviest of the "Century Series" fighters, the McDonnell F-101 Voodoo pushed the world record to 1207 mph.



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1992

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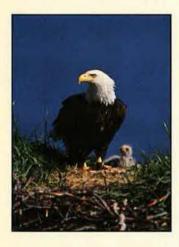
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All of which means, in the air battles of the future, the F-22 will dominate the skies.



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About the cover: Change is on the wing for the Air Force as three fledgling major commands take over the responsibilities of five old, established commands. Cover photo and Almanac logo photo © 1991 Tom & Pat Leeson.

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Editorial

By John T. Correll, Editor in Chief

The Troop Losses Mount

BETWEEN the Japanese surrender in September 1945 and May 1947, the strength of the Army Air Forces dropped from 2,253,000 to 303,600. The demobilization was so fast that by late 1945, airplanes were stranded in all parts of the world for lack of mechanics to keep them flying.

Some recall the World War II demobilization and see today's military reduction as a smaller and less severe version. The comparison is wrong in

nearly all respects.

Most of the troops let go between 1945 and 1947 entered service after Pearl Harbor. They were eager to return to civilian life and good jobs as the economy shifted to peacetime production. The Army Air Forces had trouble recruiting and retaining people to fill their reduced ranks.

By contrast, the present cuts are borne by an all-volunteer force, including veterans with up to fourteen years of service who had counted on a full military career. Many of them will now be pushed out into one of the tightest job markets in recent

In the winter of 1990, with war looming in the Persian Gulf, the Department of Defense put a "stop loss" order into effect, preventing troops from retiring or separating. Today, it is working to reduce the armed forces by more than a million military members and civilian employees, compared to the levels of 1987.

The Army is hit hardest of all the services, but the Air Force takes the second-deepest reductions, cutting its active-duty component by twenty-nine percent and its civilian personnel by

twenty-three percent.

Congress is allowing severance pay to those forced out and has approved two programs to induce departures. Those who leave before they are pushed can choose between the lump-sum Special Separation Benefit (SSB)—fifty percent greater than involuntary separation pay-and the Voluntary Separation Incentive (VSI), an annuity for double the number of years served.

For a staff sergeant with twelve years' service, for example, involuntary separation pay would be \$21,349.

4			
	1987	1997	Net Change
Active-duty			
Air Force	607,000	430,000	-177,000
All services	2,174,100	1,626,000	-548,100
Guard and Reserve			
Air Force	195,000	200,000	+5.000
All services	1,151,100	920,100	-231,000
Civilian employees			
Air Force	264,000	202,767	-61,233
Total defense civilians	1,133,000	904.345	-228,655

The SSB lump sum is \$32,024, and the VSI annuity is \$5,337, paid for twenty-four years. As of March 23, the Defense Department reported that 40,182 persons (out of the year's goal of 45,123) had requested separation

under these incentives.

"Involuntary separation" is a technical term, says Lt. Gen. Billy J. Boles, USAF deputy chief of staff for Personnel. "Many of the people who are taking VSI or SSB want to stay in the Air Force, but they understand that if they stay, they are very likely to be forced out with less compensation than if they leave voluntarily."

The Air Force has met its reduction goals so far with volunteers, early retirements, and curtailed recruiting. Force-outs become almost unavoidable, however, if deeper reductions

are ordered.

General Boles told the Senate March 26 that "the anxiety factor for our people is almost off the chart." In their view, he said, the government is "breaking faith with the all-volunteer force" and defaulting on the implied promise of reasonable career security in return for good performance and faithful service. The anxiety increases with each new proposal to cut the force deeper, he said.

"Option C," a force structure alternative suggested in February by Rep. Les Aspin (D-Wis.), chairman of the House Armed Services Committee, would cut 233,000 more troops by 1997 than the Pentagon plans. (The Air Force would lose 66,000 from active duty and 7,000 in the reserve components under Option C.) The consensus among military leaders is that Option C should be taken out and shot, but it has appeal for many in Congress.

Our consumption-oriented nation seems to regard the drawdown as a chance to squeeze a bigger "peace dividend" from the armed forces. The annual catalog of spending and revenue options, published in February by the Congressional Budget Office, included forty-three ideas for further defense cuts.

One of these options is holding military pay raises below inflation. CBO recognized that pay is higher in the private sector but said that, since the requirement for people in the armed forces is falling, "military pay could be even lower than it is today and still be competitive.'

As for the incentive programs, CBO said, "limiting military pay raises could accomplish the same goal of increasing voluntary separations but, unlike the incentives, would increase rather than offset the savings from personnel reductions.'

It has been a surprise to the budgeteers that so many of the departing troops-85.4 percent of them-chose the lump-sum SSB rather than the VSI annuity, which should be more attractive in the long term.

A plausible explanation is the need for immediate cash as they enter an uncertain job market. Some, however, may have had their bait of long-term assurances from the federal government and decided to take the sure cash and run.

Letters

"The Best of the Best"

"The Warthog Round at Gunsmoke" [March 1992, p. 32] was excellent, but I noticed two anomalies worth noting. First, the maximum possible points listed in three cases were in error: Top Team should have been 9,000 rather than 10,000; Top Gun should have been 2,250 rather than 2,500; and Top Maintenance Team should have been 3,600 rather than 4,000. The significance is that the top scores were very close to the maximums, indicating the intensity of the competition and the near perfection at the top. Winners were determined by inches and tractions of a second. Gunsmoke lives up to its slogan of being a competition of the "best of the best.

I think the article was a bit remiss in not sufficiently recognizing the very impressive performance of the Guard and Reserve teams. Their achievements included top two teams overall, top four pilots in "Top Gun" competition, "Top Guns" in four of seven individual weapon delivery events, Top Crew Chief, Top Maintenance Team, and Top Weapons Load Team.

I am glad to hear they will be updating Gunsmoke to include more current weapons and tactics.

Mike Nipper Fort Worth, Tex.

Why the A-10 Won

"The Warthog Round at Gunsmoke" was short on facts and long on politically correct propaganda. Instead of focusing on what the competition was, who won it, and why, you chose to explain what it was not (tactically oriented or an actual war, like Desert Storm) and refocus on the current weapon systems of favor (F-16 and F-15E), explaining why their less-than-expected finishing positions were not really that important.

Your preoccupation with whether or not Gunsmoke is tactically oriented overlooks its stated purpose, which is to demonstrate the air-to-surface capabilities of the tactical air forces, increase training efficiency, enhance esprit de corps, and recognize the best aircrews and maintenance teams in the TAF.

The fact is that, with the exception of navigation attack; low-angle, low-drag bomb; and level bomb, the Air National Guard and the Air Force Reserve won every possible group and individual award that they competed for. The A-10 placed first in every weapons delivery event except navigation attack and high-altitude dive bomb.

Why did the A-10 and the Guard and Reserve do so well? I say the answer is experience—experience in the Guard and Reserve that far outdistances that gained in a short-duration combat tour; experience in A-10s, doing no other mission besides ground attack for hours and years. Do you really suggest that LASTE and the A-10's slower speed were more than a match for the F-16's advanced avionics and radar targeting systems, or the combination of that level of capability and a weapon systems officer?

The capability found in the new and improved A-10 and any other airframe flown by Guard and Reserve units throughout the US is based on the people in those units. That's the resource that won Gunsmoke '91. They won because of their experience and determination to be exactly what they are: the best! Their mission and/or forte is not just dropping small dumb bombs either, and you can tell that by the winners list you printed on p. 37.

Capt. Herman C. Brunke, Jr., AFRES RIchards-Gebaur AFB, Mo.

Battling the Source Tax

I read "The Source Tax" [March 1992 "Editorial," p. 4] with great interest. The

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

article was an excellent "heads-up" for all retirees, whether military or civilian. The source tax is truly "taxation without representation."

Mr. Correll was absolutely right when he wrote, "The most aggressive [sourcetaxer] is California." Many other states have similar laws on their books and may, depending on the continued success of California, proceed just as aggressively.

The National Association of Retired Federal Employees has been very active in forming coalitions with AFA, ROA, and many others, as Mr. Correll mentioned. He is also right when he implied that the American Association of Retired Persons is not doing much at all. This is difficult to understand because AARP represents so many retirees.

Mr. Correll did not mention the specific bills in Congress at the moment that have stagnated in various committees. Two of these bills are H.R. 431 and S. 267. These bills would do away with the source tax and make it illegal for states to impose taxes of this sort. All retirees should write their Congressmen urging them to become cosponsors of these bills.

Thanks for such a timely article. We do not want more "horror stories," and there are many of them.

Frank G. Atwater Thousand Oaks, Calif.

Brown Cradle Jamming

As a former member of the 42d Tactical Reconnaissance Squadron at RAF Chelveston, UK, and Toul-Rosieres AB, France, and a navigator on one of the three EB-66B aircraft that wiped out UK air traffic control during the Brown Cradle test, I read "The Other Jammer" [March 1992, p. 74] with interest and reminiscence.

I would like to thank August Seefluth and AIR FORCE Magazine for tracing the beginnings of operational ELINT to the passive and active ECM activities of the 42d TRS. The mission of the 42d was one of the few real operational missions being conducted by the tactical air forces during that time, and every member of the squadron was very dedicated and proud of the role he had in mission accomplishment.

8





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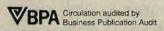
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Letters

believe RAF Chelveston is closed now, but someplace on the old base they ought to put a marker stating, "ELINT with tactical forces was born here."

> Lt. Col. Thomas E. Rowney, USAF (Ret.) Reston, Va.

I was fortunate to be with the B-66B from its beginnings with the 17th Bomb Wing at Hurlburt Field, Fla., in 1956, through its move to RAF Sculthorpe and RAF Alconbury, UK, where it replaced the aging B-45, and later with the EB-66B in Thailand.

There are several discrepancies in the article concerning installation of the Brown Cradle and the general history of the aircraft, which could be attributed to the lapse of forty-five years or so, but I cannot stand by and let two glaring errors stand uncorrected.

First, concerning the deployment of the aircraft to southeast Asia and several moves by the 42d Tactical Electronics Warfare Squadron, eventually ending up at Udorn RTAFB, Thailand, in September 1966. The truth is that the 42d TEWS flew the passive ELINT B-66 with those godawful downward ejection seats for the four EWOs. Its job was to locate and pinpoint SAMs, radar-guided AAA, and anything else electronic the North Vietnamese were using and to warn of active hostile actions during strikes. The EB-66B jammer aircraft were flown by the 6460th TEWS, and its job was to jam that enemy equipment before and during the air strikes. Both were based at Takhli RTAFB, Thailand.

Second, the article states that from late 1966 through early 1967 the fighters no longer needed our support, since they were equipped with QRC 160 selfprotection pods, and that the EB-66Bs were assigned to support B-52 and Navy strikes. I flew in the 6460th from October 1966 through June 1967, and of my ninety-one missions in the North, an overwhelming number were in support of F-105 and F-4 strikes in the Yen Bai, Hanoi, and Haiphong area. A few missions were flown by the 6460th in support of B-52 strikes, along with the occasional C-130 leaflet drop or rescue mission, but supporting the Navy was frowned on.

In January 1967, I flew a mission in support of a flight of F-4s in the Haiphong area. As I was departing, I was contacted by the Navy and asked to support a flight of A-6 Intruders because their ECM aircraft had aborted. I told them I would have to find a tanker, and in an instant an A-3D tanker appeared. I refueled and remained on station until the strike aircraft had cleared the area.

When I returned to Takhli, I found 7th Air Force was seething. I was spoken to strongly by the commander of the 355th TFW, who said, "The Navy got six sorties out of that." Hq. 7th Air Force sent a message saying that the B-66 was incompatible with Navy fuel and that refuelings with Navy aircraft would not occur again. Since I was the squadron standardization and evaluation officer, I sent a reply that the B-66 manual lists JP-5 as an unrestricted substitute. That was quickly met by another message from 7th Air Force: "Repeat, the B-66 will not refuel from Navy aircraft again."

We got their message.

Maj. Kenneth H. High, USAF (Ret.) Lake Jackson, Tex.

August R. Seefluth's informative article on B-66 electronic warfare activities omitted one important facet of their operations.

Starting in 1961 and lasting until the alrcraft were deployed to southeast Asia in 1966, 10th Tactical Reconnaissance Wing RB-66 aircraft provided electronic counter-countermeasures training for the US, other NATO, and other friendly nations throughout Europe and the Middle East. This was not always easy, in view of the dense air traffic and bad weather prevalent in the theater, but the RB-66s were the only jet aircraft capable of providing a realistic jamming environment at the time.

These "Dancing Doll" exercises not only resulted in a marked improvement in allied air defense forces' ability to function when jammed but also served as a constant reminder to the Soviet Bloc of Allied technological superiority at the height of the cold war. Thus, the RB-66s made a valuable contribution to NATO's deterrence mission.

> Col. William Bruenner, USAF (Rel.) Dawson, Ga.

Clark's Closing

"Last Days at Clark" [February 1992, p. 56] elicited mixed feelings on the part of this reader. As a former serviceman who was stationed at Clark Field in 1946-47 and who later returned for visits in 1979 and 1981, I had feelings of nostalgia and pride for this great military base. To read of reports of looting and theft after the eruption of Mount Pinatubo angered and saddened me. However, the removal of the US military presence with the closing of Clark and, later, of Subic Bay, should eventually be in the best interests of the Philippine government, as well as our own.

As long as the American military remained in the Philippines, it would continue to foster unrest and undermine the stability of Corazon Aquino's administration. Withdrawing to Guam seems only logical in view of the diminishing threat in the Far East. Perhaps this will be a sign for the gradual removal of American military forces in countries where the Stars and Stripes has become an unwelcome symbol.

Harry A. Stokes Old Hickory, Tenn.

Another Volcano

"Last Days at Clark" discusses the eruption of Mount Pinatubo and the other volcanic eruptions in the Philippines, including Luzon. However, it fails to mention the famous Taal eruption of 1965, which took place only thirty-five miles south of Manila and killed more than 300 people. Taal is now shaking and fuming again.

Lt. Col. Roy J. Bierman, AFRES (Ret.) Bella Vista, Ariz.

■ "Last Days at Clark" contained several errors of omission and commission. Pampanga Agricultural College, to which USAF personnel evacu-

ated after the eruption, is not located at Clark but on Mount Aryat. Mud flows that raced through Clark's base exchange area seriously damaged several buildings, but did not technically "flatten" them. USAF personnel saw no need to clear the runways because flight operations had ceased. Rather, they thought the base's earth-moving equipment could best be used to clear the golf course, which was situated on a major flood plain and whose drainage system had been clogged by volcanic ash and mud, raising the danger that heavy rains could create safety and security problems. They did not clear the putting greens.—THE EDITORS

Uniform Hue and Cry

The hue and cry over a new USAF uniform reminded me of my recall during Korea ["New Uniform Blues," February 1992 "Letters," p. 8]. My new "blue Army uniform" had the same holes punched through its outraged fabric as my old bottle-green USAAF blouse. Metal bars, lapel gizmos, wings—armies of the world glory in these gadgets. My rank was captain, another anachronism, so the rustics back home never figured out whether I was a Marine, soldier, policeman, or ship captain.

Itotally approve of the removal of the army brass, but its replacement with blatant metallic silver stripes boggles the brain! Hasn't Chief of Staff Gen. Merrill A. McPeak ever noted how the subdued sleeve stripes of RAF officers' coats blend unobtrusively with the uniform? Evidently not.

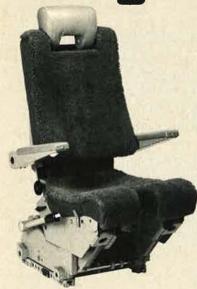
In 1948 enlisted ranks were changed commensurate with air rather than surface tradition. Officer ranks still duplicate the Army and Marines. During the 1920s, the RAF pioneered more appropriate air officer titles. In England, if your rank is Flying Officer or Wing Commander, it's obvious you are not in the Army or Navy.

Lt. Col. Robert H. Farley, USAF (Ret.) Carmel, Calif.

Erratum

The telephone number for the Transition Support and Services Directorate published on p. 66 in "Veterans Flood the Job Market" in the April 1992 issue is incorrect. The correct number is (800) 727-3677. We apologize for the error.

Designed for the Long Haul



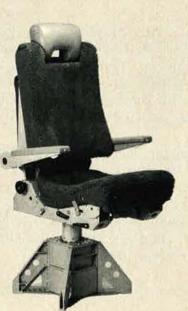
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A new night targeting system will help gunners of U.S. Army Cobra attack helicopters accurately direct TOW missiles, cannon and rocket fire through darkness, smoke, adverse weather and countermeasures. This system, called COBRA-NITE, or C-NITE, is produced by Hughes. C-NITE has been installed on AH-1F Cobras assigned to the 8th U.S. Army in South Korea. The Army National Guard also plans to upgrade selected Cobras with this new, around-the-clock combat capability.

Major industrial plants in the United States are now benefitting from Hughes technologies that are providing environmental solutions. These technologies include thermal imaging to detect vapor spills, laser spectrometers for monitoring gas emissions, and fiber optic leak detectors. Hughes is actively involved in a Superfund cleanup project at a major U.S. industrial plant where it is providing systems engineering, remediation planning, technology application and environmental laboratory support, as well as helping manage these efforts. These innovative, science-based solutions draw upon many of Hughes' defense and non-defense technologies.

A high-performance night vision system that significantly improves the combat effectiveness of light armored vehicles (LAVs) is being produced by Hughes. The modular system, called Hughes Infrared Equipment (HIRE), provides LAV crews with a thermal imaging system comparable to those installed on the world's most modern main battle tanks. HIRE consists of three components: the sensor and gunner's display; the commander's remote display; and the power supply/electronics unit. Due to its modular design, HIRE can replace the image intensifiers used on most existing armored vehicles.

Hughes-built transmitter and receiver units are having a dramatic impact on private cable TV systems. Thanks to a Federal Communications Commission rule change, this newly authorized microwave system service has been hooked up to nearly 2,000 cable TV units in Los Angeles' Bunker Hill area, giving residents a lengthy lineup of cable services. These residents will be the nation's first to enjoy the benefits of the improved 18 GHz microwave distribution system, which includes a powerful single satellite-receiving station and smaller, more economical medium-power outdoor transmitter and receiver units.

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Aerospace World

By Frank Oliveri, Associate Editor

Leaders of New Commands Nominated

The Department of Defense formally announced the nominations of several Air Force general officers for leadership positions in three new Air Force and US unified commands.

Gen. John Michael Loh has been nominated to head USAF's new Air Combat Command, headquartered at Langley AFB, Va., and set to be activated on June 1. Since 1991, General Loh has been commander of Tactical Air Command, which will deactivate on June 1. Maj. Gen. Stephen B. Croker has been nominated to be ACC vice commander and was simultaneously nominated for promotion to lieutenant general. He currently serves as ACC provisional commander.

Gen. Ronald W. Yates, commander of Air Force Systems Command (AFSC), Andrews AFB, Md., has been nominated to head the new Air Force Materiel Command, headquartered at Wright-Patterson AFB, Ohio, and due to be activated July 1. Lt. Gen. Charles J. Searock, Jr., has been nominated to be vice commander of AFMC. General Searock is currently vice commander of Air Force Logistics Command (AFLC), headquartered at Wright-Patterson. Like AFSC, AFLC will deactivate July 1.

Air Force Gen. George L. Butler has been nominated to be commander in chief of US Strategic Command, the new multiservice organization to be headquartered at Offutt AFB, Neb. General Butler currently heads Strategic Air Command (which disbands June 1) and is director of the Joint Strategic Target Planning Staff, also at Offutt.

The Navy's Vice Adm. Michael C. Colley has been nominated for deputy commander in chief of USSTRATCOM. Admiral Colley currently serves as vice director of the Joint Strategic Target Planning Staff.

B-52 Bombers Visit Moscow

Two Air Force B-52 bombers and one Air Force KC-10 aerial refueling and cargo aircraft, assigned to the 2d Wing, Barksdale AFB, La., visited Ryazan AB in Moscow in early



At McKinley Climatic Laboratory, Eglin AFB, Fla., the Bell Boeing V-22 Osprey tiltrotor aircraft is undergoing limited icing, rain, and solar tests. Installation in a raised test fixture allows the aircraft to be run in both helicopter and airplane modes.

March. The flight to Russia was part of an Air Force exchange program with the Commonwealth of Independent States

Ryazan is a Tu-95 bomber training base. About sixty Air Force personnel, including aircrews and operations and support workers, accompanied the bombers to the CIS. A reciprocal visit this month by up to three CIS Tu-95 "Bear" bombers, a Tu-160 "Blackjack" bomber, and support is part of the exchange program. The agreement also provides for an exchange of fighter aircraft. Discussions on the fighter exchange are ongoing.

B-2 Team Wins Collier Trophy

The joint government-industry team that is producing the stealthy B-2 bomber has won the 1991 Collier Trophy. The trophy, awarded annually by the National Aeronautic Association, recognizes what NAA deems "the greatest achievement in aeronautics or astronautics." The 1991 award was announced in March.

The B-2 Systems Program Office at Wright-Patterson AFB, Ohio, manages Air Force development, production,

and deployment of the B-2. It is part of AFSC's Aeronautical Systems Division.

Last year's Collier winner was the V-22 Osprey tiltrotor aircraft. Ironically, both the B-2 and the V-22 programs have significant funding problems, with each fighting off termination attempts for the past few years.

Separation Programs Begin

The Air Force announced in February that more than 14,000 members had applied for either the Voluntary Separation Incentive or the Special Separation Benefit. About 9,000 applications had been approved.

Some 1,442 officers applied for the incentive program, with 763 opting for the VSI and 679 seeking the lump sum payment of the SSB. Enlisted people taking advantage of the offer numbered 13,245, with 11,911 applicants taking SSB and 1,334 choosing yearly VSI payments.

Gen. Merrill A. McPeak, the Air Force's Chief of Staff, finds the figures for enlisted personnel encouraging. However, he reported that the number of officers seeking separa-

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tion is far less than the Air Force had hoped for. General McPeak and Air Force Secretary Donald B. Rice told Congress that, if the number of separating officers does not increase, involuntary reductions would commence in Fiscal 1993. General McPeak said many officers seem to be waiting to see how things develop before making a move.

The VSI program provides annual payments to the separating member equal to 2.5 percent of annual basic pay multiplied by the member's years of service. The payments will be made in equal installments for a period equal to twice the number of years of service of the member. Under the SSB plan, DoD would provide to the separating member a lump sum payment equal to fifteen percent of annual pay multiplied by the number of service years.

F-22 External Design Completed

The external design of the Lockheed/Boeing/General Dynamics F-22 air-superiority fighter was completed in February, marking a major milestone in the fighter's development.

The external design is critical to the performance and stealthiness of the fighter. According to Lockheed, the design will first be used in building

radar cross section models and numerous wind tunnel models to validate the configuration. The completion of the external lines will permit the completion of an internal design and allow for preparation of tooling and manufacturing processes.

The final F-22 differs subtly from the earlier YF-22 prototype. However, the contractor team maintains that it will bring significant improvements to the fighter. The changes:

- Increase the span of the diamondshaped wing from forty-three feet on the YF-22 to forty-four feet, six inches on the F-22. The aim is to improve maneuver performance and subsonic cruise efficiency by reducing drag.
- Decrease the wing leading edge sweep from forty-eight degrees to forty-two degrees in order to enhance F-22 maneuver performance. All other perimeter edges with the same sweep as the wing leading edge were changed to forty-two degrees for radar cross section reduction.
- Decrease the wing root thickness to reduce drag. The wing camber and twist was also modified to improve the fighter's supersonic maneuver performance.
- Reduce the area of the vertical tails to eighty-nine square feet per side, down from the 109 square feet

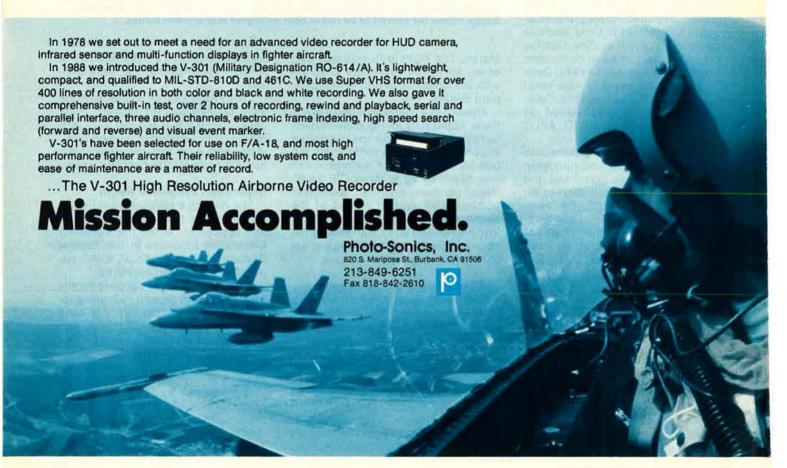
per side on the YF-22. The smaller vertical tails will reduce weight, drag, and aircraft height—from the YF-22's seventeen feet, seven inches to sixteen feet, five inches.

- Move the inlet lip aft approximately 1.5 feet relative to that of the YF-22, to reduce weight and enhance stability and control.
- Shift the cockpit forward, compared to the YF-22, and make the nose more blunt. The latter change aims to enhance the plane's radar performance. The forward movement of the cockpit improves the pilot's overthe-nose vision.
- Shorten the length of the F-22 to sixty-two feet, one inch—twenty-five inches less than the YF-22.
- Scarf the trailing edge of the F-22's horizontal tails and align them with the aftbody boom trailing edge to produce one continuous line.

SERBs to Convene

The Air Force plans to conduct selective early retirement boards (SERBs) for prior-service captains and majors. The service expects to select up to thirty percent of those eligible, according to officials.

About 1,200 captains and majors each are eligible for the SERBs, which are scheduled to meet June 1.





Gen. Donald J. Kutyna (left), commander in chief of North American Aerospace Defense Command and US Space Command, receives the AFSPACECOM flag from Lt. Gen. Thomas S. Moorman, Jr., at assumption-of-command ceremonies at Peterson AFB, Colo., as Senior Enlisted Advisor CMSgt. Delamar T. Jones looks on.

Projected end-strength reductions compel the service to examine a number of methods to best manage force drawdowns.

Separation boards will be held for each grade, with the Secretary of the Air Force determining the number of electees. This figure, however, must not exceed thirty percent in each grade. Those considered eligible are captains with a May 31, 1989, or earlier, date of rank and majors with an October 1, 1991, or earlier, date. Each must have at least nineteen years of service and seven years of commissioned service as of June 1.

B-2 "Cost to Go" \$2.6 Billion

It would cost only an additional \$2.6 billion to increase the number of B-2s from the current level of sixteen to the Administration's new ceiling of twenty stealth bombers, Air Force Secretary Donald B. Rice told the House Armed Services Committee in February.

Secretary Rice said that figure would include termination costs related to the program. The Air Force has already received complete approval for fifteen B-2s. Congress appropriated funds last year for the sixteenth, but the release of those funds must be approved by Congress in a second vote.

The Air Force's calculation, based on the assumption that Congress will release those funds, is that the additional four bombers would put the total program cost at \$44.4 billion. Without the last four, says the Air Force, the total program cost would be \$41.8.

Committee Chairman Rep. Les Aspin (D-Wis.) questioned the latter figure, contending that the actual cost was \$39.2 billion. Secretary Rice explained that that was last year's figure and that it did not include the costs for the joint Navy-USAF Inertial Aided Munitions program, additional work on the B-2, and the cost to change R&D aircraft to production configuration.

New B-2 Mission Statement

A new B-2 mission statement, approved by Secretary Rice in February, emphasizes the bomber's conventional capabilities over its nuclear deterrent role.

"The new mission statement represents a fine-tuning of the original mission statement, placing emphasis on the B-2's inherent conventional capabilities. This statement mirrors the new world order," an Air Force spokesman said.

The original document, released in 1981, strongly emphasized the B-2's nuclear deterrent capabilities, but officials stressed the original document's projection of the B-2 across the spectrum of combat missions.

The new statement says, "The primary mission of the B-2 is to enable any theater commander to hold at risk and—if necessary—attack an enemy's warmaking potential, especially those time-critical targets which, if not destroyed in the first hours or days of a conflict, would allow unacceptable damage to be inflicted on the friendly side."

The statement then outlined specific targets: "emerging capabilities for the production, support, and use of weapons of mass destruction";

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"massed conventional forces of an adversary threatening or invading a friendly state"; "key nodes of enemy command and control and air defenses"; and "enemy air attack assets and other offensive capabilities."

The statement said the B-2 will also retain its potential as a nuclear bomber.

MRF and A-X Role for F-22

The Lockheed/Boeing/General Dynamics industrial team will maximize its investment in the F-22 fighter program by using some technology from the aircraft program in proposals for two other forthcoming aircraft. Mickey Blackwell, Lockheed Vice President and General Manager of the F-22 program, said the two aircraft were the Air Force Multirole Fighter (MRF) and the Navy's A-X attack plane.

Mr. Blackwell emphasized that Lockheed will attempt to convince the Navy that a carrier-based version of the F-22 could fill the attack fighter role. He said that the F-22 was designed with an Inherent strike capability. He added that the Navy could get a cheaper fighter as a result of F-22 work already done.

The F-22 is several feet longer and much heavier than the aging A-6 Intruder that it would replace. These

factors could be decisive in the development of an aircraft that has to be able to withstand carrier takeoffs and landings.

"We'll have to wait and see what requirements come out of the Navy to see how to tailor the airplane," Mr. Blackwell said. This also applies to the MRF proposal, Mr. Blackwell said. He added, however, that one-third of the cost of building a fighter stems from the avionics, an area the F-22 has revolutionized.

Mr. Blackwell said there was no indication that the Air Force would cut the planned buy of 648 aircraft. In fact, he said, he has not even asked about it. "The best way to keep this program sold is for us to do what we are contracted to do and see that the Air Force gets what it asks for on schedule," Mr. Blackwell said.

Maj. Gen. James Fain, the F-22 program manager, said in December that the F-22 would be about 10,000 pounds over original projections of 50,000 pounds but that meeting that weight was a goal and not a requirement of the program. Mr. Blackwell said the actual weight of the F-22 will be determined in August.

Mr. Blackwell said that the engineers are still being pushed for the

best technologies to put in the F-22 but that they also must face the reality of weight concerns.

B-1B Operations Emphasized

As the US looks to a smaller B-2 bomber force, the B-1B bomber begins to take on greater importance in Air Force planning, said Secretary Rice to Congress.

The Secretary testified that, in its future B-1B plans, the Air Force will incorporate the Joint Direct Attack Munitions program, which will mate an inertial navigation kit, updated by the Global Positioning System, and a precision seeker to existing general-purpose bombs. Each bomb will be able to steer itself to a target, even in weather unsuitable for current optical and laser weapons. The B-1B will also use the Triservice Standoff Attack Missile, currently in engineering and manufacturing development.

IG Terms C-17 Payments "Premature"

A report prepared by the Pentagon's Inspector General maintains that Douglas Aircraft Co. prematurely received \$148 million in progress payments on the C-17 program. The IG office's report challenged the payment, saying it was made possible by a cost-accounting change that the IG considered questionable even though it had been allowed by the government.

In the mid-February report, the IG office found that Douglas redefined the point at which engineering costs shifted from development to production costs. "Audit of Contractor Accounting Practice Changes for C-17 Engineering Costs" called the redefinition inappropriate and the release of funds premature. The IG recommended the redefinition be disapproved until the impact of the move is better understood.

The move allowed \$172 million to be reallocated from development to production, leading to the receipt of \$148 million in progress payments. The IG accused the government and Douglas of practices contrary to cost-accounting standards, although the alleged improprieties will not increase the overall cost of the program. The IG said the action taken by Douglas and the government may have violated federal acquisition regulations in order to keep a steady flow of funds to the program.

The Defense Contract Audit Agency is still formulating a final response to the audit, which is due April 13. The DCAA was faulted in the audit for not

Senior Staff Changes

PROMOTION: To be Major General: Donald J. Harlin.

RETIREMENTS: B/G Charles L. Bishop; B/G Patricia A. Hinneburg; B/G James M. Johnston III.

CHANGES: Gen. George L. Butler, from CINC, Hq. SAC, and Dir., JSTPS, Offutt AFB, Neb., to CINC, Hq. USSTRATCOM, Offutt AFB, Neb., ... M/G Stephen B. Croker, from Cmdr., ACC (Prov. Hq.), Langley AFB, Va., to Vice Cmdr., Hq. ACC, and Vice CINC, USAFLANT, Langley AFB, Va... B/G (M/G selectee) Gary L. Curtin, from Ass't Dep. Dir., Int'l Negotiations, J-5, Jt. Staff, Washington, D. C., to Dep. Dir., Int'l Negotiations, J-5, Jt. Staff, Washington, D. C. ... B/G Orin L. Godsey, from DCS/Ops., and Dep. Dir., Ops., STRACOS, Hq. SAC, Offutt AFB, Neb., to Dep. Dir., Command and Control, J-3/4, Hq. USSTRATCOM, Offutt AFB, Neb.

B/G John B. Hall, Jr., from Spec. Ass't to Cmdr., 18th Wg., PACAF, Kadena AB, Japan, to Cmdr., 363d FW, TAC, Shaw AFB, S. C... M/G Frank B. Horton III, from DCS/Intel., Hq. SAC, and Dep. Dir., Intel., STRACOS, Offutt AFB, Neb., to Dir., Intel., J-2, Hq. USSTRATCOM, Offutt AFB, Neb. . . . B/G Albert D. Jensen, from Dep. Dir., Analysis, Concepts, & Sys., JSTPS, Offutt AFB, Neb., to Cmdr., 22d ARW, SAC, March AFB, Calif. . . . B/G (M/G selectee) Robert E. Linhard, from Dir., USSTRATCOM (Prov. Hq.), Offutt AFB, Neb., to Dir., P&P, J-5, Hq. USSTRATCOM, Offutt AFB, Neb.

Gen. John M. Loh, from Cmdr., Hq. TAC, and CINC, USAFLANT, Langley AFB, Va., to Cmdr., Hq. ACC, and CINC, USAFLANT, Langley AFB, Va. . . . B/G Teddy E. Rinebarger, from JCS Rep. to Defense & Space Talks, J-5, Jt. Staff, Washington, D. C., to Ass't Dep. Dir., Int'l Negotiations, J-5, Jt. Staff, Washington, D. C., replacing B/G (M/G selectee) Gary L. Curtin . . . L/G Charles J. Searock, Jr., from Vice Cmdr., Hq. AFLC, Wright-Patterson AFB, Ohio, to Vice Cmdr., AFMC, Wright-Patterson AFB, Ohio . . . Gen. Ronald W. Yates, from Cmdr., Hq. AFSC, Andrews AFB, Md., to Cmdr., Hq. AFMC, Wright-Patterson AFB, Ohio.



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following its own audit manual in reviewing and approving the redefini-

The Air Force justified its action based on the high degree of concurrency between development and production. However, the IG audit blamed the level of concurrency in the C-17 program on schedule delays that occurred in development.

SDI Pegged at \$90 Billion

The Strategic Defense Initiative program will cost the US about \$90 billion from 1991 to 2005, with peak spending hitting a level of about \$7 billion a year from 1995 to 2000, according to a General Accounting Office (GAO) report released in March.

The report, "Strategic Defense Initiative 15-Year Funding Require-ments," was requested by House Armed Services Committee Chairman

Rep. Les Aspin (D-Wis.).

GAO concentrated on SDIO's Global Protection Against Limited Strikes (GPALS) system. It calculated that technology development would cost about \$34 billion, national defenses about \$18.6 billion, theater and global defenses about \$10 billion each, and support about \$17.2 billion.

Hedge F-22 with F-16, Says Aspin

Representative Aspin suggested in February that the Pentagon should continue to procure such critical systems as the F-16 fighter at low levels. even if the buys exceed needs.

In a speech outlining his developing strategy for preserving the defense industrial base, Representative Aspin called for selective upgrading of existing systems, selective low-rate procurement, rolling over new development technologies, and "silver bullet" procurements. Mr. Aspin said the Air Force might be well advised to continue to procure the F-16 to hedge against risks in the F-22 program.

New Head for NASA

In March, President Bush named senior TRW executive Daniel S. Goldin to succeed Adm. Richard Truly as NASA Administrator.

Mr. Goldin has worked in the SDI program and is the vice president and general manager of the TRW Space and Technology Group. The President called him a "leader in America's aerospace Industry and a man of extraordinary energy and vitality."

Mr. Goldin, relatively unknown in Washington, began his career thirty years ago as a NASA research scientist in electrical propulsion. If approved by the Senate, Mr. Goldin will replace

Admiral Truly, who left the agency in February.

LTV to Sell Defense Business

LTV Corp. signed an agreement with Lockheed and Martin Marietta in February to sell its aerospace and defense businesses for \$355 million.

Through their newly formed Vought Corp., Lockheed and Martin Marietta will pay LTV \$319 million in cash and \$36 million in preferred stock, which together earned about \$131 million last year on \$1.7 billion in sales. The new firm will be run by LTV executives, but Lockheed and Martin Marietta will split profits.

Painful Defense Cuts

Defense reductions being proposed from both sides of the political aisle in Congress would lead to a weaker military and would hurt firms that do the bulk of their business with the Pentagon, Congressional Budget Office (CBO) Director Robert Reischauer told the Senate Armed Services Committee.

The director said that, though larger cuts are possible, serious repercussions should be expected. Mr. Reischauer said that operations and maintenance accounts would suffer, causing lower rates of peacetime readiness. Furthermore, while cutting defense would improve the economy and expand the Gross National Product (GNP) over the long term, it would impede short-term economic recovery, he said.

"The Economic Effects of Reduced Defense Spending," a CBO report released in February, said that defense spending can be safely reduced. It adds, however, that "the substantial defense spending reductions being proposed will result in additional unemployment, business failures, and temporarily depress communities in the areas around shuttered military bases."

While CBO paints a bleak picture, there are some highlights. If the so-called peace dividend were used to reduce the federal deficit, national savings and investment would increase, benefiting the economy. "By the next decade, the dividend realized under the 1991 plan could result in a permanent increase in GNP of around \$50 billion a year (in 1992 dollars)," CBO said.

The report sees problems ahead for the aircraft manufacturing industry. CBO indicated that despite reductions in defense, aircraft builders may see increases in nondefense markets. However, firms that hope to sell their wares abroad have slim chance for success, said CBO.

"Some defense producers are trying to increase their sales to foreign government in an effort to replace DoD orders," the report states. "For most, however, prospects in that area are limited: Because of their technological sophistication, US weapons are expensive to buy and maintain."

New Guidance Kit a Success

A new guidance kit developed under the Autonomously Guided Conventional Weapons (AGCW) program successfully maneuvered a 2,000pound conventional bomb to a direct hit on its target in a test conducted in February.

The test of the kit, developed by Texas Instruments, demonstrated a transfer of data from the aircraft to the guidance system, weapon separation from the aircraft, and performance of a midcourse maneuver. The bomb, which was dropped from an F-4E of the 3246th Test Wing, Eglin AFB, Fla., guided itself without assistance from the plane or pilot.

The AGCW program is integrating an autonomous guidance kit for airto-surface weapons for attacking heavily defended, high-value, fixed targets. The kit consists of an imaging infrared seeker and a software package that acquires and tracks to the target independent of the aircraft.

Pentagon Names Top Contractors

Five companies held their spots as

the top defense contractors last year, but Northrop Corp. made the largest jump, from twenty-sixth to sixth place in Fiscal 1991, with the B-2 moving into production.

McDonnell Douglas remained at the top of the heap, with \$8 billion in contracts, while General Dynamics (\$7.8 billion), General Electric (\$4.86 billion), General Motors Corp. (\$4.4 billion), and Raytheon Co. (\$4 billion) held the next four slots.

Northrop brought in \$3.3 billion in contracts. United Technologies was seventh, with \$2.7 billion in contracts, while Martin Marietta (\$2.68 billion), Lockheed Corp. (\$2.66 billion), and Grumman Corp. (\$2.36 billion) rounded out the top ten.

News Notes

■ A Boeing-Rocketdyne Lightweight Exoatmospheric Projectile (LEAP-III) test vehicle tracked a rocket motor on January 31 in a seventeen-second hover test at SDIO's National Hover Test facility at Edwards AFB, Calif., the Pentagon said in February. The twenty-two-pound vehicle lifted off and rose to an altitude of about twelve feet and acquired and tracked the target rocket plume. This was the second test of a series that will evaluate the vehicle before use in suborbital tests late this year at White Sands Missile Range, N. M.

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- In February, the Marine Corps rolled out its first F/A-18D reconnaissance aircraft at MCAS El Toro, Calif. The service plans to buy forty-eight of the fighters. The D version can use the Advanced Tactical Air Reconnaissance System and a reconnaissance conversion kit.
- In the March 1992 issue, AIR FORCE Magazine reported unit recipients of the Joint Meritorious Service Awards but failed to mention US Space Command, which received the award in December for its service during Operation Desert Storm. USSPACECOM provided tactical missile warning, satellite communications, navigation, weather, and intelligence support to US Central Command and warfighters in Desert Storm.
- The troubled Japanese LE-7 rocket engine program suffered another setback when it failed a firing test in January because of damage to its fuel pump turbine blades. The problem could lead to the rejection of the

B-1B Shatters Records

The Air Force B-1B bomber in February broke eight world time-to-climb records in its class and set marks in three new categories. The record-breaking and -setting aircraft was flown by the 319th Wing, Grand Forks AFB, N. D.

Seven of the eight shattered records had been set by USAF KC-135R tankers and the eighth by a DC-10. A National Aeronautic Association representative was aboard the aircraft on all eleven flights to verify the records.

	New record (minutes:seconds)	Old record
3,000 meters, category C-1.O (176,368 to 220,	460 pounds) 1:13	2:12
3,000 meters, category C-1.P (220,460 to 330,6	690 pounds) 1:19	2:48
3,000 meters, category C-1.Q (330,690 to 440,	920 pounds) 1:59	
6,000 meters, category C-1.O	1:42	3:46
6.000 meters, category C-1.P	1:55	3:39
6,000 meters, category C-1.Q	2:39	TOTAL PROPERTY.
9,000 meters, category C-1.O	2:11	5:40
9,000 meters, category C-1.P	2:23	7:14
9,000 meters, category C-1.Q	3:47	
12,000 meters, category C-1.0	5:01	7:49
12,000 meters, category C-1.P	6:09	10:15

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overall engine design, further delaying the first launch of the H2 rocket, Japan's new heavy-lift booster, to well beyond early 1993.

- In late February, Martin Marietta rolled out its Titan III booster at its Denver, Colo., facility. The booster will launch NASA's Mars Observer spacecraft later this year from Cape Canaveral AFS, Fla. The booster, which is 145 feet long and weighs 766 tons, will launch a 31,000-pound payload between September 16 and October 13.
- In February, LTV and Allied-Signal's Garrett Engine Division successfully used a carbon/carbon composite turbine motor in a turbojet engine—the first time such a composite has been used in rotating engine components. Carbon/carbon materials can withstand far higher temperatures than metal components, allowing for greater thrust. The carbon/carbon system can withstand temperatures of up to 3,000° Fahrenheit, while metal components can only withstand up to 1,900° Fahrenheit.
- McDonnell Douglas and British Aerospace said in February they will work together to develop technology for an advanced fighter capable of short runway and vertical takeoff and landing. The new aircraft, expected to have supersonic capabilities, will be an advanced version of the AV-8B Harrier designed by British Aerospace and built in the US by McDonnell Douglas.
- The Army has issued a request for proposals for the Corps Surface-

to-Air Missile (CORPSSAM), with more than 100 firms vying for a piece of the program. The Army mailed out the RFP in late February. The CORPSSAM is expected to replace the Hawk missile for medium-altitude defense against aircraft, antiradiation missiles, unmanned aerial vehicles, and tactical ballistic missiles. The Army plans to issue multiple firm fixed-price contracts.

■ British Defence Minister Tom King said in March that his government plans to award British Aerospace a \$1 billion development—initial production contract for the Advanced Short-Range Air-to-Air Missile. ASRAAM is a Sidewinder replacement program.

■ General Electric Aircraft Engines plans to slash another 2,800 workers from its payroll in an attempt to save \$150 million in annual costs, the firm announced in February. The firm, which cut 4,300 slots last year, blames the cutbacks on the recession.

■ The US will end or reduce operations at an additional eighty-three installations in Europe under the European Base Realignment Plan, the Pentagon said in late January. This brings the total to 463 installations to date that will end or reduce their operations in Europe.

■ House Armed Services Committee ranking Republican Rep. William Dickinson will not run for reelection. The Alabama congressman's retirement will elevate Rep. Floyd Spence (R–S. C.) to the position of ranking minority member.

■ Pratt & Whitney tested a scramjet engine combustor at a speed of Mach eight at a simulated altitude of 100,000 feet, the firm said in February. This technology is being developed for use in the National Aerospace Plane.

■ A McDonnell Douglas Delta II rocket delivered another Global Positioning System satellite in February, launching from Cape Canaveral, Fla. Once it is activated, the satellite will join sixteen other operational GPS satellites orbiting Earth.

■ Hercules, Inc., was selected to design and develop an advanced rocket motor for a new extended-range Patriot Missile, the firm said in March. Hercules will be a subcontractor to Martin Marietta. Raytheon is the prime contractor for the Patriot missile system.

■ Northrop signed a letter of intent in late February to explore the possibility of a teaming agreement with Brazil's Embraer to develop a derivative of the Tucano turboprop trainer. The plane would be a candidate for the USAF-Navy Joint Primary Aircraft Training System (JPATS).

■ The T-1 C-17 transport has suffered a number of groundings as a

result of fuel leaks. T-1 returned to testing service in February after it was grounded for about a month to reseal its fuel tanks, according to the Air Force. The aircraft had flown forty times for 118 hours. The plane was grounded again in March for fuel leaks. Air Force officials said its tanks have been resealed.

Purchases

The Air Force awarded a \$13.6 million fixed-price incentive contract to McDonnell Aircraft Co., for Fiscal 1992 flight test support for the F-15 aircraft. Expected completion: November 1991.

The Navy awarded a \$252 million modification to exercise a Fiscal 1992 option to a firm fixed-price contract to Texas Instruments for 1,328 AGM-88 high-speed antiradiation missiles for the Navy (749), the Air Force (465), and the governments of Italy (seventy-four) and Korea (forty), plus spare sections for Germany, and technical data to support the hardware. Expected completion: October 1994.

The Navy awarded a \$22.5 million firm fixed-price contract to Williams International Corp. for 163 Tomahawk sea-launched cruise missile F107-WR-402 engines. Expected completion: December 1993.

The Air Force awarded a \$395 million face-value increase to a fixed-

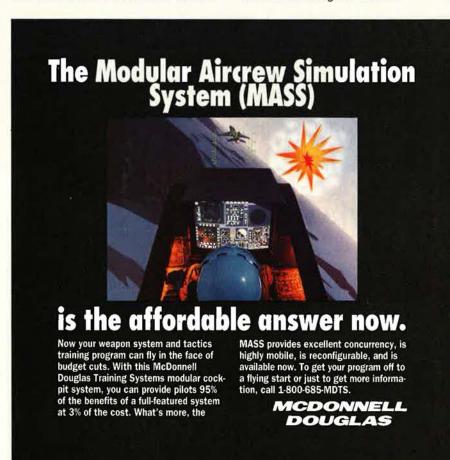
price incentive firm contract to General Dynamics for extension of Fiscal Years 1992 and 1993 long lead for 144 F-16C/D aircraft. Expected completion: July 1995.

The Air Force awarded a \$115 million face-value increase to a fixed-price incentive fee contract to Douglas Aircraft Co., for an extension of the Lot IV long-lead/advanced buy for four C-17 aircraft and Lot V long-lead/advanced buy for eight C-17 aircraft. Expected completion: August 1995.

The Air Force awarded a \$20 million firm fixed-price contract of long-lead funds to Martin Marietta for eighteen navigation and nineteen targeting pods for use on F-16C/D aircraft. Expected completion: October 1994.

Honors

Tactical Air Command's 58th Fighter Squadron at Eglin AFB, Fla., won the 1991 Hughes Achievement Award as the outstanding air-to-air squadron. It was the second year in a row that the 58th has brought home the trophy. The citation credited the 58th with sixteen aerial victories against Iraqi forces, including the first three kills, while suffering no losses. The unit also maintained the highest utilization rate and longest sortie duration among Desert Storm units, flying twenty-four hours a day and 100 percent of its assigned sorties.





LTV/FMA team has 130-year headstart on JPATS.

In the search for our country's next trainer, LTV evaluated more than two dozen candidates from around the world.

Jets. Turboprops. Different seating and wing configurations. Until we singled out an aircraft that we believe has all the features to provide the best training to generations of future Air Force and Navy pilots: the Pampa 2000.

The Pampa 2000 is a team effort from LTV and Fabrica Militar de Aviones (FMA) of Argentina. LTV has more than 70 years' experience in

aviation, making history with aircraft like the F4U Corsair and the A-7 Corsair II. FMA has been building military aircraft for more than 60 years. Since 1988, the Pampa has proven itself with a flawless record in the Argentine Air Force. Together, LTV and FMA are making the Pampa 2000 a world-class JPATS contender.

Watch for the Pampa trainer as it makes a U.S. flight demonstration tour this year.



Aerospace and Defense

FMA



1992 USAF Almanac The US Air Force in Facts and Figures

Edited by Tamar A. Mehuron, Associate Editor

A Vision for the Future

By Gen. Merrill A. McPeak, USAF Chief of Staff

The US Air Force is a quality outfit, a class act, and it has been for a long time. Amid all the changes we are making today, that's one thing we won't change. Our organization will continue to define what excellence means in an air force.

Because we have stepped up to the need for change, we must ensure that the adjustments we make are carefully crafted to move us toward our most desired goals. A vision can be helpful here. By "vision," I mean a statement about our most hoped-for future state. A vision declares what we want the organization to become. It provides energy and direction for change.

Air Force senior leadership has thought long and hard about the problem of providing clear direction in a time of rapid change. Last fall, Secretary Rice and the four-star generals developed a vision statement:

"Air Force people building the world's most respected air and space

force . . . global power and reach for America."

Our vision begins by saying who we are: Air Force people. This reminds us that people come first; that our vision cannot be realized unless good people share it, identify with it, and commit to it.

These people are building, not starting from scratch, because the many talented people who went before us already created the world's best air force. The notion of "building" connects us to the early airmen whose vision of airpower revolutionized warfare. It ties us to those who worked to make us a separate service. It joins us with all the airmen who, since 1947, have made deterrence and air superiority givens for the nation.

What we want to be—our most desired future state—is the world's most respected air and space force. Friends should admire us and want to cooper-

ate with us. We seek no enemies, but any country contemplating a test of arms with America should fear us. Nobody should want to fight us.

Our product is global power and reach. The raw materials are the inherent qualities of airpower and space-power: responsiveness, speed, range, and flexibility.

Our customer is America. We exist for a single purpose: to protect the people and values of our nation. Our conviction is that a strong Air Force is fundamental to America's well-being.

This is a simple but compelling vision. It can guide us regardless of budget dynamics or the international situation. It is a vision for the whole Air Force, one that all our constituent commands can use as a framework to construct their own objectives and goals. When shared by all of us, our best possible future—our vision—will become a fact for us and for those who come after us.

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 fig-

ures 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 Air Force 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

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 field units of the US Air Force are assigned to one of the **major commands** (see p. 53). Major commands are headed by senior general officers and have broad functional or geographic responsibility. Operational 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. Various units, including squadrons and support organizations, make up the wing. Such functions as personnel, security police, and civil engineers may be organized as a combat support group.

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, detachments, and flights.

The Service and Its Early Leaders

Designation

Aeronautical Division, US Signal Corps Aug. 1, 1907 – July 18, 1914

Aviation Section, US Signal Corps July 18, 1914 - May 20, 1918

Division of Military Aeronautics May 20, 1918 - May 24, 1918

Air Service May 24, 1918 - July 2, 1926

Air Corps July 2, 1926 - June 20, 1941

Army Air Forces
June 20, 1941 - Sept. 18, 1947

United States Air Force Sept. 18, 1947

Commander (at highest rank)

Chief, Aeronautical Division Capt. Charles deForest Chandler Capt. Arthur S. Cowan

Chief, Aviation Section Lt Col Samuel Reber Lt. Col. George O. Squier Lt. Col. John B. Bennet

Director of Military Aeronautics Maj. Gen. William L. Kenly (Kept same title three months into absorption by Air Service)

Director of Air Service John D. Ryan Maj. Gen. Charles T. Menoher

Chief of Air Service Maj. Gen. Charles T. Menoher Maj. Gen. Mason M. Patrick

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

Chief, Army Air Forces Lt. Gen. Henry H. Arnold

Commanding General, AAF Gen. of the Army Henry H. Arnold Gen. Carl A. Spaatz

Chief of Staff, USAF Gen. Carl A. Spaatz

Dates of Service

Aug. 1, 1907 - 1911 1911 - unknown

July 18, 1914 - May 5, 1916 May 20, 1916 - Feb. 19, 1917 Feb. 19, 1917 - May 20, 1918

May 20, 1918 - Aug. 1918

Aug. 28, 1918 - Nov. 27, 1918 Jan. 2, 1919 - June 4, 1920

June 4, 1920 - Oct. 4, 1921 Oct. 5, 1921 - July 2, 1926

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

June 20, 1941 - Mar. 9, 1942

Mar. 9, 1942 - Feb. 9, 1946 Feb. 9, 1946 - Sept. 26, 1947

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.

	Air Fo	orce Insta	llations		
	FY 1980	FY 1983	FY 1986	FY 1989	FY 1992
Major installations					
US and possessions	107	105	104	102	101
Foreign	27	30	35	39	23
Worldwide	134	135	139	141	124
Minor installations					
US and possessions ^a	2,098	2,039	2,007	107	105
Foreign `	642	643	704	13	17
Worldwide	2,740	2,682	2.711	120	122

USAF Personnel Strength by Commands, FOAs, and DRUS

	Military	Civilian	Total
Major commands			
Air Force Intelligence Command (AFIC)	12,681	1,598	14,279
Air Force Logistics Command (AFLC)	13,394	72,681	86,075
Air Force Space Command (AFSPACECOM)	11,438	4,093	15,531
Air Force Special Operations Command (AFSOC)	5,850	109	5,959
Air Force Systems Command (AFSC)	21,495	22,942	44,437
Air Training Command (ATC)	49,226	10,837	60,063
Air University (AU)	5,845	1,496	7,341
Military Airlift Command (MAC)	66,718	13,867	80,585
Pacific Air Force (PACAF)	34,828	10,281	45,109
Strategic Air Command (SAC)	94,198	10,761	104,959
Tactical Air Command (TAC)	95,138	11,410	106,548
United States Air Forces in Europe (USAFE)	54,067	8,573	62,640
Total major commands	464,878	168,648	633,526
Field operating agencies (FOAS)			
Air Force Audit Agency (AFAA)	119	663	782
Air Force Base Disposal Agency (AFBDA)	_	150	150
Air Force Center for Environmental Excellence (AFCEE)	62	227	289
Air Force Civil Engineering Support Agency (AFCESA)	378	498	876
Air Force Civilian Personnel Management Center (AFCPMC)	4	1,556	1,560
Air Force Combat Operations Staff (AFCOS)	214	19	233
Air Force Communications Command (AFCC)	5,280	2,542	7,822
Air Force Cost Analysis Agency (AFCAA)	24	72	96
Air Force Flight Standards Agency (AFFSA)	60	14	74
Air Force Frequency Management Agency (AFFMA)	19	22	41
Air Force Historical Research Agency (AFHRA)	19	68	87
Air Force Inspection Agency (AFIA)	214	125	339
Air Force Intelligence Support Agency (AFISA)	387	130	517
Air Force Legal Services Agency (AFLSA)	453 199	155 114	608
Air Force Management Engineering Agency (AFMEA) Air Force Medical Operations Agency (AFMOA)	43	27	313 70
Air Force Medical Support Agency (AFMSA)	54	41	95
Air Force Military Personnel Center (AFMPC)	1,346	534	1,880
Air Force Morale, Welfare, & Recreation Agency (AFMWRA)	23	32	55
Air Force News Agency (AFNEWS)	526	196	722
Air Force Office of Special Investigations (AFOSI)	1,957	439	2,396
Air Force Program Executive Office (AFPEO)	36	8	44
Air Force Reserve (AFRES)	383	13,690	14,073
Air Force Review Boards Agency (AFRBA)	14	63	77
Air Force Safety Agency (AFSA)	106	_	106
Air Force Security Police Agency (AFSPA)	46	51	97
Air Force Studies and Analyses Agency (AFSAA)	92	34	126
Air Force Technical Applications Center (AFTAC)	1,226	103	1,329
Air National Guard Support Center (ANGSC)	27	26,025	26,052
Air Reserve Personnel Center (ARPC)	105	550	655
Air Weather Service (AWS)	3,813	367	4,180
Center for Air Force History	8	30	38
Joint Services Survival, Evasion, Resistance, and Escape Agency (JSSA) 7th Communications Group	31 758	39 254	70 1,012
Total FOAs	18,026	48,838	66,864
Direct reporting units (DRUs)			
Air Force District of Washington (AFDW)	1,566	1,616	3,182
Air Force Operational Test and Evaluation Center (AFOTEC)	449	186	635
United States Air Force Academy (USAFA) ^a	2,619	1,555	4,174
Total DRUs	4,634	3,357	7,991
		(222/2/2)	5 <u>0246</u> 0500405704
Total major commands, FOAs, DRUs	487,538	220,843	708,381

Many commands and FOAs are in transition. Some FOAs have disappeared, while some, such as Flight Standards Agency, will reach full staff later this summer.

*4,335 cadets not included.

The Active-Duty Force by Grade

(As of September 30, 1991)

Grade	Number
Officers	
General	12
Lieutenant General	36
Major General	112
Brigadier General	161
Colonel	4,875
Lieutenant Colonel	12,089
Major	18,431
Captain	43,311
First Lieutenant	10,743
Second Lieutenant	6,829
Total	96,599
Airmen	
Chief Master Sergeant	4,183
Senior Master Sergeant	8,165
Master Sergeant	38,810
Technical Sergeant	56,582
Staff Sergeant	105,839
Sergeant/Senior Airman	108,366
Airman First Class	57,657
Airman	18,956
Airman Basic	10,867
Total	409,425
Officers	96,599
Cadets	4,408
Airmen	409,425
Total strength	510,432

Active Force Demographics

	(As of Septen	nber 30, 1991)		
Grade	Force	Black*	Other ^b	Women®
	Offi	cers		
General	321	6	1	4
Colonel	4,875	95	86	130
Lieutenant Colonel	12,089	375	207	781
Major	18,431	1,197	351	2,306
Captain	43,311	2,887	1,215	6,701
First Lieutenant	10,743	602	552	2,125
Second Lieutenant	6,829	396	344	1,276
Total	96,599	5,558	2,756	13,323
	Air	men		
Chief Master Sergeant	4,183	549	63	67
Senior Master Sergeant	8,165	1,331	162	429
Master Sergeant	38,810	7,390	1,175	2,865
Technical Sergeant	56,582	10,379	2,068	6,415
Staff Sergeant	105,839	20,424	4,539	13,498
Sergeant/Senior Airman	108,366	20,380	5,693	18,347
Airman First Class	57,657	7,581	2,489	11,231
Airman	18,956	2,058	696	3,610
Airman Basic	10,867	1,250	360	2,078
Total	409,425	71,342	17,245	58,540
Total personnel	506,024d	76,900	20,001	71,863
		Average Age	es of Military	Personnel
		(As of	September 30, 19	91)
*Includes 14,174 women.		(.15 01		- 24
Includes 2,642 women. Includes women from "Black" and	"Other"	Officers		34.8
categories.		Airmen		28
Does not include 4,408 Academy	cadets.	1/06/04 PARTO 20		170.70

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	486,800
1933	15,099	1963	868,644	1993	449,900
1934	15,861	1964	855,802		
1935	16,247	1965	823,633		
1936	17,233	1966	886,350		*Programmed

Specialties in the Enlisted Air Force

Code	Career Field	Assigned
10	First Sergeant	1,680
11	Aircrew Operations	8,470
12	Aircrew Protection	2,635
20	Intelligence	12,301
22	Geodetic	96
23	Visual Information	2,159
24	Safety	1,308
25	Weather	3,118
27	Command Control Systems Operation	
30	Communications-Electronics Systems	18,913
31	Instrumentation	509
32	Precision Measurement	2,197
34	Training Devices	40
36	Wire Communications Systems Maintenance	3,912
39	Maintenance Management Systems	2,497
40	Intricate Equipment Maintenance	236
41	Missile Systems Maintenance	3,384
45	Manned Aerospace Maintenance	92,653
46	Munitions & Weapons	22,669
47	Vehicle Maintenance	5,024
49	Communications-Computer Systems	19,008
54	Mechanical/Electrical	9,099
55	Structural/Pavements	10,750
56	Sanitation	1,471
57	Fire Protection	5,863
59	Marine	40
60	Transportation	12,440
61	Commissary Services	924
62	Services	5,445
63	Fuels	6,210
64	Supply	20,380
65	Contracting	1,581
66	Logistics Plans	926
67	Financial	5.003
70	Information Management	18,596
73	Personnel	12,099
74		
75	Morale, Welfare, & Recreation	1,430
79	Education & Training	3,085
	Public Affairs	1,133
81	Security Police	32,584
82	Special Investigations	978
87	Band	1,033
88	Paralegal	810
89	Chaplain Management	620
90-92	Medical	25,744
98	Dental	3,570
99	Miscellaneous (Special Duty, Patients Unclassified, etc.)	, 9,719

Specialties in the Officer Force

Code	Utilization Field Title A	ssigned
00	Commanders and Directors	2,617
02	International Politico-Military Affairs	268
05	Disaster Preparedness	N/A
09	Special Duty	1,733
10-14	Pilot	17,968
15, 22	Navigator	7,682
16	Air Traffic Control	406
17	Air Weapons Director	2,046
18	Missile Operations	2,364
19	Operations Management	1,560
20	Space Operations	1,583
23	Visual Information	98
25	Weather	1,206
26	Scientific	1,428
27	Acquisition Program Management	2,560
28	Development Engineering	5,353
31	Missile Maintenance	278
40	Aircraft Maintenance & Munitions	3,194
49	Communications-Computer Systems	5,836
55	Civil Engineering	2,136
60	Transportation	937
62	Services	413
64	Supply Management	1,060
65	Acquisition Contracting/Manufacturin	g 1,417
66	Logistical Plans & Programs	990
67	Financial	1,285
70	Information Management	1,991
73	Personnel	1,270
74	Manpower Management	447
75	Education & Training	335
76	Mission Support	102
79	Public Affairs	469
80	Intelligence	3,160
81	Security Police	1,027
82	Special Investigations	564
87	Band	27
88	Legal	1,364
89	Chaplain	792
90	Health Services Management	1,254
91, 92, 99		2,565
93–96	Physician	4,238
97	Nurse	5,254
98	Dental	1,445

These figures do not include general officers or UPT/UNT/medical/law students.

USAF Force Educational Levels

(As of September 30, 1991)

Enlisted			Line Officers	ı	
Level	Number	Percent	Level	Number	Percent
Below high school	106	0.03	Below baccalaureate/unknown	71	0.09
High school	113,286	27.67	Baccalaureate degree	40.577	51.09
Some college (less than two years)	201,397	49.19	Master's degree	37,656	47.41
AA/AS degree	34,918	8.53	Doctoral and professional degrees	1,122	1.41
Two to three years college	44,343	10.83	T-4-1	70 400	400.00
Baccalaureate degree	13,715	3.35	Total	79,426	100.00
Master's degree or higher	1,660	0.41			
Total	409,425	100.00			







AGM-130. THE STANDOFF WEAPON SYSTEM THAT WON'T MAKE A DENT IN THE BUDGET.

In deep strikes against fixed or mobile high-value targets, precision, payload and range are essential to mission success. And to aircraft survivability.

The U.S. Air Force/Rockwell AGM-130 standoff weapon system has proved itself capable of not just fulfilling these requirements, but doing so at an affordable price.

Recent development and operational tests demonstrated AGM-130's ability to deliver a 2,000-lb. warhead with pinpoint accuracy under a rigorous set of tactical profiles that included various range and altitude flights.

AGM-130 provides an unmatched combination of high lethality, aircraft survivability, flight profile flexibility and low cost. As a powered derivative of the modular

GBU-15 system currently operational with the U.S. Air Force, it's built on proven technologies and tactics. And it benefits from GBU-15's established production, logistics, training and support resources.

No other weapon system can deliver as much punch with as much precision. And no standoff weapon system is as affordable. For more information, write: Tactical Systems Division, Rockwell International, 1800 Satellite Blvd., Duluth, Georgia 30136, or call (404) 476-6300.



Armed Forces Manpower Trends

(Figures in thousands)

	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991 ^a	FY 1992 ^b	FY 1993 ^b
Active-duty mi	litary							
Army Navy Marine Corps Air Force	781 581 199 608	781 587 200 607	772 593 197 576	770 593 197 571	732 579 197 535	711 570 194 510	660 551 188 487	618 536 182 458
Total	2,169	2,174	2,138	2,130	2,043	1,985	1,886	1,794
Guard and Res	erve							
Army National (Army Reserve Naval Reserve Marine Corps R Air National Gu Air Force Reser	310 142 leserve 42 ard 113	453 319 149 43 113 80	455 313 149 44 115 82	457 319 152 44 116 83	437 299 149 45 117 81	446 310 152 45 118 85	440 365 174 42 118 83	425 296 141 42 119 82
Total	1,130	1,157	1,158	1,171	1,128	1,156	1,226	1,105
Direct-hire civi	ilian							
Army° Navy Air Force° Defense agenci	353 332 250 ies 92	358 343 252 96	336 337 241 96	347 343 249 98	327 330 238 102	313 320 222 118	288 299 210 137	309 283 214 151
Total ^o	1,027	1,049	1,010	1,037	997	973	934	958

Numbers are rounded and may not sum to totals.

Budget Terms Explained

Funding levels can be expressed in several ways. Totals are most frequently stated as budget authority (the value of new obligations, including some to be met in later years, which the government is authorized to incur) or outlays (actual expenditures, some of which are funded by budget authority from previous years).

Another difference concerns the value of money. When funding is in constant 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. 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.

Service Shares of the Defense	Budget	
-------------------------------	--------	--

	FY 1990	FY 1991	FY 1992	FY 1993
Share (current \$ billions)				
Army	77.9	72.5	67.0	63.3
Navy/Marine Corps	99.5	94.9	84.8	84.6
Air Force	92.4	83.6	80.2	83.9
Defense agencies, DoD-wide	21.2	25.0	38.9	35.9
Total	291.0	276.0	270.98	267.6
Percentage				
Air Force	31.75	30.28	29.60	31.35
Army	26.76	26.26	24.73	23.65
Navy	34.19	34.38	31.30	31.61
Defense agencies, DoD-wide	7.27	9.05	14.35	13.40

Numbers are rounded and may not sum to totals. Totals are stated as budget authority, or the value of new obligations, including some to be met in later years, which the government is authorized to incur.

[&]quot;Includes 25,562 Selected Reserve called to active duty for Operation Desert Shield.

Programmed manpower.

Includes Army and Air National Guard Technicians, who were converted from state to federal employees in FY 1969.

^{*}Reflects recisions of \$6.6 billion from enacted \$277,5 billion 1992 budget.

Air Force Budget—A Ten-Year Perspective

(Budget authority in \$ millions)

	FY '83	FY '84	FY '85	FY '86	FY '87	FY '88	FY '89	FY '90	FY '91	FY '92
Current dollars										
Military personnel	13,111	13,791	19,415	20,440	21,210	21,605	21,854	21,773	22,717	20,821
Operations and maintenance	19,756	20,357	21,929	21,569	21,794	23,270	25,157	25,493	29,020	22,478
Procurement	27,367	35,221	38,937	36,009	33,599	27,978	30,990	30,145	24,119	24,555
RDT&E	10,591	12,230	13,108	13,110	14,871	15,058	14,668	13,585	11,975	13,591
Military construction	1,597	1,622	1,715	1,657	1,415	1,505	1,476	1,388	1,169	1,227
Family housing	857	794	846	758	840	896	954	877	963	1,075
Rev. and mgmt. funds	162	1,289	549	396	140	226	187	111	945	n/a
Total	73,440	85,304	96,499	93,938	93,869	90,538	95,286	93,371	90,908	83,746
Constant FY '93 dollars										
Military personnel	19,855	19,958	25,361	25,770	25,981	25,471	24,946	24,472	24,470	21,749
Operations and maintenance	Control Control	25,715	27,438	27,105	26,792	28,132	29,130	28,765	29.505	23,279
Procurement	38,284	47,705	51,162	45,824	41,278	33,117	35,344	33,219	25,718	25,358
RDT&E	14,884	16,548	17,206	16,768	18,436	17,995	16,835	15,011	12,746	14,042
Military construction	2,228	2,190	2,250	2,113	1,748	1,789	1,687	1,529	1,247	1,267
Family housing	1,168	1,051	1,089	954	1,031	1,070	1,095	970	1,019	1,111
Rev. and mgmt. funds	226	1,739	716	502	173	271	215	123	1.006	n/a
Total	101,351	114,906	125,222	119,037	115,438	107,845	109,253	104,090	95,712	86,806
Percentage real growth										
Military personnel	2.4	0.5	27.1	1.6	0.8	-2.0	-2.1	-1.9	0.0	-11.1
Operations and maintenance	8.3	4.1	6.7	-1.2	-1.2	5.0	3.5	-1.3	2.6	-21.1
Procurement	11.6	24.6	7.2	-10.4	-9.9	-19.8	6.7	-6.0	-22.6	-1.4
RDT&E	15.0	11.2	4.0	-2.6	9.9	-24	-6.5	-10 8	-15.1	10.2
Military construction	-8.1	-1.7	2.7	-6.1	-17.3	2.3	-5.7	-9.4	-18.5	1.6
Family housing	743.6	-10.1	3.7	-12.4	8.1	3.7	2.4	-11.5	5.1	9.0
Total	10.0	13.4	9.0	-4.9	-3.0	-6.6	1.3	-4.7	-8.1	-9.3

Allowano	ac for C	Martare	and Su	bsistence
Alluwallu	es lui u	Judileis	allu Su	DSISTELLE

Pay Grade I	Single Full Rate	Partial Rate	Married Full Rate			
0-10	\$689.40	\$50.70	\$848.10			
O-9	689.40	50.70	848.10			
O-8	689.40	50.70	848.10			
O-7	689.40	50.70	848.10		c	ash/in Kind
O-6	632.40	39.60	764.10	Officers	1000000	34.42/month
O-5	609.00	33.00	736.20	Officers	φι	34.42/111011111
0-4	564.30	26.70	649.20			
O-3	452.40	22.20	537.30		E-1<4	All Other
0-2	358.80	17.70	458.70	Enlisted Members	Months	Enlisted
O-1	302.10	13.20	409.80			
				When on leave or authorized		
O-3E	488.40	22.20	577.20	to mess separately	\$5.92/day	\$6.41/day
O-2E	415.20	17.70	520.80	When rations in-kind	ACTIVATION STATES	Same and All Triangler &
O-1E	357.00	13.20	481.20	are not available	\$6.68/day	\$7.23/day
				When assigned to duty under	200 000 000	of German
W-5	573.00	25.20	626.40	emergency conditions where		
W-4	509.10	25.20	574.20	no US mess facilities are		
W-3	427.80	20.70	526.50	available	\$8.86/day	\$9.59/day
W-2	379.80	15.90	484.20		2046 LLUFECCH SACCHELL	0.000 (100 (100 (100 (100 (100 (100 (100
W-1	318.30	13.80	418.80	Uniformed service members without depen		
				rates of basic allowance for quarters, Partia		
E-9	418.20	18.60	551.10	service members without dependents wh Service Academy cadet pay is \$543.90 m		
E-8	384.30	15.30	507.90	corride ridudenty duder pay is 40 to 50 in	ommy, encoure o	andary 1, 1000
E-7	327.90	12.00	471.90			
E-6	296.70	9.90	436.20			
E-5	273.60	8.70	392.10			
E-4	238.20	8.10	341.10			
E-3	233.70	7.80	317.40			
E-2	190.20	7.20	302.10			
E-1>4 months	168.90	6.90	302.10			
E-1<4 months	168.90	6.90	302.10			

Annual Pay for Federal Civilians

(Effective January 1, 1992)

Cameral	Schedule
General	achequie

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	
GS-1	\$11,478	\$11,861	\$12,242	\$12,623	\$13,006	\$13,230	\$13,606	\$13,986	\$14,003	\$14,356	
GS-2	12,905	13,212	13,640	14,003	14,157	14,573	14,989	15,405	15,821	16,237	
GS-3	14,082	14,551	15,020	15,489	15,958	16,427	16,896	17,365	17,834	18,303	
GS-4	15,808	16,335	16,862	17,389	17,916	18,443	18,970	19,497	20,024	20,551	
GS-5	17,686	18,276	18,866	19,456	20,046	20,636	21,226	21,816	22,406	22,996	
GS-6	19,713	20,370	21,027	21,684	22,341	22,998	23,655	24,312	24,969	25,626	
GS-7	21,906	22,636	23,366	24,096	24,826	25,556	26,286	27,016	27,746	28,476	
GS-8	24,262	25,071	25,880	26,689	27,498	28,307	29,116	29,925	30,734	31,543	
GS-9	26,798	27,691	28,584	29,477	30,370	31,263	32,156	33,049	33,942	34,835	
GS-10	29,511	30,495	31,479	32,463	33,447	34,431	35,415	36,399	37,383	38,367	
GS-11	32,423	33,504	34,585	35,666	36,747	37,828	38,909	39,990	41,071	42,152	
GS-12	38,861	40,156	41,451	42,746	44,041	45,336	46,631	47,926	49,221	50,516	
GS-13	46,210	47,750	49,290	50,830	52,370	53,910	55,450	56,990	58,530	60,070	
GS-14	54,607	56,427	58,247	60,067	61,887	63,707	65,527	67,327	69,167	70,987	
GS-15	64,233	66,374	68,515	70,656	72,797	74,938	77,079	79,220	81,361	83,502	
				Senio	r Executive	Service					
Level 1		Level 2		Level 3		Level 4		Level 5		Level 6	
\$90,000		\$94,400		\$98,600		\$104,000		\$108,300		\$112,100	

Monthly Military Basic Rates of Pay

(Effective January 1, 1992)

						Yea	ers of Se	rvice						
Pay Grad	Under e 2	2	3	4	6	8	10	12	14	16	18	20	22	26
						Commi	ssioned	Officers	a a					
O-10 O-9 O-8 O-7 O-6 O-5 O-4 O-3 ^b O-2 ^b	5,688 5,152 4,280 3,173 2,537 2,139 1,988 1,733	\$6,644 5,837 5,306 4,571 3,486 2,979 2,605 2,222 1,893	\$6,644 5,961 5,432 4,571 3,714 3,185 2,778 2,376 2,274	\$6,644 5,961 5,432 4,571 3,714 3,185 2,778 2,629 2,351	\$6,644 5,961 5,432 4,777 3,714 3,185 2,830 2,754 2,399	\$6,898 6,113 5,837 4,777 3,714 3,185 2,955 2,853 2,399	\$6,898 6,113 5,837 5,054 3,714 3,282 3,156 3,008 2,399	\$7,280 6,367 6,113 5,054 3,714 3,458 3,334 3,156 2,399	\$7,280 6,367 6,113 5,306 3,840 3,690 3,486 3,234 2,399	\$7,801 6,898 6,367 5,837 4,448 3,967 3,639 3,234 2,399	\$7,801 6,898 6,644 6,238 4,675 4,194 3,739 3,234 2,399	\$8,324 7,280 6,898 6,238 4,777 4,321 3,739 3,234 2,399	\$8,324 7,280 7,068 6,238 5,054 4,472 3,739 3,234 2,399	\$8,842 7,801 7,068 6,238 5,481 4,472 3,739 3,234 2,399
O-1 ^b		1,566 missione	1,893		1,893 More Th				and the second					1,893
O-3E O-2E O-1E	<u>2</u> ;	_	=	2,629 2,351 1,893	2,754 2,399 2,022	2,853 2,476 2,097	3,008 2,605 2,173	3,156 2,704 2,248	3,282 2,778 2,351	3,282 2,778 2,351	3,282 2,778 2,351	3,282 2,778 2,351	3,282 2,778 2,351	3,282 2,778 2,351
						Enli	sted Me	mbers						
E-9 E-8 E-7 E-6 E-5 E-4 E-3 E-2 E-1°	1,379 1,187 1,041 971 915 881 786	1,489 1,293 1,133 1,026 965 881 786	1,544 1,347 1,189 1,086 1,004 881 786	1,598 1,405 1,240 1,170 1,043 881 786	1,652 1,457 1,322 1,216 1,043 881 786	1,976 1,705 1,510 1,376 1,216 1,043 881 786	2,356 2,032 1,760 1,565 1,430 1,216 1,043 881 786	2,409 2,086 1,815 1,646 1,483 1,216 1,043 881 786	2,463 2,140 1,897 1,697 1,510 1,216 1,043 881 786	2,520 2,196 1,951 1,752 1,510 1,216 1,043 881 786	2,576 2,247 2,005 1,779 1,510 1,216 1,043 881 786	2,626 2,302 2,031 1,779 1,510 1,216 1,043 881 786	2,764 2,437 2,167 1,779 1,510 1,216 1,043 881 786	3,033 2,708 2,437 1,779 1,510 1,216 1,043 881 786

Amounts have been rounded to the nearest dollar. Basic pay while serving as Chairman of the Joint Chiefs of Staff or as Chief of Staff of the Air Force is \$9,363.30, regardless of cumulative years of service. Basic pay while serving as Chief Master Sergeant of the Air Force is \$3,537.90, regardless of cumulative years of service.

^{*}Basic pay is limited to \$8,441.70, regardless of cumulative years of service.

Does not apply to commissioned officers who have been credited with more than four years' active service as an enlisted member or warrant officer.

Basic pay for E-1s with less than four months of service is \$697.20.

Hazardous Duty Pay

Pay Grade	Monthly Rate
0-10	\$110
O-9	110
0-8	110
0-7	110
0-6	250
O-5	250
0-4	225
O-3	175
0-2	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

Hazardous duty pay for noncrew members is \$110 per month.

Aviation Career Incentive Pay

Monthly Rate	Years of Aviation Service as an Officer
	Phase I
\$125 156 188 206 650	2 or fewer more than 2 more than 3 more than 4 more than 6
	Phase II
\$585 495 385 280 250	more than 18 more than 20 more than 22 more than 24 more than 25

Officers in pay grade O-7 are paid \$200 or less per month. Officers in pay grade O-8 or above are paid \$206 or less per month. Phase I rates are paid to officers with fewer than six years of aviation service but more than eighteen years of commissioned service. Phase I rates go to rated officers, flight surgeons, and other designated officers. Phase II rates of \$250 per month apply to officers with more than twenty-five years of aviation service, at grades O-6 and below.

USAF Total Force

	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992
Air Force active-duty Officers Airmen USAF Academy cadets	109,000 494,700 4,500	107,300 495,200 4,500	105,100 466,900 4,500	103,700 462,800 4,400	100,000 430,800 4,400	96,600 409,400 4,400	92,000 390,500 4,300
Total, Air Force military	608,200	607,000	576,500	570,900	535,200	510,400	486,800
Career reenlistments (second-term) Rate First-term reenlistments Rate	38,900 88% 23,500 58%	41,400 87% 25,600 62%	51,500 86% 26,500 50%	39,400 87% 18,100 59%	44,600 82% 23,600 51%	41,500 87% 22,500 59%	41,000 87% 18,500 59%
Civilian personnel Direct hire (including technicians) Indirect hire—foreign nationals	249,604 13,644	261,771 12,559	241,120 12,041	248,666 11,909	237,844 11,031	222,489 10,172	209,483 9,299
Total, civilian personnel	263,248	264,330	253,161	260,575	248,875	232,661	218,782
Total, military and civilian	871,448	871,230	829,607	831,455	784,075	743,061	705,582
Technicians (included above as dire	ect-hire civi	lians)					
AFRES technicians ANG technicians	8,348 22,497	8,772 23,221	9,111 23,409	10,061 23,644	9,596 24,119	9,527 24,703	10,467 24,675
Guard and Reserve Air National Guard, Selected Reserve Air Force Reserve, paid Air Force Reserve, nonpaid	112,592 78,519 44,568	114,600 80,415 43,783	115,221 82,116 51,658	114,975 83,214 49,553	117,786 83,814 68,714	117,786 84,539 75,002	118,100 83,396 74,330
Total, Ready Reserve	235,679	238,798	248,995	247,742	270,314	277,327	275,826
Standby	25,823	24,479	21,772	17,299	15,369	14,234	16,000
Total, Guard and Reserve	261,502	263,277	270,767	265,041	285,683	291,561	291,826

Numbers are rounded and may not sum to totals. FYs 1986-91 are actual figures; FY 1992 is an estimate.

The Civilian Force

(As of September 30, 1991)

General Schedule/Other		Wage Grade Positions			Grade Leader ositions	Wage Grade Supervisory Positions		
Grade	Population	Grade	Population	Grade	Population	Grade	Population	
1	58	1	153	1	11	1	27	
2	201	2	890	2	17	2	48	
3	2,603	3	499	3	0	3	115	
4	10,201	4	755	4	40	4	174	
5	19,171	5	3,507	5	44	5	238	
6	8,916	6	3,033	6	36	6	425	
7	12,196	7	5,087	7	103	7	643	
8	1,767	8	6,032	8	116	8	788	
9	17,607	9	5,536	9	292	9	1,079	
10	1,059	10	17,379	10	826	10	1,565	
11	18,954	11	4,862	11	136	11	544	
12	20,674	12	2,138	12	37	12	279	
13	9,292	13	312	13	1	13	197	
14	3,882	14	149	14	0	14	307	
15	1,314	15	2	15	0	15	191	
16 17	0	Total	50,334	Total	1,649	16 17	102 63	
18	1					18	5	
ST ³	21 189					Total	6,790	
Total	128,106							

Air Force Civilian Personnel: Average Age and Length of Service

Average length of service (overall)

General schedule
Federal wage system

15 years
14 years
15 years
15 years

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

bSenior Executive Service.

Air Defens	se Unit Fin Fla	ashes
Description	Aircraft	Unit and Location
Air Nat	ional Guard Unit	s
Minuteman over Massachusetts	F-15A/B	102d FIW, Otis ANGB, Mass.
Stylized waterfall	F-16A/B	107th FIG, Niagara Falls IAP, N. Y.
Red stripe with "Happy Hooligans" logo	F-16A/B	119th FIG, Hector Field, N. D.
Dark gray bison skull against prairie/mountain profile	F-16A/B	120th FIG, Great Falls IAP, Mont.
Red hawk with banner in talons	F-15A/B	123d FIS (142d FIG), Portland IAP, Ore.
Dark gray lightning bolt	F-16A/B	125th FIG, Jacksonville IAP, Fla.
Black griffin with talons extended and "California" logo	F-16A/B	144th FIW, Fresno Air Terminal, Calif.
Texas star on red/white jagged stripes	F-16A/B	147th FIG, Ellington Field, Tex.
Stars of Little Dipper constellation	F-16A/B	148th FIG, Duluth IAP, Minn.
Black falcon with "Vermont" on gold stripe	F-16A/B	158th FIG, Burlington, Vt.
Red delta	F-16A/B	177th FIG, Atlantic City Airport, N. J.
Dark gray and gold checkerboard	F-16A/B	191st FIG, Selfridge ANGB, Mich.
Air Defense	Training Units ((ANG)
Black eagle and "Oregon" logo	F-16A/B	114th TFTS (142d FIG), Kingsley Field, Ore
Starburst state flag	F-16A/B	162d TFTS, Tucson, Ariz.
Dark gray jayhawk	F-16C/D	184th FG, McConnell AFB, Kan.

The Active-Duty Fleet

(Current as of September 30, 1991)

	197		Sapred	Years				THE REAL PROPERTY AND ADDRESS OF THE PERSON			1 -1 -1	
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24+	verage age	Tota numbe	
A-7	_	-	-	2	_	_	1	2	_	16.5		
DA/A-10 DA-37	-	_	52	230	115	7 5		_	=	11.1 16.5	404	
3-1		94	2	-	-	-		_	-	4.3	96	
3-2	3		-	_	1	_	_	=	-	1.1		
3-52	51 -10	, -		_		_	_	_	191	30.7	19	
B-111		_	· ·	_			37	2	-	20.0	39	
)-5)-9	11	39	_	_	_	3	29 9	3 11	=	9.9 20.5	8:	
-10 (KC-10)	1	23	24	11	7			_	_	6.7	5	
-12	-	-	45	_ 7		20	,	-	_	10.1	7	
-17	1	_	_ _ 3					-	-	0.0 9.4		
-18ª -20	_	10	3			_	_	-	_	5.1	1	
3-21	27 C		75	-		_	_	3 <u></u>	_	6.7	7	
-22			1	_	<u></u> 3		-	· ·	_	7.6		
-23	1 Total	4 3	90	(1 - 1	=	-	9-3	-	6.9		
-25	2		10 <u>—</u> 1	_		S	-	S T - S	_	0.9		
-27 -130 ^h	12	18	3	-	_ 8	 55	26	38	175	0.0 21.5	33	
-131	-	-	_	_	_	-	_	_	1/3	36.5	33	
-135°	_	=		-	-	_	-		567	30.1	56	
-137	-	<u> </u>	1	_	_	_		_	4	22.3		
-141	_	_	-		_	_	_	26	227	25.0	25	
-3 -4	_	_	5	9	15	5 2		_		11.9 17.3	3	
-8	2		13-		-		_	-	5	0.7		
-4 ^d	_ 137	100	_	_ 178	187	17	63 2	101	9	20.9	19 74	
	504	327	109 53	32	14	31	_		_	8.6 3.1	93	
-22	1		_	_		_	_	_	-	0.4		
-106	-	-	-			1000	-	_	1	32.8		
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-1		_	_	_		-	85	10	_	20.1 22.9	9	
-3 -53	1	7	_	_		3	12	13 21	3 5	18.4	1	
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-33 -37	10-10-10-10-10-10-10-10-10-10-10-10-10-1	_	_	_		_	_	132	1 435	39.9 29.0	56	
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	770	644	386	475	352	180	486	737	2,148	17.3	6,18	
		10	6	8	6	3	8	12	34		10	
ercent*	12	10	U	U	•	-	•				, ,	



The sky has trenches, too.

Throughout the years, the tough jobs have always gone to the Hercules airlifter.

The Air National Guard Fleet

(Current as of September 30, 1991)

	6 = 3	18/1/2	ST. PARKE		Yea	rs	July 2		-52		
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24+	Average age	Total number
A-7	_	_	6	12	5	45	169	8	_	18.2	245
A-10	_	-	11	80	33	_	_	-	_	11.0	124
A-37	_	_	-	_	_	12	5 7	5	_	18.1	22
C-5	-	-	_	_		1	7	4		20.5	12
C-12	_	10	3	_		-	-	_	_	4.9	13
C-21	-	4		_		_	_	-	_	4.0	4
C-22	_	_	4	-	-	_	_	-	-	6.7	4
C-26	12		27	_	<u> </u>	-	_	9 	_	1.9	12
C-130	34	24	17	16	8	_	_	_	123	18.6	222
KC-135	_	_	· ·	_	-	_	_	-	131	32.2	131
C-141	_	_	×—	_	-	-	_		8	25.3	8
HH-60	16	_	_	-		_	-		_	2.7	16
F-4	_	_		_		-	-	39	126	24.7	165
F-15	-	_	_	_	106	57	_		_	14.4	163
F-16	-	99	263	274	22		_	-	_	8.6	658
T-43	-	_		· —	-	4	_	-	-	17.5	4
Total	62	137	301	382	174	119	181	56	388	15.1	1,803
Percent ^a	3	8	17	21	10	7	10	3	21		100

Percentages have been rounded

The Air Force Reserve Fleet

(Current as of February 3, 1992)

	S.S. Constitution of the			The state of	Years			I Digital	CINICI	A SEE	
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24+	Average age	Total number
A-10	_	_	_	_	87	_	_	-	_	12.6	87
AC-130A	1000	_	_	_	-	_	_	-	9	35.5	9
C-130B	_	_		-	-		-	_	24	30.9	24
C-130E		_	_	-	_	_	_	_	52	28.1	52
C-130H	8	24	10	6	-	_	_	_	_	4.6	48
HC-130P	-	_	_	_	-	_	-	_	9	25.3	9
WC-130E	_			10000	_	_	200	6 <u>—</u> 3	4	28.3	4
WC-130H	_	_	_	-	_	_	_	-	6	26.1	6
C-141B		_	_	_	_	_	_	-	8	25.9	8
KC-135E	-	_	_		<u></u>		_	<u></u>	30	32.5	30
F-16	_	13	43	50	44	_	_	-	_	8.9	150
H-3E	S	-		_		_	_	4	9	23.8	13
C-5A	_	_	_	-	_	_	-	22	6	20.9	28
HH-60G	7	-	_	_	-	_	_	-	_	2.5	7
Total	15	37	53	56	131	_	_	26	157	21.9	475
Percent*	3	8	11	12	28	_	_	5	33		100

*Percentages have been rounded.

USAF Personnel by Geographic Area

(As of September 30, 1991; not including Operations Desert Shield and Desert Storm deployments)

Total military personnel	510,432
US territory and special locations	411,108

Europe	67,919
Germany	29,829
UK	20,434
Italy	4,009
Spain	2,543
Turkey	4,839
All other countries	6,265

East Asia and Pacific	26,538
Japan/Okinawa	14,741
South Korea	9,028
Guam	2,461
All other countries	308

Africa, Near East, south Asia	363
Saudi Arabia	202
Egypt	40
All other countries	121

Western hemisphere	2,551
Panama	2,349
Canada	117
All other countries	85

Other areas	1 953

Total in foreign	
countries	99,324



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tems helped the U.S. Air Force meet their goal to increase Pave Hawk flight time.

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Number of Aircraft in Service and Flying Hours FY 1985 FY 1986 FY 1987 FY 1988 FY 1989 FY 1990 FY 1991 Type of aircraft Bomber, strategic 330 346 393 422 412 366 335 Tanker 559 572 576 567 578 555 569 Fighter/interceptor/attack 3,057 3,046 3,033 3,027 2,896 2,798 2.859 Reconnaissance/electronic warfare 418 394 432 424 416 346 380 Cargo/transport 859 855 848 859 825 824 814 Search & rescue (fixed wing) 37 37 35 33 35 36 32 232 200 212 Helicopter (includes rescue) 234 191 205 201 1,543 1,535 Trainer 1,613 1,643 1,595 1.540 1.538 Utility/observation/other 180 120 110 120 140 141 132 Total, USAF 7,287 7,245 7,213 7,195 7,047 6,813 6,860 1,688 1,732 1,730 1,782 1.735 1.719 Air National Guard total 1,749 Air Force Reserve total 468 467 502 491 497 500 524 Total active-duty, ANG, AFRES 9,443 9,494 9,447 9,416 9,279 9,032 9,133 Active-duty aircraft, including 9,529 9,578 9,501 9,500 foreign-government-owned 9,355 9,130 9,217 Flying hours (000s) 2,752 USAF 2.914 2,905 2,883 2.830 2.760 2.961 Air National Guard 423 408 431 437 427 442 497 Air Force Reserve 140 143 149 151 155 164 208 3,477 3,456 3,463 3,412 Total flying hours 3,340 3,366 3,666

USAF Flyin	ig Squ	Jaurons	Dy IVIISS	ion Type		
	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	F 1992
Active forces						
Strategic bomber	24	25	24	21	18	17
Air refueling	36	35	35	35	35	32
Strategic command & control	6	6	6	6	6	6
Intelligence	3	3	3	3	3	3
Strategic reconnaissance	1	1	1	0	0	(
Strategic interceptor	3	2	2	1	0	(
Fighter	81	79	79	79	70	6
Tactical reconnaissance	7	5	5	5	1	(
Tactical electronic warfare	4	4	4	4	2	
Special operations forces	5	10	11	11	11	1
Tactical air command & contro	3	3	3	3	3	9
Tactical air control	7	7	7	7	7	- 10
Weather	2	1	1	1	1	
Rescue	9	6	7	7	7	
Tactical airlift	13	13	12	12	12	1
Strategic airlift	17	19	20	21	21	2
Special mission	1	1	1	2	2	
Aeromedical airlift	3	3	3	3	3	
GLCM	6	5	3	2	0	
ICBM	20	20	20	20	20	19
Total	251	248	247	243	222	209
Reserve forces						
ANG selected reserve	91	91	91	91	92	9
Air Force Reserve	57	58	58	58	58	5
Total	148	149	149	149	150	15
Grand total	399	397	396	392	372	35

Tactical air command and control and tactical air control figures for FY 1992 reflect new allocations of reserves as part of the Air Force restructuring. These figures, as well as others such as those for air refueling, will continue to change throughout 1992.

Aircraft per Active-Duty USAF Squadron

(End FY 1991)

Aircraft T	ype Number
A-10A	18 or 24
B-1B	11, 15, 16, or 17
B-52	10, 13, 14, or 19
C-5	11 to 18
C-9A	3 or 11
C-130	8, 10, 13, 14,
	16, or 18
AC-130	10
KC-10A	9 or 10
KC-135	11 to 21
C-141B	12 to 17
E-3	4 or 9
F-4	18 or 24
RF-4	18
F-15	15, 18, or 24
F-16	18 or 24
F-111	12, 18, or 24
FB-111A	4, 10, or 11
F-117A	18

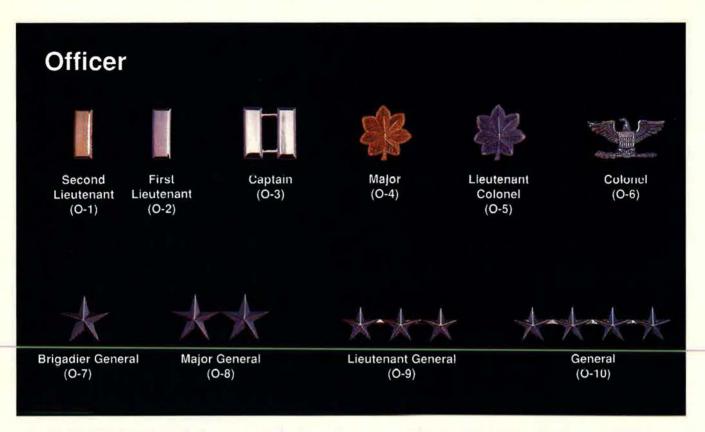
For some types of aircraft, squadrons vary in size as shown here. HC-130s, WC-130s, T-39s, and T-38s are counted as Total Unit Equipment, not by squadrons.

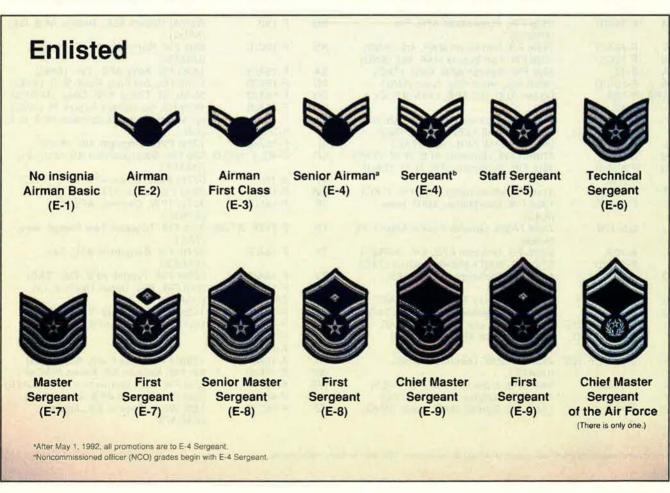
USAF Aircraft Tail Markings

Code	Aircraft	Unit, Location, and Commanda	Code	Aircraft	Unit, Location, and Commanda
AK	F-15C/D/E	3d Wing, Elmendorf AFB, Alaska (PACAF)	МВ	A-10A	354th FW, Myrtle Beach AFB, S. C. (TAC)
AK	F-16,	343d Wing, Eielson AFB, Alaska	MC	F-16A/B/C/D	56th FW, MacDill AFB, Fla. (TAC)
15/22/50	OA-10A	(PACAF)	MD	A-10A	175th FG, Martin Airport, Md. (ANG)
AL	F-16A/B	187th FG, Dannelly Field, Ala. (ANG)	MI	F-16A/B	127th FW, Selfridge ANGB, Mich.
AZ	F-16A/B	162d FG, Tucson IAP, Ariz. (ANG)	505594	A CONTRACTO	(ANG)
ВА	RF-4C	67th RW, Bergstrom AFB, Tex. (TAC)	MJ	F-16C/D	432d FW, Misawa AB, Japan (PACAF)
ВС	OA-10/	110th FG, Battle Creek ANGB,	MO	F-15C/E,	366th Wing, Mountain Home AFB,
1459/001	A-10	Mich. (ANG)		F-16C, F-111A,	
BD	A-10A	917th FW, Barksdale AFB, La.		EF-111A	
		(AFRES)	MY	F-16C/D	347th FW, Moody AFB, Ga. (TAC)
BH	RF-4C	117th TRW, Birmingham MAP, Ala.	NF	OA-10	602d AIRCW, Davis-Monthan AFB,
		(ANG)			Ariz. (TAC)
BT	F-15C/D	36th FW, Bitburg AB, Germany	NJ	KC-135E	108th ARFW, McGuire AFB, N. J. (ANG)
		(USAFE)	NM	A-7D	150th FG, Kirtland AFB, N. M. (ANG)
CC	F-111D/F/G	27th FW, Cannon AFB, N. M. (TAC)	NO	A-10A	926th FG, NAS New Orleans, La.
CO	F-16C/D	140th FW, Buckley ANGB, Colo.		120100000	(AFRES)
102020		(ANG)	NT	T-43A	323d FTW, Mather AFB, Calif. (ATC)
CR	F-16C/D	32d FG, Soesterberg AB, the	NY	F-16A/B	174th FW, Hancock Field, N. Y. (ANG)
		Netherlands (USAFE)	ОН	A-7D	121st FW, Rickenbacker ANGB;
CT	A-10A	103d FG, Bradley ANGB, Conn.(ANG)			178th TFG, Springfield; 180th TFG,
DC	F-16A/B	113th FW, Andrews AFB, Md. (ANG)	OV	A 7D	Toledo, Ohio (ANG)
DM	A-10A,	355th FW, Davis-Monthan AFB,	OK	A-7D	138th FG, Tulsa IAP, Okla. (ANG)
DO	EC-130H F-16A/B	Ariz. (TAC)	os	F-16C/D,	51st Wing, Osan AB, Korea (PACAF)
DO	F-10A/D	906th FG, Wright-Patterson AFB,	ОТ	OA-10 F-15A/B/C/E,	USAFAWC, Eglin AFB, Fla. (TAC)
ED	Various	Ohio (AFRES) Air Force Flight Test Center, Edwards	01	F-16A/B/C/D	OSALAWO, Egilli Al B, Fla. (TAO)
LU	various	AFB, Calif. (AFSC)	PA	OA-10A	111th FG, Willow Grove ARFF, Pa.
EG	F-15C/D	33d FW, Eglin AFB, Fla. (TAC)	618.5	0,1 1011	(ANG)
EL	A-10A	23d FW, England AFB, La. (TAC)	PA	EC-130E	193d SOG, Harrisburg IAP, Pa. (ANG)
ET	Various	3246th Test Wing, Eglin AFB, Fla.	PR	A-7D	156th FG, Puerto Rico IAP, Puerto
		(AFSC)			Rico (ANG)
FF	F-15C/D,	1st FW, Langley AFB, Va. (TAC)	PT	KC-135E	112th ARFG, Greater Pittsburgh IAP, Pa.
	UH-1	WINDOWS ORDERS OF THE PARTY OF	Venil baset	T10275 1205 9070	(ANG)
FM	F-16A/B	482d FW, Homestead AFB, Fla.	RG	F-15B	Warner Robins ALC, Robins AFB, Ga.
	E 40 N D	(AFRES)		E 400/D	(AFLC)
FS	F-16A/B	188th FG, Fort Smith MAP, Ark. (ANG)	RS	F-16C/D	86th FW, Ramstein AB, Germany
FW	F-16C/D	122d FW, Fort Wayne MAP, Ind. (ANG)	SA	E 1CA/D	(USAFE)
GA HA	F-4E F-16C/D	35th FW, George AFB, Calif. (TAC) 185th FG, Sioux City, Iowa (ANG)	SD	F-16A/B F-16C/D	149th FG, Kelly AFB, Tex. (ANG) 114th FG, Joe Foss Field, S. D. (ANG)
HAFB		Ogden ALC, Hill AFB, Utah (AFLC)	SH	F-16A/B	507th FG, Tinker AFB, Okla. (AFRES)
HALD	F-4E	Ogden ALC, Hill Ar B, Otan (Ar LC)	SI	F-16A/B	183d FG, Springfield Airport, Ill. (ANG)
HF	F-16C/D	181st FG, Hulman RAP, Ind. (ANG)	SJ	F-15E,	4th Wing, Seymour Johnson AFB, N. C.
HI	F-16A/B/C/D	419th FW, Hill AFB, Utah (AFRES)		KC-10A	(TAC)
HL	F-16C/D	388th FW, Hill AFB, Utah (TAC)	SL	F-15A/C	131st FW, Bridgeton, Mo. (ANG)
НМ	AT-38B	479th TTW, Holloman AFB, N. M. (TAC)	SP		52d FW, Spangdahlem AB, Germany
HO	F-15A/B,	49th FW, Holloman AFB, N. M. (TAC)			(USAFE)
0.000.533	AT-38		SR	A-10A	507th ACW, Shaw AFB, S. C. (TAC)
HS	F-16C/D	31st FW, Homestead AFB, Fla. (TAC)	SW	F-16C/D	363d FW, Shaw AFB, S. C. (TAC)
IA	F-16C/D	132d FW, Des Moines MAP, Iowa	TF	F-16C/D	301st TFW, Carswell AFB, Tex.
150		(ANG)	verseet!		(AFRES)
IL	OA-37B	182d TASG, Greater Peoria Airport, III.	TR	F-117A, AT-38	[[경스스] 플링크에 [[[경영에] 인도 (전경) 그리고 하고 있다면서 [] [[[[200] 이 [[200]] 이 [200]] [[200]] [[200]] [[200]
161	A 40A	(ANG)	TV	E 1CA/D	(TAC)
IN IS	A-10A	930th FG, Grissom AFB, Ind. (AFRES)	TX	F-16A/B	924th FG, Bergstrom AFB, Tex.
KC	F-15C/D A-10A	57th FIS, NAS Keflavik, Iceland (TAC) 442d FW, Richards-Gebaur AFB,	TY	F-15A/B	(AFRES) 325th FW, Tyndall AFB, Fla. (TAC)
NO	A-TOA	Mo. (AFRES)	ÜН	F-111E,	20th FW, RAF Upper Heyford, UK
KE	RF-4C	186th TRG, Key Field, Miss. (ANG)		EF-111A	(USAFE)
KS	EC-130E	7th ACCS, Keesler AFB, Miss. (TAC)	VA	F-16C/D	192d FG, Byrd Field, Va. (ANG)
LA		405th TTW, Luke AFB, Ariz. (TAC)	WA	F-15A/C/D/E,	USAFFWC, Nellis AFB, Nev. (TAC)
LF	F-16A/B/C/D,	58th FW, Luke AFB, Ariz. (TAC)		F-16C/D,	
	F-15E			A-10A	
LN	F-111F, F-15E		WI	A-10A	128th FW, Truax Field, Wis. (ANG)
		(USAFE)	WP	F-15C/D	8th FW, Kunsan AB, Korea (PACAF)
LR	F-16C/D	944th FG, Luke AFB, Ariz. (AFRES)	WR	A-10A	81st FW, RAF Bentwaters, UK (USAFE)
LY	F-15A/B	48th FIS, Langley AFB, Va. (TAC)	WW	F-4E/G	35th FW, George AFB, Calif. (TAC)
MA	A-10A	104th FG, Barnes MAP, Mass. (ANG)	ZZ	F-15C/D	18th Wing, Kadena AB, Japan (PACAF)
					(LUCAL)

^aUnit and command assignments are subject to change during summer 1992 with Air Force restructuring,

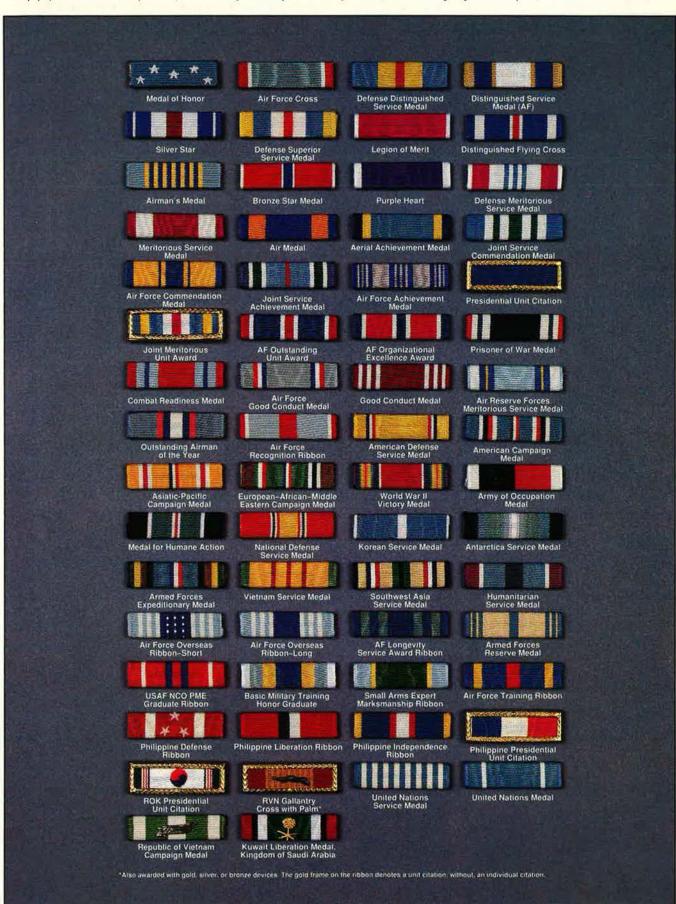
USAF Grades and Insignia





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 AFR 35-10 and AFR 900-48.





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USAF Leaders Through the Years

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	

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. 18, 1990
Gen. Merrill A. McPeak	Oct. 30, 1990	STATE BASE STATE AND STATE

Chief Master Sergeants of the Air Force		
CMSAF Paul W. Airey	Apr. 3, 1967	Aug. 1, 1969
CMSAF Donald L. Harlow	Aug. 1, 1969	Oct. 1, 1971
CMSAF Richard D. Kisling	Oct. 1, 1971	Oct. 1, 1973
CMSAF Thomas N. Barnes	Oct. 1, 1973	Aug. 1, 1977
CMSAF Robert D. Gaylor	Aug. 1, 1977	Aug. 1, 1979
CMSAF James M. McCoy	Aug. 1, 1979	July 1, 1981
CMSAF Arthur L. Andrews	Aug. 1, 1981	Aug. 1, 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	7.2. 10 1.0 4 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

Air Combat Command

(Formally activates June 1, 1992) Gen. John Michael Loh (nominated)

June 1, 1992

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

Established as Air Defense Command Mar, 21, 1946. Activated as a major command Mar, 27, 1946. Discontinued July 1, 1950. Reestablished as a major command and organized Jan, 1, 1951. Redesignated Aerospace Defense Command Jan, 15, 1968. Inactivated Mar, 31, 1980; its resources were divided between Tactical Air Command and Strategic Air Command. Some functions were passed to the Aerospace Defense Center.

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. Became a field operating agency July 1, 1991.

Air Force	Intelligence	Command
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Maj. Gen. Gary W. O'Shaughnessy Oct. 1, 1992

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. Deactivates July 1, 1992.

Air Force Materiel Command

(Formally activates July 1, 1992) Gen. Ronald W. Yates (nominated)

n. Ronald W. Yates (nominated) 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
Mai, 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	(C)

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).

Air Force Space Command		
Gen. James V. Hartinger	Sept. 1, 1982	July 30, 1984
Gen. Robert T. Herres	July 30, 1984	Oct. 1, 1986
Mai. 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. Kutvna	Mar. 23, 1992	

Air Force Special Operations Command		
Maj. Gen. Thomas E. Eggers	May 22, 1990	June 30, 199
Maj. Gen. Bruce L. Fister	June 30, 1991	

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. Handolph	July 17, 1967	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. Deactivates July 1, 1992.

Air Mobility Command

(Formally activates June 1, 1992) Gen. H. T. Johnson (nominated)

June 1, 1992

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	

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. John K. Cannon	Apr. 15, 1946	Oct. 15, 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. 31, 1975

Gen. John W. Roberts Gen. B. L. Davis Gen. Thomas M. Ryan, Jr. Gen. Andrew P. Iosue Gen. John A. Shaud Lt. Gen. Robert C. Oaks Lt. Gen. Joseph W. Ashy	Sept. 1, 1975 Apr. 1, 1979 July 29, 1981 July 1, 1983 Aug. 28, 1986 June 6, 1988 June 25, 1990	Apr. 1, 1979 July 29, 1981 June 30, 1983 Aug. 28, 1986 June 6, 1988 June 25, 1990
Air University		
Maj. Gen. Muir S. Fairchild Maj. Gen. Robert W. Harper Gen. George C. Kenney Lt. Gen. Idwal H. Edwards Lt. Gen. Laurence S. Kuter Lt. Gen. Dean C. Strother Lt. Gen. Walter E. Todd Lt. Gen. Troup Miller, Jr. Lt. Gen. Ralph P. Swofford, Jr. Lt. Gen. Alvan C. Gillem II Lt. Gen. Alvan C. Gillem II Lt. Gen. F. Michael Rogers Lt. Gen. Raymond B. Furlong Lt. Gen. Stanley M. Umstead Lt. Gen. Charles G. Cleveland Lt. Gen. Thomas C. Richards Lt. Gen. Truman Spangrud Lt. Gen. Ralph E. Havens Maj. Gen. David C. Reed Lt. Gen. Charles G. Boyd	Mar. 15, 1946 May 17, 1948 Oct. 16, 1948 July 28, 1951 Apr. 15, 1953 June 1, 1955 July 15, 1958 Aug. 1, 1961 Jan. 1, 1964 Aug. 1, 1968 Aug. 1, 1968 Aug. 1, 1970 Nov. 1, 1973 Sept. 1, 1975 July 1, 1979 July 24, 1981 Aug. 1, 1984 Nov. 6, 1986 July 12, 1988 Oct. 6, 1989 Jan. 4, 1990	May 17, 1948 Oct. 15, 1948 July 27, 1951 Feb. 28, 1953 May 31, 1955 June 30, 1958 July 31, 1961 Dec. 31, 1963 July 31, 1965 July 31, 1965 July 31, 1970 Oct. 31, 1973 Aug. 31, 1975 July 1, 1979 July 1, 1979 July 24, 1981 Aug. 1, 1984 Nov. 6, 1986 July 12, 1988 Oct. 6, 1989 Jan. 4, 1990

Alaskan Air Command	ALC: UNITED BY	
Brig. Gen. Joseph H. Atkinson	Oct. 1, 1946	Feb. 25, 19

Air University was part of Air Training Command between May 1978 and July 1983.

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, 1990ª
CONTRACTOR AND	CHENCENT WAY AND COM	

*Redesignated Eleventh Air Force, part of Pacific Air Forces, on August 9, 1990. Lt. Gen. Thomas McInerney continues as commander of Eleventh Air Force.

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

Oct. 26, 1948	July 5, 1949
July 6, 1949	Feb. 21, 1951
Feb. 22, 1951	Feb. 13, 1953
Feb. 14, 1953	Jan. 3, 1957
Jan. 4, 1957	Aug. 5, 1959
Aug. 6, 1959	Sept. 20, 1959
	July 6, 1949 Feb. 22, 1951 Feb. 14, 1953 Jan. 4, 1957

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, Deactivated 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
Mai, Gen. Nils O. Ohman	July 5, 1968	Apr. 30, 1972
Maj. Gen. John L. Locke	May 1, 1972	Feb. 25, 1974
Mai. 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 July 1976; many of its functions passed to Military Airlift Command.

Military Airlift Command		
Lt. Gen. Laurence S. Kuter	June 1, 1984	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. Deactivates 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	

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

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

Deactivates June 1, 1992.

Tactical Air Command		The state of
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

Deactivates June 1, 1992,

1	US Air Forces in Europe		
	Brig. Gen. John F. McBlain	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
- 1	Gen. Richard H. Ellis	Sept. 1, 1975	July 31, 1977
	Gen. William J. Evans	Aug. 1, 1977	Aug. 1, 1978
- 1	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
- 1	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	mmana-makasa 1720-1940

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	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	

USAF Medal of Honor Recipients

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, III.	Oct. 6, 1918, Binarville, France	KIA Oct. 6, 1918
Luke, 2d Lt. Frank, Jr. Rickenbacker, Capt. Edward V	Phoenix, Ariz.	Sept. 29, 1918, Murvaux, France Sept. 25, 1918, Billy, France	KIA Sept. 29, 1918 Died July 23, 1973
Thekenbacker, Capit Laward	. Columbuo, Omo	copi. 20, 1010, Birry, Franco	Died odly 20, 1070
		World War II	
Baker, Lt. Col. Addison E.	Chicago, III.	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. Castle, Brig. Gen. Frederick W	Fort Worth, Tex. Manila, P. I.	Oct. 26, 1944, South China Sea Dec. 24, 1944, Liège, Belgium	KIA Oct. 26, 1944 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	Carmel, Calif. (Ret. Gen.)
Erwin, SSgt. Henry E. Femoyer, 2d Lt. Robert E.	Adamsville, Ala. Huntington, W. Va.	Apr. 12, 1945, Koriyama, Japan Nov. 2, 1944, Merseburg, Germany	Leeds, Ala. 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	Belleair Bluffs, Fla. (Ret. Brig. Gen.)
Hughes, 2d Lt. Lloyd H. Jerstad, Maj. John L.	Alexandria, La. Racine, Wis.	Aug. 1, 1943, Ploesti, Romania Aug. 1, 1943, Ploesti, Romania	KIA Aug. 1, 1943 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. Portland, Ore.	Oct. 11, 1943, Wewak, New Guinea	KIA Mar. 5, 1944, Wewak, New Guinea
Kingsley, 2d Lt. David R. Knight, 1st Lt. Raymond L.	Houston, Tex.	June 23, 1944, Ploesti, Romania Apr. 25, 1945, Po Valley, Italy	KIA June 23, 1944 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 Mathis, 1st Lt. Jack W.	Scotland San Angelo, Tex.	Feb. 20, 1944, Leipzig, Germany Mar. 18, 1943, Vegesack, Germany	KIA Feb. 20, 1944 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, III.	Apr. 11, 1944, Brunswick, Germany	Fairfield, Calif. (Ret. Lt. Col.)
Morgan, 2d Lt. John C. Pease, Capt. Harl, Jr.	Vernon, Tex. Plymouth, N. H.	July 28, 1943, Kiol, Gormany Aug. 7, 1942, Rabaul, New Britain	Died Jan. 17, 1991 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. Truemper, 2d Lt. Walter E.	Caro, Mich. Aurora, III.	May 1, 1943, St. Nazaire, France Feb. 20, 1944, Leipzig, Germany	Died May 11, 1984 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. Wilkins, Maj. Raymond H.	Cerrillos, N. M. Portsmouth, Va.	Jan. 5, 1943, Rabaul, New Britain Nov. 2, 1943, Rabaul, New Britain	KIA Jan. 5, 1943 KIA Nov. 2, 1943
Zeamer, Maj. Jay, Jr.	Carlisle, Pa.	June 16, 1943, Buka, Solomon Is.	Stoneham, Mass. (Ret. Lt. Col.)
		358	3
		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. Sebille, Maj. Louis J.	Portland, Me. Harbor Beach, Mich.	Nov. 22, 1952, Sniper Ridge, N. Korea Aug. 5, 1950, Hamch'ang, S. Korea	KIA Nov. 22, 1952 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.	Vietnam 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.		Kuna, Idaho (Ret. Col.)
Fleming, 1st Lt. James P. Jackson, Lt. Col. Joe M.	Sedalia, Mo. Newnan, Ga.	Nov. 26, 1968, Duc Co, S. Vietnam May 12, 1968, Kham Duc, S. Vietnam	Active-duty Col., McGuire AFB, N. J. 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. Wilbanks, Capt. Hilliard A.	Seattle, Wash. Cornelia, Ga.	Apr. 19, 1967, N. Vietnam Feb. 24, 1967, Dalat, S. Vietnam	Seattle, Wash. (Ret. Col.) KIA Feb. 24, 1967
Young, Capt. Gerald O.	Anacortes, Wash.	Nov. 9, 1967, Da Nang area, S. Vietnam	Died June 6, 1990
- 1870 M	5%	27 SK 820 M	60.

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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.

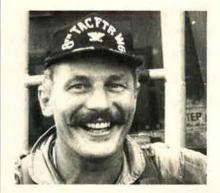
American Aces of World War I



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
Swabb, 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.	28a	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 F	26.83	Varnell, Capt. James S., Jr.	17
Meyer, Lt. Col. John C.	24ª	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
	The state of the s		
Voll, Capt. John J.	21	Brown, Maj. Samuel J.	15.50
Mahurin, Maj. Walker M.	20.75ª	Peterson, Capt. Richard A.	15.50
Lynch, Lt. Col. Thomas J.	20	Whisner, Capt. William T., Jr.	15.50
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, Mai. Robert W.	15
Carson, Capt. Leonard K.	18.50	Hofer, 2d Lt. Ralph K.	15
Eagleston, Maj. Glenn T.	18.50ª	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
Green, maj. Herscher H.	10	1 0wors, Oapt. 306 11., 01.	14.50



Maj. Richard I. Bong

Ranks are as of last victory in World War II.

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

^{*}Aces who added to these scores by victories in the Korean War.

AAF/USAF Aces With Victories in Both World War II and a Later War

	ww II	Other	Total
Gabreski, Col. Francis S.	28	6.50	34.50
Meyer, Col. John C.	24	2	26
Mahurin, Col. Walker M.	20.75	3.50	24.25
Davis, Maj. George A., Jr.	7	14	21
Whisner, Maj. William T., Jr.	15.50	5.50	21
Eagleston, Col. Glenn T.	18.50	2	20.50
Garrison, Lt. Col. Vermont	7.33	10	17.33
Baker, Col. Royal N.	3.50	13	16.50
Jabara, Maj. James	1.50	15	16,50
Olds, Col. Řobin	12	4ª	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 7	3	8
Hockery, Maj. John J.	7	1	8 7
Creighton, Maj. Richard D.	2	5	7
Emmert, Lt. Col. Benjamin H., Jr.	2 6 1	1	7
Bettinger, Maj. Stephen L.		5	6
Visscher, Maj. Herman W.	5	1	6
Liles, Capt. Brooks J.	_1	4	5
Mattson, Capt. Conrad E.	1	4	6 5 5
Schaeffer, Maj. William F.	2	3	5

*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. Jabara, Maj. James Fernandez, Capt. Manuel J.	16 15 ^a 14.50	
Davis, Maj. George A., Jr.	14ª	
Baker, Col. Royal N.	13ª	
Blesse, Maj. Frederick C.	10	
Fischer, 1st Lt. Harold E.	10	
Garrison, Lt. Col. Vermont	10*	
Johnson, Col. James K.	10ª	
Moore, Capt. Lonnie R.	10	
Parr, Capt. Ralph S., Jr.	10	
Foster, Capt. Cecil G.	9	
Low, 1st Lt. James F.	9	
	8.50°	
Hagerstrom, Maj. James P.	8	
Risner, Capt. Robinson		
Ruddell, Lt. Col. George I.	7	
Buttlemann, 1st Lt. Henry	8ª 7 7 7	
Jolley, Capt. Clifford D.	7	
Lilley, Capt. Leonard W.	6.50	
Adams, Maj. Donald E.	6.50°	
Gabreski, Col. Francis S.	6.50	
Jones, Lt. Col. George L.		
Marshal, Maj. Winton W.	6.50	
Kasler, 1st Lt. James H.	6	
Love, Capt. Robert J.	6	
Whisner, Maj. William T., Jr.	5.50ª	
Baldwin, Col. Robert P.	5	
Becker, Capt. Richard S.	5	
Bettinger, Maj. Stephen L.	5	
Creighton, Maj. Richard D.	5"	
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 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
Overton, Capt. Dolphin D., III	5	
Thyng, Col. Harrison R.		
Westcott, Maj. William H.	5	

*In addition to World War II victories,

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1992 USAF Almanac The New Eagles: Reports from the 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.

Commands in Transition

In 1992, the Air Force sends its major command structure through the most far-reaching transformation in history. The number of commands drops by a net of two—from twelve to ten—but those modest figures mask the true magnitude of the change. Five of the oldest and largest commands vanish. Three new ones emerge.

USAF's two largest combat arms organizations—Strategic Air Command and Tactical Air Command—dissolve. Their assets transfer elsewhere. SAC, long the largest of USAF commands, hands off its ballistic missiles, long-range bombers, aerial refueling planes, reconnaissance aircraft, and command-and-control systems. Control of TAC's fighters, support planes, and other systems moves to a new command. USAF's prime combat mobility organization, Military

Airlift Command, also goes out of business, dividing its fleet of some 1,000 airlifters among a number of US and overseas commands. June 1, 1992, was set as deactivation date for all three.

Two materiel organizations—Air Force Logistics Command and Air Force Systems Command—deactivate, passing assets to another organization. AFLC's responsibility to maintain and keep ready the Air Force's weapon systems goes to a new supercommand. So do the missions of AFSC, long the focus of USAF arms-making. The Air Force set July 1, 1992, as the deactivation date for both.

Three new commands activate. In the new setup, **Air Combat Command** becomes the principal USAF combat arms organization. ACC's missions include training and equipping a large part of the Air Force's fighting force, and it gains personnel and equipment from MAC, SAC, and TAC. Air Mobility Command, another new command, has a broad global mobility mission. It combines much of the force structure of MAC with key SAC assets. June 1, 1992, was set as the activation date for both ACC and AMC.

Most of USAF's acquisition responsibility resides in the new Air Force Materiel Command, which combines the resources of AFLC and AFSC. Plans call for AFMC, whose activation was set for July 1, 1992, to integrate the processes and resources of the older commands in order to develop weapon systems, buy the systems, and support them throughout their life cycles.

Following the reports on these eight commands in transition, AIR FORCE Magazine outlines USAF's other seven major commands.

Air Combat Command

Activates June 1, 1992

Air Combat Command is a new major command being created to train and equip a large part of USAF's fighting forces—formerly divided into "tactical" and "strategic" categories—for integrated combat operations. ACC combines all of the assets of Tactical Air Command, most of those of Strategic Air Command, and a small portion of those of Military Airlift Command. TAC, SAC, and MAC roll up their flags and deactivate.

Air Force Secretary Donald B. Rice and Chief of Staff Gen. Merrill A. McPeak announced ACC's creation at AFA's National Convention in September 1991. Secretary Rice said that ACC "will focus on deterrence and air campaign operations—global power." ACC forces are based within the continental US.

The ACC concept springs from the realization that long-standing distinctions between strategic and tactical forces have become artificial in an era of long-range, multipurpose airpower. In the Gulf War, for example, F-15E "tactical" fighters hit strategic targets while B-52 "strategic" aircraft bombed tactical targets. Close air support A-10s were employed against Scud missile launchers and other "strategic" targets.

The Air Force chose Langley AFB, Va., as ACC headquarters. Nominated to be ACC Commander in Chief was Gen. John Michael Loh, who has headed Tactical Air Command since March 1991. ACC's Vice Commander will be Maj. Gen. Stephen B. Croker, nominated for promotion to lieutenant general. General Croker has served as commander of ACC Provisional.

The assets of all surviving TAC wings and organizations transfer to ACC. From SAC's old structure, ACC takes possession of 8th Air Force, which controls all B-1 and B-52 bombers and will control B-2 Stealth bombers when

operational; 2d Air Force, which controls all battle-management airplanes; and 20th Air Force, with its Peace-keeper and Minuteman ICBMs. ACC and the European and Pacific theater commands will acquire about a third of SAC's KC-10s, less than half of its KC-135s, and about half of MAC's tactical C-130 airlifters. It is not clear how many of each will go to ACC.

The new command will assume control of TAC's old bases, including Bergstrom AFB, Tex.; Cannon AFB, N. M.; Davis-Monthan AFB, Ariz.; England AFB, La.; George AFB, Calif.; Holloman AFB, N. M.; Homestead AFB, Fla.; Langley AFB, Va.; Luke AFB, Ariz.; MacDill AFB, Fla.; Moody AFB, Ga.; Mountain Home AFB, Idaho; Myrtle Beach AFB, S. C.; Nellis AFB, Nev.; Seymour Johnson AFB, N. C.; Shaw AFB, S. C.; and Tyndall AFB, Fla.

From SAC will come Barksdale AFB, La.; Beale AFB, Calif.; Carswell AFB, Tex.; Castle AFB, Calif.; Dyess AFB, Tex.; Eaker AFB, Ark.; Ellsworth AFB, S. D.; Fairchild AFB, Wash.; F. E. Warren AFB, Wyo.; Grand Forks AFB, N. D.; Griffiss AFB, N. Y.; K. I. Sawyer AFB, Mich.; Loring AFB, Me.; McConnell AFB, Kan.; Minot AFB, N. D.; Offutt AFB, Neb.; Whiteman AFB, Mo.; and Wurtsmith AFB, Mich. From MAC, ACC will take command of Pope AFB, N. C.

Under the ACC setup, new "composite wings" combining different kinds of aircraft will multiply. One "air intervention wing," the 366th Wlng, Is being formed at Mountain Home AFB. It will combine air-combat and ground-attack fighters, tankers, reconnaissance air-



Composite wings that combine several types of aircraft into one effective force package are the wave of the future. These F-15Es and KC-10 are from the new composite 4th Wing, Seymour Johnson AFB, N. C.

craft, E-3 AWACS planes, and B-52 bombers. Another composite wing, the 4th at Seymour Johnson AFB, combines F-15Es and KC-10 tankers. A different composite wing, the 23d, is in the works at Pope AFB near Fort Bragg, N. C., where A-10 close support planes, F-16 multirole fighters, and a sizable C-130 force will work with the Army's 82d Airborne Division. Other composite wings will be created, but not all wings will be of the composite type. Some, such as the 388th Wing of F-16s at Hill AFB, Utah, will continue to be the "monolithic" type.

ACC will have command of Air Reserve Component tankers and transports of the Reserve associate unit at Seymour Johnson AFB and of Air Reserve airlift, air rescue, operational support airlift, and aeromedical evacuation forces in Alaska and Hawaii.

Current plans call for the Air Force to transfer many generals from staff positions to operational jobs under ACC. Brigadier generals, rather than colonels, will command combat air wings and their bases as well—a fulfillment of the "one base, one wing, one boss" concept. Air divisions disappear. Numbered air forces become operational echelons and lose staff personnel.

ACC manages USAF's strategic nuclear forces, but they will come under operational control of the new, unified US Strategic Command, based at Offutt AFB, Neb., as the world security situation dictates, much as TAC provided alert-force interceptors to North American Aerospace Defense Command. Some key SAC resources do not move to ACC at all but go to STRATCOM.

Senior Air Force officials say that, in some contingencies, ACC's US-based units, configured for rapid movement overseas, will be the mainstay of combat operations. In other cases, the command will play a supporting role. ACC will support the NATO commitment and be available to deal with contingencies beyond Europe in the Persian Gulf and southwest Asia.

General McPeak says that Air Combat Command will serve as a model for the reorganization of the major overseas commands, Pacific Air Forces and US Air Forces in Europe.



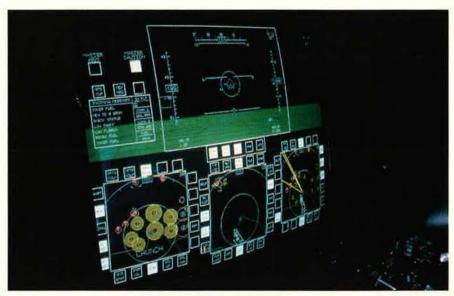
In an era of long-range, multipurpose airpower, distinctions between "tactical" and "strategic" are artificial. ACC assumes control of such formerly "strategic" aircraft as long-range bombers. The conventional capabilities of aircraft like this B-1 are being emphasized.

Air Force Materiel Command, headquartered at Wright-Patterson AFB, Ohio, is a new major command that combines the resources of two giants, Air Force Systems Command and Air Force Logistics Command, in a single acquisition and management organization.

Capitalizing on AFLC and AFSC strengths, AFMC integrates their processes and resources to develop weapon systems, buy the systems, and support them in the future. AFMC works with its users—the operational commands and other customers such as NASA and the Navy—to explore their missions and tasks and find ways to give them what they need, when and where they need it.

Gen. Ronald W. Yates, commander of AFSC from 1990 to 1992, has been nominated to be the commander of AFMC. Nominated to be vice commander is Lt. Gen. Charles J. Searock, Jr., who has served as Vice Commander of AFLC. July 1, 1992, is the official activation date for AFMC. Its two predecessor commands deactivate on that date.

When activated, AFMC becomes the Air Force's single acquisition command, with a skilled work force of 120,000, a chain of top-quality labo-



Air Force Materiel Command will provide cradle-to-grave management for USAF systems. Top-quality laboratories and test facilities inherited from Systems Command support research and development of new systems. This laboratory "glass cockpit" is one such test system being developed for production.

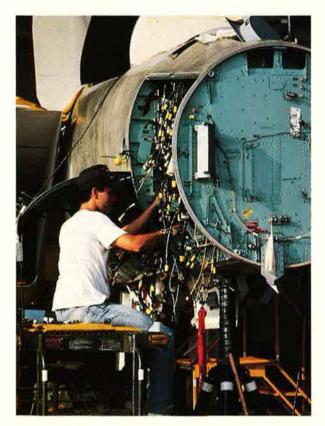
ratories and test facilities, world leadership in environmental and critical technologies, and national recognition for outstanding quality.

AFMC manages more than fifty percent of the Air Force's budget and ninety-seven percent of Air Force foreign military sales dollars. The command operates thirteen bases, the Air Force's medical and test pilot schools, and seventy-five different types of aircraft. AFMC supports the Air Force's more than 10,000 aircraft and 32,000 engines. If AFMC were listed in the Fortune 500, it would be among the top five companies.

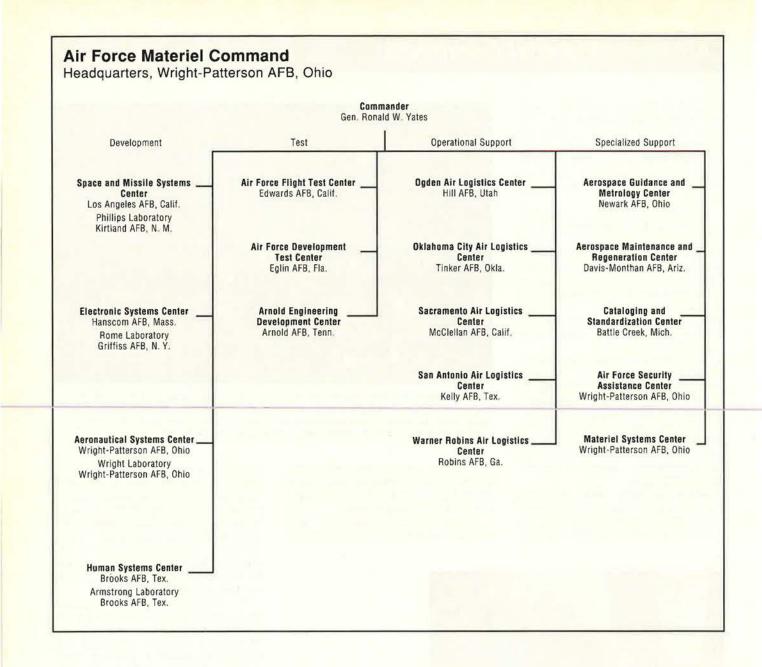
AFLC's expertise in providing world-wide logistics support, including maintenance, modification, and overhaul of weapon systems, combined with AFSC's expertise in science, technology, research, and development, makes AFMC a world-class organization. As the Air Force's acquisition command, AFMC provides a single point of contact for its customers. This simplifies the relationship between the command and the customer.

Integration of AFLC and AFSC was possible because the two organizations already had significantly streamlined their operations, using Total Quality Management principles of continuous process improvement, spread of authority and responsibility to the lowest level, and a strong partnership with the operational commands and industry. Total Quality Management plays a major role in building AFMC. Teams were formed in every functional area to review the ways AFSC and AFLC did business and to select the best.

AFMC's cornerstone is integrated



Materiel Command can rely on the old Logistics Command's track record for reliability and maintainability. Here, an aircraft technician from Warner Robins Air Logistics Center, Robins AFB, Ga., troubleshoots an F-15's electrical system during depot maintenance.



weapon system management (IWSM), a process that covers a system's cradle-to-grave life cycle—from initial development to cancellation or retirement from the operational inventory. This allows leaders to consider the impact of their decisions on all phases of the system's life cycle, which can span several decades. Twenty-one of the hundreds of programs in the command are now developing, testing, and refining the IWSM process for command-wide application starting in July.

Under IWSM, the system program director, a single manager in a program organization, manages the weapon system or commodity. The makeup of the program organization will change over time, support elements will likely be at multiple locations, and the manager may change

locations as the system matures from development to operational support. However, program management responsibility never leaves the hands of the system program director.

System program directors will also have more authority over a wider range of decisions and resources and have more control of funding and support organizations. Directors have the backing of the full complement of laboratories, test centers and ranges, and product and logistics centers within the command.

AFMC takes possession of AFLC's five large industrial hubs, the air logistics centers: Warner Robins ALC, Robins AFB, Ga.; Oklahoma City ALC, Tinker AFB, Okla.; San Antonio ALC, Kelly AFB, Tex.; Ogden ALC, Hill AFB, Utah; and Sacramento ALC, McClellan AFB. Calif.

AFMC's centers and laboratories carry out the command's mission in five key areas: technology, test, systems acquisition, logistics, and base operating support. Critical and emerging technologies are born in the laboratories and integrated into weapon systems in the product centers. As they are developed, newer technologies are also integrated through ALCs as weapon systems are modernized. The systems undergo testing at the command's test ranges and three major test centers. Operational testing also takes place at the logistics centers or test ranges, following maintenance or major modifications. The command's bases represent an investment in unique research, test, and manufacturing capability that would cost more than \$32 billion to replace today.

Air Mobility Command (AMC) is a new major command whose mission is to supply "global reach" to the US Air Force and other armed services. It combines most of the force structure of Military Airlift Command (MAC) with key Strategic Air Command (SAC) assets. AMC becomes the sole provider of intercontinental-range military air transport. It also retains some intratheater airlift capability and will provide other specialized services.

Plans to create the new command were announced by Air Force Secretary Donald B. Rice and Chief of Staff Gen. Merrill A. McPeak at AFA's National Convention in September 1991. Service officials selected June 1, 1992, as the official activation date when MAC and SAC disband. The Secretary explained that, in the new setup, Air Mobility Command has "the mission of air mobility—global reach." AMC replaces MAC as the Air Force

AMC replaces MAC as the Air Force component of US Transportation Command. As one of USTRANSCOM's component commands, it provides airlift, aerial refueling, aeromedical evacuation, and combat rescue for all US defense forces.

The permanent site of AMC headquarters is Scott AFB, III., which also has been the site of MAC and US-



Air Mobility Command will be the sole provider of intercontinental-range military air transport, inheriting all of MAC's long-range C-141 StarLifters and C-5 Galaxies (above). The Persian Gulf War highlighted the importance of strategic airlift.

TRANSCOM headquarters. Nominated to be the first AMC Commander in Chief was Gen. H. T. Johnson, who also serves as Commander in Chief of the unified USTRANSCOM and is the most recent MAC commander.

When it becomes operational, the C-17, which made its first flight last September, will give AMC the short-field capability of the C-130 combined with the range and capacity of the C-5 and C-141.

The new command's work force will consist of more than 181,000 military and civilian personnel. The Air Force Reserve and Air National Guard make up nearly half of that total force. Its annual operating budget is about \$7.5 billion. Sixteen installations will fly the AMC banner, but the new command's presence will also be felt at twentynine associated units and twelve overseas locations. Another fifty-nine Air Force Reserve and Air National Guard units share in AMC's mobility mission. The nearly 1,700 airlift, tanker, and rescue aircraft make up the bulk of the command's assets.

The command consists of three numbered air forces: 21st Air Force at McGuire AFB, N. J.; 22d Air Force at Travis AFB, Calif.; and 15th Air Force at March AFB, Calif. AMC maintains a tanker and airlift control center at Scott AFB. The command's assets are, for the most part, based within the continental United States.

As the successor to MAC, AMC takes control of MAC's 21st Air Force and 22d Air Force and all Air Force long-range C-5 and C-141 airlift aircraft, as well as the in-theater maintenance, aerial port, and command-and-control assets that go with them. AMC continues to manage about half of the Air Force's C-130 tactical airlifters. Operational support aircraft (C-21 and C-12), along with aeromedical evacuation and rescue planes, will also be assigned.

Air Mobility Command Headquarters, Scott AFB, III.

22d Air Force
Travis AFB, Calif.
60th Airlift Wing
Travis AFB, Calif.
62d Airlift Wing
McChord AFB, Wash.
63d Airlift Wing
Norton AFB, Calif.
314th Airlift Wing
Little Rock AFB, Ark.
375th Airlift Wing
Scott AFB, III.

463d Airlift Wing Dyess AFB, Tex. 542d Crew Training Wing

Altus AFB, Okla.

15th Air Force March AFB, Calif.

Commander Gen. H. T. Johnson (nominated)

> 19th Air Refueling Wing Robins AFB, Ga.

22d Air Refueling Wing March AFB, Calif.

43d Air Refueling Wing Malmstrom AFB, Mont.

305th Air Refueling Wing Grissom AFB, Ind.

340th Air Refueling Wing Altus AFB, Okla.

380th Air Refueling Wing Plattsburgh AFB, N. Y.

458th Air Refueling Group Barksdale AFB, La. 21st Air Force McGuire AFB, N. J.

89th Wing Andrews AFB, Md.

317th Airlift Wing Pope AFB, N. C.

436th Airlift Wing Dover AFB, Del.

437th Airlift Wing

Charleston AFB, N. C. 438th Airlift Wing

McGuire AFB, N. J.

834th Air Base Wing Hurlburt Field, Fla.

65th Support Wing Lajes Field, Azores

From the SAC force structure, AMC acquires 15th Air Force, based at March AFB, Calif., and assumes control of a majority of the nation's aerial refueling aircraft. Plans call for AMC to manage approximately two-thirds of the KC-10s and more than half of the KC-135s. The 600 SAC tankers are vital to extending the range of US

fighter, bomber, and airlift aircraft and, under AMC, are viewed as an integral part of the airlift team.

The remainder of the C-130s and tankers—those not in the AMC force structure—go to theater commands or specially designed composite wings.

General Johnson, commander in chief of MAC and USTRANSCOM.

explained that Air Mobility Command is the lead command for all of these systems, meaning AMC is responsible for doctrine, formal training schools, and logistics support.

AMC gains command of all Air Reserve Component tankers and transports except the Reserve Associate unit at Seymour Johnson AFB, N. C. It also gains command of all Guard and Reserve airlift, air rescue, operational support airlift, and aeromedical evacuation forces, except those in Alaska and Hawaii.

Numerous changes combine command and control of worldwide airlift assets and reorganize the missions for air refueling, aeromedical evacuation, rescue, the Air Combat Camera Service, and the Defense Courier Service.

General McPeak said that the creation of AMC is a significant advance because it "gives us a single Air Force manager who deals not just with airlift but with the broader problem of mobility and deployability." He noted that the new commander of AMC, because he will have control of long-range tank ers, will be responsible for handling worldwide tanker scheduling and will strive to maximize the efficiency of the tanker fleet. The ability to conduct airlift and tanking operations, said Secretary Rice, assumes greater importance at a time when the US is cutting back on overseas bases and forward deployment of fighting forces.



A distinction between Air Mobility Command and Military Airlift Command is that AMC also controls the long-range tankers that provide the fuel for the transports. AMC will deal not only with airlift but also with the broader problem of deployability over long distances—the global reach part of USAF's mission. Above, a KC-135 refueler's station.

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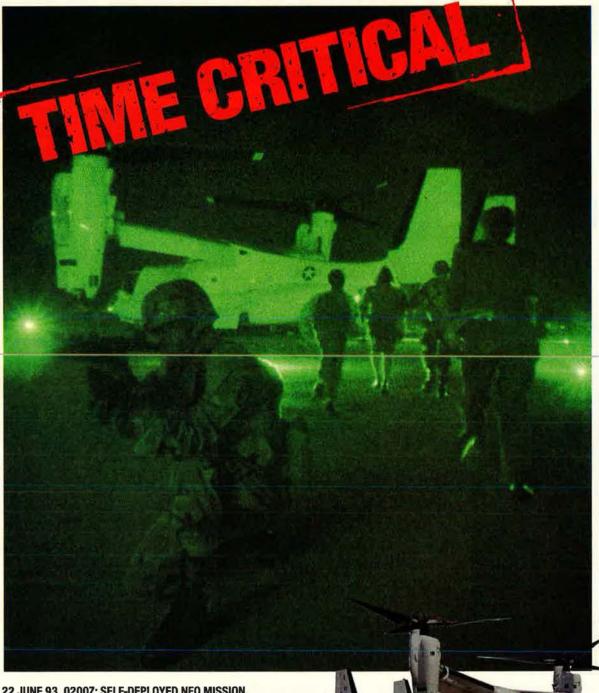
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broad range of capabilities to meet all essential special operations requirements and support American interests around the world.

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Air Force Logistics Command (AFLC), with headquarters at Wright-Patterson AFB, Ohio, comprises 86,000 military and civilian members who buy, supply, transport, and maintain everything necessary to keep weapon systems combat-ready. AFLC manages \$50 billion annually and has capital assets worth \$158 billion.

AFLC relies on its people, processes, and products to provide the best possible customer support. The command has a commitment to its customers, which have included Strategic Air Command, Tactical Air Command, Military Airlift Command, and some eighty-one foreign nations.

The pursuit of high quality remains a driving force. More than three years ago, AFLC made a commitment to the precepts of Total Quality Management. This has made it a TQM leader. The customer support that AFLC provides derives directly from TQM. AFLC's TQM accomplishments led in part to the decision by Secretary of the Air Force Donald B. Rice to integrate AFLC and Air Force Systems Command into a single new entity, Air Force Materiel Command, effective July 1, 1992. [See p. 55.]

AFLC won the 1991 President's Award for Quality, given by the Federal Quality Institute to government agencies that exhibit significant upgrades in quality. The award is the federal equivalent of the Malcolm Baldridge Award, which recognizes



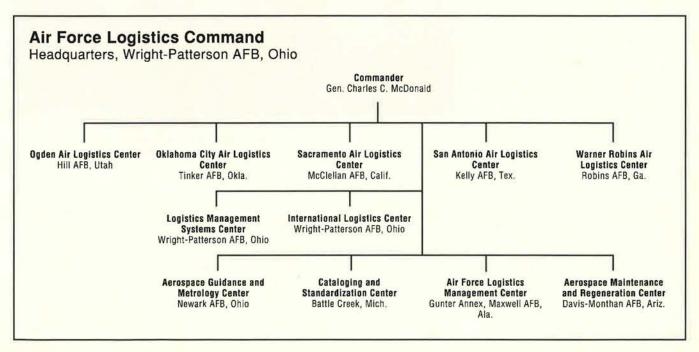
At Warner Robins Air Logistics Center, Robins AFB, Ga., workers repair an F-15. Known as "Eagle Country," Warner Robins is one of five Logistics Command ALCs. Each specializes in depot-level maintenance for specific USAF systems.

initiatives to improve quality in private business.

Air Force aircraft flew 65,000 sorties during the Persian Gulf War while maintaining an overall mission capable rate of ninety-two percent, proving that the command's efforts in reliability and maintainability have paid off. AFLC's support also included acceleration of depot maintenance on seventy aircraft, getting them out of the

depots and back into service ahead of schedule and adding nearly 1,000 flying days. AFLC people surged repair of 90,000 items, moved 85,000 tons of cargo through their terminals, and shipped 600,000 tons of ammunition. Combat Logistics Support Squadrons repaired thirty battle-damaged aircraft.

"Nowhere was quality more evident than during our support of Operations Desert Shield and Desert Storm,"



said Gen. Charles C. McDonald, commander of AFLC. "We proved we could reach out anywhere in the world and help deploy forces quickly, and then sustain them after deployment."

In the months before its deactivation as a major command, AFLC has been working to develop the cornerstone of Air Force Materiel Command—a process known as Integrated Weapon System Management. In this cradleto-grave management concept, the entire life cycle of a weapon system will be the responsibility of a single manager. Customers will benefit by having a single face to deal with on issues concerning a particular system.

AFLC has undergone an organizational restructuring, maximizing resources while providing better logistics support to its customers. Department of Defense streamlining initiatives, budget reductions, projected force-structure changes, and related reductions in manpower caused AFLC to seek better structuring for its five large industrial hubs, the air logistics centers: Warner Robins ALC, Robins AFB, Ga.; Oklahoma City ALC, Tinker AFB, Okla.; San Antonio ALC, Kelly AFB, Tex.; Ogden ALC, Hill AFB, Utah; and Sacramento ALC, McClellan AFB, Calif.

The centers now operate through "product" and "service" directorates instead of along functional lines. AFLC's customers benefit by dealing directly with a specific product directorate.

Customers are also benefiting from the command's efforts to exploit the latest computer technology. The command is in the midst of a ten-year, \$1.7 billion modernization of its computer information systems. The modernization, scheduled for completion in 1994, allows AFLC greatly to improve its day-to-day business methods.

AFLC's computer successes helped pave the way for Wright-Patterson to be named the site of a new Joint Logistics Systems Center. The center oversees the development of logistics computer systems for all services and the Defense Logistics Agency.

Environmental quality and protection are high priorities in AFLC. Protecting the environment is viewed as an integral part of its mission. This commitment is paying off. AFLC is DoD's recognized leader in hazardous waste reduction. Oklahoma City ALC's efforts in pollution prevention earned it the 1990 Secretary of Defense Environmental Quality Award. By winning the award, the center set a standard in environmental quality for all of the Department of Defense.

Air Force Systems Command

Deactivates July 1, 1992

Research, development, test, evaluation, and acquisition have formed the heart of Air Force Systems Command's mission for forty-two years. During this time, AFSC, headquartered at Andrews AFB, Md., has made advanced technology and the Air Force an unbeatable combination.

The name of Systems Command has always been synonymous with high-quality systems, personnel, and training. The command achieved its reputation through commitment to three primary goals: satisfying customers' needs, ensuring acquisition excellence, and enhancing the technological superiority of the Air Force.

In recent years, AFSC has streamlined its entire operation. Its efforts took on new meaning over the past year as the command prepared to merge its assets with those of Air Force Logistics Command to form a new acquisition organization, Air Force Materiel Command, scheduled for activation on July 1, 1992. On that date, AFSC and AFLC will deactivate. [See p. 55.]

AFSC has been dedicated to research and development since its inception. It has channeled technology into development of the finest weapon systems in the world. That early move to harness higher technology for Air Force application continues to pay dividends.

For example, breakthrough aircraft such as the upcoming F-22 Advanced Tactical Fighter are possible in part



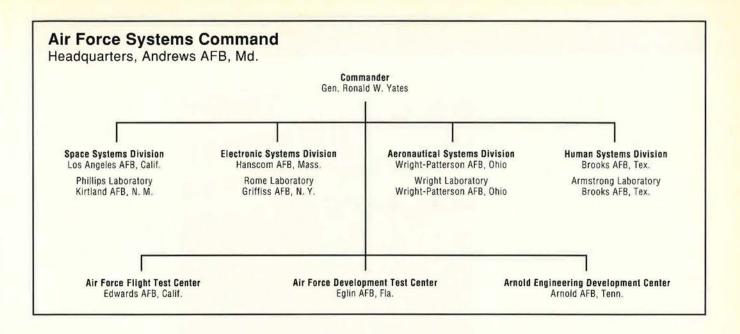
Specialists at Air Force Systems Command's Electronic Systems Division, Hanscom AFB, Mass., fine-tune a Milstar satellite terminal. AFSC will merge with AFLC July 1 to form Air Force Materiel Command, with headquarters at Wright-Patterson AFB, Ohio.

because AFSC scientists of the 1940s believed plastics could be made strong enough for use in aircraft structures, eventually leading to the development of strong boron fibers and later composites.

Fly-by-wire technology is another of today's aviation baselines pioneered by AFSC research. Tested on a B-52 and an F-4 before being considered for the F-16, fly-by-wire is now the standard for military and civilian jet aircraft.

Perhaps AFSC's greatest boost to technology is its least known. In 1958, while AFSC was conducting research on the microchip, US scientists in the private sector succeeded in its creation. AFSC recognized the importance of their work and provided support funding when no one else would.

After cutting personnel throughout the command and streamlining major product divisions from six to four,



AFSC transferred program management authority, contract management activities, and space-launch operations to other organizations.

The command also streamlined its science and technology laboratory structure from fourteen fairly independent centers of expertise to four integrated "superlabs": Wright Laboratory at Wright-Patterson AFB, Ohio; Phillips Laboratory at Kirtland AFB, N. M.; Rome Laboratory at Griffiss AFB, N. Y.; and Armstrong Laboratory at Brooks AFB, Tex. Aviation science and technology have reached the point where essential research and development must be completed in an integrated, interdisciplinary manner. The creation of the new superlabs is critical to the continuation of this vision under the AFMC banner.

Each of the superlabs channels its efforts into specific areas of research, complementing the mission of the four major product divisions: Aeronautical Systems Division for air vehicle technologies; Space Systems Division for space and missile alternatives; Flectronic Systems Division for command, control, communications, and intelligence; and Human Systems Division for man-machine interface.

AFSC's world-class testing facilities evaluate everything from human systems to space systems, employing methods from climatic testing to computational fluid dynamics.

While AFSC supplied expert support to the Program Executive Officer structure, it launched the Acquisition Professional Development Program to groom acquisition professionals of the future.

AFSC has fostered aeronautical developments and worked to main-

tain the Air Force's technology edge. From conception of a promising idea through research, development, testing, production, and delivery, the complex process of transferring technology to the battlefield continues to evolve.

As this process yields such innovations as new high-strength, lightweight materials, highly efficient propulsion systems, and high-speed computational capabilities, yesterday's ideas become reality. The C-17, the Air Force's next-generation transport aircraft, is now in production. Air-breathing single-stage-to-orbit flight will be demonstrated by the National Aerospace Plane in the not-too-distant future.

Vision and leadership have been the integral yet immeasurable elements of AFSC's laboratory-to-field success. Advanced technologies that gave the Air Force the winning edge in Operation Desert Storm began on the drawing board more than twenty years ago.

AFSC is proud to have helped fund the work of more than thirty Nobel prize winners. Such partnerships and pooling of resources will be a key to future technology development, enabling the Air Force to benefit from some of the finest minds in the world. Built upon change and committed to high quality, AFSC is ready to take the next logical step in its evolution.



Under spotlights at a Saudi base, this E-8 Joint STARS airplane was a surveillance superstar in the Gulf War. AFSC's Electronic Systems Division had its two prototype E-8s in shape for war even before completing their development.

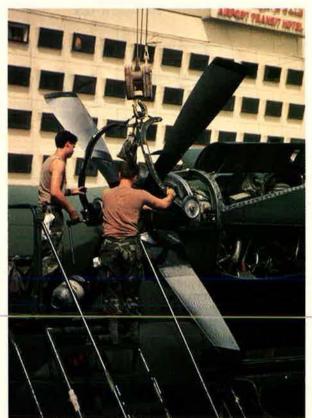
Military Airlift Command, headquartered at Scott AFB, Ill., is the principal provider of air transportation for US military forces. It is the Air Force component of US Transportation Command and a major command of the US Air Force.

MAC comprises nearly 80,000 people—both active-duty military and civilian—and some 1,000 aircraft at 287 locations in twenty-five countries. When Air Force Reserve and Air National Guard components are mobilized, MAC gains an additional 71,000 people and another 400 aircraft.

The value of MAC's assets exceeds \$33 billion. Its annual operating budgets come in at \$5.2 billion, a figure that puts the command on a par with the top ten Fortune 500 companies in the US.

MAC operates thirteen bases in the United States and controls US facilities at Lajes Field in Portugal's Azores. On April 1, 1992, MAC turned over Rhein-Main AB, Germany, to USAFE. In addition to Scott AFB, MAC's US bases are Altus AFB, Okla.; Andrews AFB, Md.; Charleston AFB, S. C.; Dover AFB, Del.; Hurlburt Field, Fla.; Kirtland AFB, N. M.; Little Rock AFB, Ark.; McChord AFB, Wash.; McGuire AFB, N. J.; Norton AFB, Calif.; Pope AFB, N. C.; and Travis AFB, Calif.

On June 1, 1992, control of MAC's assets and responsibilities will pass to the newly created Air Mobility Command. AMC also will have its head-quarters at Scott AFB and will take command of other Air Force assets as well. [See p. 57.]

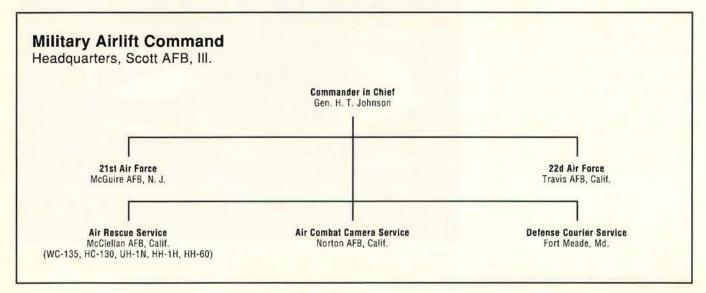


A crew from the 374th Aircraft Regeneration Squadron, Yokota AB, Japan, replaces engines on a C-130 at Kuwait International Airport after the Persian Gulf War. MAC won the 1990 Secretary of the Air Force Safety Award while outdoing itself in the air.

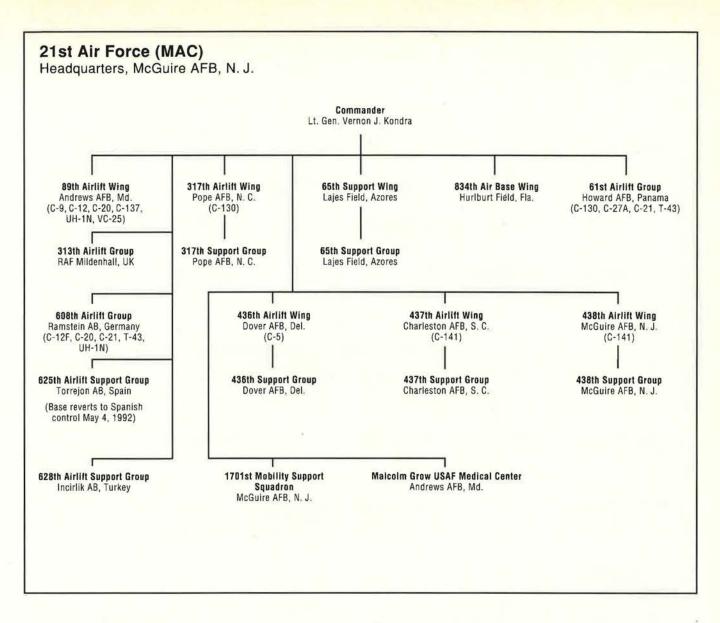
Army photo by Sgl. Steven R. Mover

CINCMAC supports the Secretary of the Air Force and the Chief of Staff. He lends administrative and logistic support to assigned airlift forces, the Air Combat Camera Service, rescue-and-recovery forces, operational support airlift units, aeromedical airlift forces, and special aircrew training.

CINCMAC doubles as the Air Force component commander of US Transportation Command, managing directives from the Secretary of Defense and the Joint Chiefs of Staff. As CINCTRANS, he controls airlift forces assigned by the Secretary of Defense to support Department of Defense agencies.







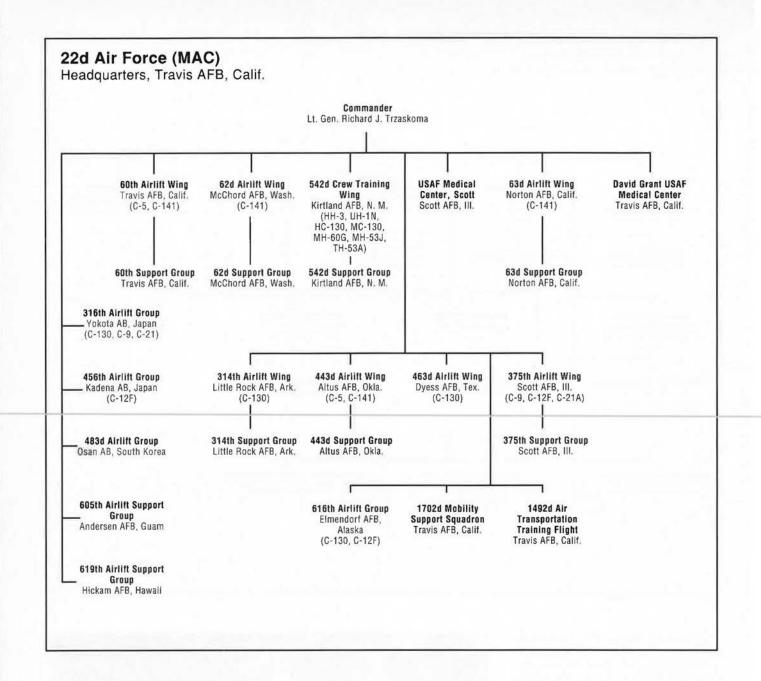
Operations Desert Shield and Desert Storm generated the largest airlift in US history, matching the sixty-five-week-long Berlin Airlift ton-mile record every six weeks. By the end of 1991, MAC had flown 26,764 missions, moved more than 1,016,752 passengers, and delivered more than 796,221 tons of cargo. Even in 1992, MAC continues to rotate troops and supplies to Saudi Arabia.

During the early stages of the buildup, CINCMAC activated Stage I of the Civil Reserve Air Fleet for the first time in its thirty-eight-year history. To meet even greater requirements, the Secretary of Defense activated CRAF's Stage II on January 16, 1991, doubling capabilities with 140 additional aircraft.

MAC started an overnight delivery service, dubbed Desert Express, for critical items. Such supplies went by C-141 from Charleston AFB, S. C., to Saudi Arabia in seventeen hours, and



C-5 crew members confer during an Operation Provide Hope flight ferrying food to Moscow. Humanitarian missions have long been hallmarks of Military Airlift Command, which will give way on June 1 to the newly created Air Mobility Command.



there was never a late delivery. C-5s and C-141s frequently rushed Patriot missiles directly from their assembly line to the Mideast.

During the covert US flanking operation that preceded the start of ground operations, MAC C-130s were landing at unimproved forward airstrips every ten minutes, twenty-four hours per day.

By March 10, 1991, redeployment began, and repatriated American prisoners of war flew out of the combat theater on special MAC missions. Bringing home troops and equipment and resupplying remaining units in Saudi Arabia was complicated by simultaneous relief operations—Operation Provide Comfort to aid Kurdish refugees in Turkey and northern Iraq, Operation Fiery Vigil to rescue Philippine and US citizens in the Philippines after Mount Pinatubo erupted, and Operation Sea Angel to rush relief to Bangladeshis hard hit by cy-

clones and floods.

Last year, MAC won the 1990 Secretary of the Air Force Safety Award. The command completed 704,000 flying hours with only one Class A mishap. C-130s flew all year without a single Class A or Class B mishap. MAC's helicopters completed eighteen months of mishap-free flying. MAC's 11,100 motor vehicles completed fifty-six million miles without a fatality.

Last year brought the C-17's first flight (in September), with continuously successful flight testing. C-130s were chosen to be the Air Force's first aircraft to receive a new microwave landing system, beginning in Fiscal Year 1993. The C-27A Spartan became part of MAC's inventory in October 1991, fulfilling short-distance and small-load airlift requirements. Late in 1991, a C-5 became the first airplane to receive the new flat gray paint scheme. All of MAC's C-5s, C-130s, and C-141s are scheduled to be repainted.

In February, the Air Weather Service was redesignated a Field Operating Agency. It was removed from MAC under the Directorate of Weather as a part of Plans and Operations at Hq. USAF in Washington, D. C.

At year's end, nearly all of MAC's objective wings were in place, eliminating the trideputate system, simplifying unit structure and command-andcontrol systems.



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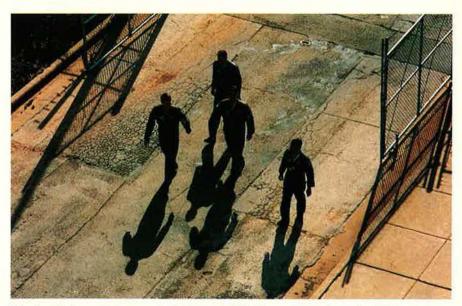
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Strategic Air Command long has been the Air Force's largest command. For more than forty years, SAC's nuclear and conventional capabilities have deterred aggression. SAC has supported conventional operations in Korea, Vietnam, Panama, and the Mideast, especially the 1991 Persian Gulf War.

US nuclear strength consists of intercontinental ballistic missiles, long-range bombers, and submarine-launched ballistic missiles. In addition to maintaining two legs of this triad, SAC supports worldwide conventional power projection with bombers and tankers. SAC's fighting capability is strengthened by reconnaissance, refueling, and command-and-control systems.

SAC, headquartered at Offutt AFB, Neb., comprises more than 114,000 officers, enlisted personnel, and civilians, as well as 17,280 SAC-gained Reservists and Guardsmen. More than 250 SAC B-1B and B-52 bombers are ready to fly, fight, and win. Peace-keeper and Minuteman ICBMs provide rapid retaliatory capability. SAC has decentralized operations, streamlined its structure, consolidated where possible, and clarified functional responsibilities.

The command, older than the Air Force itself, faces deactivation June 1, 1992. Control of most SAC assets and responsibilities passes to Air Combat Command, headquartered at Langley AFB, Va. Most of SAC's aerial refuelers come under the control of Air Mobility Command, which, like ACC, activates June 1, 1992. [See p.



The last B-1 crew to go on alert at Dyess AFB, Tex., passes through the Alert Facility entrance. In September 1991, the bomber fleet stood down from alert. Air Combat Command will take over most of SAC's assets.

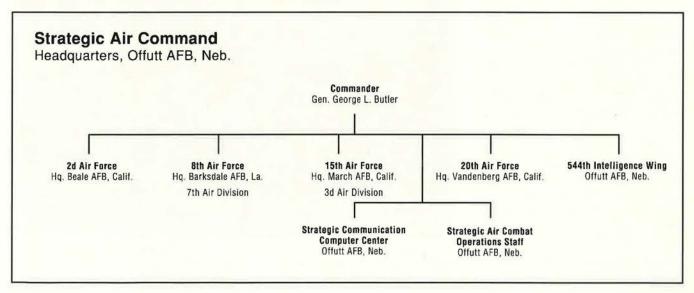
57.] Other key SAC assets go to a new unified command, US Strategic Command at Offutt AFB, which activates June 1, 1992. STRATCOM will assume operational control of the entire strategic nuclear triad.

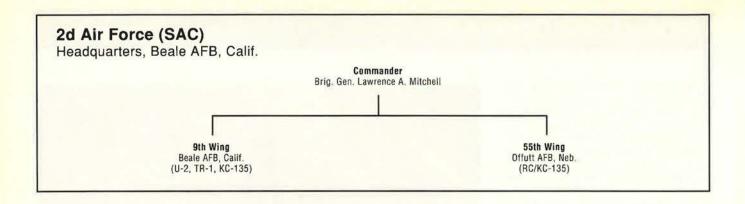
SAC's numbered air forces are organized according to war contributions. Eighth Air Force, at Barksdale AFB, La., owns and controls bombers. Fifteenth Air Force at March AFB, Calif., has operational control of tankers. Newly formed 2d Air Force, at Beale AFB, Calif., handles reconnaissance and airborne command-and-

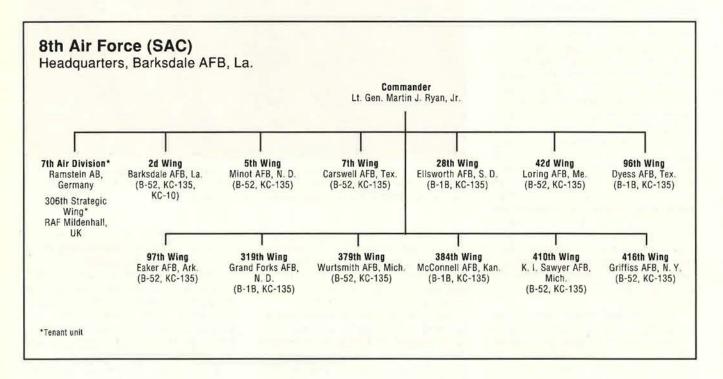
control systems. Another new unit, 20th Air Force, at Vandenberg AFB, Calif., oversees the ICBMs.

SAC also tailored wing/base organizations by installation mission to fit the goals of the Chief of Staff's objective wing. These reorganization actions lend themselves well to the structuring of Air Combat Command and Air Mobility Command.

The bomber force made many advances in the past decade. The B-1B fleet became fully operational. The B-1B is the best operational bomber in the world. It flies low, fast, and far





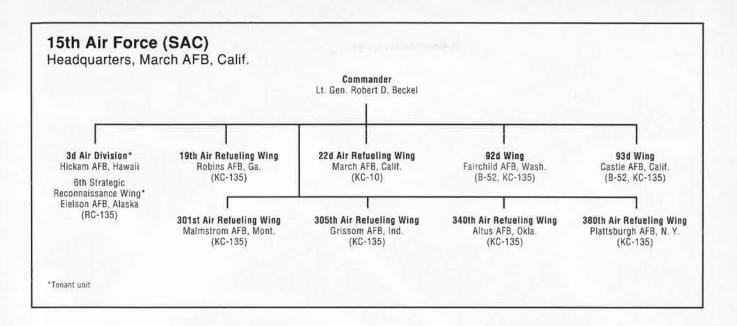


and puts its weapons precisely on target. These capabilities ensure that the bomber can perform both its mission of deterrence and its conventional role with equal effectiveness.

Modifications to the thirty-year-old B-52 maintain its vitality. The B-52 is the command's cruise missile carrier. The Advanced Cruise Missile offers greater range and makes use of low-observable, or stealth, technology, allowing B-52s to strike heavily defended targets while standing off well outside enemy territory. The plane's range, payload, and response capabilities make it an important conventional warfare asset. All B-52 crews train to deliver both nuclear and nonnuclear weapons. The B-52's heavy payload capability includes a variety of overflight weapons and standoff missiles. In Desert Storm, B-52s flew more than 1,600 sorties, dropping 26,000 tons of bombs. The B-52's long range makes



A SAC KC-135 and a carrier-based Navy F-14 move into position for aerial refueling. SAC's tanker fleet proved indispensable to the Gulf War success of allied coalition aircraft. Much of the fleet will go to Air Mobility Command on June 1.



it well suited to such naval operations as surveillance of open seas and surface attack.

The B-2 Stealth bomber will enhance SAC's ability to protect the US and its allies. Well into the next century, the B-2 will be able to deliver a wide variety of weapons, both nuclear and conventional, employing advanced tactics. The B-2 continues to expand its operational performance with every test flight.

Peacekeeper and Minuteman ICBMs constitute SAC's hardened, quick-response retaliatory force. The Peacekeeper ICBM has been fully operational for more than four years. It has consistently exceeded design standards for accuracy during flight tests. The missile can hold at risk hardened facilities and warfighting assets an enemy values most.

SAC's 500 Minuteman III missiles,

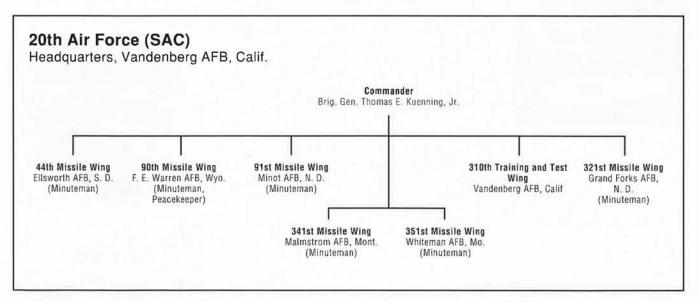
each with three warheads, have been the backbone of the ICBM leg of the triad for more than twenty years. They have proven highly accurate and reliable. Although undergoing deactivation, SAC's Minuteman II ICBMs can be generated to full alert status. This single-warhead system provides flexibility over a wide range of potential targets.

SAC's fleet of more than 600 tankers is vital to extending the range of US and allied fighter, bomber, and airlift aircraft. KC-135s and KC-10s, including those of the Air Force Reserve and Air National Guard, proved their worth in the Gulf War. In the first four months, they flew some 34,000 sorties, logged nearly 141,000 flying hours, performed more than 85,000 refuelings, and delivered more than 194 million gallons of fuel. After the war, Gen. Merrill A. McPeak, USAF's

Chief of Staff, said that "the tanker contribution to Desert Storm is what made it work. Period."

Reconnaissance aircraft provide specialized support for theater commanders. The U-2, TR-1, and RC-135 use the latest technology to gather and relay intelligence data. Reliable, secure command-and-control systems such as the EC-135 and E-4B aircraft are survivable means of communication with forces.

SAC's new underground command center is the latest in command-and-control technology. Fully computerized and hardened against the effects of electromagnetic pulse, the center uses the Defense Satellite Communications System, Milstar satellites, the Air Force Satellite Communications System, and the Ground Wave Emergency Network to ensure worldwide communications.





JSOW: low risk and ready to meet the challenge



AIWS fit check on F-15E

The Texas Instruments team has combined resources and experience to offer U.S. Armed Forces a low risk, low cost Joint Standoff Weapon system - JSOW - program. This design meets the requirements for standoff, lethality, and aircraft survivability. And it exceeds the required performance specifications. The modular baseline design allows low risk growth to P3I, and maximizes supportability.

AN EXPERIENCED, COMMITTED TEAM TI is a recognized leader in designing and producing high volume, low cost tactical weapons. These systems were proven under fire, since a majority of the smart weapons employed during "Desert Storm" were developed and produced by TI.

BEST VALUE JSOW adds a new dimension to Air Force, Navy and Marine Corps strike warfare capability by providing:

- Standoff outside point defenses
- All weather, day/night delivery capability
- Non-line-of-sight weapon delivery
- Target-hit accuracy beyond requirements
- Simplified mission planning

LOW RISK, DEM/VAL TO PRODUCTION The TI team has

been selected for the JSOW Engineering and Manufacturing Development. Extensive risk reduction efforts were conducted on all facets of the design. This includes free-flight, submunition dispensing, mission planning and wind tunnel.

Texas Instruments – leading the team for JSOW development and production.



JSOW Dynamic Submunition Dispense Test



Tactical Air Command, with headquarters at Langley AFB, Va., organizes, trains, equips, and maintains combat-ready forces for rapid deployment and employment and ensures that strategic air defensive forces are ready to meet the challenges of peacetime air sovereignty and wartime air defense.

Against a backdrop of base closures, force-structure changes, severe budget reductions, roorganization, and the Gulf War, the extraordinary performance of TAC personnel and equipment throughout 1991 established "TAC Quality" as a high standard. For the duration of Operations Desert Shield and Desert Storm, as TAC supplied US Central Command with fighter aircraft and support forces, its strategic air defense forces were vigilant over US airspace and participated in antidrug operations.

TAC consists of more than 3,000 aircraft and some 189,862 people (13,153 officers, 81,004 enlisted personnel, and 11,535 civilians), including personnel and assets from the Guard and Reserve. When mobilized, more than 84,170 members of the Air National Guard and Air Force Reserve, along with their 1,400 aircraft, are assigned to TAC.

On June 1, 1992, control of TAC's assets and responsibilities pass to the newly created Air Combat Command, which takes up residence in TAC's old headquarters at Langley. [See p. 53.] ACC gains some tankers from Strategic Air Command and some tactical lifters from Military Airlift Command.

TAC's forces are organized under



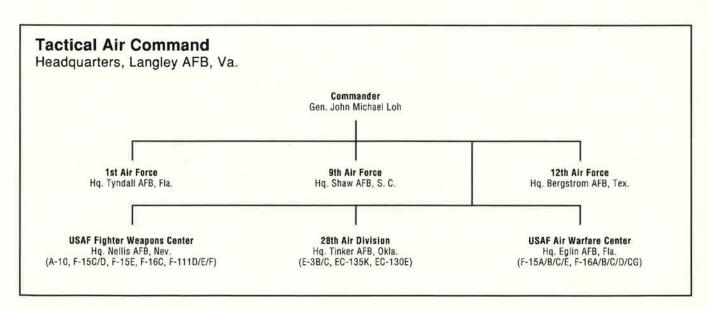
An F-15E from Seymour Johnson AFB, N. C., gets the once-over at a Saudi air base during the Gulf War. Tactical Air Command fighters and support forces played a major role in the allied victory. TAC will dissolve into Air Combat Command June 1.

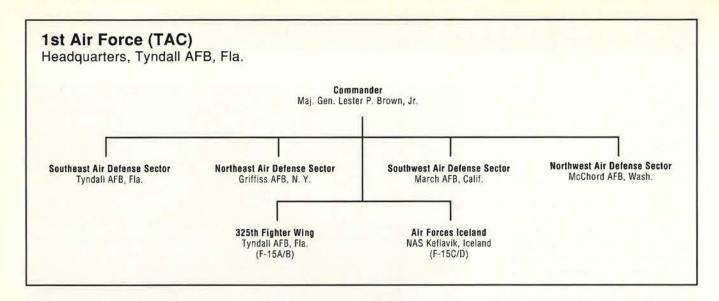
three numbered air forces and three major direct reporting units. TAC's commander, Gen. John Michael Loh, is also Commander in Chief, US Air Forces Atlantic. General Loh becomes the first commander of ACC.

Headquartered at Tyndall AFB, Fla., 1st Air Force performs a daily operational mission as the Continental US (CONUS) North American Aerospace Defense Command (NORAD) Region. The 1st Air Force commander, as the region commander, reports directly to CINCNORAD for air defense of the

CONUS. Four air defense sectors responsible for the air defense of their respective quadrants of the CONUS, using aircraft on around-the-clock alert, come within 1st Air Force's purview.

It also plays a key role in the nation's war on drugs. In close coordination with the US Coast Guard and the US Customs Service, air defense units monitor and intercept illegal air traffic attempting to penetrate US airspace. The 325th Fighter Wing, Tyndall AFB, Fla., which provides aircrew training





and specialized training for strategic air defense radar systems and personnel, is commanded by 1st Air Force. Air Forces Iceland at NAS Keflavik, under the operational control of the Commander in Chief, US Atlantic Command, provides a combat force for the air defense of Iceland and air surveillance data in support of NORAD.

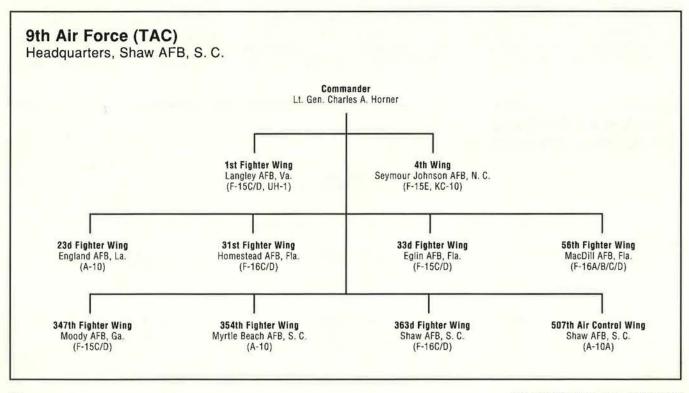
At Shaw AFB, S. C., 9th Air Force has ten wings performing tactical fighter operations, training, and tactical air control. It comprises 41,099 people and 750 aircraft. As part of its dual-role responsibilities, 9th Air Force becomes US Central Air Forces (USCENTAF), the air component of US Central Command. Operations

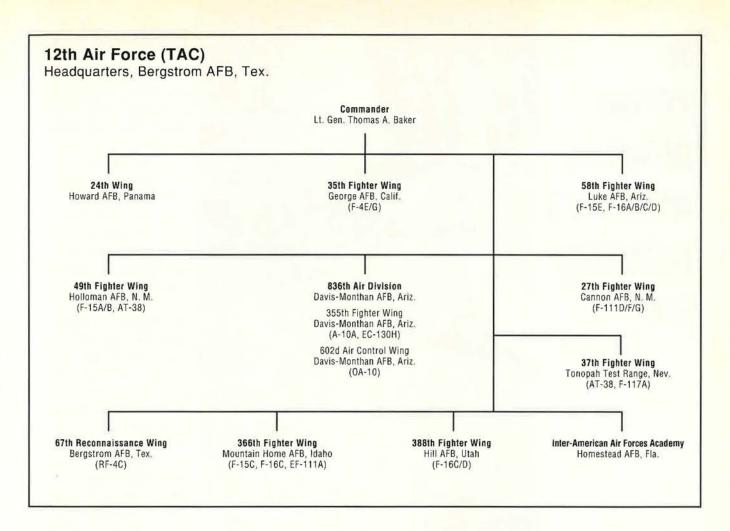
Desert Shield and Desert Storm brought USCENTAF staff to the southwest Asian theater, where they, together with joint and multinational air staffs, masterminded the Gulf War air campaign.

At Bergstrom AFB, Tex., 12th Air Force operates combat-ready forces and equipment for air superiority, interdiction, reconnaissance, and close air support. The command operates nine wings and one air division that perform tactical fighter operations and training, reconnaissance, tactical air control, and a wide range of electronic combat tasks. In addition, 12th Air Force is the Air Force component of US Southern Command. The 24th

Wing at Howard AFB, Panama, has responsibility for air defense and tactical air operations in the Panama area, provides logistics support for Air Force units under its jurisdiction, and provides air support for other service elements.

In 1991, the Air Force announced that the YF-22, built by the team of Lockheed, Boeing, General Dynamics, and Pratt & Whitney, won the Advanced Tactical Fighter competition. The F-22, drawing on advanced technologies, entered engineering and manufacturing development in August 1991. It will be the Air Force's premier air-superiority fighter in 2002. In September 1991, the Advanced Medium-





Range Air-to-Air Missile (AMRAAM) became operational at the 33d Fighter Wing, Eglin AFB, Fla.

In the Gulf War, the F-117A Stealth fighter flew more than 1,250 sorties without receiving a scratch. The F-15 and F-16 Low-Altitude Navigation and Targeting Infrared for Night (LANTIRN) systems proved their effectiveness. The E-8A Joint STARS airplane was used for the first time in a combat role and was successful in tracking and detecting ground movements in forward and rear echelon areas.

TAC hosted its biennial worldwide fighter air-to-ground gunnery competition, Gunsmoke '91, in October at Nellis AFB, Nev. Fourteen US teams (active-duty, Air National Guard, and Air Force Reserve) from CONUS, PACAF, and USAFE bases attended.

The USAF Air Demonstration Squadron, the Thunderbirds, flew sixty-four shows throughout the US for more than nine million spectators. They also performed for eleven audiences in eight European countries, including Poland, Hungary, and Switzerland, before more than one million people.

A Tactical Air Command F-16 on a Gulf War mission takes on fuel from a tanker. TAC forces are organized under three numbered air forces and three major reporting units, all of which are undergoing changes in the reorganization of the Air Force.



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At our Microwave Technology Center, for example, ground-breaking developments in gallium arsenide circuitry are revolutionizing military electronics. Smaller, more reliable, and less expensive, GaAs chips are forming the core of the military's electronic future. Our MIMIC-based modules are integral parts of Sanders countermeasure systems, expendable decoys, active antenna arrays, groundbased radars, and automated test systems.

Similar breakthroughs can be seen in our work with the most modern cockpit display systems. These will see widespread use in new aircraft as well as in the growing area of aircraft retrofits.

At Sanders, we're meeting customer needs with affordable technology. We're also finding ways to make quality, reliable systems even better.



Lockheed Sanders

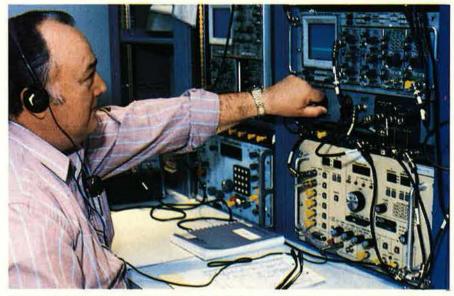
Air Force Intelligence Command

Air Force Intelligence Command (AFIC) is headquartered at Kelly AFB, Tex. Activated October 1, 1991, AFIC was formed by integrating the people and missions of Electronic Security Command, Kelly AFB, Tex.; the Foreign Technology Division, Wright-Patterson AFB, Ohio (now the Foreign Aerospace Science and Technology Center); the Air Force Special Activities Center, Fort Belvoir, Va., now the 696th Intelligence Group; and elements of the Air Force Intelligence Support Agency.

At activation, AFIC was composed of some 17,000 people at locations around the world. The integration of these people and their expertise into one command allows combat commanders to come to one organization for their intelligence needs.

AFIC provides direct intelligence support to national decision-makers and field air component commanders. This support includes services, products, and resources in interrelated areas of intelligence, security, electronic combat, foreign technology, and treaty monitoring; objective evaluations of weapon systems; and foreign threat-related data. AFIC also gives combat commanders data that help them decide when to exploit, jam, deceive, or destroy hostile military communication to deny enemy commanders effective command and control of their forces.

By providing training in command,



Electronic technician Frank Patterson of Air Force Intelligence Command performs a TEMPEST security test in the anechoic chamber of the Air Force Cryptologic Support Center, San Antonio, Tex. Newly formed as part of the Air Force reorganization, AFIC integrates all USAF intelligence missions, operations, and personnel.

control, and communications countermeasures (C³CM) to operations support exercises, AFIC helps prepare the Air Force for combat operations in a hostile electromagnetic environment. This training paid off during Operation Desert Storm when numerous electronic warfare operations supported coalition forces.

AFIC also develops, maintains, updates, and disseminates the Air

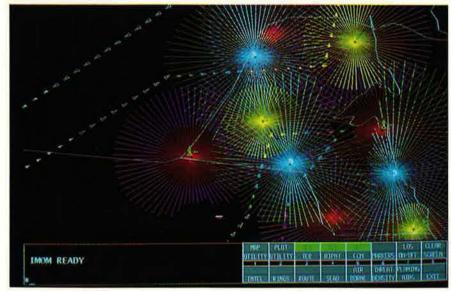
Force's electronic combat operational support database—an all-source intelligence database to help commanders satisfy their electronic combat operational requirements. Command specialists advise combat commanders of electronic options. The specialists may suggest nonlethal or lethal choices of action or a combination. The defensive element of C³CM minimizes the Air Force's vulnerability to exploitation or manipulation.

The command also provides database support and services to the multiservice Joint Electronic Warfare Center, which is collocated with AFIC.

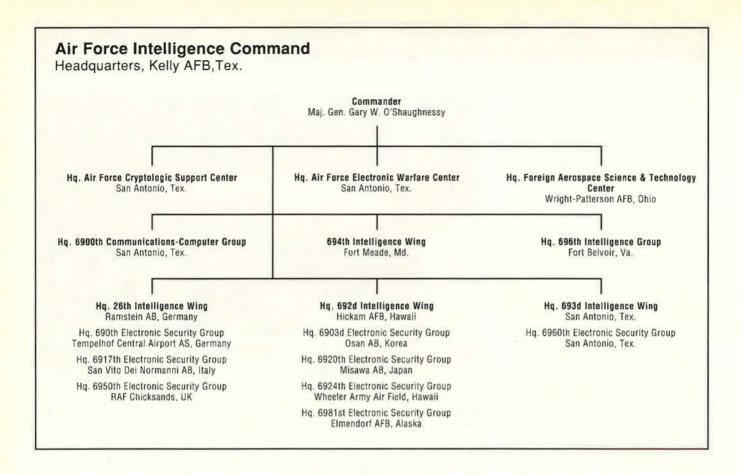
The intelligence mission includes providing Human Intelligence and Scientific and Technical Intelligence support.

The 696th Intelligence Group, Fort Belvoir, Va., conducts AFIC's Human Intelligence mission. This mission involves interviews of people and complements data collected by technical means. In peacetime, the 696th collects foreign intelligence in support of Air Force, theater, and national requirements. In war or contingencies, the group also interrogates enemy prisoners of war, debriefs refugees and detainees, and exploits captured documents.

The focal point for AFIC's Scientific and Technical Intelligence mission is the Foreign Aerospace Science and Technology Center at Wright-Patterson AFB. The center develops



AFIC's Improved Many on Many (IMOM) electronic combat analysis depicts enemy fire-control "shooter" radars in red and enemy aircraft-spotting "looker" radars in other colors. IMOM enables pilots to plot safe, radar-avoiding courses to their targets and gives combat crews the option of degrading or destroying enemy radars.



scientific and technical intelligence by analyzing all available data on foreign weapon systems to determine their performance, capabilities, characteristics, and vulnerabilities.

The Cryptologic Support Center is the Air Force's focal point for cryptologic matters. The center provides advice and technical assistance to AFIC, other major commands, and combat commanders. It also works with the National Security Agency and other national agencies on cryptologic matters. The Cryptologic Operations

Directorate comprises four functional divisions: fixed operations, space and advanced programs, airborne and mobile operations, and support.

The deputy commander for securities is the Air Force executive agent for communications security (COMSEC), computer security (COMPUSEC), operations security (OPSEC), and TEMPEST (control of electronic emanations). The Cryptologic Support Center helps safeguard the security of space communications worldwide. It is the only military agency

capable of performing depot-level repair and spaceflight recertification of space COMSEC equipment.

The Air Force Electronic Warfare Center provides electronic combat evaluation, analysis, and planning support during combat, contingency, exercise, and test activities. The center also provides electronic combatrelated technical studies and develops and maintains electronic combatrelated databases and database services to support Air Force and other agencies.

Air Force Space Command

Air Force Space Command personnel reached a high point in the history of the command when its systems played a key role in what some have called "the first space war." Operation Desert Storm "was a watershed event in military space applications," said Lt. Gen. Thomas S. Moorman, Jr., then AFSPACECOM's commander, "because for the first time, space systems were both integral to the conduct of terrestrial conflict and . . . crucial to the

outcome of the war." AFSPACECOM's constellations of navigation, communications, weather, and early warning satellites provided instantaneous information to troops in the field.

Global Positioning System satellites provided continuous navigation updates to more than 4,500 receivers in aircraft, ships, and tanks and on the ground. The precise navigation capability allowed US ground forces to operate effectively in a featureless terrain and was invaluable in establishing position, speed, and altitude for accurate bombing.

As demand for communications grew, Air Force Space Command moved a Defense Satellite Communications System satellite from its geosynchronous station over the Pacific to one over the Indian Ocean to augment communications capability. This was the first time a DoD satellite was repositioned to support

US combat operations; satellites provided seventy-five percent of intraand intertheater communications in the Gulf War.

AFSPACECOM launched a Defense Meteorological Satellite Program (DMSP) satellite during Desert Shield. The three DMSP satellites on orbit, the ground readout terminals, and the data distribution network used during Desert Storm provided critical weather information essential to strike planning and execution. Another of the command's spaceborne systems, the Defense Support Program, detected the launch of Iraqi Scud missiles, giving timely warning to civilian populations and coalition forces.

Approximately 16,000 Air Force military and civilian personnel and 14,500 contractor employees make up Air Force Space Command. They are assigned to more than 100 units



Air Force Space Command specialists in the Space Surveillance Center at Cheyenne Mountain AFB, Colo., keep track of some 7,000 man-made objects in orbit. AFSPACE-COM is the Air Force's fastest-growing major command.

Air Force Space Command

Headquarters, Peterson AFB, Colo.

Commander Gen. Donald J. Kutyna

21st Space Wing Peterson AFB, Colo.

Missile warning units at:

Beale AFB, Calif.
Cape Cod AFS, Mass,
Cavalier AFS, N. D.
Eldorado AFS, Tex.
Robins AFB, Ga.
Thule AB, Greenland
Woomera AS, Australia
Clear AFS, Alaska

Communications units at:

Buckley ANGB, Colo. Holloman AFB, N. M. Kapaun Adm. Annex, Germany

Software and computer support units at:

Lowry AFB, Colo. Peterson AFB, Colo.

Host base support:

Thule AB, Greenland Sondrestrom AB, Greenland Peterson AFB, Colo. Cheyenne Mountain AFB, Colo. 50th Space Wing Falcon AFB, Colo.

Satellite operations units at:

Cape Canaveral AFS, Fla. *Fairchild AFB, Wash. Falcon AFB, Colo. Offutt AFB, Neb. Onizuka AFB, Calif.

Satellite remote tracking stations at:

Andersen AFB, Guam Diego Garcia, Indian Ocean Falcon AFB, Colo. Kaena Point, Hawaii Mahe, Seychelles New Boston AFS, N. H. RAF Oakhanger, UK Thule AB, Greenland Vandenberg AFB, Calif.

Host base support:

Falcon AFB, Colo. Onizuka AFB, Calif. 45th Space Wing Patrick AFB, Fla.

Launch units at:

Cape Canaveral AFS, Fla.

Tracking Stations at:

Cape Canaveral AFS, Fla.
Patrick AFB, Fla.
Jonathan Dickinson Annex, Fla.
Antiqua AS, Antiqua

Ascension Auxiliary Air Field, St. Helena

> Host base support: Patrick AFB, Fla.

30th Space Wing Vandenberg AFB, Calif.

Launch units at:

Vandenberg AFB, Calif.

Tracking stations at:

Pillar Point, Calif. Kaena Point, Hawaii

Host base support:

Vandenberg AFB, Calif.

73d Space Group Falcon AFB, Colo.

Command and control units

Cheyenne Mountain AFB, Colo.

Surveillance units at:

*Griffiss AFB, N. Y. Misawa AB, Japan Lackland AFB, Tex. San Vito Dei Normanni AB,

Italy
Edzell Army Air Field,
Scotland
Osan AB, Korea
RAF Feltwell, UK
Shemya AFB, Alaska
Peterson AFB, Colo.
Pirinclik AS, Turkey
*Eglin AFB, Fla.
Stallion, N. M.
Choe-Jong San, Korea
Maui, Hawaii
Diego Garcia, Indian Ocean

Saipan, Marianas Islands

*Located near

around the world, operating the systems that allow the command to use heat-detecting space platforms and earthbound radars to warn of attacks from ballistic missiles; to keep track of nearly 7,000 man-made objects in space; to keep dozens of satellites functioning flawlessly in support of units on land, at sea, or in the air; and to launch DoD satellites.

During the past year, Air Force Space Command reorganized to streamline operations and move more day-to-day responsibility to its wings. As a result, by this summer, four space wings and one space group will have replaced the command's three wings and two launch centers.

In October 1991, the 9th Space Division, formed a year earlier at Patrick AFB, Fla., to oversee spacelaunch operations at Vandenberg AFB, Calif., and Cape Canaveral AFS, Fla., was inactivated as part of an Air Force program to reduce intermediate headquarters.

A month later, the Eastern Space and Missile Center at Patrick was redesignated the 45th Space Wing and the Western Space and Missile Center at Vandenberg became the 30th Space Wing. The wings operate the facilities used to launch DoD satellites into orbit.

The 2d Space Wing at Falcon AFB, Colo., was inactivated in January 1992, and the 50th Space Wing was activated in its place to command and control military satellites and manage the Air Force Satellite Control Network, the system that controls USAF satellites and determines how well they are working.

The 73d Space Surveillance Group, located at Falcon AFB, will be redesignated the 73d Space Group. It will assume responsibility for the command's space surveillance missions, which formerly belonged to the 1st Space Wing.

In another restructuring action, the 1st Space Wing and 3d Space Support Wing at Peterson AFB, Colo., will merge this summer, be redesignated the 21st Space Wing, and take over responsibility for missile warning. The 1st Space Wing now operates the sensors that would provide warning of missile attack. The 3d Space Support Wing mission of providing support for Peterson AFB, Cheyenne Mountain AFB, and Falcon AFB will be performed by the new wing.

Air Force Special Operations Command

The motto of Air Force Special Operations Command is "Air Commandos—Quiet Professionals." AF-SOC was established May 22, 1990, and is the air component of US Special Operations Command, a unified command. All Air Force special operations forces are under the command of Hq. AFSOC at Hurlburt Field, Fla.

AFSOC organizes, trains, equips, and educates Air Force special operations forces. Maj. Gen. Bruce L. Fister, commander of AFSOC, is responsible for the command's world-wide support to the unified commands. This support includes unconventional warfare, direct actions, special reconnaissance, counterterrorism, and foreign internal defense.

AFSOC wings have epitomized the composite wing concept for decades. The 1st Special Operations Wing at Hurlburt Field is the oldest and most seasoned. Its units include the 8th Special Operations Squadron, which flies the MC-130E Combat Talon; the 16th SOS, which flies the AC-130H Spectre gunship; and the 20th SOS, which flies the MH-53J Pave Low helicopter. The 1st SOW has two flying squadrons at nearby Eglin AFB, Fla.: The 9th SOS flies the HC-130N/P Combat Shadow, and the 55th SOS flies the MH-60G Pave Hawk helicopter.

The 39th SOW, the designated air component for Special Operations Command Europe, is consolidating units at RAF Alconbury, UK. The wing

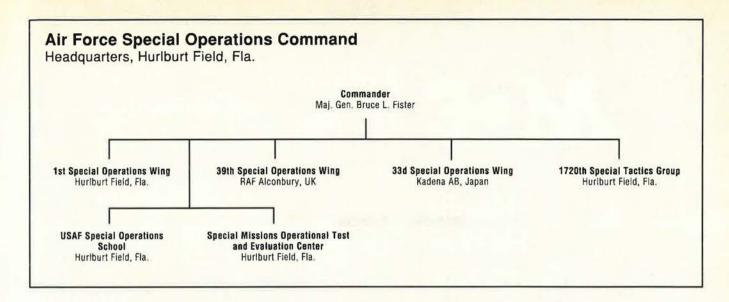


This photo was snapped from an Air Force Special Operations Command MH-53J rescue helicopter just after Sgt. Ben Pennington (right) leaped from it deep in Iraq to pick up Navy Lt. Devon Jones (left), who had been shot down the night before. AFSOC is the air component of US Special Operations Command, a unified command.

headquarters moved there early this year. Two squadrons, the 21st SOS, which flies the MH-53J Pave Low, and the 67th SOS, equipped with the HC-130N/P Combat Shadow aircraft, are in the process of moving from RAF Woodbridge. The 7th SOS, equipped with MC-130E Combat Talons, will be moving from Rhein-Main AB, Germany, to RAF Alconbury late this year.

Due to the eruption of Mount

Pinatubo and the closure of Clark AB, the Philippines, Air Force special operations forces in the Pacific are in transition. A provisional special operations wing has temporarily formed at Kadena AB, Japan, as the air component of Special Operations Command Pacific. Its aircraft include the MC-130E Combat Talon, the MH-53J Pave Low, and the HC-130N/P Combat Shadow.



Also assigned to AFSOC are the USAF Special Operations School, the 1720th Special Tactics Group, and the Special Missions Operational Test and Evaluation Center.

The USAF Special Operations School educates personnel from the four services and the Coast Guard, governmental agencies, and allied nations. Subjects covered in the thirteen courses presented at the school range from regional affairs and crosscultural communications to antiterrorism awareness, revolutionary warfare, and psychological operations.

The 1720th Special Tactics Group, headquartered at Hurlburt Field, has units strategically located in the US, Europe, and the Pacific. The group is composed of special operations combat control and pararescue forces. Their missions include air traffic control, establishing air assault landing zones, providing control for close air



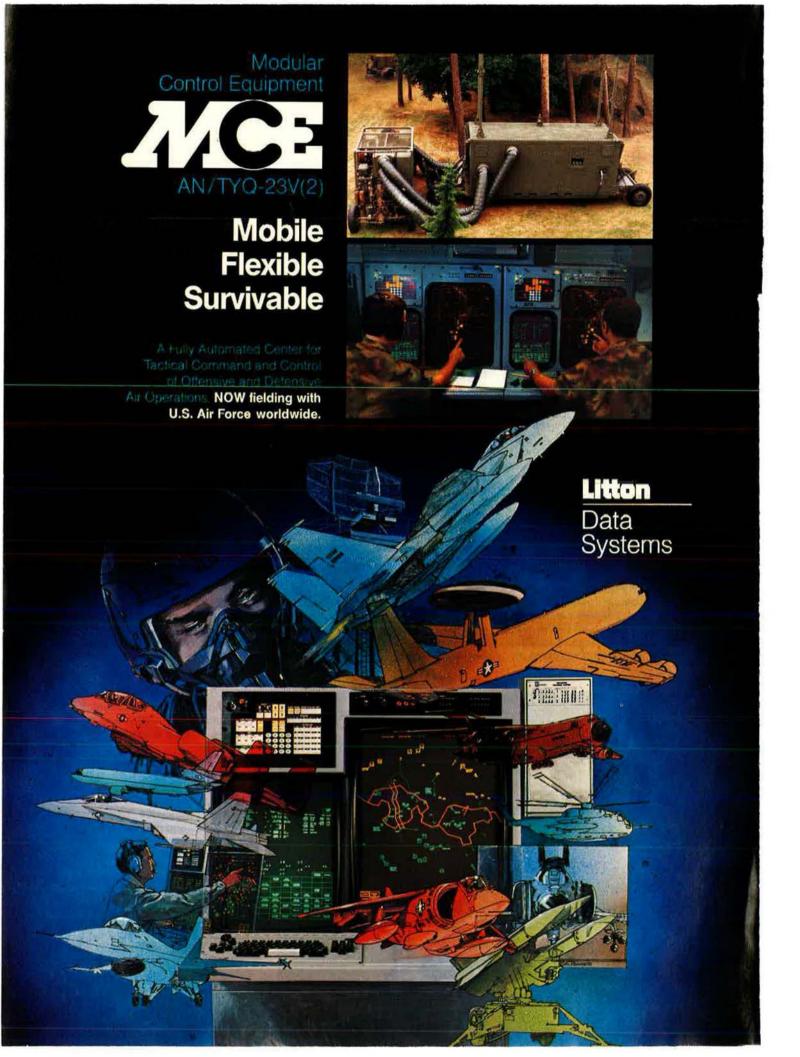
Above, a 9th Special Operations Squadron HC-130 refuels a 55th Special Operations Squadron MH-60 helicopter. Below, a crew loads a howitzer aboard an AC-130 Spectre special operations gunship. AFSOC organizes, trains, and equips all Air Force special operations forces. Its motto is "Air Commandos—Quiet Professionals."



support for strike aircraft and Spectre gunship missions, establishing casualty collection stations, and providing trauma care for wounded and injured personnel.

The Special Missions Operational Test and Evaluation Center provides expertise to improve the capabilities of special operations and combat rescue forces worldwide. Testing includes operational and maintenance suitability factors. Many of these tests are joint command and joint service projects.

Two component forces were gained by AFSOC: the 919th Special Operations Group (AFRES) at Duke Field, Fla., flying the AC-130 Spectre, and its subordinate unit, the 71st SOS at Davis-Monthan AFB, Ariz.; and the 193d SOG (ANG) at Harrisburg, Pa., flying the EC-130E.



Air Training Command

Air Training Command recruits, accesses, commissions, and trains the men and women of the US Air Force. ATC accomplishes its missions through solective recruiting, initial military training, comprehensive technical training, and flying training.

The Air Force Recruiting Service continued to recruit high-quality people in 1991. More than ninety-nine percent of the 30,000 active-duty enlistees held high school diplomas. Recruiting Service brought in 120 physicians and 435 nurses in Fiscal Year 1991.

ATC provided initial military training for more than 34,800 men and women. The "Gateway to the Air Force," Lackland AFB, Tex., graduated more than 32,900 active-duty, Guard, and Reserve enlistees from basic military training in FY 1991. ATC commissioned more than 2,500 officers through Air Force Reserve Officers Training Corps detachments located on 147 university campuses and the Officer Training School at Lackland. ATC also provided military indoctrination training to more than 1,450 newly commissioned medical service officers, chaplains, and lawyers.

Each year, ATC trains approximately 230,000 people in more than 2,500 courses covering some 310 technical specialties. ATC's six training centers and the ninety worldwide field training detachments and operating locations of the 3785th Field Training Group constitute one of the largest technical

training systems.



Munitions maintenance students fine-tune a guidance mechanism during munitions training at Lowry AFB, Colo. Last year Air Training Command instructed some 230,000 students in more than 2,500 courses covering some 310 technical specialties. ATC also provided initial military training for more than 34,800 men and women.

The command works with other military services through the Interservice Training Review Organization to increase training efficiency through joint training opportunities. A few of the current side-by-side training areas are intelligence, law enforcement, and fire fighting.

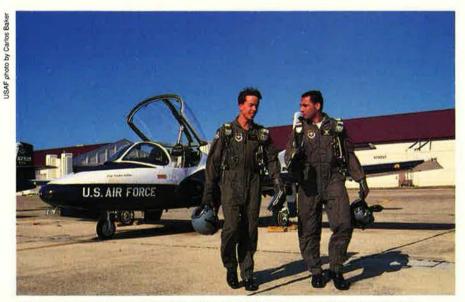
ATC's flying training programs graduated more than 1,900 fixed-wing and rotary-wing pilots and 660 navigators from undergraduate flying training in

1991. The Euro-NATO Joint Jet Pilot Training Program at Sheppard AFB, Tex., trained approximately 150 foreign military pilots last year. ATC's Aviation Leadership Program also offers T-37 training to Latin American pilots and other international student pilots.

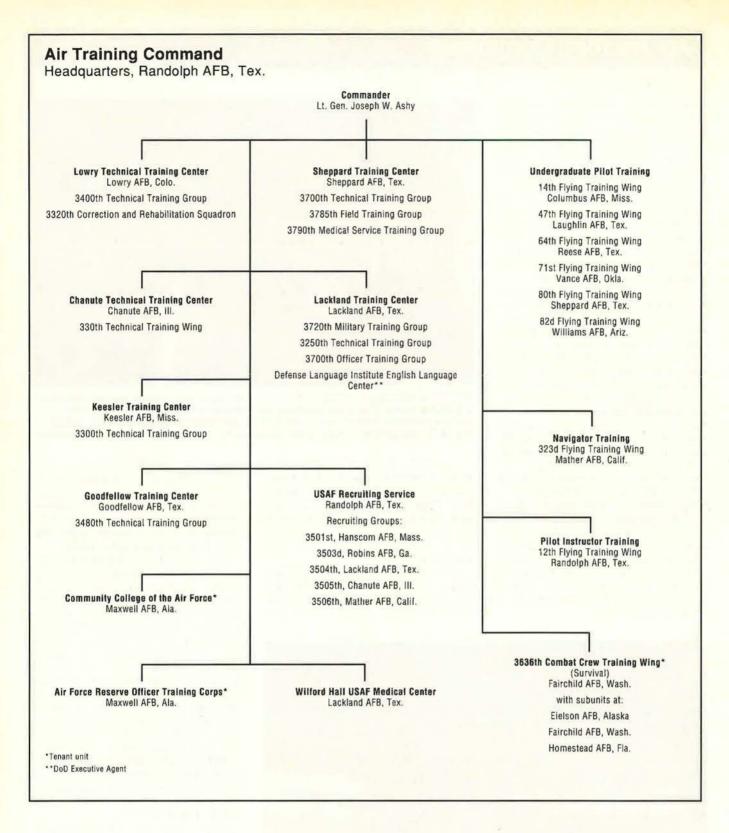
This year, ATC implemented Specialized Undergraduate Pilot Training (SUPT), which tailors pilot training to the operational aircraft that students will fly after graduation. SUPT includes a common core of fundamental flying training in the T-37, followed by specialized training in either of two tracks: Tanker/Transport, which is performed in the T-1A Jayhawk, and Bomber/Fighter, in the T-38. The new T-1A Jayhawk trains students in areas unique to flight deck—configured aircraft. Reese AFB, Tex., received the first T-1A Jayhawk early this year.

ATC is also responsible for a number of other missions, including medical services, security assistance training, and the Community College of the Air Force (CCAF).

More than 12,700 physicians, nurses, dentists, technicians, and other health professionals completed medical courses at the 3970th Medical Services Training Wing or at technical training centers last year. ATC has the two largest medical centers in the Air Force, providing thirty-two percent of the Air Force's graduate dental education, seventy-six percent of its enlisted medical training, and



A flight instructor and student head for debriefing after a T-37 training flight at Randolph AFB, Tex. ATC's aircrew training programs turned out more than 1,900 fixed-wing and rotary-wing pilots and 660 navigators in Fiscal 1991.



forty-five percent of its graduate medical education.

As the executive agent for the Air Force's security assistance training, ATC manages the language, technical, and flying training of some 5,000 international students from more than 100 countries. Last year, more than 1,700 international students, both military and civilian, graduated from the

Defense Language Institute's English Language Center at Lackland AFB.

The Community College of the Air Force integrates on-duty technical education with off-duty education at civilian institutions, leading to a two-year associate's degree in applied science.

During Operations Desert Shield and Desert Storm, ATC deployed more

than 3,000 people, including intelligence, maintenance, medical, civil engineering, security police, public affairs, transportation, and services personnel, who supported theater combat forces. Although not a combat command, ATC has considerable tasking for keeping ready numerous combat support units for deployment when and if the situation dictates.

Air University

Air University (AU), with headquarters at Maxwell AFB, Ala., is responsible for providing professional military education (PME) and degreegranting professional continuing education (PCE) for officers, NCOs, and DoD civilians.

Approximately 3,000 military and 2,313 civilian personnel are permanently assigned to AU. Close to 25,000 military and civilian students completed resident AU classes last year, and thousands more completed courses through

nonresident programs.

The Air War College (AWC), located at Maxwell AFB, is the Air Force's premier PME school. Its mission is to improve the Air Force's contribution to national security through joint education and senior leader development focused on military strategy and the

employment of airpower.

Air Command and Staff College (ACSC) at Maxwell provides intermediate professional military education. Its mission is to produce officers who understand the profession of arms, the requisites of command, the nature of war, and the application of aerospace power at the theater level of war. The school has incorporated jointservice specialties into its curriculum and emphasizes employment of aerospace forces in joint operations.

At Squadron Officer School (SOS), captains build the foundations for their careers in leadership, officership, communicative skills, and force employment. SOS emphasizes individual leadership and teamwork. Officers develop skills, techniques, and attitudes to serve better as leaders and midlevel supervisors.

The Senior Noncommissioned Officer Academy, located at Maxwell's Gunter Annex, is the capstone of enlisted PME. Its curriculum focuses on leadership and management, communication skills, and military studies. The academy conducts six sevenweek courses each year with 330 students in each class, for an annual enrollment of 1.980. The number of students will increase to 3,000 in 1993.

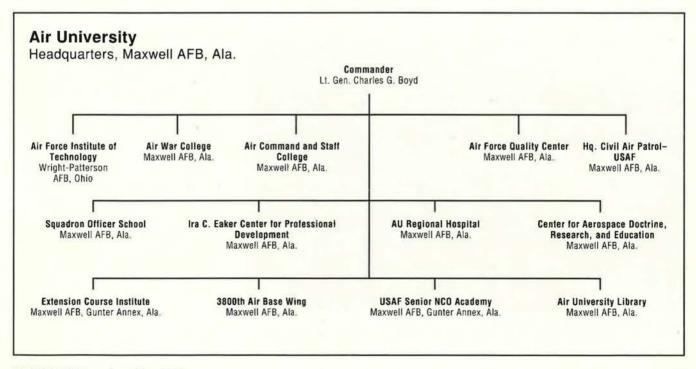
The Ira C. Eaker Center for Professional Development at Maxwell provides professional continuing education through eight schools with sixtytwo courses of study. Last year, approximately 5,000 students graduated from such courses as academic instructor, international officer, comptroller, judge advocate, chaplain, technology management, manpower and personnel management, and commander professional development. The center also provides resource material for Air Force chapel programs worldwide through the USAF Chaplain Service Resource Board.

The Center for Aerospace Doctrine. Research, and Education (CADRE)

at Maxwell conducts several courses. including the Joint Flag Officer Warfighting Course, the Combined Air Warfare Course, and the Contingency Wartime Planning Course, designed to provide students with unique, operational, combat-oriented experience to enhance their understanding of wartime operations in a joint context. The Air Force Wargaming Center supports Air Force PME, Joint PME, and operational wargaming while serving as the focal point for USAF wargaming efforts. The Airpower Research Institute publishes Airpower Journal, performs research on the employment of airpower, and develops USAF doctrine. The AU Press supports the research, writing, and PME missions of the service. CADRE also directs the newly established School of Advanced Airpower Studies.

The Air Force Quality Center, activated in August 1991, provides Air Force commanders and their organizations with advice, concepts, methods, and educational resources and a common frame of reference for attaining consistently high quality.

The Air Force Institute of Technology (AFIT) at Wright-Patterson AFB, Ohio, supports Air Force and DoD graduate-level education requirements by providing accredited resident degree and PCE programs in its School of Engineering and Services and its



School of Systems and Logistics. AFIT saves the government approximately \$29 million a year through student and faculty research projects.

The Extension Course Institute at Gunter is the center for the Air Force's distance education programs. It serves more than 200,000 students enrolled in career development, specialized, and PME courses.

The Air University Library at Maxwell AFB—the most comprehensive library devoted to military science and research in the Western world—has upgraded and extended automated access to its 2.4 million books, documents, newspapers, periodicals, and microforms. Its holdings include 500,000 military documents, 400,000 monographs

and bound periodical volumes, 870,000 maps and charts, 150,000 current regulations and manuals, and 700,000 microforms. The Integrated Library System, which provides access to all books and most documents, is available to dial-in customers. Also active under the AU umbrella is Headquarters Civil Air Patrol–USAF (CAP-USAF).

Pacific Air Forces

With headquarters at Hickam AFB, Hawaii, Pacific Air Forces (PACAF) is the principal air arm of US Pacific Command. PACAF's primary mission is to plan, conduct, and coordinate offensive and defensive air operations in an area extending from the west coast of the Americas to the east coast of Africa and from the Arctic to the Antarctic.

To maintain security in the vast Pacific region, PACAF has approximately 300 aircraft, including airsuperiority F-15C/Ds, F-15Es, multirole F-16s, OA-10s, KC-135s, and E-3 Airborne Warning and Control System (AWACS) aircraft. As part of the Air Force's "objective wing" restructuring, former SAC KC-135 tankers, MAC C-130 airlifters, and TAC AWACS aircraft have been incorporated into PACAF units.

The commander in chief of PACAF commands more than 48,000 Air Force military and civilian people in the Pa-



These F-16Cs of the 432d Fighter Wing, Misawa AB, Japan, represented Pacific Air Forces in 1991 at the biennial Gunsmoke fighter competition. Headquartered at Hickam AFB, Hawaii, PACAF has approximately 300 aircraft for offensive and defensive air operations to maintain security throughout the vast Pacific region.

A 3d Wing maintenance crew preflights an F-15C at Elmendorf AFB, Alaska. PACAF's 48,000 military and civilian personnel are distributed among twelve major installations and many smaller ones in Hawaii, Alaska, Japan, Guam, and Korea.

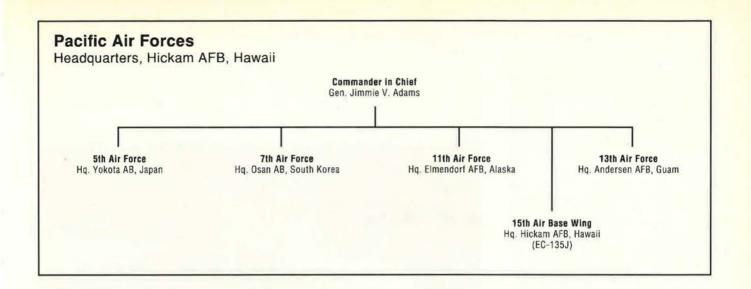
cific. Along with more than 37,000 family members, this force is distributed among twelve major and many smaller installations, primarily in Hawaii, Alaska, Japan, Guam, and the Republic of Korea.

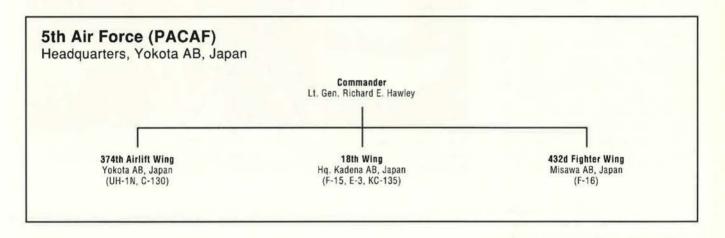
Organizational improvements and the introduction of newer weapon systems get the most out of PACAF's widely dispersed forces. The most significant combat additions to PACAF are the F-15E dual-role fighters based in Alaska. The new C and D model F-16s, with improved engines and avionics, operate out of Kunsan and Osan ABs in South Korea, Eielson AFD in Alaska, and Misawa AB in Japan. The Combat-Oriented Supply Organization has expanded operations to support jet engine and aerospace ground equipment maintenance, improving PACAF's ability to generate combat sorties.

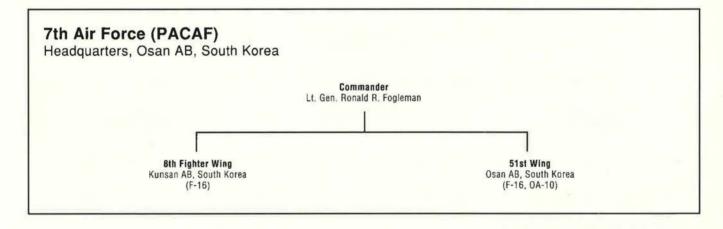
Even with the most sophisticated

USAF photo by MSgt. Wayne Spect

USAF photo by SMSgt. Bob Wickley







weapons, highly trained and motivated people, and improved logistics systems, PACAF's planners realize that their success ultimately depends on joint and combined operations. Teamwork with sister services forms the core of the PACAF exercise program, with more than ninety percent of all exercises conducted jointly with Navy, Marine, and Army units. More than seventy percent of all PACAF exercises involve regional allies.

More than sixty times last year, PACAF's dynamic and realistic exercise program tested combat capability in the same locations and environment in which hostilities are likely to occur. Although scaled back in scope due to Operations Desert Shield and Desert Storm, these exercises demonstrated PACAF's theaterwide warfighting capability and resolve to support allies and defend US interests. This dedication was

embodied in last year's Team Spirit exercise in Korea, when more than 6,000 sorties were flown by US Air Force, US Navy, US Marine Corps, and Republic of Korea forces to provide a visible demonstration of the US commitment to defend the region. While carrying out their extensive exercise mission, PACAF's pilots honed their warfighting skills flying more than 84,000 sorties for more than 116,000 hours.

To streamline operations but maintain readiness, five bases in the Republic of Korea converted from active or standby status to collocated operating base status. This conversion allowed PACAF to preserve existing facilities and to maintain prepositioned war reserve materiel, resulting in an ability to reinforce and sustain combat operations more rapidly in support of a contingency or exercise.

With the evacuation of Clark AB, the Philippines, PACAF's premier flying training exercise, Cope Thunder, was moved to Alaska. In June 1991, US Air Force, US Marine Corps, and Canadian aircraft flew more than 1,200 missions in exercise Cope Thunder North—the first Alaska-based exercise of this type. The Yukon range complex near Eielson AFB will be the site of four Cope Thunder exercises scheduled in 1992.

The eruption of Mount Pinatubo and subsequent destruction of Clark AB tested PACAF's medical, transportation, logistics, and other support units. During Operation Fiery Vigil, more than 20,000 military and civilian personnel were evacuated from Clark and the nearby Subic Bay naval facility by PACAF and US Navy experts from all disciplines. Some 3,000 re-

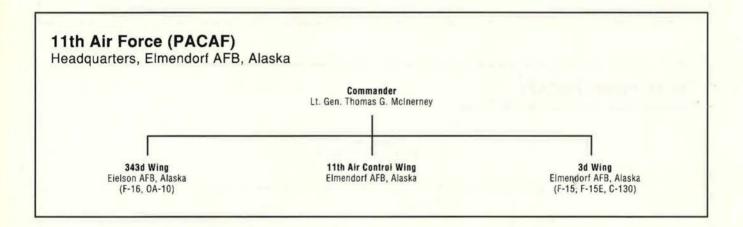
quired medical assistance, varying from outpatient visits to aeromedical evacuation.

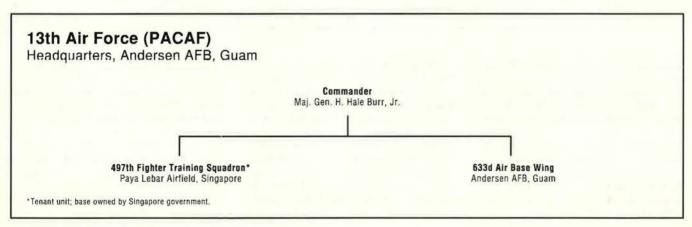
Of special importance are programs that continue to modernize working and living conditions at overseas bases. One program will expand host nation burden-sharing responsibilities

to help pay for new housing and other quality-of-life facilities. This concern for its people's welfare paid PACAF big dividends in higher enlisted retention rates. About seventy percent of eligible PACAF first-termers reenlisted in FY 1991, a rate well above the Air Force average.



SrA. Kevin Metcalfe, a canine handler with the 15th Security Police Squadron at Hickam AFB, issues orders to Barry, a Belgian Malinois patrol dog trained to sniff out narcotics. PACAF's enlisted retention rates are extraordinarily high.





US Air Forces in Europe

During 1992, United States Air Forces in Europe (USAFE) celebrates its fiftieth anniversary. USAFE's history dates back to the formation of Fighth Air Force in 1942.

In the past two years, USAFE has enjoyed success in the cold war, Gulf War, and Kurdish relief effort. With the demise of the Warsaw Pact and Soviet Union, the drawdown of US forces from Europe has accelerated. While the command will become smaller in future years, it will continue to represent a key element of the Air Force's strategy of "Global Reach, Global Power" and a significant part of the US's forward deployed commitment to NATO.

USAFE deployed fifty-five percent of its aircraft to southwest Asia and Turkey in support of Operations Desert Shield and Desert Storm. More than 10,000 people—one of every six in USAFE—deployed and contributed significantly to the war effort. USAFE pilots accounted for half of USAF's air-to-air victories.

At Incirlik AB in Turkey, USAFE formed the 7440th Composite Wing (Provisional), which conducted a "back door" northern air campaign to deny Saddam Hussein a sanctuary out of reach of the southern air and ground assault. With more than 100 fighter and combat aircraft operating from the same location, mission planning and command and control were greatly enhanced. Operational concepts and targeting were discussed in mass mis-

Crew chief A1C Bronda McKisson of the 36th Fighter Wing, Bitburg AB, Germany, surveys the scene at Incirlik AB, Turkey, from his F-15C. US Air Forces in Europe deployed fifty-five percent of its aircraft to Turkey and southwest Asia in support of Operations Desert Shield and Desert Storm.



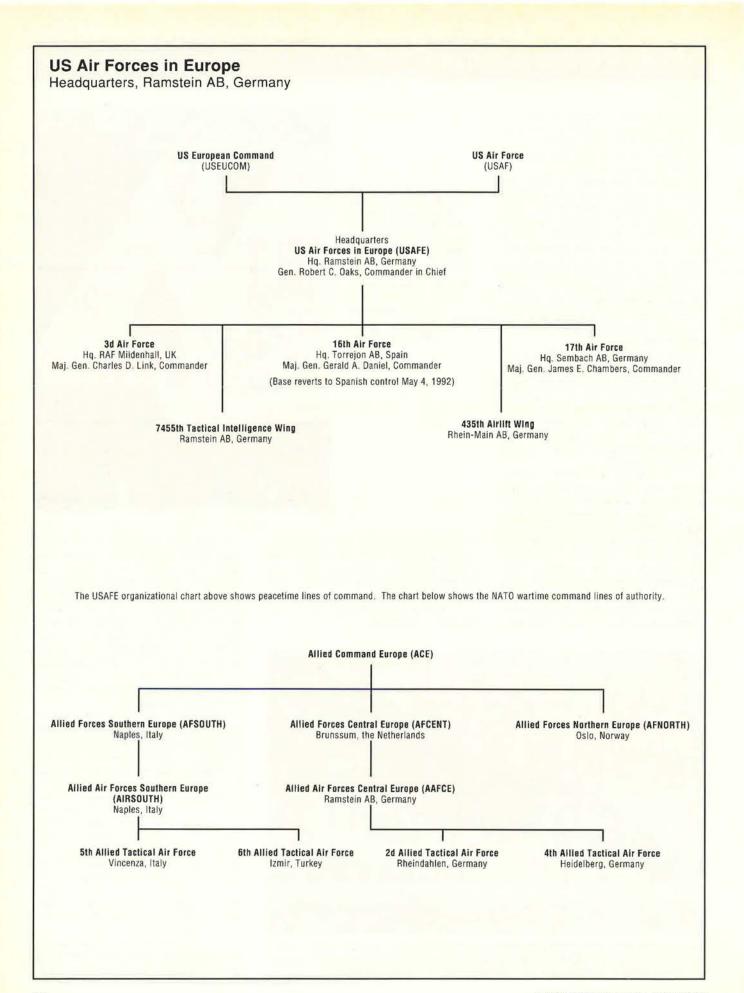
sion debriefings and immediately incorporated into the next attack. The 4,600 combat sorties flown from Incirlik as part of Operation Proven Force validated the composite wing concept now being implemented within Air Combat Command. Those who remained at USAFE's main operating facilities proved the value of a logistics infrastructure at overseas forward operating bases. More than 75,000 aircraft and 600,000 passengers passed through USAFE bases during the buildup and war. More than 500 engines were overhauled and 6,000 avionics units repaired at eleven USAFE bases as the command performed intermediatelevel maintenance required to support the air campaign.

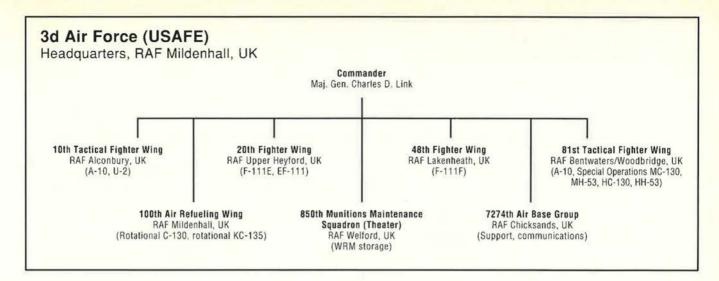
Within five weeks of the end of hostilities, USAFE deployed aircraft and people back to Turkey to support Operation Provide Comfort. USAFE A-10s and F-16s, while patrolling northern Iraq for ground and air threats to the Provide Comfort operation, also served as aerial scouts to pinpoint refugee concentrations and airdrop locations. Incirlik AB supported a combined task force representing thirteen nations to deliver life-saving humanitarian aid, build a life-sustaining logistics support system, and provide the necessary security to allow refugees to return home and work toward a long-term solution.

In the midst of these operations, the drawdown continued. Reverting to host nation control were several



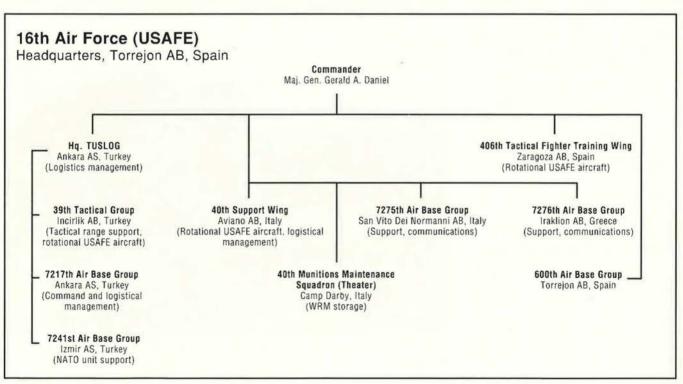
A 52d Fighter Wing F-4G Wild Weasel from Spangdahlem AB, Germany, bears down on its Gulf War target. USAFE celebrates its fiftieth anniversary this year in the wake of its successes in the cold war, the Gulf War, and the Kurdish relief effort.

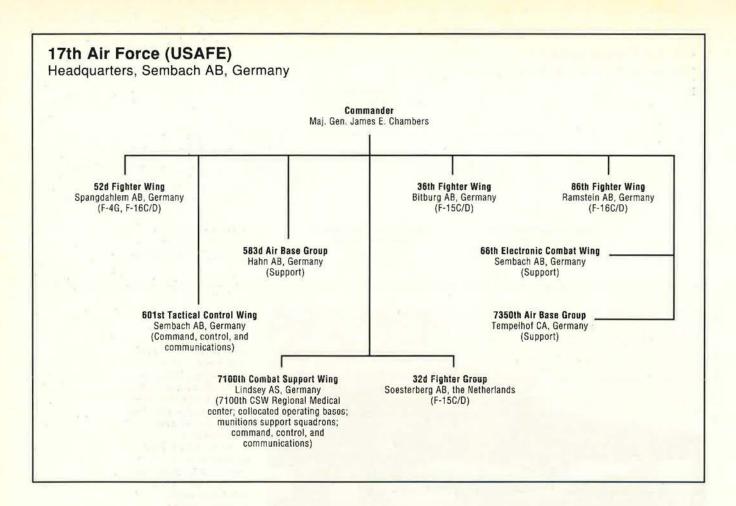






SSgt. Michael
Weinfurther, an F-111F
crew chief with the
48th Fighter Wing,
RAF Lakenheath, UK,
guides a GBU-10 bomb
into loading position at
Taif, Saudi Arabia.
The Air Force is
modernizing its dualcapable wing at
Lakenheath, replacing
F-111s with F-15Es,
which will anchor
NATO's nuclear
deterrent.





major operating locations, including Comiso AB, Italy, Zweibrücken AB, Germany, and Hellenikon AB, Greece. Flying operations ceased at Sembach AB and Hahn AB, Germany, and Torrejon AB, Spain. Future drawdown actions are planned for RAF Greenham Common, RAF Upper Heyford, RAF Bentwaters, and RAF Woodbridge, UK; Zaragoza AB, Spain; and Lindsey AS and Tempelhof Central Airport AS, Germany.

Mission changes also occurred at several bases as the command realigned operations in order to maintain a significant force structure while reducing management overhead and

base operating support.

USAFE is modernizing its dualcapable aircraft with the arrival of F-15Es at RAF Lakenheath. F-15Es will gradually replace the F-111F fleet and will anchor NATO's nuclear deterrent in the wake of the withdrawal of US ground-based theater nuclear weapons. Ramstein's 86th Fighter Wing began the USAFE unit shift to the objective wing structure. Four air divisions within the European theater were eliminated. Rhein-Main AB transferred back to USAFE from MAC as part of the integration of airlift and air refueling management under the theater commander.

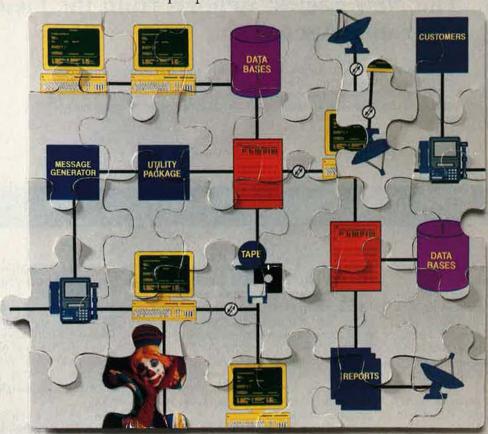
NATO's emphasis today is on mobility, and its new strategy calls for smaller, more versatile, and multinational forces capable of rapid reaction, providing Allied leaders maximum flexibility with which to respond to future crises. USAFE maintains

interoperability with Allied air forces through many common systems, procedures, and routine training. Hq. USAFE is collocated with Headquarters Allied Air Forces Central Europe (AAFCE), which controls approximately 1,500 tactical aircraft.



SrA. Robert Theiler of the 36th Fighter Wing at Bitburg AB helps build a temporary dining facility at Silopi, Turkey, in support of Operation Provide Comfort, the Kurdish refugee relief program in the wake of Operation Desert Storm.

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1992 USAF Almanac The New Eagles: Reports from the Field Operating Agencies

A field operating agency is a subdivision of the Air Force that carries out field activities under the operational control of an Hq. USAF functional manager. Although 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

The Air Force Audit Agency, headquartered in Washington, D. C., provides all levels of Air Force management with independent, objective, and constructive evaluations of managerial responsibilities (financial, operational, and support). Reports of audit evaluate the effectiveness, efficiency, and economy of Air Force program management.

The Auditor General of the Air Force, John W. Boddie, reports directly to the Secretary of the Air Force. This enables AFAA to assess independently the activities and functions it audits.

The Auditor General and the staff directorates—Operations and Resource Management—are located in Washington, D. C.

AFAA's line operations are undertaken through three directorates.

The Acquisition and Logistics Audit Directorate, located at Wright-Patterson AFB, Ohio, directs the

development and management of multisite audits related to acquisition, weapon systems, supply, maintenance, transportation, foreign military sales, and the computer systems of Air Force Logistics Command and Air Force Systems Command (Air Force Materiel Command as of July 1, 1992). The directorate is also responsible for the Materiel Audit Region at Wright-Patterson, which supervises its eleven area audit offices.

The Financial and Support Audit Directorate, located at Norton AFB, Calif., directs the development and management of multisite audits related to financial management; personnel; support services; command, control, communications, and computer systems; and morale, welfare, and recreation.

The Field Activities Directorate, located in Washington, D. C., manages installation-level audit work at fortyeight area audit offices (AAOs). In

recognition of the restructuring of the Air Force major commands, this directorate will be realigned July 1, 1992, to exercise supervision of the AAOs through four regional offices: the Eastern Audit Region, Langley AFB, Va.; the Central Audit Region, Scott AFB, Ill.; the Western Audit Region, Randolph AFB, Tex.; and the European Audit Region, Ramstein AB, Germany.

AFAA has more than 780 people. Implementation of the 1990 decision to convert all military positions to civilian positions in 1991–94 has resulted in a current civilian-to-military ratio of about eight to one. Of the auditors assigned, ninety-nine percent have at least one college degree and forty-two percent have graduate degrees. Twenty-seven percent of the agency's auditors are certified public accountants, certified internal auditors, and/or certified information system auditors.

Air Force Base Disposal Agency

The Air Force Base Disposal Agency was activated by the Secretary of the Air Force on November 15, 1991. Headquartered in Washington, D. C., the new field operating agency is attached to the office of the Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment. AFBDA serves as the federal real property disposal agent and provides integrated execution management for Air Force bases in the US as they are closed under the delegated authorities of the Base Closure and Realignment Act of 1988

and the Defense Base Closure and Realignment Act of 1990. The major air commands are responsible for running their installations and terminating or shifting military missions to other units, up to the base closure date. Thereafter, installations are transferred to AFBDA for final disposition.

AFBDA works closely with state and local reuse commissions, committees, and special authorities created to develop viable reuse opportunities to minimize the economic impact of the closing of a base.

AFBDA comprises an Office of the

Director, a professional services staff, executive services specialists, program managers, and base operating locations. The professional and executive services staffs are designed to make AFBDA self-sufficient, with expertise in environmental and real estate law, real and personal property, environmental cleanup and compliance, resource management, facility maintenance, operations management, public affairs, legislative liaison, civilian personnel and manpower, and information systems.

Program managers (PMs) are re-

sponsible for all aspects of cleanup, installation management, and disposal of several bases. They are aligned along the standard regional lines adopted by the federal government to facilitate cooperation and coordination among various agencies involved in base closings, particularly the Environmental Protection Agency. Reporting to the PMs are base-level operating locations that have been established to coordinate environmen-

tal cleanup, reuse planning with local communities, caretaker responsibilities, and property disposal both prior to and after closure.

AFBDA is supported by other execution agents to avoid duplication of government services available elsewhere. The General Services Administration, Air Force Center for Environmental Excellence, and Human Systems Division Contracting Office are used for support in their various specialties.

When it closed Pease AFB, N. H., on March 31, 1991, the Air Force became the first service to close an installation under the new base closure laws. The base has been maintained, operated, and managed by AFBDA since April 1, 1991, following its transfer from Strategic Air Command. Three bases are scheduled to close in 1992, seven in 1993, seven in 1994, and the last base on the current closure lists in 1995.

Air Force Center for Environmental Excellence

The Air Force Center for Environmental Excellence was established July 23, 1991, to provide the Air Force with an in-house capability to handle all aspects of environmental cleanup, planning, and compliance.

The center, directed by J. B. Cole, a member of the Senior Executive Service, spearheads the Air Force's overall environmental program. Head-quartered at Brooks AFB, Tex., AFCEE will employ a total work force of 275 military and civilians—primarily scientific and technical professionals.

The three operational directorates in the center are Environmental Services, Construction Management, and the Air Force Design Group.

The Environmental Services Directorate encompasses restoration, planning, pollution prevention, and environmental compliance. It includes three regional compliance offices, located in Dallas, Atlanta, and San Fran-

cisco. They are responsible for keeping Air Force commanders advised of and in compliance with all applicable environmental laws and regulations.

The Construction Management Directorate handles all wastewater treatment and medical facility construction in the Air Force's military construction program (MCP), all MCP projects for the smaller Air Force commands, and any MCP projects requested by the major commands.

The Design Group is responsible for achieving optimum design quality in every Air Force facility investment, making the Air Force home and workplace environment safe, comfortable, and efficient.

In addition to these directorates, AFCEE has a dedicated environmental contracting function. Through innovative contracting strategies, the center seeks to respond quickly to the

needs of its customers whenever and wherever required, no matter what the job entails.

As a whole, the center forms a comprehensive environmental service team. As the total force structure adapts to new political, social, and economic conditions, AFCEE will execute the Air Force's environmental strategy to recognize and meet the needs of all concerned.

The center's business philosophy is completely rooted in serving its customers, Air Force commanders in the field. It pledges to clean up waste from past practices, ensure compliance, vigorously execute pollution prevention programs, manage construction from cradle to grave, and provide expert planning and architectural design services for these customers.

Providing high-quality work, on time and within budget, AFCEE will meet the most exacting customer needs.

Air Force Civil Engineering Support Agency

In 1991, the Air Force Engineering and Services Center became the Air Force Civil Engineering Support Agency, a field operating agency. AFCESA will serve as the single-point clearinghouse for all technology-related issues for Air Force civil engineering worldwide.

AFCESA combines the talents of engineers, scientists, communications and computer systems professionals, fire fighters, and explosive ordnance disposal (EOD), disaster preparedness, and air base operability professionals into a new organization designed to be responsive and

furnish quality products and services. It seeks to provide its customers focused management, professional and technical expertise, and technology products.

The Directorate of Readiness is responsible for establishing standards in Prime BEEF (Base Emergency Engineering Force), RED HORSE (Rapid Engineer Deployable, Heavy Operational Repair Squadron, Engineer), EOD, and disaster preparedness. A detachment under AFCESA will conduct Combat Support Training. The Reserve Affairs office is also located within the directorate.

The Fire Protection Directorate has two divisions—one for operations and the other for fire prevention engineering.

The Maintenance Directorate has divisions responsible for work-force management; airfield support; and the Civil Engineering Maintenance, Inspection, and Repair teams' mission, including field teams.

The newly created Systems Engineering Directorate has combined operations and maintenance systems with design and construction to provide cradle-to-grave infrastructure responsibilities in a single directorate.

The directorate includes electrical engineering, mechanical engineering, and civil engineering divisions.

One of the biggest changes was the creation of the Research, Development, and Acquisition Directorate. This directorate includes the Programs and Plans Division, the Product Development and Delivery Division, the Privatization Strategies Office, and the Air Force Civil Engineering Laboratory.

The Construction Cost Management Directorate produces independent cost analyses on major weapon systems acquisition programs and develops cost models for environmental recovery.

ery.
The Communications-Computer
Systems Directorate provides com-

puter systems software maintenance and development support to field activities, including management of the Air Force's worldwide AMMUSNET telecommunications network.

The Executive Services Directorate serves as a focal point for budget, personnel, administration, history, public affairs, graphics, visual information, law, and meteorology.

Air Force Civilian Personnel Management Center

The mission of the Air Force Civilian Personnel Management Center, Randolph AFB, Tex., is to manage, operate, and support Air Force civilian personnel programs and systems. These affect more than 225,000 civilian employees, including foreign nationals, at Air Force installations worldwide.

AFCPMC, formerly the Office of Civilian Personnel Operations, was established in 1986. It is organized into two divisions: Integrated Systems Management and Career Management. Each plays an integral role in the personnel life-cycle management of the civilian resource.

The Integrated Systems Management Division is the Air Force's focal point for civilian personnel systems management. It supports civilian personnel by determining requirements and ensuring that they are met, either by developing systems in-house or arranging for their development and maintenance by other organizations.

It oversees civilian personnel systems management staff worldwide. It keeps abreast of changing technology to plan and improve civilian personnel management support.

The Career Management Division helps identify civilian executive positions that need to be centrally managed for job referral and training. It provides a pool of career employees with strong skills in professional, technical, management, and administrative fields.

In addition to managing the white-collar employee pool through career programs, the Career Management Division formulates and administers three recruiting programs to develop future civilian leaders in the Air Force. The Palace Acquire program recruits and trains recent college graduates with degrees in a variety of technical or managerial disciplines for duty in most occupations used by the Air Force. The Palace Knight program recruits and trains scientists and en-

gineers capable of assuming research and development leadership roles in the increasingly technical Air Force of the twenty-first century. The Copper Cap program recruits and trains individuals for contract management and oversight roles in the procurement process.

The Career Management Division interacts with the Air Staff in developing and administering Air Force civilian education and training budgets. It helps civilian personnel managers find the right school or course for employees' educational needs.

Twelve career programs are now in effect: Comptroller; Engineering; Historian; Public Affairs; Logistics; Manpower and Personnel, which includes education, technical training, and family matters; Contracting and Manufacturing; Communications-Computer Systems; Safety, Security, and Special Investigations; Information Management; Scientist and Engineer; and Acquisition Program Management.

Air Force Combat Operations Staff

The Air Force Combat Operations Staff is a field operating agency commanded by a colonel who reports to the USAF Director of Operations (AF/XOO). Its readiness-oriented, combat-related staff structure supports the Chief of Staff of the Air Force and the Deputy Chief of Staff for Plans and Operations (AF/XO) in their roles as member, Joint Chiefs of Staff (JCS), and as Air Force Operations Deputy to the JCS, respectively.

On a day-to-day basis in the basement of the Pentagon, AFCOS keeps a twenty-four-hour watch on current operations and the world situation and handles emergency actions through the Air Force Operations Support Center (AFOSC), which is in constant contact with the JCS National Military Command Center (NMCC), USAF major commands, and other field operating agencies. This activity serves as the permanent nucleus of a centralized, highly responsive, and integrated combat support structure, the Hq. USAF Crisis Action Team.

AFCOS provides the facilities, policy, procedures, and staffing for use during crises, contingencies, and exercises. During such times, the Chief of Staff, AF/XO, or AF/XOO can direct

the AFCOS commander to activate the Crisis Action Team. The Crisis Action Team then operates around-the-clock, providing rapid reaction staffing of Chief of Staff taskings and of requests by USAF major commands providing forces for unified or specified command operations.

The Crisis Action Team normally operates from dedicated facilities in the AFOSC, although in the event of imminent attack on the United States, AFCOS could move to alternate sites for survivability and continuity of essential headquarters functions. The Crisis Action Team was activated for

the entire seven months of Operations Desert Shield and Desert Storm—the first wartime activation since Nickel Grass, the logistical resupply of Israel in 1973.

AFCOS also provides the management and staffing for many other activities. A situation and combat readiness reporting capability tracks the status of all Air Force combat and combat support forces. AFCOS develops Air Force counterdrug policy, guides counterdrug program man-

agement, and regulates USAF counterdrug operations. It manages programming and policy for Air Force wargaming and for participation in JCS exercises. It maintains the Chief of Staff's briefing team. It provides operational weather support for the White House and the joint staff as well as several other Washington-area federal agencies.

A total of 285 personnel in the AFCOS and ten Air Staff functions can be called on in peacetime or wartime to meet AFCOS support requirements for the Chief of Staff. Those Air Staff functions are represented by the AFCOS Directors of Operations, Plans, Logistics, Manpower and Personnel, Intelligence, Civil Engineering, Security Police, and Information-Systems Management. The Chiefs of the Medical Readiness Division and the Chaplain Response Forces are also members of AFCOS. The Air Force Reserve and Air National Guard are fully integrated.

Air Force Communications Command

Air Force Communications Command develops communications, computer, and air traffic control standards for the Air Force. Though it was a major command at one time and will keep the name "command," it became an FOA on July 1, 1991, responsible to the Air Force deputy chief of staff for C⁴ (Command, Control, Communications, and Computers). AFCC is headquartered at Scott AFB, III., and is commanded by Maj. Gen. John S. Fairfield. AFCC has nearly 8,200 people.

The communications, computer, and air traffic control systems now in place will carry the Air Force through the 1990s, and AFCC's projections of future communications needs will shape the look of the Air Force well into the next century.

AFCC obtains standard communications and computer systems, develops guidelines for their use, and ensures the integration and interoperation of these systems. It is the life-cycle



Above, 1st Lt. Scott Moser of Air Force Communications Command's Technology Integration Center at Scott AFB, Ill., tests the security of a local area network. Below, MSgt. Joseph Colter sets up a test in the center's technical control facility. AFCC became a field operating agency on July 1, 1991.



manager for USAF-wide standard systems, including computer hardware and software, and manages the standard contracts for off-the-shelf products.

The Standard Systems Center at Gunter Annex, Maxwell AFB, Ala., commanded by Brig. Gen. Frederick A. Zehrer III, is the primary Air Force organization for the development, acquisition, and life-cycle support of microcomputer contracts, standard baselevel computer regionalization, the integrated computer-aided software engineering program, and the Air Force wing command-and-control system.

The Communications Systems Center at Tinker AFB, Okla., commanded by Col. William E. Einspahr, is the Air Force's single manager for engineering and installing communications and air traffic control systems and facili-

ties around the world. Systems telecommunications engineering managers from the CSC evaluate and interpret major commands' C⁴ systems templates and develop blueprints of the C⁴ infrastructures for Air Force bases. Security systems, navigational aids, weather systems, modern telecommunications systems, and computer networks are a few of the enhancements that the CSC has provided its customers.

The BIDDS (Base Information Digital Distribution System) program, managed by CSC's Communications Systems Program Office at Scott AFB, is replacing outdated telephone switching sys-

tems and base distribution systems.

The Technology Integration Center at Scott AFB, commanded by Col. James G. Nicholas, supports Air Force communications and computer systems. The TIC offers a range of systems engineering, integration, testing and evaluation, and systems management to the Air Force and Department of Defense.

The Telecommunications Certification Office at Scott AFB, commanded by Col. Monti J. Riordan, purchases more than \$400 million worth of telecommunications services from commercial companies to meet the Air Force's annual long-distance needs.

It combines leased transmission services with purchased networking equipment to improve service and keep down operating costs.

The 200th Management Engineering Squadron at Scott AFB, commanded by Maj. Roger Hawkins, improves the efficiency and effectiveness of AFCC organizations while quantifying the manpower needed to accomplish peacetime and wartime missions. The 200th MES focuses on management engineering efforts, while two detachments provide manpower and organization services to the Communications Systems Center and the Standard Systems Center.

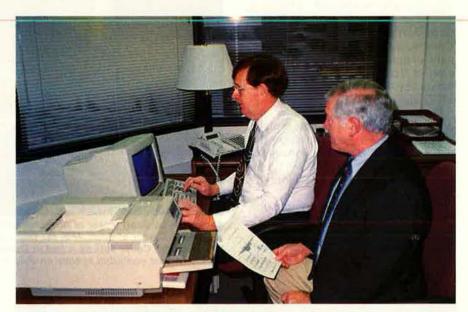
Air Force Cost Analysis Agency

The Air Force Cost Center was established in 1986 to analyze, estimate, and validate the cost of executing the Air Force's total program. Since then, it has been redesignated the Air Force Cost Analysis Agency.

AFCAA develops the cost and planning factors used to estimate the cost of operating and supporting forces and to formulate the Air Force budget, leads the Air Force cost analysis program for all major Air Force acquisition programs, and provides cost expertise to the Assistant Secretary of the Air Force (Financial Management and Comptroller), Air Force Cost Analysis Improvement Group, Air Force System Acquisition Review Council, and Air Staff, including the global reach/global power teams. The agency also develops and validates new cost-analysis tools and methods for use USAF-wide.

AFCAA employs ninety-six civilian and military personnel in three divisions: Acquisition, Operations and Support, and Information Systems.

The Acquisition Division leads the Air Force's Independent Cost Analysis Program for major weapon systems. Every major command and Air Force activity involved in these major systems receives guidance and support from the Acquisition Division. This division deals with the cost issues associated with the research, development, and production of new weapon systems and automated information systems. It is concerned with improving the Air Force's ability to estimate the costs of future weapon systems and automated information systems.



John Carney, left, and Chris Thompson of the Air Force Cost Analysis Agency's Information Systems Division retrieve and analyze data on USAF's aircraft operating and support costs. AFCAA was established in 1986 as the Air Force Cost Center.

The Acquisition Division is the financial management focal point for Selected Acquisition Reports, contract performance report analysis, and Defense Acquisition Executive Summaries.

The Operations and Support Division's analysts perform cost studies to support the Air Staff. These studies include operating and support cost estimates for major weapon system acquisition or modification programs, force-mix studies, and base-realignment studies. The division develops and publishes Air Force Cost and Plan-

ning Factors that affect more than thirty percent of the Air Force's annual budget. In addition, the division updates, maintains, and enhances operations and support cost models for use by the Air Staff, major commands, and other USAF units.

The Information Systems Division is responsible for computer and communications support to the agency as well as research and field support activities. It is the financial management focal point for the Air Force Statistical Digest. The Cost Bulletin Board and Defense Data Network (DDN) host

interface allows the agency to provide on-line cost consulting services and facilitates the flow of cost information in the Air Force. The VAX computer systems hosts the Visibility and Management of Operations and Support Costs (VAMOSC) system along with other cost databases and software, including cost models and tools.

Air Force Flight Standards Agency

The Air Force Flight Standards Agency was activated October 1, 1991, as a field operating agency reporting to Hq. USAF, Director of Operations. It manages the interoperability of civil and military airspace and air traffic control systems to ensure worldwide combat and peacetime capabilities. Through its various components, the agency develops and maintains standards and procedures for flight operations, air traffic control (ATC), aeronautical information, flight planning, Notice to Airmen, and navigation and landing systems worldwide. In addition, the agency facilitates the development of common civil and military airspace.

The following components are part of AFFSA: a headquarters element (Hq. AFFSA), Federal Aviation Administration (FAA) Liaison, USAF Instrument Flight Center (IFC), Flight Inspection Center (FIC), and (functionally) the AFCC Air Traffic Services Organization (ATSO).

The headquarters element at the Pentagon provides overall direction and coordinates the agency's activities. It coordinates with the other services and civil aviation organizations both nationally and internationally to provide Air Force input on issues affecting military flight operations.

At FAA headquarters, the FAA liaison component maintains continuous liaison among the Air Force, other services, Hq. FAA, and nine FAA regional offices.

At Randolph AFB, Tex., the IFC component serves as the focal point and authority for all USAF instrument flight functions.

The FIC at FAA headquarters in Oklahoma City maintains combatready aircrews and operates various FAA aircraft to conduct global flight inspection of navigation systems, airfields, and instrument approach procedures The ATSO at Scott AFB serves as the office of primary responsibility (OPR) for all air traffic services and airfield management, including guidance, standardization and integration for procedures, systems management, training, and mission support.

The Flight Standards Agency serves the Air Force as OPR for maintaining awareness of technological, organizational, and regulatory change proposals in other services, the FAA, the International Civil Aviation Organization (ICAO), and foreign ATC systems. It consolidates major commands' airspace planning documents for DoD and interagency review and maintains flight standard regulations and instrument procedures for approval of Hq. USAF/XOO. The agency also assists the major commands and the National Guard Bureau in coordinating with FAA on major exercises, special use airspace, and military training routes.

Air Force Frequency Management Agency

The Air Force Frequency Management Agency implements USAF's use of the radio frequency electromagnetic spectrum. AFFMA develops procedures on a national, international, and government-to-government basis within the scope of international agreements. AFFMA represents the Air Force in various national and international forums concerning the radio-frequency spectrum.

On October 1, 1991, AFFMA was realigned organizationally as an FOA. AFFMA is commanded by Lt. Col. William A. Belote, Jr., and has twelve officer, twelve enlisted, and twenty-two civilians authorized. It operates the Interservice Radio Frequency Management School (IRFMS) at Keesler AFB, Miss.

The Command Section's technical director is the Air Force representative to both the Interdepartment Radio Advisory Committee and the US National Committee of the International Radio Consultative Committee. The Special Assistant for International Affairs is the Air Force's representative at World Administrative Radio Conferences and the NATO Allied Radio Frequency Agency (ARFA) Joint Civil/Military meetings, among other duties.

The Plans Division works to ensure that Air Force spectrum-management policy, operational plans, programmanagement directives, and statements of need can be supported within the framework of established DoD, national, and international frequency-management rules and regulations.

The Systems Engineering Division provides technical solutions to a wide variety of complex spectrum-management policy issues. Division personnel advise Air Force personnel on portions of the spectrum that are available for new systems to use. They quantify mutual electromagnetic compatibility between USAF systems and other military and civilian telecommunication systems worldwide.

The Technical Services Division directly supports users of the operational radio frequency spectrum by obtaining and documenting all frequency assignments used to support Air Force operations worldwide. The division consists of an Assignments Branch and Special Operations Branch.

Air Force Historical Research Agency

Operating under the guidance of the Air Force Historian, the Air Force Historical Research Agency is the repository for Air Force historical documents. It is collocated with the Air University Library and provides research facilities for professional military education students, faculty, visiting scholars, and the general public.

The agency's collection, begun in Washington, D. C., during World War II, moved to Maxwell AFB, Ala., in 1949. It comprises more than sixty million pages devoted to the history of the service and constitutes the largest and most valuable specialized collection of documents on US military aviation in the world.

Materials in the agency's collection cover topics ranging from the use of balloons in the Civil War through the record of Air Force activities in World War II, Korea, Vietnam, and the Desert Storm air campaign.

About three-fourths of the agency's documents are US Air Force unit histories. Special collections, some dating back to the early 1900s, complement the unit histories. Among them are historical monographs and studies, more than 2,000 oral history interviews, end-of-tour reports of major overseas commanders, course materials of the Air Corps Tactical School from the 1930s, and working papers of key Army Air Forces staff offices, the British Air Ministry, and the German Air Force during World War II. More than 400 collections of personal papers of retired Air Force civilian and military officials are also available to researchers.

In addition to being a repository for USAF historical documents, the agency performs research and other historical services for the Air Force. The agency's staff answers requests for historical information from official sources and the general public, prepares historical reference works, conducts the Air Force's oral history program, maintains the record of the status of the Air Force organizations and aircraft, processes Air Force unit emblems, and verifies the lineage and honors of Air Force units.

To make the historical collection more accessible to its users, the agency provides research aids, including a computerized database and bibliographies for identifying relevant documents on specific topics. Almost the entire collection is recorded on 16-mm microfilm, with copies deposited at the National Archives and Records Administration, Washington, D. C., and the Center for Air Force History, Bolling AFB, D. C.

Air Force Inspection Agency

The Air Force Inspection Agency is an FOA responsible to the Air Force Inspector General (IG). Commanded by Maj. Gen. Alexander K. Davidson at Norton AFB, Calif., AFIA provides the Inspector General an independent assessment of Air Force leadership, fighting capability, and resource management. The agency assesses operational readiness and evaluates management effectiveness and efficiency. AFIA recommends improvements to existing Air Force methods for fulfilling peacetime, contingency, and wartime missions and conducts inquiries and investigations of allegations regarding Air Force personnel and activities.

On August 1, 1991, the Air Force Inspection and Safety Center was reorganized into two separate FOAs: AFIA and AFSA (Air Force Safety Agency). AFIA subsequently modified its internal organization and operating procedures to meet changing requirements. AFIA now comprises five directorates reporting directly to the agency commander, with 247 personnel assigned.

A new Field Inspection Directorate was established to provide independent assessments of USAF unit capa-



The Air Force Inspection Agency makes sure USAF does it right. Here, AFIA inspectors (left to right) Maj. Ralph D. Harshbarger, Lt. Col. Paul J. Ryall, and Maj. Jaime E. Irizarry record their findings while inspecting an aerial refueling wing.

bility. The field inspectors also look into items of special concern in accordance with the statutory obligation of the Air Force IG to "inquire into and report upon the discipline, efficiency,

and economy of the Air Force." In October 1991, AFIA inspectors began accompanying major command IG teams, implementing the field inspection program.

AFIA established two other new directorates, Management Inspection and Acquisition Inspection, to execute its new approach to management inspections. With completely revised formats, Functional Management and Acquisition Management Reviews have replaced the Functional Management and System Acquisition Management Inspections. The goal is to provide timely measurement of process output against established criteria and standards rather than providing broad-scale process analysis and control evaluations done previously.

Follow-ups to these reviews will be flexible and stress process owner responsibility.

The Medical Inspection Directorate continues its thorough and rigorous oversight of the Air Force Medical Service, performing Health Services Management Inspections (HSMIs) of active-duty medical treatment facilities and Health Services Readiness Inspections of Air Force Reserve and ANG medical units. In addition, it is testing a new HSMI with increased emphasis on outcome and performance. This inspection will replace its 800-page evaluation with a twentysix-page checklist.

Amid these organizational and conceptual changes-designed to complement the "global reach, global power" theme of today's Air Force, AFIA continues to plan for its move to Kirtland AFB, N. M., slated for mid-1993. The new location will provide a modern facility tailored to AFIA's mission and incorporating state-of-the-art communications and information-processing capabilities designed to maximize the efficiency of the organization and the quality and timeliness of its products.

Air Force Intelligence Support Agency

The Air Force Intelligence Support Agency provides analysis and assessments in the application of all-source intelligence and services in support of the Air Staff and combatant commands. Under the command of Col. Storm C. Rhode III, this FOA reports directly to the Assistant Chief of Staff for Intelligence.

More than 300 active-duty, Guard and Reserve, and civilian intelligence professionals worldwide collect, process, disseminate, and apply accurate and timely intelligence for Air Force commanders during peace, war, and contingency situations. Headquartered at Fort Belvoir, Va., AFISA is composed of four major directorates.

Col. James W. Hutchison, Director of Assessments, whose office is in the Pentagon, is responsible for estimative and warning intelligence. AFISA's Intelligence Assessments Directorate works closely with the Office of the Assistant Secretary of the Air Force for Acquisition and Air Force Systems Command to determine the threat to USAF weapon systems posed by current and projected foreign weapon systems.

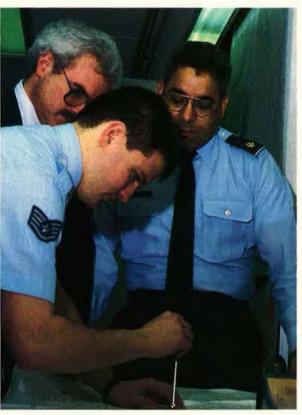
AFISA's Intelligence Assessments Directorate provides intelligence briefings to the Secretary of the Air Force and the Chief of Staff. The directorate provides products to the joint-service Daily Intelligence Digest and Defense

Intelligence Network.

The directorate also acts as the executive agent for the Assistant Chief of Staff for Intelligence in the national intelligence process by developing Air Force positions in National Intelligence Estimates, Defense Intelligence Projections for Planning, The Air Force Planning Guide, and other assessments used by plans and operations staffs.

The Targets Directorate, headed

SSqt. Lorne Hanson, cartographer Rich Macy, and Maj. Ron Esaw of the Air Force Intelligence Support Agency's Targets Directorate map out Iraqi targets in support of Operation Desert Storm air operations. AFISA provides the Air Staff and combat commands with a wide range of intelligence services.



by Col. James Blackburn and located at Bolling AFB, Washington, D. C., recommends and implements USAF targeting and mapping, charting, and geodesy policy; provides peacetime and contingency targeting support to the Air Staff; and assists in research, development, and acquisition of weapon systems. The directorate also develops specialized data requirements for USAF-wide operational use and for systems under development.

Security and Communications Man-

agement, directed by Col. Frank Nekoba and located at Bolling AFB, manages the worldwide Air Force Special Security Office system, implementing Sensitive Compartmented Information (SCI) policy and procedures and providing management and oversight for the Air Force SCI Security program. This includes accreditation and inspection of all SCI facilities as well as SCI eligibility determination for all Air Force military, civilian, and contractor personnel. The direc-

JSAF photo by TSgt. Marvin

torate also manages the Hq. Air Force Special Security Office and the Air Force Security Clearance Office (AFSCO), the focal point for all security clearance determinations. The Directorate of Intelligence Systems, headed by Col. James Enger and located at Bolling, manages intelligence data-handling systems requirements, planning, resources, and security. The directorate promotes efficient, cost-effective standardization and interoperability to meet Air Force and joint operations needs.

Air Force Legal Services Agency

The Air Force Legal Services Agency, headquartered in Washington, D. C., helps provide complete civil and military legal services to the Air Force and its members around the world.

AFLSA provides specialized legal services in military justice, claims for and against the Air Force, tort litigation, legal assistance, and labor, environmental, acquisition, and preventive law. It also handles all Air Force patent, copyright, and other intellectual property matters, provides judges and counsel for courts-martial, and reviews trial results.

The Judiciary Directorate in AFLSA has three divisions.

The Military Justice Division prepares regulations and policy on military justice. It advises The Judge Advocate General on petitions for new trial and other applications for relief, and it reviews general court-martial records not reviewed by the Court of Military Review.

The Trial Judiciary Division oversees seven judiciary circuits, five in CONUS and two overseas.

The Defense Services Division represents USAF members before the Court of Military Review and the Court of Military Appeals and assists the Solicitor General in appeals to the Supreme Court.

AFLSA's Civil Law and Litigation Directorate consists of six divisions.

The Legal Assistance Office provides personal legal assistance to Air Force personnel assigned to the Pentagon and metropolitan Washington, D. C., manages the Air Force's preventive law and legal assistance programs, and advises the Air Staff on federal and state income tax issues affecting military interests.

The Claims and Tort Litigation Division adjudicates aviation, environmen-

tal, medical malpractice, and general tort claims and defends lawsuits arising from such claims.

The Environmental Litigation Division represents the Air Force in environmental, occupational safety and health, and land-use litigation.

The General Litigation Division represents the Air Force in administrative proceedings and all civil litigation brought against USAF and its officials involving personnel actions, the Freedom of Information Act, the Privacy Act, taxes, utilities, and constitutional and personal torts.

The Contract Law Division represents the Air Force in Federal Court litigation involving USAF contracts.

The Patents Division investigates and makes administrative decisions on patent and copyright claims of infringement against, and prepares and submits patent applications for, the Air Force.

Air Force Management Engineering Agency

The Air Force Management Engineering Agency is located at Randolph AFB, Tex., and reports directly to the Air Force Director of Manpower and Organization, Washington, D. C. AFMEA's commander is Col. James S. Seevers. AFMEA's primary mission is to provide the Air Force and Department of Defense the best possible means to determine manpower requirements and manage manpower resources in an effective and responsible manner.

The agency oversees the implementation of technical and procedural guidance for Air Force Management Engineering and Productivity Programs. It also develops and maintains manpower determinants and programming tools, provides information systems support for management engi-

neering and productivity programs, and works with major commands and operational units to apply progressive industrial engineering techniques.

AFMEA administers productivity programs capitalizing on technological advances and new ideas to increase productivity and free manpower for other priorities. These programs include the Air Force Suggestion Program, Fast Payback Capital Investment Program, and Commercial Activities (A-76) Program.

The agency provides leadership and administrative support to seven functional management engineering teams. At bases throughout the US, these teams use process analysis and work-measurement techniques to assist functional leaders in developing productive organizations.

These teams provide consultant services and develop determinants in functional areas common to most Air Force installations. The resulting manpower determinants specify, by grade and skill, the correct number of people necessary to perform each unit's mission. AFMEA also includes the Joint Health-Care Management Engineering Team, which develops manpower determinants for medical functions common to the Navy, Army, and Air Force.

AFMEA also directs the Air Force Wartime Manpower and Personnel Readiness Team, which supports wartime plans and readiness issues, and the Air Force Manpower Systems Office, which assists Air Force head-quarters with automated support for manpower management.

Air Force Medical Operations Agency

The Air Force Medical Operations Agency has its headquarters at Bolling AFB, Washington, D. C. Its commander serves on the staff of the Air Force Surgeon General.

AFMOA assists the Air Force Surgeon General in formulating plans, policies, and programs for the Air Force Medical Service, aerospace medicine, clinical investigations, quality assurance, health promotion, family advocacy, bioenvironmental engineering, military public health, and radioactive material management. The agency is organized into five divisions and one secretariat.

The Aerospace Medicine Division formulates policy and oversees all aspects of the Aerospace Medicine Program (aerospace physiology, aircrew physical standards, bioenvironmental engineering, military public

health, and flight, hyperbaric, occupational, and preventive medicine), as well as the Air Force Fitness Program and the Air Force Weight Management Program.

The Clinical Quality Management Division, using information derived from its quality-service function, develops policies and plans; programs resources; and educates and evaluates health-care delivery, using access, clinical outcome, and cost as benchmarks.

The Health Promotion Division develops, coordinates, and evaluates the USAF Health Promotion Program, which enhances personal and organizational well-being through self-care, health improvement, and avoidance of modifiable disease risks. Primary components are tobacco cessation/prevention, physical fitness, stress

management, nutrition, chronic disease prevention, and substance abuse prevention.

The Family Advocacy Division manages, monitors, and coordinates policy and guidance of the Air Force Exceptional Family Member Program and the Air Force Child and Spouse Abuse Program.

The USAF Radioisotope Committee Secretariat coordinates administrative and regulatory aspects of licensing, possession, use, storage, handling, and disposal of all of the radioactive material used by the Air Force.

AFMOA works directly on a daily basis with the Air Force Surgeon General, other Air Staff directorates, major commands, and other federal agencies in support of medical operational policies and practices.

Air Force Medical Support Agency

The Air Force Medical Support Agency has its headquarters at Brooks AFB, Tex. Its commander reports to the Director of Medical Support, Office of the Surgeon General.

AFMSA assists the Air Force Surgeon General in developing programs, policies, and practices relating to Air Force health care in peace and war. The office is organized into the Directorate of Medical Care Support. AFMSA develops plans, programs, and management guidance through four divisions.

The Patient Administration Division develops and implements plans to manage medical administrative functions for patient administration, ambulatory services, and medical records.

The Health Facilities Division serves as a consultant for the design, construction, and maintenance of medical facilities.

The Medical Service Information Systems Division monitors the development, acquisition, installation, and application of computer-based medical information-handling and -retrieval systems.

The Medical Logistics Division develops plans and policies concerning medical materiel, supply, and equipment; biomedical equipment maintenance repair; facility management; and service contracts.

AFMSA works directly on a daily basis with the Air Force Surgeon General, other Air Staff directorates, major commands, and other federal agencies in support of health-care operational policies and practices.

Air Force Military Personnel Center

More than 507,000 active-duty Air Force men and women around the world are affected by the procedures and policies implemented at the Air Force Military Personnel Center, Randolph AFB, Tex. AFMPC provides services to approximately 650,000 retired Air Force members and spouses of deceased Air Force people.

AFMPC puts people with the right

skills in the right jobs at the right time to enable commanders to accomplish their missions. Its Personnel Readiness Center directs AFMPC's actions in support of deployed forces or any contingency operations where Air Force members or their families are at risk.

AFMPC's military and civilian personnel balance the need to accommodate individual preferences and professional goals with the skill needs of commanders. Even before initial assignments are made, AFMPC works closely with the Air Force Recruiting Service and Air Training Command to acquire, classify, and train the numbers and types of personnel the Air Force needs.

AFMPC manages officer programs

and conducts selection boards. The center administers the Weighted Airman Promotion System (WAPS) and the Stripes for Exceptional Performers (STEP) program and develops Air Force equal opportunity and treatment and substance abuse control programs. AFMPC develops, implements, and manages the officer and enlisted evaluation systems, directly affecting more than 700,000 active-duty, Guard, and Reserve officers and enlisted members.

Military awards and decorations, quality force, line-of-duty determinations, USAF-level special trophies and recognition programs, and dress and personal appearance programs are AFMPC's responsibilities as well. AFMPC handles all separations and retirements, administers survivor an-

nuity programs, and serves as the focal point for retiree activities.

AFMPC provides operational guidance and long-range planning for 119 active-duty military personnel flights worldwide. AFMPC is functional manager for more than 2,400 unit orderly rooms USAF-wide and is responsible for orderly-room automation initiatives. One of those initiatives, Personnel Concepts III (PC-III), is designed to improve personnel support to commanders, staffs, and units. PC-III will be implemented at all bases.

The Personnel Data System (PDS), developed and operated by AFMPC, supports active-duty military and civilian, Reserve, and Guard members through the personnel life cycle, from accession to retirement or separation.

Another program handled by AFMPC is the "Want Ads" program for transition assistance. The Air Force has formed a team to help people leaving the service find productive employment in the civilian economy. A central feature of the program is a combined effort by DoD, the Department of Labor, and the Department of Veterans Affairs to provide seminars covering all aspects of the job search to retiring and separating Air Force members.

One of AFMPC's most sensitive responsibilities is administering the Air Force Casualty Services Program. In addition to assisting families of active-duty and retired casualties, the center maintains contact with the families of Air Force members unaccounted for in the Vietnam War.

Air Force Morale, Welfare, and Recreation Agency

The mission of the Air Force Morale, Welfare, and Recreation Agency (AFMWRA), located at Randolph AFB, Tex., is to promote Air Force readiness and mission accomplishment by providing activities that stimulate physical fitness, unit and community cohesion, family well-being, and quality of life, using available resources to provide customer-driven services.

Morale, welfare, and recreation programs were first introduced during the Revolutionary War. With the establishment of a huge "citizen" army during World War I, such programs as library services, troop canteens, and sports programs were founded. In 1920, the Army Motion Picture Service was established, followed by the founding of service clubs during World War II.

Air Force MWR got its start as part of the Army Special Services prior to the Air Force's becoming a separate service in 1947. At that time, Hq. USAF program management was overseen by the Air Force personnel staff. Elements of the Air Force personnel function moved from Washington, D. C., to Randolph AFB, Tex., in 1963. In 1972, the Air Force Welfare Board Secretariat and Nonappropriated Fund Office collocated with Hq. Air Force Military Personnel Center Directorate of MWR. In February 1991 MWR was designated a field operating agency as part of the Air Force reorganiza-

MWR programs have developed activities according to the needs of per-



The Air Force Morale, Welfare, and Recreation Agency arranges quality-of-life activities in support of Air Force combat readiness. Here, the Grants, an Air Force Academy family, find their Christmas tree during AFMWRA outdoor recreation.

sonnel on each base. All MWR facilities and associated programs exist to meet the physical and mental needs of Air Force families. AFMWRA supports libraries, child-development centers, youth programs, and the entertainment group Tops in Blue. Its programs include such diverse activities as golf, bowling, arts and crafts, fine and casual dining, outdoor recreation, and membership programs, including aero, rod and gun, scuba, and audio clubs.

Hq. AFMWRA accomplished much

in 1991. It implemented a cost-savings program called the Essential Products Program, which develops contracts that maximize leverage in the marketplace on commonly used products. The annual projected savings on current contracts include paper products (\$3.2 million), guest checks (more than \$90,000), and soft drink supplies (\$500,000–\$600,000). It is also developing a market-research program, Corporate Prism, a base-level project that helps activity man-

agers determine customers' priorities. It is designed to enable managers to anticipate customer needs and increase program participation. It is centrally funded and administered.

In September 1991, Morale, Welfare, and Recreation merged with the Services Branch of the Air Force Engineering and Services Center headquartered at Tyndall AFB, Fla. The services

organization includes billeting, food service, and mortuary affairs. The combination of MWR and Services has created the single largest customer-service organization at base level.

Air Force News Agency

The Air Force News Agency, headquartered at Kelly AFB, Tex., gathers and distributes news and information about Air Force activities to a worldwide audience.

AFNEWS is commanded by Col. William H. Johnson, Jr., who reports directly to the Air Force Director of Public Affairs. AFNEWS has three mission elements: the Air Force Internal Information Directorate, the Army and Air Force Hometown News Service, and the Air Force Broadcasting Service (AFBS).

The Air Force Internal Information Directorate produces broadcast and printed materials to help commanders at all levels communicate with their military and civilian members and families. Products include Air Force News Service, Air Force Radio News, Airman Magazine, and Air Force Television News. The directorate oversees the base newspaper and base guide programs and originates the Air Force lithograph series and the Air Force Policy Letter.

The Army and Air Force Hometown News Service provides stories about newsworthy individuals to their hometown newspapers and radio and television stations throughout the US. In 1991, more than 208,000 service members were featured in nearly 800,000 releases to hometown newspapers.

The Air Force Broadcasting Service broadcasts information and entertainment through radio and television programs to DoD military and civilian members and their families in Alaska, Greenland, Europe, the Middle East, southwest Asia, and the Pacific. AFBS manages the Air Force element of the Armed Forces Radio and Television Service (AFRTS), the world's largest radio-television network. The network's 160 radio and television outlets reach an estimated audience of 250,000. More than 700 airmen, soldiers, sailors, Marines, and civilian employees serve in the broadcast operation.

AFNEWS is the executive agent for DoD work-force standards and wartime planning for AFRTS and for wartime planning and communications-computer systems support for Air Force Public Affairs. Additionally, AFNEWS operates the Air Force Public Affairs Network, a computer network that will eventually connect

all public affairs offices and provide them access to a central resource library.

The agency also provides resourcemanagement support for the Air Force regional public affairs offices in New York, Chicago, and Los Angeles.

In 1991, AFNEWS established and activated the Air Force Hotline twice. for Operations Desert Shield and Desert Storm and for Operation Fiery Vigil, to answer general questions from family members in the US about Air Force members involved in those operations. The hotline for Desert Storm started from scratch, using volunteers-retired Air Force public affairs professionals, Guardsmen and Reservists, AFNEWS members, and others-to keep US citizens advised on what was happening with their loved ones. AFNEWS also set up and ran the Armed Forces Desert Network during Desert Storm to broadcast information to members in the region and deployed internal information to the rest of the Air Force and to family members.

AFNEWS operates with a staff of 526 military members and 196 civilians.

Air Force Office of Special Investigations

The Air Force Office of Special Investigations has been the Air Force's major investigative service since August 1, 1948. Headquartered at Bolling AFB, D. C., it is commanded by Brig. Gen. Francis R. Dillon.

AFOSI provides criminal investigative and counterintelligence information and services to commanders USAF-wide. AFOSI seeks to identify and prevent criminal activity, including homicide, drug abuse, espionage, terrorism, sabotage, economic crime, and other crimes that may threaten Air Force resources. AFOSI command-

ers work closely with local Air Force commanders.

Local AFOSI detachments have a full range of on-call specialists and state-of-the-art techniques to assist them. Electronics, computer, forensic, and behavioral-science specialists routinely deploy worldwide to protect Air Force people and resources. AFOSI's polygraph examiners also provide valuable investigative support.

AFOSI has about 2,300 personnel, of whom two-thirds are special agents. Eighty-eight percent of the special

agents are military, and twelve percent are civilian. AFOSI recruits, selects, and trains its own special agents, who come from almost every Air Force specialty and many civilian occupations. Each year, new special agents are trained at the USAF Special Investigations Academy, also at Bolling AFB. Almost 400 individual mobilization augmentees or Reservists also provide a wealth of civilian experience through AFOSI's Reserve program.

Investigating such major crimes as drug trafficking, murder, theft, rape,

and assault consumes the largest portion (about forty percent) of AFOSI man-hours. These are AFOSI's most visible efforts and most directly affect USAF discipline.

AFOSI has a threefold responsibility in the war on drugs. First are AFOSI's traditional law enforcement responsibilities. Second is the Narcotics and Contraband Smuggling Enforcement Program, an active approach to detecting and deterring the use of Air Force personnel and resources as conveyances to smuggle illicit drugs and contraband. The third

and newest mission is AFOSI's investigative support to the DoD counterdrug mission. In this role, AFOSI develops, analyzes, and disseminates drug intelligence and provides specialized investigative support to unified and component commanders.

During 1991, AFOSI's antidrug efforts resulted in the seizure of more than \$745 million worth of illicit drugs. Nearly 600 drug criminals have been arrested and convicted as a direct result of AFOSI drug enforcement activities.

Fighting fraud at all levels is one of

AFOSI's priorities, particularly in major weapon system procurement where inferior parts can affect flight safety, false accounting can cost taxpayers millions of dollars, and corruption can degrade the integrity of the government procurement system.

Foreign intelligence service activities and terrorist threats directed against Air Force people and resources remain high-priority concerns for AFOSI. AFOSI's counterintelligence analysts are recognized within DoD as experts on active worldwide terrorist organizations.

Air Force Program Executive Office

Air Force Program Executive Officers manage and are directly accountable for the execution (cost, schedule, and performance) of major and selected Air Force acquisition programs. There are six PEOs, each managing a portfolio of mission-area programs assisted by a small military and civilian staff.

The PEO structure was established as a direct reporting unit of the Air Force Acquisition Executive/Assistant Secretary for Acquisition in February 1990, based on recommendations of the Packard Commission and the Defense Management Review, and is now an FOA. The structure streamlines the chain of command between the program directors and the Air Force Acquisition Executive. The PEOs' only responsibilities are the programs in their portfolios.

Maj. Gen. Richard M. Scofield is the Strategic Systems PEO. His programs include the B-1B, B-2, Short-Range Attack Missile II, Advanced Cruise Missile, Silo-Based ICBM, and Small ICBM.

The Tactical Strike Systems PEO is Maj. Gen. Stephen M. McElroy. His programs include the Advanced Medium-Range Air-to-Air Missile, Sensor-Fuzed Weapon, Joint Surveillance and Target Attack Radar System, Powered GBU-15, and Triservice Standoff Attack Missile.

The Tactical/Airlift Systems PEO, Maj. Gen. Charles E. Franklin, manages the F-15, F-16, F-22, C-17, T-1A, and Joint Primary Aircrew Training System programs.

Robert Majors is the Information Systems PEO. His portfolio includes the Command and Control Information Processing System for Air Mobility Command, Depot Maintenance Management Information System, Requirements Database, Combat Ammunition System, Reliability and Maintainability Information System, and Super Minicomputer Acquisition programs.

Programs under Brig. Gen. (Maj. Gen. selectee) Garry A. Schnelzer, the Space Systems PEO, include the Defense Meteorological Satellite Program, Defense Support Program, Defense Satellite Communications System, Follow-On Early Warning System, Navstar Global Positioning System, Titan IV, and Milstar.

Command, Control, and Communications (C³) Systems PEO Brig. Gen. Kenneth R. Israel handles the E-3B/C Airborne Warning and Control System, National Airspace System, Joint Tactical Information Distribution System, and Cheyenne Mountain Upgrade programs.

The PEO structure will continue to be refined and improved to meet the evolving needs of today's Air Force.

Air Force Reserve

Air Force Reservists continue to respond to national challenges. Air Force Reserve assets played a major role in Operation Just Cause in Panama and the subsequent overthrow of Manuel Noriega in 1990. Some 23,000 Air Force Reservists played a major role in Operations Desert Shield and Desert Storm.

Called-up and mobilized Reservists from every walk of life quickly followed the 6,000 who volunteered at the outset of the crisis. This was the first time

Reservists were mobilized as part of the Total Force Policy. Air Force Reservists worked side-by-side with their active-duty counterparts around the world, performing the same missions with the same dedication and professionalism and with the same success. Operations Desert Shield and Desert Storm proved that the Air Force Reserve is an equal partner in defense.

Reserve airlifters carried more than 524,000 tons of equipment and nearly 330,000 personnel halfway around the

world as part of the greatest military airlift in history. Six C-5 and ten C-141 units—eighty percent of the Reserve's strategic airlift force—were called to active duty. Reserve C-130 units provided vital intratheater airlift support, ferrying people and mission-essential parts and supplies throughout the area of operations (AOR). The 1650th Tactical Airlift Wing, a provisional C-130 unit drawn mostly from the Reserve's 914th Tactical Airlift Group and 927th TAG, made the first tactical airdrop of

Air Force Reserve Flying Wings and Assigned Units

Wing Hq.	Group	Squadron	Aircraft	Location Gain	ing Command
4	th Air Force • Hq. N	AcClellan AFB, Calif. • I	Brig. Gen. James E. S	herrard III, Commander	
939th RQW	919th SOG	71st SOS 711th SOS	HH-60G AC-130A	Davis-Monthan AFB, Ariz. Eglin AFB, Fla. (Aux. 3)	AFSOC AFSOC
		304th RQS	HC-130	Portland IAP, Ore.	MAC
349th AW (Assoc.)		301st RQS 301st AS (Assoc.)	HC-130N, HH-60G C-5A/B	Homestead AFB, Fla. Travis AFB, Calif.	MAC MAC
145111 AVV (ASSUC.)		312th AS (Assoc.)	C-5A/B	Travis AFB, Calif.	MAC
		708th AS (Assoc.)	C-141B	Travis AFB, Calif.	MAC
SECULATION OF ACTS		710th AS (Assoc.)	C-141B	Travis AFB, Calif.	MAC
103d AW	2244 10	815th AS	C-130E, WC-130E/H		MAC
224 7/1/	934th AG	96th AS 68th AS	C-130E C-5A	Minneapolis-Saint Paul IA	P, Minn.* MAC MAC
33d AW 302d AW		731st AS	C-130E	Kelly AFB, Tex. Peterson AFB, Colo.	MAC
024711	943d AG	303d AS	C-130B	March AFB, Calif.	MAC
40th AW		95th AS	C-130H	General Mitchell IAP, Wis.	
	927th AG	63d AS	C-130E	Selfridge ANGB, Mich.	MAC
45th AM (Acces)	928th AG	64th AS (Asses)	C-130H C-141B	O'Hare ARFF, III.*	MAC MAC
45th AW (Assoc.)		729th AS (Assoc.) 730th AS (Assoc.)	C-141B	Norton AFB, Calif. Norton AFB, Calif.	MAC
46th AW (Assoc.)		97th AS (Assoc.)	C-141B	McChord AFB, Wash.	MAC
(100000)		313th AS (Assoc.)	C-141B	McChord AFB, Wash.	MAC
		726th AS (Assoc.)	C-141B	McChord AFB, Wash.	MAC
	10th Air Force • F	lq. Bergstrom AFB, Tex	c. ∙ Brig. Gen. David F	l. Smith, Commander	
301st TFW	2044 50	457th FS	F-16C/D	Carswell AFB, Tex.	TAC
110th EM	924th FG	704th FS 466th FS	F-16A/B F-16A/B	Bergstrom AFB, Tex.	TAC TAC
19th FW	507th FG	465th FS	F-16A/B	Hill AFB, Utah Tinker AFB, Okla.	TAC
	944th FG	302d FS	F-16C/D	Luke AFB, Ariz.	TAC
34th ARW		72d ARS (H)	KC-135E	Grissom AFB, Ind.	SAC
	98th ARG (H)	78th ARS (H) (Assoc.)		Barksdale AFB, La.	SAC
10.1.5111	916th ARG (H)	77th ARS (H) (Assoc.)	KC-10A	Seymour Johnson AFB, N.	
42d FW	020th EC	303d FS 45th FS	A-10A A-10A	Richards-Gebaur AFB, Mo	.* TAC
17th FW	930th FG	47th FS	A-10A A-10A	Grissom AFB, Ind. Barksdale AFB, La.	TAC
		46th FTS	A-10A	Barksdale AFB, La.	TAC
	926th FG	706th FS	A-10A	NAS New Orleans, La.	TAC
52d ARW (H)		336th ARS (H)	KC-135E	March AFB, Calif.	SAC
		79th ARS (H) (Assoc.)		March AFB, Calif.	SAC
82d FW	940th ARG	314th ARS (H) 93d FS	KC-135E F-16A/B	Mather AFB, Calif. Homestead AFB, Fla.	SAC
02U FW	906th FG	89th FS	F-16A/B	Wright-Patterson AFB, Ohi	
	AND CONTRACTOR OF THE PARTY OF	Hg. Dobbins AFB, Ga.	AL (ACCUMENTAL)	AND THE STATE OF T	
	932d AAG (Assoc.)		C-9A	Scott AFB, III.	MAC
94th AW	ERCHART ACCOUNT	700th AS	C-130H	Dobbins AFB, Ga.*	MAC
	908th AG	357th AS	C-130H	Maxwell AFB, Ala.	MAC
MELL AVA//A V	910th AG	757th AS (A)	C-130H	Youngstown MAP, Ohio*	MAC
115th AW (Assoc.)		300th AS (Assoc.) 701st AS (Assoc.)	C-141B C-141B	Charleston AFB, S. C. Charleston AFB, S. C.	MAC
		707th AS (Assoc.)	C-141B	Charleston AFB, S. C.	MAC
39th AW		337th AS	C-5A	Westover AFB, Mass.*	MAC
	911th AG	758th AS	C-130H	Greater Pittsburgh IAP, Pa	
DECEMBER OF THE STATE OF THE ST	914th AG	328th AS	C-130H	Niagara Falls IAP, N. Y.*	MAC
59th AW	0.001.40	756th AS	C-141B	Andrews AFB, Md.	MAC
	913th AG 907th AG	327th AS 356th AS	C-130E C-141B	Willow Grove ARFF, Pa.* Rickenbacker ANGB, Ohio	MAC MAC
12th AW (Assoc.)	907th AG	326th AS (Assoc.)	C-5A	Dover AFB, Del.	MAC
712(117111 (710000.)		709th AS (Assoc.)	C-5A	Dover AFB, Del.	MAC
1 4th AM (Accor)		335th AS (Assoc.)	C-141B	McGuire AFB, N. J.	MAC
14(11 AVV (ASSUC.)		702d AS (Assoc.)	C-141B	McGuire AFB, N. J.	MAC
14(11 AVV (ASSOC.)		7224 10 (10000)	C-141B	McGuire AFB, N. J.	MAC
714111 AVV (ASSOC.)		732d AS (Assoc.)			
			months of the section	AAS Aaramadiasi A	irlift Cauadran
AFRES Base	c	AAG Aeromedical	Airlift Group	AAS Aeromedical A ARFF Air Reserve Fo	
AFRES Base AG Airlift Group	Group		Airlift Group Facility	AAS Aeromedical A ARFF Air Reserve Fo ARW Air Refueling V	rces Facility
AFRES Base AG Airlift Group ARG Air Refueling AS Airlift Squadr	on	AAG Aeromedical ARF Air Refueling ARS Air Refueling AW Airlift Wing	Airlift Group Facility Squadron	ARFF Air Reserve Fo ARW Air Refueling V FG Fighter Group	rces Facility
AG Airlift Group ARG Air Refueling	on dron	AAG Aeromedical ARF Air Refueling ARS Air Refueling	Airlift Group Facility Squadron ing Squadron	ARFF Air Reserve Fo ARW Air Refueling V	rces Facility Ving

^aAll units assigned to MAC, TAC, and SAC bases will be reassigned to Air Combat Command, Air Mobility Command, Air Force Materiel Command, or Air Force Intelligence Command in summer 1992. Some AFRES units will be assigned to new composite wings.



This C-5A with an Air Force Reserve crew delivered the goods to Saudi Arabia. AFRES airlifters and crews proved indispensable to the success of Operations Desert Shield and Desert Storm, playing a leading role in the greatest troop movement in history.

the war and flew the first tactical aeromedical evacuation mission of the ground campaign.

More than 8,000 medical Reservists mobilized to locations in the US, Europe, and the AOR. Many were aeromedical evacuation flight crews specially trained to provide medical care to patients aboard aircraft. Reservists also manned fixed and mobile medical facilities and sent liaison teams to the front lines to process casualties for transport to hospitals outside the combat zone. Other Reserve medical personnel deployed for the Persian Gulf War. For the first time in Air Force history, 137 retirees were called up, as part of the medical effort.

An A-10 pilot from the 926th Tactical Fighter Group, NAS New Orleans, La., shot down an Iraqi helicopter, scoring the first air-to-air kill by an A-10. Later in the war, another 926th TFG pilot and his active-duty wingman destroyed ten mobile Scud launchers and two ammunition depots in one day, then returned to the site to direct coalition F/A-18 Hornets onto the target to destroy ten more Scuds. Closer to home, Westover AFB, Mass., played a major role in Desert Shield and Desert Storm airlift. Serving as an

eastbound staging base for C-5s, Westover and its Reservists turned 3,267 flights and 110,000 tons of cargo and processed 34,000 passengers.

Air Force Reserve C-5s and C-141s

also helped airlift much-needed supplies to the Kurdish refugees who fled to northern Iraq. Reserve crews airlifted tents, blankets, food, water, clothing and medical supplies into Incirlik AB, Turkey, where C-130s took over to deliver the supplies to the refugees.

When Mount Pinatubo covered Clark AB, the Philippines, with volcanic ash, crews from the 445th Military Airlift Wing, Norton AFB, Calif., helped evacuate Air Force personnel and their families to safety.

A-10 pilot Lt. Col. Roger Disrud, 442d Tactical Fighter Wing, Richards-Gebaur AFB, Mo., captured the "Top Gun" trophy at Gunsmoke '91, while the F-16-equipped 944th TFG took second overall in the same competition.

Reserve numbered air forces have been streamlined to a smaller operations-oriented headquarters, also focusing on logistics and safety. More authority and responsibility was given to Reserve wing commanders. A Reserve composite wing of KC-135s and A-10s will be formed at Grissom AFB, Ind. The 916th Air Refueling Group, an associate unit at Seymour Johnson AFB, N. C., became part of the composite wing there.



Medical reservists board a C-5 in Germany en route to the combat theater. The Air Force Reserve makes a significant contribution to USAF's wartime medical capability. Nearly 8,000 medical reservists were deployed during the Persian Gulf War.

Air Force Review Boards Agency

The Air Force Review Boards Agency was established in 1982 to manage various military and civilian appellate processes for the Secretary of the Air Force. The Deputy for Air Force Review Boards directs the op-

erations of the organizations that make up AFRBA, develops overall policy, and acts for the Secretary of the Air Force in deciding individual cases before the various boards. The deputy reports to the Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment.

Three separate but related organizations report to the deputy.

The Air Force Personnel Council (AFPC) reviews a broad range of military personnel issues by seven component boards: the Air Force Personnel Board, Physical Disability Appeal Board, Board of Review, Discharge Review Board, Decorations Board, Clemency and Parole Board, and DoD Civilian/Military Service Review Board. The DoD Civilian/Military Service Review Board acts as DoD's executive agent in the review of group requests that service by a civilian or contract worker be considered active-duty service.

The Air Force Civilian Appellate Review Agency (AFCARA) processes discrimination complaints and griev-

ances filed by Air Force civilian employees. Its Appellate Examining Division provides on-site investigators and grievance examiners to investigate and make recommendations on discrimination complaints and employee grievances to the local commander. The Appellate Review Office analyzes grievances and complaints and recommends a final Air Force decision to the Secretary of the Air Force.

The Air Force Board for Correction of Military Records (AFBCMR) is a statutory board of civilians that examines requests for correction of military records submitted by service members, veterans, or their heirs. Air Force civilian executives are appointed by the Secretary of the Air Force to serve as members of the board as a collateral duty. The board meets several times each week to consider a broad range of military personnel issues: evaluation reports, discharges, ben-

efits and allowances, and any other issue related to military personnel records. Because it renders the final administrative decision, the AFBCMR is known as the "Supreme Court" of the Air Force.

The Deputy for Air Force Review Boards is responsible for rendering final decisions for the Secretary of the Air Force regarding remissions of indebtedness for enlisted members and waivers for officers and civilian personnel. He also coordinates cases having Presidential, congressional, Secretarial, or other interests concerning individual cases, inquiries, or complaints affecting Air Force members or civilian employees and their families.

AFRBA exists to correct errors or injustices in military records and ensure due process, equity, and fair and impartial treatment for all Air Force military members and civilian employees.

Air Force Safety Agency



CMSgt. Robert T. Holritz, a writer with Flying Safety Magazine, makes the acquaintance of a 63d Military Airlift Wing C-141 in Antarctica. The Air Force Safety Agency publishes the magazine and manages all manner of USAF safety programs.

The Air Force Safety Agency, headquartered at Norton AFB, Calif., is responsible for implementing and executing Air Force Safety and Nuclear Surety policies, plans, and programs USAF-wide as directed by the Chief of Safety. Col. Charles W. Parker commands AFSA.

AFSA comprises a command section and nine directorates. The command section provides legal, manpower, personnel, budget, supply, administrative, and historical support. The directorates provide expertise in flight safety, life sciences, system safety and engineering, reports and analysis, ground safety, weapons safety, computer systems, safety education, and nuclear surety.

AFSA is the Air Force's manager of

flight, ground, missile, explosives, space, nuclear surety, and systems safety programs. The agency guides and monitors the implementation and effectiveness of mishap prevention programs. This includes administering the investigation and reporting of mishaps to determine their causes and corrections. AFISA also designs, plans, and develops resources for professional safety education programs, including university-level safety courses. It publishes Flying Safety and Road & Rec magazines, and it maintains the USAF's only "crash laboratory" for training personnel in aircraft mishap investigation and analysis.

AFSA's Directorate of Nuclear Surety is located at Kirtland AFB, N. M. The directorate's responsibilities include managerial oversight of the Air Force Nuclear Weapons Surety Program to make it a top priority that nuclear safety is incorporated during all phases of design, maintenance, modifications, and logistical movement. The directorate also maintains nuclear surety responsibility for terrestrial nuclear reactor systems and reviews procedures concerning space nuclear power systems and space or missile use of radioactive material. Directorate personnel originate all Air Force 122-series regulations and publish the USAF Nuclear Safety Journal for distribution to all nuclear-capable units.

Air Force Security Police Agency

In April 1991, the headquarters of the Air Force Security Police (AF/SP) moved from Kirtland AFB, N. M., to the Pentagon, concurrently moving from Inspector General to Air Staff oversight. The staff remaining at Kirtland formed the Air Force Security Police Agency (AFSPA), an FOA reporting to AF/SP. This major change took place in six months during the height of AF/SP involvement in Desert Storm.

Col. Dennis Prescott commands AFSPA. The agency serves as liaison between AF/SP and USAF major commands on policies and programs. It manages the highly successful DoD Military Working Dog (MWD) program. The agency comprises sixty-eight military and twenty-two civilian personnel assigned to three divisions.

The Security Police Policy Division (AF/SPO), directed by Col. Jay A. Swander, develops policy and requirements and issues functional guidance

pertaining to weapon systems security, nuclear security, air base defense, law enforcement, contingencies, counterdrug and corrections programs, security police training, and combat arms training and maintenance. This division develops measures to prevent or react to threats and acts of terrorism, theft, sabotage, and other forms of attack.

The Security Police Plans and Programs Division (AF/SPX) involves USAF with DoD Joint Services in research, development, testing, and evaluation of small arms and physical security equipment. The division formulates peacetime and wartime criteria relating to the protection of USAF resources. AF/SPX assigns individuals designated as program element monitors to oversee USAF's security programs on air base ground defense, antiterrorism, surface guns and rounds, ground training munitions, electronic security equipment, flight

line security, delay/denial systems, wartime host nation support, and Stinger missiles. Budgeting and allocation of personnel and equipment worldwide are performed by AF/SPX.

The Information Security Division (AF/SPI) develops USAF policy for personnel, industrial, and engineering systems security. AF/SPI helps establish information security policies for USAF-wide implementation. The division, directed by Eugene J. White, reviews document declassification and resolves issues associated with USAF classification actions.

Responding to a new Air Force mission of point air defense (PAD/surfaceto-air), plans are under way to equip four USAF wings with PAD systems recently approved by the Chief of Staff. The system will be wholly USAFowned; however, plans include closer integration of air base ground defense initiatives between the Air Force, Army, and Marine Corps.

Air Force Studies and Analyses Agency

The Air Force Studies and Analyses Agency aids the Secretary of the Air Force, the Chief of Staff of the Air Force, and other Air Force decision-makers in addressing issues concerning resource allocation, force structure, weapon systems acquisition and employment, and arms reductions proposals, as well as explaining to senior leaders how the results of their analyses affect the implementation of national security policy.

AFSAA advises the Secretary and the Chief of Staff on responses to congressional inquiries and requests for testimony. The agency serves as the configuration manager for a variety of simulation models used within the Air Force and by other DoD agencies and civilian contractors. It also has liaison responsibilities with various DoD and professional analytical organizations and professional societies.

Reporting to the Air Force Director of Programs and Evaluation (AF/PE), the agency is the lead organization in providing the simulation modeling tools and analytical assessments of the Air

Force's portion of the Program Objectives Memorandum.

The Global Forces Division's analytical efforts include strategic bomber and ballistic missile force structure and deterrence assessments for START I, II, and the post-START era; analyses of B-2 and other heavy bomber operational capabilities in selected strategic and conventional scenarios; and campaign-level analyses comparing different strategic force models. This division also assesses airlift modernization issues; C3I, including tactical reconnaissance and strategic connectivity issues; and current and future Air Force space system and space support infrastructure capabilities.

The Regional Forces Division's efforts include analyses and evaluation of the effectiveness of air-to-air and air-to-surface aircraft and munitions; aircraft survivability, including self-protection effectiveness; force package integration and effectiveness; electronic combat systems effectiveness; the effectiveness of force structure options and mixes, including con-

ventional heavy bombers; and different force employments options in multiple regional conflicts.

The Resource Analyses Division assesses the combat capabilities obtained for planned Air Force resources by integrating quantitative analyses from the other AFSAA product divisions or external agencies, analyzing resource allocation options, modeling the capability and cost relationships within the program, and providing resource summaries of historical, exercise, or program databases. The key product of the division is the Air Force Program Assessment at the end of each exercise. This assessment is the basis for option analyses. Special interest studies for senior leadership, such as the recent Toothto-Tail Study, which examined the balance in the programmed drawdown, are conducted during each exercise. The division also supports the new resource allocation process by generating programming tools that implement analytic decision support for integration of the Air Force program.

Air Force Technical Applications Center

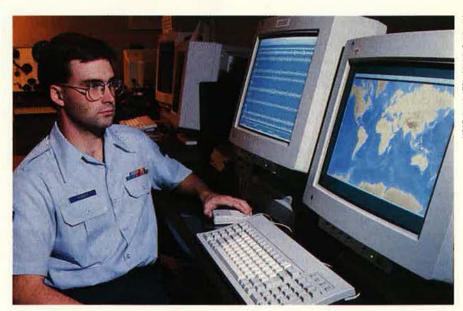
The Air Force Technical Applications Center is a specialized agency whose primary mission is to monitor compliance with several important nuclear treaties.

AFTAC operates and maintains the US Atomic Energy Detection System (USAEDS), a worldwide system of sensors to detect explosions underground, underwater, in the atmosphere, and in space. This network of seismic and hydroacoustic sensors, satellite instrumentation, and airborne and ground-based samplers is used by AFTAC analysts to determine if explosions are nuclear in origin and to report them to the national command authorities.

Headquartered at Patrick AFB, Fla., AFTAC has one major subordinate unit, fourteen detachments, six operating locations, and more than seventy unmanned equipment locations worldwide. Its largest subordinate unit is the Technical Operations Division at McClellan AFB, Calif. The division includes the McClellan Central Laboratory—AFTAC's primary analysis facility—and AFTAC's centralized engineering, maintenance, and supply functions. The division also trains airborne special equipment operators and conducts atmospheric sampling operations aboard WC-135 aircraft operated by the Air Rescue Service.

AFTAC is unique in that it translates nuclear monitoring requirements into system requirements, acquires the systems to satisfy those requirements, and then operates and supports those systems—all with its own resources.

AFTAC supports US Space Command with nuclear detonation (NU-DET) information obtained from sensors on all Global Positioning System



SrA. Clifford Rudder of the Air Force Technical Applications Center's Atomic Energy Detection Center analyzes data on a prototype seismic detection system. AFTAC uses a worldwide system of sensors to monitor compliance with nuclear treaties.

satellites. AFTAC detachments within US Space Command facilities manage these NUDET sensors, process data, and provide an assessment of any nuclear events detected. AFTAC also supports NASA's manned flights by warning of any potential nuclear radiation exposure to astronauts. AFTAC can track nuclear debris from accidents in a number of possible scenarios, such as satellites reentering the atmosphere with nuclear materials on board or a nuclear reactor accident like the 1986 disaster at Chernobyl. Such information would be used to change aircraft routing and to warn the general populace in a nuclear emergency.

With the signing of the protocols to

the Threshold Test Ban and Peaceful Nuclear Explosions treaties, AFTAC specialists began applying their special skills to assist the On-Site Inspection Agency (OSIA) in monitoring compliance with these historic agreements. AFTAC technicians helped evaluate Soviet seismic equipment and traveled to the former Soviet Union as members of the seismic station inspection teams. AFTAC technicians also helped develop special radiation monitoring equipment to support OSIA inspections under the Intermediate-Range Nuclear Forces Treaty and travel as members of those teams.

AFTAC employs approximately 1,200 military personnel and 100 civilians.

Air National Guard

With both a state and a federal mission, the Air National Guard is unique among the Air Reserve components.

Air Guard units in a nonmobilized status are commanded by the governors of the fifty states, the Commonwealth of Puerto Rico, the Territories of Guam and the Virgin Islands, and the

Commanding General of the District of Columbia. Each governor is represented in the state or territory chain of command by an adjutant general.

Units may be called to federal service by the President, Congress, or both to enforce federal authority, to suppress insurrection, or in the national defense. During peacetime, ANG

units are assigned to gaining Air Force major commands, which provide advisory assistance and evaluate unit training, safety, and readiness programs.

Air Guard units from all mission areas participate annually in training deployments, both within the US and overseas. Every day, ANG units work beside their active-duty counterparts.

ANG units consistently place high in USAF-wide competitions.

At the beginning of Operation Desert Shield, Air National Guardsmen were among the first volunteers to support the deployment of initial units to Saudi Arabia. On August 23, the President authorized the call-up of the Guard and Reserve to support the operation in a true test of the Total Force Policy. By the January 15 UN deadline, more than 6,000 Air Guard men and women had been called to active duty. They were augmented by more than 1,300 ANG volunteers.

ANG members took part in Desert Shield and Desert Storm in the following missions: tactical fighters, aerial refueling, tactical and strategic airlift, tactical reconnaissance, combat communications, aeromedical evacuation, civil engineering, services, mobile aerial port units, and security police.

Today the ANG has nearly 118,000 members and provides ninety-two percent of the fighter interceptor force, eighty-six percent of the reconnaissance force, forty-five percent of the tactical air support, thirty-eight percent of the tactical airlift, thirty-five percent of the air rescue capability, twenty-six percent of the tactical fighters, twenty-two percent of the air refueling capability, and six percent of the strategic airlift capability of the total Air Force. It also has six percent of USAF's special operations aircraft.

ANG F-15 and F-16 air defense units perform a twenty-four-hour alert mission along the coasts and borders



Flying these A-10s, the Maryland Air National Guard's 175th Tactical Fighter Group took top honors at Gunsmoke '91, the Air Force's worldwide gunnery meet. It was the second consecutive Gunsmoke win for the Guard. With nearly 118,000 members, ANG units account for significant percentages of all types of Air Force combat forces.

of the US. The Hawaiian F-15 unit is responsible for the entire air defense of that state. Also in Hawaii, a new KC-135 air refueling squadron is to be activated in 1993.

In 1992, ANG fighter units will continue modernization through conversions to the F-16 and upgrades in the airlift and refueling missions. A-7s, F-4Es, and OA-37s will be completely phased out by the end of 1993. Two tactical units will convert to the strategic air refueling mission and receive

ten KC-135 aircraft each in 1992. In airlift, the 164th Tactical Airlift Group, Memphis, Tenn., converts to the C-141B strategic airlift mission. The 124th at Boise, Idaho, is scheduled to convert from the present RF-4C reconnaissance mission to the F-4G Wild Weasel.

In 1992, Air Guard people and equipment will continue to serve the nation in the air and on the ground as important components of the US counternarcotics program.

Air Reserve Personnel Center

The Air Reserve Personnel Center, Lowry AFB, Colo., provides personnel support for the call-up, mobilization, and demobilization of more than 500,000 Air National Guard, Air Force Reserve, and retired members. ARPC's mission is to assist in the mobilization of the Air Reserve components, provide personnel support to individual members, and maintain their master personnel records.

ARPC has a staff of 655 military and civilian workers who provide support in assignments, promotions, discharges, retirements, school selections, orders, pay, airline tickets, veterans' entitlements, Servicemen's Group Life Insurance, Defense Enrollment/Eligibility Report System, Reserve Component Survivor Benefit

Plan, and myriad other personnelassistance activities to reservists worldwide. ARPC is one of only two places in the world where Air Force officers are considered for promotion by central selection boards.

ARPC's Consolidated Reserve Personnel Office is the largest base-level consolidated base personnel office (CBPO) in the Air Force, serving nearly 14,000 individual mobilization augmentees (IMAs) and participating Individual Ready Reservists. Because IMAs train directly with the active-duty force, their CBPO functions are handled at ARPC.

The center operates three centrally managed programs for nearly 1,900 medical, 800 legal, and 470 chaplain reserve personnel. ARPC also pro-

vides support to some 2,100 students working toward medical degrees under the Health Professions Scholarship program, twenty-five legal interns, and nearly 230 chaplain candidates.

Operation Desert Shield marked the first time in more than two decades that reserve forces had been called up and the first time ever that IRR and retired regulars were mobilized. ARPC's chaplain, medical, and legal directorates were involved in recalling their professional individual mobilization augmentees. These augmentees were assigned to Stateside bases with personnel shortages due to active-duty deployments. In all, ARPC supported the mobilization of 2,566 IMAs, 911 IRRs, and 142 regular retirees.

The Air National Guard by Major Command Assignment

Military Airlift Command

C-5A transport	
105th Airlift Group	Newburgh, N. Y.
C-130 transport	
118th Airlift Wing	Nashville, Tenn.
123d Airlift Wing	Louisville, Ky.
133d Airlift Wing	Minneapolis-St. Paul, Minn.
136th Airlift Wing	Dallas, Tex.
137th Airlift Wing	Oklahoma City, Okla.
146th Airlift Wing	Channel Islands, Calif.
109th Airlift Group	Schenectady, N. Y.
130th Airlift Group	Charleston, W. Va.
135th Airlift Group	Baltimore, Md.
139th Airlift Group	St. Joseph, Mo.
143d Airlift Group	Quonset State Airport, R. I.
145th Airlift Group	Charlotte, N. C.
153d Airlift Group	Cheyenne, Wyo.
164th Airlift Group	Memphis, Tenn.
165th Airlift Group	Savannah, Ga.
166th Airlift Group	Wilmington, Del.
167th Airlift Group	Martinsburg, W. Va.
176th Composite Groupa	Anchorage, Alaska
179th Airlift Group	Mansfield, Ohio

C-141B transport 172d Airlift Group

189th Training Group^b

Jackson, Miss.

Little Rock, Ark.

EC-130E special operations aircraft

193d Special Operations Group Harrisburg, Pa.

HC-130/MH-60G special operations aircraft

106th Rescue Group

Suffolk, N. Y.

129th Rescue Group

NAS Moffett Field, Calif.

Pacific Air Forces

F-15A/B fighter

154th Composite Group

Hickam AFB, Hawaii

Strategic Air Command

KC-135E tanker	
101st Air Refueling Wing	Bangor, Me.
108th Air Refueling Wing	McGuire AFB, N. J.
126th Air Refueling Wing	Chicago, III.
141st Air Refueling Wing	Fairchild AFB, Wash.
171st Air Refueling Wing	Pittsburgh, Pa.
112th Air Refueling Group	Pittsburgh, Pa.
128th Air Refueling Group	Milwaukee, Wis.
134th Air Refueling Group	Knoxville, Tenn.
151st Air Refueling Group	Salt Lake City, Utah
157th Air Refueling Group	Portsmouth, N. H.
160th Air Refueling Group	Rickenbacker ANGB, Ohio
161st Air Refueling Group	Phoenix, Ariz.
168th Air Refueling Group	Eielson AFB, Alaska
170th Air Refueling Group	McGuire AFB, N. J.
186th Air Refueling Group	Meridian, Miss.
190th Air Refueling Group	Topeka, Kan.

On June 1, 1992, all units assigned to MAC, SAC, and TAC will be reassigned to Air Combat Command, Air Mobility Command, Pacific Air Forces, or US Air Forces in Europe.

Tactical Air Command

A-7D/K attack aircraft	
121st Fighter Wing	Rickenbacker ANGB, Ohio
138th Fighter Group	Tulsa, Okla.
150th Fighter Group	Kirtland AFB, N. M.
156th Fighter Group	San Juan, Puerto Rico
178th Fighter Group	Springfield, Ohio
180th Fighter Group	Toledo, Ohio

A-10A attack aircraft

128th Fighter Wing 103d Fighter Group 104th Fighter Group 110th Fighter Group 175th Fighter Group Madison, Wis. Windsor Locks, Conn. Westfield, Mass. Battle Creek, Mich. Baltimore, Md.

F-15A/B fighter 116th Fighter Wing 131st Fighter Wing 159th Fighter Group

Dobbins AFB, Ga. St. Louis, Mo. NAS New Orleans, La.

F-15A/B fighter—air defense

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

F-16A/B/C/D fighter 113th Fighter Wing 122d Fighter Wing 127th Fighter Wing 132d Fighter Wing 140th Fighter Wing 174th Fighter Wing 114th Fighter Group 149th Fighter Group 162d Fighter Group® 169th Fighter Group 181st Fighter Group 183d Fighter Group 184th Fighter Group® 185th Fighter Group 187th Fighter Group 188th Fighter Group 192d Fighter Group

Andrews AFB, Md. Fort Wayne, Ind. Selfridge ANGB, Mich. Des Moines, Iowa Buckley ANGB, Colo. Syracuse, N. Y Sioux Falls, S. D. Kelly AFB, Tex. Tucson, Ariz. McEntire ANGB, S. C. Terre Haute, Ind. Springfield, III. McConnell AFB, Kan. Sioux City, Iowa Montgomery, Ala. Fort Smith, Ark. Richmond, Va.

F-16A/B fighter—air defense

144th Interceptor Wing 107th Interceptor Group 119th Interceptor Group 120th Interceptor Group 125th Interceptor Group 147th Interceptor Group 148th Interceptor Group 158th Interceptor Group 177th Interceptor Group 191st Interceptor Group Fresno, Calif.
Niagara Falls, N. Y.
Fargo, N. D.
Great Falls, Mont.
Jacksonville, Fla.
Ellington Field, Tex.
Duluth, Minn.
Burlington, Vt.
Atlantic City, N. J.
Selfridge ANGB, Mich.

OA-10A observation aircraft

111th Fighter Group

NAS Willow Grove, Pa.

OA-37B observation aircraft

182d Fighter Groupd

Peoria, III.

RF-4C reconnaissance aircraft

117th Reconnaissance Wing 124th Fighter Group^e 152d Reconnaissance Group 155th Reconnaissance Group 163d Reconnaissance Group

Birmingham, Ala. Boise, Idaho Reno, Nev. Lincoln, Neb. March AFB, Calif.

^{*}Includes 210th Air Rescue Squadron with HC-130 and MH-60G aircraft.

PAircrew CCTU.

Replacement Training Unit (RTU)

As of July 1992, 182d Fighter Group will convert to F-16A/B fighter air defense.

[&]quot;Combat Crew Training Unit (CCTU).

Programs scheduled for implementation in 1992 include installation of new office automation software and equipment as the first step in networking computers throughout the center. Along with the Air Force Military Personnel Center, ARPC expects to begin conversion of all microfiche personnel records to optical disk storage.

Air Weather Service

The Air Weather Service (AWS), Scott AFB, III., provides centralized weather support to all levels of the Air Force and Army and serves as USAF's technical center of weather expertise.

The FOA's major subordinate units include Air Force Global Weather Central (AFGWC), Offutt AFB, Neb.; the Air Force Environmental Technical Applications Center (AFETAC) at Scott; and the Air Force Space Forecast Center (AFSFC), Falcon AFB, Colo.

These units provide centralized weather, climatological, and space support to Air Force and Army operations, while the headquarters performs the other three facets of the AWS mission: providing technical advice, developing standardized procedures, and fielding standard systems and new technology for the integrated weather support system.

AFGWC, the largest center, is the weather processing hub for the Air Force and Army. The center gathers thousands of observations and pro-

vides hundreds of products to its customers on a daily basis.

AFETAC provides centralized climatological support by assessing the natural environment from a historical perspective. AFETAC stores historical weather information and conducts climatological studies of weather effects on weapon systems and operations.

Slated to become operational this summer, AFSFC will be the third unit providing centralized support. AFSFC is responsible for monitoring solar activity that can adversely affect surveillance and warning systems, satellite tracking systems, high-frequency communications, and manned spaceflight. AFSFC uses data from sites around the world to monitor the sun and its effects on near-Earth space.

At its headquarters, AWS develops standardized weather and space environmental support procedures and practices that apply across the integrated weather support system. This minimizes training for weather personnel, whether they deploy to the

tactical arena from widely scattered sites or move from one conventional weather station to another.

The agency is currently working on several key initiatives to help weather personnel of the major commands do their jobs more effectively and efficiently. One of these is the Automated Weather Distribution System (AWDS). Already installed at more than sixty military weather facilities around the globe, AWDS revolutionizes the reception, storage, display, and dissemination of weather data. AWDS helps forecasters rapidly manipulate weather data and deliver customer-oriented products.

AWS has also been working closely with the National Weather Service and the Federal Aviation Administration on a new Doppler weather radar program. The Doppler radar network will double the field's capability to detect damaging storms and reduce the number of false alarms by two-thirds. The initial deployment of radars and remote workstations is under way.

Center for Air Force History

Established as an FOA in October 1991, the Center for Air Force History, formerly the Office of Air Force History, is one of two FOAs operating under the policy guidance of the Air Force Historian. The center has two basic missions: to research, write, and publish books and other studies on the history of the Air Force and to provide historical support through the Air Force Historian to Hq. USAF.

The center maintains a dynamic, long-term publishing program. Books are researched and written by center historians, on contract, or by scholars at large. Books published by CAFH help the Air Force formulate strategy, plans, and doctrine; conduct operations; and educate Air Force students at professional military schools, providing them with the knowledge and perspective to lead the Air Force. These books also provide scholars

with research and teaching materials and inform the public about the role of the Air Force and airpower in national security. Center staff also research and write shorter monographs and studies to support the Air Staff and other government agencies.

The book-publishing program of CAFH consists of five series. The USAF at War series comprises narrative histories of the Air Force in combat. The General Histories series analyzes the institutional development of the Air Force and the evolution of broad Air Force functions in peace and war. The Special Studies series addresses more narrow, discrete issues in warfare or the development of Air Force policies, operation, or institutions. Books in the Reference series provide information, usually in dictionary or encyclopedia form, for use by Air Force members,

scholars, and the public. USAF Warrior Studies is a series that makes available reprints of classic works in the development of airpower, airpower and military history memoirs, bibliographies of air histories, and lineage histories.

CAFH also provides a wide range of historical support, through the Air Force Historian, to Hq. USAF. First, it produces an annual history of Hq. USAF, complete with supporting documents appended. Second, it conducts research and provides historical information, analysis, and staff studies as needed to support planning, policy development, and decision-making. Finally, it maintains a library and massive document collection relating to the history of the Air Force for the use of its own personnel and the Air Staff at large, as well as other scholars and the general public.

Joint Services SERE Agency

The Joint Services Survival, Evasion, Resistance, and Escape (SERE) Agency (JSSA) is headquartered at Fort Belvoir, Va. The director of this new, sixty-five-person FOA reports to the Deputy Chief of Staff for Plans and Operations. JSSA serves as the Department of Defense's executive agent for three areas: JCS Operational Evasion and Escape matters, DoD Code of Conduct/SERE training, and the DoD POW/MIA program.

Shortly after the start of the Korean War, the JCS tasked the Air Force to be the DoD Executive Agent for Operational Evasion and Escape (E&E) matters. These E&E responsibilities were divided among Air Staff operations, intelligence, and plans officers until 1983, when these functions were centralized in the Air Force Intelligence Agency/Joint Service Support Directorate (AFIA/INU). On November 15, 1991, AFIA/INU became an FOA and was renamed the Joint Services SERE Agency.

Under its E&E charter, JSSA is responsible for working E&E operational matters with command planners and operators to ensure that tactics, procedures, equipment, and training are adequate and consistent with JCS policy. JSSA recently drafted JCS Joint Publication 3-50.3, "Evasion and Recovery Doctrine," currently being coordinated throughout DoD. JSSA support to Operation Desert Storm included productions of a Mideast SERE guide, evasion charts, blood chits, E&E aids, and SERE update materials, which were sent to CENTCOM, EUCOM, and SOCOM units in southwest Asia. JSSA also assisted CENT-COM and the Rescue Coordination Center in Saudi Arabia with E&E planning and coordination, helped the JCS analyze evasion and recovery information, and managed the debriefings of returned American POWs.

JSSA sponsored and coordinated the joint mobile training team of sixteen SERE instructors sent to Saudi Arabia to provide timely desert survival, evasion, and captivity-related refresher training for Operation Desert Storm's high-risk-of-capture personnel.

JSSA has a special training division, with nineteen personnel, responsible for providing advanced instruction and running exercises for selected high-risk-of-capture personnel in the Army, Navy, and Air Force. This program includes in-depth hostage survival courses for Defense Intelligence Agency military attachés and enlisted support staffs. This division trains personnel in residence and via mobile training teams worldwide. This unit also interviews selected returnees and hostages to improve DoD training programs, policies, and guidelines.

DoD has tasked the Air Force with inspecting the five approved SERE schools, researching training and SERE experiences to recommend improved training, and maintaining a DoD library and archives of Code of Conduct and Prisoner of War materials.

Recently, the Assistant Secretary of Defense for International Security Affairs tasked the Air Force to be the DoD Executive Agent for the drafting and coordination of a DoD Directive on POW/MIA Affairs. This tasking has been placed on JSSA, since it has already been an Executive Agent in two related areas.

7th Communications Group

The 7th Communications Group, located in the Pentagon, is an FOA under the Deputy Chief of Staff for Command, Control, Communications, and Computers. It comprises more than 1,000 military and civilian personnel and provides twenty-four-hour communications and computer support to high-level customers in the Office of the Secretary of Defense (OSD), the Joint Staff, the Office of the Secretary of the Air Force, and the Air Staff.

The 7th CG's wide range of support encompasses voice and data communications operations, maintenance, and security; computer hardware operations, maintenance and security; software applications development and maintenance; and communications-computer requirements, acquisition, installation, and integration. The 7th CG also provides mobile secure communications support to the Sec-

retary of Defense and Chairman of the Joint Staff during trips away from Washington, D. C.

The 7th CG manages more than 2,500 leased circuits and 9,000 telephone lines. It operates and maintains six major switching networks supporting high-quality conferencing capability for the National Military Command Center (NMCC), the OSD Crisis Coordination Center, and the Air Force Operations Center. The Group installs and maintains more than 6,000 administrative telephone units and 3,000 Secure Telephone Units (STU-IIIs) located throughout the Pentagon. It also manages one of the largest communications security (Comsec) key management accounts in the Air Force with more than 2,100 Comsec keys issued on a monthly basis.

To provide mission support for its customers, the 7th CG operates and

maintains fifteen centralized mid- and large-scale computer systems supporting OSD, Joint Staff, and Hq. USAF general-purpose and scientific data-processing needs.

The 7th CG controls more than 20,000 separate items, valued at \$250 million, primarily located in the 30,000-square-foot Central Computer Facility. Connected to the seventy-five-mile USAF local area network (LAN), the 7th CG serves 6,000 Air Force customers and another 5,000 OSD users using the OSD LAN and video teleconferencing system.

For command-and-control systems, the 7th CG engineers, installs, operates, and maintains systems for emergency actions dissemination, missile warning and display, and automated decision-making tools supporting the operational missions of the NMCC, the OSD Crisis Coordination Center, and the Air Force Operations Center.



1992 USAF Almanac The New Eagles: Reports from the 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. A DRU has the same administrative and organizational responsibilities as a major command.

Air Force District of Washington

The Air Force District of Washington (AFDW) is the single manager for support of Air Force activities in the National Capital Region. It is commanded by Brig. Gen. James L. Vick. Although its headquarters is at historic Bolling AFB, D. C., there are AFDW operating locations at the Pentagon; Andrews AFB, Md.; and Fort Meade, Md. AFDW comprises the 1100th Air Base Group (ABG) and the 1100th National Capital Region Support Group (NCR SPTG).

The 1100th ABG is the host unit for Bolling AFB. It has the squadrons and support agencies usually found at base level. Supporting 3, 128 military members and 1,603 civilians, the group provides housing for 295 officers and 1,100 noncommissioned officers; it has 165 transient quarters and maintains a payroll of \$126 million. Its support functions also serve numerous tenant units at Bolling, such as the Air Force Office of Scientific Research, Air Force Office of Special Investigations, and Office of Air Force History. The Surgeon General and the Chief of Chaplains are also among Bolling's Air Staff tenants.

The 1100th NCR SPTG provides broad support to organizations in the region, including the Office of the Secretary of Defense and its agencies, the Joint Staff, Hq. USAF, headquarters of USAF direct reporting units and field operating agencies, the Air Force Civilian Personnel Management Center, and other Air Force elements. Its key functions include personnel, operations, comptroller, accounting and finance, and recreation services for AFDW assets. The Hq. USAF Security Force manages physical, personal, electronic, and information security within the Pentagon.

In addition to the duties associated with these units, AFDW is responsible

Within the purview of the Air Force District of Washington, the Air Force Honor Guard is a highly visible ambassador, participating in military funcrals at Arlington National Cemetery (left) and at arrival and departure ceremonies for visiting dignitaries.

for Air Force ceremonial events in the nation's capital. Two of its most visible ambassadors are the US Air Force Honor Guard and the US Air Force Band, both based at Bolling.

The Honor Guard represents the Air Force at arrival and departure ceremonies for visiting dignitaries at the White House, the Pentagon, and Andrews AFB. It also participates in military funerals at Arlington National Cemetery and in memorial ceremonies at the Tomb of the Unknowns.

The Air Force Band boasts some of the nation's best musicians. Its varied components perform music worldwide in support of Air Force community relations programs.

AFDW's "Drug Free" program has appeared at National Capital Region schools. This program, designed to educate young people on the hazards of drug use and provide them with positive, drug-free role models, is cosponsored by the Drug Enforcement Administration (DEA).

Cabata h. Valid Wallet

Air Force Operational Test and Evaluation Center



AFOTEC helps reduce risks in the acquisition process by operating and maintaining new and modified systems in a realistic environment. It is currently evaluating the C-17 (above), the B-2, and other systems critical to the Air Force's future.

The Air Force Operational Test and Evaluation Center (AFOTEC) is the Air Force's independent test agency responsible for operational testing of new or modified weapon systems and components being developed for Air Force and multiservice use.

AFOTEC's commander, Maj. Gen. Marcus A. Anderson, reports directly to the Chief of Staff of the Air Force. The primary purpose of operational test and evaluation is to reduce risk in the acquisition process by deter-

mining how well systems perform when operated and maintained by USAF personnel in a realistic operational environment. The results from the center's tests are used at all levels of the Air Force and DoD to support program decisions that lead to the production and fielding of systems. The center focuses on evaluating the operational effectiveness and suitability of the Air Force's future weapon systems and support equipment.

The center tests and evaluates equipment used over the entire spectrum of Air Force missions, including aircraft, strategic missiles, munitions, space systems, flight simulators, intelligence systems, and command, control, and communications systems. The center is currently conducting tests that involve the B-2 Stealth bomber, the Advanced Medium-Range Air-to-Air Missile (AMRAAM), and the Consolidated Space Operations Center. The center is also testing the high-



Part of providing a realistic test environment is using equipment already in the inventory to test newer systems. This F-4E is being used to test and evaluate the operational effectiveness of versions of the Maverick missile (here, the AGM-65G). The 2,000 personnel under AFOTEC's operational control form an independent test force with current operational experience.

speed antiradiation missile (HARM) and the C-17 transport plane.

AFOTEC has approximately 600 people assigned to its headquarters at Kirtland AFB, N. M., three detachments, and operating locations. The center has detachments at Eglin AFB, Fla.; Edwards AFB, Calif.; and Peterson AFB, Colo.

AFOTEC personnel form the management cadre for test programs, while the major commands supply the test teams with the majority of their evaluators. There are approximately 2,000 individuals under the center's operational control. The additional personnel provide current operational experience to ensure that the evaluation

reflects the needs of the ultimate users of the system—operators, maintainers, and support and training specialists. By testing under operationally realistic conditions, the center ensures that the equipment will meet users' requirements and will be ready for operational use in accomplishing the Air Force's mission.

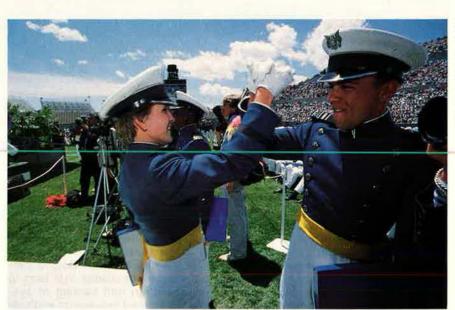
US Air Force Academy

The staff and faculty of the United States Air Force Academy are charged with providing instruction and experience to all cadets so that they graduate with the knowledge, character, and motivation essential to leadership as career officers in the US Air Force. Before its graduates enter various flying and support specialties, the Academy trains them to be, first and foremost, Air Force officers. Of the more than 24,000 cadets who have graduated from the Academy in thirty-three classes, nearly sixty percent are still on active duty.

During its short history, the Academy has become a leader among undergraduate institutions. Thirty cadets have earned Rhodes scholarships. Nearly 200 others have been named Guggenheim or Natlonal Science Foundation Fellows, earned Marshall or Fulbright-Hays scholarships, or accepted scholarships to attend Harvard University's John F. Kennedy School of Government.

Cadets completing four years of studies earn a bachelor of science degree. Academics, military training, athletic conditioning, and spiritual and ethical development are emphasized. Academics include classes in the basic sciences, engineering, the humanities, and the social sciences. Within this framework, all cadets complete a core curriculum of 91.5 semester hours. They can specialize in any of twenty-five academic majors.

Nearly all Academy professors wear the uniform of the US Air Force. Military development is central to the Academy experience and distinguishes it from other institutions of higher learning. Four primary areas are stressed: professional military studies, theoretical and applied leadership experiences, aviation science and airmanship programs, and military training. The intent is to provide the cadets the knowledge, skills, values, and behavior patterns necessary



After four years of meeting stringent academic, athletic, and ethical requirements, Academy grads allow themselves a display of congratulatory emotion. In a little more than thirty years of providing instruction and experience to future officers, the Academy has moved into the higher echelons of US universities.

to meet the leadership challenges of the twenty-first century.

Most cadets complete the sailplane program, about half earn parachutist badges, and all cadets planning to become pilots complete training in T-41s. About two-thirds of all graduates attend undergraduate pilot training.

Graduates from the Class of 1992 who enter pilot training incur an active-duty service commitment of eight years after earning their wings. Class of 1992 graduates not attending flying training incur a five-year active-duty service commitment. Those in the Class of 1996 and subsequent years will incur a six-year commitment.

Few schools in the country have an athletic program as extensive as the Academy's. It includes intercollegiate sports, intramurals, and physical education. The Academy's goal is to enhance the physical conditioning of all cadets, develop the physical skills nec-

essary for officership, teach leadership in a competitive environment, and build character.

Seventeen men's and ten women's intercollegiate teams compete nationally. Each of the forty cadet squadrons fields a team in nineteen intramural sports, such as football, tennis, swimming, wrestling, and crosscountry. The physical education program consists of mandatory courses and electives ranging from gymnastics to scuba diving.

The Honor Code is the centerpiece of a cadet's moral and ethical development. Cadets pledge: "We will not lie, steal, or cheat, nor tolerate among us anyone who does." All cadets take a formal course in ethics and receive honor and ethics instruction.

Information on admission procedures can be obtained from the Director of Admissions, US Air Force Academy, CO 80840-5651.

JSAF photo by TSgt. Dennis Rogers



1992 USAF Almanac Guide to Air Force Installations Worldwide

Major Installations

Altus AFB, Okla. 73523-5000; within Altus city limits. Phone (405) 482-8100; DSN 866-1110. MAC base. As of June 1, 1992, Altus becomes an AMC base. 443d Airlift Wing; 340th Air Refueling Wing; Field Training Det. 403; 71st Flying Training Wing, OLK ACE Det. (ATC), T-37 aircraft operations. Base activated Jan. 1943; inactivated May 1945; reactivated Jan. 1953, Area 3,876 acres, plus 818 leased. Altitude 1,376 ft. Military 3,203; civilians 796; approx. 200–300 TDY students (officer and enlisted) in training per month. Payroll \$92.9 million. Housing: 143 officer, 657 NCO, 382 VAC, 160 VOQ, 10 transient family units. 20-bed hospital.

Andersen AFB, Guam, APO AP 96542-5000; 2 mi. N of Yigo. DSN 366-1110. PACAF base. No aircraft assigned. Hq. 13th Air Force (transferred from Clark AB, the Philippines). Host unit: 633d Air Base Wing, Tenant unit: 605th Military Airliff Support Sqdn. Det. 1, 909th Air Refueling Sqdn. (PACAF); Det. 1, 633d Air Base Wing; 44th Aerial Port Sqdn. (AFRES); Field Training Det. 911th OLB; 254th Air Base Gp. (ANG); Det. 5, 2d Satellite Tracking Gp; Det. 6, 2d Aircraft Delivery Gp; Det. 815, Air Force Audit Agency; Det. 4203, Air Force Office of Special Investigations. Base also supports Joint Typhoon Warning Center, Northwest Field, and Andersen South housing area. Andersen serves as a vital refueling point for aircraft operating in the Pacific. Base activated 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, Headquarters Army Air Forces, Pacific Ocean Areas. Area: 20,504 acres. Altitude: 612 ft. Military 2,461; civilians 925. Payroll \$75.1 million. Housing: 249 officer, 1,503 enlisted. Unaccompanied housing: 109 officer, 1,026 enlisted. 217 VOQ, 407 VAQ. One clinic and one Navy hospital on island.

Andrews AFB, Md. 20331-5000; 11 mi. SE of Washington, D. C. Phone (301) 981-9111; DSN 858-1111, MAC base. As of June 1, Andrews becomes an AMC base. Hq. Air Force Systems Command (AFSC) until July 1, 1992, official date of AFSC deactivation and transfer of assets to Air Force Materiel Command, headquartered at Wright-Patterson AFB, Ohio. Home of Air Force One and gateway to the nation's capital, Host Wing is 89th Wing. Responsible for Presidential support and base operations. It supports all branches of service, several major commands, and federal agencies. The wing also hosts the Air National Guard Readiness Center (ANGRC); 113th Fighter Wing (D. C. ANG); 459th Airliff Wing (AFRES); 1361st Audiovisual Sqdn.; Naval Air Facility; Marine Alrcraft Gp. 41, 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 (incl. easements). Altitude 281 ft. Military 10,009; civilians 3,201. Payroll \$402.8 million. Housing: 362 officer, 1,721 NCO, 210 mobile home spaces, 312 transient (incl. 68 temporary living quarters for incoming personnel, 88 DV suites, 128 VOQ, 28 VAQ), 235-bed hospital.

Arnold AFB, Tenn. 37389; approx. 7 mi. SE of Manchester. Phone (615) 454-3000; DSN 340-5011. AFSC base. As of July 1, 1992, Arnold becomes an AFMC base. Site of Arnold Engineering Development Center, the nation's largest complex of wind tunnels, jet and rocket engine test cells, space simulation chambers, and hyperballistic ranges. AEDC supports the acquisi-

tion of new aerospace systems by conducting research, development, and evaluation testing for DoD, other government agencies, and commercial aerospace firms. Base dedicated June 25, 1951; named for Gen. H. H. "Hap" Arnold, wartime Chief of the AAF. Area 40,118 acres. Altitude 1,100 ft. Military 143; civilians 232; contractor employees 3,084. Payroll \$173.7 million. Housing: 23 officer, 17 NCO, 45 transient. Medical aid station.

Aviano AB, Italy, APO AE 09601; adjacent to Aviano, 50 mi. N of Venice, Italy. Phone (commercial, from CONUS) 011-39-434-667111; DSN 632-1110, USAFE base. 40th Support Wing manages this USAFE main operating base in support of USAFE and NATO. Although no aircraft are permanently assigned, host unit would exercise command and control of a variety of deployed weapon systems in case of a war in Europe, It also provides administrative and logistical support to 50 off-base units at 31 locations throughout Italy, Aviano is the only USAF tactical air base in Italy. Originally an Italian flying school, which opened in 1939; 40th SW began operation in Apr. 1966. Area 1,140 acres. Altitude 319 ft. Military 2,500; civilians 550. Payroll \$85.1 million. No on-base or government-leased housing. 490 billeting spaces (including contracted spaces), 560 dorm bed spaces, Clinic.

Barksdale AFB, La. 71110-5000; in Bossier City. Phone (318) 456-2252; DSN 781-1110. SAC base. As of June 1, 1992, Barksdale becomes an ACC base. Hq. 8th Air Force; 2d Wing, B-52G, KC-135, and KC-10 operations; 1st Electronic Combat Range Gp.; 46th Communications Sqdn.; Det. 1, 307th Civil Engineering Sqdn. RED HORSE; Det. 1, 14th Flying Training Wing, T-37 operations; Det. 5, 3904th Management Engineering Sqdn.; Det. 3, 458th Airlift Sqdn., C-21 operations; 49th Test Sqdn.; Det. 1, 3903d School Sqdn.; 98th Air Refueling Gp. (AFRES), KC-10 operations; 917th Fighter Wing (AFRES), A-10 operations; Det. 1, 1360th Aerospace Audiovisual Sqdn. Also home of 8th Air Force Museum. The 917th FW trains all ANG and AFRES pilots in the 46th Fighter Training Sqdn. Base activated Feb. 2, 1933; named for Lt. Eugene H. Barksdale, WW 1 airman killed Aug. 1926 in crash near Wright Field, Ohio. Area 22,000 acres (20,000 acres reserved for recreation). Altitude 166 lt. Military 7,428; civilians 1,193. Payroll \$327 million. Housing: 161 officer, 268 NCO, 27 transient. 40-bed hospital.

Beale AFB, Calif. 95903-5000; 13 mi. E of Marysville. Phone (916) 634-3000; DSN 368-1110. SAC base. As of June 1, 1992. Beale becomes an ACC base. Hq. 2d Air Force; 9th Wing; 7th Missile Warning Sqdn. (AF-SPACECOM). Aircraft include U-2/TR-1 reconnaissance circraft, KC-135 Stratotankers, and T-38 Talon trainers. Originally US Army's Camp Beale. Became Air Force installation Apr. 1948; became AFB Nov. 1951. Named for Brig. Gen. E. F. Beale, Indian agent in California prior to Civil War. Area 22,944 acres. Altitude 113 ft. Military 3,442; civilians 444. Payroll \$93.6 million. Housing: 217 officer, 1,501 enlisted, 94 transient, 25-bed hospital.

Bergstrom AFB, Tex. 78743-5002; 7 mi. SE of downtown Austin. Phone (512) 479-4100; DSN 685-1110. TAC base. As of June 1, 1992, Bergstrom becomes an ACC base. 67th Reconnaissance Wing, RF-4C reconnaissance operations; Hq. 12th Air Force; Hq. 10th Air Force (AFRES); 924th Fighter Gp. (AFRES), F-

16A fighter operations; TAC NCO Academy West; 602d Air Control Gp. Base activated 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. Area 4,050 acres. Altitude 541 ft. Military 3,870; civilians 634. Payroll \$122 million. Housing: 75 officer, 644 enlisted, 408 transient (88 VOQ, 120 VAQ, 200 TLF). 30-bed hospital. Base scheduled for closure September 1992.

Bitburg AB, Germany, APO AE 09132-5000; 15 mi. N of Trier, Germany. Phone (commercial, from CONUS) 011-49-6561-61-1110; DSN 453-1110. USAFE base, 36th Fighter Wing with two fighter squadrons flying F-15C/D Eagles. Base activated 1952. Area 1,735 acres. Altitude 1,228 ft. Military 4,995; civilians 1,020. Payroll \$168 million. Housing: 75 officer, 1,237 NCO, 9 transient. 40-bed hospital.

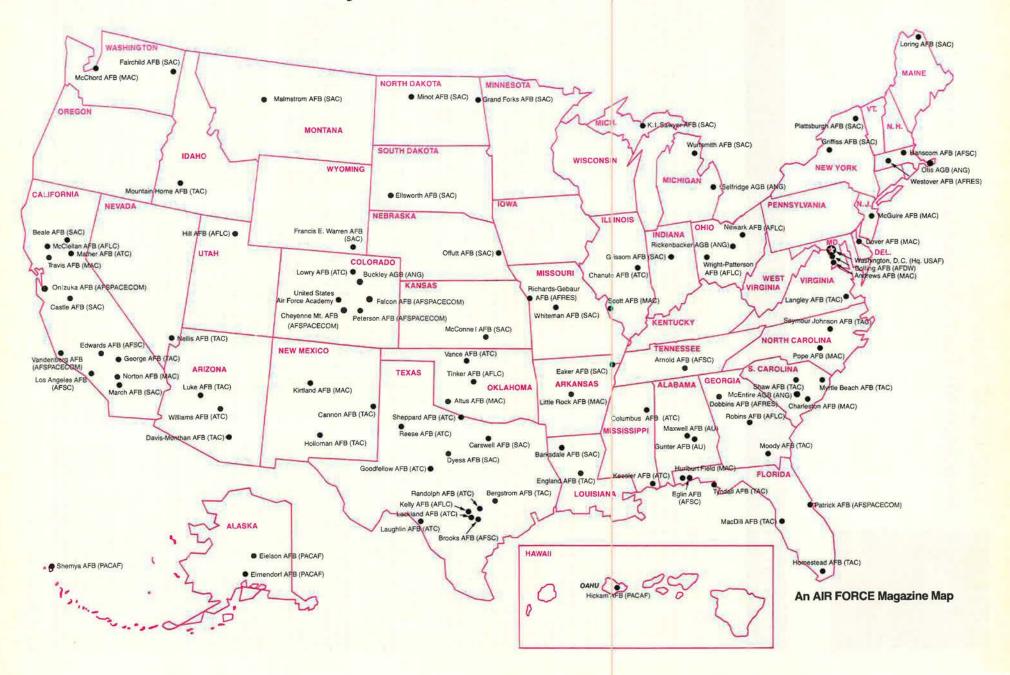
Bolling AFB, D. C. 20332-5000; 3 mi. S of US Capitol. Phone (202) 545-6700; DSN 227-0101. Air Force District of Washington. 1100th Air Base Gp.; US Air Force Honor Guard; US Air Force Band; Air Force Office of Scientific Research (AFSC); Air Force Chief of Chaplains; Air Force Surgeon General; Air Force Office of History; Hq. Air Force Office of Special Investigations; Defense Intelligence Agency. Activated Oct. 1917; named for Col. Raynal C. Bolling, first high-ranking Air Service officer killed in WW I. Area 604 acres. Military 3,128; civilians 1,063. Payroll \$126 million. Housing: 295 officer, 1,100 NCO, 165 transient. Clinic.

Brooks AFB, Tex. 78235; in SE San Antonio. Phone (512) 536-1110; DSN 240-1110. AFSC base. As of July 1, 1992, Brooks becomes an AFMC base. Human Systems Div.; USAF School of Aerospace Medicine (AFSC); Armstrong Laboratory; 6570th Air Base Gp. Tenant units include 6575th School Sqdn. (Systems Acquisition School); Air Force Office of Medical Support; Det. 26, 6592d Management Engineering Sqdn.; 6906th Electronic Security Sqdn. Base activated Dec. 8, 1917; named for Cadet Sidney J. Brooks, Jr., killed Nov. 13, 1917, on his commissioning flight. Area 1,310 acres. Allitude 600 ft. Military 1,858; civilians 1,410. Payroll \$98 million. Housing: 69 officer, 101 NCO. Clinic.

Cannon AFB, N. M. 88103-5000; 7 mi. W of Clovis. Phone (505) 784-3311; DSN 681-1110. TAC base. As of June 1, 1992, Cannon becomes an ACC base. 27th Fighter Wing, EF/F-111D/F/G fighter operations. Base activated 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. Altitude 4,295 ft. Military 4,465; civilians 490. Payroll \$128,5 million, Housing: 149 officer, 862 enlisted, 81 transient (20 VAQ, 30 VOQ, 31 TLF). 20-bed hospital.

Carswell AFB, Tex. 76127-5000; 7 mi. WNW of downtown Fort Worth. Phone (817) 782-5000; DSN 739-1110, SAC base, As of June 1, 1992, Carswell becomes an ACC base, Th Wing; 301st Tactical Fighter Wing (AFRES); 436th Strategic Training Sqdn.; Det. 7, USAF Global Weather Central; Det. 415, 3751st Field Training Sqdn.; aircraft include B-52s, KC-135s, and AFRES F-16s, T-37 Accelerated Copilot Enrichment Program. Base activated Aug. 1942; named Jan. 30, 1948, for Maj. Horace S. Carswell, Jr., native of Fort Worth, WW IIB-24 pilot, and posthumous Medal of Honor recipient. Carswell is the only military

Major Air Force Installations in the US



facility to have its namesake interred on the premises, Area 3,274 acres. Altitude 650 ft. Military 6,814; civilians 1,545. Payroll \$173.1 million. Housing: 78 officer, 299 NCO, 106 VOQ, 18 TLF, 80 VAQ. 140-bed regional hospital. June 1, 1992, the housing waiting list will be frozen, Base scheduled for closure September 1993.

Castle AFB, Calif. 95342-5000; 8 mi. NW of Merced. Phone (209) 726-2011; DSN 347-1110. SAC base. As of June 1, 1992, Castle becomes an ACC base. 93d Wing. Conducts training of all SAC B-52 and KC-135 aircrews. Site of Castle Air Museum. Base activated Sept. 1941; named for Brig. Gen. Frederick W. Castle, WW II B-17 pilot and Medal of Honor recipient. Area 2,700 acres. Altitude 188 ft. Military 4,731; civilians 492. Payroll \$145.9 million. Housing: 92 officer, 841 NCO, 392 transient (incl. 88 VAQ, 272 VOQ, 12 family quarters, 20 DVQ), 25-bed hospital.

Chanute AFB, III. 61868-5000; 14 mi. N of Champaign at Rantoul, III. Phone (217) 495-1110; DSN 862-1110. ATC base. Chanute Technical Training Center provides training in missile and aircraft mechanics, aerospace ground equipment, life support, metallurgy and nondestructive inspection, weather forecasting, and fire protection and rescue. Display center and historical aircraft park constitute a base museum, Base activated May 1917; named for Octave Chanute, aeronautical engineer and glider pioneer who died in 1910, Area 2,174 acres. Altitude 735 ft. Military 4,033; civilians 845. Payroll \$114.8 million. Housing: 154 officer, 1,169 enlisted, 1,285 transient (285 VOQ, 1,000 VAQ, 32 TLF). 15-bed hospital. Base scheduled for closure September 1993.

Charleston AFB, S. C. 29404-5000; located in North Charleston 10 mi. from downlown Charleston. Phone (803) 566-6000; DSN 673-2100. MAC base. As of June 1, 1992, Charleston becomes an AMC base. Joint-use airfield. 497th Airlift Wing; 315th AW (AFRES Assoc.); Det. 1, 107th Fighter Interceptor Gp.; Det. 7, 1361st Audiovisual Sqdn. Base activated Dec. 1941; inactivated Feb. 1946; reactivated 1952. Area 6,256 acres (incl. auxiliary airfield). Altitude 45 ft. Military 7,733 (incl. AFRES); civilians 1,946. Payroll \$163 million. Housing: 127 officer, 850 NCO, 1,636 dormitory spaces, 75 trailer spaces, 535 transient (7 DV suites, 128 VOQ, 400 VAQ). Medicat clinic.

Cheyenne Mountain AFB, Colo. 80914-5515; 6 mi. S of Colorado Springs. Phone (719) 554-7321; DSN 692-7011. AFSPACECOM base. Host unit: 21st Space Wing (AFSPACECOM). Cheyenne Mountain Support Group, North American Aerospace Defense Command (NORAD) Command Center, and US Space Command operations center. Base activated 1966. Area 451 acres. Altitude 7,200 ft. More than 1,400 people representing US Army, Navy, and Air Force; Canadian Forces; and civilian technicians. No housing or transient quarters. Medical aid station.

Columbus AFB, Miss. 39701-5000; 10 mi. NNW of Columbus. Phone (601) 434-7322; DSN 742-1110. ATC base. 14th Flying Training Wing, undergraduate pilot training. Base activated 1941 for pilot training. Area 6,015 acres. Altitude 214 ft. Military 2,000; civilians 550. Payroll \$56 million. Housing: 357 officer, 448 NCO, 60 transient. 7-bed hospital.

Davis-Monthan AFB, Ariz. 85707-5000; within the city limits of Tucson. Phone (602) 750-3900; DSN 361-1110. TAC base. As of June 1, 1992, Davis-Monthan becomes an ACC base. 836th Air Div.; 355th Fighter Wing, A-10 combat crew training; 602d Air Control Wing, OA-10 and FAC training, operations, and management of 12th AF Air Control Sqdn.; 41st Electronic Combat Sqdn., EC-130H electronic operations; 71st Special Operations Sqdn. (AFRES), HH-3 Jolly Green Giant helicopter operations; Det. 1, 120th Fighter Interceptor Gp. (Mont. ANG), F-16 air defense operations. Also site of AFLC's Aerospace Maintenance and Regeneration Center, storage location for excess DoD aerospace vehicles. Base activated 1927; named for two local early aviators: 1st Lt. Samuel H. Davis, killed Dec. 28, 1921, and 2d Lt. Oscar Monthan, killed Mar. 27, 1924. Area 11,000 acres. Altitude 2,620 ft. Milliary 5,155; civilians 1,369. Payroll \$174.1 million. Housing: 133 officer, 1,106 enlisted, 518 transient (334 VAQ, 168 VOQ, 16 TLF), 35-bed hospital.

Dover AFB, Del. 19902-5154; 3 mi. SE of Dover, Phone (302) 677-2113; DSN 455-3000. MAC base. As of June 1, Dover becomes an 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 1946; reactivated Feb. 1951. Area 3,734 acres. Altitude 28 ft. Military 6,681; civilians 1,421. Payroll \$123.8 million. Housing: 108 officer, 1,448 enlisted, 763 transient (608 VAQ, 155 VOQ). 14 TLF. 30-bed hospital.

Dyess AFB, Tex. 79607-5000; WSW border of Abilene. Phone (915) 696-0212; DSN 461-1110. SAC base. As of June 1, 1992, Dyess becomes an ACC base. 96th Wing, two B-1B squadrons (one operational, one training), one KC-135 squadron; 463d Airlift Wing, two C-130 squadrons; 12th Flying Training Wing ACE Det. OLC. First base to activate an operational B-1B wing. Conducts all B-1 combat crew training for the Air Force. First B-1B arrived June 1985; wing met initial operational capability Oct. 1986. Base activated Apr. 1942; deactivated 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., Dec. 1943. Area 6,405 acres. Altitude 1,789 ft. Milltary 5,331; civilians 449. Payroll \$220 million. Housing: 120 officer, 870 NCC, 271 VAQ/VOQ, 40 TLF. 35-bed hospital.

Eaker AFB, Ark. 72315-5000; 4 mi. NW of Blytheville. Phone (501) 762-7000; DSN 721-1110. SAC base. As of June 1, 1992, Eaker becomes an ACC base. 97th Support Gp, Base activated June 1942; inactivated Feb. 1947; reactivated Aug. 1955; scheduled for closure Dec. 1992. Known as Blytheville AFB until 1988, when name was changed to honor the late Gen. Ira C. Eaker, airpower pioneer and leader of 8th Air Force in World War II. Area 3,931 acres. Altitude 254 ft, Military 920; civilians 200. Payroll \$79.1 million. Housing: 195 officer, 733 NCO, 69 transient. Clinic.

Edwards AFB, Calif. 93523; 20 mi. E of Rosamond. Phone (805) 277-1110; DSN 527-1110. AFSC base. As of July 1, 1992, Edwards becomes an 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 Lab's Astronautics Directorate, US Army Aviation Engineering Flight Activity, NASA's Ames Dryden Flight Research Facility, Jet Propulsion Laboratory's test facility, and secondary landing site for space shuttle missions. Base activities began in Sept. 1933, Originally Muroc Army Air Field; renamed for Capt. Glen W. Edwards, killed June 5, 1948, in crash of a YB-49 "Flying Wing." Area 301,000 acres. Altitude 2,302 ft. Military 4,600 (incl. tenant units); government and contractor civilians 11,000. Payroll \$571.4 million (incl. tenant units and contractors). Housing: 536 officer (incl. BOQ), 3,164 enlisted (incl. 1,466 dormitory spaces and 191 BNCOQ), 196 transient (60 VAQ, 70 VOQ, 5 SNOQ, 10 VIP/VOQ, 51 TLF), 188 mobile home spaces. 25-bed hospital.

Eglin AFB, Fla. 32542; 2 ml. SW of the twin cities of Niceville and Valparaiso; 7 ml. NE of Fort Walton Beach. Phone (904) 882-1110; DSN 872-1110. AFSC base. As of July 1, 1992, Eglin becomes an AFMC base. Eglin is the nation's largest air force base in terms of land area, covering an area roughly two-thirds the size of Rhode Island. Host unit: Air Force Development Test Center. Associate units: Aeronautical Systems Division, Eglin, and Armament Directorate of Wright Laboratory (AFSC); 33d Fighter Wing; Air Warfare Center; 3207th Communications—Computer Systems Gp.; 919th Special Operations Gp. (AFRES); 20th Surveillance Sqdn.; 55th Special Operations Sqdn.; 9th Special Operations Sqdn.; 655th Special Operations Maintenance Sqdn.; 728th Tactical Control Sqdn.; US Army Ranger Training Battalion; a US Navy Explosive Ordnance Disposal School; Air Force Armament Museum. Base activated 1935; named for Lt. Col. Jercelick I. Eglin, WW I flyer killed in aircraft accident Jan. 1, 1937. Area 463, 452 acres. Altitude 85 ft. Military 11,109; civilians 4,535 (excl. Hurlburt Field), Payroll \$475 million (excl. Hurlburt Field). Housing: 226 officer, 2,071 enlisted, 226 trailer spaces (officer and enlisted), 87 family transient. 145-bed USAF regional hospital. AFSC clinic at Hurlburt Field.

Eielson AFB, Alaska 99702-5000; 26 mi. SE of Fairbanks. Phone (907) 377-1178; DSN (317) 377-1170. PACAF base. Host unit: 343d Wing. F-16C/D fighter operations and OA-10 forward air control operations. Major tenants include 6th Strategic Reconnaissance Wing (6th SRW is scheduled for inactivation in 1992 with RC-135 reconnaissance mission transferring to 55th Wing, Offutt AFB, Neb. Cope Thunder exercises assigned in 1992 increase the base population by 126 permanent party military and civilians and 2,000 temporary duty members); Arctic Survival School (ATC): 168th Air Refueling Gp. (ANG). Base activated Oct. 1944; named for Carl Ben Eielson, Arctic aviation pioneer who died Nov. 1929. Area 23,500 acres. Attitude 534 ft. Military 3,500; civilians 1,300. Payroll \$123.3 million. Housing: 810 enlisted, 118 VOQ, 152 VAQ. Clinic.

Ellsworth AFB, S. D, 57706-5000; 12 mi. ENE of Rapid City. Phone (605) 385-1000; DSN 675-1000. SAC base. As of June 1, 1992, Ellsworth becomes an ACC base. Host unit: 28th Wing, two B-1B squadrons, one KC-135R squadron, and one EC-135 squadron. Tenant units: 44th Missile Wing, Minuteman II operations; 99th Tactics and Training Wing, SAC focal point for strategic tactics development and bomber crew training. Home of South Dakota Air and Space Museum. Base activated July 1942 as Rapid City Army Air Base; 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. Altitude 3,286 ft. Military 6,360; civilians 714. Payroll \$146.3 million. Housing: 364 officer, 1,722 enlisted, 246 transient units (DV 7, VOQ 40, VAQ 112, Tactics and Training Center crews quarters 48, TLF 39). 25-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 operations. Tenant units: 11th Air Control Wing (PACAF); Alaskan NORAD Region Operations Control Center; Rescue Coordination Center; 962d AWACS; 6981st Electronic Security Gp. (AFIC); 616th Military Airlift Gp.; 17th Airlift Sqdn.; 3d Medical Center; plus varied US Army, Navy, and Marine activities. Base activated July 1940; named for Capt. Hugh Elmendorf, killed Jan. 13, 1933, at Wright Field, Ohio, while flight-testing a new pursuit plane. Area 13,130 acres. Altitude 118 ft. Military 6,254; civilians 1,590. Payroll \$236.4 million. Housing: 232 officer, 1,484 NCO, 94 temporary lodging units, 94 VOQ, 301 VAQ. Unaccompanied housing: 1,190 enlisted. 75-bed hospital.

England AFB, La. 71311-5004; 5 mi. W of Alexandria. Phone (318) 448-2100; DSN 683-1110. TAC base. As of June 1, 1992, England becomes an ACC base. 23d Fighter Wing "Fighting Tigers." A-10 fighter operations (scheduled for transfer to Pope AFB, N. C., in 1992). Base activated Oct. 1942; named for Lt. Col. John B. England, WW II P-51 pilot and ace credited with 17.5 victories, killed Nov. 17, 1954, in F-86 crash in France. Area 2,282 acres. Altitude 89 ft. Military 2,933; civilians 1,136. Payroll \$103.1 million. Housing: 92 officer, 506 enilisted, 48 trailer park spaces, 76 transient (38 VAQ, 33 VOQ, 5 TLF). 15-bed hospital, Base scheduled for closure December 1992.

Fairchild AFB, Wash. 99011-5000; 12 mi. WSW of Spokane. Phone (509) 247-1212; DSN 657-1212, SAC base. As of June 1, 1992, Fairchild becomes an ACC base. 92d Wing; 3636th Combat Crew Training Wing (ATC); 141st Air Refueling Wing (ANG); Det. 24, 37th Air Rescue Sqdn.; 5th Satellite Control Sqdn. (AFSPACECOM); 2039th Communications Sqdn. Base activated Jan. 1942; named for Gen. Muir S. Fairchild, USAF Vice Chief of Staff at his death in 1950. Area 4,223 acres. Altitude 2,462 ft. Military 4,356; civilians 957. Payroll \$103.8 million for active-duty military and civilian; \$20 million for ANG. Housing: 221 officer, 1,359 NCO, transient includes 126 VOQ, 121 VAQ, and 8 temporary lodging facilities. 40-bed hospital.

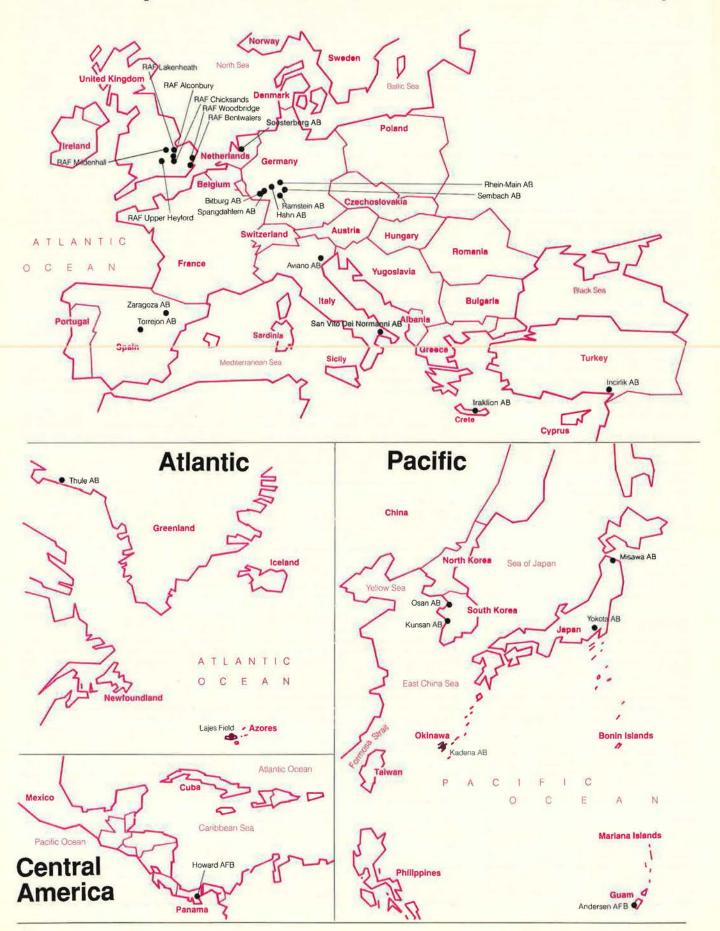
Falcon AFB, Colo. 80912-5000; 10 mi. E of Colorado Springs. Phone (719) 550-4113; DSN 560-1110. AFSPACECOM base. Host unit: 50th Space Wing. Tenant units: 73d Space Gp.; Air Force Space Forecast Center; Strategic Defense Initiative National Test Facility. Base activated Sept. 26, 1985. Area 3,840 acres. Altitude 6,267 ft. Military active-duty 1,900; civilians 300; 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. SAC base. As of June 1, 1992, Warren becomes an ACC base. 90th Missile Wing; 37th Air Rescue Sqdn. 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, plus 50 Peacekeeper and 150 Minuteman III missile sites distributed over 12,600 sq. mi. in Wyoming, Colorado, and Nebraska. Altitude 6,142 ft. Military 4,173; civilians 547. Payroll \$100 million. Housing: 114 officer, 717 enlisted, 36 transient. 25-bed hospital.

George AFB, Calif. 92394-5000; 6 mi, NW of Victorville. Phone (619) 269-1110; DSN 353-1110. TAC base. As of June 1, 1992, George becomes an ACC base. 35th Fighter Wing, F-4d training and operations, F-4 transitional and upgrade training, and German Air Force F-4 training; Det. 1, 144th Interceptor Wing (Calif. ANG). Base activated 1941; named for Brig. Gen.

USAF's Major Installations Overseas

Europe



Harold H. George, WW I fighter pilot killed Apr. 29, 1942, in aircraft accident in Australia. Area 5,348 acres. Altitude 2,875 ft. Military 3,600; civilians 507. Payroll \$93.8 million. Housing: 145 officer, 1,494 enlisted, 115 transient (23 VAQ, 52 VOQ, 40 TLF). 20-bed hospital. Base scheduled for closure December 1992.

Goodfellow AFB, Tex. 76908-5000; 2 mi. SE of San Angelo. Phone (915) 654-3231; DSN 477-3231. ATC base. Goodfellow Technical Training Center provides technical training for all Air Force people entering intelligence career fields and also provides cryptologic training for members of the other military services, civilian intelligence agencies, and foreign military services. Major units include 3480th Technical Training Gp. (ATC); 8th Missile Warning Sqdn, at nearby Eldorado AFS, the location of Southwest Pave Paws radar site (AFSPACECOM); NCO Professional Military Education Center (Air Force Intelligence Command); 344th Military Intelligence Battalion (Army); Naval Technical Training Center Detachment; Marine Corps Detachment. Base activated Jan. 1941; named for Lt. John J. Goodfellow, Jr., WW I fighter pilot killed in combasept. 14, 1918, Area 1,136 acres. Altitude 1,877 ft. Military 3,134; civilians 622. Payroll \$97 million. Housing: 35 officer, 264 NCO, 934 transient (734 VAQ, 170 VOQ, 30 TLF). Clinic.

Grand Forks AFB, N. D. 58205-5000; 16 mi. W of Grand Forks. Phone (701) 747-3000; DSN 362-1110. SAC base. As of June 1, 1992, Grand Forks becomes an ACC base. 319th Wing (KC-135R and B-1B); 321st Missile Wing (Minuteman III); 2152d Communications Sqdn.; Det. 15, 26th Weather Sqdn.; 419th Field Training Det. (ATC); Det. 3, 37th Air Rescue Sqdn.; 41st Flying Training Sqdn. (ATC); ACE Det. Base activated 1956; named after the city 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. Attitude 911 ft. Military 4,662; civilians 773. Payroll \$124 million. Housing: 384 officer, 1,887 NCO, 136 translent. 15-bed hospital.

Griffiss AFB, N. Y. 13441-5000; 1 mi. NE of Rome. Phone (315) 330-1110; DSN 587-1110. SAC base. As of June 1, 1992, Griffiss becomes an ACC base. 416th Wing; Rome Laboratory (AFSC); 485th Engineering Installation Gp.; Northeast Air Defense Sector. 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 while in the line of duty). Area 3,896 acres. Altitude 504 ft. Millitary 5,923; civilians 3,009. Payroll \$244.8 million. Housing: 169 officer, 566 NCO, 50 trailers, 109 transient, 20-bed hospital.

Grissom AFB, Ind. 46971-5000; 7 mi. S of Peru. Phone (317) 688-5211; DSN 928-1110. SAC base. As of June 1, 1992, Grissom becomes an AMC base, 305th Air Refueling Wing; 930th Fighter Gp. (AFRES); 434th Air Refueling Wing (AFRES). Activated Jan. 1943 for Navy flight training; reactivated June 1954 as Bunker Hill AFB; renamed May 1968 for 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. Area 3,000 acres. Altitude 800 ft. Military 2,693; civilians 836. Payroll \$59 million (SAC only). Housing: 144 officer, 972 NCO, 133 transient. Clinic, outpatient care only.

Gunter AFB, Ala. 36114; see Maxwell AFB, Gunter Annex.

Hahn AB, Germany, APO AE 09122-5000; 2 mi. from Sohren, approx. 70 mi. W of Frankfurt. Phone (commercial, from CONUS) 011-49-6543-51-1110; DSN 450-1110. USAFE base. 583d Air Base Gp. with six supporting sqdns. Base activated in 1951; USAF began operations in 1953. A major portion of the base will be returned to German government control. Area 1,920 acres. Altitude 1,560 ft. Military 2,327; civilians 507. Payroll \$126.6 million. Housing: 727 apts., 300 US Govt. leased housing. Billeting: 16 VOQ, 87 VAQ, 1,150 enlisted dormitory units, 27 TLF, 8 DV. Clinic, outbatient care only.

Hanscom AFB, Mass. 01731-5000; 17 mi. NW of Boston. Phone (617) 377-4441; DSN 478-5980. AFSC base. As of July 1, 1992, Hanscom becomes an AFMC base. Hq. Electronic Systems Div. (AFSC) manages development and acquisition of C³1 systems. Also site of Geophysics Directorate of Phillips Lab (AFSC), center for research and exploratory development in the terrestrial, atmospheric, and space environments, as well as two Rome Laboratory Directorates. Base has not 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.

Altitude 133 ft. Military 2,391; civilians 2,398, Payroll \$214 million, Housing: 387 officer, 472 NCO, 35-unit TLF, 754 BOQ/VOQ, Clinic,

Hickam AFB, Hawaii 96853-5000; 9 mi. W of Honolulu. Phone (808) 471-7110 (Cahu 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; subordinate unit 6010th Aerospace Defense Gp. Major associate units include 154th Composite Gp. (ANG); Det. 1, 89th Airlift Wing. Base activated 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. Altitude sea level. Military 5,077; civilians 1,627. Payroll \$233.4 million (incl. Hickam and Fort Kamehameha). Housing: 569 officer, 1,920 enlisted. Unaccompanied housing: 24 officer, 1,038 enlisted. 266 VOQ, 234 VAQ. Clinic.

Hill AFB, Utah 84056-5990; 8 mi. S of Ogden. Phone (801) 7777-7221; DSN 458-1110, AFLC base, As of July 1, 1992, Hill becomes an AFMC base. Hq. Ogden Air Logistics Center. Furnishes logistics support for Minuteman, Peacekeeper, and Small ICBM; Maverick airto-ground missiles; laser and electro-optical guided bombs; F-4 and F-16 systems manager; air munitions; aircraft landing gear, including wheels, brakes and struts, tires, and tubes; photographic and aerospace training equipment. Other units include 388th Fighter Wing; 419th Fighter Wing (AFRES); 729th Control Sqdn.; 6545th Test Gp. (AFSC), which oversees management of Utah Test and Training Range and RPV test programs. Hill AFB Heritage Museum. Base activated Nov. 1940; named for Maj. Ployer P. Hill, killed Oct. 30, 1935, test-flying the first B-17. Area 6,666 acres; manages 961,401 acres. Altitude 4,788 ft. Military 4,900; civillians 13,600, Payroll \$587 million, Housing: 263 officer, 882 NCO, 45 transient. 35-bed hospital.

Holloman AFB, N. M. 88330-5000; 8 mi, SW of Alamogordo, Phone (505) 479-6511; DSN 867-1110, TAC base. As of June 1, 1992, Holloman becomes an ACC base. 49th Fighter Wing, F-15 operations and AT-38B "top-off" training (wing changing from F-15s to F-117As in 1992); Det. 1, 475th Weapons Evaluation Gp., QF-106 drone operations; 83d Control Sqdn.; 6585th Test Gp. (AFSC). Twenty other tenant units located at Holloman, including 4th Satellite Communications Sqdn. (AFSPACECOM), 1984th Communications Sqdn., Balloon Branch of the Phillips Laboratory, and an Army unit. Base activated 1942; named for Col. George Holloman, guided-missile pioneer, killed in B-17 crash on Formosa Mar. 19, 1946. Area 57,000 acres. Altitude 4,093 ft. Military 5,100; civilians 1,600. Payroll \$193 million. Housing: 191 officer, 1,360 NCO, 483 transient (239 VAQ, 194 VOQ, 50 TLF). 20-bed hospital.

Homestead AFB, Fla. 33039-5000; 5 mi. NNE of Homestead. Phone (305) 257-8011; DSN 791-0111. TAC base. As of June 1, 1992, Homestead becomes an ACC base. 31st Fighter Wing, F-16C/D fighter operations; site of ATC sea-survival school; 726th Control Sqdn.; Naval Security Group Activity; 482d Fighter Wing (AFRES); 301st Rescue Sqdn. (AFRES); Det. 1, 125th Interceptor Gp. (Fla. ANG); Inter-American Air Forces Academy; System of Cooperation Among the American Air Forces (SICOFAA) Secretirat, Base activated Sept. 1942. Area 3,345 acres. Altitude 7 ft. Military 6,534; civilians 1,075. Payroll \$152 million. Housing: 228 officer, 1,385 enlisted, 337 transient (137 VAQ, 181 VOQ, 19 TLF). 40-bed hospital.

Howard AFB/Albrook AFS, Panama, APO AA 34001-5000. DSN 284-9805, TAC base, As of June 1, 1992, Howard becomes an ACC base. With headquarters at Howard, 24th Wing represents USAF in operations throughout Latin America. 24th Wing is a TAC unit reporting to 12th Air Force, Bergstrom AFB, Tex. Major tenant: 61st Airliff Gp., Howard established in 1928 as a military post, known as Bruja Point Military Reservation; later named for Maj. Charles Harold Howard, Military 2,005; civilians 618. Payroll \$44.4 million, Housing: 256 officer, 918 enlisted.

Hurlburt Field, Fla. 32544-5000; 5 mi. W of Fort Walton Beach. Phone (904) 882-1110 (Eglin AFB); for information DSN 579-1110. Hurlburt Field is a MAC base, though located on the Eglin AFB (AFSC) reservation. As of June 1, 1992, Hurlburt becomes an AMC base. Host unit: 834th Air Base Wing, Home of Air Force Special Operations Command, the focal point for all USAF special operations matters. Major tenant: 1st Special Operations Wing, equipped with MC-130E (Combat Talon), AC-130H (Spectre Gunship), and MH-53J (Pave Low) aircraft located at Hurlburt Field. Also part of 1st SOW are the HC-130 and MH-60G (Pave

Hawk) aircraft located at Eglin AFB. Other tenants include USAF Special Operations School; 720th Special Tactics Gp.; 23d Special Tactics Sqdn.; Det. 4, Air Weather Service; 834th Operations Support Sqdn.; 41st Training Gp.; Det. 1, 3400th Technical Training Gp. (ATC); Joint Wartare Center; 327th Field Training Det.; Det. 14, 1600th Management Engineering Sqdn.; Special Missions Operational Test and Evaluation Center; 505th Air Control Gp., which includes US Air Force Air Ground Operations School and 727th Air Control Sqdn.; 823d Civil Engineering Sqdn. RED HORSE; Det. 8, 1361st Audiovisual Sqdn. Base activated 1943; named for Lt. Donald W. Hurlburt, WW II pilot killed Oct. 1, 1943, in a crash on Eglin reservation. Altitude 38 ft. Military 5, 800; civilians 753. Payroll \$150 million. Housing: 36 officer, 344 NCO, transient VOO/VAQ 258, TLF 24. Medical clinic only at Hurlburt, but 145-bed hospital at Eglin Regional Hospital 12 mi, away.

Incirlik AB, Turkey, APO AE 09824; 10 mi. E of Adana. Phone (commercial, from CONUS) 011-90-71-221774 through 221780; DSN 676-1110. USAFE base. Host unit: 39th Tactical Gp., supports rotational weapons training deployments for USAFE fighter aircraft. Also home for 628th Airliff Support Sqdn., 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. Altitude 240 ft. Military 2,136; civilians 1,805. Payroll \$59.8 million, Housing: 950 units, 50 TLF, 337 VAQ, 91 VOQ, 432 dorm rooms. Sixty BOQ and 243 TLF will be added during 1993. Regional hospital.

Iraklion AB, Crete, Greece, APO AE 09846; 10 mi. E of Iraklion. Phone (commercial, from CONUS) 011-30-81761-196/197; DSN 668-1110. USAFE base. Host unit: 7276th Air Base Gp. 6931st Electronic Security Sqdn. Base named after Crete's capital city. Area 197 acres. Altitude 90 ft. Military 870; civilians 196. Payroll \$23 million. Housing: 23 officer, 28 Senior NCO, 132 NCO, 45 billeting rooms, 73 beds. 3-bed hospital.

Kadena AB, Japan, APO AP 96368-5000; 15 mi. N of Naha, Okinawa. Phone (commercial, from CONUS) 011-81-9938-1111; DSN 630-1110, PACAF base. Host organization: 18th Wing, F-15C/D operations; 909th Air Refueling Sqdn. (PACAF), KC-135 operations; 6990th Electronic Security Sqdn. (AFIC); 961st Airborne Warning and Control Sqdn. (PACAF), E-3 operations; 603d Airlift Support Gp.; 33d Air Rescue Sqdn., HH-3 operations; 17th Special Operations Sqdn. (AFSOC), HC-130 operations; Western Pacific Rescue Coordination Center; 13th Airlift Sqdn., C-12F operations; 82d Reconnaissance Sqdn., Base named for city of Kadena, Japan. Area 12,547 acres. Military 7,519; appropriated fund civilians 4,791; nonappropriated fund civilians, including contractors, 13,165, Payroll \$276.3 million. Housing: 1,822 officer, 6,114 enlisted, 2 temporary lodging units. Unaccompanied housing: 2,550 officer, 2,948 enlisted, 323 VOQ, 280 VAQ. Clinic. US Naval Hospital at Camp Lester.

Keesler AFB, Miss. 39534-5000; located in Biloxi. Phone (601) 377-1110; DSN 597-1110. ATC base. Keesler Training Center (avionics, communications, electronics, radar systems, computer and command-and-control systems, personnel, and administrative courses); Keesler Medical Center. Hosts AFRES weather reconnaissance units; AFRES tactical airlift units; TAC airborne command-and-control squadron; AFCC engineering installation group; ATC NCO Academy–Keesler; ATC PME Center; USAF First Sergeant's Academy. Base activated June 12, 1941; named for 2d Lt. Samuel R. Keesler, Jr., WW I aerial observer killed in action Oct. 9, 1918, near Verdun, France. Area 3,546 acres. Altitude 26 ft. Military 8,518; civilians 2,174, Payroll \$297 million. Housing: 287 officer, 1,666 NCO, 49 trailer spaces, 2,122 transient (366 VOQ and 1,756 VAQ), 350-bed hospital.

Kelly AFB, Tex. 78245-5000; 5 mi. SW of San Antonio. Phone (512) 925-1110; DSN 945-1110. AFLC base. As of July 1, 1992, Kelly becomes an AFMC base. Hq. San Antonio Air Logistics Center provides logistics management, procurement, and distribution support for such USAF aircraft as the C-5A and C-5B, C-17, C-9, CF-106, OV-10A, T-37, T-38, T-41, and T-43. As a specialized repair activity, SA-ALC modernizes and performs heavy depot maintenance on the entire USAF fleet of C-5s, a significant portion of SAC's B-52s, and various engines, including the TF39, TF56, F100, and Air Force nonaircraft engines. SA-ALC also manages more than half of the Air Force's engine inventory, all fuel lubricants used by the Air Force and NASA, the Air Force's fleet of boats and ships, and the Department of Defense Working Dog Program. Other major units include Hq. Air Force Intelligence Command; Air Force Senter; Air Force Cryptologic Support Center; Joint Electronic Warfare Center; Air Force

News Center; 433d Airlift Wing (AFRES); 149th Fighter Gp. (ANG); 1827th Electronics Installation Sqdn.; Defense Reutilization and Marketing Office; Air Force Audit Agency Office. 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. Altitude 689 ft. Military 4,600; civillans 14,400. Payroll \$462 million. Housing: 45 officer, 368 NCO. Clinic.

Kirtland AFB, N. M. 87117-5000; SE quadrant of Albuquerque. Phone (505) 844-0011; DSN 244-0011. MAC base. As of June 1, 1992, Kirtland becomes an AMC base, 542d Crew Training Wing. Major agencies and units include Air Force Operational Test and Evaluation Center; Phillips Laboratory; 150th Fighter Gp. (New Mexico ANG); Field Command's Defense Nuclear Agency; Naval Weapons Evaluation Facility; Sandia National Laboratories; Lovelace Biomedical and Envi-ronmental Research Institute; Department of Energy's Albuquerque Operations Office; AFSC NCO Academy; 3098th Aviation Depot Sqdn.; Det. 1, 1369th Audiovi-sual Sqdn.; Air Force Directorate of Nuclear Surety; Interservice Nuclear Weapons School, These agencies furnish contract management; nuclear and laser research, development, and testing; advanced helicopter training and search-and-rescue operations; pararescue training; and operational test and evalua-tion. Other major units include AFLC Nuclear Support Office, Albuquerque Seismological Laboratory, University of New Mexico Civil Engineering Research Facility, Base activated Jan. 1941; named for Col. Roy C. Kirlland, air pioneer and commandant of Langley Field in the 1930s, who died May 2, 1941. Area 52,678 acres. Altitude 5,352 ft. Military 5,772; civilians 13,616. Payroll \$850 million. Housing: 2,122 homes, VAQ/ VOQ, 130 officer, 180 enlisted. Air Force/Veterans Administration joint medical center located outside

K. I. Sawyer AFB, Mich. 49843-5000; 23 mi. S of Marquette. Phone (906) 346-8511; DSN 742-1110. SAC base. As of June 1, 1992, K. I. Sawyer becomes an ACC base. 410th Wing; Naval Communications Units, Marquette; 410th Communications Sqdn.; Weather Support Branch of the 410th Operations Gp.; 410th Support Gp.; Det. 2 (SATAF); 410th Operations Gp.; 410th Logistics Gp.; 410th Medical Gp. Base activated 1959; named for Kenneth I. Sawyer, former mayor and county commissioner of Marquette, who proposed site for county airport, died 1944. Area 5,202 acres. Altitude 1,220 ft. Milltary 3,300; civilians 500. Payroll \$95.1 million. Housing: 279 officer, 1,398 NCOQ, 192 SNCOQ, 193 trailer spaces, 1,320 BNCOQ, 18 BOQ, 114 transient (incl. 35 tully furnished TLFs, 39 VAQ, 32 VOQ, 3 DVQ, and 5 Senior NCO). 15-bed hospital.

Kunsan AB, Republic of Korea, APO AP 96264-5000; 8 mi. SW of Kunsan City. Phone (commercial, from CONUS) 011-82-654-470-1110; DSN 782-1110. PACAF base. Host unit: 8th Fighter Wing, F-16C/D operations, home of the "Wolf Pack." The 8th TFW converted to the F-16 Fighting Falcon in Sept. 1981, making it the first active overseas F-16 wing. Base built by Japanese in 1938. Area 2,174 acres. Altitude 29 ft. Military 3,000; US civilians 33; local nationals 460. Payroll \$59.4 million, Unaccompanied housing: 251 officer, 3,940 enlisted, 46 VOQ, 120 VAQ. 5-bed hospital.

Lackland AFB, Tex. 78235-5000; 8 mi. SW of San Antonio. Phone (512) 671-1110; DSN 473-1110. ATC base. Lackland Training Center provides basic military training for active-duty, Air National Guard, and Air Force Reserve airmen; technical training for basic and advanced security police and law enforcement personnel; cryptographic maintenance operators and technicians; DoD military working dogs and handlers; recruiters and social actions and drug abuse counselors; 3700th Officer Training Gp.; Defense Language Institute English Language Center; Wilford Hall USAF Medical Center, the Air Force's largest, with 1,000 beds, conducts medical education and clinical research; ATC NCO Academy-Lackland; military training instructor reserve squadron; ATC Band. Base activated 1941; named for Brig. Gen. Frank D. Lackland, early comandant of Kelly Field flying school, died 1943. Area 6,726 acres (incl. 3,973 acres at Lackland Training Annex). Altitude 745 ft. Military 7,160; civilians 3,566. Payroll \$310 million. Housing: 100 officer, 619 NCO, 2,340 transient, plus 160 TLF units.

Lajes Field, Azores, Portugal, APO AE 09720-5000; Terceira Island, 900 mi. W of Portugal, DSN 725-1410. MAC base. As of June 1, 1992, Lajes becomes an AMC base. Host unit: 606th Support Wing, Support base for aircraft crossing the Atlantic Ocean. Tenant units: US Forces Azores; Navy Forces Azores; Army Transportation Terminal Unit Azores; Naval Security Gp. Activity Azores; Det. 3, Air Force European Broadcasting

Sqdn. Base provides en route support for MAC, USAF, USN, USMC, third nation, and other authorized aircraft crossing the Atlantic and supporting US Navy antisub-marine warfare missions. US operations began at Lajes Field in 1946. Area 1,148 acres, Altitude 180 ft. Military 1,625; civilians 1,725. Payroll \$35.2 million. Housing: 99 officer, 390 enlisted, 30 TLF, 103 VOQ, 748 VAQ, 6 DVQ, 2 senior NCO. Nine-bed hospital.

Langley AFB, Va. 23665-5000; 3 mi. N of Hampton. Phone (804) 764-9990; DSN 574-1110. TAC base. Hq. Tactical Air Command until June 1, 1992, official date of TAC deactivation and transfer of assets to Air Combat Command, whose activation date is June 1, 1992 and whose headquarters is Langley AFB. Host unit: 1st Fighter Wing, F-15 fighter operations. Tenant units: 2d Aircraft Delivery Gp.; 480th Air Intelligence Gp.; 1912th Computer Systems Gp.; Tactical Air Command Band; Det. 1, 457th Airlift Squadron; US Army TRADOC Flight Det.; Center for Low Intensity Conflict. 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 located adjacent to the base. Area 5,411 acres. Altitude 10 ft. Milltary 9,162; civilians 3,427. Payroll \$334 million. Housing: 384 officer, 1,250 NCO, 270 transient (92 VAQ, 78 VOQ, 100 TLF). 70-bed hospital.

Laughlin AFB, Tex. 78843-5000; 6 mi. E of Del Rio. Phone (512) 298-3511; DSN 732-1110. ATC base. 47th Flying Training Wing, undergraduate pilot training. Base activated 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. Altitude 1,080 ft. Military 1,861; civilians 1,230. Payroll \$71.5 million. Housing: 599 units, 54 mobile home sites, 62 transient and 24 temporary family lodging facilities. 20-bed hospital. In 1989, Laughlin converted from military to all civil-service aircraft maintenance operation.

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. MAC base. As of June 1, 1992, Little Rock becomes an AMC base. 314th Airlift Wing, only C-130 training base in DoD, training crew members from all branches of service and some foreign countries. Tenants include Hq. Joint Readiness Training Center, US Army Center (JRTC trains and evaluates light infantry units within the Army, using Fort Chaffee, Ark., as the training ground); Ark. ANG; 96th Mobile Aerial Port Sqdn.; 3548th USAF Recruiting Sqdn. Base activated 1955. Area 11,372 acres. Altitude 310 ft. Military 7,792; civilians 609. Payroll \$157 million. Housing: 212 officer, 1,323 enlisted, 13 single-occupancy dormitories house 974 people, 360 transient (140 VAQ, 220 VOQ)-25-bed hospital.

Loring AFB, Me. 04751-5000; 4 mi, W of Limestone, Phone (207) 999-1110; DSN 920-1110, SAC base. As of June 1, 1992, Loring becomes an ACC base. 42d Wing was activated here Feb. 25, 1953, as Limestone AFB; renamed for Maj. Charles J. Loring, Jr., F-80 pilot killed Nov. 22, 1952, in North Korea and posthumously awarded Medal of Honor. Area 11,165 acres. Altitude 756 ft. Military 3,593; civilians 500, Payroll \$76.6 million, Housing: 303 officer, 1,481 NCO, 122 transient, 4 VIP., 20-bed hospital. The bomber mission converted to conventional on Oct. 1, 1988.

Los Angeles AFB, Calif. 90009-2960; located in Southbay Los Angeles, city of El Segundo, 3 ml. S of Los Angeles IAP, Phone (310) 363-1110; DSN 833-1110. AFSC base. As of July 1, 1992, Los Angeles becomes an AFMC base. Headquarters of AFSC's Space Systems Division, which manages the design, development, acquisition, and launch of DoD's space program and shares rocket booster launch with Air Force Space Command. Support unit is 6592d Air Base Gp. 25 tenant units on base. Activated Apr. 1, 1964, as Los Angeles AFS. Area 96 acres at Los Angeles AFB and 96 acres at Fort MacArthur Annex and Crest/Heights housing areas. Altitude 95 ft. Military 1,578; civilians 1,742. Payroll \$100 million. Housing at Fort MacArthur Annex: 574 townhouses, 56 enlisted quarters, 29 VOQ, 4 DVQ, 22 TLF. Clinic, commissary, child-care center, and Air Force Family Support Center.

Lowry AFB, Colo. 80230-5000; on border between Denver and Aurora. Phone (303) 676-1110; DSN 926-1110. ATC base. Lowry Technical Training Center conducts training in avionics, space operations, munitions, logistics, and audiovisual fields. Other major organizations on the base include the Defense Finance and Accounting Service-Denver Center; Air Reserve Personnel Center; 3320th Correction and

Rehabilitation Squadron. Base activated Oct. 1, 1937; named for 1st Lt. Francis B. Lowry, killed in action Sept. 26, 1918, near Crepion, France, while on a photo mission. Area 2,089 acres. Altitude 5,400 ft. Military 6,519; civilians 5,292, Payroll \$263.3 million. Housing: 87 officer, 780 NCO, 542 VOQ, 773 VAQ, 40 TLF. USAF clinic on base, with Fitzsimons Army Medical Center 15 minutes away. Base projected to close September 1994.

Luke AFB, Ariz. 85309-5000; 20 mi, WNW of Phoenix. Phone (602) 856-7411; DSN 855-1110. TAC base, As of June 1, 1992, Luke becomes an ACC base, 58th Fighter Wing, F-15 and F-16 operations; 944th Fighter Gp. (AFRES), F-16 operations; 607th 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. Altitude 1,090 ft. Military 5,600; civilians 1,400, Payroll \$171 million, Housing: 95 officer, 779 enlisted, 301 transient (162 VOQ, 99 VAQ, 40 TLF), 40-bed hospital.

MacDill AFB, Fla. 33608-5000; adjacent to Tampa city limits. Phone (813) 830-1110; DSN 968-1110. TAC base. As of June 1, 1992, MacDill becomes an ACC base. Softh Fighter Wing, F-16 operations; Hq. US Special Operations Command; Hq. US Central Command; 1st Air Control Sqdn. 56th Fighter Wing conducts training of USAF pilots in the F-16. Base activated Apr, 15, 1941; named for Col. Leslie MacDill, killed in an aircraft accident Nov. 8, 1938, near Washington, D. C. Area 5,631 acres. Altitude 6 ft. Military 6,317; civilians 1,120. Payroll \$147 million. Housing: 130 officer, 674 enlisted, 247 transient (53 VAQ, 170 VOQ, 24 TLF). 80-bed hospital.

Malmstrom AFB, Mont. 59402-5000; 1.5 mi, E of Great Falls. Phone (406) 731-1110; DSN 632-1110. SAC base. As of June 1, 1992, Malmstrom becomes an AMC base. 301st Air Refueling Wing; 341st Missile Wing. Base activated Dec. 15, 1942; named for Col. Einar A. Malmstrom, WW II fighter commander killed in air accident Aug. 24, 1954. Site of SAC's first Minuteman wing. Area 3,573 acres, plus about 23,000 sq. mi, of missile complex. Altitude 3,525 ft. Military 4,325; civilians 550. Payroll \$161.6 million. Housing: 258 officer, 1,148 NCO, 105 transient. Clinic.

March AFB, Calif. 92518-5000; 9 mi. SE of Riverside. Phone (714) 655-1110; DSN 947-1110. SAC base. As of June 1, 1992, March becomes an AMC base. Hq. 15th Air Force; 22d Air Refueling Wing; Southwest Air Detense Sector; 22d Medical Gp.; 452d Air Refueling Wing (AFRES); 943d Airlift Gp. (AFRES); 163d Reconaissance Gp. (Calif. ANG); Customs Aviation Operations Center West. Base activated Mar. 1, 1918; named for 2d Lt. Peyton C. March, Jr., who died in Texas of crash injuries Feb. 18, 1918. Area 6,846 acres. Altitude 1,530 ft. Military 3,484; civilians 1,436. Payroll \$184 million. Housing: 103 officer, 808 NCO, 153 transient, 90-bed hospital.

Mather AFB, Calif. 95655-5000; 12 mi. ESE of Sacramento. Phone (916) 364-1110; DSN 674-1110. ATC base. DoD executive agent for Specialized Undergraduate Navigator Training (SUNT); USAF, Navy, and Marine Corps basic navigator training. Provides navigator training for 2d German Air Force and 90 other countries. Only navigator training base; also trains USAF electronic warfare officers. 323d Flying Training Wing (ATC), T-43A and T-37B; 940th Air Refuelling Gp. (AFRES), KC-135E operations; 3564th USAF Recruiting Sqdn. (ATC); 3506th USAF Recruiting Gp. (ATC). Base activated 1918; named for 2d Lt. Carl S. Mather, killed in midair collision Jan. 30, 1918, in Texas. Area 5,845 acres. Altitude 96 ft. Military 4,347; civilians 2,071. Payroll \$112.3 million. Housing: 370 officer, 901 enlisted. 55-bed hospital. Base projected to close September 1993.

Maxwell AFB, Ala. 36112-5000; 1 ml. WNW of Montgomery. Phone (205) 953-1110; DSN 493-1110. AU base. 3800th Air Base Wing; Hq. Air University, professional military education center for USAF; Air War College; Air Command and Staft College; Air Force Quality Center; Center for Aerospace Doctrine, Research, and Education; Ira C. Eaker Center for Professional Development; Squadron Officer School; USAF Historical Research Center; Hq. Air Force ROTC (ATC); Hq. Civil Air Patrol-USAF; Community College of the Air Force (ATC); 908th Airlifft Gp. (AFRES). Base activated 1918; named for 2d Lt. William C. Maxwell, killed in air accident Aug. 12, 1920, in the Philippines. Area 2,524 acres. Altitude 168 ft. Military 2,821; civilians 1,654. Payroll \$315 million. Housing: 299 officer, 549

NCO, 1,374 transient (1,253 VOQ, 91 VAQ, 30 TLF). 60-bed hospital.

Maxwell AFB, Gunter Annex, Ala. 36114; 4 mi. NE of Montgomery. Phone (205) 416-1110; DSN 596-1110. AU base. Standard Systems Center; Air Force Logistics Management Center; USAF Extension Course Institute; USAF Senior NCO Academy. Activated Aug. 27, 1940; named for William A. Gunter, longtime mayor of Montgomery and airpower advocate, died 1940. Area 368 acres. Altitude 220 ft. Milliary 1,526; civilians 903. Payroll included in Maxwell lentry. Housing: 104 officer, 220 NCO, 470 transient (107 VOQ, 360 VAQ, 3 TLF).

McChord AFB, Wash. 98438-5000; 8 mi. S of Tacoma. Phone (206) 984-1910; DSN 976-1110. MAC base, As of June 1, 1992, McChord becomes an AMC base. Host Wing is 62d Airlift Wing. Major tenants include: 446th Airlift Wing (AFRES Assoc.); Northwest 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 located 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. Altitude 332 ft. Military 4,209; civilians 2,407. Payroll \$167 million. Housing: 127 officer, 854 NCO, 284 transient. Dispensary on base. Madigan Army Medical Center is the newest regional DoD hospital, located 4 mi. SE, with 414 beds.

McClellan AFB, Calif. 95652; 9 mi. NE of Sacramento. Phone (916) 643-2111; DSN 633-1110. AFLC base. As of July 1, 1992, McClellan becomes an AFMC base. As Hq. Sacramento Air Logistics Center provides logistics management, procurement, maintenance, and distribution support for F/EF-111, A-10, and F-117A weapon systems. It will also 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 radiology on F-111-sized aircraft. Other major units include Hq. Air Rescue Service; 1849th Electronics Installation Sqdn.; Technical Operations Division, Air Force Applications Center; 431st Test and Evaluation Sqdn.; Hq. 4th Air Force (AFRES); US Coast Guard Air Station, Sacramento (DOT). Named for Majaezekiah McClellan, pioneer in Arctic aeronautical experiments, killed in crash May 25, 1936. Area 3,755 acres. Military 2,799; civilians 11,921. Payroll \$555 million. Housing: 132 officer, 343 enlisted, 21 transient. USAF Medical Clinic.

McConnell AFB, Kan. 67221-5000; 5 mi. SE of Wichita. Phone (316) 652-6100; DSN 743-1110. SAC base. As of June 1. 1992, McConnell becomes an ACC base. 384th Wing; 184th Fighter Gp. (ANG). First B-1B arrived Jan. 1988. Base activated June 5, 1951; named for Capt. Fred J. McConnell, WW II B-24 pilot who died in 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 attack on Bougainville. Area 3,113 acres. Altitude 1,371 ft. Military 3,058; civilians 413. Payroll \$101.6 million. Housing: 123 officer, 364 NCO, 66 transient (17 VOQ, 25 VAQ, 24 TLF).

McGuire AFB, N. J. 08641-5000; 18 mi. SE of Trenton. Phone (609) 724-1100; DSN 440-1100, MAC base, As of June 1, 1992, McGuire becomes an AMC base, 438th Airlift Wing; Hq. 21st Air Force; N. J. ANG; N. J. Civil Air Patrol; 170th Air Refueling Gp. (ANG); 514th Airlift Wing (AFRES Assoc.); MAC NCO Academy East; OLB, 1361st Audiovisual Sqdn. 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 Phillippines. Area 3,597 acres. Altitude 133 fl. Military 10,148 (Incl. AFRES and ANG); civilians 1,771 (Incl. AFRES). Payroll \$218 million, Housing; 193 officer, 1,560 NCO, 990 transient (238 VOQ, 752 VAQ), Dispensary and 150-bed hospital at Fort Dix.

Minot AFB, N. D. 58705-5000; 13 mi. N of Minot. Phone (701) 723-1110; DSN 453-1110. SAC base, As of June 1, 1992, Minot becomes an ACC base. P1st Missile Wing, Minuteman III operations; 5th Wing, B-52H and KC-135 operations; 2150th Communications Sqdn.; Det. 7, 37th Air Rescue Sqdn., HH-1H operations; 64th Flying Training Wing OLB (ATC), T-38 operations; Det. 21, 9th Weather Sqdn. (AWS); AFOSI Det. 1312; Det. 35, 3904th Management Engineering Sqdn.; Det. 520, Air Force Audit Agency; 15th Air Force NCO Leadership School. Base activated Jan. 1957; named after the city of Minot, whose citizens donated \$50,000 toward purchase of the land for the

Air Force, Area 5,085 acres, plus additional 19,324 acres for missile sites. Altitude 1,668 ft. Military 5,324; civilians 617. Payroll \$102 million. Housing: 487 officer, 3,410 enlisted, 156 transient (incl. 32 VOQ, 84 VAQ, 40 TLF). 45-bed hospital.

Misawa AB, Japan, APO AP 96319-5000; within Misawa city limits. Phone (commercial, from CONUS) 011-81-176-53-5181; DSN 226-1110. PACAF base; joint service base. Host unit: 432d Fighter Wing, F-16C/D operations. Tenant units: 39th Air Rescue Sqdn., MH-60 helicopter operations. 6920th Electronic Security Gp. (AFIC); Naval Air Facility (USN); Naval Security Gp. Activity (USN); US Army field station; Company "E" US Marine Corps. Base occupied by US forces Sept. 1945. Area 3,873 acres. Altitude 119 ft. Military 5,389 (total US forces); US civilians 278; local nationals 839. Payroll \$151.1 million. Housing: 325 officer, 1,803 enlisted, 16 temporary lodging units. Unaccompanied housing: 120 officer, 1,562 enlisted, 149 VOQ, 64 VAQ. 15-bed hospital.

Moody AFB, Ga. 31699-5000; 10 mi. NNE of Valdosta. Phone (912) 333-4211; DSN 460-1110. TAC base. As of June 1, 1992, Moody becomes an ACC base. 347th Fighter Wing, F-16C/D (LANTIRN-equipped) fighter operations. 3536th USAF Recruiting Sqdn., OSI Det. 717, Field Training Det. 322. Base activated June 1941; named for Maj. George P. Moody, killed May 5, 1941, while test-flying Beech AT-10. Area 6,050 acres. Altitude 233 ft. Military 3,045; civilians 502. Payroll \$95 million. Housing: 36 officer, 268 enlisted, 79 transient (34 VAQ, 33 VOQ, 12 TLF), 39 trailer spaces. 30-bed hospital.

Mountain Home AFB, Idaho 83648-5000; 10 mi. SW of Mountain Home. Phone (208) 828-2111; DSN 857-2111. TAC base. As of June 1, 1992, Mountain Home becomes an ACC base. 366th Wing, USAF's first air intervention composite wing; F-16C attack, F-15E interdiction, F-15C air-superiority, B-52 bomber, KC-135R air refueling, E-3C surveillance, and EF-111A electronic countermeasures aircraft prepared to deploy rapidly worldwide and perform intervention operations; Det. 3, Air Warfare Center. Base activated Aug. 1943. Area 9,112 acres. Altitude 3,000 ft. Strike Reservoir recreation area 25 mi. SW of base, Military 4,500; civilians 1,369, Payroll \$106 million. Housing: 152 officer, 1,369 enlisted, 150 transient (76 VAQ, 60 VOQ, 14 TLF). 35-bed hospital.

Myrtle Beach AFB, S. C. 29579-5000; in south Myrtle Beach. Phone (803) 238-7211; DSN 748-1110. TAC base. As of June 1, 1992, Myrtle Beach becomes an ACC base. Shares runway with Myrtle Beach Jetport. 354th Fighter Wing, A-10 fighter operations; 73d Control Sqdn. Served as Army air base 1941-47; USAF base since 1956. Area 3,793 acres. Altitude 25 ft. Military 3,236; civilians 464. Payroll \$85 million. Housing: 95 officer, 682 enlisted, 65 trailer lots, 133 transient (81 VAQ, 38 VOQ, 14 TLF). 20-bed hospital.

Nellis AFB, Nev. 89191-5000; 8 mi. NE of Las Vegas. Phone (702) 652-1110: DSN 682-1110. TAC base. As of June 1, 1992, Nellis becomes an ACC base. USAF Fighter Weapons Center, F-15, F-15E, F-16, and F-111; 57th Fighter Wing; USAF Fighter Weapons School; USAF Air Demonstration Sqdn. (Thunderbirds); 57th Operations Gp., including the 547th Adversary Training Sqdn. (Red Flag); 549th Joint Training Sqdn. (Air Warrior); 57th Test Gp., including 422d and 431st Test and Evaluation Sqdns.; 57th Logistics Gp.; 544th Medical Gp.; 554th Support Gp.; 66th Air Rescue Sqdn.; 820th Civil Engineering Sqdn. RED HORSE; and 3096th Aviation Depot Sqdn. Base activated July 1941 as an Army Air Forces 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. Area 11,274 acres, with ranges totaling 3,014,566 acres. Altitude 1,869 ft. Military 8,500; civilians 1,050. Payroll \$273 million. Housing: 107 officer, 1,275 enlisted, 100 trailer spaces, 737 transient (193 VOQ, 484 VAQ, 60 TLF), 35-bed hospital.

Newark AFB, Ohio 43057-5990; 1 mi. SW of Newark. Phone (614) 522-2171; DSN 346-2171. AFLC base. As of July 1, 1992, Newark becomes an AFMC (Air Force Materiel Command) base. Aerospace Guidance and Metrology Center repairs inertial guidance and navigation systems for most of the Air Force's 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 130 precision measurement equipment laboratories at bases around the world. Four tenant units. Activated as an Air Force station Nov. 7, 1962. Military 80; civilians 2,000. Payroll \$78 million.

Norton AFB, Calif. 92409-5000; 60 mi. E of Los Angeles, within San Bernardino corporate limits. Phone (714) 382-1110; DSN 876-1110. MAC base. As of June 1, 1992, Norton becomes an AMC base. 63d Airlift Wing; Hq. Air Force Safety Agency; Hq. Air Force Audit Agency; Hq. Aerospace Audiovisual Service; Ballistic Missile Organization (AFSC); 445th Airlift Wing (AFRES Assoc.); MAC NCO Academy West. Base activated Mar. 2, 1942; named for Capt. Leland F. Norton, native of San Bernardino, WW II A-20 attack bomber pilot, killed in action May 27, 1944, near Amlens, France. Area 2,431 acres. Altitude 1,156 ft. Military 7,615 (incl. AFRES); civilians 2,638. Payroll \$242 million. Housing: 653 transient (40 TLQ, 439 VAQ, 174 VOQ), 1,492 dormitory beds, 19 full hook-up trailer lots, 20 trailer sites. Clinic, Scheduled for closure in 1994.

Offutt AFB, Neb. 68113-5000; 8 mi. S of Omaha. Phone (402) 294-1110; DSN 271-1110. SAC base. Hq. Strategic Air Command until June 1, 1992, date of SAC deactivation and transfer of assets to Air Combat Command and Air Mobility Command, both of which activate on June 1, 1992. Hq. US Strategic Command, 55th Wing; 544th Intelligence Wing; Air Force Global Weather Central; 1st Aerospace Communications Gp.; 1000th Satellite Operations Gp. (AFSPACECOM); 6949th Electronic Security Sqdn. (AFIC); Joint Strategic Target Planning Staff (JSTPS); National Emergency Airborne Command Post (NEACP); 702d Air Force Band. Base activated 1896 as Army's Fort Crook; landing field named in 1924 for 1st Lt. Jarvis J. Offutt, WW i pilot who died Aug. 13, 1918, from injuries received at Valheureux, France. Area 1,914 acres (incl. housing area and off-base sites). Altitude 1,048 ft. Military 12,181; civilians 1,958 (incl. 483 contractors). Payroll \$400 million. Housing: 513 officer, 2,167 enlisted, 134 VAQ, 169 VOQ, 62 TLF. 93-bed hospital.

Onizuka AFB, Calif. 94088-3430; 37 mi. S of San Francisco at Sunnyvale. Phone (408) 752-3110; DSN 561-3110. AFSPACECOM base. Host unit: 750th Space Gp. Tenant units: Consolidated Space Test Center (AFSC); Det. 6, SSD. Base activated Dec. 2, 1959, as Sunnyvale AFS, renamed for Lt. Col. Ellison S. Onizuka, killed Jan. 28, 1986, in the space shuttle Challenger accident. Area 20 acres. Altitude 34 ft. Military 704; civilians 222; contractors 2,000. Housing: 20 officer, 80 NCO (located at NAS Moffett Field). No transient housing.

Osan AB, Republic of Korea, APO AP 96278-5000; 38 mi. S of Seoul, Phone (commercial, from CONUS) 011-82-333-414-1110; DSN 784-4110. PACAF base. Hq. 7th Air Force. Host unit: 51st Wing, F-16C/D and OA-10 operations. Tenant units: 6903d Electronic Security Gp. (AFIC); 611th Airlift Support Gp.; 554th Civil Engineer-ing Sqdn. RED HORSE (PACAF); 38th Air Rescue Sqdn. Originally designated K-55; runway opened 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. Altitude 38 ft. Military 7,013; US civilians 263; local nationals 38 ft. Military 7,013; US civilians 263; local nationals 1,717. Payroll \$126.6 million, Housing: 153 officer, 59 enlisted, 16 temporary lodging facility units. Unaccompanied housing: 357 officer, 5,296 enlisted, 141 VOQ, 468 VAQ. 30-bed hospital.

Patrick AFB, Fla. 32925-6655; 2 mi. S of Cocoa Beach. Phone (407) 494-1110; DSN 854-1110. AFSPACECOM base. Operated by the 45th Space Wing in support of DoD, NASA, and other agency missile and space programs. Major tenants are Defense Equal Opportunity Management Institute; Air Force Technical Applications Center; 41st Air Rescue Sqdn.; 71st Air Rescue Sqdn.; 741st Consolidated Aircraft Maintenance Sqdn.; 2d Combat Communications Gp. Base activated 1940; serves as control center for Cape Canaveral AFS, which has supported more than 3,000 launches since 1950, 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. Altitude 9 ft. Millitary 3,550; civilians 1,367. Payroll \$140.6 million (military, Civil Service). Housing: 150 officer, 1,406 NCO, 15-bed hospital.

Peterson AFB, Colo. 80914-5000; at eastern edge of Colorado Springs. Phone (719) 554-7321; DSN 692-7011. AFSPACECOM base. Hq. Air Force Space Command. Host unit: 21st Space Wing (AFSPACECOM). Provides support to Hq. North American Aerospace Defense Command; Hq. US Space Command; Hq. Army Space Command; 302d Airlifft Wing (AFRES); 50th Space Wing, located 10 mi. E at Falcon AFB. Base activated 1942; named for 1st Lt. Edward J. Peterson, who was killed Aug. 8, 1942, in aircraft crash at the base. Area 1,277 acres. Altitude 6,200 ft. Military active-duty 4,380; reserves 1,414; civilians 2,940. Payroll \$206 million. Housing: 107 officer, 384 NCO, 217 transient (75 VOQ, 102 VAQ, 40 TLF). Clinic. Home of Edward J. Peterson Air & Space Museum.

Plattsburgh AFB, N. Y. 12903-5000; adjacent to Plattsburgh. Phone (518) 565-5000; DSN 689-5000. SAC base. As of June 1, 1992, Plattsburgh becomes an AMC base. 380th Air Refueling Wing, tanker operations with KC-135; 380th Air Refueling Wing Airmen Leadership School; Det. 21, 3904th Management Engineering Sqdn.; Det. 21, 10LA 3753th Field Training Sqdn. Oldest active military installation in the US, established 1814; AFB since 1955. Area 4,879 acres. Altitude 235 ft. Military 2,334; civilians 725, Payroll \$83.6 million. Housing: 216 officer, 1,417 NCO, 132 transient (60 VAQ, 49 VOQ, 23 TLF). 15-bed hospital.

Pope AFB, N. C. 28308-5000; 12 mi. NNW of Fayetteville. Phone (919) 394-0001; DSN 486-1110. MAC base. As of June 1, 1992, Pope becomes an ACC base. 317th Airllift Wing; USAF Airllift Center; 1st Aeromedical Evacuation Sqdn.; 1721st Combat Control Sqdn.; 53d Mobile Aerial Port Sqdn. (AFRES); Det. 3, MACOS (Combat Control School); 215th Field Training Detachment (ATC); Tactical Air Control Party; OLC, 1361st Audiovisual Service and 1724th 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 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. Altitude 218 ft. Military 4,410; civilians 719. Payroll \$212 million. Housing: 260 transient. Clinic.

RAF Alconbury, United Kingdom, APO AE 09470; 3 mi, NW of Huntingdon; 60 mi. N of London. Phone (commercial, from CONUS) 011-44-480-82300; DSN 223-1110. Royal Air Force base, A host unit to support the 39th Special Operations Wing (AFSOC) is still to be designated. Initially activated in 1938; first used by US forces in Sept. 1942. Area 2,954 acres. Altitude 160 ft. Military 3,800; civillans 1,250. Payroll \$122 million. Housing: 89 officer, 767 enlisted, 300 leased units (enlisted only), 1,187 dorm spaces. Clinic.

RAF Bentwaters/RAF Woodbridge, United Kingdom, APO AE 09497; 90 mi. NE of London. Phone (commercial, from CONUS) 011-44-394-433000; DSN 225-1110. Royal Air Force base, 81st Fighter Wing (USAFE) operates the twin bases (which are four miles apart) and four A-10 attack squadrons (two at each base). The twin bases will be returned to the British Ministry of Defence by Sept. 1993, at which time the 81st FW will be inactivated. Bases opened by RAF in 1944 and 1943, respectively, and reactivated by the US in 1951 and 1952. Bases named after local landmark and nearby town, respectively. Area 2,087 acres. Altitude 86 ft. Military 4,804; civilians 556. Payroll \$126.9 million. Housing: 156 officer, 1,295 enlisted, 1,815 dorm spaces, 226 transient quarters. Clinic.

RAF Chicksands, United Kingdom, APO AE 09465-5000; 9 mi. S of Bedford; 45 mi. N of London. Phone (commercial, from CONUS) 011-44-462-812571; DSN 234-1110. Royal Air Force base, 7274th Air Base Gp. (USAFE) provides logistics, administrative, and air base management. Mission units provide rapid radio relay; secure communications; and 03CM support to US and Allied forces. The base supports three major mission units: 693d Electronic Security Wing (AFIC); 6950th Electronic Security Wing (AFIC); 6950th Electronic Security Gp. (AFIC); Department of Defense Joint Operations Center Chicksands (DoD). Base activated in 1939; US presence began November 1950. Base named after the sandy soil on which it sits. Area 411 acres. Military 1,320; civilians 426. Payroll \$39 million. Housing: 45 officer, 368 enlisted, 13 TLF, 71 billeting rooms, four dorms with 596 bed spaces. Clinic.

RAF Lakenheath, United Kingdom, APO AE 09464-5000; 70 ml. NE of London; 25 ml. from Combridge, Phone (commercial, from CONUS) 011-44-638-52-3000; DSN 226-1110. Royal Air Force base. 48th Fighter Wing (USAFE) flies the F-111 (the wing began the transition to the F-15E in early 1992) and trains for and conducts tactical 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. Altitude 32 ft. Military 4,480; civilians 2,025, Payroll \$167.6 million. Housing: 1,024 units, 1,065 US 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) 011-44-638-51-1110; DSN 238-1110. Royal Air Force base. Hq. 3d Air Force (USAFE). 513th Airborne Command and Control Wing (USAFE) supports four major USAFE functions. Associate units include 306th Wing (rotational), 313th Airlift Gp. (rotational). Base activated in 1934; US presence began in

July 1950, Named after nearby village, Area 1,121 acres, Altitude 33 ft. Military 2,858; civilians 1,094, Payroli \$100.4 million. Housing: 95 officer, 510 enlisted, 1,115 US Govt. leased housing, 670 transient (40 TLF, 260 VOQ, 370 VAQ). Medical annex.

RAF Upper Heytord, United Kingdom, APO AE 09466; 13 mi, N of Oxford. Phone (commercial, from CONUS) 011-44-869-232331; DSN 263-1110. Royal Air Force base. 20th Fighter Wing (USAFE) provides long-range, all-weather fighter and electronic combat sorties for NATO. Associate units include 2130th Communications Gp., 317th Contingency Hospital, 7520th Air Base Sqdn., and 2119th Communications Sqdn. Activated during WW I; 20th FW began operations here in Dec. 1969. Named after local town. The base will be placed in standby status by late 1994, and the 20th FW will inactivate. Area 1,221 acres. Altitude 412 ft. Military 5,210; civilians 1,918. Payroll \$178 million. Housing: 273 officer, 1,032 enlisted, 350 enlisted US Govt. leased housing, 53 TLF, 8 BOQ, 62 VOQ, 104 senior enlisted and 1,970 junior NCO/airman BEQ, 72 VEQ. Hospital.

Ramstein AB, Germany, APO AE 09094-5000; adjacent to Ramstein; 10 mi. W of Kaiserslautern. Phone (commercial, from CONUS) 011-49-6371-47-113; DSN 480-1110. USAFE base. Hq. USAFE; Hq. Allied Air Forces Central Europe (NATO). Host unit: 86th Fighter Wing, which flies the F-16C/D. The wing commander also serves as commander of the Kaiserslautern Military Community, the largest concentration of US citizens outside the United States. Base activated and US presence began in 1953. Area 5,292 acres. Altitude 782 ft. Military 7,867; civilians 6,531. Payroll \$545 million, Housing: 5,891 units, 569 US Govt. leased units, 5,116 billeting units. Clinic.

Randolph AFB, Tex. 78150-5000; 17 mi. ENE of San Antonio. Phone (512) 652-1110; DSN 487-1110. ATC base. Hq. Alr Training Command; 12th Flying Training Wing, T-37 and T-38 pilot instructor training and T-41 flight screening at Hondo, Tex.; Air Force Military Personnel Center; Hq. Air Force Management Engineering Agency; USAF Occupational Measurement Sqdn.; Civilian Personnel Management Center; Hq. USAF Recruiting Service; USAF Instrument Flight Sqdn. Base activated 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. Altitude 761 ft. Military 5,149; civilians 4,794. Payroll \$296.9 million. Housing: 254 officer, 765 NCO, 542 transient (144 VAQ, 358 VOQ, 40 TLF). Clinic.

Reese AFB, Tex. 79489-5000; adjacent to Lubbock. Phone (806) 885-4511; DSN 838-1110. ATC base. 64th Flying Training Wing, undergraduate pilot training. Base activated 1942; named for 1st Lt. Augustus F. Reese, Jr., P-38 fighter pilot killed during a trainstrafing mission at Cagliari, Sardinia, May 14, 1943. Area 3,953 acres. Altitude 3,338 ft. Military 1,702; civilians 765. Payroll \$60 million. Housing: 109 officer, 289 NCO, 79 transient (8 suites, 25 TLF, 14 VOQ, 32 VAQ), 18-bed hospital.

Rhein-Main AB, Germany, APO AE 09097-5000; 5 mi. S of Frankfurt, Phone (commercial, from CONUS) 011-49-69-699-1110; DSN 330-1110. USAFE base. (Until April 1, 1992, Rhein-Main was a MAC base.) Host unit 435th Airlift Wing, Largest combined cargo and pas-senger terminal in the Air Force. Shares runways with the busiest commercial airport on the Continent, The 37th Airlift Sqdn. flies C-130E aircraft in support of DoD and European theater airlift requirements. The 2d Aeromedical Evacuation Sqdn. and 55th Aeromedical Airlift Sqdn, provide inter- and intratheater aeromedical airlift. Other major units include 7th Special Operations Sqdn. (AFSOC); On-Site Inspection Agency-Europe: Army's 21st Replacement Battalion, Base activated July 1936; US Forces began operations Mar. 1945. Named after the confluence of the Rhein and Main rivers west of Frankfurt, Area 923 acres, Altitude 365 ft. Military 4,279; civilians 2,472. Military payroll \$121.8 million, Housing, on-base, government-owned: 152 officer, 490 enlisted; off-base, government-owned: 12 officer, 145 enlisted; off-base, government-leased: 10 officer, 290 enlisted; 268 rooms/531 beds at base hotel, 176 rooms/278 beds VAQ, USAF clinic,

Robins AFB, Ga. 31098; 15 mi. SSE of Macon at Warner Robins. Phone (912) 926-1110; DSN 468-1110. AFLC base. As of July 1, 1992, Robins becomes an 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, the Joint Tactical Information Distribution System, E-3 Airborne Warning and Control System 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, and in Apr. 1991 Robins AFB was selected as the US main operating base for the E-8 Joint Surveillance and Target Attack Radar System aircraft. Other major units include Hq. Air Force Reserve (AFRES); 2853d Air Base Gp.; 19th Air Refueling Wing; 5th Combat Communications Gp.; 1926th Communications-Computer Systems Gp. (AFLC); 9th Missile Warning Sqdn. (AFSPACECOM). Base activated 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. Altitude 294 ft. Military approx. 4,000; civilians approx. 14,000. Payroll \$763.5 mll-lion. Housing: 249 officer, 1,147 NCO, 40 TLF, 145 VOQ, 100 trailer spaces. 25-bed hospital.

San Vito Del Normanni AB, Italy, APO AE 09605; 7 mi. NW of Brindisi; 200 mi. ESE of Naples. Phone (commercial, from CONUS) 011-39-831-42-3519; DSN 622-1110. USAFE base. 7275th Air Base Gp. provides logistics, administrative, and air base management support to other associate and tenant units such as 6917th Electronic Security Gp. (AFIC); 7275th Communications Sqdn.; Air Force Space Forecast Center; OLA, Det. 7, Air Force European Broadcasting Service; OLA, Det. 6, 7000th Contracting Sqdn.; Det. 1, 4th Surveillance Sqdn.; Naval Security Group Activity, San Vito. Base activated and US presence began Nov. 1960. Named for nearby village. Area 318 acres. Attitude 15 ft. Military 1,447; civilians 325. Payroll \$41.6 million, Housing: 42 officer, 338 enlisted, 447 dorm spaces for E-1 to E-6, 6 Senior NCO, 10 VOQ, 3 DVS, 36 VAQ, 30 TLF rooms. Clinic.

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

Scott AFB, III. 62225-5000; 6 mi, ENE of Belleville. Phone (618) 256-1110; DSN 576-1110. MAC base. 375th Airlift Wing; Hq. Milltary Airlift Command until June 1, 1992, date of MAC deactivation and transfer of assets to Air Combat Command and Air Mobility Command, both of which activate on June 1, 1992. Hq. Air Mobility Command, activation date of June 1, 1992. Hq. Air Force Communications Command (an FOA); Hq. US Transportation Command; Hq. Air Weather Service; Defense Commercial Communications Office; Environmental Technical Applications Center; USAF Medical Center, Scott; 7th Weather Wing; 932d Aeromedical Airlift Gp. (AFRES Assoc.); 375th Support Gp. 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, while "hitching" a ride in one of the Wright B Flyers at College Park, Md. Area 3,000 acres. Altitude 453 ft. Military 8,300; civilians 3,400. Payroll \$334,7 million. Housing: 309 officer, 1,396 NCO, plus 115 spaces for privately owned trailers, 300 transient. 130-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). Host unit: 66th Electronic Combat Wing, Major associate units include 601st Control Wing; USAFE Air Ground Operations School; 2134th Communications Sqdn.; 31st Weather Sqdn.; 6914th Electronic Security Sqdn (AFIC). Sembach is also a forward operating location for Det. 1, 81st Fighter Wing, RAF Bentwaters, which flies the A-10 Thunderbolt II. Base activated 1930; US presence began July 1953. Named after a nearby farming community. Area 862 acres. Altitude 1,037 ft. Military 1,931; civilians 563, Payroll \$46.7 million. Housing: 92 officer, 402 enlisted. Billeting: 72 officers, 332 enlisted, 8 chief master sergeant suites. Clinic.

Seymour Johnson AFB, N. C. 27531-5000; within city limits of Goldsboro. Phone (919) 736-5400; DSN 488-1110. TAC base. As of June 1, 1992, Seymour Johnson becomes an ACC base. 4th Wing, F-15E fighter and KC-10 tanker operations; 916th Air Refueling Gp. (AFRES), KC-10 operations; 01AD, Det. 1, 191st Interceptor Gp. (Mich. ANG), F-16 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 3,320 acres. Altitude 109 ft. Military 4,600; civilians 900. Payroll \$140 million. Housing: 154 officer, 1,543 enlisted, 138 transient (65 VAQ, 46 VOQ, 27 TLF). 20-bed hospital.

Shaw AFB, S. C. 29152-5000; 10 mi. WNW of Sumter, Phone (803) 668-8110; DSN 965-1110, TAC base, As of June 1, 1992, Shaw becomes an ACC base, 363d Fighter Wing, F-16 fighter operations; Hq. 9th Air Force; 507th Air Control Wing, OA-10 FAC operations. 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 on July 9, 1918, when his Bristol fighter was shot down during a reconnaissance mission. Area 3,363 acres; supports another 8,353 acres. Altitude 244 ft. Military 5,798; civilians 1,206. Payroll \$167 million. Housing: 170 officer, 1,534 enlisted, 294 transient (164 VAQ, 90 VOQ, 40 TLF), 40-bed hospital.

Shemya AFB, Alaska (APO AP 96512-5000); located at western tip of the Aleutian Islands chain, midway between Anchorage, Alaska, and Tokyo, Japan. Phone (907) 392-3000; DSN 392-3000. PACAF base. Host unit: 673d Air Base Gp. (PACAF). Tenant units: 16th Surveillance Sqdn. (AFSPACECOM); Det. 1, 6th Reconnaissance Wing. Base activated 1943. Shemya was used as a bomber base in WW II. The International Date Line has been bent around Shemya so that the local date is the same as elsewhere in the US. Island area about 11.25 sq. mi. Altitude 270 ft. Military 702; civilian contract employees 122; seasonal civilian construction workers 170. Payroll \$19.5 million, Unaccompanied housing: 70 officer, 1,357 enlisted, 173 VOQ, 79 VAQ. Dispensary.

Sheppard AFB, Tex. 76311-5000; 4 mi. N of Wichita Falls. Phone (817) 676-2511; DSN 736-1001. ATC base. Sheppard Training Center Includes 3700th Technical Training Gp., which conducts courses in aircraft maintenance, civil engineering, communication, comptroller, transportation, and instructor training; 3790th Medical Service Training Gp., which provides training in biomedical sciences, dentistry, health service administration, medical readiness, medicine, nursing, and the Physician Assistant Training Program; and 3785th Field Training Gp., which provides training on specific weapon systems and on-the-job training advisory service at 72 field training detachments and 18 operating locations worldwide; 80th Flying Training Wing (ATC), which conducts T-37 and T-38 undergraduate pilot training and instructor pilot training for 12 nations in the Euro-NATO Joint Jet Pilot Training Program. Base activated June 14, 1941; named for US Sen, Morris E. Sheppard of Texas, who died Apr. 9, 1941. Area 5,486 acres. Altitude 1,015 ft, Military 6,594; civilians 3,277. Payroll \$159 million. Housing: 199 officer, 1,087 NCO, 1,770 transient (1,322 VAQ, 50 TLF, 136 UOQ, 262 VOQ), 115-bed hospital.

Soesterberg AB, the Netherlands, APO AE 09719; 3 mi, from Zeist; 26 mi, from Amsterdam. Phone (commercial, from CONUS) 011-31-3463-58199; DSN 363-8199. Royal Netherlands air base. 32d Fighter Gp. (USAFE) prepares for and conducts all-weather operations in intercept, identification, and air-superiority roles in support of NATO using the F-15, Base activated 1913; US presence began 1954, Area 515 acres. Altitude 66 ft. Military 1,533; civilians 1,740. Payroll \$78.6 million. Housing: 40 officer, 190 leased units (incl. 14 officer), 140 govt.-owned units (incl. 26 officer), 461 dorm spaces, 31 VAQ, 6 VOQ. Clinic.

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 is the only Wild Weasel base in USAFE. The wing flies both F-16Cs and F-4Gs. It will begin receiving A-10s and OA-10s in 1993. Base activated and US presence began in 1953. Named after local town. Area 1,282 acres. Altitude 1,196 ft. Milltary 4,800; civillans 900. Payroll \$110 million. Housing: 43 officer, 615 enlisted, 500 US Govt. leased units, 1,110 billeting spaces. Clinic.

Thule AB, Greenland, APO AE 09704-5000; NW coast of Greenland; 700 mi. N of Arctic Circle; approx. 900 mi. S of North Pole. Phone (commercial, from CONUS) 011-299-50124; DSN 834-1211 for Cheyenne Mountain AFB, then ask for Thule operator. AFSPACECOM base. 1012th Air Base Sqdn.; 12th Missile Warning Gp.; Det. 3, 2d Satellite Tracking Gp. Base activated in 1952. Area 2,600 acres. Altitude sea level. Military 150; civilians 150 American contractors and approx. 1,550 Danish contractors and 50 Greenlandic contractors, Housing: no family housing; no quarters of facilities for visitors. Permanent party dormitories for military and civilian personnel. Transient quarters available only for TDY personnel.

Tinker AFB, Okla. 73145-5990; 8 mi. SE of Oklahoma City. Phone (405) 732-7321; DSN 884-1110. AFLC base. As of July 1, 1992, Tinker becomes an AFMC base. Hq. Oklahoma City Air Logistics Center furnishes logistics support for bombers, jet engines, instruments, and electronics. Other major units include Engineering

Installation Div.; 3d Combat Communications Gp.; 28th Air Div.; 507th Fighter Gp. (AFRES). Base activated 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 on June 7, 1942. Area 4,885 acres. Altitude 1,291 ft. Military 7,193; civilians 14,880. Payroll \$673 million (FY 1991). Housing: 106 officer, 622 NCO. 30-bed hospital.

Torrejon AB, Spain, APO AE 09641; 14 mi. NE of Madrid. Phone (commercial, from CONUS) 011-341-665-7777; DSN 723-1110, USAFE base, Hq. 16th Air Force (USAFE). Host unit: 401st Fighter Wing (USAFE). Base activated and US forces began operation June 1957; base reverts to Spanish control May 4, 1992. Named for the village of Torrejon de Ardoz. Area 3,206 acres. Altitude 2,000 ft. Military and civilian population will decrease to less than 300 by late 1992. Payroll \$168.2 million. Housing: 67 units, 858 US Govt, leased units, 254 VOQ/VAQ rooms, 147 TLF, 616 dormitory units. 35-bed hospital.

Travis AFB, Calif. 94535-5000; 50 mi. NE of San Francisco at Fairfield. Phone (707) 424-5000; DSN 837-1110. MAC base. As of June 1, 1992, Travis becomes an AMC base. Hq. 22d Air Force; 60th Airlift Wing; 349th Airlift Wing (AFRES Assoc.); David Grant Medical Center; Air Force Band in Blue. Primary mission of 60th AW is strategic airlift. Base activated May 17, 1943; named for Brig. Gen. Robert F. Travis, killed Aug. 5, 1950, in a B-29 accident. Area 7,580 acres. Altitude 62 ft. Military 12,900; civilians 3,600. Payroll \$305 million. Housing: 294 officer, 2,171 enlisted, 3,546 enlisted dormitory spaces, 704 transient (100 TLF, 165 VOQ. 439 VAQ). 298-bed hospital (acute care), 75 aeromedical staging flight beds and 52 dental treatment rooms.

Tyndall AFB, Fla. 32403-5000; 12 mi. E of Panama City, Phone (904) 283-1113; DSN 523-1113. TAC base. As of June 1, 1992, Tyndall becomes an ACC base. 325th Fighter Wing, F-15 operations. The 325th FW provides training of F-15 pilots and centralized training for all F-15 maintenance personnel. TAC units include Hq. 1st Air Force; Southeast Air Defense Sector; 475th Weapons Evaluation Gp.; 4484th Test Sqdn.; and TAC NCO Academy East. Tenant units include Air Force Civil Engineering Support Agency (AFCESA) and 3625th Technical Training Sqdn. (ATC). Base activated Dec. 7, 1941; named for 1st Lt. Frank B. Tyndall, WW I fighter pilot killed July 15, 1930, in crash of P-1 near Mooresville, N. C. Area 29,115 acres. Altitude 18 fl. Military 5,025; civilians 1,781. Payroll \$140 million. Housing: 149 officer, 922 enlisted, 1,143 transient (820 VAQ, 283 VOQ, 40 TLF). 35-bed hospital.

US Air Force Academy, Colo, 80840-5000; N of Colorado Springs. Phone (719) 472-1818; DSN 259-3110. Direct Reporting Unit. Established Apr. 1, 1954. First class entered Lowry AFB, Colo., July 1955. Moved to permanent location Aug. 1958. Tenant units include 1876th Communications Gp.; Frank J. Seiler Research Lab (AFSC); DoD Medical Exam Review Board. Aircraft flown: T-41; Cessna 150 (cadet flying team); UV-18 (Det. 1, Peterson AFB); 126E (sailplane); ASK-21 (sailplane); SGS-2-33A (glider); TG7A (motor glider). Area 19,268 acres. Altitude 7,280 ft. Military 2,669; cadets 4,345; Preparatory School students 226; civilians 1,488. Payroll \$273 million. Housing: 445 officer, 772 enlisted, 78 transient, 28 temporary family quarters. 65-bed hospital.

Vance AFB, Okla, 73705-5000; 3 mi. SSW of Enid. Phone (405) 237-2121; DSN 962-7110. ATC base, 71st Flying Training Wing, undergraduate pilot training. Base activated 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. Altitude 1,007 ft. Military 1,288; civilians 1,380 (1,200 contract employees). Payroll \$78.2 million. Housing: 131 officer, 98 civilians, 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. AFSPACECOM 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. The major associate unit is Hq. 20th Air Force, the SAC numbered Air Force responsible for ICBM operations. Another major associate unit, the 310th Training and Test Wing, trains SAC's ICBM crews in the Minuteman and Peacekeeper weapon systems and conducts ICBM operational testing and evaluation. Originally Army's Camp Cooke.

Activated 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. Altitude 400 ft. Military 3,349; civilians 1,294; civilian contractors 3,835. Payroll \$126.4 million (military and civilians); \$132.4 million (contractors). Housing: 494 officer, 1,499 NCO, 172 mobile 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, SAC base, As of June 1, 1992, Whiteman becomes an ACC base. As of June 1, 1992, Whiteman becomes an ACC base. 351st Missile Wing; Det. 509 was activated in 1990. Whiteman AFB is responsible for 150 Minuteman II ICBMs and is scheduled to receive the first B-2 bombers when they become operational in the 1990s. Base activated 1942; named for Sedalia resident 2d Lt. George A. Whiteman, the first pilot to die in aerial combat during the attack on Pearl Harbor. Area 4,627 acres, plus missile complex of about 10,000 sq. mi. Altitude 869 ft. Military 3,586; civilians 436. Payroll \$99 million. Housing: 129 officer, 849 enlisted, 74 transient (incl. 12 3-bdrm. guest houses, 40 VAQ, 26 VOQ, 4 DVQ), 30-bed hospital.

Williams AFB, Ariz. 85240-5000; 10 mi, E of Chandler, Phone (602) 988-2611; DSN 474-1011. ATC base. 82d Flying Training Wing, undergraduate pilot training base; home of AFSC Armstrong Laboratory/Flying Training Division doing extensive research on flight simulators. Base activated July 1941; named for 1st Lt. Charles L. Williams, killed in aircraft crash near Fort DeRussy, Hawaii, July 6, 1927. Area 5,398 acres, Altitude 1,385 ft. Military 1,976; civilians 1,611. Payroll \$66.3 million. Housing: 270 officer, 429 NCO, 134 transient. 15-bed hospital. Base projected to close September 1993.

Wright-Patterson AFB, Ohio 45433; 10 mi. ENE of Dayton. Phone (513) 257-1110; DSN 787-1110, AFLC base. Hq. Air Force Logistics Command until July 1, 1992, official date of AFLC deactivation and transfer of assets to Air Force Materiel Command, which activates on July 1, 1992 with headquarters at Wright-Patterson AFB.; Hq. Aeronautical Systems Div. (AFSC); Air Force Institute of Technology; USAF Medical Center, Wright-Patterson; US Air Force Museum; Logistics Management Systems Center; AFLC International Logistics Center; 2750th Air Base Wing (AFLC); 906th Fighter Gp. (AFRES); more than 100 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. Area 8, 145 acres. Altitude 824 ft. Military 10,222; civilians 18,264; contracted service and contractor employees 6,000. Payroll \$968 million. Housing: 732 officer, 1,629 NCO, 301-bed hospital.

Wurtsmith AFB, Mich., 48753-5000; 3 mi. NW of Oscoda. Phone (517) 739-2011; DSN 623-1110. SAC base. As of June 1992, Wurtsmith becomes an ACC base. 379th Wing. Base activated 1924 as Camp Skeel, gunnery camp for Selfridge Field; became Oscoda AAF during WW II; renamed in 1953 for Maj. Gen. Paul B. Wurtsmith, killed Sept. 13, 1946, in a B-25 crash. Base assigned to SAC Apr. 1, 1960. Area 5,221 acres. Altitude 634 ft. Military 3,062; civilians 701, plus 170 contractors. Payroll \$92.1 million. Housing: 224 officer, 1,118 NCO, 33 TLF units, 8 UOQ, 18 VOQ, 24 VAQ. 20-bed hospital. Base scheduled for closure June 30, 1993.

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. Host unit: 374th Airlift Wing (PACAF), C-130, UH-1N, MAC C-9, and C-21 operations. Primary aerial port in Japan. Base opened as Tama Army Air Field by Japanese in 1940. Area 1,750 acres. Altitude 457 ft. Military 4,412; US civilians 901; local nationals 1,424. Payroll \$156 Illians 901; local nationals 901; local n

Zaragoza AB, Spain, APO AE 09646; 12 mi. SW of Zaragoza. Phone (commercial, from CONUS) 011-34-76-32-67-11; DSN 724-1110. USAFE base slated for return to the Spanish Government by Sept. 30, 1992, 406th Tactical Fighter Training Wing hosted air-to-ground and air-to-air training for USAFE's Central Region fighter bases. Current US presence began in Feb. 1970. Area 2,982 acres. Altitude 863 ft.

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. When an installation can be reached by a general-purpose DSN number, that number is listed. In some cases, the designation air base (AB) is used.

Ankara AS (Turkey), APO AE 09822 (USAFE)	DSN 672-1110	Hessisch-Oldendorf AS (Germany), APO AE 09205 (USAFE)	DSN 331-1110
Avon Park AFS, Fla. 33825 (TAC) ^a	DSN 968-1110	High Wycombe AS (UK),	DSN 232-1110
Cape Canaveral AFS, Fla. 32925-5000	DSN 467-1110	APO AE 09471 (USAFE)	
(AFSPACECOM)		Indian Springs Air Force Auxiliary Field, Nev. 89018-5000 (TAC) ^a	DSN 682-6201
Cape Cod AFS, Mass, 02561-0428 (AFSPACECOM)	DSN 557-2202	Izmir AS (Turkey), APO AE 09821 (USAFE)	DSN 675-1110
Cavalier AFS, N. D. 58220-5000 (AFSPACECOM)	DSN 330-3292	King Salmon Airport (Alaska), APO AP 96513 (PACAF)	cmcl. 907-721-3301
Clear AFS (Alaska), APO AP 96509-5000 (AFSPACECOM)	DSN 585-6416	Lindsey AS (Germany), APO AE 09196 (USAFE)	DSN 339-1110
Decimomannu AB (Italy), APO AE 09606 (USAFE)	DSN 621-9267	New Boston AFS, N. H. 03031-5000 (AFSPACECOM)	DSN 881-1550
Duke Field AFS, Fla. 32542-6005 (MAC) ^b	DSN 872-1110	Pirinclik AS (Turkey), APO AE 09825 (USAFE)	DSN 679-1110
Eldorado AFS, Tex. 76936-5000	DSN 477-4220	Pruem AS (Germany), APO AE 09207 (USAFE)	DSN 453-1110
(AFSPACECOM)		RAF Croughton (UK), APO AE 09494 (USAFE)	DSN 236-1110
Galena Airport (Alaska), APO AP 96510 (PACAF)	cmcl, 907-446-3311	RAF Fairford (UK), APO AE 09456 (USAFE)	DSN 247-1110
Gila Bend Air Force Auxiliary Field, Ariz. 85337-5000 (TAC)*	DSN 853-5220	RAF Greenham Common (UK), APO AE 09462 (USAFE)	DSN 266-1110
		Sondrestrom AB (Greenland), APO AE 09709 (AFSPACECOM)	DSN 834-1211, ask for Sondrestrom AB.
		Tempelhof Central Airport AS (Germany), APO AE 09187 (USAFE)	DSN 332-5300
*Becomes ACC base June 1, 1992. *Becomes AMC base June 1, 1992.		Woomera AS (Australia), APO AP 96552 (AFSPACECOM)	DSN 730-1350

ANG and AFRES Bases

Note: This section of the Guide consolidates major Air National Guard (ANG) and Air Force Reserve (AFRES) bases into a single listing. Most ANG locations are listed alphabetically, according to the city in which or near which they are located. 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 that are located on active-duty bases. These may be found in the "Major Installations" section above.

Anchorage, Alaska (Kulis ANG Base at Anchorage International Airport) 99502. Phone (907) 249-1208; DSN 626-1208. 176th Composite 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. Altitude 124 ft. Military 1,094, full-time personnel 422. Payroll \$19.3 million. Six-bed hospital.

Atlanta, Ga. (McCollum ANG Station, Kennesaw, Ga.) 30144; 27 mi. N of Atlanta, 10 mi. from Dobbins AFB. Phone (404) 422-2500; DSN 925-2500. 129th Control Sqdn. and 118th Control Sqdn. (ANG). Area 13 acres. Altitude 1,060 ft. Military 355, full-time personnel 47. Payroll through Dobbins AFB.

Atlantic City International Airport, N. J. (400 Langley Rd., Pleasantville) 08232-9500; 10 mi. W of Atlantic City. Phone (609) 645-6000; DSN 455-6000. 177th Interceptor Gp. (ANG). Area 286 acres. Altitude 76 ft. Military 1,015, full-time support 383. Payroll \$14.3 million.

Baltimore, Md. (Martin State Airport) 21220-2899; 8 mi. E of Baltimore, Phone (301) 687-6270; DSN 243-6210, 175th Fighter Gp. (ANG); 135th Airlift Gp. (ANG). Area 175 acres. Altitude 24 ft. Military 1,890, full-time personnel 520. Payroll \$20.1 million. Clinic.

Bangor International Airport, Me. 04401-3099; 4 mi. NW of Bangor, Phone (207) 990-7700; DSN 698-7700.

101st Air Refueling Wg. (ANG); 776th Radar Sqdn. (TAC). Area 300 acres. Altitude 192 ft. Military 1,026, full-time personnel 385, Title 5 civilians 25, Payroll \$16.2 million. Small BX.

Battle Creek, Mich. 49015-1291; adjacent to W. K. Kellogg Regional Airport. Phone (616) 963-1596; DSN 580-3210. 110th Fighter Gp. (ANG). Area 315 acres. Altitude 941 ft. Military 951, full-time personnel 254. Payroll \$10.6 million.

Birmingham Municipal Airport, Ala. 35217. Phone (205) 841-9200; DSN 694-2210. 117th Reconnaissance Wg. (ANG). Area 86 acres. Altitude 650 ft. Milltary 1,204, full-time personnel 344. Payroll \$17.6 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 lield training site) and Marine Corps Reserve. Airport named for Lt. Paul H. Gowen, killed in B-10 crash in Panama July 11, 1938. Area 1,994 acres. Altitude 2,858 ft. Military 1,511, full-time personnel 537. Payroll \$16.2 million. Limited transient facilities available during Army Guard camps.

Bradley International Airport, Windsor Locks, Conn. 06026-5000; 15 mi. N of Hartford at East Granby. Phone (203) 623-8291; DSN 636-8310. 103d Fighter Gp. (ANG); Army National Guard aviation battalion. Base named for Lt. Eugene M. Bradley, killed in P-40 crash in Aug. 1941. Area 165 acres. Allitude 173 ft. Military 996, full-time personnel 310. Payroll \$14.1

Buckley ANG Base, Colo, 80011; 8 mi. E of Denver. Phone (303) 366-5363; DSN 877-9011, 140th Fighter Wg, (ANG); 154th Tactical Control Gp.; Hq. Colorado ANG; 227th Air Traffic Control Fit. (ANG); and

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 gunery training facility. ANG assumed control from US Navy in 1959. Base named for Lt. John H. Buckley, National Guardsman, killed in the Argonne, France, Sept. 27, 1918. Area 3,328 acres. Altitude 5,663 ft. Military 1,436, full-time personnel 364, Title 5 civilians 257. Payroll \$26.8 million. Dispensary.

Burlington, Vt. (Burlington International Airport) 05401; 3 mi. E of Burlington. Phone (802) 658-0770; DSN 220-5210. 158th Interceptor Gp. (ANG). Area 241 acres. Altitude 371 ft. Military 995, full-time personnel 398, Payroll \$14,3 million.

Channel Islands ANG Base, Calif. (Point Mugu) 93041-4001, Phone (805) 986-8000; DSN 893-7000, 146th Airlift Wg. (ANG), Area 86 acres. Altitude 12 ft. Military 1,506, full-time personnel 369. Payroll \$18.2 million.

Charleston, W. Va. (Yeager Airport) 25311-5000; 4 mi. NE of Charleston. Phone (304) 341-6210; DSN 366-9210. 130th Airlift Gp. (ANG). Airport named for Brig, Gen. Charles "Chuck" Yeager, first man to break the sound barrier. Area 236 acres. Altitude 981 ft. Military 942, full-time personnel 249. Payroll \$11.1 million. Dispensary, clinic.

Charlotte, N. C. (Charlotte/Douglas International Airport) 28208. Phone (704) 391-4100; DSN 583-9210. 145th Airliff Gp. (ANG). Area 79 acres. Altitude 749 ft. Military 1,284, full-time personnel 332. Payroll \$17.1 million. Clinic.

Cheyenne, Wyo. (Cheyenne Municipal Airport) 82001. Phone (307) 772-6201; DSN 943-6201, 153d Airlift Gp. (ANG). Area 71 acres. Altitude 6,156 ft. Military 1,025, full-time personnel 266. Payroll \$11.7 million. Des Moines International Airport, Iowa 50321; in city of Des Moines. Phone (515) 287-9210; DSN 939-8210. 1326 Fighter Wg. (ANG). Area 113 acres. Altitude 957 tt. Military 1,091, full-time personnel 344. Payroll \$14.2 million.

Dobbins AFB, Ga. (Marietta) 30069-5000; 16 mi. NW of Atlanta. Phone (404) 421-5000; DSN 925-1110. AFRES base. Hq. 14th Air Force (AFRES); 94th Airlift Wg. (AFRES); 116th Fighter Wg. (ANG); 151st Military Intelligence Battalion (ARNG); 145th and 412th Medical Detachments (USAR). Base activated 1943. Named or Capt. Charles Dobbins, WW II pilot killed in action near Sicily. Area 1,656 acres (ANG 55 acres). Altitude 1,068 ft. AFRES: active-duty 50, civilians 1,050, Reservists 2,011. Payroll \$81.3 million. ANG: military 1,213, [ull-time personnel 134. Payroll \$4.2 million. USAR: active-duty 16, Reservists 69. Housing: 5 NCO, VOQ, VAQ. Dispensary. NAS Atlanta, Lockheed Aeronautical Systems Co./Air Force Plant 6 adjoin Dobbins AFB and use airfield facilities.

Duluth International Airport, Minn. 55811-5000; 5 mi. NW of Duluth. Phone (218) 727-6886; DSN 825-7210. 148th Interceptor Gp. (ANG). Area 409 acres. Altitude 1,429 ft. Military 1,009, full-time personnel 379 (plus 24 civilians). Payroll \$16.3 million.

Ellington Field, Tex. 77034-5586; a City of Houston Airport 17 mi. SE of downtown Houston. Phone (713) 929-2221; DSN 954-2221. 147th Interceptor Gp. (ANG). Other tenants include NASA Flight Operations, US Coast Guard, Army National Guard, FAA. Base named for Lt. Eric L. Ellington, pilot killed in Nov. 1913. Area 213 acres. Altitude 40 ft. Military 1,025, full-time personnel 418, Payroll \$18.1 million.

Fargo, N. D. (Hector International Airport) 58105-5536. Phone (701) 237-6030; DSN 362-8110. 119th Interceptor Gp. (ANG). Area 133 acres. Altitude 900 It, Military 1,154, full-time personnel 400. Payroll \$18.6 million.

Forbes Field, Kan. 66619-5000; 2 mi. S of Topeka. Phone (913) 862-1234; DSN 720-1234. 190th Air Refueling Gp. (ANG). Area 192 acres. Altitude 1,079 ft. Military 978, full-time personnel 346 (plus 40 civilians). Payroll \$14.7 million.

Fort Smith Municipal Airport, Ark. 72906. Phone (501) 648-5210; DSN 962-8210. 188th Fighter Gp. (ANG). Area 98 acres. Altitude 468 ft. Military 1,048, full-time personnel 301. Payroll \$12.2 million.

Fort Wayne, Ind. (Fort Wayne Municipal Airport) 46809-5000; 5 mi. SSW of Fort Wayne. Phone (219) 478-3210; DSN 786-1210. 122d Fighter Wg. (ANG). Area 138 acres. Altitude 800 ft. Military 1,328, full-time personnel 365. Payroll \$15.7 million.

Fresno Air Terminal, Calif. 93727-2199; 5 mi, NE of Fresno. Phone (209) 454-5155; DSN 949-9210. 144th Interceptor Wg. (ANG). Area 127 acres. Altitude 332 ft. Military 1,004, full-time personnel 395. Payroll \$16 million.

General Mitchell International Airport, Wis. 53207-6299; 3 ml. S of Milwaukee. AFRES base. Altitude 723 ft. ANG and AFRES have separate telephone lines and facilities. ANG (414) 747-4410; DSN 580-8410. 128th Air Retueling Gp. (ANG). ANG area 111 acres. Military 999, full-time personnel 334. Payroll \$14.6 million. AFRES phone (414) 482-5000; DSN 369-5000. 440th Airlifft Wg. (AFRES). AFRES area 103 acres. Full-time personnel and civilians 340, Reservists 1,294. Payroll \$18.9 million.

Greater Peoria Airport, III. 61607-1498; 7 mi. SW of Peoria. Phone (309) 633-3000; DSN 724-4210. 182d Fighter Gp. (ANG). Area 386 acres. Altitude 624 ft. Military 1,018, full-time personnel 266. Payroll \$10.9 million. Dispensary.

Greater Pittsburgh International Airport, Pa. 15231-0459; 15 mi. NW of Pittsburgh. Altitude 1,203 ft. AFRES base. ANG and AFRES have separate phones and facilities. 171st Air Refueling Wg. (ANG); phone (412) 269-8402; DSN 277-8402. 112th Air Refueling Gp. (ANG); phone (412) 269-8441; DSN 277-8441. ANG area 94 acres. Military 1,881, full-time personnel 517. Payroll \$21.2 million. AFRES phone (412) 269-8000; DSN 277-8000. 911th Airlift Gp. (host unit). AFRES area 116 acres. Military 26, full-time personnel 142, civilians 222, Reservists 1,302. Payroll \$20 million. Base activated 1943. Housing: 24 VOQ, 230 enlisted qtrs. Limited BX; no on-base housing.

Great Falls International Airport, Mont. 59401-5000; 5 mi, SW of Great Falls, Phone (406) 727-4650; DSN 279-2301, 120th Fighter Interceptor Gp. (ANG), Area 139 acres. Altitude 3,674 ft. Military 1,019, full-time personnel 392. Payroll \$17.1 million. Dispensary.

Gulfport-Biloxi Regional Airport, Miss. 39501; within city limits of Gulfport. Phone (601) 868-6200; DSN 363-8200. Training site; also host to 255th Tactical Control Sqdn. (ANG); Army National Guard Transportation Repair Shop; and 173d Civil Engineering Flt. An air-to-ground gunnery range is located 70 mi. due N of site. Area 219 acres. Altitude 28 ft. ANG military 513, full-time personnel 50. Payroll \$4.4 million. Two-bed dispensary.

Harrisburg, Pa. 17057; 10 mi. E of Harrisburg. Phone (717) 948-2201; DSN 454-9201. 193d Special Operations Gp. (ANG). ANG area 64 acres. Altitude 310 ft. Military 1,125, full-time personnel 319. Payroll \$20.7 million.

Jackson, Miss. (Allen C. Thompson Field) 39208-0810; 7 mi. E of Jackson. Phone (601) 939-3633; DSN 731-9210. 172d Airlift Gp. (ANG). ANG area 116 acres. Altitude 346 ft. Military 1,198, full-time personnel 316. Payroll \$16.4 million. Six-bed dispensary.

Jacksonville International Airport, Fla. 32229; 15 mi. NW of Jacksonville. Phone (904) 741-7150; DSN 460-7150. 125th Interceptor Gp. (ANG). Area 332 acres. Altitude 26 ft. Military 1,007, full-time personnel 405. Payroll \$17.7 million. Five-bed dispensary.

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). Field named for 2d Lt. David R. Kingsley of Oregon, WW II Medal of Honor winner, killed June 23, 1944, over Ploesti, Romania. Area 425 acres. Altitude 4,000 ft. Military 406, full-time personnel 375, Title 5 civilians 16. Payroll \$40.1 million. Clinic.

Knoxville, Tenn. (McGhee Tyson Airport) 37901; 10 mi. SW of Knoxville. Phone (615) 985-3210; DSN 588-3210. Host unit is 134th Air Refueling Gp. (ANG). Tenants include 228th Combat Communications Sqdn. and ANG's I. G. Brown Professional Military Education Center. Area 282 acres. Altitude 980 ft. Military 1,162, full-time personnel 354. Payroll \$16.4 million. Dispensary.

Lambert International Airport, Bridgeton, Mo. 63145; 3 mi. E of St. Louis. Phone (314) 263-6200; DSN 693-6200. 131st Fighter Wg. (ANG). Area 49 acres. Attitude 589 ft. Military 1,551, full-time personnel 375. Payroll \$22,8 million.

Lincoln Municipal Airport, Neb. 68524-1897; 1 mi. NW of Lincoln. Phone (402) 473-1326; DSN 720-1352. 155th Reconnaissance Gp. (ANG). Also hosts Army National Guard unit. Area 175 acres. Altitude 1,207 ft. Milltary 1,117, full-time personnel 342. Payroll \$12.9 million. Tactical clinic.

Louisville, Ky. (Standiford Field) 40213. Phone (502) 364-9400; DSN 989-4400. 123d Airlift Wg. (ANG); 223d Communications Sqdn. (ANG). Area 65 acres. Allitude 497 ft. Military 1,121, full-time personnel 317. Payroll §13.5 million.

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. Altitude 1,296 ft. Military 945, full-time personnel 259. Payroll \$10,8 million. Clinic. Limited dependent ID card service. Coast Guard exchange.

Martinsburg, W., Va. (Eastern W., Va. Airport/Shepherd Field) 25401; 4 mi, S of Martinsburg. Phone (304) 267-5100; DSN 242-9210. 167th Airlift Gp. (ANG). Area 420 acres. Altitude 556 ft. Military 1,269, full-time personnel 295. Payroll \$13.8 million. Dispensary.

McEntire ANG Base, S. C. 29044; 12 mi. E of Columbia. Phone (803) 776-5121; 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 an F-104 accident in 1961. Area 2,473 acres. Altitude 250 ft. Military 1,356, full-time personnel 383. Payroll \$14.9 million. Dispensary.

Memphis International Airport, Tenn. 38181-0026; within Memphis city limits. Phone (901) 369-4111; DSN 966-8111, 164th Airliff Gp. (ANG). ANG occupies 99 acres. Altitude 332 ft. Military 949, full-time personnel 263. Payroll \$11.7 million. Clinic.

Meridian, Miss. (Key Field) 39302-1825; located at municipal airport near Hwys. 20 and 59. Phone (601) 484-9000; DSN 694-9210. 186th Air Refueling Gp. (ANG); host to 238th Combat Communications Sqdn. (ANG). Area 116 acres, Altitude 297 ft, Military 1,272, full-time personnel 368. Payroll \$15.2 million. Dispensary.

Minneapolis-St. Paul International Airport, Minn. 55450-5000; in Minneapolis, near confluence of the Mississippi and Minnesota Rivers. AFRES base. Altitude 840 ft. ANG and AFRES have separate phones and facilities. ANG phone (612) 725-5011; DSN 825-5552. 133d Airlift Wg. (ANG). ANG area 128 acres. Military 1,406, full-time personnel 300. Payroll \$16.2 million. AFRES phone (612) 725-5011; DSN 825-5110. 934th Airlift Gp. (AFRES) flies C-130s. AFRES area 300 acres. Reservists 1,200, full-time personnel 130, civilians 180. Payroll \$18 million. Other units include 210th Engineering and Installation Sqdn. (ANG); 237th Air Traffic Control Fit. (ANG); Navy Readiness Comd., Region 16; OLG, 2185th Communications Gp. (AFRES); Naval Air Reserve Center; Marine Wg. Support Gp. 47, Det. A; USAF-CAP/NCLR and CAP MNLO; Rothe Development Inc. (AFRES); Billeting and BX available.

Montgomery, Ala. (Dannelly Field) 36196; 7 mi. SW of Montgomery. Phone (205) 284-7210; DSN 742-9210. 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. Altitude 221 ft. Military 1,053, full-time personnel 346. Payroll \$18.1 million. Dispensary.

Nashville Metropolitan Airport, Tenn. 37217-0267; 6 mi. SE of Nashville. Phone (615) 361-4600; DSN 446-6210, 118th Airlift Wg. (ANG). Area 85 acres. Altitude 597 ft. Military 1,392, full-time personnel 372, Payroll \$19 million.

Naval Air Station Dallas, Tex. (Hensley Field) 75211. Phone (214) 266-6111; DSN 874-6111, 136th Airlift Wg. (ANG). Area 49 acres. Altitude 495 ft. Military 961, full-time personnel 255. Payroll \$13,1 million.

Naval Air Station Moffett, Calif. 94035; 2 mi. N of Mountain View. ANG phone (415) 404-9129; DSN 494-9129. 129th Rescue Gp. (ANG). Area 13 acres. Altitude 34 ft. Military 749, full-time personnel 263. Payroll \$15.4 million.

Naval Air Station New Orleans, La. (Alvin Callender Field) 70143-5400; 15 ml. S of New Orleans. Altitude 3 ft. ANG and AFRES have separate phones and facilities. ANG phone (504) 391-8618; DSN 457-8618, 159th Fighter Gp. (ANG). ANG military 1,215, full-time personnel 426. Payroll \$18 million. AFRES phone (504) 393-3293; DSN 363-3293. 926th Fighter Gp. (AFRES). Military 986, full-time personnel 303. Payroll \$15 milion. NAS New Orleans 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. Area 3,245 acres (ANG 19 acres). Dispensary.

Newburgh, N. Y. 12550-0031; 15 mi. N of USMA (West Point). Phone (914) 563-2000; DSN 247-2000. Hq. New York ANG; 105th Airlift Gp. (ANG); USMA subpost airport. Stewart AFB until 1959; acquired by state of New York in 1970. ANG area 304 acres. Altitude 491 ft. ANG military 1,757, full-time personnel 672. Payroll \$18 million. Dispensary. Most military services available through West Point or subpost.

Niagara Falls International Airport, N. Y. 14304-5000; 6 mi. E of Niagara Falls. Phone (716) 236-2000; DSN 489-3011. AFRES base, 914th Airlift Gp. (AFRES); 107th Interceptor Gp. (ANG). Base activated Jan. 1952. Area 979 acres (ANG 104 acres). Altitude 590 (I. AFRES: Reservists 1,200, civilians 255. Payroll \$19.5 million. ANG: military 995, full-time personnel 375, Payroll \$18,4 million.

O'Hare Air Reserve Forces Facility, III. 60666; 22 mi. NW of Chicago's Loop. Phone (312) 825-6000; DSN 930-6000. AFRES base. 928th Airliff Gp. (AFRES); 126th Air Refueling Wg. (ANG); Defense Contract Administration Services Region, Chicago. Base activated Apr. 1946, Named for Ll. Cmdr. Edward H. "Butch" O'Hare, USN, Medal of Honor recipient, killed Nov. 26, 1943, during battle for Gilbert Islands. Area 391 acres (ANG 36 acres). Altitude 643 It. Reservists 1,575, full-time personnel and civilians (all units) 1,410, Illinois ANG 1,435, full-time personnel 348. Payroll for total facility \$67.5 million.

Ontario International Airport, Ontario, Calif. 91761. Phone (714) 984-2705; DSN 947-3559. 148th Combat Communications Sqdn. (ANG); 210th Weather Fit. (ANG). Area 11 acres. Altitude 900 ft. Military 154, fulltime personnel 26. Payroll \$1.1 million.

Otis ANG Base, Mass. 02542-5001; 7 mi. NNE of Falmouth. Phone (508) 968-1000; DSN 557-4003. 102d Interceptor Wg. (ANG); 567th USAF Band (ANG);

101st and 202d Weather Flts. (ANG). Adjacent installations and organizations include Cape Cod AFS (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 3,849 acres. Altitude 132 ft. ANG military 1,149, ANG full-time personnel 417 (plus 318 Title 5 civilian employees). Payroll \$27.8 million.

Phelps Collins Airport, Alpena, Mich. 49707; 7 mi. W of Alpena. Phone (517) 354-6291; DSN 741-3500. Training site detachment. Facilities used by ANG and AFRES units for annual field training and by ARNG and Marine Reserve for special training. Base named for Capt. W. H. Phelps Collins, American Flying Corps, killed in France, Mar. 1918. Area 2,708 acres. Altitude 689 ft. Milltary 69, civilian full-time support 69. Payroll \$2.2 million. Housing: 1,500 personnel. 14-bed hospital. Dispensary.

Phoenix, Ariz. (Sky Harbor International Airport) 85034. Phone (602) 244-9841; DSN 853-9072. 161st Air Refueling Gp. (ANG). Area 51 acres. Altitude 1,230 ft. Military 1,076, full-time personnel 342. Payroll \$16.6 million.

Portland International Airport, Portland, Ore. 97218-2797. Phone (503) 335-4100; DSN 638-4000. 142d Interceptor Gp. (ANG); 244th Combat Communications Sqdn. (ANG); 272d Combat Communications Sqdn. (ANG); 12th Special Forces Gp. (USAR); Oregon Wg., CAP. Also host to 939th Rescue Wing (AFRES) and 83d Aerial Port Sqdn. (AFRES). Area 232 acres, Altitude 26 ft. Military 1,773, full-time personnel 621 (plus 100 civilians). Payroll \$20.5 million.

Portsmouth, N. H. 03803-5505, Phone (503) 430-2453; DSN 852-2453, 157th Air Refueling Gp. (ANG). Area 220 acres, Altitude 101 It. ANG military 1,170, ANG full-time personnel 370. Payroll \$12 million.

Providence, R. I. (Quonset State Airport) 02852; 20 mi. S of Providence. Phone (401) 886-1200; DSN 476-3210, 143d Airliff Gp. (ANG), Area 79 acres. Altitude 9 tt. Military 996, full-time personnel 270. Payroll \$15.1 million.

Puerto Rico International Airport, Puerto Rico (Muniz ANG Base) 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 an aircraft accident July 4, 1960. Area 86 acres. Military 969, fulltime personnel 300. Payroll \$15,7 million.

Reno-Cannon International Airport, Nev. (May ANG Base) 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 64 acres. Altitude 4,411 ft. Military 1,104, full-time personnel 334, Payroll \$13.5 million. Dispensary.

Richards-Gebaur AFB, Mo. 64030-5000; 17 mi. S of Kansas City. Phone (816) 348-2000; DSN 463-1110. 442d Fighter Wg. (AFRES); Navy and Army Reserve units. Base activated Mar. 1944; named for 1st Lt. John F. Richards and Lt. Col. Arthur W. Gebaur, Jr. Richards was killed Sept. 26, 1918, in France, while on an artillery-spotting mission; Gebaur, an F-84 pilot, was killed Aug. 29, 1952, over North Korea during his 99th mission. Area 729 acres; another 120 acres occupied by non-USAF military units and federal agencies. Jointuse airport facility with Kansas City, Mo. Attitude 1,090 ft. AFRES and active-duty USAF 1,417, full-time personnel 398. Payroll \$21.3 million, On-base, USMC-operated, all-service housing: 27 officer, 214 enlisted. Consolidated open mess and 156 transient quarters available.

Richmond, Va. (Byrd Field) 23150; 4 mi. SE of downtown Richmond. Phone (804) 222-8884; DSN 274-8884, 192d Fighter Gp. (ANG). Airport named for Adm. Richard E. Byrd, famous Arctic and Antarctic explorer. Area 143 acres. Altitude 167 ft. Military 1,089, full-time personnel 337. Payroll \$13.9 million.

Rickenbacker ANG Base, Ohio 43217; 13 mi. SSW of Columbus. Phone (614) 492-8211; DSN 950-1110. Base transferred from SAC to ANG Apr. 1, 1980. 121st Fighter Wg. (ANG); 907th Airlift Gp. (AFRES); 160th Air Refueling Gp. (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, died July 23, 1973. Area 2,016 acres. Altitude 744 ft. ANG military 1,940, full-

time personnel 583, Title 5 civilians 299, Payroll \$32,7 million, AFRES 1,176, full-time personnel 238, Payroll \$11.1 million.

Roslyn ANG Station, Roslyn, N. Y. 11576-2399; 27 mi. E of New York City. Phone (516) 299-5214; DSN 456-5201. 274th Combat Communications Sqdn. (ANG); 213th Engineering Installation Sqdn. (ANG), Also hosts two Army National Guard units. Area 50 acres. Altitude 320 ft. Military 399, full-time personnel 42. Payroll through Newburgh, N. Y.

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 Fits, Area 132 acres. Altitude 4,220 ft. Milltary 1,585, full-time personnel 409 (plus 41 civilians). Payroll \$20.2 million. Dispensary.

Savannah International Airport, Ga. 31402; 4 mi. NW of Savannah. Phone (912) 964-1941; DSN 860-8210. 165th Airlift Gp. (ANG). Also field training site. Area 232 acres. Altitude 50 ft. Military 1,176, full-time personnel 330. Payroll \$17.7 million. Housing: 156 officer, 736 enlisted. Three-bed dispensary.

Schenectady Airport, Scotia, N. Y. 12302-9752; 2 mi. N of Schenectady. Phone (518) 381-7300; DSN 974-9221. 109th Airllift Gp. (ANG). Area 106 acres. Altitude 378 ft. Military 1,102, full-time personnel 258. Payroll \$11,6 million. Dispensary.

Selfridge ANG Base, Mich. 46045; 3 mi, NE of Mount Clemens, Phone (313) 466-4011; DSN 273-0111. 127th Fighter Wg. (ANG); 191st Interceptor Gp. (ANG); 927th Airlift Gp. (AFRES). Also hosts Air Force, Navy Reserve, Marine Air Reserve, Army Reserve, Army units, and US Coast Guard Air Station for Detroit. Base activated July 1917; transferred to Michilgan 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 3,071 acres. Altitude 583 ft. ANG military 2,070, ANG full-time personnel 581 (plus 530 civilians). Payroll \$44.6 million. Dispensary.

Sioux Falls, S. D. (Joe Foss Field) 57104; N side of Sioux Falls. Phone (605) 393-5700; DSN 939-7210.114th 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 163 acres. Altitude 1,428 ft. Military 962, full-time personnel 291. Payroll \$12 million.

Sioux Gateway Airport, lowa 51110; 7 mi. S of Sioux City. Phone (712) 255-3511; DSN 939-6210, 185th Fighter Gp. (ANG). Area 112 acres. Altitude 1,098 ft. Military 937, full-time personnel 294. Payroll \$13.4 million. Dispensary.

Springfield, III. (Capital Airport) 63707-5000; 2 mi. NW of Springfield. Phone (217) 753-8850; DSN 892-8210, 183d Fighter Gp. (ANG). Area 91 acres. Altitude 592 ft. Military 1,168, full-time personnel 336. Payroll \$14.1 million. Dispensary.

Springfield-Beckley Municipal Airport, Ohio 45501-1780; 5 mi. S of Springfield. Phone (513) 323-8653; DSN 346-2311. 178th Fighter Gp. (ANG); 251st Combat Communications Gp. (ANG); 269th Combat Communications Sqdn. (ANG). Area 114 acres. Altitude 1,052 ft. Military 1,205, full-time personnel 333. Payroll \$15.9 million. Six-bed dispensary.

St. Joseph, Mo. (Rosecrans Memorial Airport) 64503; 4 mi. W of St. Joseph. Phone (816) 271-1300; DSN 720-9210, 139th Airlift Gp. (ANG). Area 207 acres. Altitude 724 ft. Military 916, full-time personnel 264. Payroll \$11.5 million.

Suffolk County Airport, Westhampton Beach, N. Y. 11978-1294; within corporate limits of Westhampton Beach. Phone (516) 288-7300; DSN 456-7410. 106th Rescue Gp. (ANG). Area 70 acres. Altitude 67 ft. Military 793, full-time personnel 270. Payroll \$12.7 million.

Syracuse, N. Y. (Hancock Field) 13211-7099; 5 mi. NE of Syracuse. Phone (315) 470-6100; DSN 587-9100. 174th Fighter Wg. (ANG). Base operations for Hancock ANG Base. 152d Tactical Control Gp.; 108th and 113th Tactical Control Sqdns. (ANG). Area 376 acres. Altitude 421 ft. Military 1,433, full-time personnel 378, Payroll \$15.1 million. Dispensary.

Terre Haute, Ind. (Hulman Regional Airport) 47803-5000; 5 mi. E of Terre Haute, Phone (812) 877-5210;

DSN 724-1210, 181st Fighter Gp. (ANG), Area 279 acres. Altitude 585 ft. Military 1,170, full-time personnel 321, Payroll \$13.9 million, Five-bed dispensary.

Toledo Express Airport, Swanton, Ohio 43558; 14 mi. W of Toledo. Phone (419) 868-4078; DSN 580-4078, 180th Fighter Gp. (ANG). Area 84 acres. Altitude 684 ft. Military 1,040, full-time personnel 297. Payroll \$14.3 million. Four-bed clinic.

Truax Field, Madison, Wis. (Dane County Regional Airport) 53704-2591; 2 mi. N of Madison. Phone (608) 241-6200; DSN 273-8210. 128th Fighter Wg. (ANG). Activated June 1942 as AAF base; taken over by Wis. ANG in Apr. 1968. Named for Lt. T. L. Truax, killed in a P-40 training accident in 1941. Area 155 acres. Altitude 862 ft. Military 1,006, full-time personnel 310. Payroll \$12.2 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. Altitude 2,650 ft. Military 1,583, full-time personnel 862. Payroll \$24.3 million.

Tulsa International Airport, Okla. 74115. Phone (918) 832-8300; DSN 956-5297. 138th Fighter Gp. (ANG); 219th Electronic Installation Sqdn. Area 82 acres. Altitude 676 ft. Military 1,148, full-time personnel 310, Payroll \$13 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. Base and field named for Lt. Jerome A. Volk, first Wisconsin ANG pilot killed in the Korean War. Area 2,273 acres. Altitude 910 ft. Millitary 74, full-time personnel 74. Payroll \$2.1 million. Six-bed dispensary.

Westfield, Mass. (Barnes Municipal Airport) 01085; 3 mi. N of Westfield. Phone (413) 568-9151; DSN 636-1210/11. 104th Fighter Gp. (ANG). Area 133 acres. Allitude 270 ft. Milltary 1,046, full-time personnel 309. Payroll \$14.3 million.

Westover AFB, Mass. 01022-5000; 5 mi. NE of Chicopee. Phone (413) 557-1110; DSN 589-1110. AFRES base. 439th Airlift Wg. (AFRES). Also home of Army, Navy, and Marine Corps Reserve and Massachusetts Army National Guard. 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. Altitude 244 ft. Reservists 2,446, full-time personnel (AFRES and tenant units) 533, civilians 587. Payroll \$61 million. Housing: 360 VAQ (656 beds), 50 VOQ (80 beds).

Willow Grove Air Reserve Forces Facility, Pa. 19090-5130; 14 mi. N of Philadelphia. Altitude 356 feet. ANG and AFRES have separate phones and facilities. ANG phone (215) 443-1500; DSN 991-1500, 111th Fighter Gp. (ANG). ANG area 39 acres. Military 1,147, full-time personnel 292. Payroll \$11,2 million. AFRES phone (215) 443-1062; DSN 991-1062. 913th Airliff Gp. (AFRES). AFRES area 162 acres. Reservists 856, full-time personnel 147, civilians 122. Payroll \$9.3 million. Other units include Army, Navy, and Marine Corps Reserve. Defense Contract Administration Services Region, Philadelphia; 92d Aerial Port Sqdn. off-base tenant. Base activated Aug. 1958. Navy transient quarters available but limited.

Will Rogers World Airport, 5624 Air Guard Dr., Oklahoma City, Okla. 73169-5000; 7 mi. SW of Oklahoma City. Phone (405) 686-5210; DSN 956-8210, 137th Airlift Wg. (ANG). Area 134 acres. Altitude 1,290 ft. Military 1,253, full-time personnel 254, Payroll \$14,2 million.

Wilmington, Del. (Greater Wilmington Airport) 19720; 5 mi. S of Wilmington. Phone (302) 323-3500; DSN 445-3360, 166th Airliff Gp. (ANG); Army National Guard aviation company. Area 57 acres. Altitude 80 ft. Military 1,010, full-time personnel 261. Payroll \$10.8 million. Two-bed dispensary.

Youngstown Municipal Airport, Ohio 44473-5000; 16 mi, N of Youngstown. Phone (216) 392-1000; DSN 346-1000. AFRES base. 910th Airlift Gp. (AFRES); 757th Airlift Sqdn. (AFRES); Other units include 76th Mobile Aerial Port Sqdn. (AFRES); Defense Contract Administration Services OLC, 2046th Communications Gp.; Naval Reserve, REDCOM 5; Marine Corps Reserve, H&S Co., H&S Bn., 4th FSSG; Army Corps of Engineers, Louisville District; FAA Area Office. Base activated 1952. Area 403 acres; Altitude 1,196 ft. Reservists 1,073, full-time personnel 132, civilians 349, Payroll \$17.2 million.



1992 USAF Almanac Records, Trophies, and Competitions

Absolute Aviation World Records

The desirability of a standard procedure to certify air records was recognized early in the history of powered flight. In 1905, representatives of Belgium, Germany, the US, Great Britain, France, Spain, Italy, and Switzerland met in Paris to form the Fédération Aéronautique Internationale (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 Washington, D. C., 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 su-

preme 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. Biengined, 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. Round-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. Allweather 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, 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 USAF, 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, 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.

The Robert J. Collier Trophy

- 1983 US Army, Hughes Helicopters, industry team. AH-64A Apache helicopter.
- 1984 NASA, Martin Marietta, 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.

Airlift Rodeo

Airlift Rodeo was Military Airlift Command's annual tactical airlift competition, held under different names by MAC's predecessor commands. The week-long contest at Pope AFB, N. C., showcased the top USAF active-duty, Air National Guard, and Air Force Reserve aircraft and teams and those of allied nations. Since 1980, the trophy for the best overall wing has been named after Gen. William G. Moore, Jr., the eighth commander in chief of MAC.

Recipients of the Moore Trophy

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	136th TAW (ANG) Hensley Field, Dallas, Tex.
1987	West German airlift wing
1988	No competition
1989	Australian airlift wing
1990	63d MAW, Norton AFB, Calif.
1991	No competition

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, Fargo, 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

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 person, persons, 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 Street, 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 Second Bombardment Group (General Headquarters Air Force). All those in the Second 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, SSgt. James E. Sands.
- 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
- 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, SSgt. Frank C. Barrett. Nightlime, 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. Nocl T. Warner, and Maj. James P. Cooney). YF-12A flight that established nine speed and alitude 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.
- 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, 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, 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 MAW). C-5 airlift to Zaire.

The Mackay Trophy

- 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.

Proud Shield

Proud Shield was SAC's annual Bombing and Navigation Competition. The Gen. Muir S. Fairchild Trophy, named for the first commandant of Air University, was awarded to the SAC bomber-tanker wing with the highest competition effectiveness.

Recipients of the Fairchild Trophy

1956	/ear	Unit(s)	Aircraft
93d BMW, Castle AFB, Calif. 97th BMW, Biggs AFB, Tex. (tie) 8-50D 1953 92d BMW, Fairchild AFB, Wash. 8-36D 1954 11th BMW, Carswell AFB, Tex. 8-36H 1955 320th BMW, March AFB, Calif. YRB-47 1956 11th BMW, Carswell AFB, Tex. 8-36H 1957 321st BMW, Pinecastle AFB, Fla. 8-47B 1958 306th BMW, MacDill AFB, Fla. 8-47E 1959 307th BMW, Lincoln AFB, Neb. 8-47E 1960 11th BMW, Altus AFB, Okla. 8-52E 1961 4137th BMW, Robins AFB, Ga. 8-52G 1962 No competition 1963 2d BMW, Barksdale AFB, La.a 8-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a 8-52b 1965 454th BMW, Columbus AFB, Miss. 8-52F 1966 19th BMW, Homestead AFB, Fla. 8-52H 1967-68 No competition 1969 319th BMW, Grand Forks AFB, N. D. 8-52H 1970 93d BMW, Castle AFB, Calif. 8-52F 1971 449th BMW, Kincheloe AFB, Mich. 8-52H 1972-73 No competition 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111	951	97th BMW, Biggs AFB, Tex.	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-47 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 BMW, Robins AFB, Ga. B-52E 1962 No competition B-52G 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a B-52b 1965 454th BMW, Columbus AFB, Miss. B-52F 1966 19th BMW, Homestead AFB, Fla. B-52H 1967-68 No competition B-52H 1970 93d BMW, Castle AFB, Calif. B-52H 1972-73 No competition B-52H 1972-73 No competition B-52H 1976 380th BMW, Plattsburgh AFB, N. Y. FB-11	952		B-50D
1954 11th BMW, Carswell AFB, Tex. B-36H 1955 320th BMW, March AFB, Calif. YRB-47 1956 11th BMW, Carswell AFB, Tex. B-36H 1957 321st BMW, Pinecastle AFB, Fla. B-47B 1958 306th BMW, MacDill AFB, Fla. B-47F 1959 307th BMW, Lincoln AFB, Neb. B-47E 1960 11th BMW, Altus AFB, Okla. B-52E 1961 4137th BMW, Robins AFB, Ga. B-52G 1962 No competition 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla. B-52b 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-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111		97th BMW, Biggs AFB, Tex. (tie)	B-50D
1955 320th BMW, March AFB, Calif. YRB-47 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 BMW, Robins AFB, Ga. B-52G 1962 No competition 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a B-52b 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-111 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111	953	92d BMW, Fairchild AFB, Wash.	B-36D
1956	954	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 BMW, Robins AFB, Ga. B-52G 1962 No competition B-52G 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a B-52b 1965 454th BMW, Columbus AFB, Miss. B-52F 1966 19th BMW, Homestead AFB, Fla. B-52F 1967-68 No competition B-52H 1970 93d BMW, Grand Forks AFB, N. D. B-52H 1971 449th BMW, Kincheloe AFB, Mich. B-52F 1971 449th BMW, Kincheloe AFB, Mich. B-52H 1972-73 No competition B-52H 1975 No competition B-52H 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y.	955	320th BMW, March AFB, Calif.	YRB-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 BMW, Robins AFB, Ga. B-52G 1962 No competition B-52b 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a B-52b 1965 454th BMW, Columbus AFB, Miss. B-52F 1966 19th BMW, Homestead AFB, Fla. B-52H 1967-68 No competition B-52H 1970 93d 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 B-52H 1975 No competition B-52H 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	956	11th BMW, Carswell AFB, Tex.	B-36H
1959 307th BMW, Lincoln AFB, Neb. B-47E 1960 11th BMW, Altus AFB, Okla. B-52E 1961 4137th BMW, Robins AFB, Ga. B-52G 1962 No competition B-52b 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a B-52b 1965 454th BMW, Columbus AFB, Miss. B-52F 1966 19th BMW, Homestead AFB, Fla. B-52H 1967-68 No competition B-52H 1970 93d 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 B-52H 1975 No competition B-52H 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	957	321st BMW, Pinecastle AFB, Fla.	B-47B
1960 11th BMW, Altus AFB, Okla. B-52E 1961 4137th BMW, Robins AFB, Ga. B-52G 1962 No competition 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a B-52b 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-111 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	958	306th BMW, MacDill AFB, Fla.	B-47E
1961 4137th BMW, Robins AFB, Ga. B-52G 1962 No competition 1963 2d BMW, Barksdale AFB, La. ^a B-52 ^b 1964 70th BMW, Clinton-Sherman AFB, Okla. ^a B-52 ^b 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-111 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	959	307th BMW, Lincoln AFB, Neb.	B-47E
1962 No competition 1963 2d BMW, Barksdale AFB, La.a B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.a B-52b 1965 454th BMW, Columbus AFB, Miss. B-52F 1966 19th BMW, Homestead AFB, Fla. B-52H 1967-68 No competition B-52H 1970 93d BMW, Grand Forks AFB, N. D. B-52H 1971 449th BMW, Kincheloe AFB, Mich. B-52F 1972-73 No competition B-52H 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1975 No competition FB-111 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	960	11th BMW, Altus AFB, Okla.	B-52E
1963 2d BMW, Barksdale AFB, La.ª B-52b 1964 70th BMW, Clinton-Sherman AFB, Okla.ª B-52b 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 B-52H 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1975 No competition FB-111 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	961		B-52G
1964 70th BMW, Clinton-Sherman AFB, Okla. ^a B-52 ^b 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 B-52H 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	962	No competition	
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 B-52H 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	963	2d BMW, Barksdale AFB, La.ª	B-52 ^b
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 B-52H 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	964	70th BMW, Clinton-Sherman AFB, Okla.a	B-52 ^b
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 B-52H 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1975 No competition FB-111 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	965	454th BMW, Columbus AFB, Miss.	B-52F
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-111 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	966	19th BMW, Homestead AFB, Fla.	B-52H
1970 93d BMW, Castle AFB, Calif. B-52F 1971 449th BMW, Kincheloe AFB, Mich. B-52H 1972–73 No competition B-52H 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111 1975 No competition FB-111 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	967-68	No competition	
1971 449th BMW, Kincheloe AFB, Mich. B-52H 1972–73 No competition 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111.	969	319th BMW, Grand Forks AFB, N. D.	B-52H
1972–73 No competition 1974 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111.	970	93d BMW, Castle AFB, Calif.	B-52F
1974 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111.	971	449th BMW, Kincheloe AFB, Mich.	B-52H
1975 No competition 1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	972-73		
1976 380th BMW, Plattsburgh AFB, N. Y. FB-111 1977 380th BMW, Plattsburgh AFB, N. Y. FB-111 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111	974	380th BMW, Plattsburgh AFB, N. Y.	FB-111A
1977 380th BMW, Plattsburgh AFB, N. Y. FB-111. 1978 380th BMW, Plattsburgh AFB, N. Y. FB-111.	975		
1978 380th BMW, Plattsburgh AFB, N. Y. FB-111.	976		FB-111A
	977		FB-111A
	978	380th BMW, Plattsburgh AFB, N. Y.	FB-111A
	979	509th BMW, Pease AFB, N. H.	FB-111A
1980 320th BMW, Mather AFB, Calif. B-52G	980		
	981		FB-111A
	982		FB-111A
	983		FB-111A
	310.000000		FB-111A
1985 97th BMW, Blytheville AFB, Ark. B-52 ^b			
1986 92d BMW, Fairchild AFB, Wash. B-52b			5 T T 1 T T T T T T T T T T T T T T T T
1987 379th BMW, Wurtsmith AFB, Mich. B-52G			
1988 5th BMW, Minot AFB, N. D. B-52 ^b			Control of the Contro
1989 28th BMW, Ellsworth AFB, S. D. B-1B			B-1B
1990 No competition			
1991 No competition	991	No competition	

^{*}Trophy given for overall annual performance, not for scores in SAC bombing and navigation competition.

^bNo model listed in official standings.

Olympic Arena

Olympic Arena was Strategic Air Command's annual competition to determine the top strategic missile wing. It was held at Vandenberg AFB, Calif. Each ICBM wing competed in operations, maintenance, security police, civil engineering, and communications. The winner of Olympic Arena received a trophy named for former Air Force Vice Chief of Staff Gen. William H. Blanchard.

Recipients of the Blanchard Trophy

Veer Unit(e)	System
Year, Unit(s)	System
1967 351st SMW,	Minuteman
Whiteman AFB, Mo.	
1968 No competition	8/801
1969 321st SMW,	Minuteman
Grand Forks AFB, N. D.	21221 30
1970 44th SMW, Ellsworth AFB, S. D.	Minuteman
Ellsworth AFB, S. D.	www.mannessys.com
1971 351st SMW,	Minuteman
Whiteman AFB, Mo.	T-100000
1972 381st SMW,	Titan
McConnell AFB, Kan.	
1973 90th SMW,	Minuteman
F. E. Warren AFB, Wyo.	
1974 321st SMW,	Minuteman
Grand Forks, N. D.	Tires
1975 381st SMW,	Titan
McConnell AFB, Kan.	Minutoman
1976 341st SMW,	Minuteman
Malmstrom AFB, Mont.	Minuteman
1977 351st SMW, Whiteman AFB, Mo.	winuteman
1978 91st SMW,	Minuteman
Minot AFB, N. D.	winuteman
1979 390th SMW,	Titan
Davis-Monthan AFB, Ariz.	IIIaII
1980 381st SMW,	Titan
McConnell AFB, Kan.	Illan
1981 351st SMW,	Minuteman
Whiteman AFB, Mo.	wiinatoman
1982 44th SMW,	Minuteman
Ellsworth AFB, S. D.	minatoman
1983 381st SMW,	Titan
McConnell AFB, Kan.	11.50
1984 90th SMW, F. E.	Minuteman
Warren AFB, Wyo.	· · · · · · · · · · · · · · · · · · ·
1985 308th SMW,	Titan
Little Rock AFB, Ark.	
1986 341st SMW,	Minuteman
Malmstrom AFB, Mont.	
1987 321st SMW,	Minuteman
Grand Forks AFB, N. D.	
1988 91st SMW,	Minuteman
Minot AFB, N. D.	
1989 351st SMW	Minuteman
Whiteman AFB, Mo.	
1990 341st SMW,	Minuteman
Malmstrom AFB, Mont.	
1991 341st SMW,	Minuteman
Malmstrom AFB, Mont.	

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.

William Tell Winners

Year	Unit, Base	Aircraft
1954	3550th FTW (Interceptor), Moody AFB, Ga.	F-94C
1955	26th Air Division, Duluth MAP, Minn.	F-94C
	(Members of the 48th, 96th, and 332d FISs)	N: 75.000
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
1000 00	331st FIS, Webb AFB, Tex.	F-104A
1966–69 1970	No competition 119th TFG (ANG), Hector Field, Fargo, N. D.	F-101B
1970	148th TFG (ANG), Duluth IAP, Minneapolis, Minn.	F-101B
	71st FIS, Malmstrom AFB, Mont.	F-106A
1972	119th TFG (ANG), Hector Field, Fargo, N. D.	F-101B
1312	115th TFG (ANG), Truax Field, Wis.	Γ-102A
	460th FIS, Grand Forks AFB, N. D.	F-106A
1974	101st TFG (ANG), Bangor IAP, Me.	F-101B
1014	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-106A1
1982	409 Squadron, CFB Comox, British Columbia, Canada	
	18th TFW, Kadena AB, Japan ^a	F-15C
	49th FIS, Griffiss AFB, N. Y.	F-106A
104242.00	57th FIS, NAS Keflavik, Iceland	F-4E
1984	33d TFW, Eglin AFB, Fla. ^a	F-15C
	142d FIG (ANG), Portland IAP, Ore.	F-4C
4000	177th FIG (ANG), Atlantic City IAP, N. J.	F-106A
1986	33d TFW, Eglin AFB, Fla. ^a	F-15C
1000	119th FIG (ANG), Hector Field, Fargo, N. D.	F-4D
1988	49th TFW, Holloman AFB, N. M. ^a	F-15A F-15C
	33d TFW, Eglin AFB, Fla. 18th TFW, Kadena AB, Japan	F-15C
	57th FIS, NAS Keflavik, Iceland	F-15C
1990	No competition	1-150
1990	No competition	

*Overall competition winner. The naming of an overall winner was instituted 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, 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, Fargo, 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. Davis 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	

Gunsmoke

Gunsmoke was Tactical Air Command's air-to-ground fighter gunnery competition, held biannually at Nellis AFB, Nev. Gunsmoke tested the capabilities of the tactical air forces and recognized the best aircrews, maintenance teams, and munitions load teams.

Gunsmoke Top Guns

Year	Individual	Aircraft	Unit, Base
1949	Unknown	F-86A	4th FIW, Langley AFB, Va.
1950	Unknown	Unknown	Unknown, Nellis AFB, Nev.
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.
1964-1980	No competition		- A
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)
	THE COURT OF THE COURT COURT OF THE COURT		Richards-Gebaur AFB, Mo.

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 Mai. 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., and 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, and 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 Tost 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.), and Gen. John L. Piotrowski, USAF (Ret.). Strengthening USAF space systems and forces.

1991 Award to be announced mid-1992.

The Reconnaissance Air Meet

Tactical Air Command's Reconnaissance Air Meet (RAM), held every two years, focused on procedures and techniques used by allied reconnaissance units. Teams came from Australia, Germany, the UK, and the US, among other nations.

Winners of the RAM Competition

Year	Unit, Location	
1986	152d TRG (ANG), Reno, Nev.	
1988	26th TRW, Zweibrücken AB, West Germany	
1990	152d TRG (ANG), Reno, Nev.	



1992 USAF Almanac Gallery of USAF Weapons

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

As of summer 1992, all aircraft currently assigned to MAC, TAC, and SAC bases will be reassigned to the new commands ACC, AMC, and AFMC. Where possible, the editors have included new designations for wings, groups, squadrons, etc., that are already in effect. For example, AFRES's 433d MAW becomes the 433d AW.

Bombers

B-1B Lancer

Advanced aerodynamic technology and improved engine performance permit the B-1B Lancer to carry a considerably greater weapons load than the larger B-52, which it partners in the USAF strategic bomber force. The Air Force currently possesses 97 B-1Bs, each with three weapons bays providing the flexibility to carry long- and short-range nuclear air-to-surface missiles, nuclear and conventional gravity bombs, mines, other weapons, or additional fuel, as required. They are expected to remain capable of penetrating sophisticated enemy defenses through much of this decade and of operating within less heavily defended areas into the next century. A movable bulkhead in the forward weapons bay allows for the carriage of a wide range of different size weapons. USAF has no plans to convert B-1Bs to cruise missile carriers, though they have that capability.

The B-1B has a blended wing/body configuration with variable-geometry wings. The unswept wing setting would permit rapid takeoff from a base threatened by imminent attack, or operation 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 and terrain-following radar, an extremely accurate inertial navigation system, new computer-driven avionics, strategic Doppler radar, and a radar altimeter. The efficiency of these systems was demonstrated in November 1989 when an operational B-1B flew the type's first low-level night sortie over terrain that varied greatly in altitude, using the fully automatic terrain-following equipment.

The defensive avionics package is built around the ALQ-161 ECM system, with a wide frequency coverage and tail warning function, supplemented by such expendables as chaff and flares to protect against radarhoming and heat-seeking missiles. Development of the full potential of this system has proved difficult, and the decision was made to develop a separate radar warning receiver for the B-1B while efforts to improve the existing avionics suite continue. Radar-absorption materials are used to reduce the aircraft's radar signature, which is only one percent that of a B-52. A program to attach Kevlar, a tough, synthetic fiber, to vulnerable areas of the B-1B should reduce the risks associated with birdstrike, following the loss of an aircraft in 1987. Other modifications in hand are stability enhancement function (SEF) upgrades, installation of fire detection and suppression systems in the aircraft's overwing fairing, and fuel tank resealing on early B-1Bs.

overwing fairing, and fuel tank resealing on early B-1Bs. IOC for the B-1B was achieved at Dyess AFB, Tex., in September 1986. Deliveries were completed in April 1988, with Dyess now having 28 aircraft; Ellsworth AFB, S. D., 26; and Grand Forks AFB, N. D., and McConnell AFB, Kan., each 16 B-1Bs.

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.

Contractors: Rockwell International, North American Aircraft; Eaton Corporation, AlL Systems; Boeing Military Airplanes; General Electric.

Power Plant: four General Electric F101-GE-102 turbofans; each 30,780 lb thrust.

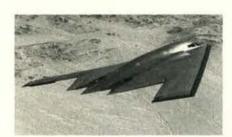
Accommodation: four: pilot, copilot, and two systems operators (offensive and defensive).

Dimensions: span spread 136 ft 8½ in, fully swept

78 ft 2½ in, length 147 ft, height 34 ft.
Weights: empty, equipped 192,000 lb, gross 477,000



B-1B Lancer



B-2A

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 AGM-69 SRAMs, 12 B28 or 24 B61 or B83 free-fall nuclear bombs; in a nonnuclear role up to 84 Mk 82 (500 lb) bombs or Mk 36 (500 lb) mines.

B-2/

Development of this wholly unique advanced technology bomber and demonstration of the soundness of its aerodynamics during flight testing gained for Northrop, its subcontractors Boeing and LTV, and USAF the Robert J. Collier Trophy for 1991.

The original program, for 132 B-2s, including the prototype, had been cut first to 75 aircraft. Now, as a result of the President's 1992 arms initiative, it is proposed to procure only 20 aircraft, and funding has been curtailed severely. In FY 1992, a sum of \$4.4 billion has been allocated, with \$1.6 billion for R&D and \$2.8 billion for procurement. One billion dollars of procurement funding is fenced until specific congressional restrictions are met. The rest of the production money is to be used to protect production capability. R&D funding will be used to continue the test process.

The B-2A was conceived as a highly survivable strategic bomber to supplement, and ultimately re-

place, the B-1B in its penetration role. A new B-2 mission statement, however, emphasizes its conventional capabilities. It employs sophisticated technologies, notably low-observable stealth techniques, to minimize the possibility of detection, and including the Hughes AN/APG-181 low-probability-of-intercept (LPI) covert strike radar. With its ability to cruise at high or low altitude at relatively high subsonic speed, SAC claimed that it would be "difficult to track and shoot down."

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 with two large weapons bays side by side to the rear. These contain rotary launchers capable of carrying a total weapons load of between 40,000 and 75,000 lb; but about 25,000 lb of nuclear weapons would be normal under the nation's Single Integrated Operational Plan (SIOP). The B-2A also will carry the conventional Triservice Standoff Attack Missile (TSSAM), currently in full-scale development, 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 flyby-wire digital flight control system, actuating movable surfaces at the wing trailing edges, which combine aileron, elevator, and flap functions. A landing gear track of 40 ft enables the B-2A to use any runway that will handle a Boeing 727 airliner. In flight, the bomber is reported to be near neutrally stable. It is claimed to have almost 50 percent better fuel efficiency than the B-1B and to require less than half the latter's air refueling support to accomplish SIOP missions. A typical unrefueled range of 5,182 milles is estimated for a hill-or hilmsision carrying 16 B61 nuclear free-fall bombs.

hi-lo-hi mission carrying 16 B61 nuclear free-fall bombs. The first B-2A made its first flight from Air Force Plant 42 in Palmdale, Calif., to Edwards AFB, Calif., in July 1989. Since then, the aircraft has entered a program of flight tests that has expanded the flight envelope and included aerial refuelings. Certain problems became apparent during critical low-observability (LO) testing, begun in October 1990, and much effort has gone into remedying these. The second B-2A, which flew for the first time in October 1990, is instrumented for dynamic loads testing. The third (flown in June

1991) and fourth B-2As are designed with full avignics and are assigned to low-observability and weapons testing. The fifth aircraft will conduct climatic and weapons trials, and the sixth will be assigned to operational test and evaluation.

Flight testing is expected to continue for four years, with the key radar signature tests due for completion next year. It is planned to deliver the first operational B-2As to Whiteman AFB, Mo., and to achieve IOC in the mid-1990s

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 turbo-fans, each estimated at 19,000 lb thrust.

Accommodation: basic crew of two, with provision for

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

Weights: empty 100,000-110,000 lb, gross 400,000

Performance: approach speed 161 mph, service ceiling 50,000 ft, unrefueled range 7,255 miles.

Armament: in a nuclear role: up to 20 B61 nuclear

bombs; or 16 AGM-69A SRAMs, or B83 nuclear bombs, or a combination. In a conventional role: 80 x 500 lb bombs or various other conventional weapons, including sea mines. There are no plans to carry the AGM-129A ACM on the B-2A.

B-52G/H Stratofortress

The versatility inherent in this aging veteran of the Vietnam War was ably demonstrated during Operation Desert Storm, when conventionally equipped B-52s flew 1,624 missions, delivering 25,700 tons of weapons, including a conventionally armed version of the AGM-86 ALCM, against both tactical and strategic targets. A mission capable rate of 81 percent, better than peacetime rate, was achieved. Constituting a substantial element in the bomber inventory, the B-52 had a heavy payload capability that includes a wide range of weapons that can be used against many types of targets, including overflight weapons and standoff missiles. Apart from their nuclear mission, they are employed in important conventional roles, including show of force, maritime interdiction, precision strikes and defense suppression. Their long range has suited them to other collateral missions in recent years, including sea surveillance flights, aerial minelaying and antisurface warfare operations in cooperation with the US Navy, and support for NATO allies.

During the early 1970s, all B-52Gs and Hs were modified to carry AGM-69A short-range attack mis siles (SRAMs), Additionally, all Gs and Hs were equipped with an AN/ASQ-151 electro-optical viewing system (EVS), using forward-looking infrared (FLIR) and lowlight-level TV sensors to improve their low-level flight capability, and were updated with Phase VI avionics. These include ALQ-122 SNOE (smart noise operation equipment) and AN/ALQ-155(V) advanced ECM; an AFSATCOM 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-117 Pave Mint or ALQ-172 ECM jamming system. The G/Hs have also been fitted with a digital-based solidstate offensive avionics system (OAS) that includes inertial guidance, Tercom (terrain comparison) guidance, and microprocessors to upgrade their navigation and weapons delivery systems.

Deployment of the B-1B and development of the B-2A have led to a change in the primary role of the B-52 to ALCM (AGM-86) carrier. 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 or SRAMs (currently grounded), USAF originally deployed AGM-86s on 98 on-line B-52Gs and 95 B-52Hs, each with 12 external cruise missiles, but the former are being retired by FY 1993. Full-scale production of the Common Strategic Rotary Launcher (CSRL), which will permit internal carriage of eight additional AGM-86s in the B-52H, is under way. This will allow a total ALCM offensive weapon load of 20 cruise missiles. Full operational capability for this system at all SAC bases is scheduled for late summer 1993. B-52Hs will also be equipped



B-52H (G. Aceto)



F-15C (G. Aceto)

Two versions are still in service: the B-52G, which introduced a redesigned wing containing integral fuel tanks, fixed underwing external tanks, a tailfin of reduced height and broader chord, and a remotely controlled tailgun turret that allowed the gunner to be repositioned with the rest of the crew; deliveries began in February 1959; 193 were built, of which 85 remain operational; and the B-52H, which switched to TF33 turbofans, providing increased unrefueled range, and which has improved defensive armament, including a 20-mm Vulcan multibarrel tailgun; 102 were built, with deliveries beginning in May 1961; 95 remain operational



F-15E (G. Aceto)

with the AGM-129A Advanced Cruise Missile (ACM). Captive-carry tests of twelve ACMs mounted on a B-52H's underwing pylons began early in 1989. Initial operational capability is anticipated this year at SAC's 410th Bomb Wing, K. I. Sawyer AFB, Mich.

All B-52 crews train to drop conventional weapons and the ALCM-modified B-52Gs have been assigned increasingly to support conventional operations by employing airpower over great distances at short notice on behalf of theater CINCs. In 1988, certain B-52Gs achieved IOC fitted with an Integrated Conventional Stores Management System (ICSMS). This enables aircraft to carry a range of conventional weapons, as required, by rearranging data stored in the weapon systems computer using a preprogrammed, removable software cassette. Other modifications being assessed to enhance the B-52's conventional capabilities in-clude GPS, multimode radio, and a Vinson secure voice radio system. Future upgrades under consideration include a microwave landing system, replacement of the offensive avionics system computer, and certification of GBU-10 and GBU-12 laser-guided bomb carriage and deployment. The 39 non-ALCM-modified B-52Gs are assigned to the primary role of supporting the conventional requirements of theater CINCs and naval antisurface warfare operations, with 30 of the aircraft modified for Harpoon deployment; one full squadron is based at Loring AFB, Me., for Atlantic operations. (Data for B-52G, except where noted.)
Contractor: Boeing Military Airplanes.

Power Plant: eight Pratt & Whitney J57-P-43WB turbojets; each 13,750 lb thrust.

Accommodation: two pilots, side by side, plus navigator, radar navigator, and electronic warfare of-

Dimensions: span 185 ft 0 in, length 160 ft 11 in,

Weight: G/H models gross more than 488,000 lb. Performance (approx): max level speed at high altitude 595 mph, service ceiling 55,000 ft, range more than 7.500 miles

Armament: G/H models carry eight SRAMs and nuclear free-fall bombs internally and 12 AGM-86B ALCMs instead of SRAMs externally, Provision for eight more ALCMs instead of SRAMs internally on H model. Alternatively, G and H models can carry conventional weapons including bombs up to 2,000 lb, air-dropped mines, cluster bombs, and, on some B-52G aircraft, AGM-142A Have Nap missiles or eight to 12 Harpoons in underwing clusters.

Fighters

F-15 Eagle
The F-15 is USAF's primary air-superiority fighter, in service with PACAF, TAC, USAFE, and ANG, The original single-seat F-15A and two-seat F-15B were followed in June 1979 by the F-15C and F-15D, respectively, with 2,000 lb of additional internal fuel and provision for carrying conformal fuel tanks (CFTs). Basic F-15 equipment includes a Hughes Aircraft APG-63 or APG-70 lightweight X-band pulse-Doppler radar for long-range detection and tracking of small high-speed objects down to treetop level. Under ongoing contracts initiated in February 1983, the F-15 is under-going a Multistage Improvement Program (MSIP). Im-provements include: Programmable Armament Control Set (PACS), improved central computer, an expanded tactical electronic warfare system (TEWS) that provides improvements to the ALR-56C radar warning receiver and ALQ-135 countermeasures set, a major upgrade to the Hughes APG-63 radar to APG-70 standard, and provision for AIM-120A AMRAAM. Installa-tion of JTIDS Class 2 terminals begins this year. F-15C/Ds deployed to the Persian Gulf in support of Operation Desert Storm accounted for thirty-six of the

thirty-nine USAF air-to-air victories.
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-fieldof-view head-up display, 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, highspeed 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 forward-looking infrared (FLIR).

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 weap-ons, 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 electro-optical (EO), infrared (IR), and stan-dard bombs; air-to-ground missiles; dispenser munitions; and nuclear weapons. A new engine bay was developed by McDonnell Douglas to permit installation of improved turbofans. The 4th TFW 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 STARS aircraft. The FY 1992 budget has reversed an earlier decision to terminate F-15E production in FY 1991, following acquisition of the 200th aircraft. The production line is to be kept open, and a further nine aircraft have been authorized.

An advanced one-off experimental version of the F-15, the F-15 Short Takeoff and Landing and Maneu-15, the F-15 Short Takeoff and 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 has shown high maneuverability, in-flight thrust reversing, and reductions of thirty-five percent in takeoff distance and sixty-five percent in landing distance. It has also demonstrated the ability to land autonomously at night and in poor weather.

A further version of the F-15 has been proposed by the manufacturers to fulfill USAF's requirement for a Follow-On Wild Weasel (FWW) defense suppression aircraft to replace the current F-4G. (Data for F-15C, except where stated.)

Contractor: McDonnell Aircraft Company, Division of McDonnell Douglas Corporation.

Power Plant: F-15C: two Pratt & Whitney F100-PW-100 or F100-PW-220 turbofans; each approx 23,450 Ib thrust. F-15E: two Pratt & Whitney F100-PW-220 or F100-PW-229 turbofans.

Accommodation: pilot only in F-15A/C; two seats in F-15B/D; crew of two in F-15E.

Dimensions: span 42 ft 93/4 in, length 63 ft 9 in, height 18 ft 51/2 in. Weights: empty 28,600 lb, gross 68,000 lb in F-15A/B/

C/D; empty 32,500 lb, gross 81,000 lb in F-15E. Performance: F-15C: max speed Mach 2.5, service ceiling 60,000 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 2,765 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 carry ing up to 24,500 lb of ordnance on weapon stations on F-15E.

F-16 Fighting Falcon

More sorties were flown by the USAF F-16 multimission fighters deployed to the Gulf theater than any other type during Operation Desert Storm. In 13,500 missions, the 249 F-16s were used to attack airfields, military production facilities, Scud missile sites, and a

variety of other targets.

The F-16 was developed to replace F-4s in the active-duty force and to modernize the air reserve forces. Advanced technologies incorporated from the start in the single-seat F-16A and two-seat F-16B versions made them 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 head-up display, internal chaff/flare dispensers, and a 500-round 20-mm internal gun. The aircraft also has provisions for ECM.

The F-16 entered operational service with TAC's 388th TFW at Hill AFB, Utah, in January 1979. Production of the F-16A and B for USAF ended in 1985. However, USAF and NATO operators are cooperating in an operational capabilities upgrade. The OCU program improves the radar, fire-control computer, storesmanagement computer, and avionics software, giving F-16A/Bs the ability to use next-generation air-to-air and air-to-surface weapons. Reliability/maintainability improvements scheduled for the early 1990s include a ring-laser gyro INS and installation of the upgraded F100-PW-220E turbofan.

A forward-looking plan for the aircraft, known as the Multinational Staged Improvement Program (MSIP), was implemented by USAF in February 1980 to ensure the aircraft's ability to accept systems under develop-ment, thereby minimizing retrofit costs. All F-16s deliv-ered since November 1981 have had built-in structural and wiring provisions and systems architecture that



F-16C (G. Aceto)



YF-22



F-111D (R. Jolly)

expand the single-seater's multirole flexibility, MSIP II was applicable to the improved F-16C (single-seat) and F-16D (two-seat) versions, of which deliveries to USAF began in July 1984. These aircraft have a Westinghouse APG-68 multimode radar, with increased range and advanced ECCM, and advanced cockpit displays including a wide-angle head-up display. Weapons improvements include multitarget AMRAAM compatibility. patibility. Also introduced were systems improvements that include installation of a LANTIRN nav/attack system, GPS, EEGS, digital flight controls, automatic terrain following, advanced IFF, increased T-O weight and maneuvering limits, an 8,000-hour airframe, and 9g capability. Follow-on systems include ALE-47 im-proved defensive countermeasures, ALR-56M advanced radar warning receiver, advanced programmable sig-nal processor employing VHSIC technology in the APG-68(V5) fire-control radar, HARM/Shrike capability, a ring-laser gyro INS, and increased performance en-gines supplied by Pratt & Whitney (F100-PW-229) and General Electric (F110-GE-129), F-16C/Ds, with interim HARM/Shrike capability, are used for defense sup-pression/destruction missions in conjunction with F-4G Wild Weasels based at Spangdahlem AB, Germany-a partnership that proved highly successful during the Gulf War.

A sophisticated research variant of the F-16, known as the AFTI/F-16, in use at Edwards AFB, Calif., has been modified to demonstrate new technologies for next-generation close air support/battlefield air interdiction (CAS/BAI) aircraft. Systems tested and evaluated include a digital flight-control system, pilot/ve-hicle interface, automated maneuvering attack system, digital terrain management and display system, head-steerable FLIR, integrated night vision helmet, Automatic Target Handoff System (ATHS), and Pave

Two hundred seventy of the original F-16A/Bs 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 eleven ANG continental air defense squadrons. 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.

Another 130 of the original USAF F-16A/Bs are involved in an F-16 MLU (midlife upgrade) codevelopment and coproduction program with the European Participating Governments (EPG) of the F-16 Multi-national Fighter Program (MNFP). The F-16 MLU will enhance the capability of the F-16A/Bs while achieving maximum avionics commonality to the latest model

Current proposals include the modification of 300-450 F-16Cs as CAS/BAI aircraft in the mid-1990s. These F/A-16 aircraft will be modified with DTS, Navstar GPS, and ATHS. Meanwhile, ANG's 138th TFS at Syracuse, N. Y., was first to convert from A-10s to F-16As in the dedicated CAS/BAI role, with centerline GPU-5/A

30-mm gun pod.
F-16s are standard equipment throughout TAC, USAFE, and PACAF and are progressively replacing older aircraft in AFRES and ANG. F-16As also equip USAF's Thunderbirds. A further 72 aircraft have been approved in FYs 1992-93. The total F-16 program involves the US Navy, as well as 17 foreign nations, more than 50 distinct aircraft configurations, and extensive foreign coproduction. (Data for F-16C.)

Contractor: General Dynamics 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, increased Performance 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. 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 ib, (F110-GE-

100) 19,020 lb; gross 42,300 lb.

Performance: max speed Mach 2 class, service ceiling more than 50,000 ft, ferry range more than 2,000

Armament: one M61A1 20-mm multibarrel cannon, with 500 rounds, mounted in fuselage; wingtipmounted infrared missiles; seven other external stores stations for fuel tanks and air-to-air and air-to-surface munitions.

F-22 (formerly ATF)
The F-22 program will produce the next-generation air-superiority fighter. As the follow-on to the F-15, it will ensure air superiority is maintained beyond the turn of the century. F-22 was designed to penetrate high-threat enemy airspace and achieve air superiority with a first-look, first-kill capability against multiple targets. It combines a highly maneuverable airframe at both sub- and supersonic speeds with low-observable stealth technologies. The F-22 will cruise at super-sonic speed without afterburners, Its integrated avionics and weapon systems will permit simultaneous en-gagement of multiple targets. Common signal proces-sors are being developed using very-high-speed integrated circuit (VHSIC) technology to tie together various avionics functions. Projected armament includes the AIM-9 Sidewinder and AMRAAM air-to-air missiles, as well as an internal gun. Program emphasis from the outset has been on achieving a proper bal-ance of reliability, supportability, affordability, survivability, and performance.

In April 1991, the Secretary of the Air Force announced selection of the Lockheed, Boeing, and General Dynamics team to build the F-22, while Pratt & Whitney was selected to build the F-22 engine, the F119. In July 1991, the F-22 successfully passed the Defense Acquisition Board Milestone 2 and commenced the engineering and manufacturing development (EMD) phase. In this phase, thirteen aircraft, eleven for flight testing and two for stress testing, and thirty-three engines are to be built. Flight testing recommenced on the YF-22 prototype, enabling the contractors to refine data and complete the F-22's design. First flight of the EMD F-22 aircraft is scheduled for the fall of 1995, with

IOC slated for the early 2000s.

Contractor: Lockheed Aeronautical Systems Company, with Boeing, General Dynamics, and Pratt & Whitney as key members of the development team.

Power Plant: two Pratt & Whitney F119-PW-100 turbo-fans, each in 35,000 lb thrust class.

Accommodation: pilot only. Dimensions: span 44 ft 6 in, length 62 ft 01/2 in, height 16 ft 6 in

Weight: gross approx 60,000 lb.

Described as the "workhorse" of the Gulf War, the F-111 flew 4,000 sorties against armored formations, bridges, C³I sites, aircraft shelters, and weapons production facilities, achieving a mission capable rate of eighty-five percent. Four versions of this pioneer variable-geometry tactical aircraft were built, to maintain USAF's around-the-clock long-range, interdiction mission. Deliveries of production F-111As to the first

operational wing began in October 1967, and 141 were built. This version served with distinction in southeast Asia in 1972-73 and currently equips the 366th FW The A was superseded in production by the F-111E, with modified air intakes that improved engine performance above Mach 2.2. Ninety-four were built, and most of these serve with the 20th FW, based at RAF Upper Heyford in the UK, in support of NATO. These aircraft will, however, be returning to Cannon AFB. N. M., as RAF Upper Heyford is reduced to standby status. Replacement of their analog bombing and navigation systems with digital equipment began in 1989 and should be completed in 1993. This will enable F-111E aircraft to handle the latest munitions and advanced sensors, as well as such systems as GPS. The F-111D was designed with advanced avionics, offering improvements in navigation and air-to-air weapon delivery. Ninety-six were built, equipping the 27th FW at Cannon AFB, N. M. The F-111F, of which 106 were built, has uprated turbofans and carries in its weapons bay the Pave Tack system, which provides a day/night capability to acquire, track, and designate ground targets for laser, infrared, and electro-optically guided weapons. The F-111F is capable of employing the GBU-15, as well as TV and IR precision guided weapons. The seventy F-111F aircraft equipping the 48th FW at RAF Lakenheath will return to Cannon AFB as they are replaced by F-15Es. Under the Pacer Strike program, F-111 aircraft are undergoing an avionics modernization designed to extend the aircraft's life to the year 2010. The program involves the removal of outdated subsystems and the installation of a ringlaser gyro INS, GPS receiver, and new cockpit dis plays. The program also includes new computer soft-ware, integration and test of prototype models, and production of conversion kits. Flight testing by USAF aircraft is scheduled for this year, and delivery of production kits should begin in August 1993.

Production of the F-111 was completed in 1976. Its EW capabilities are being updated with the ALQ-131/ 184 ECM pod system, and future improvements will include AIM-9L/M self-defense capability. Following the signing of the INF Treaty in 1987, a program was initiated to modify SAC FB-111As to F-111G standard for dual-role service with TAC, AGM-69A SRAM capability is deleted, and a conventional weapons-release system is added. Other modifications include Have Quick UHF radio and a new ECM system, The first F-111Gs were completed early in 1989, and transfer from SAC to TAC's 27th TFW at Cannon AFB, N. M., began in 1990 to replace F-111Ds. In July 1991, all but thrust with afterburning, F-111F: two TF30-P-111 turbofans; each approx 25,100 lb thrust with after-

Accommodation: crew of two, side by side in escape module

Dimensions: span spread 63 ft 0 in, fully swept 31 ft

11½ in, length 73 ft 6 in, height 17 tt 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 allitude Mach 2.5, service 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 weapon bay. Wing pylons carry total external load of up to 25,000 lb of bombs, rockets, missiles, or fuel tanks.

F-117A

Precision targeting and stealth technology com-bined in the F-117A to provide outstanding results in the Gulf War. USAF's total force of 56 F-117As undertook 1,270 missions, flying undetected and unmolest-

ed while attacking top-priority targets.

The existence of the F-117A had been rumored since it became operational in 1983, but it was not revealed officially until November 1988. Until then, F-117As were restricted mainly to night flying, in order to maintain secrecy, although three had been lost in much-publicized accidents. Public acknowledgment of existence permitted the aircraft to operate in daylight and lacilitated their integration into operational planning and exercises. The only USAF unit to deploy the single-seat, twin-engined aircraft is the 37th TFW, at Tonopah Test Range Airfield, Nev.; transfer



F-117A



A-7D (J. Rhodes)

about six of the remaining FB-111s were retired; the last six are to be converted to F-111G standard for operational conversion training at Cannon AFB.

In addition to its nuclear and conventional bombing capability, the F-111 can carry up to twelve 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. 144).

Contractor: General Dynamics Corporation.

Power Plant: F-111A/E: two Pratt & Whitney TF30-P-103 turbofans; each 18,500 lb thrust with afterburning. F-111D: two TF30-P-109 turbofans; each 19,600 lb to Holloman AFB, N. M., is scheduled for late FY 1992.

The F-117A was the first production combat type designed to exploit low-observables technology. It embodies many components that were either trans-ferred or modified from existing aircraft, in order to minimize the potential risks involved in the decision to proceed concurrently with FSD and low-level production, its designers, at the famous 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 di-vided 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 (RAM) and has a dull black finish that reflects little light. The engine air intakes and exhaust nozzles are above the wings and rear fuselage, respectively, to shield them from infrared seekers below.

F-117As can be carried on board C-5 Galaxy transports with their wings removed. 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. Retractable radio antennas are located beneath the fuselage. Highprecision INS is installed, with FLIR and DLIR (downward-looking infrared) housed in a retractable, steerable turret built into the underside of the aircraft, with a boresight laser designator and an autotracker, to ensure precision attack. Plans to restart F-117A production, following the success of the aircraft during the Gulf conflict, were not realized in the FY 1992 appropriations bill, but \$42 million was made available for F-117A modifications. Various improvements have been under way since 1989, including a "four-dimensional" llight management system and new cockpit instrumentation, featuring full-color multifunction displays (MFDs) and digital moving map. Planned improvements also include installation of GPS capability, low-probability-of-intercept (LPI) aircraft-to-aircraft communications, and all-weather capability

Contractor: Lockheed Aeronautical Systems Company

Power Plant: two General Electric F404-GE-F1D2 nonafterburning turbojets; 10,800 lb thrust,

Accommodation: pilot only

Dimensions: span 43 ft 4 in, length 65 ft 11 in, height 12 ft 5 in.

Weight: max gross 52,500 lb.

Performance: high subsonic speeds; little other detail available.

Armament: full internal carriage of what is described as a wide variety of tactical weapons, including laser-guided 2,000 lb munitions; provisions (type unknown) for self-defense.

Attack and **Observation** Aircraft

A-7D/K Corsair II and YA-7F

Operated by ANG units in nine states and Puerto Rico, the A-7D Corsair II is a single-seat, subsonic, close air support and interdiction aircraft, of which 459 were delivered between 1968 and 1976. Thirty-one A-7K combat-capable two-seat training models were delivered from April 1981. The A-7D's outstanding target kill capability, first demonstrated in southeast Asia, is achieved with the aid of a continuous-solution navigation and weapon-delivery system, including all-weather radar bomb delivery. Pave Penny laser target-identification pods were installed on 383 A-7Ds. Seventy-five A-7Ds and eight A-7Ks have been modified for low-attitude night attack (LANA) capability, with a wide-angle head-up display (HUD), forward-looking infrared (FLIR), Singer tactical mission computer, and automatic terrain-following systems to provide around-the-clock effectiveness. The first LANA-equipped A-7 was delivered in July 1987 to the 150th TFG, LTV has also tested augmented wing flaps and spollers to en-hance flight control characteristics. A Singer tactical mission computer will be installed on non-LANA-modified A-7s. A single-piece windscreen that offers increased visibility and greater protection against birdstrike has been tested by the 162d TFG.

In 1987, two A-7Ds were upgraded to become supersonic YA-7Fs. They are located at Edwards AFB, Calif., and are used for testing. (Data for A-7D.)
Contractor: LTV Corporation (formerly Vought Cor-

poration).

Power Plant: one Allison TF41-A-1 nonafterburning turbofan; 14,500 lb thrust.

Accommodation: pilot only.

Dimensions: span 38 ft 9 in, length 46 ft 11/2 in, height 16 ft 03/4 in.

Weights: empty 19,781 lb, gross 42,000 lb.

Performance: max speed at S/L 698 mph, ferry range with external tanks 2,871 miles.

Armament: one M61A1 20-mm multibarrel gun; up to 15,000 lb of air-to-air or air-to-surface missiles, bombs, Gator mines, rockets, or gun pods on six underwing and two fuselage attachments.

A-10/OA-10 Thunderbolt II

Designed specifically for the close air support (CAS) mission, the A-10A's ability to combine large military load, long loiter, and wide combat radius proved a vital asset to Operation Desert Storm, A-10s flew 8,100 sorties, with a mission capable rate of 95.7 percent; they launched ninety 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 close air support 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 can fire 2,100 or 4,200 rds/min and 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, head-up display, Pave Penny laser target identification pod, 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.

Units equipped with A-10s include USAFE's 81st FW, based at RAF Bentwaters/Woodbridge in the UK, and TAC's 23d and 354th FWs (aircraft to be retired or redistributed in 1992 and 1993, respectively) and 355th FW. The 57th FW, Nellis AFB, Nev., has some A-10s.

A-10s were the first first-line aircraft to be assigned to the ANG; they equip the 128th FW and the 103d, 104th, 110th, and 175th FGs. A-10s also equip the 442d and 917th FWs and the 926th and 434th FGs of AFRES.

In October 1987, the first of 18 operational and two back-up OA-10s entered the inventory of the 23d Tactical Air Support Squadron for use in the Forward Air Control (FAC) mission, providing coordination for, and control of, CAS assets, These aircraft are A-10s that have been redesignated and are intended to be used for combat escort, search and rescue, and visual reconnaissance. The 30-mm GAU-8/A gun is retained, but underwing stores are normally restricted to canis-ters of white phosphorous rockets for target marking, OA-10s are currently operated by the 602d and 507th TCWs at Davis-Monthan AFB, Ariz., and Shaw AFB, S. C., respectively, at PACAF's Osan AB, South Korea, and Eielson AFB, Alaska, and by ANG's 111th FG.

An A/OA-10 Technology Demonstrator program is under way to evaluate avionics improvements that should increase the effectiveness of A-10 CAS and OA-10 FAC aircraft. (Data for A-10.)
Contractor: Fairchild Republic Company, Division of

Fairchild Industries

Power Plant: two General Electric TF34-GE-100 turbo-fans; each 9,065 lb thrust.

Accommodation: pilot only

Dimensions: span 57 ft 6 in, length 53 ft 4 in, height 14 ft 8 in.

Weights: empty 24,959 lb, max gross 50,000 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, six AGM-65 Maverick mis-siles, or four AIM-9 Sidewinder missiles, and jammer pods. Chalf 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-130A/H/U Spectre

Two versions of the AC-130 Spectre gunship are currently in service with USAF, Nine AC-130Hs are operated by the Air Force Special Operations Command, 1st SOW, 16th SOS, at Hurlburt Field, Fla.; a tenth aircraft was a combat loss during Operation Desert Storm. Ten AC-130As are operated by Air Force Reserve's 711th SOS at Duke Field, Fla. The AC-130H is equipped with a digital fire-control computer, two fixed 20-mm Vulcan cannon, one trainable 40-mm cannon, and a trainable 105-mm howitzer. The A model is equipped with an analog fire-control computer, two fixed 20-mm cannon, and two fixed 40-mm cannon and is capable of employing two 7.62-mm Miniguns. Both models use electro-optical sensors and target-acquisition systems, including FLIR and low-light-level TV. The H model is capable of in-flight refueling and has been undergoing modification and modernization of its fire-control computer, navigation, communications, and sensor suites. Completion is scheduled for this summer,

With a need to replace the increasingly unsupportable AC-130A, twelve new C-130H airframes were procured and are being modified to AC-130U configuration. The AC-130U is currently undergoing its lest phase, and



A-10 (G. Aceto)

All U-2s have essentially been powered gliders, with high-aspect-ratio wings and lightweight structure, designed to perform strategic reconnaissance for long periods at very high allitudes, "Superpods" can be fitted to the wings, containing specialized equipment appropriate to individual mission demands. This versatility has enabled 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-2R

delivery of the first aircraft is scheduled for March next year, This model will combine increased firepower, reliability, and superior accuracy, with the latest methods of target location. The AC-130U will have the same 40-mm and 105-mm guns as the H model but replaces the two 20-mm cannon with one trainable 25-mm cannon. All weapons can be slaved to the sensors, including the AN/APG-80 fire-control radar, which permits night or adverse weather operations.

ECM on all versions of the gunship will enhance survivability in a low-to-medium-threat environment. Other equipment includes HUD, combined INS, and GPS/Navstar, All models are capable of providing precise surgical firepower and of performing special op-erations and conventional missions, including escort, surveillance, armed reconnaissance/interdiction, close

air support, and air base defense.
As the AC-130U is delivered to the 16th SOS, AC-130Hs will transfer to the Reserve and the A models will be retired. (Data basically as for the C-130.)

Reconnaissance and Special-Duty **Aircraft**

U-2R/RT

The last of 37 U-2R and TR-1 high-altitude reconnaissance aircraft was delivered to USAF in October 1989, marking completion of a contract awarded ten years earlier as a follow-on to U-2 production. The total consisted of seven single-seat U-2Rs, one two-seat U-2RT, 25 single-seat TR-1As, two two-seat TR-1Bs, and two basically similar ER-2s delivered to NASA for Earth resources research. The U-2R and TR-1 programs are now consolidated. The TR-1 designation was deleted, and all aircraft are now designated as U-2s.

Production of the original U-2, in various forms but with similar dimensions, began in the late 1950s. These were followed by the U-2R, a version with muchincreased span and length, 12 of which were manufac-tured in the late 1960s. The U-2R is now the only operational version of the U-2, following retirement of the last U-2C in 1989.

The TR-1A (now U-2R) single-seat tactical reconnaissance version was structurally identical to the U-2R and was designed for high-altitude standoff surveillance missions. It was first flown in 1981, and pilot training at Beale AFB, Calif., began later that year. Currently, U-2Rs and U-2RT trainers are based at Beale AFB and RAF Alconbury in the UK, U-2s can be equipped with electronic sensors to provide continuously available, day or night, all-weather surveillance of the battle area or potential battle area in direct support of US and allied ground and air forces during peace, crisis, and war, The sensors include an advanced synthetic aperture radar system in side-looking

airborne radar (SLAR) form and modern ECM.
The U-2 aircraft fleet is being reengined with the
General Electric F101-GE-F29 engine. A derivative of the F118 engine used in the Northrop B-2, the new engine is in the 19,000-lb-thrust class and has the dual benefit of enhancing all-around performance in the aircraft while providing much-improved supportability over the current engine, which is used in no other USAF operational aircraft. (Data for U-2R.)

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 90,000 ft, range more than 3,000 miles

Armament: none.

RF-4C

This multisensor version of the F-4C Phantom II was developed to replace the day-only RF-101 for day/ night, all-weather reconnaissance operations. The RF-4 was the first tactical aircraft equipped with a forward-looking radar capable of simultaneous terrain-follow-ing and low-altitude navigation. The basic aircraft is configured with conventional optical cameras for day operations and infrared (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 recently by a new navigation and weapons delivery system (NWDS) and improved-accuracy ring-laser gyro. RF-4Cs were deployed to Saudi Arabia and Turkey for Operation Desert Storm. (Data similar to those for F-4.)

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 electronic warfare 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 technique was used to great effect during the Gulf War against enemy surface-to-air mis-sile batteries. Primary armament includes Shrike (AGM-45) and HARM (AGM-88), F-4Gs deployed to Saudi Arabia were also equipped with ALQ-131 and ALQ-184 electronic countermeasures pods. (Data for unmodifled F-4E; F-4G similar.)
Contractor: McDonnell Aircraft Company. Division of

McDonnell Douglas Corporation.

Power Plant: two General Electric J79-GE-17A turbolets: each 17,900 lb thrust with afterburning.

Accommodation: pilot and weapon systems operator

Dimensions: span 38 ft 71/2 in, length 63 ft 0 in, height 16 ft 51/2 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.



RF-4C (N. Leong)



F-4G (N. Leong)



EC-130H

EC-130

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

The EC-130E ABCCC, used as an airborne battlefield command and control center by the 7th Airborne Command and Control Squadron at Keesler AFB, Miss., a geographically separated unit of the 28th Air Division, Tinker AFB, Okla. Eight aircraft are being up-dated by Unisys to ABCCC III standard. The EC-130E "Volant Solo II" psychological op-erations (PSYOP) broadcasting version operated by

the 193d Special Operations Group ANG, Harrisburg, Pa.

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 Electronic Combat Squadron at Davis-Monthan AFB, Ariz., also a geographically separated unit of the 28th Air Division. Altogether, 14 EC-130Hs are in service. (Data basically as for C-130.)

EC-135, etc.

Several aircraft in the KC-135 Stratotanker series were modified for specialized missions during production or at a later date. Thirty-nine are modified for strategic airborne command-and-control missions. Five KC-135A tankers were converted for Airborne Command Post use by SAC in 1960. Additional aircraft were modified in 1962, and 17 new production KC-135B turbofan aircraft entered the system in 1965. Currently, EC-135A/C/E/G/H/J/L/P/Y aircraft are assigned to SAC, TAC, PACAF, and USAFE. They are fitted with extensive communications equipment to



E-3B

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 aircraft flies a mission each day. Accommodating a flight crew of four, a general officer, and a staff of 18, EC-135Cs can be refueled by SAC tankers. Thirteen are in service and have been adapted to provide control of Minuteman ICBMs. TAC provides overseas de-ployment control of tactical fighters with the EC-135K. Modifications to the EC-135 aircraft include continuation of the ultrahigh-frequency line-of-sight system replacement, the initial Milstar transition satellite communications terminals, and the Peacekeeper upgrades to Airborne Launch Control Aircraft, Future enhance-ments include full Milstar capability and improved lowand very-low-frequency radios and antennas.

Three EC-135N Advanced Range Instrumenta-tion Aircraft (ARIA) are operated by ASD's 4950th Test Wing as telemetry and voice relay stations to

supplement land and sea receiver stations for DoD and NASA space and missile programs. The aircraft's dis-tinctive bulbous nose houses the world's largest airborne steerable antenna

Versions of the C-135 Stratolifter series used for reconnaissance include turbofan RC-135Vs and RC-135Ws, equipped for electronic reconnaissance with SAC, and RC-135Ss, RC-135Us, and RC-135Xs for specific reconnaissance tasks. RC-135s were stationed in Saudi Arabia in support of military operations in that theater. WC-135Bs, converted C-135Bs operated by MAC, provide atmospheric sampling capability. Under the Milstar program, an NKC-135 will collect data to assist airworthiness certification of the radome installation on the SAC EC-135.

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

The EF-111A Raven is a conversion of the basic General Dynamics F-111A airframe, fitted with mainly off-the-shelf components that enable it to accomplish important defense-suppression missions in worldwide support of US tactical strike forces. Its ALQ-99E primary jammer is a modification of the Navy ALQ-99 and is 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/FB-111 (ALQ-137, ALR-62). The cockpit is revised, and a new vertical stabilizer houses the ALQ-99E receivers. An upgrade program for the EF-111A is currently being developed, with improvements to the ALQ-99E that will enable the system to counter advanced electronic defenses during the 1990s and beyond. Other improvements under the axionics modernization program (AMP) include upgrading the terrain-following radar and installing

GPS equipment and a new inertial navigation system, Forty-two EF-111As were produced for missions that include barrier standoff jamming, degradation of acquisition radars during close air support operations, and close-in jamming and direct support for deep strike missions. Flight testing began in March 1977, and the first "production" EF-111s were delivered in late 1981 to the 366th TFW at Mountain Home AFB, Idaho, where they achieved initial operational capability with the 390th Electronic Combat Squadron in December 1983. Second operational location was at RAF Upper Heyford in the UK, from February 1984, with the 42d ECS. Aircraft from this unit took part in the attack on Libyan targets in April 1986. EF-111 area jamming was crucial to allied air supremacy in the Gulf War, pouring electrons into Iraqi target-acquisition radars and rendering them useless

Contractor: Grumman Aerospace Corporation

Power Plant: two Pratt & Whitney TF30-P-109 turbo-fans; each 19,600 lb thrust with afterburning.

Accommodation: crew of two, side by side in 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, service celling 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)

AWACS is a mobile, flexible, survivable, and jam-resistant surveillance and command, control, and communications (C3) system capable of all-weather, longrange, high- or low-level surveillance of all air vehicles, manned or unmanned, above all kinds of terrain. A modified Boeing 707-320B AWACS carries an extensive complement of mission avionics, including computer, radar, IFF, communications, display, and navigation systems. The capability of AWACS is provided by its Westinghouse Electric Corp. look-down radar, which makes possible all-altitude surveillance over land or water, 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 by TAC units, 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 USA.

Deliveries of the basic production version, designated E-3A Sentry, began in March 1977, when the first aircraft was handed over to TAC's 552d Airborne Warning and Control Wing at Tinker AFB, Okla, Twentyfour were built. Twenty-two of them, plus two proto-types, have been upgraded to E-3B configuration. Improvements include much-enhanced computer capabilities, antijam communications, an austere maritime surveillance capability, additional radio communications, and five additional display consoles. The first E-3B was redelivered to the 552d AWACW in July 1984.

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 is 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 ten US Standard E-3A aircraft were, subsequently, upgraded to E-3Cs, with additional command-and-control capability, in 1984-88. In addition, a further sensor was added to USAF E-3B/C aircraft under Project Snoopy, to facilitate operations in the Gulf War. 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. Saudi Arabia has five E-3s; Britain's Royal Air Force and the French Air Force have also acquired the AWACS aircraft.

A \$425 million Multistage Improvement Program (MSIP) for the E-3 was initiated by ESD and is being phased over five years. All USAF and NATO E-3s will be equipped with the Joint Tactical Information Distribution System (JTIDS) for antijam digital communications. As a first step, Boeing was awarded a contract in May 1987 for E-3 improvements that include full-scale development and integration into US and NATO air-craft of the Quick Look ESM system that will detect signals emitted by both hostile and friendly targets. Additional enhancements to US E-3s will include upgrading of JTIDS to TADIL-J (tactical digital informa-tion link-J) capability, central computer memory upgrade, and ability to employ GPS. Full-scale development contracts for a major upgrade to the Westinghouse APY-1 and APY-2 radar, under the Radar System Improvement Program (RSIP), were awarded in September 1989. This will enable the AWACS aircraft to detect much smaller largets, such as cruise missiles. IOC for these improvements is scheduled for FY 1996,

with contract completion by 2000. E-3s assumed a US continental air defense role in January 1979, when NORAD personnel began augmenting TAC E-3 flight crews on all operational NORAD missions by 28th Air Division's 552d AWACW from Tinker AFB. Overseas units of the 28th Air Division include the 960th, 961st, and 962d AWAC Squadrons based, respectively, at NAS Keflavik, Iceland; Kadena AB, Japan; and Elmendorf AFB, Alaska. Deployments have been made to the Pacific, the Middle East, south-west Asia, the Mediterranean area, and Europe, and most recently in support of Operation Desert Storm and Operation Provide Comfort, AWACS aircraft are also used in support of the US drug enforcement program.

Contractor: Boeing Aerospace and Electronics.

Power Plant: four Pratt & Whitney TF33-PW-100/
100A turbofans; each 21,000 lb thrust.

Accommodation: basic operational crew of 17, including 13 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, service ceiling above 29,000 ft, endurance six hr on station 1,000 miles from base.

SAC is the Air Force's single-resource manager for the E-4 airborne command post aircraft, the main operating base for which is Offutt AFB, Neb. Three E-4As were built initially to support the National Emergency Airborne Command Post (NEACP). Each had a modified Boeing 747 airframe and provided an interim capability by utilizing existing EC-135 command, control, and communications (C³) equipment. Four fully developed E-4B Airborne Command Post aircraft (three of them converted from E-4As) now support the NEACP mission. They are hardened against the effects of nuclear including electromagnetic pulse; are equipped for in-flight refueling; contain a 1,200kVA electrical system designed to support advanced electronics; and have a wide variety of communications equipment. This includes a more powerful LF/VLF system, improved satellite communications system, and communications processing equipment. These systems have antijam features and 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. Recent improvements have included a data-processing capability and more survivable C3, 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.

Contractor: Boeing Aerospace

Power Plant: four General Electric CF6-50E2 turbo-fans; 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 hours.

E-8 Joint STARS

Operation Desert Storm provided an unexpected and highly successful opportunity for the USAF/US Army Joint Surveillance and Target Attack Radar Sys-

tem (Joint STARS) to prove its capability.
The original contract for full-scale development of the system was awarded to Grumman in September 1985. The company was made responsible for sub-systems installation, integration, and flight testing of specialized equipment aboard two 707-320 airframes specially modified by Boeing for this purpose, 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 operates in synthetic aperture radar (SAR) mode to detect and locate stationary objects, such as parked tanks, and alternates between SAR and a Doppler-type mode to locate and track slow-moving targets. The Joint STARS system then directs attack on the targets, in real time. via data link or radio. To facilitate this process, each production E-8 will carry a crew of around 18 USAF and Army specialists to man 18 operations-and-control consoles, two of them doubling as communications stations, that display color-coded images of behindthe-lines terrain and of wheeled and tracked vehicles moving anywhere on it. Existing E-8A prototypes have ten operations consoles and two communications stations. An estimated 386,100 sq miles can be covered in a single eight-hour sortie, cruising at 30,000-40,000 ft.

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. A third aircraft, designated E-8B, contracted to Grumman in November 1990, will serve as the preproduction example. The 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 at least 19 more E-8s (20 total) with delivery to begin in 1995 and IOC scheduled for 1997. Because new Boeing 707 airframes are no longer available, USAF has decided to purchase and modify used 707s, rather than qualify another type of aircraft. These will be designated E-8C

Contractor: Grumman Corporation.

Under this designation, two highly modified Boeing Canada (de Havilland) DHC Dash 8M aircraft are operated by the USAF Air Defense Weapons Center at Tyndall AFB, Fla., as airborne platform telemetry relay aircraft. Each is equipped with a sensor suite developed by the Sierra Research Division of LTV, including an AN/APS-128D sea surveillance radar in a ventral radome and a five-beam, electronically steerable, 75square-foot, phased-array telemetry antenna, in a starboard side fuselage fairing. This is capable of auto-matically detecting, tracking, and relaying data simultaneously from five distinct sources traveling at speeds of Mach 5 or more. It is used for low-altitude, over-thehorizon 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 Division of Boeing Canada

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

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.

The EC-18B Advanced Range Instrumentation Aircraft (ARIA) is a modified former American Airlines Boeing 707-320 series transport, of which four have replaced some of the EC-135N ARIAs operated by ASD's 4950th Test Wing. 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. A sonobuoy missile impact location system (SMILS) of the kind fitted on some USN P-3s is currently under development for the EC-18B.

A \$49 million contract was awarded to Chrysler Technologies Airborne Systems, Inc., to modify two Boeing 707s for use as dedicated Cruise Missile Mission Control Aircraft (CMMCA). Specialized equipment includes an AN/APG-63 surveillance radar, telemetry receiver, and weather radar. Designated EC-18D, they are operated by the 4950th TW at Wright-Patterson AFB, Ohio, in support of USN and SAC 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 815th TAS of AFRES. (Data similar to those for C-130.)

X-29A Forward Swept Wing Demonstrator

Flight testing of the unique X-29A Forward Swept Wing (FSW) multitechnology demonstrator has been under way at NASA's Dryden Flight Research Center at Edwards AFB, Calif., since December 1984. A re-examination of the FSW principle was made both practical and feasible by the introduction of advanced lightweight composite materials that eliminate many of the problems encountered with conventional metal construction. Day-to-day management of the program was handed over to NASA following acceptance of the aircraft by USAF's Aeronautical Systems Division in March 1985, USAF manages flight test support.

The two X-29 demonstrators were built by Grumman. A standard Northrop F-5A lorward fuselage and nose landing gear and many off-the-shelf components, such as F-16 main landing gear and control surface actuators, were utilized on each aircraft to reduce costs. Integrated with a triplex fly-by-wire flight-control system, the X-29's forward-swept wings, made of strong, lightweight graphite composites, and its stubby canards, which act as its main control surfaces, combine to enhance lift and reduce drag. In flight, the wings trailing edges change shape continuously to match flight conditions. The canards, flaperons, and strake flaps at the tail work together to enhance maneuverability.

The early phase of the flight program, following the installation of an improved backup flight-control system in the fall of 1985, was aimed at testing stability and control loads, flutter, and wing divergence up to 40,000 ft and at speeds up to Mach 1,5. The first supersonic flight took place in December 1985, when preliminary data showed Mach 1.03 airspeed at an altitude of 40,000 ft. This phase ended in December 1986 after 104 flights. Before commencement of the second phase, a calibrated engine with two thrustmeasuring systems for performance data, a NASA noseboom calibrated for air data measurements, and upgraded instrumentation were installed. In June 1988, this first X-29 made its 200th flight, a record for a single X-series aircraft, Performance and asymmetric load testing were completed after a total of 242 flights, during which a maximum speed of Mach 1.52 at 51,000 It had been recorded. The aircraft was grounded in 1988 but was subsequently restored to flight status for public display.

Work on design modification and installation of flight test instrumentation and an antispin parachute on the second X-29 began in the summer of 1987, with delivery in October 1988. First flight took place in May 1989. Since then, the aircraft has completed flight test of the low-speed, high-angle-of-attack (AOA) portion of the flight envelope. During these tests, the aircraft was pitch pointed up to 67 degrees AOA and maneuvered in all axes up to 45 degrees AOA. The forward swept wing and other integrated technologies of the X-29 were shown to provide superb roll rate performance, 70 degrees per second at 30 degrees AOA, In addition, the 120 high-AOA flight tests completed at Edwards AFB have yielded significant agility and military utility data.

The second aircraft is currently being modified for

use this year as a test-bed for a vortex flow control experiment. This flight test should provide valuable data on nose positioning and control of flight at high AOA, with application to current aircraft modifications and future fighter aircraft.

Contractor: Grumman Corporation.

Power Plant: one General Electric F404-GE-400 turbo-fan; 16,000 lb thrust class

Accommodation: pilot only.

Dimensions: span 27 ft 2½ in, length overall 53 ft 11¼ in, height 14 ft 3½ in.

Weights: empty 13,800 lb, gross 17,800 lb Performance: max level speed approx Mach 1.6.

NASP/X-30A

The National Aerospace Plane (NASP) research program, initiated jointly by DoD and NASA, is intended to develop the technology for hypersonic cruise and single-stage-to-orbit aircraft/spacecraft able to take off from and land on conventional runways. Such vehicles could place payloads in orbit at costs far below those of current expendable launch vehicles or the space shuttle. They could also point the way to future military transatmospheric vehicles (TAVs) able to leave and return to orbital flight on surveillance issions. The program is jointly managed by DoD and

NASA, with USAF designated as lead agency.
The current technology development phase of the program began in April 1986, when DoD and NASA announced the award of contracts for propulsion and airframe development. In the following year, two of the airframe contractors were eliminated, leaving General Dynamics, McDonnell Douglas, and Rockwell Interna-tional to proceed into a three-year preliminary design phase on the airframe, with Rockeldyne and Pratt & Whitney continuing their propulsion work, By late 1989, it had been decided to stretch the NASP program to reduce both cost uncertainties and technical risks in the long term. In January 1990, the five prime contractors engaged in the program announced plans to form a national contractor team to pool resources and develop the vehicle jointly. The NASP National Contractor Office relocated to Palmdale, Calif.

An experimental aircraft, designated X-30A, similar in size to a McDonnell Douglas MD-80 series airliner, is intended to be used in the third phase of the program to develop and demonstrate NASP technoloaies throughout the flight envelope for hypersonic cruise and acceleration to low-Earth orbit. This demonstrator will be a lifting body design with small wings and twin stabilizers, powered by three to five scramjets in an underfuselage pod, plus a single booster rocket in the 50,000-75,000 lb thrust class for entry into orbit and reentry; it will accommodate two persons, side by side.

Transports and **Tankers**

C-5A/B Galaxy

The huge capacity of this long-range, air refuelable, heavy logistics transport was of major importance to the massive airlift of US forces to the Persian Gulf in the early stages of Operation Desert Shield, with well over 90 percent of the total available C-5 fleet used in the operation.

The prototype flew in June 1968, and USAF took delivery of 81 basic C-5As 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. Modifica-tion of all 77 aircraft in the inventory took place between 1982 and 1987. The 433d MAW, at Kelly AFB, Tex., became the first AFRES unit to be equipped with "AFRES-owned" C-5As in December 1984, and ANG's 105th MAG, at Newburgh, N. Y., received its first C-5As in July 1985. Seven squadrons in the reserve forces are now C-5-equipped. Two C-5As 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-5Bs, generally similar to the C-5A but embodying all the improvements intro-duced since completion of C-5A production. These include the strengthened wings, General Electric TF39-GF-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. The two operational C-5B units (each with 22 aircraft) are the 60th AW at Travis AFB, Calif., and the 436th AW at Dover AFB, Del. 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 two C-5s by Lockheed under the Pacer Snow project, Testing is being undertaken at Eglin AFB, Fla., and Holloman AFB, N. M., by

the Air Force Special Missions Operations Test and Evaluation Center, One hundred and twenty-six C-5s are now within the purview of US Transportation Command. (Data for C-5B.)

Contractor: Lockheed Aeronautical Systems Com-

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 81/2 in, length 247 ft 10 in, height 65 ft 1½ in. Weights: empty 374,000 lb, max payload 261,000 lb,

gross (for 2g) 837,000 lb.

Performance: max speed at 25,000 ft 571 mph, ser-vice ceiling (at 615,000 lb) 35,750 ft, range with max payload 3,434 miles, range with max fuel 6,469

C-9A/C Nightingale

Derived from the DC-9 Series 30 commercial airliner, the C-9A is an aeromedical airlift transport, in service since August 1968, Modifications include a special-care compartment with separate atmospheric and ventilation controls. Delivery of 21 to MAC's 375th Aeromedical Airlift Wing, now redesignated the 375th Airlift Wing, was completed by February 1973; this unit is augmented by the 73d AAS (Assoc.) of AFRES, collocated at Scott AFB, III. The Nightingale also performs overseas theater aeromedical evacuation missions in Europe, with five C-9As based at Rhein-Main 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 Military Airlift Wing 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

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.

Thirty military versions of the Beechcraft Super King Air 200 were delivered to USAF under the designation C-12A. Their role is to support attaché and military assistance advisory missions throughout the world. MAC uses two C-12As to train aircrews and to supplement support airlift. C-12As refitted with PT6A-41 engines are redesignated C-12C. Six C-12D versions, with cargo door, high flotation landing gear, and provision for tiptanks, were delivered to USAF

MAC uses 40 passenger/cargo-capable Super King Air B200Cs (C-12Fs) at eleven bases throughout CONUS, PACAF, and USAFE for the time-sensitive movement of people and cargo. The C-12Fs, along with the C-21A aircraft, replaced the CT-39 fleet, Six 12Fs were delivered to the ANG, which also has six C-12Js (military versions of the 19-passenger Beechcraft 1900C). The first of the C-12Js was delivered in September 1987, and they serve as mission

support aircraft, (Data for C-12A.)
Contractor: Beech Aircraft Corporation

Power Plant: two Pratt & Whitney Canada PT6A-38 turboprops; each 750 shp. (C-12F: 850 shp PT6A-

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, service ceiling 31,000 ft, range at max cruising speed 1.824 miles.

C-17A

The McDonnell Douglas C-17A airlifter made its first flight on September 15, 1991. The test program continues to progress well, with 29 missions and 79 hours flown in the first 90 days. Flight envelope has been expanded to 35,000 ft and Mach 0.8. Over the next year, four production aircraft will join the test aircraft at Edwards AFB to continue the flight test effort, Initial operational testing of the aircraft and its on-board systems are also programmed to begin this year. The C-17A was developed to meet US forceprojection requirements. It is a heavy-lift, air refuelable cargo transport, designed to provide inter- and

intratheater airlift of all classes of military cargo, including outsize. It will be able to operate routinely into small, austere airfields (3,000 ft x 90 ft) previously restricted to C-130s and will provide the first capability to airland or airdrop/extract outsize cargo in the tactical environment. The C-17A will not only enhance US airlift capability across the board but will also provide much-needed force structure modernization. It will be based at active-duty locations.

McDonnell Douglas was announced as the se-lected prime contractor in August 1981 and received a low-level research and development 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 full-scale development (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. Sixteen production aircraft have been funded between FYs 1988 and 1992, and \$122.4 million in advance procurement has also been approved for a further eight aircraft. A buy of 120 C-17s is

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

The 437th AW at Charleston AFB, S. C., has been designated as the first C-17 unit, with delivery scheduled to commence this year and IOC in FY 1994.

Prime Contractor: Douglas Aircraft Company, Divi-sion of McDonnell Douglas Corporation.

Power Plant: four Pratt & Whitney F117-PW-100 turbofans; each 40,000 lb thrust, on early aircraft.

Accommodation: normal flight crew of two, plus

loadmaster, Provisions for the full range of military airlift missions.

Dimensions: span 172 ft 0 in, length 174 ft 0 in, height

Weights: max payload (2.25g) 172,200 lb, gross 580,000 lb.

Performance (estimated): normal cruising speed at height 518 mph (Mach 0.77), range with 160,000 lb payload 2,400 miles.

C-20A/B Gulfstream III

The Air Force acquired eleven 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 Military Airlift Wing in FY 1983 and FY 1984 under a lease/purchase agreement, were subsequently purchased. Another seven C-20Bs, with advanced mission communications equipment and revised interior, were ordered in January 1986. As these were delivered to Andrews AFB, Md., the original three C-20As were transferred to Ramstein AB, Germany, in support of the 58th MAS'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. Up to three further C-20s, designated C-20F, with advanced technology flight management systems and upgraded Rolls-Royce engines, are to be acquired by USAF to meet expanding SAM requirements

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 41/2 in. Weight: gross 69,700 lb.

Performance: max cruising speed 561 mph, service ceiling 45,000 ft, range 4,050 miles.

Eighty-three C-21As are operated by active-duty and ANG units from twelve US bases and three over-seas locations. Together with the C-12Fs, 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, All C-21A aircraft are currently undergoing modification with digital electronic engine

Contractor: Learjet Corporation. Power Plant: two Garrett 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

Weight: gross 18,300 lb.

Performance: cruising speed Mach 0.81, service ceiling 45,000 ft, range with maximum passenger load 2,420 miles, with maximum cargo load 1,653 miles.

Under the designation C-22B, four Boeing 727 commercial transports have been purchased and modi-fied 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

Eighteen Sherpa light transport aircraft, previously operated by MAC to ferry aircraft engines and spares to bases throughout Europe, have been transferred to Air Force Systems Command (using the aircraft from Edwards AFB, Calif.), the US Army, and the US Forest Service.

The Sherpa, which entered the USAF inventory in 1984, is an all-freight version of the Shorts 330 re-gional airliner, with a 6 ft 6 in square cabin section over an unimpeded hold length of 29 ft. Through loading is provided via a large forward freight door, a full-width hydraulically operated rear ramp door, and removable roller conveyors.

Contractor: Short Brothers PLC.

Power Plant: two Pratt & Whitney Canada PT6A-45R turboprops; each 1,198 shp.

Accommodation: crew of three; up to 7,000 lb of freight, including four LD3 containers, and engines the size of the F100 series.

Dimensions: span 74 ft 8 in, length 58 ft 01/2 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 of two Boeing VC-25A Presidential transports was delivered to the 89th Military Airlift Wing at Andrews AFB, Md., in August 1990, followed by the 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

USAF acquired 13 Fairchild Metro III commuter transport aircraft to replace ANG C-131s, under the designation C-26A. 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 ANGOSA (Air National Guard Operational Support Aircraft) role. They have a quick-change interior, enabling passenger seats to be replaced by a medevac or cargocarrying configuration. In addition, the first of 53 C-26B aircraft was delivered to the National Guard Bureau at San Antonio, Tex., in January, the others to follow over a five-year period. C-26Bs have TCAS II, GPS, and microwave landing systems. (Data for C-26A.)
Contractor: Fairchild Aircraft Corporation.

Power Plant: two Garrett TPE331-11U-612G turbo-

props, each 1,100 shp. Accommodation: crew of two; 19-20 passengers. Dimensions: span 57 ft 0 in, length 59 ft 41/4 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, service ceiling 26,700 ft, range with 19 passengers 1,224 miles.

C-27A

Under a contract awarded in August 1990, Chrysler Technologies Airborne Systems is delivering ten C-27A STOL intratheater transports for use by US Southern Command. The C-27As are commercially available Alenia G222 medium airlifters, modified by Chrysler to include new communications and navigation avionics. The aircraft will provide rapid response airlift of personnel and cargo to remote locations accessible primarily through unimproved airfields with short, unpre-



C-5B



C-27A



HC-130 (G. Aceto)

pared landing surfaces. The first C-27A is assigned to Howard AFB, Panama. (Data for standard G222, except where indicated.)

Contractor: Chrysler Technologies Airborne Systems

Power Plant: Iwo 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 51/2 in, height 32 ft 13/4 in.

Weights: empty 32,165 lb, gross 61,730 lb,

Performance: max level speed at 15,000 ft 336 mph; service ceiling 25,000 ft; ferry range with max fuel

C-130 Hercules

The remarkable C-130 Hercules continues to demonstrate its wide operational capabilities in both peace-time and war situations. Basic and specialized versions perform a diversity of roles worldwide, 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. Four decades have elapsed since TAC issued its original design specification, yet the aircraft remains in production. The initial production model was the C-130A, first flown in April 1955, with 3,750 ehp Allison T56-A-11 or -9 turboprops; 219 were ordered, and deliveries began in December 1956. Two DC-130As (originally GC-130As) were built as drone launchers/directors for ARDC (now AFSC), 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, C-130Bs are used in aerial firefighting missions by ANG and AFRES units, Six C-130Bs were modified in 1961 for airsnatch recovery of classified USAF satellites by the 6593d Test Squadron at Hickam AFB. Twelve C-130Ds were modified C-130As for use in the Arctic, with wheel-ski landing gear, increased fuel capacity, and provision for JATO (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 and TAC, with deliveries beginning in April 1962. A wing modification to correct fatigue and corrosion on USAF's current force of C-130B/Es has extended the life of the aircraft well into the next century. Ongoing modifica-tions include a self-contained navigation system (SCNS) to enhance navigation capabilities, especially in the low-level environment. SCNS incorporates an integrated communications navigation management system that features the USAF standard laser-gyro inertial navigational unit and the 1553B databus; installation began in 1990. Other modifications include enhanced station-keeping equipment (ESKE), 50kHz VOR/ILS receivers, secure voice capability, replacement radar for the adverse weather aerial delivery system (AWADS). and GPS capability. Eleven were scheduled for an extensive modification to enhance their Special Operations Low Level (SOLL) capability. Another major modification installs a state-of-the-art autopilot that incorporates a ground proximity warning system (GPWS). Specifically modified aircraft are used by the 757th TAS, AFRES, based at Youngstown MAP. Ohio, for aerial spraying, typically to suppress mosquitospread epidemics.

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 April 1975. Well over 350 C-130Hs and derivatives have been ordered for the US services, Four LC-130Hs, modified with wheel-skill approach to the LS of the control of the US services. gear, were acquired by ANG. Additionally, as a partial response to the "overwhelming role" played by the tactical airlift fleet in Operation Just Cause and in the Persian Gulf War, Congress has approved the pro-curement of more C-130Hs to replace aging Es. Other variants include HC-130H/N/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 one was modified as DC-130H for drone control duties. ANG C-130s acquired a new role in 1987 when about ten aircraft were assigned to ANG fighter wings and groups to provide support for jet fighter units on deployments, (Data for C-130H.)

Contractor: Lockheed Aeronautical Systems Company, Power Plant: Jour 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, service ceiling (at 130,000 lb) 33,000 ft, range with max payload 2,356 miles.

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 low-level deep-penetration tactical missions by the 1st, 7th, and 8th Special Operations Squadrons based in the Pacific, Europe, and North America, respectively, and now part of Air Force Special Operations Command (AFSOC). Six of these aircraft, located at Hurlburt Field, Fla., are modified to conduct air-to-air refueling with special operations helicopters. In addition, ten of the fourteen aircraft are modified with the Fulton Re-covery System. Operation Desert Storm proved the Combat Talon I to be 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. The MC-130E is being supplemented by the improved, night/adverse weather, low-level MC-130H (Combat Talon II). Twenty-four aircraft are being acquired, equipped with an in-flight refueling receptacle; explosion-suppressive fuel tanks; a modified cargo ramp area for the high-speed, low-level aerial delivery system; Emerson Electric ANIAPQ-170 precision terrain-following and terrain-avoidance radar; dual radar altimeters; dual inertial navigation systems; and provision for a GPS receiver. The Combat Talon II defensive avionics suite is much improved over the Combat Talon I. Deliveries of the Combat Talon II aircraft began in mid-1991 and will continue into the near future. Combat Talon II operational training is located at the 542d Crew Training Wing at Kirtland AFB, N. M. (Data similar to those for C-130.)

HC-130H/N/P Combat Shadow/Tankers

Twenty-eight active duty HC-130N/P Combat Shadow tanker aircraft are now dedicated to special operations missions. Eight primary aircraft are assigned to the 9th SOS, Eglin AFB, Fla. Six further aircraft each are assigned to the 17th SOS, Kadena AB, Japan, and the 67th SOS, RAF Alconbury, UK Others are assigned to the 542d Crew Training Wing at Kirtland AFB, N. M. All are modified with new communications, navigation, and countermeasures systems and night vision goggle (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 minimum communications. These SOF HC-130s are being modified with universal receiving ports for air-to-air refueling and a self-contained inertial navigation system (SCINS). Air Rescue Service maintains additional search-and-rescue/tanker HC-130 aircraft. Four rescue aircraft are located with an activeduty unit at Patrick AFB, Fla.; fourteen others are assigned to various AFRES and ANG units. (Data similar to those for C-130.)

KC-135 Stratotanker Another veteran of the USAF inventory, the KC-135 tanker fleet made an invaluable contribution to the success of Operation Desert Storm, flying around-theclock missions to maintain the operability of allied warplanes. The KC-135s form the backbone of the USAF tanker fleet, meeting the aerial refueling re-quirements of USAF bomber, fighter, cargo, and reconnaissance forces, as well as the needs of the US Navy and Marines and allied nations. Although similar in size and appearance to commercial 707 aircraft, the KC-135 was designed to military specifications, incorporates 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 633 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 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 have a gross weight of 322,500 lb. They embody modifications to 25 major systems and subsystems, and not only carry more fuel farther but also have reduced maintenance costs, are able to operate from shorter runways, and are less pollution-prone. The first KC-135R flight was in August 1982, and first deliveries to SAC were in July 1984; the 269th reengined aircraft was delivered in December 1991, with approval in the FY 1992 budget for the reengining of a further 26 aircraft, Second, the JT3D reengining program has upgraded 163 KC-135As serving in 13 ANG and three AFRES units to KC-135E standard with JT3D turbofans removed from surplus commercial 707s, Finally, the Life Extension Structural Modification has provided for the



KC-135R (J. Rhodes)



MC-130H



C-141B



KC-10A

renewal of the lower wing skin, enabling the fleet of KC-135s to remain fully operational past 2020. An avionics upgrade is being evaluated that would significantly improve systems reliability and maintainability. (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 or five; 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 322,500 lb.
Performance: max speed at 30,000 ft 610 mph, service ceiling 50,000 ft, range with 120,000 lb of transfer fuel 2,128 miles, ferry mission 11,192 miles.

C-135A/B Stratolifter

Thirteen C-135 transports and variants, without the KC-135's refueling equipment, remain operational with MAC. They were ordered originally to serve as interim jet passenger/cargo transports, pending de-livery 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. Additionally, two C-135s belonging to ASD's 4950th Test Wing were permanently modified as Laser Com-munications Airborne Test-Beds for the Have Lace program. (Data similar to KC-135, except where indicated.)

Dimension: 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.

VC-137B/C Stratoliner

Seven specially modified Boeing 707 transports are operated by MAC's 89th Wing from Andrews AFB, Md., for VIP duties. There are four VC-137Cs, which are Boeing 707-320s, and three smaller 707-120s, currently designated VC-137B. Two of the VC-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: VC-137B: span 130 ft 10 in, length 144 ft 6 in, height 42 ft 0 in; VC-137C: span 145 ft 9 in, length 152 ft 11 in, height 42 ft 5 in.

Weights: VC-137B: gross 258,000 lb; VC-137C: gross 322,000 lb.

Performance (VC-137C): max speed 627 mph, service ceiling 42,000 ft, range 5,150 miles.

C-141A/B StarLifter

The massive movement of troops and equipment to the Persian Gulf for Operations Desert Shield and Desert Storm relied heavily on the capabilities of 227 C-141 StarLifters. 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 modifi-cation of the entire available force of 270 (now 265) aircraft to C-141B standard (except four AFSC 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, a center wing structural modification is under way, which, coupled with other structural upgrades, will extend the C-141's original flying life by 15,000 hours. Current plans call for 118 aircraft to receive this modification. Other C-141 modification plans include installation of 50kHz 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 allweather 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. 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 electronic countermeasures environment. In addition, thirteen 437th AW C-141Bs are scheduled for modifications to increase their Special Operations Low Level (SOLL) capability and survivability.

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 vi-tal supplies to areas that, in recent years, have been devastated by natural disasters. Two hundred thirtyfour C-141Bs operate under the purview of US Transportation Command (USTRANSCOM). (Data for

Contractor: Lockheed-Georgia Company. Power Plant: four Pratt & Whitney TF33-P-7 turbofans; each 21,000 lb thrust.

Accommodation: crew of five; cargo on 13 standard 463L pallets. Alternative freight or vehicle payloads, 200 fully equipped troops, 155 paratroops, or 103 litter patients plus attendants.

Dimensions: span 159 ft 11 in, length 168 ft 31/2 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 plan-

Performance: max cruising speed 566 mph, range with max payload 2,170 miles without air refueling.

KC-10A Extender

The KC-10 was conceived to meet USAF requirements for an Advanced Tanker/Cargo Aircraft (ATCA). It is based on the commercial DC-10 Series 30CF, modified to include fuselage fuel cells, a boom operator's station with aerial refueling boom and integral hose reel/drogue unit, a receiver refueling receptacle, and military avionics. In its primary role of enhancing world-wide 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 conven-

tional operations and, as such, played a crucial role in the Persian Gulf deployment. Since it has both types of tanker refueling equipment installed, the KC-10A can service USAF, USN, USMC, and allied aircraft on the same mission.

For deployment, the KC-10A's refueling capabilities and long range will, in many situations, dispense with the need for forward bases while leaving vital fuel supplies in the theater of operations untouched. Aircraft maintenance is performed under the contractor logistics support concept, where flight-line mainte-nance 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. USAF units equipped with KC-10As include the 6th and 9th AREFS at March AFB, Calif., the 2d and 32d AREFS at Barksdale AFB, La., and the 344th and 911th AREFS at Seymour Johnson AFB, N. C. AFRES also crews the aircraft under the Associate Reserve concept. Associate units include the 79th AREFS at March AFB, the 78th AREFS at Barksdale AFB, and the

77th AREFS at Seymour Johnson AFB.
Fifty-nine KC-10As are in the USAF inventory. 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 call for 20 aircraft to be modified to accept the wing-mounted pods. An additional modification, currently in production, utilizes an on-board loader that allows pallet handling without prepositioning wide-body cargo loading equipment, and so permits autonomous cargo operations at austere locations.

Contractor: Douglas Aircraft Company, Division of McDonnell Douglas Corporation. Power Plant: three General Electric CF6-50C2 turbo-

fans; 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, service ceiling 42,000 ft, range with max cargo 4,370 miles.

specialized undergraduate pilot training (SUPT), ATC and the Air Force Academy will conduct EFS. Ongoing source selection is expected to result in a contract

T-37B Tweet

USAF's first purpose-built jet trainer, the T-37 is Air Training Command's standard two-seat primary trainer, The original T-37A was superseded in November 1959 by the T-37B; all A models were converted subsequently to B standard. A contract was awarded in August 1989 to Sabreliner Corp. for the T-37B Service Life Extension Program (SLEP). The contract included the design, testing, and production of kits, to be in-stalled by USAF, which will modify or replace critical structural components for the entire fleet, extending the capability of the T-37 into the next century. Deliv-ery of production kits will continue until 1993. Well over 1,000 T-37s were built, and more than 600 remain in USAF's inventory. All are being repainted in a distinc-tive dark blue and white to help formation training and to ease maintenance. ATC plans to replace the T-37B with a new Joint Primary Aircraft Training System (JPATS) from the fourth quarter of FY 1996, provided an RFP is issued in FY 1993.

Contractor: Cessna Aircraft Company.
Power Plant: two Continental J69-T-25 turbolets; each 1.025 lb thrust.

Accommodation: two, side by side.



T-1A



T-37B

M 10

T-38A



T-43A

Dimensions: span 33 ft 91/4 in, length 29 ft 3 in, height 9 ft 21/4 in.

Weight: empty 3,870 lb, gross 6,575 lb.

Performance: max speed at 25,000 ft 426 mph, service 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 some 800 remain in service throughout the Air Force, Most are used by ATC for high-performance pilot training; others fly with SAC and with the 479th Tactical Training Wing at Holloman AFB, N. M., where a slightly different version, designated AT-38B, with a gunsight and practice bomb dispensers, is used for Lead-In Fighter Training (LIFT).

An ongoing program called Pacer Classic (the T-38 SLEP) is integrating ten modifications, including major structural renewal, into one program. As a result, the service life of the T-38s should extend to 2010. Additionally, the introduction of the T-1A Jayhawk Tanker/ Transport Training System (TTTS) will significantly

relieve the T-38's training work load. 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. Dimensions: span 25 ft 3 in, length 46 ft 41/2 in, height 12 ft 101/2 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), service ceiling above 55,000 ft, range, with reserves, 1,093 miles.

T-41A/C Mescalero

The T-41A trainer is a standard Cessna Model 172 light aircraft acquired by USAF for use in the generalized preliminary flight screening program for USAF pilot candidates. An initial order for 170 aircraft in 1964 was supplemented by a further 34 in 1967. More powerful **T-41Cs**, based on the Cessna Model R172E, are used for cadet flight training at the USAF Academy. Around 100 T-41s remain in USAF service. (Data for T-41A.)

Contractor: Cessna Aircraft Company

Power Plant: one Continental O-300-C piston engine; 145 hp (210 hp Continental O-360-D in T-41C).

Accommodation: crew of two, side by side Dimensions: span 35 ft 10 in, length 26 ft 11 in, height

8 ft 91/2 in. Weights: empty 1,285 lb, gross 2,300 lb.

Performance: max speed at S/L 139 mph, service celling 13,100 ft, range 720 miles.

Derived from the commercial Boeing Model 737-200, the T-43A navigation trainer first flew in April 1973 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, LORAN, and other radio systems. Deliveries of the 18 aircraft ordered for ATC were completed in July 1974. Most remain in the ATC inventory; four others are assigned to the ANG; and one T-43A with VIP interior is assigned to the 58th AS at Ramstein AB. Germany. The aircraft are being repainted in an allwhite paint scheme.

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 Ofter 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

Weight: gross 12,500 lb.

Performance: max cruising speed 210 mph, service ceiling 26,700 ft, range with 2,500 lb payload 806 miles.



T-1A Jayhawk

USAF took delivery of its first T-1A Jayhawk at the beginning of this year, under a contract awarded in February 1990 for provision of the Tanker/Transport Training System (TTTS), to be used in specialized undergraduate pilot training (SUPT). As leader of the contractor team, McDonnell Douglas is responsible for system integration; Quintron is supplying flight simula tors, 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 fuse-lage fuel tank. The T-1A also has single-point pressure fueling and fewer cabin windows. A Rockwell Collins avionics package includes a five-tube EFIS, turbu-lence detection radar, digital autopilot, tactical air navigation with air-to-air capability, and a central diagnostics and maintenance system.

Seventy-seven Jayhawks have been ordered to date, with a possible eventual buy of 180. Instructor pilot training at the 64th FTW, Reese AFB, Tex., was scheduled to start this spring, with student training beginning in September, Pilots trained on the TTTS will then progress to transports such as the C-5 and C-17 and tankers such as the KC-10 and KC-135.

Contractor: Beech Aircraft Corporation.
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 9 in.

Weights: empty 5,200 lb, gross (400A) 16,100 lb Performance (400A): max speed at 27,000 ft 538 mph, ceiling 45,000 ft, range 2,222 miles.

EFS Aircraft

USAF plans to buy 113 off-the-shelf light aircraft to support the enhanced flight screening (EFS) program that will be undertaken by pilot candidates prior to

Helicopters

HH-1H Iroquois

Basically a military version of the Bell Model 205, the HH-1H is a general-purpose helicopter first or-dered by USAF in 1970 and used 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 fuse-

lage 42 ft 0 in, height 13 ft 0 in. Weight: gross 9,500 lb.

Performance: max speed 120 mph, service ceiling at mission gross weight 13,450 ft, range with max fuel 347 miles.

UH-1N Iroquois

The UH-1N is a twin-engine version of the UH-1 utility helicopter. Seventy-nine were ordered for USAF. most of which remain in the inventory for missile site support duties and administrative airlift. The UH-1N is also used by the 1550th CCTW 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 21/4 in, length of fuselage 42 ft 43/4 in, height 14 ft 101/4 in.

Weight: gross and mission weight 11,200 lb

Performance: max cruising speed at S/L 115 mph, service ceiling 13,000 ft, max range, no reserves,

Armament (optional): two General Electric 7.62-mm Miniguns or two 40-mm grenade launchers; two seventube 2.75-in rocket launchers.

This twin-engine amphibious transport helicopter. based on the US Navy's SH-3A Sea King, incorporates important design changes that permit speedier cargo Accommodation: crew of two or three; 25 fully equipped troops, 15 litters, or 5,000 lb of cargo.

Dimensions: rolor diameter 62 ft 0 in, length of fuse-lage 57 ft 3 in, height 18 ft 1 in.

Weights: empty 13,255 lb, gross 22,050 lb.
Performance: max speed at S/L 162 mph, service celling 11,100 ft, max range, with 10 percent reserve, 465 miles.

Armament: none.

HH-3E Jolly Green Giant

Modified version of the CH-3E for USAF's Air Rescue Service, originally to facilitate penetration deep into North Vietnam on rescue missions. Additional equipment includes self-sealing fuel tanks, armor, defensive armament, a rescue hoist, and a retractable inflight refueling probe. HH-3Es are now assigned primarily to rescue units of the Air Rescue Service, AFRES, and ANG. (Data basically similar to those for CH-3E,

MH-53J Pave Low/TH-53A

In a program initiated in 1986 to upgrade the Special Operations Forces, Sikorsky modified the 41 remaining HH/CH-53B/C and MH-53H helicopters. Designated MH-53J, these Pave Low III "Enhanced" 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, secure communications, titanium armor plating, mounts for .50-caliber machine



UH-1N (G. Aceto)



MH-53J (G. Aceto)

handling and ease of maintenance, with built-in equip ment for the removal and replacement of all major components in remote areas. The initial version was the CH-3C, Introduction of uprated engines led to the designation CH-3E in February 1966, applicable to 42 new production aircraft and 41 reengined CH-3Cs, of which 50 were adapted subsequently as HH-3Es (see below). CH-3 missions include rescue duty, natural

disaster relief, and evacuation.
Contractor: Sikorsky Aircraft, Division of United Technologies Corporation,

Power Plant: two General Electric T58-GE-5 turbo-shafts; each 1,500 shp.



MH-60G

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, and ALR-69 missile warning receivers. Programmed upgrades include the ALQ-136 radar missile jammer, AAR-47 missile plume detector, and the Integrated Defense Avionics System (IDAS), which manages all ECM/ECCM automatically through the 5520 multiplex bus. Additionally, the aircraft is completing a Service Life Extension Program (SLEP) that is upgrading hydraulics, wiring, and basic airframe structure, as well as a shipboard fold/compatibility modification. The aircraft was used extensively in Panama and in Operation 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 at RAF Woodbridge UK, in 1988. A further four were delivered to the 542d Combat Crew Training Wing at Kirtland AFB, N. M. This unit also uses four TH-53As, modified USMC CH-53As, as basic qualification trainers. Modifications include the installation of General Electric T64-GE-416 engines and some standard USAF equipment, Two more CH-53As for conversion were scheduled for delivery by this year. (Data for MH-53J.)

Contractor: Sikorsky Aircraft, Division of United Tech-nologies Corporation.

Power Plant: two General Electric T64-GE-7A turboshafts; each 4,325 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

Weight: gross 50,000 lb.

MH/HH-60G Pave Hawk

USAF has modified 98 Black Hawk helicopters to the Pave Hawk configuration to meet Combat SAR and Special Operations requirements. The MH-60G, used by USAF's SOF, provides a wide variety of SOF mission capabilities, including infiltration/exfiltration and personnel recovery as a collateral SOF mission. The HH-60G, used by active-duty, AFRES, and ANG Air Rescue Service units, provides combat SAR and various mission support activities worldwide, Both aircraft are equipped with an integrated navigation system using GPS, INS, and Doppler, Additionally, the SOF aircraft's navigation suite provides inputs 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, and UHF satcom for communications, Further modifications to the basic Black Hawk include an integral rescue hoist and window-mounted 7.62-mm mini-guns, 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 Tech-

nologies Corporation.

Power Plant: two General Electric T700-GE-700/701C turboshafts; each 1,560 shp.

Accommodation: crew of two or three; 11-14 troops, up to six litters, or internal or external cargo Dimensions: rotor diameter 53 ft 8 in, length of fuse-

lage 50 ft 0% in, height 16 ft 10 in, Weights: empty 10,624 lb, max gross 22,500 lb. Performance: max speed 192 mph, service ceiling 19,000 ft, max range, with reserves, 373 miles (internal fuel), 500 miles (auxiliary tank).

V-22A Osprey
Despite the DoD decision in 1990 to terminate the V-22 program, Congress continues to support and fund development of the project and in FY 1992 directed the manufacture of three production representative air

Following on from the US government's Joint Services Advanced Vertical Lift Aircraft (formerly JVX) proposal, a contract was awarded in May 1986 to Boeing Helicopters and Bell Helicopter Textron as prime contractors in a seven-year full-scale develop-ment (FSD) program for the V-22 Osprey, USN and USAF were to have participated in the program, with the former as executive service. This tiltrotor, multi-mission aircraft, based on Bell's XV-15, is designed to have the maneuverability and lift capability of a heli-copter and the speed of a fixed-wing aircraft. Boeing has overall responsibility for the aircraft's tail unit, overwing fairings, and fuselage, while Bell provides the wing, nacelles, transmissions, and rotor hub as-semblies. Under subcontracts, Grumman is responsible for the design and manufacture of the V-22's tail unit, General Electric the digital fly-by-wire flight-control system. LASC the wing control surfaces and fixed trailing edge, and Menasco of Canada and Dowty of Canada, respectively, the nose and main landing gear.

Allison supplies the aircraft's two 6,000 shp T406-AD-400 turboshaft engines.

The Marines have a stated requirement for 552 aircraft, the Navy for 50 aircraft, and USAF Special Operations Forces (SOF) for 55. The SOF (CV-22A) version was expected to carry 12 troops or up to 2,880 lb of internal cargo over a 500-mile combat radius at 288 mph, with capability to hover OGE (out of ground effect) at 4,000 ft at 95° Fahrenheit. With less demanding midmission parameters, the V-22 will be able to exceed an 800-mile combat radius.

First flight of the V-22 Osprey was made in March 1989, and four full-scale development aircraft were flying by the end of last year. On September 14, 1989, the Osprey first achieved full conversion from helicop-ter mode to airplane mode while in flight. The aircraft had also demonstrated a speed of 345 knots TAS, made 531 flights, and accumulated 631 hours flying time by early 1992.

Dimensions: rotor diameter (each) 38 ft 0 in, fuselage length 57 ft 4 in, height over tailfins 17 ft 4 in

Weights: normal mission weight: VTO 47,500 lb, STO

Performance: max cruising speed in helicopter mode 115 mph, in airplane mode 316 mph, service ceiling 26,000 ft, range VTO 1,382 miles, STO 2,073 miles.

Strategic Missiles

LGM-30F/G Minuteman

With more than two decades as a key element of the US strategic deterrent posture. Minuteman is a three-stage, solid-propellant ICBM, housed in underground silos for which an upgrade program was com-pleted 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: Similar in configuration to the original Minuteman I, Minuteman II features increased range, targeting coverage, accuracy, and pay-load capacity. Operational since 1965, it is based at Malmstrom AFB, Mont.; Ellsworth AFB, S.D.; and Whiteman AFB, Mo. In the late summer of 1986, Min-uteman IIs at Malmstrom and Whiteman AFBs were equipped with a command data buffer capability to permit remote targeting, as in Minuteman III. The first Minuteman II was removed from its silo at Malmstrom AFB last November in response to the President's

order to take Minuteman IIs off alert.

LGM-30G Minuteman III: Third-stage motor with fluid-injection thrust vector control gives longer range and, allied to MIRV capability, enables this version to place warheads on three targets with a high degree of accuracy. First lest launch was made in 1968, Minuteman III is operational at Minot AFB, N. D.; F. E. Warren AFB, Wyo.; Grand Forks AFB, N. D.; and Malmstrom AFB. A command data buffer system permits rapid

missile retargeting.
Of the original force of 450 Minuteman IIs and 550 Minuteman IIIs, 50 have been displaced by Peacekeeper missiles. However, enhancements and modifications under way will maintain the viability of the force well beyond the year 2010. On the missile itself, the second-stage motors are being washed out and repoured; and third-stage motors on Minuteman III are being remanufactured. The Rapid Execution and Combat Targeting (REACT) Program will ensure long-term supportability of the aging electronics components and will modify the launch control center, enabling realtime status information on the weapons and communi-cations nets to correct operability problems, improve responsiveness to launch directives, and provide rapid

retargeting capability.

Assembly and Checkout: Boeing Aerospace.

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: LGM-30F: Hercules, Inc., solid-propellant motor; LGM-30G: Thiokol SR73-AJ-1 solid-propellant molor: 17,000 lb thrust (LGM-30F), 34,400 lb thrust (LGM-30G)

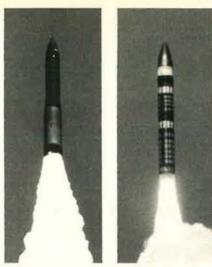
Guidance: Autonetics Division of Rockwell Interna-

tional inertial guidance system. Warheads: LGM-30F: one nuclear; LGM-30G: three Mk 12A MIRVs.

Dimensions: length LGM-30F 55 ft 10 in; LGM-30G 59 ft 10 in, diameter of first stage 5 ft 6 in

Weights: launch weight (approx) LGM-30F 73,000 lb, LGM-30G 78,000 lb.

Performance: speed at burnout more than 15,000 mph, highest point of trajectory approx 700 miles, range with max operational load LGM-30F more than 6,000 miles; LGM-30G more than 7,000 miles.



LGM-30G

LGM-118A



AGM-86B



AGM-129A

LGM-118A Peacekeeper

Deployment of 50 Peacekeeper missiles in existing Minuteman III silos near F. E. Warren AFB, Wyo., began in June 1986, Initial operational capability for the first ten Peacekeepers was achieved in December of that year and full operational capability with 50 missiles followed in December 1988. Initial deployment was made in response to the improved hardness of Soviet strategic forces, but political initiatives and the changes within the former Soviet Union have altered US strategic imperatives. Altogether, 114 Peacekeepers were funded during FYs 1984-91. However, the FY 1990 budget approved a statutory cap on deployment of only 50 of these missiles, and development of the rail-garrison mode of Peacekeeper deployment has been terminated.

Peacekeeper is a four-stage ICBM that carries up to ten independently targetable reentry vehicles. It has many advantages over other missile systems currently in the US inventory. In particular, it is more accurate, carries more warheads, and has greater range and target flexibility than the Minuteman missiles. Its greater resistance to nuclear effects and its more capable guidance system provide Peacekeeper with a much-improved ability to destroy very hard targets. The prompt retaliation made possible by these factors would provide a decisive deterrent to any hostile first strike. Basing: Boeing Aerospace and Electronics. Assembly and Test: Martin Marietta, Denver Aero-

Power Plant: first three stages solid-propellant, fourth stage storable liquid; by Thiokol, Aerojet, Hercules,

and Rocketdyne, respectively.

Guidance: inertial; integration by Rockwell, IMU by Northrop and Rockwell.

Warheads: ten Avco Mk 21 MIRVs.

Dimensions: length 71 ft, diameter 7 ft 8 in. Weight: approx 195,000 lb.

AGM-69A SRAM

All AGM-69A Short-Range Attack Missiles arming SAC's bomber fleet sitting on ground alert were ordered to be removed in June 1990 because of doubts as to their safety. This defense suppression and primary attack missile was deployed initially with the B-52Gs of SAC's 42d Bombardment Wing (Heavy) at Loring AFB, Me., in 1972, USAF contracts covering the production of 1,500 AGM-69As were authorized, and deliveries to equip 17 B-52 wings and two FB-111 wings at 18 SAC bases were completed in July 1975.

Armed with a nuclear warhead, the supersonic air-to-surface SRAM was designed to attack and neutralize enemy terminal defenses, such as surface-to-air missile sites. An inertial guidance system makes the missile impossible to jam. SAC B-1Bs can carry 24 AGM-69As internally; B-52G/Hs can carry eight AGM-69As on a rotary dispenser in the aft bomb bay, together with up to four nuclear bombs.

Contractor: Boeing Aerospace Company

Power Plant: Lockheed Propulsion Company LPC-415 restartable solid-propellant two-pulse rocket engine.

Guidance: General Precision/Kearfott inertial system, permitting attack at high or low altitude and dogleg

Warhead: W69 nuclear.

Dimensions: length 14 ft 0 in, body diameter 1 ft 5½ in. Weight: launch weight approx 2,230 lb.

Performance: speed up to Mach 2.5, range 100 miles at high altitude, 35 miles at low altitude.

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. Delivery of the last of 1,715 production models was accomplished in October 1986. USAF completed deployment of AGM-86s on 85 online B-52Gs in 1984, with 12 missiles fitted externally to each aircraft. B-52Hs have been similarly converted and are intended to be modified further to have a bomb-bay common strategic rotary launcher (CSRL) for eight more ALCMs, eight SRAMs, or a mix of both. ALCM-equipped units are at Griffiss AFB, N. Y.; Wurtsmith AFB, Mich.; Fairchild AFB, Wash.; Eaker AFB, Ark.; Carswell AFB, Tex.; Barksdale AFB, La.; and Minot AFB, N. D.

Details have recently been released of a conventionally armed version of the ALCM, development of which began in 1986, The AGM-86C has a 1,000 lb highexplosive blast fragmentation warhead and an inertial navigation unit as in the B model, but uses both Tercom and 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 Bomb Wing launched 35 missiles against eight highpriority 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 Tercom, by Litton.

Warhead: W80-1 nuclear Dimensions: length 20 ft 9 in, body diameter 2 ft 01/2 in,

wingspan 12 ft Weight: 3,200 lb.

Performance (approx): speed 500 mph, range more than 1,500 miles.

AGM-129A (ACM)

Convair Division of General Dynamics was selected in April 1983 to develop and manufacture an air-launched advanced cruise missile (ACM) to arm the B-52H and B-1B. First flight took place in July 1985. In addition, McDonnell Douglas was awarded a contract in November 1987 for technology transfer leading to second-source capability for this advanced system and has flight tested its first missiles. The ACM has improved range, accuracy, survivability, and targeting flexibility compared with the AGM-86B, notably through embodiment of lowobservability technology, Delivery of production AGM-129As began in June 1990, and it is expected to enter service this year. Total acquisition of the ACM will be no more than 640 units, following a Presidential decision to terminate subsequent production. There are no current plans to deploy them on the B-1B.

Contractor: General Dynamics (Convair)/McDonnell Douglas Missile Systems.

Power Plant: Williams International F112-WR-100 turbofan

Guidance: inertial, with midcourse terrain update. Warhead: nuclear

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. The **AIM-7E** was intended primarily for use by the F-4 Phantom. The AIM-7E-2 and E-3 are improved versions that provide better maneuverability and "dogfight" capability. A later version is the advanced solid-state AIM-7F, with larger motor, Dop-pler guidance, improved ECM, and better capability over both medium and "dogfight" ranges; this version equips USAF and USN F-4, F-14, F-15, F-16 (ADF), and E/A-18 aircraft Annovayimately 5.400.4IM-7Es were and F/A-18 aircraft. Approximately 5,400 AIM-7Fs 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. AIM-7P/RIM-7P introduces improvements to the fuze and electronics, aimed at increasing lethality against sea-skimming antiship missiles and cruise missiles. Development began in 1987. Delivery of early production missiles was due to begin last year. AIM-7s, equipped with telemetry packages in place of warheads, are being used in a program initiated by the Air Warfare Center (AWC) 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 (MHIP) is designed to improve the missile's performance against sophisticated ECM. A new infrared seeker added to the guidance and control section aims at improving terminal-phase operation. (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, weigh-

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 AIM-7E 14 miles; AIM-7F more than 25

AIM-9 Sidewinder

The AIM-9 Sidewinder is a close-range, air-to-air missile using infrared guidance. Versions currently in the USAF inventory:

AIM-9P: improved version of the AIM-9J, produced by Ford Aerospace by converting existing AIM-9Es and -9Js, Increased target-acquisition envelope, solid-state electronics, and increased lethality due to seeker improvements.

AIM-9P-3: improved version of AIM-9P, with increased lethality as a result of fuze improvements and a new rocket motor, providing reduced smoke and increased range

AIM-9P-4: improved version of AIM-9P-3 developed by Ford Aerospace. A new guidance-control unit provides an increased target acquisition envelope.

The AIM-9P-4 is for foreign military sales.

AIM-9L: third-generation Sidewinder for USAF and USN, with all-aspect intercept capability. Improvements include new motor, double-delta nose fins for improved inner boundary performance and maneuverability, AM-FM conical scan for increased seeker sensitivity and improved tracking stability, annular blast fragmentation warhead and active optical fuze for increased lethality, and low susceptibility to countermeasures. This version arms USAF F-15 and F-16 aircraft and offers self-defense capability for A-7s, A-10s, F-4s,

AIM-9M: improved version of AIM-9L, with increased IRCCM capability, improved background discrimina-tion, and reduced-smoke rocket motor. Full production began in FY 1981 with an order for approximately 1,850 missiles.

AIM-9M-9, scheduled to begin retrofit in FY 1993. This modification will improve IRCCM capability of early missiles.

AIM-9R: development of AIM-9M with improved control and guidance section for greater target acquisition range and better resistance to ECM. FSD started in 1986, and captive-carry flights began in 1988. Low-rate initial production in FY 1992 should be followed by full-scale production in 1993.

\$62,3 million was allocated to the AIM-9 program in FY 1992; \$13.5 million is for development of the AIM-9M Plus, and \$5 million will go to development of the AIM-9X, a Sidewinder for the year 2000. Features of the latter will include seeker, airframe, and warhead/ fuze improvements; the shape will be modified to reduce drag and to permit carriage, internally and externally, on stealth aircraft.

AIM-9 missiles, equipped with telemetry packages in place of warheads, are being used by USAF's Air Warfare Center (AWC), in an industry-linked program, to develop passive missile warning systems for USAF's tactical aircraft. (Data for AIM-9M.)

Contractor: Raytheon Company/Ford Aerospace and

Communications Corporation.

Power Plant: Thiokol Hercules Mk 36 Mod 11 solidpropellant rocket motor.

Guidance: solid-state infrared homing guidance. Warhead: high-explosive, weighing 20,8 lb.

Dimensions: length 9 ft 5 in, body diameter 5 in, fin span 2 ft 1 in.

Weight: launch weight 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 (AMRAAM) is expected 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 lighters. Development

has been under way since 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.

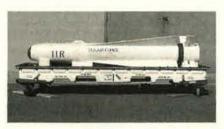
A leader/follower program has been under way (Hughes/Raytheon), with the preproduction effort (producibility and qualification) in FY 1986 and lowrate initial production in FY 1987 (180 missiles), Sub-sequent lots have been competed for and, up to Lot V,



AIM-120A (G. Aceto)



AIM-9L (G. Aceto)



AGM-65A

have been awarded to Hughes and Raytheon. The first production AIM-120A was delivered by Hughes in 1988, with the 33d FW at Eglin AFB, Fla., due to become the first operational unit to receive AMRAAMs. A preplanned product improvement (P³I) program seeks to develop AMRAAM improvements, including rapid reprogramming, adjustable countermeasures, advanced countercountermeasures, and options for smart ordnance packages and dual-mode fuzing. Funding for 450 more AMRAAMs was approved in FY 1991; a decision regarding full-rate production will be made following completion of the extended operational test program and reliability improvements.

Contractors: Hughes Aircraft Company/Raytheon Company.

Guidance: inertial midcourse, with active radar termi-

nal homing.

Dimensions: length 12 ft, body diameter 7 in, span of tail control fins 2 ft 1 in.

Weight: 340 lb.

Performance: cruising speed approx Mach 4, range approx 31 miles.

AGM-45A Shrike

Twelve versions of this supersonic air-to-surface missile were produced for USAF and USN, differing primarily in the frequency coverage of the front end detachable seeker sections. Designed to home automatically on enemy radar installations, the AGM-45 entered operational service in Vietnam during 1965. Thereafter, it played an important part in the US air offensive, becoming a standard penetration aid on US tactical aircraft. More than 13,000 were delivered to USAF between 1965 and 1978, and Shrikes continue to equip "Wild Weasel" F-4Gs and defense suppres-sion F-16Cs, Upgrading under the Shrike gravity bias modification program resulted in improved capabilities at low altitude.
Contractor: Naval Weapons Center.

Power Plant: Rocketdyne Mk 39 Mod 7 or Aerojet Mk 53 solid-propellant rocket motor.

Guidance: passive homing head by Texas Instruments. Warhead: high-explosive fragmentation, weighing

Dimensions: length 10 ft 0 in, body diameter 8 in, span

Weight: launch weight 400 lb.

Performance (estimated): range more than 3 miles.

AGM-65 Maverick

A vital element in the inventory of allied forces during Operation Desert Storm, Maverick air-to-air missiles were used extensively, with approximately 100 fired per day, ninety percent of them from A-10 close air support aircraft.

The basic AGM-65A Maverick is a launch-andleave. TV-quided, 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 down to treetop level. Mayerick missiles were first employed by USAF in Vietnam and are now carried by the A-7D, 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

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 new lower-smoke motor. AFOTEC and TAC 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 at RAF Bentwaters, UK, in February 1986.

AGM-65G: uses the IIR seeker with an alternate 298 lb blast fragmentation warhead for use against hardened targets. Software has been modified to include options for targeting ships and large land targets as well as mobile armor. This version also has a digital autopilot and a pneumatic, rather than hydraulic, actuation system. First successful launch took place in November 1987; this version is now in production. A total of 25,397 AGM-65D/Gs has been ordered

for USAF through FY 1991, with the final order awarded to Raytheon last year. A program is currently under way to integrate a millimeter-wave seeker with the AGM-65. This will provide a totally autonomous, allweather, day/night, lock-on-after-launch, standoff weapon to altack mobile ground forces. Hughes is currently demonstrating the MWR (millimeter-wave radar) Maverick in a demonstration/validation program at Eglin AFB, Fla.

In addition, Hughes has proposed a new, longerrange version of the Maverick, featuring an off-the-shell turbine engine that would triple the current AGM-65's range. The Longhorn Maverick could arm both tactical fighters and helicopters and would be equipped with INS/GPS, (Data for AGM-65A.)

Contractor: Hughes Missile Systems Group/Raytheon

Company,
Power Plant: Thiokol TX-481 solid-propellant rocket

Guidance: self-homing, electro-optical guidance sys-tem (imaging infrared (IIR) on D/G).

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)

Performance: range 0.6 to 14 miles.

AGM-84A Harpoon

USAF initiated a cooperative memorandum of under-standing with USN to equip two 15-aircraft B-52G squadrons with the Harpoon all-weather antiship missile in support of maritime antisurface warfare operations. Compatibility testing began in the spring of 1983, and full operational capability was achieved that Octo-ber, Currently, one full squadron of modified aircraft is located at Loring AFB, Me., for Atlantic operations. Each B-52G can carry eight to 12 missiles.

Contractor: McDonnell Douglas Missile Systems

Company.

Power Plant: Teledyne CAE J402-CA-400 turbojet; 660 lb thrust.

Guidance: sea-skimming cruise monitored by radar allimeter, 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

AGM-88A/B/C HARM
The lethality of USAF's F-4G "Wild Weasel" against enemy ground radar is greatly enhanced by the availability of AGM-88A HARM (High-Speed Antiradiation Missile), a fact amply demonstrated during Operation Desert Storm. IOC was achieved in September 1984. 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 sultable for adaptation to the EF-111A and F-15. Current production version is the AGM-88B, with tungsten alloy cubes in the warhead rather than steel, EEPROMs (Erasable Electronically Programmable Read Only Memory) have been retrofitted on USAFE, PACAF, and TAC HARMs, permitting changes to missile memory in the field, a facility that proved invaluable against Iraqi radar and missiles. Two competing seekers have been developed to make the missile more effective against new-generation targets. Operational test and evaluation of the Texas Instruments C-1 began last year and should be completed this year. The Loral Aeronutronic low-cost C-2 is in development testing. The latest version of the HARM will be designated AGM-88C. By the end of 1990, nearly 6,000 HARMs had been deliv-ered. Texas Instruments' FY 1991 production contract has been raised from 1,400 missiles to 3,481 to replenish the AGM-88 inventory, depleted by the Gulf War. A decision regarding the exact nature of future AGM-88 HARM procurement is awaited. (Data for AGM-88A.)

Contractor: Texas Instruments, Inc. Power Plant: Thickol smokeless, dual-thrust, solidpropellant rocket motor. Hercules second source.

Guidance: passive homing guidance system, using seeker head that homes on enemy radar emissions. Warhead: high-explosive,

Dimensions: length 13 ft 81/2 in, body diameter 10 in, wingspan 3 ft 81/2 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

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 demonstrated to great effect 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 war-damaged plant.



AGM-84A (G. Aceto)

chasing 7,728 GBU-24 and GBU-27 laser bomb kits to replace GBU-10s and GBU-12s. During development the new kits were known as Paveway III LLLGBs (lowlevel laser-guided bombs). High-lift wings and improved seekers permit very-low-altitude launch over standoff

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 com-



AGM-88 (G. Aceto)

Development began in 1974, based on experience gained in Vietnam with the earlier Pave Strike GBU-8 gained in vietnam with the earlier are considered.

HOBO modular weapon program. The GBU-15 is intended for tactical use to suppress enemy defenses and to destroy heavily defended targets. The targetdetecting 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 aircraft and has been test launched from the F-15E and F-16D. The GBU-15(V)1/B TV-guided variant qualified for operational service in 1983; production is complete. The GBU-15(V)2/B imaging infrared (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. Production of the AGM-130 rocket-powered ver-

sion of the GBU-15 was postponed under the amended FY 1988-89 budget requests. However, testing continued through completion of the originally contracted program, and the weapon is now in production. A simplified seeker, with a silicon charge coupled device (CCD) camera, correlation tracker, and rate stabilization platform, is under development to improve target detection. Warhead is the BLU-109/B, USAF is seek-ing funding for 960 TV-guided and 3,088 infraredguided versions of the AGM-130, which have been certified for use with the F-111 and are currently undergoing certification on the F-15E, (Data for GBU-15.) Contractor: Rockwell International Corporation.

Guidance: TV or imaging infrared seeker. Warhead: Mk 84 bomb (2,000 lb unitary).

Dimensions: length 12 ft 101/2 in, body diameter 1 ft 6 in, wingspan 4 ft 11 in, Weight: 2,450 lb.

Performance: cruising speed subsonic,

GBU-24/27

In a move both to replace laser-guided weapons expended in the Gulf War and to upgrade and make 'smart" older dumb bombs still in stock, USAF is purplex at Taji, 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 21/4 in. Guidance is by a modified GBU-27 system. The GBU-28 has five times the performance of the GBU-27. 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, Advanced versions are now being studied.
Contractor: Lockheed Missiles and Space Systems.

AGM-137 TSSAM

Full-scale development (FSD) of the Triservice Standoff Attack Missile (TSSAM) is in progress. USAF is heading the joint-service effort to produce a sub-sonic 2,300 lb stealthy missile with a range of less than 375 miles for the air-launched AGM-137 and 310 miles for the ground-launched MGM-137 variant. The missile is being developed by Northrop, with Boeing as second source. It will arm USAF B-2s, B-52s, and F-16s as well as USN A-6s and F/A-18s. Production for all services is expected to be 8,650 missiles by 1999, with IOC in the mid-1990s.

AGM-142 Have Nap

Under the Have Nap program, USAF began acquisition of the Israeli-built Popeye medium-range, inertial/ TV-guided standoff missile, Initial operational lest and evaluation launches were completed in May 1990, and a coproduction agreement was entered into between Rafael and Martin Marietta.

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 the conventionally dedicated B-52G

Contractor: Rafael Armament Development Author-

Power Plant: solid-propellant rocket motor.

Guidance: inertial, with TV homing.

Warhead: high-explosive, weighing 1,975 lb. Dimensions: length 18 ft 8½ in, body diameter 1 ft 81/2 in, wingspan 5 It 1 in.

Weight: 3,300 lb.

Performance: range 50 miles.

Rapier

Rapier is unusual in that US landbased antiaircraft missiles are normally operated by the Army. 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, according to 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

Launch Vehicles

Atlas E

Atlas E is a modified ICBM, used to launch various USAF and NOAA satellites. Four vehicles remain available for launch at Vandenberg AFB, Calif., with the last launch currently scheduled for FY 1994.

Prime Contractor: General Dynamics Corporation, Convair Division.

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

In May 1988, USAF selected General Dynamics to build an upgraded Atlas/Centaur vehicle, the Atlas II, to meet its 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. Eleven Atlas II vehicles will be procured. Primary DoD payload is the Defense Satel-lite Communications System (DSCS), and the first Atlas II/DSCS launch took place from Cape Canaveral

AFS in January this year. 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: General Dynamics Corporation, Convair Division.

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: 412,000 lb.

Performance: capable of putting 8,000 lb into a low-Earth orbit and 6,400 lb into a geosynchronous transfer 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.

The modified Centaur G-prime upper stage, with high-energy cryogenic propellants and multiple restart capability, will be 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: General Dynamics Corporation, Space Systems Division.

Power Plant: two Pratt & Whitney RL 10A-3A liquid

oxygen/liquid hydrogen rocket engines; each 16,500 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-primemod, approx) 53,000 lb

Scout

Scout was designed to enable NASA and DoD to conduct space, orbital, and reentry research at com-paratively low cost, using off-the-shelf major components where available. The basic current version, with fourth stage improved over earlier vehicles, was launched successfully for the first time in August 1965. In addition to increasing the payload, this version can be maneuvered in yaw and can send a 100 lb payload more than 16,000 miles into space. Using the Algol IIIA first-stage motor, Scouts can put 377 lb payloads into a 310-mile polar orbit and have been used to launch many unmanned spacecraft, including satellites, for DoD, NASA, and international groups. Only four Scouts remain in the inventory, and these will be succeeded by a new small launch vehicle.

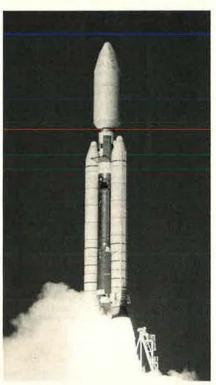
Prime Contractor: LTV Missiles & Electronics Group (a unit of LTV Corporation).





Atlas II

Delta II



Titan IV

Power Plant: first stage: CSD Algol IIIA, 109,000 lb thrust; second stage: Thiokol Castor IIA solid-propellant motor, 64,000 lb thrust; third stage: Thiokol Antares IIIA solid-propellant motor, 18,700 lb thrust; fourth stage: Thiokol Altair IIIA solid-propellant motor, 5,800 lb thrust.

Guidance: simplified Honeywell gyro guidance system.

Dimensions: height overall 75 ft 5 in, max body diameter 3 ft 9 in.

Launch Weight: 47,619 lb.

Fourteen Titan II ICBMs are being modified to provide additional expendable launch capability. Two had been launched successfully by last October,

Prime Contractor: 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

Titan IV

Titan IV was selected originally in 1985 to augment the space shuttle and to allow greater flexibility in launching critical military payloads. 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 Ib payload into geosynchronous orbit, 32,000 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 addition of upgraded solid rocket motors in 1993 will enhance performance by approximately 25 percent. USAF's original requirement of ten Titan IVs had increased to firm orders for 41 vehicles by mid-1989, First launch took place from Cape Canaveral, Fla., in June 1989; all five launches to date have been successful.

Prime Contractor: Martin Marietta Space Launch Sys-

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)

Used for the first time in October 1982, the highly reliable IUS serves as an upper stage for the Titan IV for DoD, as well as with the shuttle for NASA. 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.

Prime Contractor: Boeing Aerospace.

Power Plant: alt-stage solid rocket motor 21,400 lb thrust, forward-stage solid rocket motor 18,500 lb

Guidance: inertial, plus star tracker.

Dimensions: length 17 ft, diameter 9 ft 21/4 in.

Launch Weight: 32,500 lb.

Delta II/SB-3A

Selected by USAF in 1987 to launch the Navstar Global Positioning System (GPS) satellites, the Delta II/SB-3A is slightly larger than McDonnell Douglas's earlier Delta rocket in order to satisfy USAF's mediumpayload requirement. The first launch took place in February 1989, and, to date, eleven operational GPS satellites have been launched successfully. The current schedule calls for Navstar launches to take place at approximately two-month intervals. When complete in 1993, the Navstar constellation will consist of 21 operational satellites and three on-orbit spares, pro-viding US and allied forces with worldwide, threedimensional position and velocity information

Delta II is a three-stage booster surrounded by nine solid-propellant, graphite epoxy motors (GEMs). 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 twelve-foot stretch in the first stage tanks and, from flight number ten, an increased expansion ratio on the first-stage

Prime Contractor: McDonnell Douglas Space Systems 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, 9 ft 6 in. Liftoff Weight: 509,000 lb.

Performance: 11,110 lb to 100 nm

National Launch System (NLS)

A full-scale system development effort of a new family of launch vehicles and infrastructure that will embrace the range of DoD mission requirements and the heavy-lift requirements of NASA is under way.

Pegasus

his three-stage, solid-propellant winged vehicle is air-launched from a B-52 and is designed for maximum operational flexibility in delivering 500-800 lb payloads to low-Earth orbit, Conceived in 1987, Pegasus was developed jointly by Orbital Sciences Corporation and Hercules Aerospace Company as a private venture. The vehicle was under contract to the Defense Advanced Research Projects Agency (DARPA) for its first two flights, the first of which took place in 1990 from Vandenberg AFB, Calif. Last July it successfully placed seven minisatellites in orbit. The Pegasus pro-gram was to move to USAF following its second flight, It will support the USAF space test program and SDIO Prime Contractor: Orbital Sciences Corporation and Hercules Aerospace Company.

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 50 in.

Launch Weight: 42,000 lb.

Taurus

A more powerful version of the Pegasus space launch vehicle is being developed, using an LGM-118 Peacekeeper missile first-stage addition, Taurus will be ground-launched from regular launch complexes and will be used to test a quick-readiness, mobile launch facility.

Aerial Targets and Decoys

MQM-107B/D Streaker

A longer, reengined version of the earlier MQM-107A, originally ordered for the US Army in 1975, the MQM-107B is a recoverable, variable-speed target drone. Improvements tested and proven on the A version are incorporated on the B version.

Also in use with USAF, the MQM-107D is similar to

the B version but is powered by a Teledyne CAE 373-8 engine (960 lb thrust). MQM-107B/Ds assigned to Tyndall AFB, Fla., are used to test and evaluate air-to-air missiles. (Data for MQM-107B.)

Contractor: Beech Aircraft Corporation.

Power Plant: one Microturbo TRI 60-2 Model 074 turbojet; 831 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.

BQM-34A Firebee

Since initial development of the BQM-34A in the late 1950s, more than 6,000 of these jet target vehicles have been delivered to support weapon system and target research, development, test, evaluation, quality assurance, training, and annual service practices by all three US services and by foreign governments. The BQM-34s deployed at Tyndall AFB, Fla., are used in

the testing and evaluation of air-to-air missiles.

New reengined BQM-34As are becoming USAF's standard subscale target drones. They are equipped with an uprated General Electric J85-17C engine, which provides a thrust-to-weight ratio of 1:1, enabling this version to offer higher climb rates and 6g maneuvering



MQM-107B (G. Aceto)



QF-100



QF-106

capability. A new microprocessor flight control system (MFCS) provides a prelaunch and in-flight self-test capability. Since 1989, these targets have been used for weapon system evaluation at Tyndall AFB. (Data for BQM-34A.)

Contractor: Teledyne Ryan Aeronautical

Power Plant: one Teledyne CAE J69-T-29 turbojet; 1,700 lb thrust; later models have one General Electric J85-GE-7 turbojet; 2,450 lb thrust, or J85-GE-17C.

Guidance and Control: remote control methods include choice of radar, radio, active seeker, and automatic navigator developed by Teledyne Ryan; Vega DTCS (drone tracking and control system); microwave command and guidance system also avail-

Dimensions: length 22 ft 103/4 in, body diameter 3 ft 11/4 in, span 12 ft 10% in.

Weight: launch weight 2,500 lb.

Performance: max level speed at 6,500 ft 690 mph, operating height range 20 ft to more than 60,000 ft, max range 796 miles.

BQM-34M/L Firebee

Eighteen Firebee drones have been reactivated for tests of the Over-the-Horizon Backscatter (OTH-B) and North Warning Radar systems. The first was successfully tested in September 1987. The drones, which had been stored at the Warner Robins (Ga.) Air Logistics Center for ten years, are being used by the 6514th Test Squadron at Hill AFB, Utah.

Contractor: Teledyne Ryan Aeronautical.

Power Plant: one J69-T-41A turbojet; 1,920 lb thrust. Guidance and Control: preprogrammed digital com-puter, with Doppler guidance system.

Dimensions: length 30 ft, body diameter 3 ft 11/4 in, wingspan 14 ft 6 in.

Weight: max launch weight 3,113 lb.

Built by Northrop Corp., BQM-74C target drones were used as decoys during the Gulf War to draw the attention of Iraqi air defense radar, revealing locations of missile and gun sites

A program is under way to convert retired F-4 aircraft to full-scale aerial target configuration to replace QF-100s and QF-106s as they are expended. QF-4s will be used to support aircrew training, tactical air forces weapon systems evaluation, and development test programs. Contractor: TBD.

QF-100

These converted F-100 fighter-bombers are used as full-scale aerial targets for air-to-air and ground-toair missile evaluation at Eglin Gulf Test Range in Florida and White Sands Missile Range in New Mexico. Contractor: initial deliveries (from 1981) Sperry Corporation; follow-on (from 1984) FSI.

Power Plant: one Pratt & Whitney J57-P-21A turbojet; 16,950 lb thrust.

Guidance and Control: Dual Vega command guid-

ance and telemetry systems.

Dimensions: length 54 ft 3 in, height 16 ft 2% in, wingspan 38 ft 91/3 in.

Weight: mission operational weight 31,000 lb.

Performance: max speed at altitude Mach 1.3, operating height range 200-50,000 ft, nominal range 138 miles.

QF-106

The QF-106 is replacing 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 will be converted to FSATs.

Contractor: Honeywell Inc.

Power Plant: one Pratt & Whitney J75-P-17 turbojet;

24,500 lb thrust with afterburning.
Guidance and Control: automatic flight-control system with digital backup.

Dimensions: length 70 ft 8 in, height 20 ft 3 in, wing-span 38 ft 5 in.

Weight: mission operational weight 40,500 lb. Performance: max speed Mach 2, service ceiling 50-55,000 ft, range (approx) 400 miles.

Unmanned Aerial Reconnaissance System

Unmanned Aerial Reconnaissance System

The Unmanned Aerial Reconnaissance System (UARS), developed under a USAF/USN agreement, will provide a real-time/near-real-time unmanned reconnaissance complement to current and projected manned reconnaissance platforms. The UARS consists of the medium-range unmanned aerial vehicle (UAV-MR), being built by Teledyne Ryan Aeronautical, and the Advanced Tactical Airborne Reconnaissance System (ATARS) sensor payload, being developed by ontrol Data Corporation. The UAV-MR, designated BQM-145A, is capable of being air- or ground-launched and will carry interchangeable mission payloads up to 700 nm at high subsonic speeds. The vehicle first flew in October 1988. The ATARS payload will consist of interchangeable electro-optical and IR sensors, recorder, and data link. The first production system is scheduled for delivery in FY 1996.

Contractors: Teledyne Ryan Aeronautical/Martin

Power Plant: one Teledyne CAE 382-10 turbofan. Dimensions: length 18 ft 0 in, span 10 ft 6 in.

Valor

By John L. Frisbee, Contributing Editor

Jungle Rescue

A liaison squadron in the southwest Pacific soon became something it was not intended to be—a full-fledged combat outfit.

T THE start of World War II, the Army Air Forces created a number of liaison squadrons, equipped with Piper L-4s and Stinson L-5s flown by enlisted pilots who maintained their own planes. Originally the squadrons were intended to conduct "limited observation, transport, and miscellaneous air tasks." Their operations soon extended far beyond that, limited only by the ingenuity and daring of the pilots and the capabilities of their light planes.

One of the most renowned units was the 25th Liaison Squadron in the southwest Pacific. Its pilots soon were acting as forward air controllers, attacking Japanese outposts with tommy guns, hand grenades, and gasoline-filled drop tanks and resupplying isolated friendly forces, but the 25th was most celebrated for its many search-and-rescue missions in jungle areas far behind enemy lines.

In early 1944, the 25th's A Flight, dubbed "Guinea Short Lines," was based at Gusap, New Guinea—a strip in the Ramu Valley encircled by jungle with mountain ranges to the north and south rising to 13,000 feet. On February 15, a P-40 went down about 100 miles northwest of Gusap. Three A Flight L-5s took off immediately to locate the crash. One of them was flown by TSgt. Eugene Salternik, who was to land if possible and pick up the pilot.

The burning P-40 was sighted but not the pilot. Sergeant Salternik found an open field covered with Kunai grass about a mile away. Too late to pull up, he discovered that the tough grass was six to eight feet tall. It flipped his aircraft on its back, breaking the propeller. Uninjured and undaunted, Salternik started out on foot to find the pilot but was overtaken by darkness.

In the morning, L-5s from Gusap dropped supplies and equipment, along with a message to stay where he was. An Australian commando would be parachuted in to help with the rescue. The next day Lt. Hector Henstridge made a perfect jump from an L-5, his first ever. The day after that, Henstridge and Salternik found Lt. Nelson Flack, the P-40 pilot, hungry and lost but in good condition. The three men spent the next two days trying to prepare a strip for other L-5s that would fly them out. On February 22, SSgt. James Nichols landed on the rough strip, but his L-5 was damaged beyond repair.

The 71st Reconnaissance Group at Nadzab decided no more planes and pilots could be risked. The four men, led by the jungle-trained Australian lieutenant, would walk out to meet an Australian patrol at a point some thirty-five miles distant. Henstridge estimated that, traveling through dense jungle, swamps, and over steep ridges, it would take eight days. Their rations for two days could be stretched to last for ten, Henstridge thought. Since Japanese patrols were known to be in the area, they should start at once.

For several days, supply planes from Gusap searched for the four men, whose signals were hidden by the rain forest canopy. The men, believed captured or killed, finally were declared missing in action, and the search was abandoned.

Hacking their way through jungle growth was exhausting work for undernourished men whose nights were spent fighting swarms of mosquitoes, other tropical insects, and leeches. Whenever possible, they followed streams, wading in water sometimes chest-deep. Then a stream would turn in the wrong direction, and they had to climb ridges so steep and narrow it was necessary to crawl, clinging to roots and vines. This sequence was repeated over and over as the men fought their way painfully through the dank, sunless rain forest.

On March 3, ten days after leaving the crash site, their food ran out. From then on, they ate fish caught in the muddy streams, and nuts. Nightly rains often made it impossible to build a fire to dry their clothing. On those nights the fish were eaten raw. About that time their shoes, constantly wet, began to disintegrate. Raw, bleeding feet demanded frequent stops for rest. In their weakened condition, even gathering wood for a fire became a monumental task, but the men staggered on, a few hundred yards at a time.

Flack, Henstridge, Nichols, and Salternik were overtaken on March 10 by an Australian patrol that had been following Japanese troops who were searching for the four men. They were taken to an Australian patrol shelter and, two days later, flown to the hospital at Gusap. All had lost between twenty-five and thirty pounds and had contracted malaria, but all recovered.

Sergeants Salternik and Nichols were awarded the Silver Star for their part in saving the P-40 pilot. Such daring exploits had not been envisioned for the AAF's liaison squadrons, but the airmen who flew those small planes were a tough, determined lot. No challenge was too great for them

Thanks to retired California ANG MSgt. William Bennett for relating this story and to Eugene Salternik for providing photographs and copies of official rescue reports written by the three Americans.



Books

By Frank Oliveri, Associate Editor

Armor Attacks: The Tank Platoon, An Interactive Exercise in Small-Unit Tactics and Leadership, by John F. Antal. This "interactive" book puts the reader at the head of an M1 Abrams tank platoon. The reader encounters specific decision points that develop the story according to his or her choices, imparting tactical and operational lessons. Presidio Press, 31 Pamaron Way, Novato, CA 94949. Including charts and appendix, 341 pages. 1991. \$14.95.

DeGaulle: The Ruler, 1945–1970, by Jean Lacouture. The former foreign editor of Le Monde completes his intricate and comprehensive portrait of one of the twentieth century's greatest and most complex statesmen. This second book of the two-volume work examines the French leader's role in the life of postwar France. Through numerous interviews, the author outlines the successes and failures of the Fifth Republic. W. W. Norton & Co., Inc., 500 Fifth Ave., New York, NY 10110. Including photos, notes, bibliography, and index, 640 pages. 1991. \$29.95.

Entangled Allies: US Policy Toward Greece, Turkey, and Cyprus, by Monteagle Stearns. This study expresses views about the management of US foreign policy and specifically about the management of this country's Aegean and Cyprus policies. The Council on Foreign Relations, Inc., 58 E. 68th St., New York, NY 10021. Including index, 185 pages. 1992. \$16.95.

Eyeball to Eyeball: The Inside Story of the Cuban Missile Crisis, by Dino A. Brugioni. A rare eyewitness account of the 1962 crisis from a high-level member of the intelligence community. The author, who was a senior officer at the CIA's National Photographic Interpretation Center during the Cuban missile crisis, received a citation from President Kennedy for his work in the exploitation and analysis of overhead imagery. This is a comprehensive documentation of events surrounding the crisis. Random House, 201 E. 50th St., New York, NY 10022. Including photos, notes, and index, 622 pages. 1991. \$35.00.

Guadalcanal: The Definitive Account of the Landmark Battle, by Richard B. Frank. Using new translations of official Japanese accounts and recently declassified US radio intelligence, the author recreates this famous battle as it was seen from both sides. Penguin USA, 375 Hudson St., New York, NY 10014. In-

cluding photos, notes, and index, 800 pages. 1990, 1992. \$16.00.

Operation Buffalo: USMC Fight for the DMZ, by Keith William Nolan. In Operation Buffalo, two undermanned Marine companies from 1st Battalion, 9th Marines, 3d Marine Division, were ambushed by a regiment of North Vietnamese regulars. First-hand accounts enliven the tale of this confrontation. Presidio Press. Including photos and Index, 389 pages. 1991. \$24.95.

Operation Just Cause: The Storming of Panama, by Thomas Donnelly, Margaret Roth, and Caleb Baker. Eyewitness accounts tell the tale of Noriega's ouster. From top-level decisions to day-to-day skirmishes, here is a comprehensive history of this encounter. Lexington Books, 866 Third Ave., New York, NY 10022. Including photos and index, 453 pages. 1991. \$24.95.

Order of Battle: Hitler's Werewolves, by Ib Merchior. The Werewolves, the most fanatical of the Nazis, were carefully selected and dedicated to the cause of spreading terror and death among invading US troops. The firsthand experiences of the author, a counterintelligence agent in the last weeks of World War II, are the basis of this largely untold story. His role was to find and destroy the Werewolves' organization. The book expresses both the American and the German point of view. Presidio Press. Including bibliography, 314 pages. 1991. \$19.95.

Sandy Patch: A Biography of Lt. Gen. Alexander M. Patch, by William K. Wyant. General Patch commanded the US Seventh Army and gained prominence in the Pacific theater, where he led Army and Marine troops to victory at Guadalcanal. He also led the assault on the beaches of southern France in 1944, which was to prepare the way for D-Day and the landing at Normandy. Praeger Publishers, One Madison Ave., New York, NY 10010. Including notes, bibliography, and index, 249 pages. 1991. \$49.95.

Soldiers, Statesmen, and Cold War Crisis, by Richard K. Betts. This book explores "the nature, direction, and impact of military and civilian influence on violence." The author studies the postwar policy made and implemented by US nonmilitary and military leaders and the role of military might in foreign affairs. Columbia University Press, 562 W. 113th St., New York, NY 10025. Including index and notes 326 pages. 1991. \$16.50.

Verification: The Key to Arms Control in the 1990s, edited by John G. Tower, James Brown, and William K. Cheek. This collection of essays by verification experts (including the late Senator Tower, who was chairman of the Senate Armed Services Committee from 1981 to 1985 and later chief US START negotiator in Geneva) attempts to provide a better understanding of the political and technical aspects of arms control. Brassey's, Inc., 100 Front St., Box 500, Riverside, NJ 08075. Including index, 243 pages. 1992. \$25.00.

Yankees in the Land of the Gods: Commodore Perry and the Opening of Japan, by Peter Booth Wiley. The author recounts this adventure in gunboat diplomacy in the context of US imperial ambitions. He also reveals a relationship between Perry and East Coast opium merchants. Penguin USA. Including illustrations and index, 578 pages. 1991. \$14.95.

Other Titles of Note

China Clipper: The Age of the Great Flying Boats, by Robert L. Gandt. The personalities involved in the creation, life, and demise of the China Clipper of the 1930s. Naval Institute Press, Annapolis, MD 21402. Including photos and index, 214 pages. 1991. \$29.95.

Cleared Hot: A Marine Combat Pilot's Vietnam Diary, by Col. Bob Stoffey. War experiences of a highly decorated veteran of Vietnam who served as a helicopter pilot and a forward air controller in fixed-wing aircraft. St. Martin's Press, 175 Fifth Ave., New York, NY 10010. Including index, 300 pages. 1992. \$21.95.

Psychological Dimensions of War, edited by Betty Glad. A look into the psychological components of human motivation as it relates to war. Sage Publications, Inc., 2455 Teller Rd., Newbury Park, CA 91320. Including notes and index, 384 pages. 1990, \$19.95.

Triumph Without Victory: The Unreported History of the Persian Gulf War, by US News & World Report. Based on the work of the US News staff, an attempt to relate the "untold story" of Operation Desert Storm. Times Books/Random House. Including appendix, 450 pages. 1992. \$25.00.

The Wars of America, by Robert Leckie. A comprehensive narrative of all US wars, from the Revolutionary War to the victory in the Persian Gulf. HarperCollins Publishing, 10 E. 53d St., New York, NY 10022. 1968, 1981, 1992. Including index and notes, 1,281 pages. \$50.00.

E-SYSTEMS



Our Pledge

I pledge allegiance to the flag
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.

— Francis Bellamy, 1892



E-SYSTEMS

The science of systems.

AFA/AEF Report



By Daniel M. Sheehan, Assistant Managing Editor

National President
O. R. Crawford (left)
and Executive
Director Monroe W.
Hatch, Jr., pause in
front of the nearly
completed "P-2" C-17
at McDonnell
Douglas's Long
Beach, Calif., facility.
The P-2 will soon
enter the flight test
program and will be
used primarily to test
avionics.



Boosting Morale, Expanding Vision

Today's AFROTC cadets can be forgiven if they feel some apprehension about their careers as they look at the rapid military drawdown of the present and the foreseeable future. The troops of AFROTC Det. 128 at the University of Delaware got a significant boost to morale at their recent dining-in ceremony. Chairman of the Joint Chiefs of Staff Gen. Colin L. Powell sent the cadets an encouraging letter and autographed photo to help assure them of their value to the nation. He noted the "new and different challenges" that the cadets will face and called on them to take advantage of their opportunities and "set the example for those who look to you for leadership."

University (Del.) Chapter President Bill McCabe had the letter and photo matted and framed and presented them to Lt. Col. Dick Martel, commander of Det. 128. Cadet Col. J. Michael Haynie, corps commander of the detachment, saw the letter as a reminder of the goals of AFROTC training and said the University Chapter's support "provides us with the motivation to press ahead." President McCabe thanked General Powell for the "shot in the arm" his letter gave to the cadets and reserved spe-

cial praise for Marine Maj. Rod Von Lipsey of the General's staff for his help in carving time in General Powell's schedule to get the letter to the cadets.

Students need not wait until college to get a hand from AFA. In North Carolina, a much younger group of students will soon have two proven programs available to them, thanks to the work of the Pope (N. C.) Chapter. Astronaut Maj. Eileen Collins, USAF, spoke at a kickoff dinner to benefit the chapter's Young Astronauts Program and USA Today's "Visions of Explorations: Past, Present, and Future" program, cosponsored by AFA's Aerospace Education Foundation. Thirty grade schools in the Fayetteville area will have chapters of the Young Astronauts, and another thirty will participate in the "Visions" program. Chapter President Bob White led the applause for Major Collins's speech, which was heard by 220 area educators, chapter members, and guests.

A Display of Stealth

On March 17, AFA national headquarters staff mounted a concerted effort to explain stealth technologies to members of Congress. The three-day exhibit, which took place in the Rayburn House Office Building, featured story boards and a music video demonstrating some of the abilities of the F-22 and B-2. Fourteen members of Congress and more than 100 staffers attended the reception held in conjunction with the display, hosted by National President O. R. Crawford, Executive Director Monroe Hatch, and former National Secretary Tom McKee, a member of the board of directors and the executive committee.

Chapter News

The Greater Pittsburgh (Pa.) Chapter makes sure that November 11 is not the only day that area veterans are remembered. At a recent "Salute to Veterans," athletes from the Pittsburgh Steelers, the Pitt Panthers, and local high schools; ethnic singers and dancers; and active-duty people and veterans from all branches of the armed forces got together for a memorable day at the Pittsburgh VA Hospital. National Director and former National President Judge John G. Brosky called the day "entertaining, inspirational, and heartwarming" and thanked Thomas Gugliotti, medical center director, for making the salute a success.

The Colorado Springs/Lance Sijan (Colo.) Chapter brought a special gift to the staff of the VA satellite clinic in Colorado Springs: an American flag



Lt. Gen. Charles Horner (left) added to his list of honors when he accepted the Tennessee Ernie Ford Distinguished Achievement Award from Gen. Robert Huyser, USAF (Ret.), former commander in chief of MAC, who presented it on behalf of the California chapter that also bears the late country singer's name.

that had flown over the Capitol in Washington, D. C. Chapter Vice President (Veterans Affairs) Jim Rix presented the flag to Clinic Director Dr. Ed Wood, Dr. Clotilde Bowen, and Clinic Coordinator Donna Finiclo as a tribute to their fine work on behalf of the many veterans of the Colorado Springs area.

The Ouachita (Ark.) Chapter is on the board with its first Community Partner. Chapter President Richard E. Tooke reports that the Downtowner Motor Inn & Baths of Hot Springs, Ark., has become the first of what he hopes will be many partners to help the chapter accomplish its mission.

Fifty years ago, a remarkable group of women aviators began a significant contribution to the US effort in World War II. The WASPs (Women's Airforce Service Pilots), as they came to be known, did a lot of the necessary flying that rarely made headlines but was instrumental in the success of US forces. The Panhandle (Tex.) Chapter recently recognized one of its own who joined that select band of pioneers early on. Florene Miller Watson, one of the first twenty-five women involved with US military aviation, eventually flew every aircraft in the inventory at the time of her service. She is an active member in the Panhandle Chapter and in many other civic, social, and professional organizations.

The opening of the former Soviet Union has been an opportunity for many

to explore heretofore strictly off-limits aspects of that erstwhile secretive nation. Frances Jo Curnell Curtis, former chairman of aerospace education for Michigan AFA and a member of the Lake Superior-Northland Chapter, grabbed the opportunity with both

hands. Her trip to Finland, Russia, Ukraine, and Estonia included a tour of Haapsula AB. Ms. Curtis saw the hangars, administration buildings, and MiG-23s, but what struck her most was the uncertainty etched on the faces of the mostly Russian personnel, who hadn't the slightest clue what the future holds for them as Estonia moves to full independence.

Meryll Frost (1921-1992)

Every September, AIR FORCE Magazine publishes a list of the first officers and first board of directors of the Air Force Association. These men have been instrumental in all of the Association's subsequent successes. Meryll Frost's name is on that list as second vice president. He served AFA faithfully and well in the decades since the Association's forming, as Tucson Chapter president, Arizona state president, and permanent national director until his death March 17 at his home in Columbia Falls, Me.

Staff Sergeant Frost was badly burned during a B-24 crash on his fourth mission as a ball turret gunner in 1943, but he refused to let his injuries ruin his life. After a long hospital stay and countless operations, he returned from Italy to the Dartmouth football field, where he had been a star prior to his enlistment, earning all-American honors. He married, raised a family (he is survived by his wife Pauline, six children, and thirteen grandchildren), and forged a



Col. Donald E. Joy (second from left) received a Scott Associate plaque from Connecticut AFA to mark his appointment as Assistant Adjutant General of the Connecticut ANG. Also at the presentation were (from left) Col. G. Arvanetaki, deputy commander of Support; John McGrath, state president; Col. George Demers of the executive support staff; and Joseph Zaranka, national director.

Coming Events

May 1-2, North Carolina State Convention, Raleigh N. C.; May 9, Massachusetts State Convention, Hanscom AFB, Mass.; May 9, New England Region Workshop, Hanscom AFB, Mass.; May 15-16, Maryland State Convention, Andrews AFB, Md.; May 15-17, Alaska State Convention, Anchorage, Alaska; May 15-17, New Jersey State Convention, Atlantic City, N. J.; May 16-17, Oregon State Convention, Klamath Falls, Ore.; May 22-24, South Carolina State Convention, Columbia, S. C.; May 23, Alabama State Convention, Birmingham, Ala.; May 29-31, New York State Convention, Tarrytown, N. Y.; June 5-6, Tennessee State Convention, Memphis, Tenn.; June 9-10, Utah State Convention, Ogden, Utah; June 12-14, Virginia State Convention, Hampton, Va.; June 13, Ohio State Convention, Columbus, Ohio; June 13-14. South Dakota State Convention, Pierre, S. D.; June 19-20, Minnesota State Convention, Hinckley, Minn.; June 26-27, Mississippi State Convention, Columbus, Miss.; June 26-27, Missouri State Convention. Whiteman AFB, Mo.; July 10-11, Kansas State Convention, Wichita, Kan.; July 17-18, Arkansas State Convention, Little Rock, Ark.; July 17-18, Colorado State Convention, Lowry AFB, Colo.; July 17-19, Georgia State Convention, Savannah, Ga.; July 17-19, Michigan State Convention, Marquette, Mich.; July 17-19, Pennsylvania State Convention, Harrisburg, Pa.; July 17–19, Texas State Convention, San Angelo, Tex.; July 24–25, Florida State Convention, Panama City, Fla.; July 24-26, Washington State Convention, Tacoma, Wash.; July 31-August 1, Arizona-Nevada (Combined) State Convention, Las Vegas, Nev.; August 7-9, California State Convention, San Bernardino, Calif.; August 14-15, Louisiana State Convention, Bossier City, La.; August 15, Illinois State Convention, St. Louis, Mo.; August 22-23, Indiana State Convention, Kokomo, Ind.; August 28-29, New Mexico State Convention, Alamogordo, N. M.; September 14-16, AFA National Convention and Aerospace Development Briefings and Displays, Washington, D. C.

successful career in AFA and the real estate business. Mr. Frost was an inspiration to his peers and to those who have come after, and he will be missed.

Have AFA/AEF News?

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Unit Reunions

Aggressor Squadrons

Worldwide Aggressor Squadrons will hold a twentieth-year reunion September 25-27, 1992, in Las Vegas, Nev. Squadrons include the 64th FWS, 65th FWS, 26th TFTS, 527th AS, and the 4477th TES. Contact: Maj. Daniel "Truck" Futryk, 414th CTS/AT, Nellis AFB, NV 89191-5000. Phone: (702) 652-2071.

Veterans who served at Amarillo AFB, Tex., will hold a reunion May 15-16, 1992, at the Harvey Hotel in Amarillo, Tex. Contacts: Joe Crawford, 709 S. Alabama, Amarillo, TX 79106, Phone: (806) 376-7524. Perry Stokes, 4016 Tara Dr., Fort Worth, TX 76116-7609, Phone: (817) 244-6135.

Bainbridge AFB/Southern Airways School

Alumni of the Southern Airways School, a former USAF contract flying school assigned to Bainbridge AFB, Ga., during the 1950s, will hold a reunion September 4–6, 1992, in Bainbridge, Ga. Former employees, students, and permanent party military personnel are invited. Contact: Max E. Horn. 2114 High Rd., Tallahassee, FL 32303. Phone: (904) 385-

Berlin Airlift

Veterans of the Berlin Airlift will hold a reunion September 27-30, 1992, at the Saint Anthony Hotel in San Antonio, Tex. Contact: Col. Louis Raeke, USAF (Ret.), P. O. Box 234, Wayne, PA 19087-0234. Phone: (800) 523-7287.

Korean War Veterans Ass'n

Korean War veterans will hold a reunion September 18-20, 1992, in Colorado Springs, Colo. Contact: Louis Schindler, 8420 Candleflower Cir., Colorado Springs, CO 80920, Phone: (719) 531-7209.

Legion of Valor

The Legion of Valor of the US will hold a reunion starting July 20, 1992, on board the MS Sunward. The reunion will include men of all services who have been awarded the Medal of Honor, the Army Distinguished Service Cross, the Navy Cross, or the Air Force Cross, Contacts: Charles R. Stephan, 500 S. Ocean Blvd. #704, Boca Raton, FL 33432. Phone/Fax: (407) 395-2246. Morris G. Worley, 92 Oak Leaf Ln., Chapel Hill, NC 27516. Phone: (919)

Night Fighters

World War II night fighter squadrons will hold a reunion June 10-14, 1992, at the Sheraton Hotel in Colorado Springs, Colo. Contact: Alvin E. Anderson, 8885 Plumas Cir., D-1116, Huntington Beach, CA 92646. Phone: (714) 960-9058.

P-51 Mustang Pilots

P-51 pilots will hold a reunion September 8-12, 1992, in Las Vegas, Nev. Contact: David D. Smith, 5052 E. Tahnoo Dr., Lac Vogac, NV 80122. Phono: (702) 454-4385.

SAC/LGM

Strategic Air Command LGM personnel who served

between 1967 and 1980 will hold a reunion May 23-25, 1992, in Bellevue, Neb. Contact: Lt. Col. Walter E. Husten, USAF (Ret.), 309 Martin Dr. N., Bellevue, NE 68005, Phone: (402) 291-1545.

USAF Honor Guard

Members of the USAF Honor Guard will hold a reunion September 11-13, 1992, in Washington, D. C. Former members and friends are welcome. Contact: USAF Honor Guard Reunion, Bolling AFB. DC 20332, Phone: (202) 767-4795.

USAF Recon Technical Squadrons

Members of the USAF Reconnaissance Technical Squadrons will hold a reunion June 3–7, 1992, in Riverside, Calif. Former members are invited, Contact: Jim Butler, P. O. Box 8651, Moreno Valley, CA

6th Troop Carrier Squadron

Members of the 6th Troop Carrier Squadron will hold a reunion September 10-13, 1992, in Dayton, Ohio. Contact: William G. Hibner, 643 Crestmont Dr., Dayton, OH 45431-2949. Phone: (513) 254-3964.

7th Ferrying Group

The 7th Ferrying Group, Ferrying Division, Air Transport Command, will hold a fiftieth-anniversary reunion September 17 20, 1992, in Great Falls, Mont. Contact: Bob Milligan, Box 377, Centuria, WI 54824. Phone: (715) 646-2043 or (715) 646-2075.

12th Tactical Recon Squadron

Members of the 12th Tactical Reconnaissance Squadron will hold a reunion October 1-4, 1992, in Hampton, Va. Contact: Ed O'Brien, Rte. #4, Box 391, Luray, VA 22835. Phone: (703) 743-5560.

19th Bomb Group

Veterans of the 19th Bomb Group will hold a reunion August 10-15, 1992, in Seattle, Wash, Contact: James A. Kiracofe, 274 Quinn Rd., West Alexandria, OH 45381. Phone: (513) 839-4441.

27th Air Transport Group

Veterans of the 27th Air Transport Group will hold a reunion September 24–26, 1992, at the Rushmore Plaza Holiday Inn in Rapid City, S. D. Contact: Jack Giacoletto, 619 Fairlawn Dr., Rapid City, SD 57701. Phone: (605) 342-9588.

33d Troop Carrier Squadron

Veterans of the 33d Troop Carrier Squadron, 374th Troop Carrier Group, 5th Air Force, will hold a reunion June 4-7, 1992, at the Holiday Inn in Cromwell, Conn. Contact: Jack Nowak, 16 Dean Dr., Newington, CT 06111-4311.

38th Bomb Group

Members of the 38th Bomb Group (World War II) who served with 5th Air Force in New Guinea and Japan will hold a reunion August 26-30, 1992, in San Antonio, Tex. Contact: Col. Isham Johnson, USAF (Ret.), 11018 Whispering Wind, San Antonio, TX 78230. Phone: (512) 492-1235.

40th Bomb Group

Veterans of the 40th Bomb Group and the 28th Air Service Group will hold a reunion August 11-16, 1992, at the Marriott Seattle-Tacoma Hotel in Seattle, Wash. Contact: Flo Mallory, P. O. Box 9252, Treasure Island, FL 33740. Phone: (813) 360-3613.

50th Fighter-Bomber Wing

Members of the 50th Fighter-Bomber Wing (Clovis AFB, Hahn AB, and Toul AB) who served between 1952 and 1958 will hold a reunion September 24-26, 1992, in Colorado Springs, Colo. Contact: Ronald A. Johnson, 1134 E. Woodmen Rd., Colorado Springs, CO 80920. Phone: (719) 598-7096.



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56th Fighter Group

Veterans of the 56th Fighter Group will hold a reunion in England July 9-16, 1992. Contact: Leo Lester, 600 E. Prospect St., Kewanee, IL 61443. Phone: (309) 856-6826.

89th Attack Squadron

The 89th Attack Squadron, 3d Bomb Group, 5th Air Force (World War II), will hold a reunion October 1-5, 1992, at the Holiday Inn in Fairborn, Ohio. Contact: Adolph J. Luhta, 12361 Concord-Hambden Rd., Painesville, OH 44077, Phone: (216) 352-3228.

92d Tactical Fighter Squadron

Past and present members of the 92d Tactical Fighter Squadron will hold a fiftieth-anniversary reunion May 21-25, 1992, at RAF Bentwaters. England, Contacts: Capt. Al Clarke or Capt. Phil Haun, 92d Tactical Fighter Squadron, RAF Bentwaters, APO AE 09497, Phone: 011-44-394-432279 or 011-44-394-432192. DSN: 225-

93d Troop Carrier Squadron

The 93d Troop Carrier Squadron, 439th Troop Carrier Group, will hold a reunion September 23-27, 1992, in Lancaster, Pa. Contact: Lt. Col. Thomas L. Morris, USAF (Ret.), 456 St. George's Ct., Satellite Beach, FL 32937. Phone: (407) 773-6960.

97th Bomb Wing

Veterans of the 97th Bomb Wing (1946-59) will hold a fiftieth-anniversary reunion August 13-16, 1992, in Seattle, Wash. Contact: Col. F. E. Wikstrom, USAF (Ret.), P. O. Box 58128, Renton, WA 98058. Phone: (206) 226-9309.

111th Tactical Recon Squadron

Veterans of the 111th Tactical Reconnaissance Squadron (World War II) will hold a reunion August 27-29, 1992, at the Edgewater Hotel in Gatlinburg, Tenn. Contact: Roy D. Simmons, Jr., 3730 Edgewater Dr., Nashville, TN 37217. Phone: (615) 366-1191

305th Airdrome Squadron

The 305th Airdrome Squadron of the 5th Air Force will hold a reunion October 11-14, 1992, at the TraveLodge Hotel in San Antonio, Tex. Contact: James W. Farris, Rte. 1, Box 260 A6, Sherman, TX 75090. Phone: (903) 893-0376.

306th Bomb Group

Veterans of the 306th Bomb Group will hold a fiftiethanniversary reunion August 24-31, 1992, in Bedford and London, England. Contact: Russell A. Strong, 5323 Cheval Pl., Charlotte, NC 28205. Phone: (704) 568-0153.

310th Bomb Wing

Veterans of the 310th Bomb Wing will hold a reunion September 24–27, 1992, in Dayton, Ohio. Contact: Morris Briggs, 1120 S. Sunbury Rd., Westerville, OH 43081. Phone: (614) 891-7768.

315th Troop Carrier Group Veterans of the 315th Troop Carrier Group, 9th Air Force (World War II), will hold a reunion September 9-13, 1992, at the Sheraton Old Town Hotel in Albuquerque, N. M. Contact: B. C. Brown, 166 Rincon Loop, Tijeras, NM 87059. Phone: (505) 281-

332d Fighter Group

Veterans of the 332d Fighter Group "Red Tails," which included the 99th, 100th, 301st, and 302d Fighter Squadrons, will hold a reunion August 10-16, 1992, at the Marriott Copley Plaza Hotel in Boston, Mass. Contact: Tuskegee Airmen, P. O. Box 190695, Boston, MA 02119-9998. Phone: (617) 272-4649.

349th Troop Carrier Group

Veterans of the 349th Troop Carrier Group, which included the 23d, 311th, 312th, 313th, and 314th Troop Carrier Squadrons, will hold a fiftieth-anniversary reunion September 24–27, 1992, at the Hope Hotel at Wright-Patterson AFB, Ohio, Contact: Albert

E. Allen, 160 Ferguson Dr., Martinsville, IN 46151. Phone: (317) 342-2280.

351st Bomb Group Veterans of the 351st Bomb Group (Heavy), 8th Air Force (World War II), will hold a reunion June 25-28, 1992, at the Marriott Hotel in Worcester, Mass. Contact: Fred Dundas, 6018 Buckskin Cir., Indianapolis, IN 46250.

352d Fighter Group

Members of the 352d Fighter Group and the 1st Air Service Group will hold reunions July 1-10, 1992, in England and October 22-25, 1992, in San Antonio, Tex. Contact: Richard J. Debruin, 234 N. 74th St., Milwaukee, WI 53213. Phone: (414) 771-0744.

365th Fighter Group Veterans of the 365th Fighter Group, 386th, 387th, and 388th Fighter Squadrons (World War II), will hold a reunion in September 1992, in New Orleans, La. Contact: Robert Keefe, 2130 W. Ridge Rd., Gary, IN 46408. Phone: (219) 981-3723.

376th Bomb GroupVeterans of the 376th Bomb Group (Heavy) will hold a reunion September 23-28, 1992, in Fort Walton Beach, Fla. Contact: Bill McDonald, 319 Yacht Club Dr., Fort Walton Beach, FL 32548. Phone: (904) 243-8090.

398th Bomb Group

Veterans of the 398th Bomb Group and attached units (World War II) will hold a reunion September 18-20, 1992, in Nashville, Tenn. Contact: George R. Hilliard, 7841 Quartermaine Ave., Cincinnati, OH 45236-2313. Phone: (513) 891-8533.

436th Fighter Squadron

Veterans of the 436th Fighter Squadron, 479th Fighter Group, will hold a reunion September 30-October 3, 1992, in Columbus, Ohio. Contact: James E. Frolking, 18675 Parkland Dr., #301, Cleveland, OH 44122. Phone: (216) 752-1829.

450th Bomb Group

The 450th Bomb Group will hold a reunion September 17-20, 1992, in Albuquerque, N. M. Contact: Doid K. Raab, 5695 Ireland Rd., N. E., Lancaster, OH 43130. Phone: (614) 536-7635.

454th Bomb Squadron

Veterans of the 454th Bomb Squadron, 323d Bomb Group, 9th Air Force, will hold a reunion September 9-13, 1992, at the Sunburst Hotel in Scottsdale, Ariz. Contact: Joe Havrilla, 1208 Margaret St., Munhall, PA 15120-2048. Phone: (412) 461-6373,

455th Bomb Squadron

Veterans of the 455th Bomb Squadron, 323d Bomb Group, will hold a reunion September 3-6, 1992, in San Antonio, Tex. Contact: Anita Jung, 111 Parade Dr., San Antonio, TX 78213.

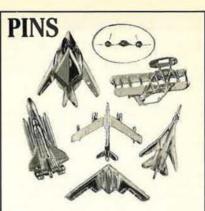
456th Bomb Squadron

Veterans of the 456th Bomb Squadron, 323d Bomb Group (World War II), will hold a reunion October 12-16, 1992, in Las Vegas, Nev. Contact: Tom Curtin, 116-13 103d Ave., Richmond Hill, NY 11419. Phone: (718) 849-7596.

456th Fighter Squadron

Veterans of the 456th Fighter Squadron, 414th Fighter Group (World War II), will hold a reunion

Readers wishing to submit reunion notices to "Unit Reunions" should mail their 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.



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Unit Reunions

September 30-October 4, 1992, at the Red Lion Inn in Colorado Springs, Colo. Contact: James H. Baird, 1645 Plummer Dr., Rockwall, TX 75087. Phone: (214) 771-8529.

459th Bomb Group

The 459th Bomb Group will hold a reunion September 24–27, 1992, at the Doubletree Hotel in Houston, Tex. **Contact:** John Devney, 90 Kimbark Rd., Rochester, NY 14610. Phone: (716) 381-6174.

464th Bomb Group

Veterans of the 464th Bomb Group, which includes the 776th, 777th, 778th, and 779th Bomb Squadrons, will hold a reunion August 11–16, 1992, at the Holiday Inn in Duluth, Minn. Contact: Frank Rekucki, P. O. Box 174, Hill City, MN 55748. Phone: (218) 697-8331.

468th Bomb Group

The 468th Bomb Group, Gen. Billy Mitchell Group, will hold reunions May 7–9, 1992, at the Ramada Inn in Niagara Falls, N. Y., and August 8–10, 1992, at the Sheraton Inn in Colorado Springs, Colo. Contacts: Harold Mufford, 57 N. Hartland St., Middleport, NY 14105. Col. James L. Pattillo, USAF (Ret.), 1143 Glenview Rd., Santa Barbara, CA 93108. Phone: (805) 969-2796.

485th Bomb Group

The 485th Bomb Group will hold a reunion September 30–October 4, 1992, in Peabody, Mass. Contact F. I. Bundy, 5773 Middlefield Dr., Columbus, OH 43235.

485th Tactical Missile Wing

Veterans of the 485th Tactical Missile Wing who

served at Florennes AB, Belgium, will hold a reunion July 31–August 2, 1992, in Colorado Springs, Colo. Contacts: Capt. Chris Ayres, 7975 Dakota Ridge, Colorado Springs, CO 80920. Phone: (719) 531-0196. MSgt. Sue Dennard, 2286 Farnsworth Dr., Colorado Springs, CO 80916. Phone: (719) 591-0018.

488th Bomb Squadron

Veterans of the 488th Bomb Squadron, 340th Bomb Group, will hold a reunion September 10–12, 1992, in Colorado Springs, Colo. **Contact**: Walter J. Stauffer, 196-A S. Monaco Pkwy., Denver, CO 80224.

509th Bomb Wing

Veterans of the 509th Bomb Wing will hold a reunion September 16–20, 1992, in Colorado Springs, Colo. Contact: Col. John F. Nuding, USAF (Ret.), 8617 Utica St., Lubbock, TX 79424. Phone: (806) 794-4377.

583d SAW Battalion

Veterans of the 583d Signal Aircraft Warning Battalion will hold a reunion August 11–13, 1992, in Newark, Ohio. Contact: George C. Greider, 1103 Lawnview Ave., Newark, OH 43055. Phone: (614) 344-5498.61

6147th Tactical Control Group

Veterans of the 6147th Tactical Control Group "Mosquitos" who served in the Korean War will hold a reunion September 22–27, 1992, at the Red Lion Inn in Sacramento, Calif. Contact: Stephen J. Rooney, 3210 Balmoral Dr., Sacramento, CA 95821. Phone: (916) 489-0476.

Air Transport Command

Seeking contact with veterans of Air Transport Command, North African Division (World War II), for a fall 1992 reunion. **Contact:** C. L. Parrott, 140 Sugar Hill Dr., Sparks, NV 89433.

28th Photo Recon Squadron

I am seeking World War II veterans who served in the 28th Reconnaissance Squadron to inform them of a reunion in September 1992 in Nashville, Tenn. Contact: Ray "Skip" Ott, 24 High Acres Rd., Ansonia, CT 06401. Phone: (203) 734-3433.

81st Airdrome Squadron

Seeking veterans of the 81st Airdrome Squadron for a fiftieth-anniversary reunion in 1992. Contact: William Kozempel, 10122 Proctor Rd., Philadephia, PA 19116. Phone: (215) 673-3694.

302d Tactical Recon Squadron

Seeking veterans of the 302d Tactical Reconnaissance Squadron who served at Shaw AFB, S. C., in 1952 and 1953, at Sembach AB, West Germany, from 1953 to 1958, and at Laon AB, France, in 1958 and 1959. The 302d will hold a reunion September 30, 1992, in Sacramento, Calif. Contacts: Roger Wilkes, 8918 Taft Hill Ct., Sandy, UT 84093. Phone: (801) 943-0529. George Alm, 3897 Archwood Rd., Shingle Springs, CA 95682. Phone: (916) 677-1156.

548th Strategic Missile Squadron

Seeking former members who are interested in planning a reunion for October 1992 to commemorate the thirtieth anniversary of the Cuban Missile Crisis. Contact: Jack Roberts, Rte. 2, Box 59A, Campbell, TX 75422.

Bulletin Board

Seeking information on the reason about a dozen F-84Gs and F-86As and Es each were painted with two different fluorescent colors while at Eglin AFB, Fla., in October 1951. They were not organizational markings. Contact: MSgt. D. W. Menard, USAF (Ret.), 5224 Longford Rd., Dayton, OH 45424-2547.

Seeking information on **Captain Williams**, USAF. He was in charge of a flying T-33 maintenance squadron at Kadena AB, Japan, in 1956-58. **Contact:** Bill MacDonald, 9680 Madison St. N. E., Blaine, MN 55434-2535.

Collector and author seeks blood chits, pointietalkies, and phrase cards from all nations and time periods. I also have some available to trade. Contact: R. E. Baldwin, P. O. Box 11131, Berkeley, CA 94701-2131.

Seeking information on NATO exercises over northern Europe, especially Norway and its numerous islands, between 1950 and 1955. Contact: Mark Ian Birdsall, 42 Carr Manor Dr., Leeds LS17 5AU, West Yorkshire, England.

Seeking contact with **Sgt. Edward F. Gallick** and **Sgt. Wayne W. Guthrie**, who were stationed at Rushmore AFS, S. D. **Contact**: Jim Aarhus, Rte. 2 Box 250A, Hayfield, MN 55940.

Seeking contact with **Michael J. Wosika** of Milwaukee, Wis., whose last known address was with the 29th Fighter-Interceptor Squadron, Malmstrom AFB, Mont. Also seeking unit patches for the 29th FIS, 778th Radar Squadron, and 10th Aerospace Defense Squadron, **Contact:** M. F. "Red" Jakober, 2520 Floral Ct., Missoula, MT 59803.

Seeking information on and photos of 2d Lt. Robert J. Buel, of the 3d Pursuit Squadron (Provisional), who was shot down at sea off Darwin, Australia, near the Houston Convoy on February 15, 1942, by a Japanese Mavis flying boat, which he shot down. Contact: Robert Kendall Piper, 7 Brazel St., Higgins, A. C. T. 2615, Australia.

The **85th Fighter Squadron**, active from January 1942 until July 1959, has been reactivated at Eglin AFB, Fla., as the 85th Test and Evaluation Squadron. We would like to hear from past members of the 85th. **Contact**: Lt. Col. Bran McAllister, USAF, Cmdr., 85th TES, Eglin AFB, FL 32542-5000.

Seeking information on **Maj. Martin E. Willson** or any of his crew on the 482d Bomb Group's mission to Oschersleben, Germany, January 11, 1944. **Contact:** Peter F. Ardizzi, P. O. Box 482, Warminster, PA 19874-0482.

Seeking information on Lt. C. D. Williams, a Flying Tiger pilot with the 76th Squadron who was rescued from the South China Sea by a Chinese farmer on November 8, 1943. Contact: Mark Raymond Chandler, 1033 Regent St., Alameda, CA 94501.

Seeking information on Col. Robert J. Rankin, USAF, a member of the 260th Coast Artillery Regimental Band, Fort Bliss, Tex., in 1941. Contact: John R. Morris, 17127, 117th Ct. NE, Bothell, WA 98011.

Seeking contact with Lt. Walter L. Elkins and SSgt. Harvey L. Wallin, members of Capt. Thomas G. A. Welsh's B-29 crew in India and Tinian in 1944–45. Contact: Ralph P. Holton, 205 Hazel Dr., Vestal, NY 13850.

Seeking information on planned reunions for the 384th Bomb Group, based at Grafton, England, during World War II flying B-17s. Also seeking contact with members of my crew, #2730, which was organized at Ardmore, Okla., in early 1944. Contact: James H. Kugler, 4613 Springers Ln., Wilmington, DE 19808.

Seeking contact with members of the **384th Bomb Group**, stationed in England during World War II. I was a member of this group in 1944 and plan to visit England in June. **Contact**: SMSgt. William C. Aplin, USAF (Ret.), 2821 Gardner Pl., Box 266, Laporte, CO 80535.

Seeking contact with the person to whom I sent information on the Japanese Baka Bomb. New information has become available. Contact: Alan E. Gruening, 1815 W. 15th Ave., Apache Junction, AZ

For a book on the F/RF-84F, I am seeking information from people who served on that aircraft between 1955 and 1963. I am especially seeking photos and details of exercises, air races, and deployments. **Contact**: R. M. Robinson, 37 Home Farm Rd., Houghton, Huntingdon, Cambs. PE17 2BN, England.

For a master's thesis, I am seeking information on troop carrier squadrons and MATS. I am especially interested in information on the training and employment of aircrews involved in airborne troop operations in World War II. Contact: Capt. Scott Mattson, 1231B S. Hickam Dr., Grand Forks AFB, ND 58204.

Seeking contact with anyone who served with the 500th Bomb Squadron, 345th Bomb Group, from

November 1942 until November 1945 who is not already a member of the 500th Bomb Squadron Association. **Contact:** Col. William J. Cavoli, USAF (Ret.), 2147 Encino Loop, San Antonio, TX 78259-1902.

Seeking information on the mission, flight, and recovery of the B-24D Liberator *Lady Be Good*, lost after a raid on Ploesti in 1943. Contact: William Porter, 2505 Faulkner Dr., Hopkinsville, KY 42240.

Seeking **patches**, US and foreign, official and unofficial, from 1940 to the present. **Contact**: SSgt. Brad Smith, 1010 Windsor St., Apt. D, Salt Lake City, UT 84105.

Seeking information on aviation cadets Robert C. Black and Richard Bixler, who were at Aerial Gunnery School in Kingman, Ariz., in July 1943 and at Bombardier School at Kirtland Field, N. M., in August 1943. Contact: Lawrence H. Boteler, 1709 James Payne Cir., McLean, VA 22101-4223.

Seeking contact with former members of Class 44-E (including washouts) from Atlantic City, Syracuse University, and Napier Field. Contact: Roy A. Spangler, 116 Fairway Dr., Ormond Beach, FL 32176.

Seeking contact with crew members of two US Navy PB4Ys piloted by **Cmdr. Raymond J. Pflum** and **R. D. Ettinger**, who rescued a downed P-51 pilot in Tokyo Bay on August 3, 1945. **Contact**: Henry Sakaida, 8626 E. Grand Ave., Rosemead, CA 91770.

Seeking contact with surviving members of the 354th Aero Squadron (observation), Second Army, World War I. I am especially interested in hearing from anyone who knew Pvt. Carl Fred Phillips, who served with the 354th at Kelly Field, Tex., and Autreville Airdrome, France. Private Phillips, 99, now lives in North Carolina. Contact: Lt. Col. Charles L. Wood, CAP, 1910 Glendale Ave., Durham, NC 27701-1326.

Seeking information on Robert David Williamson, who served as Blue Flight Leader of the 53d Fighter Squadron, 36th Fighter Group, 9th Air Force, in Atcham, England; Nancy and Cherbourg, France; Leuven, Belgium; and Aachen, Bonn, and Kassel, Germany. I am also interested in any reunions of his unit. Contact: TSgt. Scott M. Williamson, OSACEUR-SHAPE, CMR #450, Box 287, APO AE 09705.

If you need information on an individual, unit, or alrcraft, or if you want to collect, donate, or trade USAF-related items, write to "Buletin Board," Ain Force Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be brief and typewritten; we reserve the right to condense them as necessary. We cannot acknowledge receipt of letters. Unsigned letters, items or services for sale or otherwise intended to bring in money, and photographs will not be used or returned.—THE EDITORS

Seeking information on the service record and whereabouts of relatives of MSgt. Harley Fogelman, who was responsible for establishing the first training encampment at what is now Edwards AFB, Calif, Our Chief's Group is planning ceremonies to honor him. Contact: CMSgt. Kenneth D. Summers, 8637 Redwood Blvd., California City, CA 93505.

Seeking information on or contact with Sgt. Emery Lloyd, last known address Los Angeles, Calif., who

was a crew member of a B-24 Liberator shot down over Czechoslovakia, December 7, 1944. **Contact**: Paul Costolanski, 1101 Clover Dr., McLean, VA 22101-2000.

Seeking information on the whereabouts of Lt. William D. Morrison, USAF, who was with Hq. 1807th AACS Wing stationed at Kaufbeuren AB, West Germany, in 1948. His last known address was Midwest City, Okla. Contact: Herbert V. Meschwitz, 1 Berkshire Rd., Whiting, NJ 08759.

Seeking contact with **Dieter Hein**, a German Air Force Sergeant, who was stationed at Lagerlechfeld, near Augsburg, West Germany, in 1967–69. **Contact**: Laura Huckabay, 1153 Cherryview Ln., San Jose, CA 95118.

Beginning collector seeks patches from USAF, AFRES, and ANG units, current or previous designs, official or unofficial, especially from B-1 units. Contact: Lt. Mike Cale, 116 Johnson Ave., Mather AFB, CA 95655.

Seeking information on or photos of the 4146th Base Unit Secret Rocket Test Program, conducted at Dover AAF, Del., in 1944. The base museum is attempting to fill in the gaps of this important part of its history. Contact: Mike Leister, 436 AW/LGMMP. Dover AFB, DE 19902-5144.

The 15th Air Force Band, stationed at March AFB, Calif., seeks information, photos, and stories pertaining to the band, especially while it was stationed in Europe as the 523d Army Air Forces Band in 1944–45 at Le Havre, France, and at 2d Air Base Depot Area, Warton, England, in 1945. The band has also been known as the 23d Army Air Forces Band and the 523d Army Band. Contact: SSgt. Kim F. Morris, 15th Air Force Band, March AFB, CA 92518-5000.



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35-39	2.52	7.56	15.12	30.24
40-44	4.00	12.00	24.00	48.00
45-49	6.68	20.04	40.08	80.16
50-54	10.00	30.00	60.00	120.00
55-59	14.32	42.96	85.92	171.84
60-64	22.16	66.48	132.96	265.92
65-69	50.00	150.00	300,00	600.00
70-74	80.00	240.00	480.00	960.00
75-79	100.00	300.00	600.00	1,200.00



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	****	DU I DU ANA	THE BILL BELLOCATION	1		_	_	
Name (print) Last	Fi	irst	Middle		[] Male [] Female	Group 7		71
Address Street		City	State		Zip Code			
Date of Birth Mo, Day Year	Height	Weight	Social Security #	Daytir	ne Phone #	Flying Status		
Primary Beneficiary (Name and Relationship) — Contingent Beneficiary (Name and Relationship)								
Requested Amount of Coverage		(units) X \$20,000 = \$_	(amount	of coverage)				
Method and Amount of Payment Monthly Governmental Allotment (check here but of Instructions for requesting allotment will be a seem of the control of t	be sent with [policy] c nd no payment with ap Usi	certificate. oplication) Card #		Date f coverage based o	n your current age and	request	ed fr	equency
(units) X \$	(premiu	m rate per unit of cover	rage—see above) = \$	(premium a	mount).			
I. Have you been hospitalized during the pre	ceding 90 days?				1] Yes	ľ] No
2. In the past three years, have you received								
a) Cancer, Leukemia, Hodgkins Disease, o					1] Yes	I] No
b) Heart Disease, stroke, or other related					ſ) Yes	[] No
 Within the past two years, have you had pe patches in mouth, visual disturbance, rect 			nuscle weakness, unexplained weight loss of	en pounds or more	e, swollen glands, [] Yes	I] No
4 Has any application made by you for Life o	r Health insurance be	en declined, postponed, o	or issued other than as applied for?		1	Yes	[] No
Are you receiving, entitled to receive or w under any private policy or plan or govern			tion any benefits due to sickness or injury (ot d?	her th <mark>an medical</mark> e	xpense benefits)] Yes	I] No
If you answered "Yes" to any of the above question ecessary.	ns, please give details.	, dates, diagnosis, treatm	ent, and name and address of the health care	provider(s) and h	ospital(s). Use addition	nal sheet	of p	aper if
				19.				
Information in this application, a copy of which s knowledge and belief. I agree that no insurance we MetLife.								
I understand that if on the Effective Date I am no	at eligible for such ins	urance by reason of (i) a	ge or (ii) membership status, insurance will i	not become effective	e on my life.			
"Hospitalized" means inpatient confinement for: therapy, or dialysis treatment.	hospital care, hospice	care or care in an intern	nediate or long term care facility. It also inclu	ides outpatient hos	pital care for chemoth	erapy, ra	diati	on
			Furnish Medical Information					
For underwriting and claim purposes, I hereby at MetLife, on my behalf, with information in his or signed. This authorization shall be valid for two y	its possession, includi	ing the findings, relating	to medical, psychiatric or psychological care	, or examination, o	company, or other orga r surgical treatment gi	inization ven to th	to f	ırnish der-
Member Signature					Date			
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Information Disclosure: In most cases, the information we have about you will be sent to third parties only if you authorize us to do so. In some cases where disclosure is required by law or necessary for the conduct of our business, we may send the information to third parties without your consent.

Access and Correction Information: Upon written request, we will make information we have about you available to you. You have certain access and correction rights with respect to the information about

Further Information About Our Practices: Upon written request, we will send you more information about our underwriting process and your access and correction rights. Also, upon your written request, we will give you more information about the circumstances under which we will disclose the information about you to third parties without your authorization. Please write MetLife at the following address about these matters.

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