#232

Fact Sheet

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

89-15

A-10 Thunderbolt II

The A-10 Thunderbolt II is the first Air Force aircraft to be specifically designed for close air support of ground forces. It is a simple, effective and survivable twin-engine jet aircraft that can be used against all ground targets, including tanks and other armored vehicles. The aircraft has excellent maneuverability at low airspeeds and altitude and is a highly accurate weapons delivery platform. Also, it has a wide combat radius and short takeoff and landing capability.

The A-10 has better survivability in its close air support combat role than previous aircraft. The pilot is encircled by titanium armor that also protects the vital parts of the flight control system. It can survive direct hits from armor-piercing and high-explosive projectiles up to 23mm in size. Redundant primary structural sections increase survivability. Its self-sealing fuel cells are protected by internal and external foam. Also, all fuel systems pipework is inside the cells, except the lines to the engines, which have self-sealing covers. The A-10 has a redundant hydraulic flight-control system backed up by a manual system. This permits the pilot to fly and land the aircraft when all hydraulic power is lost.

The Thunderbolt II is designed to respond to the ground combat commander's immediate needs. It can loiter for extended periods of time in close proximity to the battle area and operate under 1,000-foot ceilings with 1.5-mile visibility. Its short takeoff and landing capability permits operations in and out of locations near front lines.

The A-10's design simplicity allows it to be serviced

and operated from bases with limited facilities near battle areas. Numerous aircraft parts are interchangeable left and right, including the engines, main landing gear and vertical stabilizers.

A single-seat cockpit forward of the wings has a large bubble canopy to provide the pilot all-around vision. It has a bulletproof windscreen, an environmental control system and a Douglas ejection seat that operates at speeds from 518 miles per hour down to zero at zero altitude.

Avionics equipment includes communications, inertial navigation system, fire control and weapons delivery systems, and target penetration aids. The weapons delivery system includes a head-up display that indicates airspeed, altitude and dive angle on the windscreen, and a Pave Penny laser tracking pod under the fuselage. The A-10 also has an armament control panel, and infrared and electronic countermeasures to handle surface-to-air missile threats.

The GAU-8/A Avenger 30mm seven-barrel cannon was specifically designed to provide the A-10 a tank-killing capability. The gun fires armor-piercing projectiles capable of penetrating medium and heavy tanks. Also, it can fire high-explosive ammunition, which is extremely effective against trucks and various other targets. The maneuverability of the A-10 aircraft, combined with the gun's accuracy, allows the pilot to bring his gun quickly into action, even during adverse weather and poor visibility. The GAU-8A gun fires 3,900 rounds per minute.

The initial production A-10A first flew in October 1975. Delivery of this model began in March 1976 to the 355th Tactical Training Wing, Davis-Monthan Air Force Base, Ariz. Other units in the United States equipped with the A-10 are the 354th Tactical Fighter Wing, Myrtle Beach Air Force Base, S.C.; and the 23rd Tactical Fighter Wing, England Air Force Base, La.

The first A-10s assigned to United States Air Forces in Europe arrived at Royal Air Force Station Bentwaters, England, in January 1979. The 81st Tactical Fighter Wing now has four operational A-10 squadrons at Royal Air Force stations Bentwaters and Woodbridge while the 10th Tactical Fighter Wing, Royal Air Force Station Alconbury, has two A-10 squadrons. These wings also have four forward-operating locations in West Germany to which aircraft are frequently deployed for peacetime training. In 1982, one squadron of A-10s was assigned to Suwon Air Base, South Korea, and one to Eielson Air Force Base, Alaska.

Currently, 648 A-10s are assigned to active Air Force, Air National Guard and Air Force Reserve units.

Specifications

Primary function: close air support
Prime contractor: Fairchild Republic Co.
Power plant/manufacturer: two General Electric TF34-GE-100 turbofan engines
Thrust: 9,065 lb. each engine uninstalled; approximately 8,900 lb. installed
Dimensions: wingspan 57 ft. 6 in., length 53 ft. 4 in., height 14 ft. 8 in.
Speed: 420 mph combat speed at 5,000 ft. with six Mk-82 general–purpose bombs
Ceiling: can operate under 1,000 ft. with 1.5-mile visibility
Range: 250 miles with 9,500 lb. of ordnance and 1.8-hour loiter time
Armament: one GAU-8/A 30mm seven-barrel Gatling gun; up to 16,000 lb. mixed ordnance on eight under-wing and three under-fuselage pylon stations, including 500 lb. retarded bombs, 2,000 lb. general-purpose bombs, incendiary and Rockeye II cluster bombs, Maverick missiles and laser-guided/electro-optically guided bombs; infrared countermeasure flares; electronic countermeasure chaff; and jammer pods
Crew: pilot
Maximum takeoff weight: 51,000 lb.
Status: operational

Fact Sheet

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

89-26

B-52 Stratofortress

The B-52 Stratofortress is a long-range, heavy bomber capable of flying at high subsonic speeds at altitudes up to 50,000 feet. For more than 30 years, B-52s, which can penetrate enemy defenses, have been the primary manned strategic bomber force for the United States.

The Stratofortress can carry nuclear or conventional ordnance, and in a conventional conflict can perform air interdiction, offensive counter air and suppression of enemy air defenses. Its flexibility was dramatically highlighted during the Vietnam War.

The B-52 performs missions other than bombing. It can assist the U.S. Navy in anti-ship and mine-laying operations. The bomber is highly effective when used for ocean surveillance. Two B-52s, in two hours, can monitor 140,000 square miles of ocean surface.

The B-52A first flew in 1954, and the B model began entering service in 1955. A total of 744 B-52s were built, with the last B-52H delivered in October 1962. Only the G and H models remain in the Air Force inventory.

In February 1959, the first of 193 B-52G's were delivered to the Strategic Air Command. The G model was the first missile-carrying bomber and introduced many important changes over previous models, such as a new tail fin of reduced height, a redesigned wing with integral fuel tanks and fixed under-wing tanks. The earlier B-52G's carried two AGM-28 Hound Dog air-to-surface missiles. These were replaced by up to six AGM-69 short-range attack missiles (SRAMs) under each wing and eight in the internal weapons bay. The G model also has four 50-caliber machine guns in the tail turret.

The first of 102 B-52H's was delivered to Strategic Air Command in May 1961. It has improved defensive armament, including a 20mm Gatling gun. B–52H's also were modified to carry AGM-69s. A project to install an Air Force satellite communications system on B–52s began in 1979. The system works in conjunction with communications satellites, giving the bombers an around-the-world communication capability. All operational B-52s have been modified to use the Air Force Satellite Communications System.

The B-52G's and H's have about the same outward appearance as earlier models. The gunner's station was moved from the tail to the forward crew compartment, putting the gunner with other crew members. The tail guns are remotely controlled with the aid of tail-mounted radars. All Stratofortresses are equipped with an electro-optical viewing system that uses forward-looking, infrared and low-light-level television sensors to augment the terrain-avoidance system, thus further improving low-level flight capability. The electro-optical viewing system is in two steerable turrets under the aircraft's nose.

The bombers have been modified with improved offensive and defensive systems. New avionics have improved their weapons delivery and electronic counter-measures capability, increased reliability of electronic subsystems, and hardened the electronics to nuclear effects.

Also, all B-52s are being modified to carry up to 12 AGM-86B air-launched cruise missiles externally. A later modification to B-52H's will incorporate a bomb-bay rotary launcher for eight additional internally carried air-launched cruise missiles, or either eight short-range attack missiles or gravity bombs.

Sixty-eight B-52G's were modified to carry AGM-84 Harpoon anti-ship missile. Thirty others were given a capability to carry eight missiles per aircraft. Two conventional bomber wings, the 42nd Bombardment Wing at Loring Air Force Base, Maine, and the 43rd Bombardment Wing at Andersen Air Force Base, Guam, use Harpoon missiles as well.

The use of aerial refueling gives the B-52 Stratofortress a range limited only by crew endurance. The B–52G has an unrefueled range of more than 7,500 miles, while the B-52H, with more fuel-efficient engines, has an unrefueled range beyond 8,800 miles.

To assure continued unity of the nation's strategic triad, more than 250 B-52 Stratofortresses remain in the Air Force inventory throughout the Strategic Air Command.

Specifications

Primary function: strategic heavy bomber
Prime contractor: The Boeing Military Airplane Co.
Power plant/manufacturer: eight Pratt & Whitney engines – B-52G, J57-P-43WB turbojet; B-52H, TF33-P-3 turbofan
Thrust: each engine – B-52G, up to 13,750 lbs.; B-52H, up to 17,000 lbs.
Dimensions: wingspan 185 ft.; height 40 ft. 8 in.; length: B-52G, 160 ft. 11 in.; B-52H, 159 ft. 4 in.
Speed: 650 mph maximum
Ceiling: 50,000 ft.
Maximum takeoff weight: 488,000 lbs.
Range: unrefueled ferry range – B-52G, 7,500 miles; B-52H, 8,800 miles
Armament: approximately 70,000 lbs. mixed ordnance, short-range attack missiles under wings, bombs and short-range attack missiles carried internally (some modified to carry air-launched cruise missiles and some modified to carry anti-ship missiles); B-52G, four .50-caliber machine guns; B-52H, 20mm Gatling gun
Crew: six – aircraft commander, pilot, radar navigator, navigator, electronics warfare officer and gunner
Status: operational

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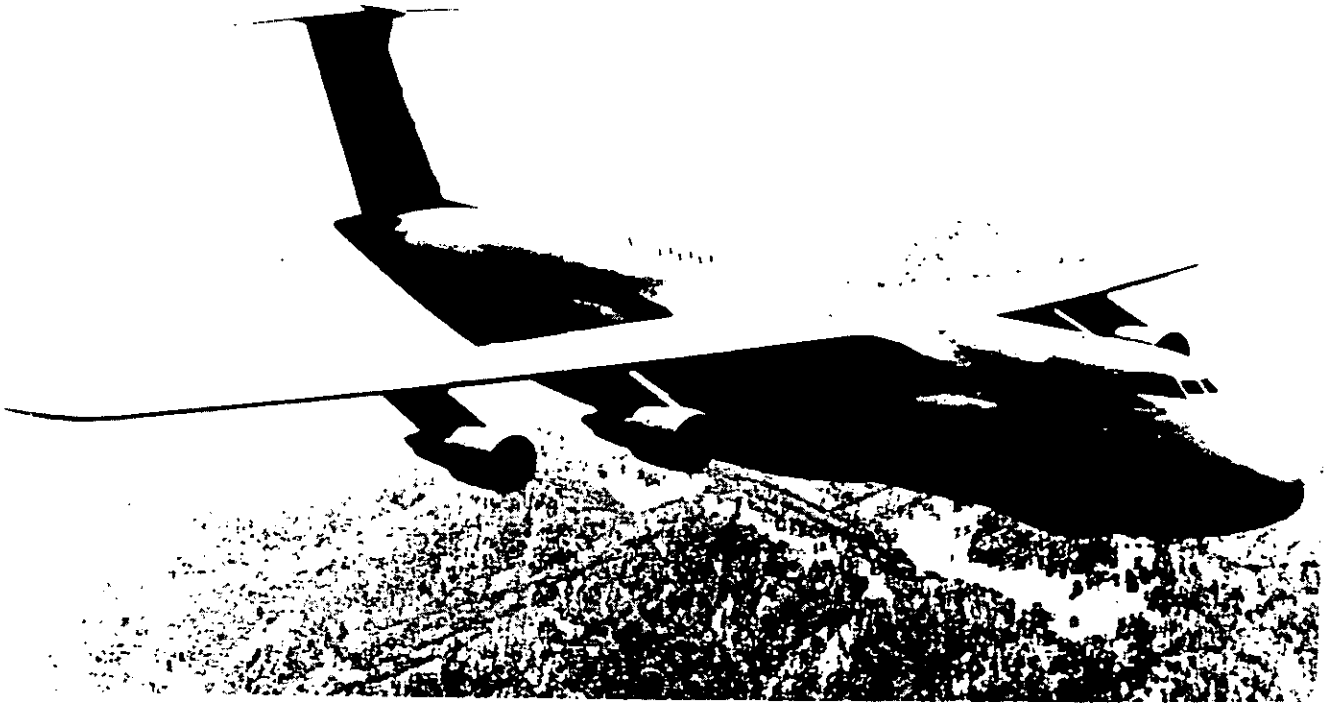
Fact Sheet

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

89-18



C-5 Galaxy

The C-5 Galaxy is a heavy-cargo transport designed to provide massive strategic airlift for deployment and supply of combat and support forces. It can carry unusually large and heavy cargo for intercontinental ranges at jet speeds. The plane can take off and land in relatively short distances and taxi on substandard surfaces during emergency operations.

The Galaxy is the Free World's largest aircraft. It is almost as long as a football field, as high as a six-story building and has a cargo compartment about the size of an eight-lane bowling alley. The C-5 is the only aircraft that can transport virtually any piece of the Army's combat equipment, including the 74-ton mobile scissors bridge, tanks and helicopters.

The C-5 and the smaller C-141B Starlifter are strategic airlift partners. Together they can carry fully equipped, combat-ready troops to any area in the world on short notice and can provide the full field support necessary to maintain a fighting force. Except for emergencies or unusual circumstances, the C-5 does not carry troops in the lower-deck cargo compartment, but in the rear compartment of the upper deck where 73 seats are available for personnel and operators of equipment being airlifted. The C-5 has carried special loads, such as large missiles, that would require extra time, manpower and dollars to transport via ship, rail or flatbed truck.

The forward upper deck accommodates a crew of six, a relief crew of seven, and eight mail or message couriers.

The flight deck has work stations for the pilot, co-pilot, two flight engineers and two loadmasters. The upper deck's forward and rear compartments have galleys for food preparation and lavatories.

The Galaxy can be loaded and off-loaded at the same time using the front and rear cargo openings. A visor nose and a rear door, each with full-width ramps, open to expose the full height and width of the cargo compartment. This permits drive-through loading and unloading of wheeled and tracked vehicles, and faster and easier loading of bulky equipment. A "kneeling" landing-gear system lowers the aircraft's cargo floor to truckbed height for easier loading. The entire cargo floor is equipped with a roller system for rapid handling of palletized equipment. A full load of 36 pallets can be placed aboard in about 90 minutes.

The Galaxy's weight is distributed on its high flotation landing gear, which has 28 wheels. This landing gear system can raise each set of wheels individually for simplified tire changes or brake maintenance.

An automatic trouble-shooting system constantly monitors more than 800 test points in the various subsystems of the C-5. The Malfunction Detection, Analysis and Recording System uses a digital computer to identify malfunctions in replaceable units. Failure and trend information is recorded on magnetic tape for analysis by maintenance people.

Four turbofan engines mounted on pylons under the wings power the C-5. Each engine pod is nearly 27 feet long, weighs 7,260 pounds and has an air intake diameter of more than 8 1/2 feet. The Galaxy has 12 integral wing tanks with a capacity of 51,150 gallons of fuel – enough to fill 6 1/2 regular-size railroad tank cars. The fuel weighs 322,500 pounds.

The Galaxy has sophisticated communications equipment and a triple inertial navigation system, making it nearly self-sufficient. It can operate without using ground-based navigational aids.

The electrical system has four engine-driven generators, each powerful enough to supply the aircraft with sufficient electricity if the other three fail. Each of the two main landing gear pods carries an auxiliary power unit to supply electric and pneumatic power for engine starts and ground air conditioning, heating, cooling and ventilation. Air turbine motors located in the landing gear pods also can power the hydraulic systems and the main landing gear kneeling motors.

The first C-5A was delivered to the Transitional Training Unit at Altus Air Force Base, Okla., in December 1969. The first operational Galaxys were delivered to the 437th Military Airlift Wing, Charleston Air Force Base, S.C., in June 1970. In December 1984, the 433rd Tactical Airlift Wing (now the 433rd Military Airlift Wing) at Kelly Air Force Base, Texas, became the first Air Force Reserve wing equipped with C-5 Galaxys. There are nearly 130 C-5A and B aircraft in the Air National Guard, Air Force Reserve, and active-duty forces.

The first C-5B incorporating significant improvements such as strengthened wings and updated avionics was delivered to Altus Air Force Base in January 1986. C-5 production concluded with delivery of the last "B" model aircraft in April 1989.

The gigantic C-5, with its tremendous payload capability, has opened unprecedented dimensions of strategic airlift in support of national defense. It has been involved in many historic airlift missions for 20 years and is invaluable to the Air Force mission and humanitarian efforts. For example, in December 1988, four C-5s participated in the delivery of more than 885,000 pounds of earthquake relief supplies to the Soviet Republic of Armenia. The C-5 also was involved in assisting with an Alaskan oil spill cleanup in March 1989, transporting nearly 2-million pounds of equipment to Elmendorf Air Force Base, Alaska.

Specifications

Primary function: long-range, heavy logistics transport
Prime contractor: Lockheed-Georgia Co.
Power plant/manufacturer: four General Electric TF39-GE-1C turbofan engines
Thrust: 41,000 lb. each engine
Dimensions: wingspan 222 ft. 9 in.; length 247 ft. 10 in.; height at tail 65 ft. 1 in.; stabilizer span 68 ft. 9 in.; cargo compartment – height 13 ft. 6 in., width 19 ft.
Speed: more than 500 mph at 25,000 ft with takeoff weight 769,000 lb.
Ceiling: 34,000 ft. at 605,000 lb. weight
Range: 5,259 miles with 112,600-lb. cargo at 507 mph
Load: C-5 – 291,000 lb. maximum wartime payload weight
Crew: six – pilot, co-pilot, two flight engineers, two loadmasters
Maximum takeoff weight: 769,000 lb.
Maximum wartime takeoff weight: 840,000 lb.
Status: operational

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Crew: six – aircraft commander, pilot, radar navigator, navigator, electronics warfare officer and gunner
Status: operational

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C-130 Hercules

The C-130 Hercules is a medium-range tactical airlift aircraft designed primarily for transport of cargo and personnel within a theater of operations. Variants of the C-130 perform many other missions, including close-air support, rescue and recovery, special operations and weather reconnaissance. More than 900 C-130s have been delivered to the U.S. Air Force in the past 30 years, making it the "workhorse of the Air Force."

The C-130 can carry more than 42,000 pounds of cargo. Up to six pallets may be loaded onto the aircraft through the hydraulically operated main loading door and ramp in the rear of the aircraft. The ramp can be lowered to the ground for loading and unloading wheeled vehicles, and can be adjusted to various heights for handling other cargo. Rollers in the floor of the cargo compartment enable quick and easy handling of cargo pallets and can be removed to leave a flat surface, if needed. Tie-down fittings for securing cargo are located throughout the compartment. The cargo area can be quickly adapted to either an all-passenger, combination passenger-cargo, all-cargo, or aeromedical airlift configuration. The comfort pallet, aft-facing airline seat pallets and lavatory pallet designed for the C-141 aircraft can be used on the C-130 Hercules.

In its personnel carrier role, the C-130 can accommodate 92 combat troops or 64 fully equipped paratroops on side-facing troop seats. For aeromedical evacuations, it can carry 74 litter patients and two medical attendants. Paratroops exit the aircraft through two doors, one on each side of the aircraft behind the landing-gear fairings, or exit off the rear ramp for free fall airdrops.

The C-130 can deliver personnel, equipment or supplies either by landing or by various aerial delivery modes. Three primary methods of aerial delivery are used for equipment. In the first, parachutes pull the load, weighing up to 42,000 pounds, from the aircraft. When

the load is clear of the plane, cargo parachutes inflate and lower the load to the ground.

The second method, called the Container Delivery System, uses the force of gravity to pull from one to 16 bundles of supplies from the aircraft. When the bundles, weighing up to 2,200 pounds each, are out of the aircraft, parachutes inflate and lower them to the ground.

The Low Altitude Parachute Extraction System is the third aerial delivery method. With LAPES, up to 38,000 pounds of cargo is pulled from the aircraft by large, inflated cargo parachutes while the aircraft is five to 10 feet above the ground. The load then slides to a stop within a very short distance. Efforts are underway to increase the maximum load weights for LAPES aerial delivery to 42,000 pounds.

The crew for airlift missions is usually five: two pilots, a navigator, a flight engineer and a loadmaster. For aerial delivery missions, a second loadmaster is added. Crews on variants of the C-130 differ according to mission. The flight deck and cargo compartment are pressurized and air-conditioned for crew and passenger comfort as well as for protection of delicate cargo.

Avionics on board the C-130 include HF, VHF and UHF communication systems, transponder, automatic direction finder, search radar, doppler navigation system and radar altimeter. By the early 1990s all C-130s will have an inertial navigation system.

Each of four turboprop engines drive a four-blade, constant-speed, reversible-pitch propeller with full feathering capability. The C-130E/H carries 6,700 gallons of fuel in six integral wing tanks. Under each wing of the C-130E/H is an external pylon fuel tank with a capacity of 1,300 gallons. A pressure refueling point is in the aft side wheel well fairing for ground refueling.

The hydraulically operated, retractable, tricycle-type landing gear has two wheels in tandem on each main unit and a steerable nose wheel. Nose wheel steering, combined with forward or reverse thrust from any engine, permits ground turns to be made in a relatively small radius. Up to eight jet-assisted takeoff units can be carried behind the main landing gear fairings. The Hercules can operate on as little as 3,000 feet of dirt runway and, as a result, was used extensively during the conflict in Southeast Asia.

Its ability to use relatively short semiprepared runways, and to airdrop personnel and cargo makes the C-130 ideally suited for disaster relief missions. C-130s have flown to crisis areas around the world to deliver food, clothing, shelter, and medical personnel and supplies, and to fly victims out of the disaster area. Some Air National Guard and Air Force Reserve C-130s are equipped to combat forest fires. A modular airborne fire-fighting system, filled with a fire-retardant mixture, is loaded aboard the C-130B, then pressurized. This modular system can spray 3,000 gallons of the fire-retardant mixture over an area 125 feet wide and one-half mile long in just 10 seconds.

Models

The C-130A was first flown on April 7, 1955, and joined the U.S. Air Force inventory in December 1956. The A models are now flown by Air National Guard, Air Force Reserve and Air Force Systems Command units throughout the United States.

The C-130B entered service in June 1959. The B model carries additional fuel in the wings, and has upgraded engines and strengthened landing gear. Both the Air National Guard and Air Force Reserve fly this model.

Several A models, redesignated C-130D, were modified with wheel-ski landing gear for service in the Arctic and for resupply missions to units along the Distant Early Warning line. The two main skis are 20 feet long, six feet wide, and weigh about 2,000 pounds each. The nose ski is 10 feet long and six feet wide. The D model also has increased fuel capacity and provision for jet-assisted takeoff. The D models were flown by the Air National Guard and were recently replaced with C-130H models.

The first C-130E, an extended-range development of the C-130B, was delivered in April 1962. This model has two underwing fuel tanks and increased range and endurance capabilities. Military Airlift Command is the primary user, with more than 200 E models. The Air Force Reserve and Air National Guard also fly the E model.

Similar to the E model, the C-130H has upgraded engines, a redesigned outer wing and other minor improvements. Delivery of the H model began in April 1975. Units in Military Airlift Command, the Air National Guard and Air Force Reserve are equipped with this model. The H model is still in production.

Variants

The AC-130A/H gunship is modified to perform close-air support, armed reconnaissance and air interdiction missions. The A-model gunships are armed with two 7.62mm miniguns, two 20mm Vulcan cannons and two 40mm Bofors cannons. The AC-130A models are operated by the 919th Special Operations Group at Eglin Air Force Base, Fla. The 10 active-duty H models, flown by Military Airlift Command's special operations forces, have one of the 40mm cannons replaced by a 105mm howitzer. The gunships, nicknamed Spectre, were used extensively, beginning in 1968, in the conflict in Southeast Asia. The Air Force has approved the procurement of 12 new gunships which should enter the inventory as the A models retire.

Several C-130E models have been modified and designated EC-130E to perform two different missions: electronic countermeasures support and airborne command and control. In its electronic warfare role the EC-130E has a large blade antenna under each outer

wing and above the dorsal fin. A smaller horizontal blade antenna is on each side of the rear fuselage. Bullet-shaped canisters located outboard of each underwing antenna and at the tail end of the aircraft house wire antennas that can be extended several hundred feet behind the EC-130E during a flight. The crew is normally made up of two pilots, a navigator, flight engineer, loadmaster, electronic warfare officer and six electronic equipment operators. Four EC-130E's are flown in an electronic countermeasures support role by the Air National Guard.

As an airborne command post, the EC-130E is configured to accept a battlefield command and control center capsule that fits into the cargo compartment. The capsule is 40 feet long and weighs about 20,000 pounds. It contains 16 airborne battle staff positions and has UHF, VHF, HF and FM radios, secure teletype and voice communication systems and automatic radio relay. The aircraft also has additional external antennas and air conditioning, and can be refueled in flight. The battle staff on board the EC-130E can control tactical air operations and functions as a direct extension of ground-based command and control facilities. A Tactical Air Command squadron flies the EC-130E airborne command post.

The HC-130H N/P are extended-range search and recovery variants with upgraded engines and equipment for the recovery of air crews and retrieval of space hardware. The HC-130s also have advanced direction-finding equipment and an air-to-air recovery system. Other search and recovery equipment includes rafts, litters, flare launchers and air-droppable survival equipment. The HC-130N and P models can refuel HH-3 and HH-53 helicopters in flight. Military Airlift Command, Air Force Systems Command, Air National Guard and the Air Force Reserve have HC-130s. All HC-130H's are being upgraded to HC-130P's in order to increase rotary wing air-fueling capability.

The MC-130 is modified for special operations missions. The aircraft, also known by its project name Combat Talon, is used primarily for infiltration and exfiltration missions and to resupply ground special operations forces. It can be refueled in flight and is equipped with terrain-following radar, inertial navigation system, high-speed aerial delivery system and the surface-to-air Fulton recovery system. MC-130E's are assigned to Military Airlift Command at Hurlburt Field, Fla.; Clark Air Base, Philippines; and Rhein-Main Air Base, West Germany. Due to operational requirements, efforts are being made to obtain 24 MC-130H Combat Talon II aircraft to increase special operations capability.

Another modification, the WC-130E/H, is used in weather reconnaissance and aerial sampling. The plane is modified to penetrate hurricanes and typhoons to collect meteorological data that make advanced warnings of such storms possible. Weather reconnaissance equipment gathers information on movement, intensity and size of storms; outside air temperature; humidity; dewpoint; and barometric pressure. WC-130s are assigned to active and Reserve units at Keesler Air Force Base, Miss.

The C-130 Hercules is also used by the U.S. Navy, Marine Corps and Coast Guard. More than 50 foreign countries, including Australia, Brazil, Canada, England, Norway, Saudi Arabia and Turkey, have bought variations of the C-130.

Specifications (C-130H)

Primary function: theater tactical airlift
Prime contractor: Lockheed-Georgia Co.
Power plant/manufacturer: four Allison T56-A-15 turboprop engines
Horsepower: 4,300 shaft horsepower
Dimensions: wingspan 132 ft. 7 in., length 97 ft. 9 in., height 38 ft. 3 in.
Speed: 386 mph with 155,000 lb. takeoff weight
Ceiling: above 25,000 ft.
Range: 2,500 miles with 25,000 lb. cargo, 5,200 miles with no cargo
Load: 47,000 lb. cargo, 92 troops, 64 paratroops or 74 litter patients with two attendants
Crew: five (two pilots, a navigator, flight engineer and loadmaster)
Maximum takeoff weight: 155,000 lb.
Status: operational

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United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

88-16

C-141B Starlifter

The C-141 Starlifter transport provides rapid long-range airlift. It was the first jet aircraft designed to meet military airlift needs for a troop and cargo carrier. The Starlifter has been the workhorse of the military airlift forces since it joined the Air Force in 1965. The C-141 and C-5 Galaxy form the Air Force's strategic airlift force with the C-141 carrying troops and less bulky, lighter-weight vehicles and equipment.

The Starlifter, operated by the Military Airlift Command, can airlift combat forces, equipment and supplies, and deliver them on the ground or by airdrop, using paratroop doors on each side and a rear loading ramp. It can be used for low-altitude delivery of paratroops and equipment, and high-altitude delivery of paratroops. It also can airdrop equipment and supplies using the container delivery system. Additionally, it is the first aircraft designed to be compatible with the 463L Material Handling System, which permits off-loading 68,000 pounds of cargo, refueling and reloading a full load, all in less than an hour.

The C-141 has an all-weather landing system, pressurized cabin and crew station. Its cargo compartment can be easily modified to perform about 30 different missions. About 200 troops or 155 fully equipped paratroops can sit in canvas side-facing seats, or 166 troops in rear-facing airline seats. Rollers in the aircraft floor allow quick and easy cargo pallet loading. A palletized lavatory and galley can be installed quickly to accommodate passengers, and when palletized cargo is not being carried, the rollers can be turned over to leave a smooth, flat surface for loading vehicles.

In its aeromedical evacuation role, the Starlifter can carry about 103 litter patients, 113 ambulatory patients or a combination of the two. It provides rapid transfer

of the sick and wounded from remote areas overseas to hospitals in the United States.

The first C-141A, delivered to Tinker Air Force Base, Okla., in October 1964, began squadron operations in April 1965. Soon almost-daily flights were made by Starlifters to Southeast Asia, carrying troops, equipment and supplies, and returning patients back to U.S. hospitals.

Several C-141s have been modified to carry the Minuteman intercontinental ballistic missile in its special container, up to a total weight of 92,000 pounds. Some C-141s have been equipped with Intraformation Positioning Sets that enable a flight of two to 36 aircraft to maintain formation regardless of visibility.

The C-141 was the first jet transport from which U.S. Army paratroopers jumped, and the first to land in the Antarctic. A C-141 established a world record for heavy cargo drops of 70,195 pounds.

To expand its capabilities, all C-141A models were modified to lengthen the fuselage, increasing cargo capacity by 30 percent, and to add in-flight refueling, reducing dependence on overseas airfields as well as permitting longer non-stop flights with increased payloads.

The first C-141B was received by the Air Force in December 1979. Conversion of the 270 C-141s from A to B models was completed in 1982.

The Air Force Reserve, through its associate units, provides 50 percent of the Starlifter's airlift crews, 40 percent of its maintenance capability and flies more than 30 percent of Military Airlift Command's peacetime worldwide missions.

The first Air National Guard and Air Force Reserve units to receive the C-141 as unit equipment became operational in fiscal year 1987. The units are located at Jackson, Miss., and Andrews Air Force Base, Md.

Specifications

Primary function: long-range troop and cargo airlift
Prime contractor: Lockheed-Georgia Co.
Power plant/manufacturer: four Pratt and Whitney TF33-P-7 turbofan engines
Thrust: 20,250 lb. each engine
Dimensions: wingspan 160 ft., length 168 ft. 4 in., height 39 ft. 3 in.
Speed: 500 mph cruising speed at 25,000 ft.
Range: unlimited with in-flight refueling
Crew: five (pilot, co-pilot, loadmaster, two flight engineers)
Maximum takeoff weight: 323,100 lb.
Status: operational

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United States Air Force
Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

88-6

E-3 Sentry (AWACS)

The E-3 Sentry aircraft is an airborne warning and control system (AWACS). It provides all-weather surveillance, command, control and communications needed by commanders of U.S. and NATO tactical and strategic air defense forces.

The E-3 Sentry is a modified Boeing 707 commercial airframe with a rotating radar dome. The dome is 30 feet in diameter and 6 feet thick, and is held 11 feet above the fuselage by two struts. It contains a radar system that permits surveillance from the Earth's surface up into the stratosphere, over land or water. The radar has a range of more than 200 miles for low-flying targets and farther for aerospace vehicles flying at medium to high altitudes. It can look down to detect, identify and track enemy and friendly low-flying aircraft by eliminating ground clutter returns that confuse other radar systems.

Other major subsystems on the Sentry are navigation, identification friend or foe (IFF), and communications and data processing. Consoles display computer-processed data in graphic and tabular format on television screens. Console operators perform surveillance, identification, weapons control, battle management and communications functions.

The radar and computer systems on the E-3 Sentry can gather and present broad and detailed battlefield information. Data is collected as events occur. This includes position and tracking information on enemy aircraft and ships, and location and status of friendly aircraft, naval vessels and ground troops. The information can be sent to major command and control centers in rear areas or aboard ships. In time of crisis, this data can be forwarded to the National Command Authorities in the United States.

In its tactical role, the E-3 Sentry can provide information needed for interdiction, reconnaissance, airlift and close-air support for friendly ground forces. It also can provide information for commanders of air operations to gain and maintain control of the air battle.

As an air defense system, the E-3 Sentry can detect, identify and track airborne enemy forces far from the boundaries of the United States or NATO countries. It can direct fighter-interceptor aircraft to these enemy targets.

Experience has proven that the E-3 Sentry can respond quickly and effectively to a crisis and support worldwide military deployment operations. It is a jam-resistant system that has performed missions under extreme electronic countermeasure conditions.

The E-3 Sentry is a flexible and survivable system. With its mobility as an airborne warning and control system, it has a greater chance of surviving in warfare than a fixed, ground-based radar system. Among other things, the plane's flight path can be changed according to mission and survival requirements.

The E-3 Sentry can fly at high speeds more than 11 hours without refueling. Its range and on-station time can be increased through use of in-flight refueling and the on-board crew rest area.

U.S. Customs Service officers may fly aboard the E-3 Sentry on precoordinated missions to detect smuggling activities.

Engineering and test evaluation began on the first E-3 Sentry in October 1975. The 552nd Airborne Warning and Control Wing at Tinker Air Force Base, Okla., received the first E-3 Sentry in March 1977. Thirty-three E-3 Sentries are assigned to the 552nd Wing; some, however, are deployed to separate operating locations in the United States and overseas. NATO has acquired 18 of the aircraft and support equipment. The first E-3 Sentry was delivered to NATO in January 1982.

Specifications

Primary function: airborne surveillance, command, control and communications
Prime contractor: Boeing Aerospace Co.
Power plant/manufacturer: four Pratt & Whitney TF33-PW-100A turbofan engines
Thrust: 21,000 lb. each engine
Dimensions: airframe — wingspan 130 ft. 10 in., length 145 ft. 6 in., height 41 ft. 4 in.; rotodome — 30 ft. diameter, 6 ft. thick, mounted 11 ft. above fuselage
Speed: more than 500 mph
Ceiling: above 29,000 ft.
Endurance: more than 11 hours (unrefueled)
Armament: none
Crew: flight crew of four plus 13-19 specialists (number of specialists varies according to mission)
Maximum takeoff weight: 325,000 lb.
Status: operational

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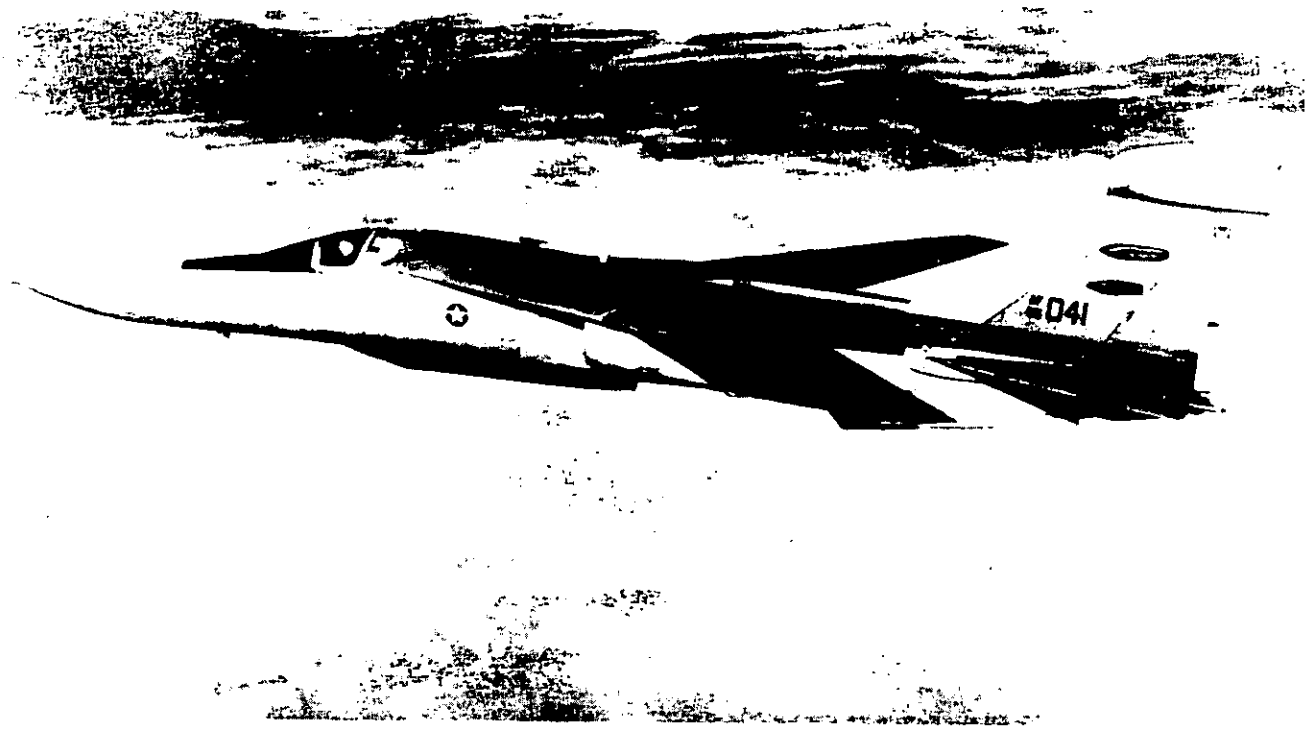
United States Air Force
Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

88-15



EF-111A Raven

The EF-111A Raven is designed to provide electronic countermeasures support for tactical air forces. The EF-111A can detect, sort and identify different enemy radars observing an attack force and make the threat radars ineffective, thereby preventing interception of the attack force by hostile air defenses.

The EF-111A is a modified F-111A. The F-111A is well-suited for modification to the role of an airborne electronic warfare platform because of its structural strength, maneuverability and performance — including the ability to penetrate enemy airspace and escape at supersonic speed. Because the aircraft is already available from the U.S. Air Force inventory, EF-111A production costs are greatly reduced.

Exterior modifications to convert the F-111A to EF-111A standards include a narrow canoe-shaped radome, about 16 feet long, on the underside of the fuselage. This houses antennas for the high-powered jamming transmitters. Also, a fin-tip pod is mounted on the reinforced vertical stabilizer to house the receiving antennas and ancillary equipment, including a processor to detect hostile radar emissions. The total weight of this equipment is about 3.5 tons.

Other modifications of the original F-111A structure include: general structural reinforcement, an improved environmental cooling system and equipment for increased electrical output.

The cockpit of the Raven also has been rearranged. The right-seat crew member — the electronic warfare officer — no longer performs flight-related duties. Flight controls have been removed from the right-hand cockpit, and the aircraft's navigation equipment has been relocated to allow access by both crew members. The resulting space is used for controls and displays of the

aircraft's electronic jamming equipment. The electronic warfare officer, through computer management, operates and monitors these systems, which previously would have required several operators and more equipment.

The primary electronic countermeasures unit is the AN ALQ-99E jamming subsystem. It is an improved version of the U.S. Navy's ALQ-99 jamming subsystem and includes 10 transmitters, five exciters and one radio frequency calibrator. Improvements to the Navy version include: capability for more rapid identification and detection of enemy transmissions, greater automation and less reliance on human involvement and manual operations, expanded computer functions to provide more sophisticated and flexible jamming options, and more independent jamming signals over a wider range of frequencies. The EF-111A's system also offers greater speed and capacity in locating and identifying uncharted radars, and defeating them.

The AN ALQ-99E detects radar signals, processes them and compares them to known threat radar characteristics stored in an onboard computer. Jamming subsystem receivers scan across frequency bands under computer or manual control. When threats are identified, appropriate countermeasures are initiated either automatically by computer or with the electronic warfare officer's assistance.

Information about new threats, not in the memory of the computer, can be fed into the system either through entries on the electronic warfare officer's keyboard in the cockpit or by programming the computer via a cassette which is plugged directly into the plane. Changing the programming takes only about five minutes if plug-in models are used. The electronic warfare officer can test the information and, if necessary, make corrections using the keyboard and display unit in the cockpit.

The self-protection subsystem is designed to protect the EF-111A against radar-directed anti-aircraft artillery, and missile or aircraft threats.

The EF-111A provides protection to tactical forces in three ways. In its standoff jammer role, the aircraft orbits outside enemy territory. From there, safely out of range of enemy ground-based weapons, EF-111A jamming systems screen the routes of friendly attack aircraft.

In its penetration role, the EF-111A flies along with the attack force through critical phases of its mission, providing countermeasures as required to protect friendly aircraft from surveillance and acquisition radars.

The close-in jamming role calls for the EF-111A to neutralize enemy battlefield acquisition radars while the attack force delivers its attack on enemy armor. The EF-111A can also screen marshaling aircraft over a friendly area.

In a typical mission, several orbiting EF-111A's could use their vast jamming power to create an electronic barrier masking the movement of friendly attack aircraft. By preventing the enemy from monitoring these aircraft, friendly aircraft are able to refuel, regroup and begin another attack, undetected by enemy radar.

The program to convert several F-111A's to EF-111A electronic warfare prototypes, and to evaluate their ability to provide electronic countermeasures jamming coverage for air attack forces, was initiated in 1972.

The Grumman Aerospace Corporation was awarded a contract to convert two existing F-111A's to EF-111A prototype configuration in January 1975. The first prototype flew in March 1977, the second in May 1977. Flight-testing by Grumman continued for about four months, and then the second prototype was turned over to the Air Force for additional testing. The Air Force tests verified various mission operational concepts and the jammer's electromagnetic compatibility with attack aircraft. These later tests dispelled an earlier concern that the friendly attack force, as well as enemy threats, might be jammed by the powerful signals emanating from the EF-111A.

The first production EF-111A flew in June 1981 and was delivered to Tactical Air Command's 388th Electronic Combat Squadron, now the 390th Electronic Combat Squadron, at Mountain Home Air Force Base, Idaho, in November 1981. A total of 42 EF-111A's are currently in the Air Force inventory. The final EF-111A was delivered to Mountain Home Air Force Base in November 1985. EF-111A's are stationed at Mountain Home Air Force Base and Royal Air Force Upper Heyford, England.

Specifications

Prime function: electronic countermeasures support
Prime contractor: Grumman Aerospace Corp.
Power plant/manufacturer: two Pratt & Whitney TF30-P-3 turbofan engines. Converting to P-109 engines.
Maximum thrust: 21,000 lb. class each engine
Range: 2,000 miles
Speed: over Mach 2.2 at 40,000 ft.
Ceiling: up to 50,000 ft.
Crew: two (pilot, electronic warfare officer)
Dimensions: wingspan (fully extended) 63 ft., length 76 ft., height 20 ft.
Maximum takeoff weight: 89,000 lb.
Status: operational

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Fact Sheet

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

89-08

F-4 Phantom II

The F-4 Phantom II is a twin-engine, all-weather, tactical fighter-bomber. The aircraft can perform three tactical air roles – air superiority, interdiction and close air support – as it did in Southeast Asia during the Vietnam conflict.

The F-4 operates at speeds of more than 1,600 miles per hour and can be flown to altitudes close to 60,000 feet. Flight speeds from 150 to 165 miles per hour, necessary for short landing field operations, are made possible by the use of high-lift flaps and boundary layer control techniques. All F-4 models have folding wings for easy aircraft storage and ground handling.

Inventory

Currently, more than 1,000 F-4s are in the Air Force inventory. They are assigned to the Tactical Air Command, United States Air Forces in Europe, Pacific Air Forces, Air National Guard and Air Force Reserve. The active Air Force flies the F-4G Wild Weasel. The Air National Guard flies the C, D and E models, while the Air Force Reserve flies the D and E models.

The **F-4G** Wild Weasel models of the active Air Force increase the survivability of tactical strike forces by seeking out and suppressing or destroying enemy radar-

directed anti-aircraft artillery batteries and surface-to-air missile sites. They are E models modified with sophisticated electronic warfare equipment in place of the internally mounted 20mm gun. The F-4G can carry more weapons than previous Wild Weasel aircraft – a greater variety of missiles as well as conventional bombs.

Primary weapons in the F-4G include Rockeye cluster bombs, air-to-surface missiles such as Shrike, HARM (high-speed anti-radiation missile) and Maverick, and air-to-air missiles.

The first F-4G Wild Weasel was delivered to George Air Force Base, Calif., in 1978.

Other Models

The **F-4C** first flew for the Air Force in May 1963 and the Air National Guard began flying the F-4C in January 1972. The Air Force Reserve received its first Phantom II in June 1978.

The **F-4D** model, with major changes that increase accuracy in weapons delivery, was delivered to the Air Force in March 1966, to the Air National Guard in 1977 and to the Air Force Reserve in 1980.

The first **F-4E** was delivered to the Air Force in October 1967. The Air National Guard received its first F-4E in 1985, the Air Force Reserve in 1987. This model, with an additional fuselage fuel tank, leading-edge slats for increased maneuverability, and an improved engine, also has an internally mounted 20mm multibarrel gun with improved fire-control system.

Starting in 1973, F-4E's were fitted with target-identification systems for long-range visual identification of airborne or ground targets. Each system is essentially a television camera with a zoom lens to aid in positive identification.

Current updating modifications on F-4E include the Pave Tack system, which provides day and night all-weather capability to acquire, track and designate ground targets for laser, infrared and electro-optically guided weapons. Another change in this model is a digital intercept computer that includes launch computations for all AIM-9 Sidewinder and AIM-7 Sparrow air-to-air missiles. Additionally, on some models the new digital ARN-101 navigation system has replaced the LN-12 inertial navigation system.

Specifications

Primary function: all-weather tactical fighter-bomber
Prime contractor: McDonnell Aircraft Co., McDonnell Douglas Corp.
Power plant/manufacturer: two General Electric turbojet engines with afterburners, F-4C/D – J79-GE-15, F-4E/G – J79-GE-17
Thrust: each engine with afterburner, F-4C/D – 17,000 lb., F-4E/G – 17,900 lb.
Dimensions: wingspan 38 ft. 11 in., height 16 ft. 5 in., length F-4C/D – 58 ft., 3 in. F-4E/G – 62 ft. 11 in.
Speed: more than Mach 2 at 40,000 ft.
Ceiling: approximately 60,000 ft.
Range: beyond 1,300 miles with typical tactical load
Crew: two – pilot and weapon systems operator
Maximum takeoff weight: 58,000 lb.
Armament: F-4C/D – four AIM-7E Sparrow and four AIM-9 Sidewinder missiles, provisions for 20mm gun pods at fuselage centerline station or outboard pylons, and one fuselage centerline bomb rack and four pylon bomb racks capable of carrying up to 12,500 lbs. of general purpose bombs; nuclear weapon capability; F-4E – one 20mm M61A-1 multibarrel gun, four AIM-7 Sparrow and four AIM-9 Sidewinder missiles, and one fuselage centerline bomb rack and four pylon bomb racks capable of carrying 12,500 lbs. of general purpose bombs; F-4G – same as F-4E except gun removed, and Shrike and HARM capability added
Status: operational

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United States Air Force

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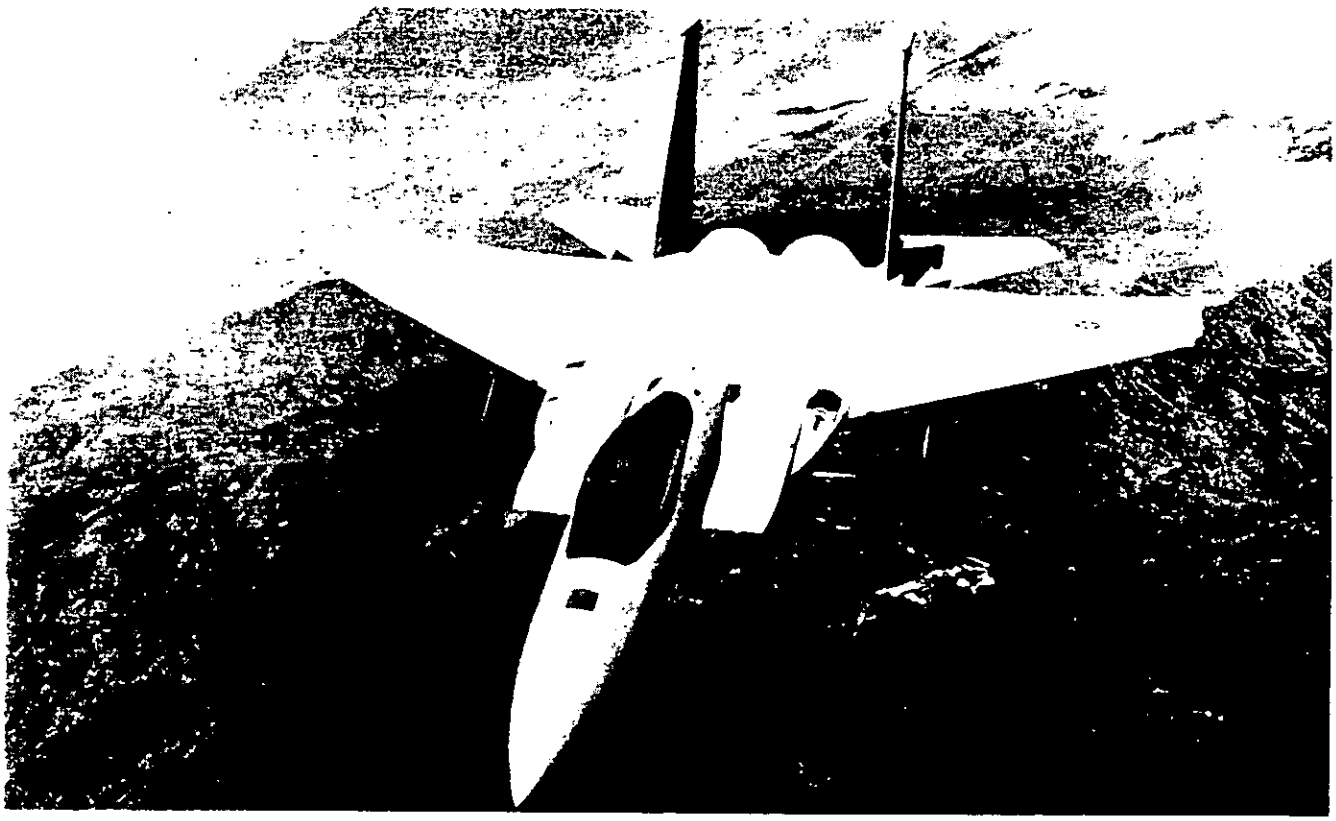
89-14



F-15 Eagle

The F-15 Eagle is an all-weather, extremely maneuverable, tactical fighter designed to gain and maintain air superiority in aerial combat. It can outperform and outfight any current or projected enemy aircraft and penetrate enemy defenses.

The Eagle's air superiority is achieved through a mixture of unprecedented maneuverability and acceleration, range, weapons and avionics. The F-15 has electronic systems and weaponry to detect, acquire, track and attack enemy aircraft while operating in friendly or enemy-controlled airspace. Its weapons and flight control systems are designed so one man can safely and effectively perform air-to-air combat.

The F-15's superior maneuverability and acceleration are achieved through high engine thrust-to-weight ratio and low wing loading. It is the first U.S. operational aircraft whose engines' thrust exceeds the plane's loaded weight, permitting it to accelerate even in a vertical climb. Low wing loading (the ratio of aircraft weight to its wing area) is a vital factor in maneuverability and, combined with the high thrust-to-weight ratio, enables the aircraft to turn tightly without losing airspeed.

The multimission avionics system sets the F-15 apart from other fighter aircraft. It includes a head-up display, advanced radar, inertial navigation system, flight instruments, UHF communications, tactical navigation system and instrument landing system. It also has an internally mounted, tactical electronic-warfare system, "identification friend or foe" system, electronic countermeasures set and a central digital computer.

The head-up display projects on the windscreen all essential flight information gathered by the integrated avionics system. This display, visible in any light condition, provides the pilot information necessary to track and destroy an enemy aircraft without having to look down at cockpit instruments.

The F-15's versatile pulse-Doppler radar system can look up at high-flying targets and down at low-flying targets without being confused by ground clutter. It can detect and track aircraft and small high-speed targets at distances beyond visual range down to close range, and at altitudes down to tree-top level. The radar feeds target information into the central computer for effective weapons delivery. For close-in dog fights, the radar automatically acquires enemy aircraft, and this information is projected on the head-up display.

The inertial navigation system enables the Eagle to navigate anywhere in the world. It gives the position of the aircraft at all times as well as pitch, roll, heading, acceleration and speed information.

The F-15's tactical electronic warfare system provides both threat warning and automatic countermeasures against selected threats.

The "identification friend or foe" system informs the pilot if an aircraft seen visually or on radar is friendly. It also informs U.S. or allied ground stations and other suitably equipped aircraft that the F-15 is a friendly aircraft.

Weaponry

A variety of air-to-air weaponry can be carried by the F-15. An automated weapon system enables the pilot to perform aerial combat safely and effectively, using the head-up display and the avionics and weapons controls located on the engine throttles or control stick. When the pilot changes from one weapon system to another, visual guidance for the required weapon automatically appears on the head-up display.

The Eagle can be armed with three different air-to-air weapons: four AIM-7F/M Sparrow missiles on its lower fuselage corners, four AIM-9L/M Sidewinder missiles on two pylons under its wings and an internal 20mm Gatling gun (with 940 rounds of ammunition) in the right wing root.

Low-drag, conformal fuel tanks were especially developed for the F-15C and D models. Conformal fuel tanks can be attached to the sides of the engine air intake trunks under each wing and are designed to the same load factors and airspeed limits as the basic aircraft. Each conformal fuel tank contains about 114 cubic feet of usable space. These tanks reduce the need for in-flight refueling on global missions and increase time in the combat area. All external stations for munitions remain available with the tanks in use. AIM-7F/M Sparrow missiles, moreover, can be attached to the corners of the conformal fuel tanks.

History

The first flight of the F-15A was made in July 1972, and the first flight of the two-seat F-15B (formerly TF-15A) trainer was made in July 1973. The first Eagle (F-15B) was delivered in November 1974 to the 58th Tactical Training Wing, Luke Air Force Base, Ariz., where pilot training is accomplished in both F-15A and B aircraft. In January 1976, the first Eagle destined for a combat squadron was delivered to the 1st Tactical Fighter Wing, Langley Air Force Base, Va.

Other units equipped with F-15s include the 36th Tactical Fighter Wing, Bitburg Air Base, West Germany; 49th Tactical Fighter Wing, Holloman Air Force Base, N.M.; 32nd Tactical Fighter Squadron, at Soesterberg, Netherlands; and the Alaskan Air Command, at Elmendorf Air Force Base. In January 1982, the 48th Fighter-Interceptor Squadron at Langley Air Force Base became the first Air Force air defense squadron to transition to the F-15.

The single-seat F-15C and two-seat F-15D models entered the Air Force inventory beginning in 1979. Kadena Air Base, Japan, received the first F-15C in September 1979. These new models have Production Eagle Package (PEP 2000) improvements, including 2,000 pounds of additional internal fuel, provision for carrying exterior conformal fuel tanks and increased maximum takeoff weight of up to 68,000 pounds.

Six of the eight world time-to-height records set in 1975 by the F-15A, Project Streak Eagle, remain unbeaten. These include a climb to 65,616 feet in 2 minutes, 2.94 seconds.

Specifications (F-15C)

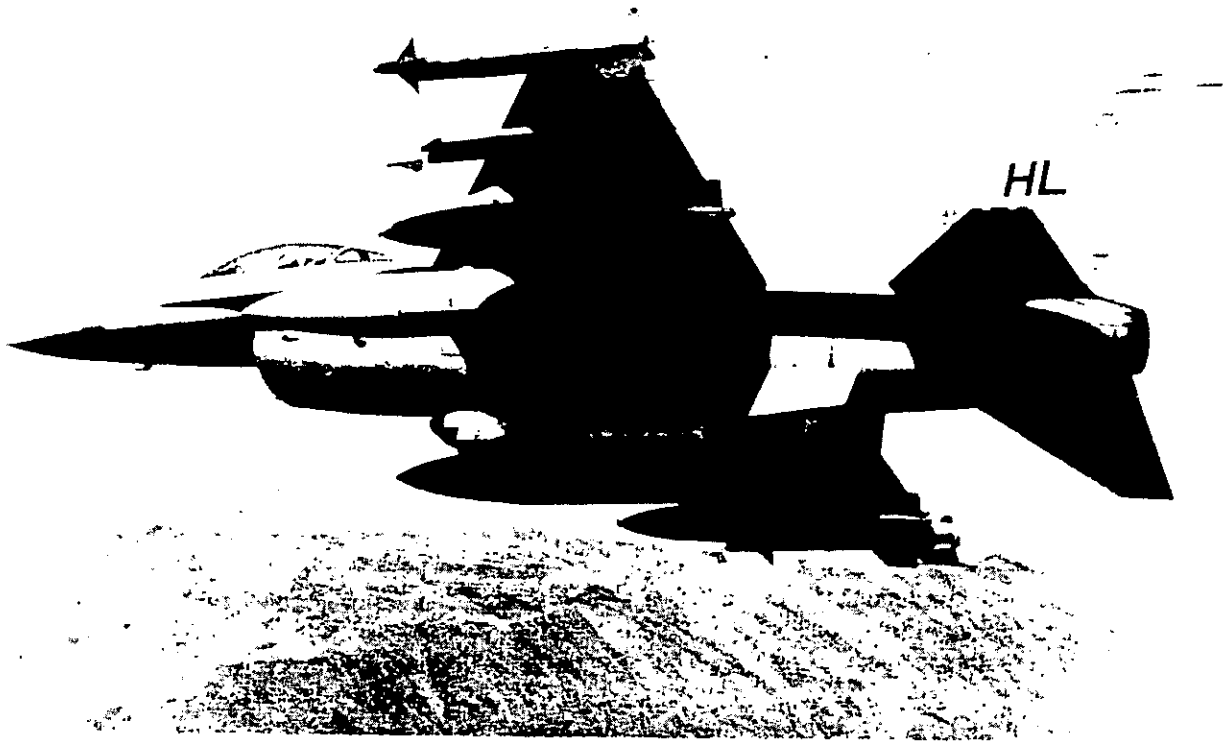
Primary function: air superiority tactical fighter
Prime contractor: McDonnell Douglas Corp.
Power plant/manufacturer: two Pratt & Whitney F 100-PW-100 turbofan engines with afterburners
Thrust: 25,000 lb. each engine
Dimensions: wingspan 42 ft. 9 3/4 in., length 63 ft. 9 in., height 18 ft. 7 1/2 in.
Speed: Mach 2.5 plus
Combat ceiling: 65,000 ft.
Range: 3,450 miles ferry range with conformal fuel tanks and three external fuel tanks
Crew: one
Armament: one M-61A1 20mm multibarrel gun mount internally with 940 rounds of ammunition, four AIM-9L/M Sidewinder and four AIM-7F/M Sparrow missiles
Maximum takeoff weight: 68,000 lb.
Status: operational

Fact Sheet

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

89-13



F–16 Fighting Falcon

The F-16 Fighting Falcon is a compact, multirole fighter aircraft. Its highly maneuverable design has proven itself in air-to-air combat and air-to-surface attack. This aircraft provides a relatively low-cost, high-performance weapon system for the air forces of the United States and allied nations.

In an air combat role, the F-16's maneuverability and combat radius (distance it can fly to enter air combat, stay, fight, and return) exceed that of all potential threat fighter aircraft. It can locate targets in all weather conditions and detect low flying aircraft in radar ground clutter. In an air-to-surface role, the F-16 can fly more than 500 miles, deliver its weapons with superior accuracy, defend itself against enemy aircraft, and return to its starting point. An all-weather capability allows it to accurately deliver ordnance during non-visual bombing conditions.

In designing the F-16, advanced aerospace science and proven reliable systems from other aircraft — such as the F-15 and F-111 — were selected. These were combined to simplify the airplane and reduce its size, purchase price, maintenance costs and weight. The light weight of the fuselage is achieved without reducing its strength. The F-16 can withstand up to nine G's (nine times the force of gravity) with internal fuel tanks filled — greater than any other current fighter aircraft.

The cockpit and its bubble canopy are designed to give the pilot unobstructed forward and upward vision, and greatly improved vision over the side and to the rear. The seat-back angle was expanded from the usual

13 degrees to 30 degrees, increasing pilot comfort and G-force tolerance.

The pilot has excellent flight control of the F-16 through its "fly-by-wire" system. Electrical wires relay commands, replacing the usual cables and linkage controls. For easy and accurate control of the aircraft during high G-force combat maneuvers, a side stick controller is used instead of the conventional center-mounted stick. Hand pressure on the side stick controller sends electrical signals to actuators of flight control surfaces such as ailerons and rudder.

Avionics systems include a highly accurate inertial navigation system in which a computer provides steering information to the pilot. The plane has UHF and VHF radios plus an instrument landing system. It also has a warning system and modular countermeasure pods to be used against airborne or surface electronic threats. The fuselage has space for additional avionics systems.

The F-16A, a single-seat model, first flew in December 1976. The first operational F-16A was delivered in January 1979 to the 388th Tactical Fighter Wing at Hill Air Force Base, Utah.

The F-16B, a two-seat model, has two tandem cockpits that are about the same size as the one in the A model. Its bubble canopy extends to cover the second cockpit. To make room for the second cockpit, the forward fuselage fuel tank and avionics growth space were reduced. During training the forward cockpit is used by a student pilot with an instructor pilot in the rear cockpit.

All F-16s delivered since November 1981 have built-in structural and wiring provisions and systems architecture that permit expansion of the multirole flexibility to perform precision strike, night attack and beyond-visual-range interception missions. This improvement program led to the F-16C and F-16D aircraft, which are the single- and two-place counterparts to the F-16A/B, and incorporate the latest cockpit control and display technology.

Later models of F-16C/D aircraft will have two advanced systems — Low-altitude Navigation and Targeting Infrared for Night (LANTIRN) and Global Positioning System. Night and weather penetration, mobile target detection and track, rapid employment of Maverick missiles, and highly accurate range estimation and destination for precision attack of fixed targets are other sophisticated components available with the LANTIRN system. Global Positioning System increases accuracy of position, velocity and time information, and enables accurate all-weather coordinate bombing. Currently, most active units have converted to the F-16C/D while existing F-16A/B aircraft will replace older aircraft in the Air National Guard and Air Force Reserve.

The F-16 is being built under an unusual agreement creating a consortium between the United States and four NATO countries — Belgium, Denmark, the Netherlands and Norway. These countries co-produced with the United States an initial 348 F-16s for their air forces. Final airframe assembly lines were located in Belgium and the Netherlands. The consortium's F-16s are assembled from components manufactured in all five countries. Belgium also provides final assembly of the F100 engine used in the European F-16s. The long-term benefits of this program will be technology transfer among the nations producing the F-16, and a common-use aircraft for NATO nations. Through this program the supply and availability of repair parts in Europe is increased and improves the F-16's combat readiness.

Specifications

Primary function: fighter, attack
Prime contractor: General Dynamics Corp.
Power plant/manufacturer: F-16A/B — one Pratt & Whitney F100-PW-200 turbofan engine with afterburner; F-16C/D — one Pratt & Whitney F100-PW-200/220 or General Electric F110-GE-100 turbofan engine with afterburner
Thrust: F-16A/B — 24,000 lbs., F-16C/D — 27,000 lbs. (Big Inlet model)
Dimensions: wingspan 32 ft. 8 in., length 49 ft. 5 in., height 16 ft.
Speed: Mach 2 class
Combat ceiling: above 50,000 ft.
Range: more than 2,000 miles ferry range
Crew: F-16A — one, F-16B — two
Armament: one M-61A1 20mm multibarrel cannon with 500 rounds; external stations can carry up to six AIM-9 infrared missiles, conventional air-to-air and air-to-surface munitions and electronic countermeasure pods
Maximum takeoff weight: 37,500 lb.
Status: operational

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Fact Sheet

United States Air Force

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89-11

F-111

The F-111 is a tactical strike aircraft that can fly at supersonic speeds and operate from tree-top level to altitudes above 60,000 feet. It has variable-sweep wings, allowing the pilot to fly from slow approach speeds to supersonic velocity at sea level and more than twice the speed of sound at higher altitudes. Wing angles from 16 degrees (full forward) to 72.5 degrees (full rear sweep) are possible. Full-forward wings give the most surface area and maximum lift for short takeoff and landing. The F-111 does not need a drag chute or reverse thrust to slow down after landing.

The crew of two sit side-by-side in an air-conditioned, pressurized cockpit module that can serve as an emergency escape vehicle and as a survival shelter on land or water. In emergencies, both crew members remain in the cockpit and an explosive cutting cord will separate the cockpit module from the fuselage. A rocket motor then sends it up and away from the aircraft, and the module descends by parachute. The ejected module includes a small portion of the wing fairing to stabilize it during aircraft separation. Airbags cushion impact and help keep the module afloat if it lands in water. The module can be released at any speed or altitude, even under water. For underwater escape, the airbags raise the module to the surface after it has been severed from the plane.

The F-111's wings and much of the fuselage behind the crew module contain fuel tanks. Using internal fuel

only, the plane has a range of more than 2,500 nautical miles. External fuel tanks can be carried on the pylons under the wings and jettisoned if necessary.

The F-111 can carry conventional and nuclear weapons. It can carry up to two bombs or additional fuel in the internal weapons bay. External ordnance includes combinations of bombs, missiles and fuel tanks. The loads nearest the fuselage on each side pivot as the wings sweep back, keeping ordnance parallel to the fuselage. Outer pylons do not move but can be jettisoned for high-speed flight.

The avionics systems include communications, navigation, terrain following, target acquisition and attack, and suppression of enemy air defense systems. A radar bombing system is used for precise night or bad weather delivery of weapons on targets.

The F-111's automatic terrain-following radar system flies the craft at a constant altitude following the Earth's contours. It allows the aircraft to fly in valleys and over mountains, day or night, regardless of weather conditions. Should any of the system's circuits fail, the aircraft automatically climbs to a safe altitude.

The F-111A flew for the first time in December 1964. The first operational F-111A was delivered in October 1967 to Nellis Air Force Base, Nev. A models were used for tactical bombing in Southeast Asia during 1968, 1972 and 1973. They are now in service with the 366th Tactical Fighter Wing at Mountain Home Air Force Base, Idaho.

The F-111B model was developed for the U.S. Navy, but was cancelled before production.

The Royal Australian Air Force flies the F-111C.

The F-111D has improved avionics with better navigation and air-to-air weapon delivery systems and newer turbofan engines. The F-111D's are flown by the 27th Tactical Fighter Wing at Cannon Air Force Base, N.M.

The F-111E has modified air intakes that improve engine performance at speeds above Mach 2.2. Most E models serve with the 20th Tactical Fighter Wing, Royal Air Force Station Upper Heyford, England, to support NATO.

The F-111F has improved turbofan engines producing 35 percent more thrust than previous F-111A and E engines. The F model avionics systems combine features of the F-111A, D and E. The last F model was delivered to the Air Force in November 1976. The F models are being modified to carry the Pave Tack system in their weapons bays. This system provides an improved capability to acquire, track and designate ground targets at night for delivery of laser, infrared and electro-optically guided weapons. F-111F's serve with the 48th Tactical Fighter Wing, Royal Air Force Station Lakenheath, England.

The EF-111A Raven is the newest version and is actually a converted F-111A airframe. Grumman Corp. integrated the ALQ-99 electronic combat jamming subsystem and provided 42 EF 2D111A tactical jamming systems. The EF-111 maintains the capabilities of the F-111A to allow both high-and low-altitude operation while screening an adversary's strike force with its electronic combat jamming system. The 390th Electronic Combat Squadron at Mountain Home Air Force Base and the 42nd Electronic Combat Squadron at Royal Air Force Station Upper Heyford are both equipped with EF-111 s.

Specifications

Primary function: multipurpose tactical fighter-bomber

Prime contractor: General Dynamics Corp.

Power plant/manufacturer: two Pratt & Whitney turbofan engines with after-burners: F-111A/E — TF30-P-3, F-111D — TF30-P-9, F-111F — TF30-P-100

Thrust: each engine with afterburning: F-1 11 A/E — 18,000 lb. class, F-111D — 19,000 lb. class, F-111F — 25,100 lb. class

Dimensions: wingspan — spread 63 ft., fully swept back 32 ft.; length 75 ft. 7 in.; height 17 ft. 1 in.

Speed: sea level, Mach 1.2; at 60,000 ft., Mach 2.5

Ceiling: above 60,000 ft.

Range: more than 3,100 nautical miles with external fuel tanks

Armament: one or two bombs in internal weapons bay; up to 25,000 lb. of bombs and missiles on external pylons

Crew: two — pilot and weapon systems officer (electronic warfare officer for EF-111)

Maximum takeoff weight: 100,000 lb.

Status: operational

Supersedes USAF Fact Sheet 86-13
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April 1989

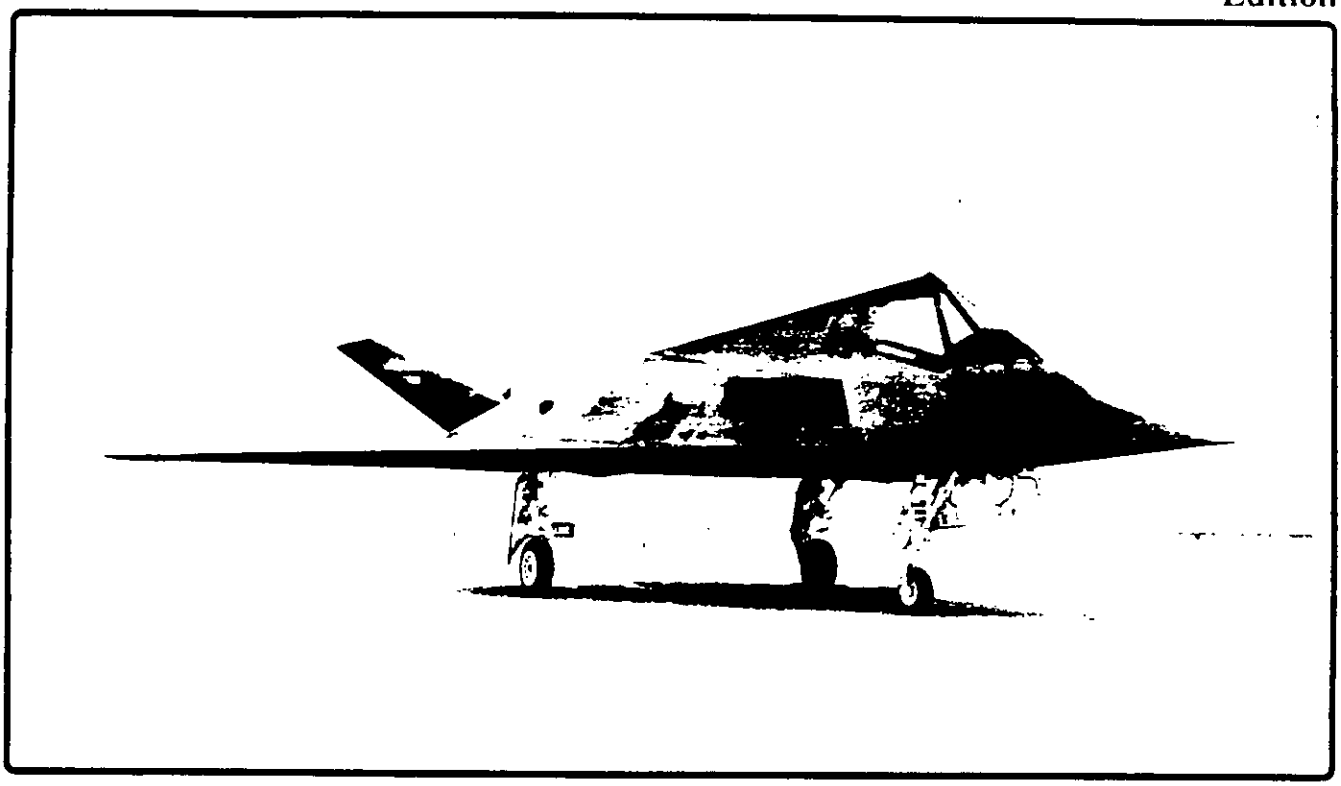
United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

FACT SHEET

F-117A Stealth Fighter

Special Edition



The F-117A Stealth Fighter is the world's first operational aircraft designed to exploit low-observable stealth technology.

A total of 59 F-117A aircraft have been procured. The first TAC aircraft were delivered in 1982, and the last delivery will be in the fall of 1990. The F-117A production decision was made in 1978 with a contract awarded to Lockheed Advanced Development Projects, the "Skunk Works," in Burbank, Calif. The first flight was in 1981, only 31 months after the full-scale development decision. TAC's only F-117A unit, the 4450th Tactical Group (redesignated 37 TFW in October 1989), achieved initial operational capability in October 1983.

Description

Flown by pilots of the Tactical Air Command's 37th Tactical Fighter Wing at Tonopah Test Range Air Field, Nev., this single-seat fighter is designed to penetrate dense threat environments and attack high-value targets with pinpoint accuracy.

The unique design of the F-117A provides exceptional combat capabilities. About the size of an F-15 Eagle, the twin-engine aircraft is powered by two General Electric F-404 turbofan engines and had quadruple redundant fly-by-wire flight controls. Air refuelable, it supports worldwide commitments and

adds to the deterrent strength of the U.S. military forces.

The F-117A can employ a variety of weapons and is equipped with sophisticated navigation and attack systems integrated into a state-of-the-art digital avionics suite that increases mission effectiveness and reduces pilot workload. Detailed planning for missions into highly defended target areas is accomplished by an automated mission planning system developed specifically to optimize the unique capabilities of the F-117A.

History

Streamlined management by Aeronautical Systems Division, Wright-Patterson AFB, Ohio, combined breakthrough stealth technology with concurrent development and production to rapidly field the aircraft. The F-117A program has demonstrated that a stealth aircraft can be designed for reliability and maintainability. The aircraft maintenance statistics are comparable to other tactical fighters of similar size and complexity. Logistically supported by Sacramento Air Logistics Center, McClellan AFB, Calif., the F-117A is kept at the forefront of technology through a planned weapon system improvement program located at USAF Plant 42 at Palmdale, Calif.

Specifications

Function: fighter, attack

Prime Contractor:
Lockheed Aeronautical System Company

Power plant/manufacturer:
two General Electric F-404 engines

Dimensions:
wingspan 43 ft. 4 in. length 65 ft. 11 in. height 12 ft 5 in.

Max Gross Weight: 52,500

Speed: high subsonic

Range: unlimited with air refueling

Crew: one

Armament: internal weapons carriage

Status: operational

(This is an interim, limited-distribution fact sheet produced by SAF/PA to correspond with the F-117A media day. An expanded Internal Information version will be released in the future.)

Fact Sheet

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

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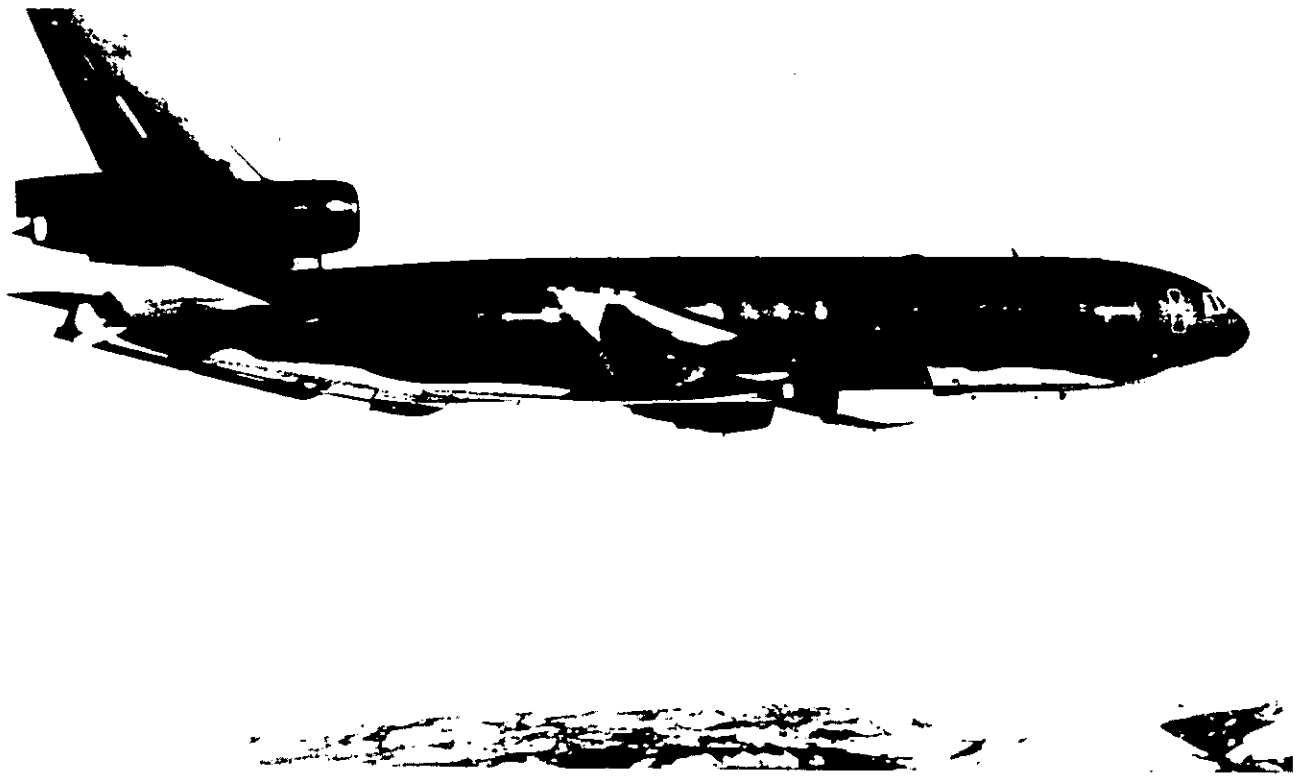


KC-10A Extender

The KC-10A Extender, Strategic Air Command's advanced tanker cargo aircraft, is designed to provide U.S. forces increased global mobility. In this role, the KC-10A combines the tasks of the tanker and cargo aircraft by refueling fighters and simultaneously carrying the fighter's support people and equipment on overseas deployments.

The KC-10A is a modification of the McDonnell Douglas DC-10. The first aircraft entered service in 1981. The KC-10 retains 88 percent systems commonality with the DC-10 and those systems and equipment necessary for the KC-10A mission were added. These include military avionics, aerial-refueling boom, hose and drogue, seated aerial-refueling operator station and aerial-refueling receptacle. The fleet is currently being modified to add wing-mounted aerial refueling pods to further enhance aircraft capabilities.

The KC-10A, in addition to the DC-10 wing fuel tanks, has two large fuel tanks under the cargo floor, one under the forward lower cargo compartment and one under the rear compartment. Combined, the six tanks carry more than 356,000 pounds of fuel — almost twice as much as the KC-135 Stratotanker.

In addition to its primary aerial refueling mission, the KC-10A can transport up to 75 people and about 170,000 pounds of cargo around 4,400 miles. Although it can be air refueled, it has an unrefueled range of more than 11,500 miles.

Using an advanced aerial-refueling boom or hose and drogue refueling system, the KC-10A can refuel a

wide variety of U.S. military aircraft as well as aircraft of allied nations. The new refueler is equipped with special lighting for night operations.

The KC-10A's boom operator controls refueling operations through a digital, fly-by-wire system. Sitting in the rear of the aircraft the operator can see the receiver aircraft through a wide viewing window. During boom refueling operations, fuel transfers to the receiver at a rate of 1,500 gallons per minute, while drogue refueling is 600 gallons per minute.

The large cargo-loading door is capable of accepting most tactical air forces fighter unit support equipment. Powered rollers and winches inside the cargo compartment facilitate moving heavy loads. The cargo compartment can accommodate loads ranging from 27 pallets to a mixture of 17 pallets and 75 passengers.

A crew includes an aircraft commander, pilot, flight engineer and boom operator. The sophisticated avionics of the aircraft are designed to improve crew efficiency and reduce crew workload. On certain missions, additional seats and bunks can be rearranged several different ways to accommodate extra crew members.

The KC-10A is maintained by Air Force active duty and Air Force Reserve Associate personnel as well as civilian contractors. This two-level maintenance system makes Air Force personnel responsible for flight-line and on-aircraft maintenance, and the contractor responsible for all other maintenance and logistics support. This concept reduces KC-10A maintenance costs by taking maximum advantage of the commercial logistics support base that already exists for the civilian aircraft counterpart, the DC-10.

The KC-10A is operated by the 2nd Bombardment Wing, Barksdale Air Force Base, La.; 22nd Air Refueling Wing, March Air Force Base, Calif.; and 68th Air Refueling Wing, Seymour Johnson Air Force Base, N.C. Air Force Reserve Associate units assigned to the 452nd and 434th Air Refueling wings at all three locations also provide aircrews.

Specifications

Primary function: aerial tanker, transport
Prime contractor: Douglas Aircraft Co., Division of McDonnell Douglas Corp.
Power plant: three General Electric CF6-50C2 turbofans
Thrust: 52,500 lbs. each engine
Dimensions: wingspan 165 ft., length 182 ft., height 58 ft.
Speed: 520 mph
Ceiling: 42,000 ft.
Range: 11,500 miles (unrefueled)
Cargo space: 12,250 cubic ft.
Maximum cargo payload: 170,000 lbs.
Maximum fuel load: 356,000 lbs.
Maximum takeoff weight: 590,000 lbs.
Crew: four
Status: operational

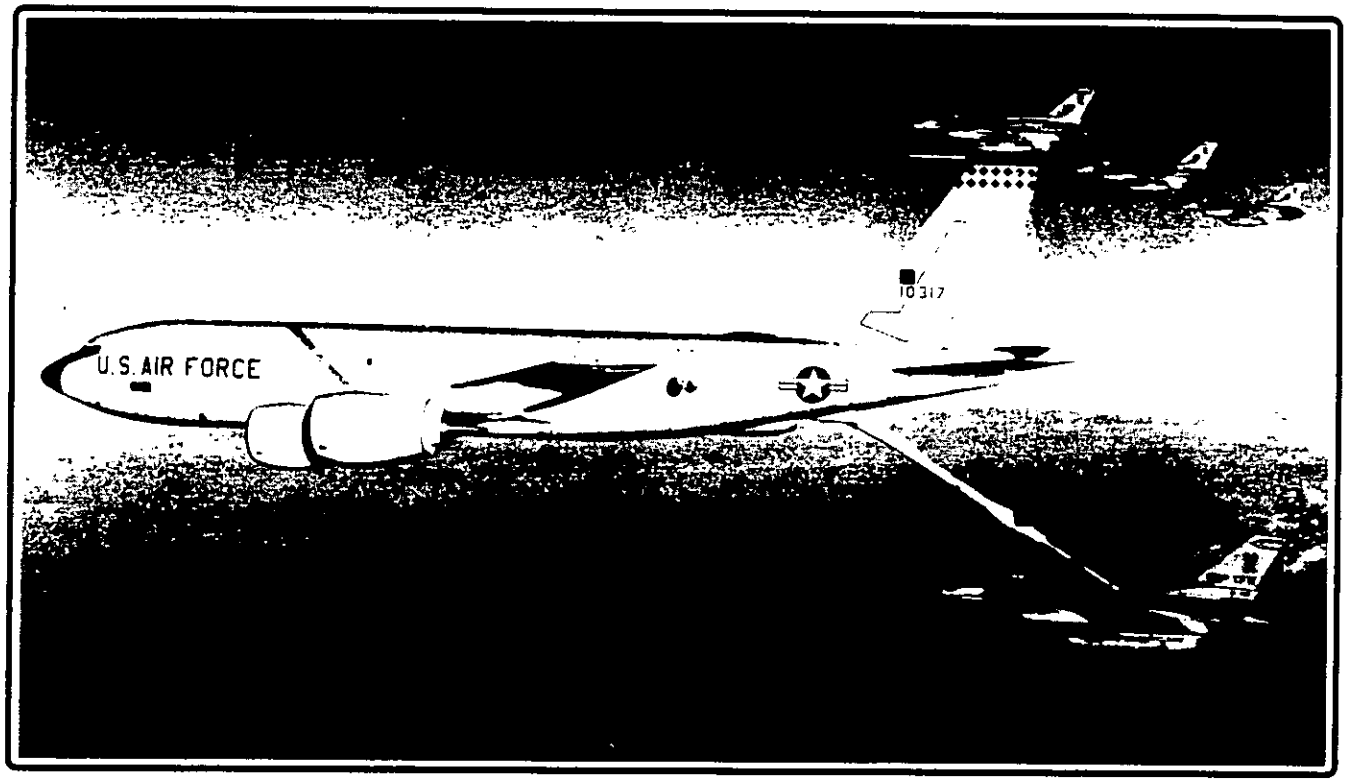
United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

F A C T S H E E T

KC-135 Stratotanker

90-07



A KC-135R refuels a flight of F-16s.

The KC-135 Stratotanker's primary mission is refueling strategic long-range bombers. It also provides aerial refueling support to Air Force, Navy and Marine Corps aircraft as well as aircraft of allied nations. While more than 440 Stratotankers are flown by Strategic Air Command crews, over 140 also are flown by the Air Force Reserve and Air National Guard crews in support of SAC's mission.

Description/History

Four turbojets, mounted under 35-degree sweptwings, power the KC-135A to takeoffs at gross weights up to 297,000 pounds. Nearly all internal fuel can be pumped through the tanker's flying boom, the KC-135's primary fuel transfer method. A special shuttlecock-shaped drogue, attached to and trailed behind the flying boom, may be used to refuel aircraft fitted with probes. An operator stationed in the rear of the plane controls the boom. A cargo deck above the refueling system can hold a mixed load of passengers and cargo. Depending on fuel storage configuration, the KC-135A can carry up to 83,000 pounds of cargo.

The Boeing Co.'s model 367-80 was the basic design for the commercial 707 passenger plane as well as the KC-135A Stratotanker. In 1954 the Air Force purchased the first 29 of its future 732-plane fleet. The first aircraft flew in August 1956 and the initial production Stratotanker was delivered to Castle Air Force Base, Calif., in June 1957. The last KC-135 was delivered to the Air Force in 1965.

In Southeast Asia, KC-135 Stratotankers made the air war different from all previous aerial conflicts. Mid-air refueling brought far-flung bombing targets within reach. Combat aircraft, no longer limited by fuel supplies, were able to spend more time in target areas.

Modifications/Models

The KC-135A's are being modified with new CFM-56 engines produced by CFM-International. The re-engined tanker, designated the KC-135R, can offload 50 percent more fuel, is 25 percent more fuel efficient, costs 25 percent less to operate and is 96 percent quieter than the KC-135A. To date, the ongoing re-engining project is nearly half complete.

Under another modification program, all Air Force Reserve and Air National Guard tankers were re-engined with the TF-33-PW-102 engines. The re-engined tanker, designated the KC-135E, is 14 percent more fuel efficient than the KC-135A and can offload 20 percent more fuel.

Through the years, the KC-135 has been altered to do other jobs ranging from flying command post missions to reconnaissance. The EC-135C is Strategic Air Command's flying command post. One EC-135C flies at all times, ready to control bombers and missiles if ground control is lost. RC-135s are used for special reconnaissance and Air Force Systems Command's NKC-135A's are flown in test programs.

With projected modifications, the KC-135 will fly and refuel into the next century. A new aluminum-alloy "skin" grafted to the underside of the wings will add 27,000 flying hours to the aircraft.

Specifications (KC-135A)

Primary Function: Aerial refueling

Prime Contractor: The Boeing Co.

Power Plant/Manufacturers: Four Pratt and Whitney J-57-P-59WB turbojet engines (KC-135R's are equipped with CFM-International CFM-56 turbofan engines; KC-135E's with Pratt and Whitney TF-33-PW-102 turbofan engines)

Thrust: 13,750 lb. each J-57-P-59WB engine (21,634 lb. each KC-135R engine; 18,000 lb. each KC-135E engine)

Dimensions: Wing span 130 ft. 10 in., length 136 ft. 3 in., height 41 ft. 8 in.

Speed: 530 mph at 30,000 ft.

Ceiling: 50,000 ft.

Range: 1,150 miles with 120,000 lb. of transfer fuel, ferry mission 9,200 miles

Crew: Four

Status: Operational

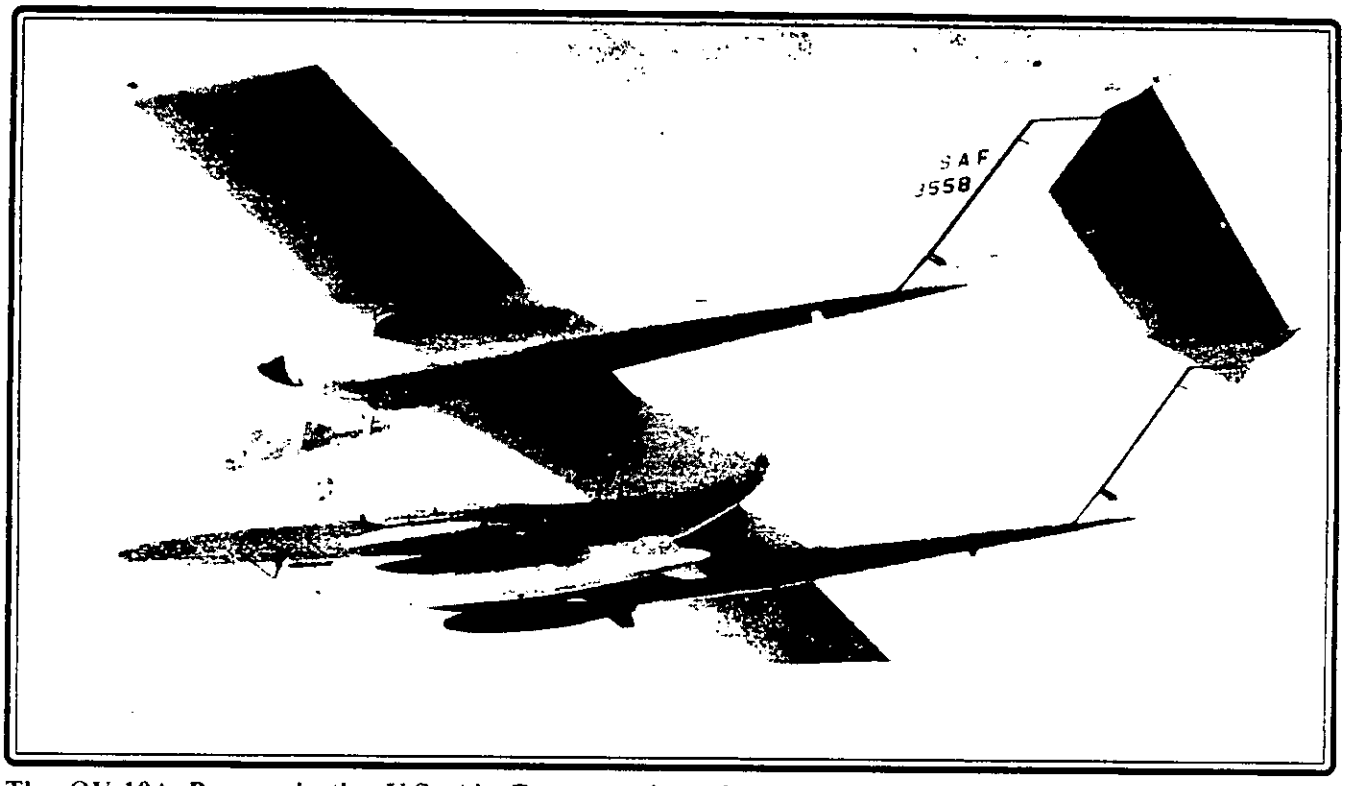
United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

F A C T S H E E T

OV-10A Bronco

90-11



The OV-10A Bronco is the U.S. Air Force version of the twin-engine turboprop short takeoff and landing aircraft developed under a triservice program with the U.S. Navy and Marine Corps. In addition to the variations flown by the U.S. Air Force, Navy and Marine Corps, other models of the OV-10A Bronco are flown by the air forces of West Germany, Indonesia, Morocco, Thailand and Venezuela.

Specifications

Primary Function: Forward air controller.

Prime Contractor: North American Rockwell.

Power Plant/Manufacturer: Two Garrett-AiResearch T-76-G-10 and -12 engines.

Horsepower: 715 h.p. each engine.

Dimensions: Wingspan 40 ft.; length 39 ft. 7 in., height 15 ft. 2 in.

Maximum Speed: 284 mph.

Ceiling: 24,000 ft.

Range: 800 miles.

Load: 3,200 lb.

Armament: Four 7.62mm machine guns; fuselage and wing pylon stations.

Crew: One pilot; aircraft can carry two, in tandem.

Status: Operational.

Employment

The versatile Bronco is used primarily as a forward air controller aircraft. It can perform many other missions, including observation, armed reconnaissance, helicopter escort, limited ground attack, gunfire spotting for ground forces, target marking and utility functions. The OV-10A also can be adapted to perform peacetime missions for disaster relief, medical missions, riot control, aerial mapping and spraying operations.

Tactical Air Command is the only command currently flying OV-10A's. They are flown by the 602nd Tactical Control Wing at Davis-Monthan Air Force Base, Ariz., and the 507th Tactical Air Control Wing at Shaw Air Force Base, S.C. The 602nd Tactical Air Control Wing's 22nd Tactical Air Support Training Squadron is the only organization in the Air Force training pilots in the Bronco. About 46 OV-10A's are presently in the Air Force inventory.

Description

The Bronco's two turboprop engines are mounted forward of the twin tail booms. The horizontal stabilizer is mounted high between the twin vertical rudders. The fuselage is located well forward between the two counter-rotating, fully feathering, three-blade metal propellers.

The short pod-type fuselage has two large upward-opening transparent door panels that provide a virtually unobstructed view. The crew normally consists of only the pilot, who sits on an ejection seat in the bubble-like cockput; however, the aircraft can carry two sitting in tandem. Standard cockpit equipment includes UHF, VHF, FM and HF radios, tactical air navigation, dual controls and an altimeter. A heating and ventilation system combines engine bleed air with cold ram air to provide temperature-controlled conditions. Engine bleed air also is used for windscreen defrosting and to acclimate the crew's anti-G suits.

A cargo compartment is aft of the rear seat with a rear loading door at the end of the fuselage pod. The rear seat is removable to provide increased space. The cargo compartment can hold up to 3,200 pounds of cargo, or the equivalent of five combat-equipped paratroopers, or two litter patients and a medical attendant.

Five self-sealing bladder-type fuel tanks in the wing have a combined capacity of about 250 gallons. Gravity refueling points are located above each tank on the upper wing surface. A 230-gallon jettisonable fuel tank, that also contains polyurethane fire suppressant foam, may be carried on an under-fuselage pylon, as well as two 100-gallon, wing-mounted fuel tanks.

The OV-10A can use either internal battery power or external power sockets for engine starting and utility services. Each engine has an independent fire warning system comprising control unit, sensing elements and warning lights. An electrically fired fire-extinguishing system also is installed in each engine housing.

The OV-10A has retractable tricycle landing gear with a single wheel on each strut. This special heavy-duty landing gear enables the OV-10A to make short takeoffs and landings from rough clearings, primitive roads and aircraft carriers, as well as prepared airfields. The nose wheel retracts forward; the main wheels retract rearward into the tail booms. A hydraulic pump actuates the landing gear and nose-wheel steering.

The Bronco is equipped with four sponson-mounted 7.62mm machine guns under the fuselage. The aircraft has five pylon stations under the fuselage near the center of gravity and two wing pylon stations that allow it to carry up to 3,600 pounds of various external stores, including rocket pods, flare pods and free-fall ordnance.

History

The initial production version of the OV-10A was ordered in 1966 and first flew in August 1967. By September 1969, 157 OV-10A's were in service for the Air Force in a forward air controller role. They also provided limited quick-response ground support pending arrival of tactical fighters. Production of the OV-10A ended in April 1969.