In December 2002, USAF canceled the defensive systems upgrade program, incorporating the ALE-55 fiber-optic towed decoy, ALR-56M radar warning receiver (RWR), and ALQ-214 receiver/processor, because of escalating cost growth and schedule delays. Officials announced plans to fund other B-1 modernization programs, including upgrading its existing ALQ-161 ECM system.

**B-2 Spirit**

**Brief:** Stealthy, long-range multirole bomber that can deliver conventional and nuclear munitions anywhere on the globe by flying through previously impenetrable defenses.

**Function:** Long-range heavy bomber.

**Operator:** ACC.

**First Flight:** July 17, 1989.

**Delivered:** Dec. 1, 1993—present.

**IOC:** April 1997, Whiteman AFB, Mo.

**Production:** 21.

**Inventory:** 21.

**Unit Location:** Whiteman AFB, Mo.

**Contractor:** Northrop Grumman; Boeing; LTV.

**Power Plant:** four General Electric F110-GE-100 turbofans, each 27,650 lb thrust.

**Dimensions:** length 170 ft, height 50 ft, wingspan 172 ft.

**Weight:** empty 225,000 lb, gross 475,000 lb.

**Performance:** maximum speed at low-level high subsonic 1,800 mph; maximum speed at high altitude 5,150 mph; and maximum speed at low altitude 1,400 mph; range 7,400 nm; maximum unrefueled range 6,200 nm; typical endurance 8–11 hr.

**Armament:** up to 8,000 lb of guided and unguided weapons.

**AIM-120 Advanced medium-range air-to-air missiles (AMRAAMs), AIM-9 Sidewinders, or AIM-9Xs**, capable of engaging multiple targets simultaneously.

**AIM-9M Sidewinder** (SrA. Christina M. Rumsey)

The B-2 is a long-range, high-altitude, long-endurance bomber that can deliver conventional and nuclear munitions anywhere on the globe by flying through previously impenetrable defenses.

**Function:** Long-range heavy bomber.

**Operator:** ACC.

**First Flight:** July 17, 1989.

**Delivered:** Dec. 1, 1993—present.

**IOC:** April 1997, Whiteman AFB, Mo.

**Production:** 21.

**Inventory:** 21.

**Unit Location:** Whiteman AFB, Mo.

**Contractor:** Northrop Grumman; Boeing; LTV.

**Power Plant:** four General Electric F110-GE-100 turbofans, each 27,650 lb thrust.

**Dimensions:** length 170 ft, height 50 ft, wingspan 172 ft.

**Weight:** empty 225,000 lb, gross 475,000 lb.

**Performance:** maximum speed at low-level high subsonic 1,800 mph; maximum speed at high altitude 5,150 mph; and maximum speed at low altitude 1,400 mph; range 7,400 nm; maximum unrefueled range 6,200 nm; typical endurance 8–11 hr.

**Armament:** up to 8,000 lb of guided and unguided weapons.

**AIM-120 Advanced medium-range air-to-air missiles (AMRAAMs), AIM-9 Sidewinders, or AIM-9Xs**, capable of engaging multiple targets simultaneously.

**AIM-9M Sidewinder** (SrA. Christina M. Rumsey)

**B-1B Lancer** (SrA. Christina M. Rumsey)

The fully swept position is used in supersonic flight and for high subsonic, low-altitude penetration.

The B-1’s offensive avionics suite includes synthetic aperture radar (SAR), ground moving target indicator (GMTI), ground moving target tracking (GMTT), and terrain-following radar (TFR), an extremely accurate Global Positioning System/inertial navigation system (GPS/INS), computer-driven avionics, and a strategic Doppler radar, enabling aircrews to navigate, update target coordinates in flight, and precision bomb.

The current defensive avionics package, built around the ALQ-161 electronic countermeasures (ECM) system, is supplemented by the AES-30 towed decoy and chaff and flares to protect against radar-guided and heat-seeking missiles. Aircraft structure and radar-absorption materials reduce the aircraft’s radar signature to approximately one percent that of a B-52. The ALE-50 provides greater protection against RF threats.

The B-2 is a long-range, high-altitude, long-endurance bomber that can deliver conventional and nuclear munitions anywhere on the globe by flying through previously impenetrable defenses.

**Function:** Long-range heavy bomber.

**Operator:** ACC.

**First Flight:** July 17, 1989.

**Delivered:** Dec. 1, 1993—present.

**IOC:** April 1997, Whiteman AFB, Mo.

**Production:** 21.

**Inventory:** 21.

**Unit Location:** Whiteman AFB, Mo.

**Contractor:** Northrop Grumman; Boeing; LTV.

**Power Plant:** four General Electric F110-GE-100 turbofans, each 27,650 lb thrust.

**Dimensions:** length 170 ft, height 50 ft, wingspan 172 ft.

**Weight:** empty 225,000 lb, gross 475,000 lb.

**Performance:** maximum speed at low-level high subsonic 1,800 mph; maximum speed at high altitude 5,150 mph; and maximum speed at low altitude 1,400 mph; range 7,400 nm; maximum unrefueled range 6,200 nm; typical endurance 8–11 hr.

**Armament:** up to 8,000 lb of guided and unguided weapons.

**AIM-120 Advanced medium-range air-to-air missiles (AMRAAMs), AIM-9 Sidewinders, or AIM-9Xs**, capable of engaging multiple targets simultaneously.

**AIM-9M Sidewinder** (SrA. Christina M. Rumsey)
B-2 Spirit (Sgt. Michael R. Nixon)

The last original Block 20 B-2, used as a test aircraft at Edwards AFB, Calif., was refurbished as an operational bomber and entered operational service in September 2002.

Block 20 configuration retains weapons capability introduced in Block 10 and 20 and adds significant new capability. Using the rotary launcher assembly, all B-2s are capable of employing 16 Mk 84 JDAMs, 16 JSOWs, or eight GAM-113s (to be replaced by EGBU-28), with JASSM capability slated for 2004. All B-2s are also capable of substituting bomb-rack assemblies in place of the rotary launchers, providing the capability to employ 80 500-lb M117s, 26750-lb M117s, 34 tactical munitions dispensers, or 80 Mk 62 sea mines. Modifications to the bomb racks will allow carriage of 80 independently targeted Mk 82 (500-lb) JDAMs in 2004. Future capability is expected to include the 250-lb Small Diameter Bomb (SDB). Other Block 30 enhancements include fully operational defensive and offensive avionics, a more sophisticated mission planning system, and additional operating modes for the SAR.

Beyond Block 30, USAF plans to add UHF and EHF satellite communications systems and Link 16 digital data sharing capability and to replace the current mechanically scanned phased array antenna with an active electronically scanned array (AESA).

The first use of B-2s in combat took place March 24, 1999, against Serb targets in Allied Force, with two aircraft each dropping 16 JDAMs. USAF deployed B-2s to Diego Garcia in the Indian Ocean for Gulf War II.

B-52 Stratofortress

Brief: A long-range, heavy multirole bomber that can carry nuclear or conventional ordinance or Air-Launched Cruise Missiles (ALCMs), with worldwide precision capability.

Function: Long-range heavy bomber.

Operator: ACC, AFRC

First Flight: April 15, 1952 (YB-52 prototype).


IOC: June 19, 1955.

Production: 744.

Inventory: 713.

Unit Location: Barksdale AFB, La. (ACC, AFRC), Minot AFB, N.D.

Contractor: Boeing.

Power Plant: eight Pratt & Whitney TF33-P-3 turbofans, each 17,000 lb thrust.

Accommodation: two pilots, side by side, plus navigator, radar navigator, and electronic warfare officer.

Dimensions: span 185 ft, length 159.3 ft, height 40.7 ft.

Weight: empty approx 188,000 lb, gross 488,000 lb.

Ceiling: 50,000 ft.

Performance (approx): max level speed 449 mph, range more than 10,000 miles.

Armament: 12 AGM-86B ALCMs or AGM-129 Advanced Cruise Missiles (ACMs) externally, with provision for eight more ALCMs or gravity weapons externally. Conventional weapons incl AGM-86C/D Conventional ALCMs (CALCMs), bombs up to 2,000 lb, CBU 67/68/87 cluster munitions, WCMs, GBU-31 JDAMs, JSOWs, JASSMs in 2003, and on some aircraft, three to four AGM-142A Have Nap missiles or eight AGM-84 Harpoons in under-wing clusters.

Commentary

The B-52’s still-expanding weapons capability reflects its continuing ability to perform a wide range of missions including show of force, maritime operations, long-range precision strikes, offensive counterair, air interdiction, and defense suppression. USAF is considering using some B-52s as jamming electronic warfare platforms. Equipment includes an electro-optical (EO) viewing system that uses forward-looking infrared (FLIR) and high-resolution low-light-level television (LLTV) sensors to augment the targeting, battle assessment, flight safety, and terrain avoidance systems, thus improving combat ability and low-level flight capability. Pilots have night vision goggles (NVGs) to further enhance night operation. The B-52’s ECM suite uses a combination of electronic detection, jamming, and infrared (IR) countermeasures to protect against hostile air defense systems. The aircraft can also detect and counter missile attack from the rear.

Several versions of the Stratofortress were produced, including:

- B-52A. Initial production version, with J57-P-1W engines and provision for in-flight refueling. First flown Aug. 5, 1954, the three aircraft built were used by Boeing for technical development purposes. Delivered to SAC November 1957. Finally retired 1969.

- B-52B. First operational version, 23 of which were built. Also, 27 RB-52B dual-role bomber/reconnaissance variants. First flown January 1955, with deliveries between June 1955–August 1956; powered by J57-P-1W, -19W, -29W, or -29WA engines. Retired in the mid-1960s.

- B-52C. Multimission version with increased gross weight and larger under-wing tanks. Powered by J57-P-19W or -29WA engines. First flown March 1956; 35 were delivered June–December 1956. Majority retired 1971.


- B-52G. Introduced important design changes, including a redesigned wing containing integral fuel tanks for increased range, fixed under-wing external tanks, a shorter tail fin of greater chord, and a remotely controlled tail gun turret that allowed the gunner to be repositioned with the rest of the crew. Initial flight August 1958, with the first of 193 aircraft entering service in February 1959. Withdrawn 1994.

- B-52H. The only version still in service, the H intro-

B-52H Stratofortress (MSgt. Andrew E. Lynch)

Ongoing modernization of its conventional capabilities is extending the B-52’s service life well into this century, with the ability to provide massive firepower in low- to mid-threat environments supplemented by a standoff attack capability. Upgrades include the installation of GPS, ARC-210 radios, Have Quick II antijam radio, KY-100 secure radio, and MIL-STD-1760 interfaces; improved weapons capability includes naval mines, precision guided weapons, and advanced weapons such as JDAM, JSOW, JASSM, and WCMD. Modifi-

Fighter and Attack Aircraft

A-10 Thunderbolt II

Brief: A simple, effective, and survivable twin-engine aircraft specifically designed for close air support (CAS) of ground forces and which can be used against all ground targets, including tanks and other armored vehicles.

Function: Attack aircraft.

Operator: ACC, AFMC, PACAF, USAFE, ANG, AFRC.


Production: 713.

Inventory: 362.


Contractor: Fairchild Republic; now Lockheed Martin.

Power Plant: two General Electric TF34-GE-100 turbofans, each 9,065 lb thrust.

Accommodation: pilot only, on zero-height/518 mph–zero-speed gliding seat.

Dimensions: span 57.5 ft, length 53.3 ft, height 14.7 ft.

Weight: empty 28,000 lb, max gross 51,000 lb.

Ceiling: 37,000 ft.

Performance: speed 518 mph, combat range with 9,500 lb of weapons and 1.7 hr loiter, 20 min reserve, 288 miles.

Armament: one 30 mm, seven-barrel GAU-8 Gatling gun with accuracy beyond 30,000 ft; eight under-wing...
hardpoints and three under fuselage for up to 16,000 lb gross 155,000 lb. performance:

Performance: speed 289 mph, range 1,500 miles, with air refueling unlimited.

Armament: two 20 mm Vulcan cannons with 3,000 rd (AC-130H); one 25 mm Gatling gun (AC-130U); one 40 mm Bofors cannon with 256 rd, and one 105 mm Howitzer with 100 rd.

COMMENTARY

The AC-130 is a C-130 modified with gun systems, electronic and EO sensors, fire-control systems, enhanced navigation systems, sophisticated communications, defensive systems, and in-flight refueling capability. These systems give the gunship crew the capability to acquire and identify targets day or night, coordinate with ground forces and command and control (C2) agencies, and deliver surgical firepower in support of both conventional and special operations missions. During operations in Afghanistan the AC-130 Spectre has worked in conjunction with the RQ-1 Predator, the latter providing live video and target referencing information.

AC-130A was the initial version, deployed in Vietnam 1968–69. Eighteen produced.

AC-130E, an improved version, of which eight were built. Constructed to H standard after service in Vietnam. The unit has eight, each equipped with a digital fire-control computer. They employ EO sensors and target- acquisition systems, including FLIR and LLLTV, and are capable of in-flight refueling. Fire-control computers, navigation, communications, and sensor suites have been upgraded; an infrared suppression system (IRSS) overhaul is under way. In addition, USAF is to evaluate wingtip tanks as replacements for the existing underwing tanks as a means of improving performance.

AC-130U Spooky is the most recent gunship conversion, converted by Rockwell, of which 13 were delivered to the 16th SOW’s 4th SOS in 1994–95. These aircraft have greater altitude capability and combat increased firepower, reliability, and superior accuracy with the latest tactics of target location. The two 20 mm cannon of the H model are replaced with one trainable 25 mm Gatling gun. All weapons can be subordinated to the APG-180 digital fire-control radar, FLIR, or all-light-level television (ALLTV) for adverse weather attack operations.

Although the AC-130H Spectre and AC-130U Spooky gunships use dissimilar avionics and other systems, fire support to troops on the ground is generally comparable.

The AC-130U will not be required for most fire support missions but provides benefits under certain circumstances (weather, dual target attack, and defensive avionics).

F-15 Eagle

Brief: A supersonic, all-weather, highly maneuverable tactical fighter designed to defeat IAD’s to swiftly gain and maintain air superiority in aerial combat.

Operator: USAF.

Performance: F-15A: max speed Mach 2.5, T-O run 900 ft, landing run without braking parachute 3,500 ft, range to forward fuel tanks more than 2,878 miles.

Armament: one internally mounted M61A1 20 mm six-barrel cannon; up to four AIM-9 Sidewinder and up to four AIM-7 Sparrow air-to-air missiles, or up to eight AIM-120 Advanced Medium-Range Air-to-Air Missiles (AMRAAMs), carried externally. Future weapons include AIM-9X.

COMMENTARY

Superior maneuverability and acceleration, range, weapons, and avionics enable the F-15 to penetrate hostile defenses and establish air superiority over enemy systems. F-15 fighters deployed to the Persian Gulf for Desert Storm accounted for 34 of the 37 USAF air-to-air victories.

F-15A (single-seat) and F-15B (two-seat) fighters became USAF’s front-line fighter immediately upon introduction in the mid–1970s. A multimission avionics system includes APG-63 pulse-Doppler radar for long-range detection and tracking of small high-speed objects using independent and effective weapons delivery.

A HUD for close-in combat, identification, friend or foe (IFF), and INS. A/Bs now serve with ANG.

F-15C (single-seat) and F-15D (two-seat) models followed in June 1979. Improvements include 2,000 lb of additional internal fuel and provision for carrying conformal fuel tanks (CFTs), reducing in-flight refueling requirements and increasing the time in the combat zone. Since 1983 tactical capabilities have been enhanced extensively through the multistaged improvement program (MSP), an ongoing program of installation of new or modification of existing avionics equipment, allowing for increased effectiveness in use, performance, and self-protection. The last 43 aircraft included improved APG-70 radar, and additional F-15C/Ds are receiving an APG-63 upgrade, the APG-63(V1). One squadron in Alaska has received the later APG-63(V2), featuring an advanced
AESA radar antenna. F-15C/D aircraft are also to be modified with the Joint Helmet Mounted Cueing System (JHMCS), a “look and shoot” head-mounted system that significantly enhances lethality in close-range aerial combat. Other modifications include improved engines and GPS equipment. All types are being equipped with Link 16 fighter data link.

F-15E Strike Eagle

**Brief:** A heavily modified, two-seat, dual-role variant of the original F-15, with weapons systems totally integrated for all-weather deep interdiction missions as well as air-to-air combat.

**Function:** Dual-role fighter.

**Operator:** ACC, AFMC, PACAF, USAFE.

**First Flight:** Dec. 11, 1986.

**Delivered:** April 1988–2004.

**IOC:** May 1989.

**Production:** 236 scheduled.

**Inventory:** 217.

**Unit Location:** Eglin AFB, Fla.; Elmendorf AFB, Alaska; Mountain Home AFB, Idaho; Nellis AFB, Nev.; RAF Lakenheath, UK; Robins AFB, Ga.; Seymour Johnson AFB, N.C.

**Contractor:** McDonnell Douglas (now Boeing); Raytheon.

**Power Plant:** two Pratt & Whitney F100-PW-220, each 25,000 lb thrust; or F100-PW-229 turbofans, each 29,000 lb thrust with max afterburner.

**Accommodation:** crew of two, on zero/eight ejection seats.

**Dimensions:** span 42.8 ft, length 63.8 ft, height 18.5 ft.

**Weight:** empty 45,000 lb, gross 81,000 lb.

**Ceiling:** 50,000 ft.

**Performance:** max speed at altitude Mach 2.5, ferry range with CFTs 3,000 miles.

**Armament:** one internally mounted M61A1 20 mm multibarrel cannon, one M61A1 20 mm internally mounted M61A1 20 mm six-barrel cannon; up to four AIM-9 Sidewinder and up to four AIM-7 Sparrow air-to-air missiles, or up to eight AIM-120 AMRAAMS; up to six AGM-65 Maverick air-to-surface missiles; AGM-130; EGBU-15 and GBU 10/12/15/24/28 guided munitions; CBU 87/89/97 cluster munitions; unguided munitions; and nuclear weapons.

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

**Dimensions:** wingspan with missiles 32.7 ft, length overall 49.4 ft, height 16.7 ft.

**Weight:** (F-16C) empty (F100-PW-229) 18,591 lb, (F110-GE-129) 18,917 lb; gross, with external load (Block 40/42) 42,000 lb.

**Ceiling:** 50,000 ft.

**Performance:** max speed Mach 2, radius of action: Block 40 and 42: with 1,000 lb embryos, gross 935 miles; with 5,000 lb load, 1,935 miles.

**Armament:** one M61A1 20 mm barreled cannon, with 511 rd 20 mm internal gun.

**F-16 Fighting Falcon

**Brief:** A compact, versatile, and low-cost multiregional fighter aircraft that is highly maneuverable and has repeatedly proved itself in air-to-air combat and air-to-ground attack.

**Function:** Multirole fighter

**Operator:** ACC, AETC, AFMC, PACAF, USAFE, ANG, AFRIC.

**First Flight:** Dec. 8, 1976 (full-scale development).

**Delivered:** August 1978–2007 (planned).

**IOC:** October 1980, Hill AFB, Utah.

**Production:** 2,206.

**Inventory:** 3,391.

**Unit Location:** 13 active wings, 27 ANG, and four AFRC units (one Associate).

**COMMENTARY**

F-16 is a strengthened airframe for increased gross weight at takeoff and maneuver at nine Gs throughout the flight envelope. Cockpit controls and displays are improved, and a wide-field-of-view (WFOV) HUD is included.

For low-altitude, high-speed penetration and precision attack on tactical targets at night and in adverse weather, the F-15E carries a high-resolution APG-70 SAR and LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) pods, with wide-field FLIR. The APG-70 gives the F-15E, with its AMRAAM, AIM-7, and AIM-9 load, a true multiregional capability with the inherent air-to-air capability of the F-15C. The triple-redundant digital flight-control system, in combination with the LANTIRN navigation pod and the WFOV HUD, permits automatic terrain following. Other improvements include an EGI and Link 16 data link. Strike capability will be enhanced with the addition of the JHMCS. Smart weapon (JSOW, JDAM, and WCMCD) capability is added from 2003. In addition, USAF has equipped some F-15E aircraft with Litening targeting pods for improved precision attack capability. External CFTs, adapted to carry ordnance tangentially, can be fitted to reduce drag while increasing combat range. During Desert Storm, 48 USAF F-15Es were deployed to the Persian Gulf where they operated mainly at night, hunting Scud missile launchers and artillery sites using the LANTIRN system. They also operated successfully with Joint STARS radar aircraft.

Congress authorized 10 additional aircraft with deliveries beginning in FY02 through FY04. These new F-15Es include upgraded programmable armament control (PAC) and software for compatibility with JDAM, JSOW, and WCMCD, as well as an enhanced night vision capability.

**F-16 Fighting Falcon

**Brief:** A compact, versatile, and low-cost multiregional fighter aircraft that is highly maneuverable and has repeatedly proved itself in air-to-air combat and air-to-ground attack.

**Function:** Multirole fighter

**Operator:** ACC, AETC, AFMC, PACAF, USAFE, ANG, AFRIC.

**First Flight:** Dec. 8, 1976 (full-scale development).

**Delivered:** August 1978–2007 (planned).

**IOC:** October 1980, Hill AFB, Utah.

**Production:** 2,206.

**Inventory:** 3,391.

**Unit Location:** 13 active wings, 27 ANG, and four AFRC units (one Associate).

**Contractor:** Lockheed Martin; Northrop Grumman.

**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 alternate 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-220 (29,100 lb thrust).

**Accommodation:** pilot only, on zero/eight ejection seat.

**Dimensions:** wingspan with missiles 32.7 ft, length overall 49.4 ft, height 16.7 ft.

**Weight:** (F-16C) empty (F100-PW-229) 18,591 lb, (F110-GE-129) 18,917 lb; gross, with external load (Block 40/42) 42,000 lb.

**Ceiling:** 50,000 ft.

**Performance:** max speed Mach 2, radius of action: Block 40 with two 2,000 lb bombs, two AIM-9 missiles, and external fuel, hi-lo-to-hi 852 miles; combat range 575 miles.

**Armament:** one M61A1 20 mm barreled cannon, with 511 rd 20 mm internal gun.

**Production** of the F-16A and B for USAF ended in 1985. Most now belong to ANG, USAF and a few operators have cooperated in an operational capability upgrade. Under this midlife update program, the radar, fire-control computer, stores-management computer, and avionics software are improved, giving F-16A/Bs the ability to use next generation air-to-air and air-to-surface weapons.

Reliability and maintainability improvements include a laser-ring gyro INS and installation of the upgraded F100-PW-220E turbofan.

**The Multinational Staged Improvement Program,** implemented in 1980, ensured the aircraft could accept systems under development without increasing retrofit costs. All F-16s delivered since November 1981 have had built-in structural and wiring provisions and systems architecture that expand the single-seater’s multiregional flexibility to perform precision strike, night attack, and beyond-visual-range intercept missions.

**F-16C** (single-seat) and **F-16D** (two-seat) aircraft were introduced at production Block 25 with MSIP II improvements in the cockpit, airframe, and core avionics, an increased-range APG-68 radar. Deliveries began in 1984. With the exception of AFMC, all of the aircraft and many of the Guard and Reserve units have since converted to F-16Cs.

Block 40/42 F-16s specialized in night attack operations with precision-guided weapons. Follow-on improvements include ALE-47 improved defensive countermeasures, ALR-56M advanced WVR (Block 40 only), Very High Speed Integrated Circuit (VHSIC) technology in the APG-68(V5) fire-control radar, a ring-laser gyro INS, a LANTIRN nav/attack system, and IPES. System improvements also introduced at Block 40/42 include core avionics hardware, installation of a LANTIRN nav/attack system, GPS, enhanced-envelope gunsight, digital flight controls, automatic terrain following, increased takeoff weight and maneuvering limits, an 8,000-hour airframe, and expanded envelope in cruise capability.

Block 50/52 F-16Js have MSIP Stage III improvements, which also show up in selected retrofits of earlier F-16 blocks. These aircraft incorporate the latest cockpit control and display technology, including a wide-angle HUD. Weapons improvements include a single-shot AMRAAM, AGM-154 JSOW, and WCMCD. ANG and AFRIC Block 25/30 F-16s are being upgraded under the combat upgrade plan integration details (CUPID) program to near Block 50 standard. Improvements include EGI, situation awareness data link (SADL), and an ECM management system. Advanced IFF will also be retrofitted to Block 25/30 aircraft.

In another program, Block 50/52 USAF F-16C/Ds, followed by Block 40/42 from 2005, are being retrofitted with a new modular mission computer being developed under an F-16 common architecture integration program (CCIP), aimed at extending operational flexibility. This effort includes the participating European governments of the F-16 Multinational Fighter Program. Other improvements to be incorporated include color displays, Sniper XR targeting pod, JHMCS, etc.
X-35A
Lockheed Martin Joint Strike Fighter concept demonstrator (Tom Reynolds)

Aim-9X. Link 16 data link, and improved weapons capabilities. First delivery made January 2002. The Block 50/52 aircraft will have dual/alternative carriage of High-speed Anti-Radiation Missile (HARM) targeting system (HTS)/smart targeting and identification via networked geolocation (STING) and advanced target pods (ATP) in Fiscal 2006. FLIR designated aircraft are equipped with LANTIRN for precision day or night attack. F-16C/DJ designated Block 50 aircraft are equipped with the HTS for suppression of enemy air defenses (SEAD).

F-35 Joint Strike Fighter

Brief: An affordable, highly common family of next generation strike aircraft.

Function: Multirole fighter.

Operator: ACC for USAF.


Delivery: 2001 (anticipated first production aircraft).

 Demonstration: 1,763 F-35A (USAF), 480-F-35B (USMC), 609 F-35C (USN), 150 (UK).

Inventory: TBD.

Unit Location: TBD.

Contractor: Lockheed Martin; Northrop Grumman; and BAE Systems; Pratt & Whitney is prime propulsion contractor; General Electric is alternate engine contractor.

Power Plant: one Pratt & Whitney F135 or General Electric F136 turbofan (production), in 35,000-lb thrust class.

Accommodation: pilot only, on zero/ejection seat.

Dimensions: TBD.

Weight: TBD.

Ceiling: TBD.

Performance (design targets): max level speed at S/L 724.5 miles calibrated airspeed for Navy and short takeoff and vertical landing (STOVL) variants, Mach 1 for USAF variant, combat radius more than 590 miles for USAF variant, 600 miles for Navy variant, and 450 miles for STOVL variant.

Armament: (main weapons bay): USAF variant: one internal gun, two AMRAAMs and two 2,000-lb JDAMs. USN variant: two AMRAAMs and two 2,000-lb JDAMs. STOVL variant: two AMRAAMs and two 1,000-lb JDAMs. External carriage will also be available. (Note: Numerous other weapons capabilities will be added as system development continues.)

Commentary: The Joint Strike Fighter (JSF) is a multinational cooperative development program that will develop and field an affordable, highly common family of next generation strike fighters. USAF is developing the JSF to replace its current force of F-16 and A-10 aircraft with a stealthy multirole fighter that will comprise the bulk of USAF’s fighter fleet for up to 50 years. This advanced multimission fighter is designed to penetrate high-threat enemy airspace and engage all enemy targets in any conflict. In addition to its advanced stealth design, the JSF incorporates maneuverability, long range, and highly advanced avionics to accomplish the bulk of USAF missions. Its fully integrated avionics and weapons systems will permit simultaneous engagement of multiple targets in enemy airspace.

The concept demonstration phase (CDP) of the program commenced November 1996, with competitive contract awards to Lockheed Martin (X-35A) and Boeing (X-32A). CDP concluded in fall 2001 with Lockheed Martin declared the winner. The system development and demonstration (SDD) phase, begun in October 2001, focuses on system development, test and evaluation, logistics support, and LRIP. Flight testing is projected to begin in August 2005. The JSF is powered by a derivative of the Pratt & Whitney F119 engine, called the F135. General Electric is developing an alternative power plant, the F136, for competitive demonstration.

F-117 Nighthawk

Brief: World’s first operational aircraft designed to exploit low observable (LO) stealth technology to expand the range of heavily defended strategic targets that can be attacked.

Function: Attack aircraft.

Operator: ACC, AFMC.

First Flight: June 18, 1981.


IOC: October 1983.

Production: 59.

Inventory: 55 (F-117A; 3YF-117).

Unit Location: Eglin AFB, Fla.; Holloman AFB, N.M.; Langley AFB, Va. (first operational location); Nellis AFB, Nev.; Tyndall AFB, Fla. (fighter training unit), with deliveries from July 2003.

Accommodation: pilot only, on zero/ejection seat.

Dimensions: span 43.3 ft, length 65.9 ft, height 12.4 ft.

Weight: empty (estimated) 29,500 lb, max gross 52,500 lb.

Ceiling: 35,000 ft.

Performance: high subsonic, top speed 646 mph (0.9 Mach), mission radius, unrefueled (5,000-lb weapon load) 656 miles.

Armament: full internal carriage of a variety of tactical weapons, incl laser- and GPS–guided 2,000-lb munitions, unguided general-purpose bombs, and cluster munitions.

Commentary: The F-117 is the Air Force’s primary strategic attack aircraft for penetrating high-threat target areas with precision weapons and is the only stealthy, true precision capability currently in the Global Strike Task Force. Its small radar signature and LO technologies allow the aircraft to penetrate dense threat environments and to deliver precision weapons against highly defended, high-value targets with pinpoint accuracy. Primary missions include strategic attack, air interdiction, SEAD, and special operations.

Acknowledged publicly in November 1988, the F-117’s first operational deployment was to Panama in 1989 for Just Cause. During Gulf War I in 1991, a fleet of more than 40 F-117As undertook 1,270 missions. No aircraft were lost or damaged by hostile fire. Twenty-four F-117s participated extensively in combat operations during Allied Force. One F-117 was lost March 27, 1999, during that conflict.

F-117A development and manufacture began simultaneously in November 1978 within a highly classified environment, using many parts either transferred or modified from existing aircraft. The F-117As were deployed with the 454th Tactical Group (designated 37th Tactical Fighter Wing in 1989) at Tonopah Test Range Airfield, Nev., up until 1992 where operations were restricted mainly to night flying to maintain secrecy.

To achieve the aircraft’s minimal radar signature, the skin panels of the arrowhead-shaped airframe are divided into many small, perfectly flat surfaces (facets), which deflect at a variety of angles all signals from probing hostile ground or airborne radars. In addition, much of the aircraft’s external surface is made of composites and radar-absorbent materials. The F-117A’s dual black finish reflects little light, and the engine air intakes and exhaust nozzles are above the wings and rear fuselage, respectively, to shield them from IR seekers. Just Cause
Armament: (projected) one internal M61A2 20 mm gun, two AIM-9 Sidewinders stored internally in the side weapons bays; six AIM-120 AMRAAMS in the main weapons bay; approx eight SDBs internally; for ground attack, two 1,000-lb JDAMs replace four AMRAAMS internally.

COMMENTARY

The recent redesignation from F-22 to F/A-22 re- flects increased emphasis on high-speed attack, in addition to rapidly achieving air dominance. The F/A-22 will counter multiple anti-access threats, such as advanced integrated air defense system (AIDS), fighters, cruise missiles, theater ballistic missile (TBM) sites, and weapons of mass destruction through the application of unmatched air-to-air capabilities coupled with inherent air-to-ground capability. The F/A-22’s unique combination of stealth, supercruise (ability to cruise at supersonic speed without using its afterburn- ers), maneuverability, and integrated avionics leads USAF’s initial “kick down the door” force, enabling 24-hour stealth operations across the spectrum of mis- sions. Its fully integrated avionics and weapons sys- tems will permit simultaneous engagement of multiple targets. Advanced maneuverability is achieved through the combination of the avionics system, structural strength, and thrust vectoring nozzles. A Raytheon common integrated processor ties together various avionics functions.

Two prototypes were built for competitive evaluation with Northrop/McDonnell Douglas YF-23 prototypes. First flight was Sept. 29, 1990, with the YF-23. The aircraft would be longer than F/A-22, with much larger wings and greater fuel and endurance at 40,000 ft with operational laser weapon load approx six hr. Chemical fuel carried on board will enable more than 20 shots.

COMMENTARY

The Airborne Laser will become the first directed energy weapon in the US arsenal. The Missile Defense Agency (MDA) assumed overall direction and budget authority for the program in summer 2001. USAF continues to man and develop the program through its Airborne Laser System Program Office at Kirtland AFB, N.M.

Maintenance Command will have operational respon- sibility and currently plans to base the attack laser in CONUS but could deploy the ABL with minimal airlift support to any region of the world. It will arrive in theater with its crew, laser fuel, and initial spares ready to fight. Operational concepts call for ABLs to fly con- tinuous patrols over deployed US forces, at an altitude of 40,000 feet. The aircraft will detect and shoot down any TBMs launched at US forces or nearby allied nations. The ABL will also have the capability of deter- mining hostile launch locations and passing that infor- mation to other US assets. As US forces achieve air superiority, ABL will be able to move closer to enemy territory. ABLs represent the only near-term boost- phase missile defense. Once the decision is made to proceed with full production, USAF’s acquisition com- munity will assume responsibility for procurement; fleet size has not been determined.

The attack laser’s main armament is a lightweight, megawatt-class COIL. This laser technology can de- liver high energy over a great distance largely because of its IR wavelength. In addition to the COIL, the ABL house three other lasers: the active range system which provides preliminary tracking data; the track illuminator laser, which produces more refined data; and the beacon illuminator laser, which measures at- mospheric disturbance.

Following a two-year structural modification, the ABL platform’s first flight took place July 18, 2002, from Boeing’s Wichita, Kan., facility. A 10-month laser mod- ule test was completed in 2002, and, in late 2002, the platform was flown to Edwards AFB, Calif., where system components will be installed and tested. A test de- stuction of a boosting ballistic missile is projected for early 2005.

The test aircraft will offer limited operational capabil- ity; this aircraft will eventually be converted to a fully operational model.

F/A-22 Raptor (Lockheed)

fleet of 339 F/A-22s, but states a requirement for at least 381.

USAf has asked Lockheed Martin to do minimal preliminary design of a dedicated attack variant, tenta- tively called FB-22. The aircraft would be longer than the F/A-22, with much larger wings and greater fuel and weapons capacity, with three times the range of the baseline aircraft. While still stealthy, the FB-22 would lack thrust vectoring and other features necessary for dogfighting. The FB-22 could be 80 percent common with the standard F/A-22.

X-45 UAV

Brief: A concept demonstrator for a stealthy un- manned combat air vehicle (UCAV) that will be capable of carrying a large weapon load for the SEAL mission. The system may be stored in “smart boxes” until required, then reassembled and made mission- ready internally. The UCAV may also be made air refuelable for self-deployment.

Function: Concept demonstrator UCAV for the SEAL mission.

First Flight: May 22, 2002
Contractor: Boeing.

Reconnaissance and Surveillance Aircraft

E-3 Sentry

Brief: Modified Boeing 707, fitted with a rotating radome, 30 ft wide and 6 ft thick, which provides all- weather air surveillance and C3 for tactical and air defense forces.

Function: Airborne early warning, BM, C3 aircraft.

Operator: ACC, PACAF, AFRIC (Assoc.).


Delivered: March 1977–84.


Production: TBD.

Unit Location: Elmendorf AFB, Alaska, Kadena AB, Japan, Tinker AFB, Okla.

E-3C Sentry (Ted Carlson)
E-3A, has an internal 450-lb surveillance payload that permits engaged forces to stay on target. The first E-8C flew in March 1994 and served as the preproduction test bed. The last seven aircraft were delivered in late 2001.

E-8A. Prototype version, with specialized equipment installed aboard two specially modified T-707-300 airframes. Equipped with 18 operations and control consoles, two of which double as communications stations. The first E-8A flew in March 1994 and served as the preproduction test bed. The last seven aircraft will feature more advanced computer systems, which will be retrofitted on the 10 earlier aircraft. Planned improvements include Link 16 upgrade of the Wescam sensor ball. The MTS provides a laser designator, a digital data link. Multiple receivers are in use, predominantly the US Army's Common Ground Station and Joint Services Work Station.

As part of their operational test and evaluation, Joint STARS aircraft flew more than 150 operational missions during Desert Storm (with two E-8A development aircraft) and Joint Endeavor (with one E-8A and one test bed E-8C).

E-8B. Production version, based on former commercial T-707-300 airframes. Equipped with 18 operations and control consoles, two of which double as communications stations. The first E-8C flew in March 1994 and served as the preproduction test bed. The last seven aircraft will feature more advanced computer systems, which will be retrofitted on the 10 earlier aircraft. Planned improvements include Link 16 upgrade for data transmission to attack aircraft; enhanced SAR; new satellite radios; upgrades to allow Joint STARS to assume the Airborne Battle Field Control and Command Control (ABCC) mission of attack support to ground force commanders; and global air traffic management (GATM) upgrades to permit use of optimum altitudes and flight routes in European airspace.

**E-8C Joint STARS (Ted Carlson)**

**Brief:** A modified Boeing 707 equipped with a large, canoeshaped radome mounted under the forward part of the fuselage, housing long-range, air-to-ground radar capable of locating, classifying, and tracking vehicles moving on Earth's surface out to distances in excess of 124 miles. Such data are then transmitted via data link to ground stations or aircraft.

**Function:** Ground surveillance, BM, C2 aircraft.

**Operator:** USAF.

**First Flight:** December 1988.

**Delivered:** May 1996–present.

**IOC:** Dec. 1991.

**Production:** 17 planned.

**Inventory:** 14.

**Unit Location:** Robins AFB, Ga.

**Contractor:** Northrop Grumman; Motorola; Cubic; Raytheon.

**Power Plant:** four Pratt & Whitney TF33-102C turbojets, each 19,200 lb thrust.

**Accommodation:** mission crew of 21 Air Force/Army operators (can be augmented to 34).

**Dimensions:** span 145.8 ft, length 152.9 ft, height 42.5 ft.

**Weight:** gross 336,000 lb.

**Ceiling:** 42,000 ft.

**Performance:** max operating speed Mach 0.84, endurance with one in-flight refueling 20 hr.

**Commentary:** Joint STARS (Surveillance Target Attack Radar System) is a B7 platform capable of providing theater commanders with C2 of air-to-ground forces and simultaneous near-real-time wide area surveillance as well as downlink of targeting information to air and ground commanders. Joint STARS battle managers, in combination with a robust communications suite, conduct C2 of air operations to engage enemy forces in day, night, and adverse weather conditions. Joint STARS also conducts near-real-time surveillance and reporting for use by air and ground forces. The radar subsystem features a multimode, side-looking, phased-array radar that provides interleave moving target indicator (MTI), SAR, and fixed target indicator (FTI) imagery. Joint STARS downlinks via a secure, jam-resistant digital data link. Multiple receivers are in use, predominantly the US Army's Common Ground Station and Joint Services Work Station.

**As part of their operational test and evaluation, Joint STARS aircraft flew more than 150 operational missions during Desert Storm (with two E-8A development aircraft) and Joint Endeavor (with one E-8A and one test bed E-8C).**

**E-8A. Prototype version, with specialized equipment installed aboard two specially modified T-707-300 airframes. One was converted to an in-flight pilot trainer in 1997, and the second has been placed in long-term storage.**

**E-8B. Production version, based on former commercial T-707-300 airframes. Equipped with 18 operations and control consoles, two of which double as communications stations. The first E-8C flew in March 1994 and served as the preproduction test bed. The last seven aircraft will feature more advanced computer systems, which will be retrofitted on the 10 earlier aircraft. Planned improvements include Link 16 upgrade for data transmission to attack aircraft; enhanced SAR; new satellite radios; upgrades to allow Joint STARS to assume the Airborne Battle Field Control and Command Control (ABCC) mission of attack support to ground force commanders; and global air traffic management (GATM) upgrades to permit use of optimum altitudes and flight routes in European airspace.**

**MQ-1 Predator A**

**Brief:** A medium-altitude, long-endurance unmanned aerial vehicle (UAV), flown remotely. Joint force commander multimission asset combining imagery sensors with strike capability.

**Function:** Unmanned reconnaissance aircraft.

**Operator:** ACC.

**First Flight:** July 1994.

**Delivered:** July 1994 (USAF from 1996)–present.

**IOC:** 2003.

**Production:** 100 air vehicles (planned).

**Inventory:** eight air vehicles.

**Unit Location:** Indian Springs; AFAF, Nev.

**Contractor:** General Atomics Aeronautical Systems.

**Power Plant:** one Rotax 914 turbocharged engine.

**Accommodation:** crew of two.

**Dimensions:** length 27 ft, height 7.2 ft, span 48.7 ft.

**Weight:** empty 950 lb, gross 2,250 lb.

**Ceiling:** 25,000 ft.

**Performance:** cruise speed 80 mph, up to 138 mph, endurance 24 hours (460 miles with 16 hours on station).

**Armament:** Two Hellfire missiles on multispectral targeting system (MTS)–equipped vehicles.

**Commentary:** USAF has activated three Predator squadrons, the 11th, 15th, and 17th RS. The 11th conducts mission qualification training as well as operational deployments. The Predator system includes four air vehicles, a ground control station, satellite link, and about 55 personnel for 24-hour operations. The Predator crew comprises a pilot and two sensor operators.

DOD first used the advanced concept technology demonstration (ACTD) Predator in 1995 to support Operation Provide Promise. In 1997, DOD named USAF to take over the Predator program. In 1999, while the UAV was still in development, USAF began to deploy the system operationally for surveillance missions over Bosnia and Iraq. In July 2001, USAF successfully experimented with Predators armed with Hellfire missiles. In Enduring Freedom, Predators provided live video feeds directly to AC-130 gunships, and Hellfire–armed Predators struck time sensitive targets. USAF changed the designation for Predator A to MQ-1 to denote its multispectral capability for both reconnaissance and strike.

**MQ-1A designates the weaponized Predator A. It carries an MTS sensor ball supplied by Raytheon in place of the Wescam sensor ball. The MTS provides a laser target designator with EO/IR sensors in a single package, where, previously one video camera had to be removed to house a laser designator. The SAR is removed to make room for some of the laser designator equipment. The MQ-1A can carry two Hellfire antitank missiles.**

**RO-1A designates the ACTD version of Predator A, all of which are slated to retire soon.**

**RO-1B, the reconnaissance-only version of Predator A, has an internal 450-lb surveillance payload that includes two EO and one IR video cameras carried in a ball-shaped turret under the nose and produced by Wescam. The internal sensor payload also includes a SAR still imagery camera for a daytime, all-weather reconnaissance capability. USAF is retrofitting most RO-1Bs to MQ-1 status.**

**MQ-9 Predator B**

**Brief:** A high-altitude, long-endurance UAV, flown remotely. Joint force commander multimission asset combining imagery sensors with expanded strike capability.

**Function:** Unmanned reconnaissance aircraft.

**Operational**

**First Flight:** February 2001.

**Delivered:** November 2003 (planned).
**MQ-9 Predator B (General Atomics Aeronautical Systems)**

The MQ-9 hunter-killer UAV flies higher, faster, and has 50 percent greater payload capacity than the MQ-1. With its 800-lb internal sensor payload capacity, the MQ-9 will be able to carry simultaneously numerous payloads, such as a larger, more capable camera system, SAR, MTS, and other detection systems. Its 3,000-lb external payload capacity will enable it to carry up to 10 Hellfire missiles. USAF is exploring other weapons and a possible air-to-air role.

**OC-135 Open Skies**

**Brief:** A modified C-135 aircraft that flies unarmed observation and verification flights over nations that are parties to the 1992 Open Skies Treaty. **Function:** Reconnaissance aircraft. **Operator:** ACC. **First Flight:** June 1993. **Delivered:** October 1993–96. **Production:** three. **Inventory:** two. **Unit Location:** Offutt AFB, Neb. **Contractor:** Boeing. **Power Plant:** four Pratt & Whitney TF33-P-5 turbofans, each 16,050 lb thrust. **Accommodation:** seating for 38. **Dimensions:** span 131 ft, length 135 ft, height 42 ft. **Weight:** gross 297,000 lb. **Ceiling:** 50,500 ft (basic C-135). **Performance:** speed 500+ mph, unrefueled range 3,000 miles. **COMMENTARY** A modified version of the WC-135, used for specialized reconnaissance with an IR linescanner, SAR, and forward- and vertical-looking video cameras installed in the rear of the aircraft. Durable low-altitude modifications include one vertical and two oblique KS-87 framing cameras, used for low-altitude photography approximately 3,000 ft above the ground, and one KA-91 pan camera, which pans from side to side to provide a wide sweep for each picture, used for high-altitude photography at approximately 35,000 ft. Durable long-endurance, LRIP and used by the Miltex camera annotation system.

**RC-135**

**Brief:** Specially configured variant of the Boeing C-135 Stratolifter, having an elongated nose and cheeks containing highly advanced electronic signal collection systems. Used to acquire real-time electronic intelligence (Elint) data for theater and tactical commanders. **Function:** Electronic reconnaissance aircraft. **Operator:** ACC. **First Flight:** not available. **Delivered:** circa 1973–99. **IOC:** circa 1973 (Rivet Joint). **Production:** (converted). **Inventory:** 21. **Unit Location:** Offutt AFB, Neb. **Contractor:** Boeing (airframe); Raytheon; Textron. **Power Plant:** four Pratt & Whitney TF33-P-5/9 turbofans, each 18,000 lb thrust. (Replaced with CFM International CFM-56s in a W version.) **Accommodation:** Flight crew of four; 25–35 mission crew. **Dimensions:** (Cobra Ball) span 131 ft, length 140 ft, height 42 ft; (Cobra Sent) span 135 ft, length 136 ft; (Rivet Joint) height 38 ft. **Weight:** max gross 299,000 lb. **Ceiling:** 35,000 ft. **Performance:** speed 500 mph plus, range, with air refueling, unlimited. **COMMENTARY** The 55th Wing at Offutt AFB, Neb., operates a highly specialized fleet for worldwide reconnaissance missions. All are due to be re-engined and are subject to ongoing modernization, with upgrade of avionics and primary mission equipment to expand capability and maintain effectiveness.

**RC-135S Global Hawk**

The MQ-9 hunter-killer UAV flies higher, faster, and has 50 percent greater payload capacity than the MQ-1. With its 800-lb internal sensor payload capacity, the MQ-9 will be able to carry simultaneously numerous payloads, such as a larger, more capable camera system, SAR, MTS, and other detection systems. Its 3,000-lb external payload capacity will enable it to carry 10 Hellfire missiles. USAF is exploring other weapons and a possible air-to-air role.

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**RC-135S Global Hawk**

Three aircraft are measure- ment and signature intelligence (MASINT) collection platforms. The Cobra Ball can deploy anywhere in the world in 24 hours and provide on-scene EO reconnaiss ance for treaty verification and TBM proliferation. Equipment includes wide-area IR sensors, long-range optical cameras, and an advanced communications suite.

**RC-135U Combat Sent**

Two aircraft with precision signals intelligence (Sigint) reconnaissance gear and a larger tailcone and fin fairing, used for measuring and analyzing foreign electronic and IR equipment. Com bat Sent can deploy anywhere in the world within 24 hours and provide on-scene precision measurement of potential threat emitters. IOC 1967. **RC-135 V/W Rivet Joint**

Used for electronic surveil lance. RC-135 Rivet Joints loiter near battlefields and provide near-real-time data updates on enemy defensive and offensive activities to harden targets, secure voice and data link networks. The aircraft’s recon systems are continuously upgraded to keep pace with new threats.

**TC-135S/W**

Used for training purposes.

**RC-4 Global Hawk**

**Brief:** A high-altitude, long-range, long-endurance UAV. **Function:** Unmanned reconnaissance aircraft. **Operator:** ACC. **First Flight:** Feb. 28, 1998. **Delivered:** five. **IOC:** currently in EMD; used operationally in Afghanistan. **Performance:** LRIP. (Initial plans call for 30 air vehi cles, incl 12 image intelligence (Imint) and 12 Sigint. Requirements exist for up to 51 aircraft through 2003.) **Inventory:** three air vehicles. **Unit Location:** Beale AFB, Calif. **Contractor:** Northrop Grumman (prime); Raytheon. **Power Plant:** one Rolls Royce–Allison AE 3007H turbofan, 7,600 lb thrust. **Accommodation:** unmanned system. **Dimensions:** length 44 ft, height 15.2 ft, span 116 ft. **Weight:** empty 8,200 lb, gross 25,600 lb. **Ceiling:** 65,000 ft. **Performance:** design goals incl endurance of up to 40 hr at a cruise speed of 400 mph and at an altitude of 65,000 ft. This would allow loiter on station 1,380 miles from base for 24 hr. Combat range 15,525 miles. **Armament:** none. **COMMENTARY** A high-altitude endurance UAV carrying a 1,960-lb payload, incorporating EO/IR and SAR sensors that permit switching among radar, IR, and visible wave lengths as required. Objective system will add Sigint and improved GMTI capability. Navigation is by GPS/ INS. Global Hawk flies autonomously from takeoff to landing, providing near-real-time imagery products for tactical and theater commanders. Vehicle ground track and mission plan can be updated in real time to re spond to changing air traffic control needs and/or mis sion collection needs. Global Hawk began as an advanced concept technology demonstrator. The No. 2 aircraft crashed March 29, 1999. Vehicle No. 3 was damaged Dec. 6, 1999, after a test flight. Vehicle No. 1 resumed test flights March 11, 2000, after a precautionary stand-down. During test it completed more than 100 flights and flew in excess of 66,000 ft altitude and 31 hours endurance, and accumulated more than 1,300 hours total flight time. Global Hawk flew over water to Alaska, complet ing the first transoceanic crossing to Portugal and back. In spring 2001, Global Hawk flew to Australia for six weeks of demonstrations. In March 2001 it entered into EMD. Although still a development system, Global Hawk first deployed operationally to support Enduring Freedom in November 2001. Global Hawk provides continuous, all-weather, day/ night, wide area surveillance. It will operate in low-to moderate air defense threat environments with the ability to fly above or stand off from enemy defenses. It is considered the likely successor to the U-2 aircraft. The Navy is also considering purchase of Global Hawk. Total buy TBD.

**U-2 Dragon Lady**

**Brief:** Single-seat, single-engine, high-altitude endurance reconnaissance aircraft carrying a wide variety of sensors and cameras, providing continuous day or night, high-altitude, all-weather area surveillance in direct support of US forces.
More than $1.5 billion has been invested in the U-2 since 1994. Completed or ongoing improvements include the new GE F118 engine, incorporating significant improvements in reliability and performance over the current designations of all 35 aircraft (30 U-2S mission aircraft, five U-2ST trainers) in the inventory, having completed conversion to S model configuration with IOC: December 1994 (U-2S).

**COMMENTARY**

The U-2 remains the Air Force’s premier high-altitude reconnaissance platform, capable of carrying Imint and Elint sensors simultaneously. The U-2 has been billed as the aircraft first flown in the U-2 since 1994. Completed or ongoing improvements include a new GE F118-101 engine, a complete electrical system replacement, a new glass cockpit utilizing up-front controls and multifunction displays (MFDs), and a new EW system. Sensors upgrades include the AN/ASQ-120 sensor system, which provides enhanced imaging modes and improves geo-location accuracy; the SVERS-2 EO imagery system, which provides multispectral and IR capability; enhanced RF-intelligence capability; and new data links enabling the U-2 to connect in near real time with near real-time data relays.

**WC-130 Hercules**

**Function:** Weather reconnaissance aircraft.

**Operator:** AFRC.

**First Flight:** circa 1958.

**Delivered:** October 1999–2002.

**IOC:** December 1999 (EC-130J).

**Function:** Weather reconnaissance.

**Accommodation:** 20 passengers.

**Dimensions:** span 118 ft, length 186.5 ft, height 54 ft.

**Weight:** gross 160,000 lb.

**Performance:** speed 370 mph; range more than 4,500 miles; max endurance 11 hr. (EC-130E).

**EC-130E Commando Solo (MSgt. David Hawkins)**

**Function:** Electronic surveillance.

**Operator:** AFMC.

**First Flight:** April 1985.

**Delivered:** January 1986.

**IOC:** January 1986.

**Production:** six.

**Inventory:** four.

**Contractor:** Boeing; Pratt & Whitney TF34 turbos, each 18,000 lb thrust.

**Accommodation:** 16–24 in EC-130B.

**Dimensions:** span 145.8 ft, length 152.9 ft, height 42.4 ft.

**Weight:** gross 326,000 lb.

**Performance:** max cruise speed 470 mph, range 7,610 miles.

**COMMENTARY**

**EC-130E**

**Brief:** A heavily modified C-130 with variants used for battlefield command, EW, and electronic combat.

**Function:** C2: psychological warfare.

**Operator:** ACC, ANG.

**First Flight:** January 1990.

**Delivered:** March 1990.

**IOC:** December 1990.

**Production:** (no USAF new-build EC-130Es); five

**Inventory:** eight (E); five (J).

**Unit Location:** ANG: Harrisburg Arpt., Pa.

**Contractor:** Lockheed Martin; Raytheon; General Dynamics.

**Power Plant:** four Allison T56-A-15 turboprops, each 4,910 shp.

**Accommodation:** four flight crew, 15 mission personnel.

**Dimensions:** span 132.6 ft, length 99.1 ft, height 38.5 ft.

**Weight:** gross 155,200 lb.

**Performance:** speed 299 mph, range in excess of 2,100 miles; max 175,000 lb.

**Ceiling:** 20,000 ft; (C-130J) 30,560 ft.

**Speed:** performance speed 299 mph.

**Range:** performance speed 299 mph.

**COMMENTARY**

**EC-130E ABCCC**

**Brief:** An airborne C2 system, the aircraft support USAF and USN missile testing and are also capable of monitoring and controlling UAVs. To retire in FY03.

**EC-130J**

**Brief:** A heavily modified C-130 with variants used for battlefield command, EW, and electronic combat.

**Function:** C2: psychological warfare.

**Operator:** ACC, ANG.

**First Flight:** January 1990.

**Delivered:** March 1990.

**IOC:** December 1990.

**Production:** (no USAF new-build EC-130Es); five

**Inventory:** eight (E); five (J).

**Unit Location:** ANG: Harrisburg Arpt., Pa.

**Contractor:** Lockheed Martin; Raytheon; General Dynamics.

**Power Plant:** four Allison T56-A-15 turboprops, each 4,910 shp; (EC-130E) T56-A-15 turboprops, each 4,200 shp; (EC-130J) four Rolls-Royce–Allison AE2100D turboprops, each 4,591 shp.

**Accommodation:** four flight crew, 15 mission personnel.

**Dimensions:** span 132.6 ft, length 99.1 ft, height 38.5 ft.

**Weight:** gross 155,200 lb; (C-130J) 175,000 lb.

**Ceiling:** 20,000 ft; (C-130J) 30,560 ft.

**Performance:** speed 299 mph.

**Range:** performance speed 299 mph.

**COMMENTARY**

**EC-130E Commando Solo**

**Brief:** A heavily modified Boeing 707 used as a flexible airborne telemetry and other data recording and relay station in tests of aircraft, spacecraft, and missiles.
EC-130H Compass Call
Brief: A heavily modified C-130 for electronic combat.
Function: Electronic Warfare.
Operator: ACC.
First Flight: 1981.
IOC: 1983; (Block 30) February 1999.
Production: (converted).
Inventory: 14.
Unit Location: Davis–Monthan AFB, Ariz.
Contractor: Lockheed Martin.
Accommodation: standard crew 13.
Dimensions: span 132.6 ft, length 99 ft, height 38 ft.
Weight: 155,000 lb.
Ceiling: 25,000 ft.
Performance: speed 374 mph at 20,000 ft.

COMMENTARY
A variant used as an airborne communications jamming and information warfare platform. Modifications include ECM system and air refueling capability. Further upgrades, including an updated receiver subsystem, will improve reliability and expand the EC-130H’s offensive counterinformation (OCI) capability against modern C2 systems. Completion expected FY07.

KC-10 Extender (SSgt. Michael Gaddis)

from the older aircraft. Entered service mid-2001 with the 193rd Special Operations Wing (ANG), Harrisburg.

KC-135R Stratotanker (MSgt. Keith Reed)

and personnel locating systems (PLS) compatible with aircrew survival radios. Ongoing modifications include an improved digital low-power color radar, integrated satellite communications radio, NVG–compatible interior/exterior lighting, and cockpit armor. The C-130 avionics modernization program (AMP) provides for complete update of the KC-130 avionics. USAF plans to convert four recently retired EC-130E ABCCC aircraft to KC-130 standard.

KC-130P/King
Brief: An extended-range, combat search and rescue (CSAR)—configured C-130 that extends the range of rescue helicopters through in-flight refueling and performs tactical delivery of pararescue jumper (PJ) specialists and/or equipment in hostile environments.
Function: Aerial refueling/transport.
Operator: ACC, ANG, AFRC.
First Flight: Dec. 8, 1964 (as HC-130H).
Delivered: from 1965.
IOC: 1968.
Production: (converted).
Inventory: 32.
Contractor: Lockheed (now Lockheed Martin).
Accommodation: four flight crew, plus mission crew.
Dimensions: span 132.6 ft, length 98.8 ft, height 38.5 ft.
Weight: gross 155,000 lb.
Ceiling: 33,000 ft.
Performance: speed 289 mph, range more than 4,000 miles.

COMMENTARY
The KC-130 can perform extended visual/electronic searches over land or water and operate from unimproved airfields. A three-man PJ team, trained in emergency trauma medicine, harsh environment survival, and assisted evasion, is part of the normal mission crew complement.
Combat air forces’ HC-130 aircraft are equipped with an integrated GPS/INS navigation package, radar/missile warning receivers, and chaff/flare countermeasures dispensers. Some aircraft have FLIR systems.

from the older aircraft. Entered service mid-2001 with the 193rd Special Operations Wing (ANG), Harrisburg.

KC-130P/King
Brief: An extended-range, combat search and rescue (CSAR)—configured C-130 that extends the range of rescue helicopters through in-flight refueling and performs tactical delivery of pararescue jumper (PJ) specialists and/or equipment in hostile environments.
Function: Aerial refueling/transport.
Operator: ACC, ANG, AFRC.
First Flight: Dec. 8, 1964 (as HC-130H).
Delivered: from 1965.
IOC: 1968.
Production: (converted).
Inventory: 32.
Contractor: Lockheed (now Lockheed Martin).
Accommodation: four flight crew, plus mission crew.
Dimensions: span 132.6 ft, length 98.8 ft, height 38.5 ft.
Weight: gross 155,000 lb.
Ceiling: 33,000 ft.
Performance: speed 289 mph, range more than 4,000 miles.

COMMENTARY
The KC-130 can perform extended visual/electronic searches over land or water and operate from unimproved airfields. A three-man PJ team, trained in emergency trauma medicine, harsh environment survival, and assisted evasion, is part of the normal mission crew complement.
Combat air forces’ HC-130 aircraft are equipped with an integrated GPS/INS navigation package, radar/missile warning receivers, and chaff/flare countermeasures dispensers. Some aircraft have FLIR systems.

onics. More recently installed wing-mounted pods have enhanced the aircraft’s capabilities. Other modifications include the addition of communications, navigation, and surveillance equipment to meet civil air traffic control requirements.

Because it has both types of tanker refueling equipment installed, the KC-10A can service USAF, USN, USMC, and allied aircraft on the same mission. Special lighting permits night operations.

KC-135 Stratotanker
Brief: A short- to medium-range tanker aircraft, meeting the air refueling needs of USAF bomber, fighter, cargo, and reconnaissance forces. It also supports USN, USMC, and allied aircraft.
Function: Aerial refueling/airlift.
Operator: AETC, AFMC, AMC, PACAF, USAFE, ANG, AFRC.
First Flight: August 1956.
Delivered: January 1957–66.
IOC: June 1957, Castle AFB, Calif.
Production: 732.
Inventory: 546.
Unit Location: Altus AFB, Okla., Aviano AB, Italy.

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Contractor: Boeing.
Accommodation: crew of four; up to 80 passengers.
Dimensions: span 130.8 ft, length 136.2 ft, height 38.5 ft.
Weight: empty 119,231 lb, gross 322,500 lb (KC-135E: 301,600 lb).
Ceiling: 50,000 ft.
Performance: max speed at 30,000 ft 610 mph, range with max fuel 11,015 miles.

COMMENTARY
Mainstay of the USAF tanker fleet, the long-serving KC-135 is similar in size and appearance to commercial 707 aircraft but was designed to military specifications, incorporating different structural details and materials. The KC-135 fuel tanks are located in the “wet wings” and in fuel tanks below the floor in the fuselage.

KC-135A. Original version with J57 turbojets. USAF built 302, 232 modified to other standards.
KC-135E. The JT3D re-engineing program upgraded 161 AFRC and ANG KC-135As to KC-135E standard with JT3D turbofans removed from surplus commercial 707s; fuel carrying capacity is increased by 20 percent.
KC-135R/T. Designation of re-engined KC-135As with CFM56 turbos. They embody modifications to 25 major systems and subsystems and not only carry more fuel farther but have reduced maintenance costs, are able to use shorter runways, and meet Stage III requirements. The first KC-135R flight was in October 1982, and redeliveries began in July 1984. KC-135T aircraft (formerly KC-135Q) were capable of refueling the now-retired SR-71s.
Ongoing modifications are extending the capability and operational utility of the KC-135 well into this century. Renewal of the lower wing skin added 27,000 flying hours to the aircraft. The Pacer CRAG avionics modernization program concluded Oct. 1, 2002. The six-year upgrade program included installation of a new compass, radar, and GPS navigation systems, a
traffic alert and collision avoidance system (TCAS), and the new digital multifunctional cockpit displays. Reduced vertical separation minima and GATM upgrades are also planned for the entire fleet. Forty-five KC-135Rs are being fitted with wing-mounted hose-and-drogue refueling pods to enhance interoperability and support to the USAF, USMC, NATO, and other allied receiver aircraft. IOC February 2000.

**MC-130P Combat Shadow**

**Brief:** Aircraft that flies clandestine or low-visibility, low-level missions into denied areas to provide air refueling for SOF helicopters/airdrop. Also, the C-130P can be used to air refuel aircraft in Europe, Africa, or the Middle East. The MC-130P is the special operations version of the C-130A/B. It carries a 13,000-lb (58,860 kg) capacity externally on hardpoints on the wings, and an additional 4,000 lb (1,814 kg) internally. It also has a tank that can refuel up to 13,000 lb (58,860 kg) of fuel on each mission. The MC-130P is able to carry a maximum of 340 passengers in an Airbus configuration, or to air-drop small special operations teams, small combat rubber raiding craft, or to air-drop small special operations teams, small combat rubber raiding craft.

**Dimensions:** span 222.8 ft, length 247.9 ft, height 65.1 ft.

**Weight:** empty 374,000 lb, gross 769,000 lb (warranty 840,000 lb).

**Engine Type:** two 27,000 lb-thrust F117-PW-100 turbofans, and updated avionics, with color weather radar and digital displays. Block 12 aircraft were delivered to the USAF in December 2002.

**IOC:** September 1970.

**Delivered:** 131.

**Unit Location:** Active: Eglin AFB, Fla., Kadena AB, Japan, Kirtland AFB, N.M., RAF Mildenhall, UK. ANG: Kilis ANGB, Alaska, AFRIC; Duke Field, Fla.

**Contractor:** Lockheed Martin (airframe); Boeing.

**Power Plant:** four Allison T56-A-15 turboprops, each 4,910 shp.

**Operator:** AETC, AFSC, ANG, AFRIC.

**First Flight:** Dec. 8, 1964 (as HC-130H).

**Delivered:** from 1965.

**IOC:** 1986.

**Production:** (converted).

**Inventory:** 27.

**C-5 Galaxy**

**Brief:** A heavy-lift, air refuelable cargo transport for intertheater (strategic) and intratheater (tactical) delivery of airlift of all classes of military cargo, including outsized items. The C-5A can carry cargo or troops or up to three AH-64A helicopters; three Bradley vehicles; one M1 main battle tank; three CH-47 helicopters; a piece of Army combat equipment the C-5 can't carry. It can take off and land in very short fields and has the capability to fly 17,000 miles with 160,000-lb payload and 2,760 miles with 340,000-lb payload. Provisions for full range of military airlift missions; airdrop capability for single platforms weighing up to 42,000 lb.

**Dimensions:** span 236.2 ft, length 265 ft, height 38.5 ft.

**Weight:** gross 155,000 lb.

**Ceiling:** 33,000 ft.

**Performance:** speed 289 mph, range more than 7,400 miles.

**COMMENTARY**

C-5 Galaxy (Maj. Thomas E. Williams)

**C-17 Globemaster III**

**Brief:** A heavy-lift, air refuelable cargo transport for intertheater (strategic) and intratheater (tactical) delivery of airlift of all classes of military cargo, including outsized items. The C-17 can carry cargo or troops or up to four AH-64A helicopters; three Bradley vehicles; one M1 main battle tank; three CH-47 helicopters; a piece of Army combat equipment the C-17 can't carry. It can take off and land in very short fields and has the capability to fly 17,000 miles with 160,000-lb payload and 2,760 miles with 340,000-lb payload. Provisions for full range of military airlift missions; airdrop capability for single platforms weighing up to 60,000 lb.

**Dimensions:** span over winglet tips 169.8 ft, length 173.9 ft, height 55.1 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Ceiling:** 45,000 ft.

**Performance:** normal cruising speed 484 mph at 45,000 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Dimensions:** span over winglet tips 169.8 ft, length 173.9 ft, height 55.1 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Ceiling:** 45,000 ft.

**Performance:** normal cruising speed 484 mph at 45,000 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Dimensions:** span over winglet tips 169.8 ft, length 173.9 ft, height 55.1 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Ceiling:** 45,000 ft.

**Performance:** normal cruising speed 484 mph at 45,000 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Dimensions:** span over winglet tips 169.8 ft, length 173.9 ft, height 55.1 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Ceiling:** 45,000 ft.

**Performance:** normal cruising speed 484 mph at 45,000 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Dimensions:** span over winglet tips 169.8 ft, length 173.9 ft, height 55.1 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Ceiling:** 45,000 ft.

**Performance:** normal cruising speed 484 mph at 45,000 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Dimensions:** span over winglet tips 169.8 ft, length 173.9 ft, height 55.1 ft.

**Weight:** empty 277,000 lb, max payload 170,900 lb, gross 585,000 lb.

**Ceiling:** 45,000 ft.

**Performance:** normal cruising speed 484 mph at 45,000 ft.
craft, delivered from 2001, have theERFCS upgrades, also to be retrofitted on earlier aircraft. Other C-17 improvements include a terrain awareness warning system (TAWS) and video integrated processor (VIP). A laser jamming system to counter the IR-homing missile threat is planned from FY03, supplementing the current self-defense system, with the first 12 aircraft receiving an accelerated interim capability by March 2004. In October 2002, the C-17 assumed the special operations low level (SOLL) mission previously supported by the C-141. Enhancements include SOLL II communications suites and carry-on external fuel tanks. The C-17A has flown numerous operational and humanitarian missions since entering operational service, including peacekeeping operations in Bosnia, where the C-17 was the only aircraft capable of delivering outsized cargo.

C-135 Stratolifter
Brief: A version of the KC-135 tanker, without refueling equipment, produced for nontanker duties.

Function: Passenger and cargo airlifter.
Operator: PACAF.
First Flight: May 1961.
Production: 48, plus five WC-135s.
Inventory: three.
Unit Location: Hickam AFB, Hawaii.
Contractor: Boeing.
Power Plant: (C-135B) four Pratt & Whitney TF33-P-5 turbofans, each 21,000 lb thrust.

Accommodation: C-135B-60 passengers.
Dimensions: span 130.8 ft, length 124.5 ft, height 38.3 ft.
Weights: C-135B: operating weight 102,300 lb, gross 275,500 lb.
Ceiling: 50,000 ft.
Performance: C-135B: max speed 600 mph, range with 54,000 lb payload 4,625 miles.

COMMENTARY
A few C-135 transports and variants, without the KC-135’s refueling equipment, remain operational within USAF. They were ordered originally to serve as interim jet passenger or cargo transports, pending delivery of C-141s. Three converted KC-135s were followed by 45 production Stratolifters in two versions.

C-135A.
The first 15 aircraft were equipped with J57-P-5W turbojets.

C-135B.
The next version included upgraded Pratt & Whitney turbofans. USAF refitted 11 Bs with revised interior for VIP transportation.

C-135E.
C-135As re-engined with Pratt & Whitney engines.

C-141 Starlifter
Brief: Workhorse of the US airlift force for many years, the Starlifter can project combat forces over long distances, inject those forces and their equipment, resupply these distant operations either by air-land or airdrop, resupply these forces, and provide air refueling.

Function: Long-range, air refuelable troop and cargo airlifter.
Operator: ANG, AFRC.
IOC: May 1965.
Production: 285.

ABR, Calif., McGuire AFB, N.J., Wright–Patterson AFB, Ohio.

Contractor: Lockheed Martin.
Power Plant: four Pratt & Whitney TF33-P-7 turbofans, each 21,000 lb thrust.

Accommodation: crew of five; cargo on 13 standard 46L pallets. Alternative freight or vehicle payloads, 200 fully equipped troops, 155 paratroops, or 103 litter patients plus attendants.

Dimensions: span 159.9 ft, length 168.3 ft, height 39.2 ft.

Weight: operating payload 38,000 lb; max payload 68,725 lb normal, 89,000 lb emergency war planning; gross 325,000 lb normal, 344,000 lb emergency war planning.

Ceiling: 45,000 ft.
Performance: max cruising speed 466 mph, range 5,290 miles without air refueling.

COMMENTARY
Longtime mainstay of USAF’s airlift fleet, the C-141 was the first jet aircraft designed to meet military standards as a troop and cargo carrier. However, with the continuing deployment of C-17 aircraft, all C-141s in active units were to be retired by FY03. USAF also announced plans to retire older C-141s in reserve units earlier than scheduled. All were to retire by 2006.

C-141A entered service with MAC in April 1965; 285 were built, some of which were structurally modified to accommodate the Minuteman ICBM.

C-141B is a stretched C-141A with in-flight refueling capability. All C-141As (except four AFMC aircraft used for test purposes) were lengthened by 23 ft 4 in to expand lift capacity. First C-141B flew March 1977 and redeliveries took place between December 1978 and June 1982. The modification gave USAF the equivalent of 90 additional C-141A aircraft. Subsequent improvements include structural upgrades, a state-of-the-art autopilot and all-weather landing system, and improved airdrop systems. Modification of 13 C-141B is aimed at increasing their SOLL capability and survivability.

C-141C is a C-141B modified with computerized glass-cockpit instrumentation and digital flight-manage ment system, with integrated GPS data for navigation and modern navigation safety equipment. The first version, which rolled out at Warner Robins ALC, Ga., Oct. 1, 1997, was assigned to AFRC’s 452nd Air Mobil ility Wing, March AB, Calif.

C-141 Starlifter (John Sidiariak)

C-9 Nightingale
Brief: A twin-engine, medium-range, swept-wing jet aircraft used primarily for the aeromedical evacuation mission. A modified version of the DC-9, it is the only USAF aircraft specifically designed for the movement of litter and ambulatory patients.
Function: Aeromedical evacuation.
Operator: AMC, PACAF, USAFE, AFRC.
First Flight: August 1968.
IOC: circa 1968.
Production: 24.
Inventory: 23.
Unit Location: Andrews AFB, Md., Chievres, Belgium, Ramstein AB, Germany, Scott AFB, Ill., Yokota AB, Japan.
Contractor: Boeing (McDonnell Douglas).
Power Plant: two Pratt & Whitney JT8D-9A turbofans, each 14,500 lb thrust.

Accommodation: crew of three; 40 litter patients or 40 ambulatory patients, or a combination of both, plus five medical staff.

Dimensions: span 93.2 ft, length 119.2 ft, height 27.4 ft.

Weight: gross 108,000 lb.
Ceiling: 35,000 ft.
Performance: max cruising speed at 25,000 ft 565 mph, range 2,500 miles.

COMMENTARY
C-9A transport is a derivative of the DC-9 Series 30 commercial airliner, modified to include a special-care compartment with separate atmospheric and ventilation controls. One C-9A also provides distinguished visitor (DV) airlift in Europe. Because of the critical nature of its mission, the aircraft carries a flight mechanic and a small supply of spares.

C-9G. Three specially configured C-9s were delivered to Andrews AFB, Md., in 1975 for the special air mission supporting the President and other US government officials. Upgrades include improvements to the passenger communications equipment, GATM, TAWS, and vertical separation equipment.

C-12 Huron
Brief: Aircraft to provide airlift support for attaché and military advisory groups worldwide.
Function: Special airlift.
Operator: AETC, AFMC, PACAF.
First Flight: Oct. 27, 1972 (Super King Air 200).
Production: 88.
Inventory: 27.
Unit Location: Elmendorf AFB, Alaska, Osan AB, South Korea, various overseas embassies.
Contractor: Beech.
Power Plant: (C-12J) two Pratt & Whitney Canada PT6A-65 turboprops, each 1,100 shp.

Accommodation: crew of two; C-12C: up to eight passengers; C-12J: up to 19 passengers.

Dimensions: (C-12J) span 54.5 ft, length 43.8 ft, height 15 ft.

Weight: (C-12J) empty 9,850 lb, gross 16,600 lb.
Ceiling: (C-12J) 25,000 ft.
Performance: (C-12J) max cruising speed at 17,000 ft 307 mph, range 14,500 lb thrust.

C-20 Gulfstream (SSgt. J.R. Ruark)

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C-12J Cirrus

C-12J Cirrus (Andrews AFB, Md.)
C-32A (Boeing)

COMMENTARY

C-12C. Re-engined C-12As, with PT6A-41 turboprops, deployed to overseas embassies.

C-12D. Similar to C-12 model and also deployed to overseas embassies.

C-12F. With uprated PT6A-42 engines, can support medical airlift.

C-12J. A military version of the larger Beechcraft Model 1900, operated by PACAF.

C-20 Gulfstream Brief: A twin-engine turbofan aircraft acquired to provide airlift for high-ranking government and DOD officials.

Function: Operational support airlift; special air missions.

Operator: AMC, USAFE.

First Flight: December 1979.


IOC: circa 1983.

Production: not available.

Inventory: Nine.

Unit Location: Andrews AFB, Md., Ramstein AB, Germany.

Contractor: Gulfstream.

Power Plant: C-20A/B: two Rolls Royce–Spey Mk511-8 turbofans, each 11,400 lb thrust; C-20H: two Rolls Royce–Tay MK611-8 turbofans, each 13,850 lb thrust.

Accommodation: crew of five; 12 passengers.

Dimensions: span 77.8 ft; length (C-20A/B) 83.1 ft, (C-20H) 88.3 ft; height 24.3 ft.

Weight: C-20A/B gross 69,700 lb; C-20H gross 74,600 lb.

Ceiling: 45,000 ft.

Performance: max cruising speed 576 mph, range 4,800 miles.

COMMENTARY

C-20A. Three Gulfstream III transports were acquired to replace aging C-140B aircraft. They provided USAFE’s operational support airlift fleet with intercontinental range and ability to operate from short runways. Retired in September 2002.

C-20B. Seven C-20B versions, with advanced mission communications equipment and revised interior, were acquired in the late 1980s. Two C-20B aircraft have been retired.

C-20H. Two Gulfstream IV SP aircraft, with advanced technology flight-management systems and upgraded Rolls Royce engines, were acquired by USAF to meet expanding special air mission requirements. The two C-20H aircraft were reassigned to USAFE to replace retired C-20As. Upgrade for C-20A/B/H aircraft includes GPS, vertical separation equipment, GATM, and TCAS.

C-21 Brief: Aircraft designed to provide cargo and passenger airlift and transport litter during medical evacuations.

Function: Pilot seasoning, passenger and cargo airlift.

Operator: AETC, AMC, PACAF, USAFE, ANG.


Production: 84.

Inventory: 78.

Unit Location: Andrews AFB, Md.; Chievres, Belgium; Hickam AFB, Hawaii; MacDill AFB, Fla.

Contractor: Gates Learjet.

Power Plant: two AlliedSignal TFE731-2 turbofans, each 3,500 lb thrust.

Accommodation: crew of two and up to eight passengers or 3,153 lb cargo. Convertible to aeromedical evacuation configuration.

Dimensions: span 39.5 ft; length 48.6 ft, height 12.2 ft.

Weight: empty, equipped 10,119 lb, gross 18,300 lb.

Performance: max level speed at 25,000 ft 542 mph, range 2,000 miles, 5.5 hr endurance.

COMMENTARY

C-22 Brief: A Boeing 727-100 used by ANG as its primary medium-range aircraft for airlift of personnel.

Function: Passenger transportation.

Operator: ANG.

First Flight: February 1963 (commercial).


Production: four.

Inventory: two.

Unit Location: Andrews AFB, Md.

Contractor: Boeing.

Power Plant: three JT8D-7 turbofans, each 14,000 lb thrust.

Accommodation: flight crew of four, plus three or four cabin crew, up to 88 passengers.

Dimensions: span 108 ft, length 133.1 ft, height 34 ft.

Weight: gross 170,000 lb.

Ceiling: 37,400 ft.

Performance: max speed 630 mph, range 2,000 miles, 5.5 hr endurance.

C-22B Brief: A Boeing 727-100 commercial transports purchased and modified as C-22Bs for use by ANG on operational support airlift missions. Two were further modified to accommodate an additional 1,100 gallons of fuel and landing gear rated for 170,000 lb gross landing weight. The last C-22B retired at end of 2002. C-22Bs were replaced by the C-40C, a Boeing 737-700.

C-32 Brief: A modified Boeing C-7A 727-200 used to provide transportation for the vice president, Cabinet, Congressional members, and other high-ranking US and foreign officials.

Function: VIP air transport.

Operator: AMC.


Production: four.

Inventory: four.

Unit Location: Andrews AFB, Md.

Contractor: Boeing.

Power Plant: two Pratt & Whitney PW2040 turbofans, each 41,700 lb thrust.

Accommodation: 16 crew and 45 passengers.

Dimensions: span 124.8 ft, length 155.2 ft, height 44.5 ft.

Weight: empty 127,800 lb, gross 255,000 lb.

Ceiling: 41,000 ft.

Performance: cruise speed Mach 0.8–0.86 (530 mph) range 5,760 miles.

COMMENTARY

A military version of the commercial Boeing 757-200, four new C-32As were purchased as replacements for C-137B/C aircraft. The commercial CV interior includes a crew rest area, DVS standby, conference area, and general passenger area. The passenger communications management system provides worldwide clear and secure voice and data communications. Modern flight deck avionics allow operations to any suitable airlifted aircraft in the world and provide an upgrade path as new capabilities become available. Upgrades include installation of a digital communications management system and broadband data transmit and receive, providing an office-in-the-sky capability.

C-37A Brief: A modified Gulfstream V utilized as part of the executive fleet, providing transportation for the vice president, Cabinet, Congressional members, Secretary of Defense, Service Secretaries, and other prominent US and foreign officials.

Function: VIP air transport.

Operator: AMC.


Production: two.

Inventory: Nine.

Unit Location: Andrews AFB, Md.; Chievres, Belgium; Hickam AFB, Hawaii; MacDill AFB, Fla.

Contractor: Gulfstream.


Accommodation: five crew and 12 passengers.

Dimensions: span 116.6 ft, length 119.6 ft, height 25.8 ft.

Weight: empty 47,601 lb, gross 90,500 lb.

Ceiling: 51,000 ft.

Performance: cruise speed Mach 0.8 (530 mph), range 6,095 miles.

COMMENTARY

TC-37A is a military variant of the Gulfstream V. Two C-37As, along with the C-32s, were purchased as replacements for the VC-137B/C aircraft. The interior includes a DVS and passenger area; an additional communications system capable of worldwide clear and secure voice and data aircraft. Aircraft are capable of operations at any suitable civilian or military airlifted worldwide. A third C-37A was purchased for combatant commander support airlift and was based at Chievres, Belgium. It has since been reassigned to Andrews AFB, Md. Two more C-37s were purchased for crisis response support. Five C-37As are being leased from Gulfstream Aerospace as combatant commander support aircraft; three are assigned to MacDill AFB, Fla.; one to Chievres; and one to Hickam AFB, Hawaii. Upgrades include GATM and continuing communications systems upgrade to the Andrews–based aircraft.

C-38A Brief: A twin-engine transcontinental aircraft used to provide transportation to combatant commander DVs, such as Congressional or high-ranking military members. It can also be configured for medevac and a wide range of special missions including C3 in time of war.

Function: VIP air transport and operational support.

Operator: ANG.


Production: two.

Inventory: two.

Unit Location: Andrews AFB, Md.

Contractor: Tracor (Israel Aircraft Industries Ltd).

Power Plant: two AlliedSignal TFE731-40R-200G, each 2,250 lb thrust.

Accommodation: typically two crew and eight passengers. In medevac role: two Spectrum 500 Life Support systems and two medical attendants. All seats removable for cargo.

Dimensions: span 54.6 ft, length 55.6 ft, height 18.2 ft.

Weight: gross 24,400 lb.

Ceiling: 33,000 ft.

Performance: cruise speed Mach 0.87.

COMMENTARY

The C-38A is a military version of the Astra SPX produced by IAI and supported worldwide by Galaxis Aerospace. The ANG’s 201st AS replacing Learjet C-21As. Equipment includes the most up-to-date navigation, communication, vertical separation, and safety equipment as well as state-of-the-art avionics. The contract includes an option for two additional aircraft.

C-40 Brief: A Boeing 727-700 used by ANG as its primary medium-range aircraft for personnel.

Function: Passenger transportation.

Operator: ANG.


Production: seven planned.
Inventory: two
Unit Location: Andrews AFB, Md., Hickam AFB, Hawaii
Contractor: Boeing
Power Plant: two General Electric CFM56-7 turbofans, each 24,000-lb thrust
Accommodation: flight crew of four, plus three or four cabin crew; up to 89 passengers
Dimensions: span 112 ft 7 in, length 110 ft 4 in, height 41 ft 2 in
Weight: gross 171,000 lb
Ceiling: 41,000 ft
Performance: cruise speed 0.78–0.82 Mach, range 3,450 miles

COMMENTARY
The C-40 is the military version of the commercial Boeing 737-700 increased gross weight aircraft. C-40s are used for SAM and support of combatant commanders.

C-40B. The B model is equipped with a DV suite, staff work area, conference area, and worldwide secure communications and data capability. USAF purchased two C-40Bs for delivery to Andrews AFB, Md., and Hickam AFB, Hawaii, in FY03 to support combatant commanders. One additional C-40B has been purchased for SAM and is assigned to Andrews. A further C-40B will be leased for the SAM mission, operating from Andrews, in 2004.

C-40C. The C model has a DV seating area, general passenger seating area, and secure communications capability. Two C-40Cs have been leased for ANG to replace recently retired C-22Bs at Andrews. Another aircraft will be leased for delivery in 2004 in support of airlift missions.

C-130 Hercules
Brief: A rugged aircraft capable of operating from rough dirt strips to provide theater airlift and para-dropping of troops and equipment into hostile areas.
Function: Inter- and Intratheater airlift
Operator: AETC, AFMC, AMC, PACAF, USAFE, ANG, AFRIC

First Flight: August 1954 (C-130A).
Delivered: December 1956–present (C-130U).
Production: more than 2,200; (C-130J: 168 planned.
Inventory: 522: 218 (E), 287 (H), 17 (U).
Unit Location: Active: Dyess AFB, Tex., Elmendorf AFB, Alaska, Little Rock AFB, Ark., Pope AFB, N.C., Ramstein AB, Germany, Yokota AB, Japan. ANG: 24 units. AFRIC: nine units.
Contractor: Lockheed Martin.

Power Plant: (C-130H) four Rolls Royce–Allison T55-A-15 turboprops, each 4,300 shp. (C-130J) four Rolls Royce–Allison AE2100D3 turboprops, each 4,591 shp.

Accommodation: (C-130H) crew of five; up to 92 ground troops, 64 paratroopers, 74 litter patients plus attendants, 54 passengers on palletized seating, or up to five 463L standard freight pallets, etc.; max load, 44,000 lb.; (C-130J) four Rolls Royce–Allison AE2100D3 turboprops, each 4,591 shp.

Dimensions: span 132.6 ft, length 97.8 ft, height 51.3 ft, flight crew of four, plus three or four cabin crew; up to 89 passengers.
Weights: empty 81,000 lb, fuel/cargo max 81,000 lb.
Power Plant: (C-130H) four Allison T56-A-7 turboprops, each 6,500 shp. (C-130J) four General Electric CFM56-7 turbofans, each 6,200 shp.

C-40 (MSgt. Terry L. Blevins)
T-6 Texan II
(M Sgt. Greg Kobashigawa)

MC-130E/H Combat Talon
Brief: A modified C-130 able to provide global, day, night, and adverse weather capability to air-drop personnel and to deliver personnel and equipment to support US and allied SOF.

Function: SOF infiltration, exfiltration, and resupply.

Operator: AETC, AFRC, AFRC.

First Flight: circa 1965 (E); January 1990 (H).

Delivered: initially 1966.

IOC: 1966 (E); June 1991 (H).

Production: 24 (new-build Hs).

Inventory: 14 (E); 22 (H).

Unit Location: Active (Assoc.) and AFRC MC-130Es at Duke Field, Fla. Active MC-130H at Hurlburt Field, Fla.; MC-130H at Kadena AB, Japan, Kirtland AFB, N.M., RAF Mildenhall, UK.

Contractor: Lockheed Martin (airframe); Boeing integrated weapons system support.


Accommodation: E: crew of nine; 53 troops or 26 paratroops; H: crew of seven; 77 troops, 52 paratroops, or 57 litters.

Dimensions: span 132.6 ft, height 38.5 ft, length 100.8 ft (E), 56 ft (H).

Weight: empty 72,892 lb, gross 155,000 lb.

Ceiling: 100.8 ft (E), 99.8 ft (H).

Performance: max speed 289 mph, range 3,110 miles, unlimited with refueling.

T-38 Talon (Guy Aceto)

Dimensions: span 195.7 ft, length 231.8 ft, height 63.4 ft.

Weight: empty (approx) 4,700 lb; gross 6,500 lb.

Performance: speed 360 mph (Mach 0.92), normal cruising speed Mach 0.84, unrefueled range 7,820 miles.

T-1 Jayhawk
Brief: A medium-range, twin-engine jet trainer version of the Beechcraft 400A. It is used by the Air Force to train student pilots to fly airlift, tanker, and bomber aircraft.

Function: Advanced pilot training.

Operator: AETC, AFRC (Assoc.).

First Flight: Sept. 22, 1989 (Beechcraft 400A).


Production: 180.

Inventory: 180.

Unit Location: Columbus AFB, Miss., Laughlin and Randolph AFBs, Tex., Vance AFB, Okla. Contractor: Raytheon.

Power Plant: four Pratt & Whitney Canada PT6A-68 turboprops, each 1,100 shp.

Accommodation: two, side by side, and one to the rear; rails are fitted to accommodate an extra four seats to permit transport of maintenance teams.

Dimensions: span 43.5 ft, length 48.4 ft, height 13.9 ft.

Weight: empty 5,200 lb, gross 16,100 lb.

Delivery: May 2000–present (operational aircraft).


Production: USAF 372 (ordered), USN 328 (planned).

Inventory: 81 (USAF).


Contractor: Raytheon.

Power Plant: one Pratt & Whitney Canada CT-137B.

Accommodation: two, in tandem, on zero/zero ejection seats.

Dimensions: span 33.5 ft, length 33.4 ft, height 10.7 ft.

Weight: empty (approx) 4,707 lb; gross 6,500 lb.

Performance: max speed 368 mph, range 920 miles.

T-37 Tweet
Brief: A twin-engine jet used for training undergraduate pilots and undergraduate navigator and tactical navigator students in fundamentals of aircraft handling and instrument, formation, and night flying.

Function: Primary trainer.

Operator: AETC, AFRC.

First Flight: September 1955.


IOC: 1957.

Production: 985.

Inventory: 404.

Unit Location: Columbus AFB, Miss., Laughlin, Randolph, and Sheppard AFBs, Tex., Vance AFB, Okla.

Contractor: Cessna.
**Power Plant:** Two Continental J69-T-25 turbojets, each 1,025 lb thrust.

**Accommodation:** Two, side by side, on ejection seats.

**Dimensions:** Span 33.7 ft, length 29.2 ft, height 9.1 ft.

**Weight:** Empty 3,870 lb, gross 6,625 lb.

**Performance:** Max speed at S/L 315 mph, range 460 miles.

**COMMENTARY**

USAF’s first purpose-built jet trainer, the T-37 has been AETC’s standard two-seat primary trainer. A distinctive blue-and-white finish is intended to help formation training and ease maintenance. T-37A, with J69-T-9 turbojets; all have been modified to T-37B standards.

T-37B. The original T-37A was superseded in November 1959 by the T-37B, with improved radio navigational equipment, UHF radio, and upgraded instruments. All A models were later converted to B standard. Kits were subsequently produced to extend the capability of the T-37 by modifying or replacing critical structural components. AETC began replacing the T-37B with the T-6A Texan II in 2000.

**T-38 Talon**

**Brief:** A twin-engine, high-altitude, supersonic jet trainer used in a variety of roles, primarily for undergraduate pilot and pilot instructor training.

**Function:** Trainer.

**Operator:** ACC, AETC, AFMC, AFRC.

**First Flight:** April 1959.

**Delivered:** 1961–72.

**IOC:** March 1961.

**Production:** More than 1,100.

**Unit Location:** Beale and Edwards AFBs, Calif., Columbus AFB, Miss., Holloman AFB, N.M., Laughlin, Randolph, and Sheppard AFBs, Tex., Moody AFB, Ga., Vance AFB, Okla., Whiteman AFB, Mo.

**Contractor:** Northrop Grumman.

**Power Plant:** Two General Electric J85-GE-5A turbojets, each 2,680 lb thrust dry, 2,900 lb thrust with afterburning.

**Accommodation:** Two, in tandem, on ejection seats.

**Dimensions:** Span 25.3 ft, length 46.3 ft, height 12.8 ft.

**Weight:** Empty 7,164 lb, gross 12,500 lb.

**Ceiling:** 37,000 ft.

**Production:** Max level speed 812 mph, range 1,000 miles.

**COMMENTARY**

Most of the T-38s in service are used by AETC for advanced bomber–fighter training task in JSUPT. Capabilities are being enhanced through an ongoing program of modifications and structural renewal, including a full avionics upgrade with a HUD and integrated GPS/INS, and a propulsion modernization. As a result of the reduction in the T-38’s workload through introduction of the T-1A and JSUPT, the service life of the T-38s should extend well beyond 2020.

**T-38A.** Close in structure to the F-5A export tactical fighter, the T-38A was the world’s first supersonic trainer aircraft. It is used to teach supersonic techniques, aerobatics, formation, night and instrument flying, and cross-country and low-level navigation. Also used to train test pilots and flight engineers at Edwards AFB, Calif., by AFMC to test experimental equipment, and by ACC to maintain pilot proficiency.

**AT-38B.** A slightly different version, with a gunsight and practice bomb dispenser, used by AETC for introduction to Fighter Fundamentals.

**T-38C.** All T-38A and AT-38B airframes will be redesignated as C models upon modification of the avionics systems, begun in 2000; first TC-38C was received late summer 2002; planned completion 2009.

**T-43**

**Brief:** A medium-range, swept-wing jet aircraft equipped with navigation and communications equipment to train navigators for strategic and tactical aircraft.

**Function:** Navigation trainer.

**First Flight:** April 1973.

**Delivered:** September 1973–July 1974.

**IOC:** 1974.

**Production:** 19.

**Inventory:** 10.

**Unit Location:** Randolph AFB, Tex.

**Contractor:** Boeing.

**Power Plant:** Two Pratt & Whitney JT8D-9 turbofans, each 14,500 lb thrust.

**Accommodation:** Crew of two; 12 students and six instructors.

**Dimensions:** Span 93 ft, length 100 ft, height 37 ft.

**Weight:** Gross 115,500 lb.

**Ceiling:** 37,000 ft.

**Performance:** Speed 114 mph, glide ratio 23:1, range dependent on soaring conditions.

**COMMENTARY**

TG-3A is a medium-performance sailplane that allows students to master basic flight maneuvers while solo before progressing to a more advanced sailplane. With the exception of the fabric covered horizontal stabilizer and control surfaces, the aircraft is all-metal construction. It is primarily used for cross-country training and high-altitude wave flight with up to six-hour flight duration.

**TG-4A**

**Brief:** Conventional two-place tandem basic training sailplane used to introduce all USAFA cadets to flight.

**Function:** Flight introduction.

**Operator:** USAFA.

**Delivered:** October 1984.

**IOC:** Not available.

**Production:** Not available.

**Inventory:** 14.

**Unit Location:** USAFA, Colo.

**Contractor:** Schweizer Aircraft.

**Accommodation:** Two (student pilot and instructor).

**Dimensions:** Span 51 ft, length 25.8 ft, height 9.3 ft.

**Weight:** Gross 1,040 lb.

**Ceiling:** 14,000 ft.

**Performance:** Speed 98 mph, glide ratio 23:1.

**COMMENTARY**

The TG-4A has an all-metal airframe with aluminum covering on wings and vertical tail and a one-piece canopy for increased visibility. USAFA introduces all cadets to flight through the Sears-for-Air program using the TG-4A. It can perform aerostall, stall recovery, slow flight, steep turn, and rectangular traffic pattern maneuvers.

**TG-7A**

**Brief:** A conventional two-place, side-by-side, fixed-gear, low-wing motorized glider that is equipped with spoilers and used to simulate the flight characteristics of the TG-4A and reduce the number of sorties needed to solo.

**Function:** Trainer.

**Operator:** USAFA.

**Delivered:** 1984.

**IOC:** Not available.

**Production:** Not available.

**Inventory:** Nine.

**Unit Location:** USAFA, Colo.

**Contractor:** Schweizer Aircraft.

**Power Plant:** One Lycoming O-235-L2C 4-cylinder engine, 112 hp.

**Accommodation:** Two (student pilot and instructor).

**Dimensions:** Span 59.5 ft, length 27.5 ft, height 7.7 ft.

**Weight:** Gross 1,850 lb.

**Ceiling:** 14,000 ft.

**Performance:** Speed 136 mph, range 230 miles.

**COMMENTARY**

The TG-7A trainer glider motor is a single-engine, fixed-gear, conventional configuration, low-wing monoplane of all-metal construction with side-by-side seating. Students use it to practice multiple pattern aerial maneuvers, and landing procedures, reducing by half the number of sorties needed to achieve a solo flight.

**TG-9A**

**Brief:** Medium-performance sailplane with tandem seating used for spins, aerobatics, and cross-country soaring.

**Function:** Trainer.

**Operator:** USAFA.

**Delivered:** October 1984.

**IOC:** Not available.

**Production:** Not available.

**Inventory:** Four.

**Unit Location:** USAFA, Colo.

**Contractor:** Schleicher GmbH, Germany.

**Accommodation:** Two, tandem.

**Dimensions:** Span 55.8 ft, length 27.4 ft, height 5 ft.

**Weight:** Gross 1,320 lb.

**Ceiling:** FL 250 ft.

**Performance:** Speed 150 mph, glide ratio 34:1, range dependent on soaring conditions.

**COMMENTARY**

The TG-9A (ASK-21) sailplane has a midwing configuration with a T-tail and air brakes on the upper wing surface. It is used primarily for spin training and aerobatic demonstrations. It is used at the regional and national level for cross-country and aerobatic competition.

**TG-10B**

**Brief:** Two-seat medium-performance sailplane used for introductory glider training, spin training, and basic cross-country soaring training.
HH-60G Pave Hawk (SSgt. Shane A. Cuomo) 

**Production:** five.  
**Inventory:** two.  
**Unit Location:** USAFA, Colo.  
**Contractor:** Blanik  
**Accommodation:** single.  
**Dimensions:** span 46.3 ft, length 21.7 ft, height 4.7 ft.  
**Weight:** 750 lb.  
**Performance:** speed 146.1 mph, glide ratio 26:1.  
**Commentary:** The TG-10A is an L-33B Blanik sailplane produced in the Czech Republic.

TG-10D  
**Brief:** Single-seat medium-performance sailplane used for cross-country soaring training and competition.  
**Function:** Trainer.  
**Operator:** USAFA.  
**Delivered:** spring 2002.  
**IOC:** December 2002.  
**Production:** four.  
**Inventory:** four.  
**Unit Location:** USAFA, Colo.  
**Contractor:** Blanik  
**Accommodation:** single.  
**Dimensions:** span 46.3 ft, length 21.7 ft, height 4.7 ft.  
**Weight:** 750 lb.  
**Performance:** speed 149.5 mph, glide ratio 33:1.  
**Commentary:** The TG-10A is an L-33B Blanik sailplane produced in the Czech Republic.

TG-11A  
**Brief:** Conventional two-place, side-by-side, self-launched high-performance sailplane used for cross-country training.  
**Function:** Trainer.  
**Operator:** USAFA.  
**Delivered:** summer 1995.  
**IOC:** not available.  
**Production:** not available.  
**Inventory:** two.  
**Unit Location:** USAFA, Colo.  
**Contractor:** Stemme GmbH, Germany.  
**Power Plant:** one Limbach L-2400 EB1 AD four-cylinder engine, T-O 93 hp at 3,400 rpm, cruise 80 hp at 3,000 rpm (S/L).  
**Accommodation:** two, side by side.  
**Dimensions:** span 53.1 ft, length 27.9 ft, height 6.2 ft.  
**Weight:** 1,124 lb.  
**Performance:** speed 142.6 mph, glide ratio 28:1.  
**Commentary:** The TG-11A is the T-3A Firefly in 1997. Cockpit and avionics are modified for military use.

UV-18 Twin Otter  
**Brief:** Modified utility transport used for parachute jump training.  
**Function:** Trainer.  
**Operator:** USAFA.  
**Delivered:** spring 2002.  
**IOC:** December 2002.  
**Production:** two.  
**Inventory:** two.  
**Unit Location:** USAFA, Colo.  
**Contractor:** Stemme GmbH, Germany.  
**Power Plant:** one Limbach L-2400 EB1 AD four-cylinder engine, T-O 93 hp at 3,400 rpm, cruise 80 hp at 3,000 rpm (S/L).  
**Accommodation:** two, side by side.  
**Dimensions:** span 53.1 ft, length 27.9 ft, height 6.2 ft.  
**Weight:** 1,124 lb.  
**Performance:** speed 142.6 mph, glide ratio 28:1.  
**Commentary:** The TG-10A is an L-33B Blanik sailplane produced in the Czech Republic.

MH-53J Pave Low III (TSgt. Scott Reed) 

**Function:** Parachutist.  
**Operator:** USAFA.  
**First Flight:** May 1965 (commercial version).  
**Delivered:** 1977.  
**IOC:** 1977.  
**Production:** three.  
**Inventory:** three.  
**Unit Location:** USAFA, Colo.  
**Contractor:** de Havilland Aircraft of Canada.  
**Power Plant:** two Pratt & Whitney Canada PT6A-27 turboprop engines, each 620 shp.  
**Accommodation:** crew of two and up to 20 passengers.  
**Dimensions:** span 65 ft, length 51.8 ft, height 19.5 ft.  
**Weight:** gross 12,500 lb.  
**Ceiling:** 26,700 ft.  
**Performance:** max cruising speed 210 mph, range with 2,500 lb payload 806 miles.  
**Commentary:** The UV-18B is a military version of the DHC-6 Twin Otter STOL utility transport used for parachute jump training at USAFA.

Helicopters

HH-60G Pave Hawk  
**Brief:** Specially modified helicopters used for SAR and support missions.  
**Function:** SOF heavy-lift helicopter.  
**Operator:** ACC, AETC, AFMC, PACAF, ANG, AFRC.  
**First Flight:** October 1974.  
**Delivered:** 1982–present.  
**IOC:** circa 1982.  
**Production:** 105.  
**Inventory:** 105.  
**Unit Location:** Kadena AB, Japan, Kirtland AFB, N.M., Moody AFB, Ga., NAS Keflavik, Iceland, Nellis AFB, Nev., Robbins AFB, Ga., ANG; Francis S. Gabreski Arpt., N.Y.; Moffett Federal Airfield, Calif. AFRC; Davis-Monthan AFB, Ariz.; Patrick AFB, Fla.; Portland AFB, Ore.  
**Contractor:** Sikorsky.  
**Power Plant:** two General Electric T700-GE-700/701C turboshafts, each 1,620 shp.  
**Accommodation:** crew of three or four; 11–14 troops, up to six litters, or internal or external cargo.  
**Dimensions:** rotor diameter 53.6 ft, length of fuselage 64.7 ft, height 16.7 ft.  
**Weight:** empty 12,330 lb, max gross 22,000 lb.  
**Ceiling:** 14,200 ft.  
**Performance:** max speed 173 mph, max range 373 miles (internal fuel), 500 miles (auxiliary).  
**Armament:** two 7.62 mm miniguns, with provision for two .50 caliber machine guns in cabin doors.  
**Commentary:** One hundred five Black Hawk helicopters were modified to HH-60G Pave Hawk configuration for use by active duty, ANG, and AFRC air rescue units for CSAR and various mission-support activities worldwide. The Pave Hawk is a highly modified version of the Army Black Hawk helicopter, featuring an upgraded communications/navigation suite that includes INS/GPS/Doppler navigation systems, SATCOM, secure/antijam communications, and a PLS that provides range/steering data to compatible survivor radios. Further modifications include an automatic flight-control system, NVG lighting, FLIR, color weather radar, engine/rotor blade anti-ice system, retractable inflight refueling probe, internal auxiliary fuel tanks, and an integral rescue hoist. Combat enhancements include RWR, IR jammer, flare and chaff countermea-
Strategic Missiles

AGM-86 Air Launched Cruise Missile

Brief: A small, subsonic, winged air vehicle, deployed on B-52H aircraft, which can be equipped with either a nuclear or conventional warhead and can be used to help dilute air defenses and complicate an enemy's air defense task.

Function: Strategic air-to-surface cruise missile.

Operator: ACC

First Flight: June 1979 (full-scale development).

Delivered: from 1981.

IOC: December 1982, Griffiss AFB, N.Y.

Production: 1,700+

Unit Location: Barksdale AFB, La., Minot AFB, N.D.

Contractor: Boeing

Power Plant: Williams/Teledyne CAE F107-WR-10 turbofan, 8,000 lb thrust.

Guidance: AGM-86B: inertial plus Terrain Contour Matching (TERCOM); AGM-86C: inertial plus GPS.


Dimensions: length 20.8 ft, body diameter 2 ft, wingspan 12 ft.

Weight: 3,150 lb (B), 3,277 lb (C).

Performance (approx): speed 550 mph (Mach 0.6), range 1,500+ miles (AGM-86B).

COMMENTARY

AGM-86. A prototype cruise missile, developed in the mid-1970s. Slightly smaller than the later versions, it never entered production.

AGM-86B. First production version, the B is programmed for strategic attack on surface targets. Small radar signature and low-level flight capability enhance the missile's effectiveness. The last of 1,715 production models was delivered in October 1986. Undergoing SLEP to extend life to FY93.

AGM-86C. A conventional warhead version, developed from June 1986, the Conventional Air Launched Cruise Missile (CALCM) was first used operationally during Gulf War I and has since been widely used in combat operations. CALCM provides the warfighter with an adverse weather, day/night, air-to-surface, accurate, standoff outside theater defenses strike capability, with a range greater than 500 miles and a 3,000-lb-class warhead. CALCM is equally effective for stand-alone, clandestine/punitive strikes and fully integrated theater warfare. Since 1986, Boeing converted 628 B-52s to the conventional configuration, the first 322 of which was delivered in December 1987. Of the 322 most recent conversions, 132 feature new Block 1A enhancements with improved accuracy and increased immunity to electronic jamming.

AGM-86D. CALCM penetrator version with a Lockheed Martin AUP-3(M) warhead. The last 50 of the 322 CALCM conversions are to AGM-86D configuration. The CALCM penetrator provides the warfighter with a cost-effective, standoff outside theater defenses capability against a wide range of hardened, deeply buried targets.

AGM-129 Advanced Cruise Missile

Brief: A stealthy, long-range, winged air vehicle equipped with a nuclear warhead and designed to evade enemy air and ground-based defenses in order to strike hard, heavily defended targets at standoff distances.

Function: Strategic air-to-surface cruise missile.

Operator: ACC


Production: 461.

Unit Location: Barksdale AFB, La., Minot AFB, N.D.

Contractor: General Dynamics; Boeing (McDonnell Douglas).

Power Plant: Williams International F112-WR-100 turbofan.

Guidance: inertial, with TERCOM update.

Warhead: W80-1 nuclear.

Dimensions: length 20.8 ft, body width 2.2 ft, wingspan 12 ft.

Weight: 3,700 lb.

MH-53P Pavex Low

Brief: Specially outfitted heavy-lift helicopters used by Air Force Special Operations Forces for infiltration/ exfiltration as well as CSAR missions.

Function: SOF terminal lift helicopter.

Operator: AETC, AFSOC.

First Flight: March 1967.

Delivered: from September 1970.

MH-53D. Over the course of development, the MH-53D went on to incorporate a number of important advanced capabilities, which included three different contemporary rotor blades. While not available, the MH-53D was the only MH-53 option to be operationalized for the Strategic Air Command (SAC) in the late 1970s.

MH-53E. A service life extension program (SLEP) upgraded MH-53H.

MH-53J. A service life extension program (SLEP) upgraded MH-53J.

MH-53K. A service life extension program (SLEP) upgraded MH-53K.

MH-53L. A service life extension program (SLEP) upgraded MH-53L.

MH-53P. A service life extension program (SLEP) upgraded MH-53P.

MH-53Q. A service life extension program (SLEP) upgraded MH-53Q.

MH-53R. A service life extension program (SLEP) upgraded MH-53R.

MH-53S. A service life extension program (SLEP) upgraded MH-53S.

MH-53T. A service life extension program (SLEP) upgraded MH-53T.

MH-53V. A service life extension program (SLEP) upgraded MH-53V.

MH-53X. A service life extension program (SLEP) upgraded MH-53X.

MH-53Y. A service life extension program (SLEP) upgraded MH-53Y.

MH-53Z. A service life extension program (SLEP) upgraded MH-53Z.

MH-53AA. A service life extension program (SLEP) upgraded MH-53AA.

MH-53AB. A service life extension program (SLEP) upgraded MH-53AB.

MH-53AC. A service life extension program (SLEP) upgraded MH-53AC.

MH-53AD. A service life extension program (SLEP) upgraded MH-53AD.

MH-53AE. A service life extension program (SLEP) upgraded MH-53AE.

MH-53AF. A service life extension program (SLEP) upgraded MH-53AF.

MH-53AG. A service life extension program (SLEP) upgraded MH-53AG.

MH-53AH. A service life extension program (SLEP) upgraded MH-53AH.

MH-53AI. A service life extension program (SLEP) upgraded MH-53AI.

MH-53AJ. A service life extension program (SLEP) upgraded MH-53AJ.

MH-53AK. A service life extension program (SLEP) upgraded MH-53AK.

MH-53AL. A service life extension program (SLEP) upgraded MH-53AL.

MH-53AM. A service life extension program (SLEP) upgraded MH-53AM.

MH-53AN. A service life extension program (SLEP) upgraded MH-53AN.

MH-53AO. A service life extension program (SLEP) upgraded MH-53AO.

MH-53AP. A service life extension program (SLEP) upgraded MH-53AP.

MH-53AQ. A service life extension program (SLEP) upgraded MH-53AQ.

MH-53AR. A service life extension program (SLEP) upgraded MH-53AR.

MH-53AS. A service life extension program (SLEP) upgraded MH-53AS.

MH-53AT. A service life extension program (SLEP) upgraded MH-53AT.

MH-53AU. A service life extension program (SLEP) upgraded MH-53AU.

MH-53AV. A service life extension program (SLEP) upgraded MH-53AV.

MH-53AW. A service life extension program (SLEP) upgraded MH-53AW.

MH-53AX. A service life extension program (SLEP) upgraded MH-53AX.

MH-53AY. A service life extension program (SLEP) upgraded MH-53AY.

MH-53AZ. A service life extension program (SLEP) upgraded MH-53AZ.

MH-53BA. A service life extension program (SLEP) upgraded MH-53BA.

MH-53BB. A service life extension program (SLEP) upgraded MH-53BB.

MH-53BC. A service life extension program (SLEP) upgraded MH-53BC.

MH-53BD. A service life extension program (SLEP) upgraded MH-53BD.

MH-53BE. A service life extension program (SLEP) upgraded MH-53BE.

MH-53BF. A service life extension program (SLEP) upgraded MH-53BF.

MH-53BG. A service life extension program (SLEP) upgraded MH-53BG.

MH-53BH. A service life extension program (SLEP) upgraded MH-53BH.

MH-53BI. A service life extension program (SLEP) upgraded MH-53BI.

MH-53BJ. A service life extension program (SLEP) upgraded MH-53BJ.

MH-53BK. A service life extension program (SLEP) upgraded MH-53BK.

MH-53BL. A service life extension program (SLEP) upgraded MH-53BL.

MH-53BM. A service life extension program (SLEP) upgraded MH-53BM.

MH-53BN. A service life extension program (SLEP) upgraded MH-53BN.

MH-53BO. A service life extension program (SLEP) upgraded MH-53BO.

MH-53BP. A service life extension program (SLEP) upgraded MH-53BP.

MH-53BQ. A service life extension program (SLEP) upgraded MH-53BQ.

MH-53BR. A service life extension program (SLEP) upgraded MH-53BR.

MH-53BS. A service life extension program (SLEP) upgraded MH-53BS.

MH-53BT. A service life extension program (SLEP) upgraded MH-53BT.

MH-53BU. A service life extension program (SLEP) upgraded MH-53BU.

MH-53BV. A service life extension program (SLEP) upgraded MH-53BV.

MH-53BW. A service life extension program (SLEP) upgraded MH-53BW.

MH-53BX. A service life extension program (SLEP) upgraded MH-53BX.

MH-53BY. A service life extension program (SLEP) upgraded MH-53BY.

MH-53BZ. A service life extension program (SLEP) upgraded MH-53BZ.
A solid-fuel ICBM capable of delivering a thermonuclear payload of 10 warheads with high accuracy over great distances.

**Commentary**
- **Operator:** AFSPC
- **First Flight:** June 17, 1983
- **Delivered:** June 1966–December 1988
- **IOC:** December 1966, F.E. Warren AFB, Wyo.
- **Production:** 550
- **Inventory:** 49, as of Oct. 3, 2002.
- **Unit Location:** F.E. Warren AFB, Wyo.
- **Contractor:** Lockheed Martin.
- **Waver Plant:** First three stages: solid propellant; fourth stage: storable liquid; by Thiokol, Aerojet, Hercules, and Rocketdyne, respectively.
- **Guidance:** inertial guidance system.
- **Warheads:** 10 Avco Mk 21 MRVs.
- **Dimensions:** length 71 ft, diameter 7.7 ft.
- **Weight:** approx. 15,000 lb.

**LGM-118A Peacekeeper**

**Brief:** A solid-fuel ICBM capable of delivering a thermonuclear payload of 10 warheads with high accuracy over great distances.

**Function:** Strategic surface-to-surface ballistic missile.

- **Operator:** AFSPC.
- **First Flight:** January 1961.
- **Delivered:** 1962–December 1978.
- **IOC:** December 1963, Malmstrom AFB, Mont.
- **Production:** 1,800.
- **Inventory:** 500.
- **Contractor:** Boeing.
- **Power Plant:** stage 1: Thiokol M-55 solid-propellant motor, 210,000 lb thrust; stage 2: Aerojet–General SR-19-A1 solid-propellant motor, 60,300 lb thrust; stage 3: Thiokol SR-7A-1 solid-propellant motor, 34,400 lb thrust.
- **Guidance:** inertial guidance system.

**Comments:**
- Three-Mk 15/21A MRVs (downloaded to one).
- **Dimensions:** length 59.8 ft, diameter of first stage 5.5 ft.
- **Weight:** launch weight (approx.) 78,000 lb.
- **Performance:** speed 5,500+ mph, more than 15,000 mph, highest point of trajectory approx. 700 miles, range with max operational load more than 6,000 miles.

**LGM-30 Minuteman**

- **Brief:** A single re-entrant vehicle configuration has been demonstrated, planned for, and is being worked in accordance with strategic arms control negotiations. Currently a total of 500 Minuteman IIs are based at Minot AFB, N.D., F.E. Warren AFB, Wyo.; and Malmstrom.
- **LGM-30F.** An extensive life extension program is ensuring Minuteman’s viability to 2020. Major upgrades include refurbishment of liquid propulsion post-boost rocket engine, remanufacture of the solid-propellant rocket motor, replacement of the guidance control system, repair of launch facilities, installation of updated, survivable communications equipment, and a C2 sustainment program.

**Tactical Missiles and Weapons**

**AIM-7 Sparrow**

**Brief:** A supersonic, medium-range, semiactive radar–guided air-to-air missile with all-weather, all-altitude, and all-aspect offensive capability and a high-explosive warhead, carried by fighter aircraft.

**Function:** Air-to-air guided missile.

- **First Flight:** December 1953 (AIM-7M).
- **Delivered:** from 1956.
- **IOC:** April 1976 (AIM-7F).
- **Production:** sustainment phase.
- **Inventory:** classified.
- **Contractor:** Raytheon (Hughes); General Dynamics.

**Power Plant:** Hercules Mk 58 Mod 0.45 sec boost–11 sec. sustain rocket motor.

**Guidance:** AIM-7M: monopulse semiactive radar.

**Warhead:** high-explosive, blast fragmentation, weighing 86 lb.

- **Dimensions:** length 12 ft, body diameter 8 in, wing span 3.3 ft.
- **Weight:** launch weight 504 lb.
- **Performance:** (estimated) speed more than 2,660 mph (Mach 3.5), range more than 34 miles.

**AIM-120 AMRAAM (top), AIM-9 Sidewinder, AGM-88 HARM (bottom) (SrA. Stan Parker)**

**AIM-120 AMRAAM**

**Brief:** A new generation supersonic, medium-range, active radar–guided air-to-air missile with a high-explosive warhead.

**Function:** Air-to-air guided missile.

- **First Flight:** December 1984.
- **Delivered:** 1988–July 2010 (planned).
- **IOC:** September 1991.
- **Production:** 10,917+ planned for USAF/USN.
- **Inventory:** classified.
- **Contractor:** Raytheon.

**Power Plant:** Alliant boost-sustain solid-propellant rocket motor.

**Guidance:** inertial/command, inertial with active radar terminal homing.

**Warhead:** high-explosive fractional fragmentation, weighing 48 lb.

- **Dimensions:** (A/B models) length 12 ft, body diameter 7 in, span of tail control fins 2.1 ft.
- **Weight:** 335 lb.
- **Performance:** cruising speed approx Mach 4, range more than 23 miles.

**AIM-9 Sidewinder**

**Brief:** A supersonic, short-range, IR-guided air-to-air missile carried by fighter aircraft, having a high-explosive warhead.

**Function:** Air-to-air missile.

- **First Flight:** September 1953.
- **Delivered:** 1983–present.
- **Production:** AIM-9X delivered May 1, 2002.
AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) is a replacement for the AIM-7 Sparrow. The AIM-120 equips F-15, F-16, F/A-18, and F/A-22 fighters. The F/A-22 will only carry the C model. Inertial and command inertial guidance and active radar terminal homing provide launch-and-manueverability. Significant improvements in operational effectiveness over the AIM-7 include increased average velocity, reduced miss distance, improved fuel efficiency, increased warhead lethality, multiple target engagement capability, improved clutter rejection in low-altitude environments, enhanced electronic protection, and handling. AIM-120C was the first production version, delivered by Hughes in 1988 to the 33rd TFW at Eglin AFB, Fla. AIM-120B/C are upgraded, reprogrammable variants of the AIM-120C. The AGM-120C currently in production has smaller, clipped control surfaces to provide for internal carriage capability in the F/A-22, with HOBS launch capability.

**AGM-65 Maverick**

Ballistic, TV- or imaging-infrared (IIR)-guided air-to-surface missile carried by fighters and designed for use in CAS, interdiction, and defense suppression missions, having standoff capability and high probability of strike against a wide range of targets.

**Function:** Air-to-surface guided missile.

**First Flight:** August 1963.

**Delivered:** from August 1972.

**Inventory:** 7,300 AGM-65A/B/H/K (EO guidance); 15,000 AGM-65D/G (IIR guidance).

**Contractor:** Raytheon.

**Power Plant:** Thiokol smokeless, dual-thrust, solid-propellant rocket motor.

**Guidance:** self-homing, EO guidance system (IR on D and G models).

**Warhead:** AGM-65A/B/D/H 125-lb high-explosive, shaped charge; AGM-65G/K 28 lb blast fragmentation.

**Dimensions:** length 8.2 ft, body diameter 1 ft, wing- span 2.3 ft.

**Weight:** launch weight (AGM-65A) 462 lb, (AGM-65G/K) 145 lb.

**Performance:** range about 9.2 miles.

**COMMENTARY**

Maverick missiles have a long and distinguished combat record. They were first employed by USAF in Vietnam and were used extensively during Gulf War I. They currently equip A-10, F-15E, and F-16 aircraft for use against tanks and columns of vehicles and in the SEAD role.

**AGM-88A.** The basic Maverick is a launch-and-leave, TV-guided air-to-surface missile that enables the pilot of the launch aircraft to seek other targets or leave the target area once the missile has been launched. Production was initiated in 1971, following successful test launches over distances ranging from a few thousand feet to many miles and from high altitudes to treeline level.

**AGM-65B.** A version with a “scene magnification” TV seeker that enables the pilot to identify and lock on to small, or more distant targets.

**AGM-65D.** System developed to overcome limitations of the TV Maverick, which can be used only in daylight and in favorable weather conditions. This version has an IR seeker as well as a smaller smoke motor. IIR Maverick became operational on A-10s in February 1986.

**AGM-65E.** 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 that is more resistant to electronic jamming than the hydraulic, actuation system. USAF received its first G model in 1989.

**AGM-65H.** AGM-65B modified with an upgraded TV seeker providing significant reliability, maintainability, and performance improvements over the AGM-65B seeker and double the standoff range.

**AGM-65K.** AGM-65K/E/G modified with the same up- graded TV seeker as in the AGM-65H to provide a TV-guided version of the Maverick with the 298-lb blast fragmentation warhead.

**AGM-84 Harpoon**

Developed as an adverse weather capable, sea-skimming, active-radar-guided, antiship cruise missile system capable of being fired from B-52H aircraft, ships, and submarines.

**Function:** Air-to-surface antiship missile.

**First Flight:** March 1974 (for USN).

**Delivered:** from 1979 (for USN).

**IOC:** circa 1985 (USAF).

**Production:** sustained phase.

**Contractor:** Boeing; McDonnell Douglas.

**Power Plant:** Teledyne CAE J402-CA-400 turbojet, 660 lb thrust.

**Guidance:** sea-skimming cruise monitored by radar altimeter, active radar terminal homing.

**Warhead:** penetration high-explosive blast type, weighing 500 lb.

**Dimensions:** length 12.6 ft, body diameter 1.1 ft, wingspan 3 ft.

**Weight:** 1,172 lb.

**Performance:** speed high subsonic, range more than 57 miles.

**COMMENTS**

**HARM**

Harpoon and its launch control equipment provide USAF the capability to interdict ships at ranges well beyond those of other aircraft. Originally acquired to equip two squadrons of now-retired B-52G aircraft for maritime antisurface operations, the Harpoon all-weather anti-ship missile currently arms conventional-missile B-52Hs.

AGM-84D is a variant of the USN Harpoon that has been adapted for B-52 bombers, which can carry eight missiles.

**AGM-88 HARM**

**Brief:** An air-to-air tactical missile designed to seek and destroy enemy radar-equipped air defense systems, and an air-to-ground system that senses and homes in on enemy radar emissions.

**Function:** Air-to-surface antiballistic missile.

**First Flight:** April 1979.

**Delivered:** 1982-98.

**IOC:** circa 1984.

**Production:** sustained phase.

**Contractor:** Raytheon.

**Power Plant:** Thiokol smokeless, dual-thrust, solid- propellant rocket motor.

**Guidance:** passive homing guidance system, using seeker head that homes on enemy radar emissions.

**Warhead:** high-explosive fragmentation, weighing 145 lb.

**Dimensions:** length 13.7 ft, body diameter 10 in, wingspan 3.7 ft.

**Weight:** 795 lb.

**Performance:** cruising speed supersonic, altitude limits S/L to 40,000 ft, range more than 10 miles.

**COMMENTS**

**High-speed Anti-Radiation Missile (HARM)**

The High-speed Anti-Radiation Missile (HARM) ex- hibits great velocity along with an ability to cover a wide range of frequency spectrums through the use of programmable digital processors in both the car- rier aircraft’s avionics equipment and in the missile. The combination gives this second generation anti- radiation missile greatly improved capability over first-generation Shrikes and Standard. The AGM-88 proved highly effective against enemy ground radar during the 1991 Persian Gulf War and continues in use in current operations. HARMs equip F-16 Block 50/52S (F-16C/D) dedicated to the SEAD mission.

**AGM-88B.** A factory-programmed version used to equip the now-retired F-4G Wild Weasel to increase its lethality in electronic combat.

**AGM-88C.** This current production version has more lethal warhead, containing tungsten alloy cubes, rather than steel, and the enhanced-capability AGM-88D-G guided cruise.

**Warhead:** high-explosive fragmentation or 800-lb penetrator.

**Dimensions:** length 15.9 ft, body diameter 1.8 ft, wingspan 9.5 ft.

**Weight:** 3,000 lb.

**Performance:** range greater than 57.5 miles.

**COMMENTS**

**AGM-130**

The AGM-130 missile system provides a conven- tional, precision, standoff hard target penetrator weap- on for the B-52H. The system consists of a standoff, air-to-ground precision guided missile, weapon data link pod, and associated support and training equip- ment. Initial operational test and evaluation launches were completed in May 1999. There are six variants of the AGM-130.

**AGM-142A.** TV seeker with 750-lb blast/frag warhead.

**AGM-142B.** IIR seeker with 750-lb blast/frag warhead.

**AGM-142C.** TV seeker with 800-lb penetrator warhead.
AGM-142D. IIR seeker with 800-lb penetrator warhead.
AGM-142D-1. IIR-Z improved seeker with 800-lb penetrator warhead.

AGM-154 Joint Standoff Weapon
Brief: First in a joint USAF and Navy family of low-cost, highly lethal glide weapons with a standoff capability, usable against heavily defended targets.
Function: Air-to-surface guided missile.
Production: 6,114 (planned).
Inventory: 148.
Contractor: Raytheon.
Guidance: INS/GPS.
Dimensions: length 13.3 ft.
Weight: 1,065–1,500 lb.
Performance: range: low-altitude launch 17 miles, high-altitude launch 40+ miles.

COMMENTARY
A medium-range, INS/GPS–guided, standoff air-to-ground weapon designed to attack a variety of soft and armored area targets (fixed, relocatable, and mobile) during day/night/adverse weather conditions. JSOW enhances aircraft survivability, as compared to current interdiction weapon systems, by providing the capability for launch aircraft to stand off outside the range of enemy point defenses. JSOW accuracy and launch-and-leave capability will allow several target kills per aircraft sortie. Integration of JSOW is currently on F-16 Block 50 and B-2 aircraft, with follow-on capability on B-52 and F-15E in FY03, B-1B and F-16 Block 30/40.

AGM-154A. The baseline BLU-97 variant for use against area targets; in full-rate production.


AGM-154C. The third variant (used by Navy only), JSOW/Unitary integrates an IIR terminal seeker and a 500-lb unitary warhead.

AGM-158A Joint Air-to-Surface Standoff Missile
Brief: An advanced weapon designed to attack heavily defended targets with high precision at great standoff range.
Function: Air-to-surface guided weapon.
First Flight: April 6, 1999.
Delivered: first of 76 LRIP missiles due April 2003; through FY17 (planned).
IOC: FY07 (planned).
Production: 2,000 (USAF) planned; 450 (Navy).
Inventory: TBD.
Contractor: Lockheed Martin; Raytheon; Honeywell; Allied Tech.
Guidance: INS/GPS, and IIR terminal seeker.
Power Plant: Teledyne Continental Motors.
Dimensions: length 14 ft.
Weight: 2,200 lb.
Performance: 1,000-lb class penetrator and blast-fractionation warheads; standoff range greater than 230 miles.

COMMENTARY
JSASS is a next generation missile that will enable Air Force and Navy fighters and bombers to destroy the enemy’s war-sustaining capabilities from outside the ranges of enemy air defenses. JSASS has INS/GPS guidance with an IIR terminal seeker. It has an LO airframe and a rocket motor for survivability and standoff beyond area defenses. This autonomous precision strike weapon will attack both fixed and relocatable targets, ranging from nonhardened above ground to moderately hardened buried targets. The system will also offer low operational support costs. Threshold aircraft are B-52H and F-16. Objective aircraft include B-1B, B-2, F-15E, F-117, F/A-18E/F, and P-3C. An extended-range version (JASSM-ER), with a range of more than 575 miles, starts development in FY03 and will begin production in FY07.

CBU-87/103 Combined Effects Munition
Brief: The CBU-87 CEM is an area cluster munition effective against light armor, material, and personnel. It is in full-rate production, incorporating improvements and used by USAF and Navy fighters and bombers for interdiction.
Function: Area cluster munition.
Production: sustainment phase.
Contractor: Aerojet General; Honeywell; Allied Tech.
Guidance: none (CBU-87).
Dimensions: length 7.7 ft; diameter 1.3 ft.
Weight: 493 lb.
Performance: dispenses 202 BLU-97 combined effect bomblets over an area roughly 800 by 400 ft. The CBU-103, USAF is retrofitting its inventory of CEMs with the WCMC tail kit. The WCMC will improve the munitions delivery accuracy when released from medium to high altitude. Tail kit purchases are based on available funding.

CBU-89/104 Gator
Brief: The CBU-89 Gator is an anti-armor/anti-personnel mine dispenser used by USAF and Navy fighters and bombers for interdiction.
Function: Scattered mines.
Production: sustainment phase.
Inventory: classified (CBU-104).
Contractor: Honeywell; Aeros Racing; Olin; Allied Tech.
Guidance: none (CBU-89).
Dimensions: length 7.7 ft; diameter 1.3 ft.

GBU-27 (SRA. Jeff Fitch)
Weight: 705 lb.
Performance: dispenses 72 BLU-91 anti-armour and 22 BLU-92 antipersonnel mines.

COMMENTARY
The CBU-89 Gator dispenser holds 94 mines, of which 72 are antitank and 22 are antipersonnel. The mines are dispersed over the target in a rectangular pattern. The antitank mines, which can be fused for up to a 72-hour delay, have a magnetic influence fuse to sense armor.

CBU-104. USAF is retrofitting its inventory of Gators with the WCMC tail kit, which will improve the munitions delivery accuracy when released from medium to high altitude. Tail kit purchases are based on available funding.

CBU-97/105 Sensor Fuzed Weapon
Brief: The CBU-97 SFW is an anti-armour cluster munition used by fighters and bombers for multiple kills per pass against moving and stationary land combat vehicles.
Function: Wide-area cluster munition.
First Flight: circa 1990.
Production: 3,937 (planned).
Inventory: classified.
Contractor: Textron Systems.
Guidance: IR sensors in each warhead search for targets, then detonate over them.
Dimensions: length 7.7 ft; diameter 1.3 ft.
Weight: 920 lb.
Performance: delivers 40 lethal projectiles over an area of about 500 ft by 1,200 ft.

COMMENTARY
The CBU-97 Sensor Fuzed Weapon comprises an BLU-108/B tactical munition dispenser with an FZU-97 fuze and a payload of 10 BLU-108/B submunitions. Each tactical munitions dispenser contains 10 BLU-108/B submunitions, and each submunition contains four “skeet” projectiles that, upon being thrown out, seek out their target and deliver an explosively formed penetrator. Each SFW can deliver a total of 40 lethal projectiles. The SKEET sensors can detect a vehicle’s IR signature; if no target is detected, the warhead detonates after a preset time. The SFW’s primary targets are massed tanks, armored personnel carriers, and propelled targets. It also provides direct attack capability and interdiction against C2 centers.

The SFW is currently delivered as an unguided gravity weapon from the A-10, B-1, B-2, B-52H, F-15E, and F-16. A preplanned product improvement SFW variant is in full-scale production, incorporating improvements such as an active laser sensor, multimission warhead, and increased footprint.

CBU-105. Designation of a CBU-97 equipped with a WCMC tail kit. The CBU-105 can be accurately delivered from high altitude and in adverse weather from the B-1, B-2, B-52H, F-15E, and F-16.

GBU-10 Paveway II
Brief: An unpowered laser guided bomb (LGB) used to destroy high-value enemy targets from short standoff distances.
Function: Air-to-surface guided munition.
First Flight: early 1970s.
Delivered: from 1976.
Production: 10,000; continuing.
Inventory: not available.
Contractor: Lockheed Martin; Raytheon.
Guidance: sematic laser.
Warhead: GBU-10C/D/E/F: Mk 84 bomb (2,000-lb unitary); GBU-10H/J/K: BLU-109.
Dimensions: length 10.9 ft, body diameter 10.7 in, wingspan 4.4 ft. Weight: 600 lb. Performance: CEP 29.7 ft; range about 6 miles. COMMENTARY: In the early fixed-wing Paveway IIs were improved versions of the earlier fixed-wing Paveway I. The LGB is used primarily to strike fixed armor. It can operate in clouds down to 2,500 ft. GBU-12 platforms include A-10, B-52, F-15E, F-16, and F-117 aircraft.

GBU-15 Paveway II Brief: An unarmed LGB used to destroy high-value enemy targets from short standoff distances. Function: Air-to-surface guided munition. First Flight: early 1970s. IOC: 1976. Production: about 30,000. Continuing. Contractor: Lockheed Martin; Raytheon. Guidance: semiactive laser. Weight: approx 500 lb. Performance: range more than 11.5 miles. COMMENTARY: GBU-24A/B: An air-to-ground weapon equipped with the third generation Paveway III guidance kit, integrated with a BLU-109 penetrating warhead. The kit consists of an advanced guidance section and high-lift airflow. It is extremely precise and highly effective against a broad range of high-value hard targets. The system can be employed from low, medium, and high altitudes. It can be up to a 5,000 lb weapon, providing for the use of an adaptive digital autopilot and large field-of-regard, highly sensitive scanning seeker. The GBU-24A/B was highly successful during Desert Storm. The GBU-24 adapts to conditions of release, flies an appropriate midcourse, and provides trajectory shaping for enhanced accuracy. The weapon is deployed on USAF F-15E and F-16 and Navy F-14 and F/A-18.

Satellite Systems

Defense Meteorological Satellite Program
Brief: Satellites that collect air, land, and sea, and space environment data to support worldwide strategic and tactical military operations.

Function: Environmental monitoring satellite.

Brief: A constellation of orbiting space vehicles that provide secure, jam-resistant EHF communications. Worldwide operations are made possible by this 24-hour, all-weather capability, ready to support any deployment at a moment's notice. The constellation was to be fully deployed by the beginning of 2003, and modernization of satellite communications will continue with the Advanced EHF (AEHF) constellation deployments. The first AEHF launch is scheduled for 2007.

Global Positioning System
Brief: A constellation of orbiting space vehicles that provides highly precise and reliable navigation data, 24 hours a day, to military and civilian users around the world. Signals permit calculation of location within less than 100 m.

Function: Communications satellite.

Brief: A satellite communications system that provides high-quality, timely weather information to military and civilian users worldwide.

Function: Strategic and tactical launch detection system.

Defense Support Program
Brief: An early warning spacecraft that travels in geosynchronous orbit and provides alert of possible ballistic missile attack on US forces or homeland.

Function: Satellites that provide secure, jam-resistant EHF communications. Worldwide operations are made possible by this 24-hour, all-weather capability, ready to support any deployment at a moment’s notice. The constellation was to be fully deployed by the beginning of 2003, and modernization of satellite communications will continue with the Advanced EHF (AEHF) constellation deployments. The first AEHF launch is scheduled for 2007.

Polar MILSATCOM
Brief: Satellite that provides secure, survivable communications, supporting peacetime, contingency, and wartime operations in the North Pole region, above 65° north latitude.

Function: Communications satellite.

Militar Satellite Communications System
Brief: A satellite communications system that provides secure, jam-resistant EHF communications. Worldwide operations are made possible by this 24-hour, all-weather capability, ready to support any deployment at a moment’s notice. The constellation was to be fully deployed by the beginning of 2003, and modernization of satellite communications will continue with the Advanced EHF (AEHF) constellation deployments. The first AEHF launch is scheduled for 2007.

Space Based Infrared System High
Brief: Advanced surveillance system for missile warning, missile defense, battlespace characterization, and technical intelligence. As Space Based Infrared satellites in geosynchronous Earth orbit (GEO) and highly elliptical orbit.

Function: IR space surveillance.

Worldwide military operations, such as precision bombing, CSAR, mapping, and rendezvous are successful in part due to the 24-hour, worldwide naviga- tion service provided by the Advanced EHF satellite communications system (GPS) navigation satellite constellation. Accurate three-dimensional (latitude, longitude, and altitude) position data and extremely precise time are provided continuously in real time to support an unlimited number of users around the globe, both civilian and military. Consequently, potential GPS applications are vast, ranging from civil, transportation, and homeland security to military and law enforcement. GPS signals are currently being used to support modernized military communications. GPS signals are currently being used to support modernized military communications.
Space Tracking and Surveillance System

Brief: Advanced surveillance system with IR and visible sensors for detecting and tracking ballistic missiles. STSS (formerly SBIRS Low) will have satellites in low Earth orbit (LEO), and theater sites to deployed warfighters. The satellites will have X-band (DSCS), Ka-band broadcast (GBS Phase 2-like), and will provide direct broadcast of digital multimedia, DISN, and all service ground mobile users. In addition, it will provide high-bandwidth imagery, and video information directly from global and theater sites to deployed warfighters. The satellites will have X-band (DSCS), and Ka-band broadcast (GBS Phase 2-like), and two-way Ka-band services.

MQM-107 Streaker

Brief: A jet-powered, variable speed, recoverable target drone.

Function: Aerial target.

Operator: ACC.

First Flight: not available.

Delivered: from 1984 (B).


Production: 70 (B); 221 (D); 78 (E).

Unit Location: Tyndall AFB, Fla.

Contractor: Raytheon (D model); Marconi (formerly Tracor) (E model).

Power Plant: initially on D model, one Teledyne CAE 373-8 engine, 950 lb thrust; MQM-107Ds delivered since 1989 have 950 lb thrust TRI 60-5 turbojets. Microturbo TRI 60-5 engine, 1,061 lb thrust or TCAE 373-68 (E model).

Guidance and Control: analog or digital, for both ground control and preprogrammed flight (D model); high-G autopilot provisions; digital autopilot and remote control by the Gulf Range Drone Control Upgrade System (GRDCUS), a multifunction C2 multilaterration system (E model).

Dimensions: length 18.1 ft, body diameter 1.3 ft, span 9.8 ft.

Weight: max launch weight (excl booster) 1,460 lb.

Performance: operating speed 207–630 mph, operating height 50–40,000 ft, endurance 2 hr 15 min.

COMMANDER

MOM-107D. A third generation version of the MQM-107 Streaker, it is a recoverable, variable-speed target drone used for research, development, test and evaluation and the Weapon System Evaluation Program.

MOM-107E. Improved performance follow-on to the MOM-107D. In operational service, it replaces the MOM-107D and expands the flight envelope.

BQM-34 Firebee

Brief: A jet-powered, variable speed, recoverable target drone.

Function: Aerial target.

Operator: ACC.

First Flight: 1951; 1958 (BQM-34A).

Delivered: from 1951.

IOC: circa 1951.

Production: 1,800+.

Inventory: 33.

Unit Location: Tyndall AFB, Fla.

Contractor: Teledyne Ryan.

Power Plant: one General Electric J85-GE-100 turbojet, 2,850 lb thrust.

Guidance and Control: remote-control methods incl the GRDCUS (Tyndall) and the Drone Formation and Control System (Holloman); will also accommodate the triservice Target Control System currently under development.

Dimensions: length 16 ft, height 6 ft, wingspan 38.4 ft.

Weight: mission operational weight 49,500 lb.

Performance: max speed Mach 2+; ceiling 55,000 ft, range (approx) 500 miles.

COMMANDER

The QF-4 replaced the QF-106 Full-Scale Aerial Target (FSAT) in 1998 when the F-106 inventory was depleted. The QF-4 provides for a larger operational performance envelope (maneuvering) and greater pay-load capability compared with its predecessors. More than 125 F-4 surplus aircraft have been converted to QF-4 FSATS since 1995. QF-4s are used for research, development, test and evaluation and the Weapon System Evaluation Program.