2010 USAF Almanac

**B-1 Lancer**

**Brief:** A long-range, air refuelable multirole bomber capable of flying intercontinental missions and penetrating enemy defenses. The B-1 incorporates the largest payload of guided and unguided weapons in the Air Force inventory.

**Function:** Long-range bomber.

**Operator:** ACC, AFMC.

**First Flight:** Dec. 23, 1974 (B-1A); Oct. 18, 1984 (B-1B).

**Delivered:** June 1985-May 1988.

**IOC:** Oct. 1, 1986, Dyess AFB, Tex. (B-1B).

**Production:** 104.

**Inventory:** 66.

**Aircraft Location:** Dyess AFB, Tex., Edwards AFB, Calif., Eglin AFB, Fla., Ellsworth AFB, S.D.

**Contractor:** Boeing; ATL Systems; General Electric.

**Power Plant:** four General Electric F101-GE-102 turbofans, each 30,780 lb thrust.

**Dimensions:** Span spread 137 ft, swept aft 79 ft, length 146 ft, height 34 ft.

**Weight:** empty 192,000 lb, max operating weight 477,000 lb.

**Ceiling:** more than 30,000 ft.

**Performance:** max speed at low level 1,03/104/105); up to 24 GBU-31 (2,000-lb) or 15 GBU-38 (500-lb) Joint Direct Attack Munitions (JDAMs); up to 120 Link 16 digital data sharing capability.

**Armament:**
- In each of three weapons bays (500-lb) Joint Direct Attack Munitions (JDAMs), up to 24 GBU-31 (2,000-lb) or 15 GBU-38 (500-lb) Joint Direct Attack Munitions (JDAMs); up to 24 Wind-Corrected Munitions Dispensers (WCMD) (CBU-87/89/97) or 30 Naval Mines (CBU-87/89/97); up to 30 cluster munitions (CBU-87/89/97) or 82 (500-lb) or 24 Mk 84 (2,000-lb) general-purpose bombs;
- as part of this RCS reduction, necessitating a reduction of the radar cross section (RCS). The inlet was extensively modified to improve aircraft reliability.

**Optional ordnance**
- In a nuclear role, up to 16 nuclear weapons (B61 nuclear free-fall bombs is 5,000 miles, with a conventional role, 80 Mk 82 500-lb bombs, 32 tactical munitions dispensers, 80 Mk 62 sea mines, or 80 GBU-38 (500-lb) JDAMs mounted on bomb rack assemblies, or up to 16 rotary launcher-mounted weapons: 16 GBU-31 (2,000-lb) JDAMs, or a penetration version of a BLU-109, or 16 Mk 84 2,000-lb bombs; 16 Joint Standoff Weapons (JSOWs), 16 JASSMs, or eight 4,700-lb GBU-37/GBU-28/C guided weapons. Future weapons incl Small Diameter Bomb (SDB) II and the 30,000-lb Massive Ordnance Penetrator (MOP).

**COMMENTS**
- The B-1 is a key element of any joint/composite strike force.
- The bomber’s offensive avionics include synthetic aperture radar (SAR), capable of tracking, targeting, and engaging moving vehicles, self-targeting stationary targets, and terrain-following. An extremely accurate Global Positioning System-equipped inertial Navigation System (GPS/INS) enables aircraft to autonomously navigate globally, without the use of ground-based navigation aids and to engage targets with a high level of precision. Beyond-line-of-sight (BLOS) reachback connectivity is being enhanced through the Digital Communications Improvement (DCI) program.
- The B-1 is certified for unlimited use of synthetic fuel blend.

**B-2 Spirit**

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

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

**Operator:** AFGSC, ANG.

**Performance:** 146 ft, height 34 ft.

**Dimensions:** span spread 137 ft, swept aft 79 ft, length 146 ft, height 34 ft.

**Weight:** empty 192,000 lb, max operating weight 477,000 lb.

**Ceiling:** more than 30,000 ft.

**Performance:** max speed at low level 1,03/104/105); up to 24 GBU-31 (2,000-lb) or 15 GBU-38 (500-lb) Joint Direct Attack Munitions (JDAMs); up to 120 Link 16 digital data sharing capability.

**Armament:**
- In each of three weapons bays (500-lb) Joint Direct Attack Munitions (JDAMs), up to 24 GBU-31 (2,000-lb) or 15 GBU-38 (500-lb) Joint Direct Attack Munitions (JDAMs); up to 24 Wind-Corrected Munitions Dispensers (WCMD) (CBU-87/89/97) or 30 Naval Mines (CBU-87/89/97); up to 30 cluster munitions (CBU-87/89/97) or 82 (500-lb) or 24 Mk 84 (2,000-lb) general-purpose bombs;
- as part of this RCS reduction, necessitating a reduction of the radar cross section (RCS). The inlet was extensively modified to improve aircraft reliability.

**Optional ordnance**
- In a nuclear role, up to 16 nuclear weapons (B61 nuclear free-fall bombs is 5,000 miles, with a conventional role, 80 Mk 82 500-lb bombs, 32 tactical munitions dispensers, 80 Mk 62 sea mines, or 80 GBU-38 (500-lb) JDAMs mounted on bomb rack assemblies, or up to 16 rotary launcher-mounted weapons: 16 GBU-31 (2,000-lb) JDAMs, or a penetration version of a BLU-109, or 16 Mk 84 2,000-lb bombs; 16 Joint Standoff Weapons (JSOWs), 16 JASSMs, or eight 4,700-lb GBU-37/GBU-28/C guided weapons. Future weapons incl Small Diameter Bomb (SDB) II and the 30,000-lb Massive Ordnance Penetrator (MOP).

**COMMENTS**
- The B-2 bomber is a unique, highly advanced system, combining sophisticated technologies, notably low observable (LO) stealth design, with high aerodynamic efficiency, enabling it to attack heavily defended targets and neutralize enemy defenses.
- Based on the flying wing concept, the B-2 has no vertical tail surfaces. The smoothly blended “ fuselage” section accommodates two flight crew and two large weapons bays side by side in the lower centerbody. These bays contain rotary launchers or bomb rack assemblies capable of carrying up to 60,000 lb of weapons.
- The aircraft has a quadruple-redundant fly-by-wire digital
B-2A Spirit (SrA. Jessica Snow)

flight-control system, actuating moving surfaces at the wing trailing edges that combine aileron, elevator, and rudder functions. A landing gear track of 40 ft enables the B-2 to use any runway that can handle a Boeing 727 airliner.

B-2A. B-2 production represents three successive blocks of capability. Block 10 aircraft carried B63 nuclear bombs or 16 Mk 84 2,000-lb conventional munitions. Block 20 aircraft additionally carried B61/7 and B61/11 nuclear bombs, as well as GPS-aided munitions (GAMs), and GBU-38, on two rotary launcher assemblies, providing an interim, near-precision strike capability. All Block 10 and 20 aircraft were upgraded to Block 30. (The last original Block 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 30 configuration added significant new weapons capability. Using the rotary launcher assembly, all B-2s are capable of employing 16 Mk 84 JDAMs, 16 JSOWs, 16 JASSMs, 16 BLU-109 JDAMs, or eight GBU-37s or GBU-28C/Ds. 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 Mk 82s. Modifications to the bomb racks add carriage of 80 independently targetable GBU-38 (500-lb) JDAMs. Other Block 30 enhancements include fully operational defensive and offensive avionics, a more sophisticated mission planning system, and additional operating modes for the synthetic aperture radar. A new stealth coating introduced under the Alternative High Frequency Material (AHFM) program is dramatically improving combat readiness. The entire fleet will be converted by 2012.

Beyond Block 30, USAF has added the Link 16 digital data sharing capability and is replacing the radar. Future plans include adding an EHFs satellite communications system.

The first use of B-2s in combat took place March 24, 1999, against Serb targets in Allied Force, with two aircraft including an EHF satellite communications system. This capability, together with targeting data from the combined air operations center over CTI and the updated mission data system, provides increased situational awareness and battle damage assessment.

B-52H Stratofortress (Clive Bennett)

jammer variant MALD-J, and the JASSM ER.

**COMMENTS**

The B-52’s still-expanding weapons capability reflects its continued ability to perform a wide range of missions, including show of force, maritime operations, long-range precision strikes, close air support (CAS), offensive counterair, air interdiction, and defense suppression. Equipment includes GPS, ARC-210 radio with a ‘Free Quick II anti-jam feature; KY-100, providing secure voice and data transmission; Combat Track II (CT II) radio, permitting an interim secure BLOS back-up connectivity allowing aircraft to receive targeting data from the combined air operations center over CTI and then update mission data in the offensive avionics system; an electro-optical (EO) viewing system that uses forward-looking infrared (FLIR) and high-resolution low-light-level television (L3TV) sensors to augment the targeting, battle assessment, flight safety, and terrain-avoidance systems, improving combat and low-level flight capability; and night vision goggles (NVG). B-52s are modified to carry weapons targeting pods. Future plans include modification of the entire fleet with an integrated self-targeting and battle damage assessment (IDA) capability and a new radar system. A MIL-STD-1760 interface supports advanced precision weapons capability.

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 B-52 was the first USAF aircraft to fly using synthetic fuel. It also was first to release the MOP weapon. 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 August 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, as well as 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. First flown March 1956; 35 were delivered June-December 1956. Majority retired 1961.

**B-52D.** Long-range bomber version, first flown June 1956 and used during the Vietnam War. Total of 170 built, attitude, often followed by B-52 penetration to attack other targets. When tasked with precision weapons delivery, it conducts close air support and attacks targets using GPS/INS guided weapons.

Ongoing modernization of its conventional capabilities is extending the B-52’s service life well into the 21st century, with the ability to provide massive firepower in low- to midthreat environments supplemented by a stand-off attack capability. Iraq Freedom saw B-52s delivering laser guided bombs for the first time using Litening targeting pods. Sniper targeting pods integration is under development. Use of heavy stores adapter beams enables aircraft to carry most B-52-certified munitions. ALCMs and CALCMs are carried on unique pylons or internally on a rotary launcher. Avionics improvements include the Avionics Midlife Improvement (AMI) Program, which replaces the current system processors, inertial navigation unit (INU), and data transfer system (DTS) cartridges. Electronic attack improvements include the ECM improvement upgrade to the ALQ-172 set. The Combat Network Communications Technology (CONNECT) improvement provides a modern cockpit information avionics architecture, color displays, and enhanced situational awareness, network-centric warfare/capability, fully integrated line-of-sight (LOS) and beyond-line-of-sight (BLOS) data link capabilities, and mission/weapon reprogramming capability. The B-52’s EHF program will add UHF/EHF satellite communications to the fleet.

USAF’s nuclear-capable bomber forces were transferred from ACC to AFGSC in February 2010. One B-52 unit will dedicate itself to the nuclear mission at all times.

**Fighter and Attack Aircraft**

**A-10 Thunderbolt II**

A simple, effective twin-engine aircraft specifically designed for close air support (CAS) of ground forces against a wide range of ground targets, including tanks and other armored vehicles.

**Function:** Attack aircraft.

**Operator:** ACC, AFMC, PACAF, USAFE, ANG, AFRIC.
A-10A Thunderbolt II (Clive Bennett)

Air Force Magazine
May 2010


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

**Power Plant:** (F-15C) two Pratt & Whitney F100-PW-220 turbofans, each 41,000 lb; (F-15D) two Pratt & Whitney F100-PW-229 turbofans, each 29,000 lb thrust; or F100-PW-229 turbofans, each 29,000 lb thrust; or F100-PW-229 turbofans, each 29,000 lb thrust. Each engine can achieve 22,000 lb of thrust in afterburner.

**Function:** Dual-role fighter.

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

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

**Delivered:** April 1988-2004.

**IOC:** May 1989.

**Production:** 236.

**Inventory:** 221.

**Aircraft Location:** Eglin AFB, Fla., 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-239 turbofans, each 29,000 lb thrust with max afterburner.

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

**Dimensions:** span 42.8 ft, length 63.8 ft, height 18.7 ft.

**Weight:** empty 28,600 lb, gross 68,000 lb.

**Ceiling:** 65,000 ft.

**Performance:** (F-15C) max speed Mach 2.5, T.O run 905 ft, landing run without braking parachute 3,500 ft, ferry range with external fuel tanks more than 2,876 miles.

**Armament:** one internally mounted M61A1 20 mm six-barrel cannon; up to four AIM-9L/M/X Sidewinder and four AGM-65B/D/E/G/H/K Maverick missiles, and up to four AIM-120 Advanced Medium-Range Air-to-Air Missiles (AMRAAMs), carried externally.

**Commentary:** For more than 30 years, the F-15 has provided the capability to deploy to air superiority missions as the backbone of the USAF’s air-to-air combat force, and to deploy to the air combat in contingency operations.

**A-10A**

**Equipment:** one internally mounted M61A1 20 mm six-barrel cannon; up to four AIM-9L/M/X Sidewinder and four AGM-65B/D/E/G/H/K Maverick missiles, and up to four AIM-120 Advanced Medium-Range Air-to-Air Missiles (AMRAAMs), carried externally.

**Commentary:** For more than 30 years, the F-15 has provided the capability to deploy to air superiority missions as the backbone of the USAF’s air-to-air combat force, and to deploy to the air combat in contingency operations.

**A-10C**

**New designation:** the A-10A for aircraft currently being upgraded with the precipitation engagement modification, with new multifunction color displays, hands-on throttle and stick (HOTAS), digital stores management, JAM/AMC integration, Sniper targeting pod capability, a Situational Awareness Data Link (SADL), and integration of sensors with aircraft systems.

**Aircraft Location:** Kadena AB, Japan, 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-239 turbofans, each 29,000 lb thrust with max afterburner.

**Accommodation:** crew of two, on zero/ejector 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 level speed at altitude 1,000 ft, landing run without braking parachute 3,500 ft, ferry range with external fuel tanks more than 2,876 miles.

**Armament:** one internally mounted M61A1 20 mm six-barrel cannon; up to four AIM-9L/M/X Sidewinder and four AGM-65B/D/E/G/H/K Maverick missiles, and up to four AIM-120 Advanced Medium-Range Air-to-Air Missiles (AMRAAMs), carried externally.

**Commentary:** For more than 30 years, the F-15 has provided the capability to deploy to air superiority missions as the backbone of the USAF’s air-to-air combat force, and to deploy to the air combat in contingency operations.
F-22A from late 1991: Block 50: F110-GE-129 (29,000 lb thrust); Increased performance engines (IPEs) in aircraft delivered in Indiana, Iowa, Maryland, Minnesota, New Jersey, New AB, Germany, and ANG in Alabama, California, Colorado, Osan AB, South Korea, Shaw AFB, S.C., Spangdahlem AB, Japan, NAS JRB Fort Worth, Tex., Nellis AFB, Nev., Fla., Kunsan AB, South Korea, Luke AFB, Arizona, Misawa Air Base, Japan, proved itself in air-to-air combat, suppression of enemy hunting Scud missile launchers and artillery sites using the F-22, and integration of the SDB I and AIM-120D.

Resolution and range; an updated computer processor to enable the F-15E to perform at high altitudes and in cluttered environments.

Modernization efforts include near-term upgrades such as addition of AESA radar with improved air-to-ground and connectivity using Link 16 and ARC-210 SATCOM.

F-15E aircraft have 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. The aircraft carries LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) pods or advanced pods such as Sniper or Litening on dedicated sensor stations. The F-15E’s ground attack capability is supported through a multitude of GPS-aided and precision weapons and by its 20 mm gun for strafing. For its air-to-air capability, it employs a vast array of radar guided and IR homing weapons. The Strike Eagle offers a large and varied ordnance load, long loiter time, precision guided and unguided weapons delivery, and connectivity using Link 16 and ARC-210 SATCOM. Modernization efforts include near-term upgrades such as addition of AESA radar with improved air-to-ground range and resolution; an updated computer processor to allow high-volume, high-speed data transfer; M-code to enhance GPS reception and accuracy; universal armament interface (UAI); and integration of the SDB I and AIM-120D.

F-16 Fighting Falcon

A compact, versatile, and low-cost multirole fighter that is highly maneuverable and has repeatedly proved itself in air-to-air combat, suppression of enemy air defenses (SEAD), and air-to-surface attack.

Function: Multirole fighter.

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

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


Production: 2,206.

Inventory: 1,156.

Aircraft Location: Aviano AB, Italy, Edwards AFB, Calif., Eielson AFB, Alaska, Hill AFB, Utah, Homestead AFB, Fla., Kunsan AB, South Korea, Luke AFB, Arizona, Misawa AB, Japan, NAS JRB Fort Worth, Texas., Nellis AFB, Nev., Osan AB, South Korea, Shaw AFB, S.C., Spangdahlem AB, Germany, and ANG in Alabama, California, Colorado, Indiana, Iowa, Maryland, Minnesota, New Jersey, New Mexico, New York, Ohio, Oklahoma, South Carolina, South Dakota, and Vermont.

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 alternative standard engines. Increased performance engines (IPEs) in aircraft delivered from late 1991: Block 50: F110-GE-129 (29,000 lb thrust); Block 52: F100-PW-229 (29,100 lb thrust).

Accommodation: pilot only, on zero/zero 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) 18,317 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-to-hi-fire 852 miles, combat range 576 miles.

Armament: one M61A1 20 mm multibarrel cannon, with 511 rd, mounted in fuselage; wingtip-mounted missiles; seven other external stores stations for fuel tanks and a range of air-to-air and air-to-surface munitions.

COMMENTARY

The F-16 is the workhorse of the USAAF fighter fleet, supporting the majority of precision guided munitions taskings in combat operations.

F-16A (single-seat) and F-16B (two-seat) versions incorporated advanced technologies from the start, making these aircraft two of the most maneuverable fighters built. USAF has retired almost all its A and B models, but the versions are still in use with many international operators. Equipment included a multimode radar with a clutter-free look-down capability, advanced radar warning receiver (RWR), HUD, internal chaff/flare dispensers, and IPEs, and expanded envelope nine-G capability. The F-16 Common Configuration Implementation Program (CCIP) has been completed for bulk of F-16 fighters with Block 50/52 in 2006 and most Block 40/42 in spring of 2010 (PACAF expected to finish June 2010). CCIP provides a new modular mission computer and color displays, Sniper XR targeting pod, JHMCS, AIM-9X, Link 16, and improved weapons capabilities.

F-16CJ-designated Block 50/52 aircraft are equipped with the High-speed Anti-Radiation Missile (HARM) targeting system (HTS) for suppression of enemy air defenses (SEAD). Block 50/52 F-16CJs have MSIP Stage III improvements, which also show up in selected retrofits of earlier F-16 blocks. These aircraft incorporate the General Electric F110 and Pratt & Whitney F100 increased performance engines, the latest cockpit control and display technology, including a wide-angle HUD. Weapons improvements include AIM-9X, multishot AMRAAM compatibility, GBU-31/38/54 JDAM, WCMD, AGM-158 JASSM, and laser guided bomb variants (GBU-10/12/24) using Sniper and Litening AT targeting pods. Downlink capability integrates with ROVER systems to support joint terminal attack controllers (JTACs) on the ground to increase close air support (CAS) effectiveness. Planned future upgrades include selective availability anti-spoofing module (SAASM), MALD with new mission planning software and SDB integration.

During Desert Storm, USAF F-16s flew more sorties than any other type, with 13,500 missions.

F-22A Raptor

Brief: Aifth generation, multilrole fighter designed to penetrate advanced air-threats and achieve air dominance.

Function: Air dominance multilrole fighter.

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


Delivered: 2002 (first production representative aircraft).


Production: 187 (planned).

Inventory: 141.


Contractor: Lockheed Martin; Boeing.

Power Plant: two Pratt & Whitney F119-PW-100 turbo-
40,000-lb thrust class. Performance (design target): max level speed at S/L 900+ mph, range more than 2,000 miles. Armament: about 10,000 lbs weight. Performance: pilot only, zero/ejection seat. Dimensions: span 44.5 ft, length 62 ft, height 16.6 ft. Weight: gross 50,000 lb. Contractor: Lockheed Martin (airframe); Boeing (AC-130). Aircraft Location: Cannon AFB, N.M. (H model), Hurlburt Field, Fla. (U model). Contractor: Lockheed Martin (airframe): Boeing (AC-130H); Rockwell, now Boeing (AC-130U). Power Plant: four Allison T56-A-15 turboprops, each 4,910 shp. Accommodation: crew of 13. Dimensions: span 132.6 ft, length 99 ft, height 38.5 ft. Weight: gross 155,000 lb. Ceiling: 25,000 ft. Performance: speed 289 mph, range 1,500 miles, with airrefueling 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. 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 the capabilities 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. For operations in Afghanistan and Iraq, the AC-130 gunships work in conjunction with the MQ-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. Converted to H standard after service in Vietnam.

**Special Operations Forces Aircraft**

**AC-130 Gunship**


**AC-130H Gunship**


**AC-130E**

An improved version, of which eight were built. Converted to H standard after service in Vietnam.

**F-35 Lightning II**

Dimensions: approx. span 35 ft, length 50.5 ft, height 17.3 ft. Weight: TBD. Ceiling: TBD. Performance (design targets): max level speed at S/L 630 knots calibrated airspeed (KCAS) for the F-35A conventional takeoff and landing (CTOL) variant (Mach 1 max power for CTOL only) and the F-35C carrier variant (CV), and 600 KCAS for the F-35B short takeoff/vertical landing (STOVL) aircraft, combat radius 590 miles for CTOL variant, 460 miles for CV, and 450 miles for STOVL. Armament: 11 weapons stations (four internal, seven external), capable of carrying bombs up to 2,500 lb. The CTOL will have one internal 25 mm gun; the STOVL and CV variants will have the same weapon with an external missionized gun pod. Internal weapons bay: CTOL: two AIM-120Cs and two GBU-31 JDMs. CV: two AMRAAMs and two GBU-31 JDMs; STOVL: two AMRAAMs and two GBU-32 JDMs. All variants will have internal and external GEU-12 and external AIM-9X. More than 30 stores are to be certified for carriage as system development continues. COMMENTARY: The F-35 Lightning II Joint Strike Fighter is a multinational cooperative development program aimed at developing and fielding an affordable, highly common family of next generation strike aircraft. For US forces, these comprise the F-35A CTOL version, the F-35B STOVL version for USMC, and F-35C CV version for USN. USAF’s F-35A will 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 F-35 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 system development and demonstration (SDD) phase, begun in October 2001, focuses on system development, test and evaluation, logistics support, and LRIP planning. A total of 18 test aircraft are being built, 12 for flight testing, six for nonairborne activities. Lockheed Martin completed assembly of the first F-35A flight-test aircraft in February 2008 and flight testing commenced Dec. 15, 2004. The final SDD aircraft are scheduled for completion 2010. Full-scale flight-test operations are planned to begin at Edwards AFB, Calif., in 2010, as well as delivery of the first production models for the joint training program at Eglin AFB, Fla.

The first flight by a USAF test pilot took place on Jan. 30, 2008. An F-35A achieved supersonic speed for the first time in November 2008. The first weight-optimized F-35A, AF-1, flew for the first time Nov. 14, 2009. The F-35 is powered by the F135, a derivative of the Pratt & Whitney F119 engine. General Electric has been under contract to develop an interchangeable power plant, the F136, but the future for the alternative production engine is still unclear.

**LOCKHEED Martin (airframe); Boeing (AC-130H).**
AC-130H Spectre aircraft serve with the 27th SOW. They are equipped with a digital fire-control computer, EO sensors, and target-acquisition systems, including FLIR and LLLTV, and are capable of in-flight refueling. Flight control, navigation, communications, and sensor suites have been upgraded. Planned modifications include a new ground moving/weather radar, enhanced traffic and collision avoidance system (ETCAS), large aircraft infrared countermeasures (LAIRCM), and expanded precision weapons capability.

AC-130U Spooky aircraft serve with 1ST and gunship conversions by Rockwell, of which 13 were delivered to AFSOC’s 4th SOS in 1994-95. Four additional aircraft were recently converted by Boeing to U standards. A planned replacement for the 40 mm gun has been canceled. All weapons can be subordinated to the APQ-180 digital control radar, FLIR, or all-light-level television (ALLTV) for adverse weather attack operations. Ongoing and planned modifications include ETcas, Link 16, an advanced gunship multisensor system (GMS2), and expanded precision weapons capability.

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 primary mission for the gunship is close air support for special operations forces. Other missions include armed reconnaissance, interdiction, point defense, armed escort, and surveillance.

**CV-22 Osprey**

**Brief:** A long-range, tilt-rotor, multimission transport aircraft designed to have the maneuverability and lift capability of a helicopter and the speed of a fixed-wing aircraft. It can operate in adverse weather and restricted visibility.

- **Function:** Multirole transport.
- **Operator:** AETC, AFSOC, AFRC.
- **First Flight:** March 19, 1989 (V-22).
- **Delivered:** 2006.
- **Inventory:** 20 (planned).
- **Production:** 50 (planned).
- **Aircraft Location:** Hurlburt Field, Fla., Kirtland AFB, N.M., Fort Bragg, N.C., RAF Mildenhall, UK.
- **Contractor:** Bell Boeing; Raytheon.
- **Power Plant:** Two Rolls-Royce-Allison AE1107C turbo-shafts, each 6,200 shp.
- **Accommodation:** Two (two pilots, two flight engineers); additional pilot for extended duration missions; up to 18 troops, 3,600 lb, or 8,000 lb internal cargo.
- **Dimensions:** Proportion diameter 38 ft, width, rotors turning 84.6 ft, fuselage length 57.3 ft, height 22 ft.
- **Weight:** Gross weight 34,900 lb, max VTO 52,870 lb, STO 57,000 lb, self-deploy TQ 60,500 lb.
- **Ceiling:** 26,000 ft.
- **Performance:** Typically will carry troops or cargo over a 500-mile combat radius at 265 mph. Self-deployment range with one air refueling 2,417 miles.

**COMMENTARY**

CV-22 Osprey is the designation for the US Special Operations Command variant of the V-22 Osprey. The CV-22 is a multirole, dual-piloted, self-deployable, medium-lift vertical takeoff and landing (VTOL) tilt-rotor aircraft for the conduct of special operations, including nuclear, biological, and chemical (NBC) warfare conditions. It is designed to operate from land bases and austere forward operating locations, as well as air capable ships without reconfiguration or modification. An in-flight refueling capability extends combat mission range when required, and the aircraft is self-sustaining to the maximum practical extent. The CV-22’s mission is long-range clandestine penetration of denied areas in adverse weather and low visibility to infiltrate, exfiltrate, and resupply Special Forces (SOF).

CV-22 avionics include a fully integrated precision navigation suite with GPS and INS, a digital cockpit management system oriented around four multifunction displays (MFDs), FLIR, an integrated NVG HUD, terrain-following/terrain-avoidance (TF/TA) radar, and digital map system. Additionally, it is equipped with robust self-defensive avionics and secure anti-jam, redundant communications compatible with current and planned systems used by command and control agencies and ground forces. The CV-22 unequaled combat range satisfies current and emergent major theater war (MTW) requirements, as well as national mission tasks. The aircraft is capable of completing most assigned missions during one period of darkness.

The first operational CV-22 squadron, the 8th SOS at Hurlburt Field, Fla., received its first aircraft in January 2007. IOT&AE was completed by summer 2008. The first operational deployment to Africa, took place in November 2008, and the first combat deployment, to Iraq, in summer 2009.

**MC-130H Combat Talon II**

**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, AFSOC, AFRC.
- **First Flight:** circa 1965 (MC-130E); January 1990 (MC-130H).
- **Delivered:** Initially 1966.
- **IOC:** 1966 (MC-130E); June 1991 (MC-130H).
- **Production:** 22 new-build MC-130Hs.
- **Inventory:** 14 (MC-130E); 20 (MC-130H).
- **Aircraft Location:** Luke Field, Fla., Hurlburt Field, Fla., Kadena AB, Japan, Kirtland AFB, N.M., RAF Mildenhall, UK.
- **Contractor:** Lockheed Martin (airframe); Boeing (integrated weapons system support).
- **Power Plant:** Four Allison T56-A-15 turboprops, each 4,910 shp.
- **Accommodation:** MC-130E: crew of nine; 53 troops or 26 paratroopers; MC-130H: crew of seven; 77 troops, or 57 paratroopers, or 57 liters.
- **Dimensions:** Span 132.7 ft, height 38.8 ft, length 100.8 ft (MC-130E), 99.8 ft (MC-130H).
- **Weight:** Empty 72,892 lb, gross 155,000 lb.
- **Ceiling:** 30,000 ft.
- **Performance:** Max speed 289 mph, range 3,110 miles, unlimited with refueling.

**COMMENTARY**

MC-130H Combat Talon aircraft are equipped with terrain-following and terrain-avoidance radars, precision navigation systems using INS/GPS, and electronic and infrared countermeasures for self-protection. Both E and H aircraft are capable of aerial refueling as a receiver and tanker, are NVG-compatible, and have a modified tail empennage for their high-speed, low-level aerial delivery system. The primary mission of the aircraft is to conduct infiltration, resupply, and exfiltration of special operations forces (SOF). They are also capable of supporting psychological operations with leaflet bundle drops. Combat Talons are able to air-drop, including using precision airdrop system (JPADS) or to land on austere unmarked landing or drop zones.

**MC-130J Combat Talon I**

Fourteen modified C-130E aircraft were additionally equipped with a pod-based system to air refueled SOF helicopters and tilt-rotor aircraft.

**MC-130P Combat Shadow**

**Brief:** Aircraft that flies clandestine or low-visibility, low-level missions into denied areas to provide air refueling for special operations forces (SOF) helicopters or to air-drop small special operations teams, small bundles, and nuclear and combat rubber raiding craft.

**Function:** Air refueling for SOF helicopters and tilt-rotor aircraft and airdrop.
- **Operator:** AETC, AFSOC, ANG, AFRC.
- **First Flight:** Dec. 8, 1964 (as HC-130H).
- **Delivered:** from 1965.
- **IOC:** 1986.
- **Production:** (converted).
- **Inventory:** 27.
- **Aircraft Location:** Luke Field, Fla., Eglin AFB, Fla., Kadena AB, Japan, Kirtland AFB, N.M., Moffett Field, Calif., RAF Mildenhall, UK.
- **Contractor:** Lockheed Martin (airframe); Boeing.
- **Power Plant:** Four Allison T56-A-15 turboprops, each 4,910 shp.
- **Accommodation:** Four flight crew, plus four mission crew.
- **Dimensions:** Span 132.6 ft, height 98.8 ft, range 38.5 ft. Weight: gross 155,000 lb.
- **Ceiling:** 33,000 ft.
- **Performance:** Speed 290 mph, range with max normal payload 1,208 miles, unlimited with air refueling.

**COMMENTARY**

MC-130P Combat Shadow aircraft fly clandestine formation or single-ship intrusion of hostile territory missions to
provide aerial refueling of special operations vertical-lift and tilt-rotor assets and the infiltration, exfiltration, and resupply of SOF by airdrop or airland operations. Upgrades to the MC-130P feature improved navigation, communications, and threat detection, and countermeasures systems. The Combat Shadow fleet has fully integrated INS/GPS and NVG-compatible interior and exterior lighting. It also has FFLR, radar and missile warning receivers, chaff and flare dispensers, NVG-compatible HUD, satellite and data-burst communications, as well as in-flight refueling capabilities as a receiver. Secondary capabilities include the ability to air drop small teams, bundles, and rubber raiding craft. The aircraft is capable of surveillance from Earth’s surface up to the stratosphere, including parts of the incoming atmosphere. It is directly subordinate to the joint air operations center. Its extensive range of missionavionics enables it to provide an accurate real-time battlespace picture of friendly, neutral, and hostile activity; C2 for an area of responsibility; BM of theater forces; all-altitude all-weather air surveillance and command, control, and C2BM and ISR elements. It provides the theater with the ability to find, fix, track, and target airborne or maritime threats and to locate and identify emitters. It can operate beyond the coverage of ground based radar and can exchange data with other C2 platforms and weapon systems.

E-3A. Of the 24 built for USAF in standard production configuration, 22 were later upgraded. An improved US/NATO Standard E-3A configuration was initiated with the 25th USAF Sentry, delivered in December 1981, with a large-memory computer and a maritime detection capability. Nine were built new for USAF, and one of the original E-3As was upgraded.

E-3B is the upgraded earlier version E-3A. Twenty-two product prototypes were produced. Improvements include much-enhanced computer capabilities, jam-resistant communications, maritime surveillance capability, additional radio communications, and five additional display consoles.

E-3C is an upgrade to the original 10 US/NATO Standard E-3A aircraft, with additional radio, console, and radar capabilities. Redefined in 1984. A major of system sustainability, reliability, and availability upgrades for USAF E-3s has been undertaken to support the continuing demands on the system. The Block 40/45 upgrade is a major initiative for all 32 AWACS aircraft, significantly enhancing the Air Force’s C2BM and ISR capabilities for the 21st century battlespace. It provides increased mission effectiveness for AWACS operators, improved reliability of the mission system, and reduced life-cycle costs. Aging computer systems are being replaced by an open system local area network (LAN)-based architecture. Multiuse on-board integration increases mission effectiveness and establishes a foundation for network-centric operations, producing better track quality, shortening the response time, and reducing operator/workload errors. AWACS net-centric mission systems will be complemented by the integration of advanced LOS and BLOS network communications which will enable operators to interact with a broad range of information across the net-centric battlespace.

E-4B National Airborne Operations Center Brief: A four-engine, swept-wing, long-range high-altitude aircraft providing a highly survivable command, control, and communications (C3) center allowing national defense leaders to direct US forces, execute emergency war orders, and coordinate actions by civil authorities.

Function: Airborne operations center.

Operator: ACC

First Flight: June 13, 1973 (E-4A); June 10, 1978 (E-4B).

Delivered: IOC December 1974 (E-4A); January 1980 (E-4B).

Production: four.

E-8 Joint STARS

A modified Boeing 707-300 series equipped with a large canope-shaped 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. Function: Ground surveillance, battle management (BM), C2 aircraft.

Operator: ACC and ANG, as the blended 116th Air Control Wing.


Delivered: May 1996-2005


Production: 18

E-8C Joint STARS (USAF photo)
is a commercial Boeing 707-300 series platform extensively remanufactured and modified with radar, communications, operations, and control subsystems. A 27-ft-long canoeshaped radome under the forward fuselage houses the 24-ft-long, side-looking phased air-to-ground radar capable of locating, classifying, and tracking vehicles moving on Earth’s surface. The antenna can be tilted to either side of the aircraft to detect targets. Data is then transmitted via data link to ground stations or other aircraft. It provides theater ground and air commanders with ground surveillance to support attack operations and targeting that contributes to the delay, disruption, and destruction of enemy forces. The weapon system is capable of providing commanders with transformational C2 and near-real-time area wide surveillance, ultimately passing targeting information to air and ground commanders. Joint STARS evolved from Army and Air Force programs to develop, detect, locate, and attack enemy armor at ranges beyond the forward area of troops. The first two developmental aircraft deployed in 1991 to Desert Storm and also supported Joint Endeavor in December 1995. Joint STARS supported NATO troops over Bosnia in 1996 and Allied Force in 1999. It continues to fly in support of Enduring Freedom and Iraqi Freedom. During the initial stages of Iraqi Freedom, E-8C Joint STARS aircraft were airborne 24 hours a day to help coalition forces maintain battlefield awareness.

E-8A. Prototype version, with specialized equipment installed aboard two specially modified 707-300 airframes. One was converted to an in-flight pilot trainer in 1997, and the second was scrapped.

E-8C. Production version, based on former commercial 707-300 airframes. Equipped with 18 operations and control consoles, two of which double as communications stations, all the aircraft have been modified to the more capable Block 20 aircraft, featuring more powerful computers and an Internet protocol (IP) local area network and beyond-line-of-sight (BLOS) connectivity. The first E-8C became operational in 1996, and these aircraft are expected to remain airworthy until at least 2034. System improvements under way include enhancing Internet protocol (IP) connectivity with a BLOS capability; enhanced radar capabilities to improve tracking of land and sea targets through the Enhanced Land Maritime Mode (ELMM) program; communications upgrades to address crypto, JTIDS, and broadcast intelligence equipment obsolescence; upgrades to the Prime Mission Equipment (PME), including radar signal processor and mission central computer and work station processor equipment; and communications navigation surveillance air traffic management upgrades to permit use of optimum altitudes and flight routes in increasingly congested commercial airspace. The process of re-engining the E-8C with improved performance Pratt & Whitney JTBD turbosets is in hand, with the first operational aircraft expected to receive the new engines circa late 2010.

EC-130 Commando Solo

Brief: A heavily modified C-130 used for psychological warfare broadcasts and information operations.

Function: Psychological warfare.

Operator: ANG.

First Flight: December 1980.

Delivered: December 1980.

IOC: January 1981.

Production: nine new-build EC-130H.

Contractor: Lockheed Martin; Raytheon; General Dynamics.

Power Plant: (EC-130I) 7T6-A-15 turboprops, each 4,910 shp.

Accommodation: six flight crew, six mission.

Dimensions: (EC-130J) span 132.6 ft, length 99 ft, height 38 ft.

Weight: (EC-130J) gross 175,000 lb.

Performance: range 3,740 nm at 20,000 ft.

EC-130H Compass Call

Brief: A manned intelligence-surveillance-reconnaissance (ISR) version of the C-12, based on the Beechcraft King Air C350, providing near-real-time ISR to ground forces in Iraq and Afghanistan.

Operator: ACC.

IOC: April 2009.

Production: 37 (planned).

Contractor: Hawker Beechcraft.

Power Plant: two Pratt & Whitney Canada PT6A-60A turboprops, each 1,050 shp.

Accommodation: two pilots and two sensor operators.

Dimensions: span 38 ft, length 46.7 ft, height 14.3 ft.

Weight: (King Air 350) gross 15,000 lb.

Performance: endurance: King Air 350 six hrs; King Air 350 ER 7.5 hrs.

EC-130W Commando Solo

Brief: Used by the ANG as a broadcasting station for psychological warfare operations. Specialized modifications included enhanced navigation systems, self-protection equipment, and worldwide color television configuration. Replaced by EC-130J version.

EC-130J Commando Solo II

Specialized versions of the latest-model C-130 aircraft, ordered to replace E models, with current mission equipment transferred from the older E model Commando Solo aircraft. Entered service in 2004 with the 193rd SOW (ANG). Modifications include enhanced navigation systems, additional self-protection equipment, air refueling, and the ability to broadcast radio and color TV on all worldwide standards. Commando Solo aircraft have been used in every war and most contingency operations since 1980, supporting a broad spectrum of information operations and psychological operations missions.

EC-130 Compass Call

Brief: A heavily modified C-130 for electronic combat.

Function: Electronic warfare.

Operator: ACC.

First Flight: 1981.


Production: (converted).

Inventory: 15.

Aircraft Location: Davis-Monthan AFB, Ariz.

Contractor: Lockheed Martin.


Accommodation: standard crew 13, incl nine mission.

Dimensions: span 132 ft, length 98 ft, height 38 ft.

Weight: 155,000 lb.

Ceiling: 25,000 ft.

Performance: speed 374 mph at 20,000 ft.

COMMENTARY

The EC-130H Compass Call is designed to disrupt enemy communications and limit adversary coordination essential for enemy force management. Modifications include electronic attack (EA) system and air refueling capability. Programmed upgrades will expand the EC-130H’s mission by procuring a secondary EA capability against early warning and acquisition radars.

MC-12W Liberty Project Aircraft (LPA)

Brief: A manned intelligence-surveillance-reconnaissance (ISR) version of the C-12, based on the Beechcraft King Air C350, providing near-real-time ISR to ground forces in Iraq and Afghanistan.

Operator: ACC.


Production: 37 (planned).

Inventory: 31.

Aircraft Location: Key Field, Miss. (initial weapon system training); others TBD.

Contractor: Hawker Beechcraft.

Power Plant: two Pratt & Whitney Canada PT6A-60A turboprops, each 1,050 shp.

Accommodation: two pilots and two sensor operators.

Dimensions: span 38 ft, length 46.7 ft, height 14.3 ft.

Weight: (King Air 350) gross 15,000 lb.

Performance: (King Air 350) 35,000 ft.

MC-12W Liberty Project Aircraft (LPA)

The MC-12W Liberty Project Aircraft (LPA) is a modified sensor-equipped version of the C-12 aircraft, based on the Beechcraft King Air C350. Thirty-seven are being acquired by USAF to augment existing overhead ISR assets operating in Iraq and Afghanistan, providing ground forces with high-value targeting data and other tactical intelligence. Modifications include full-motion video (FMV) and Sigint capabilities, data links to ground forces, a state-of-the-art countermeasures system, and a Blue-Force tracker. The first seven aircraft are modified, used King Air 350s; the remainder are based on the King Air 350 Extended-Range model. The MC-12W began operations in Iraq in June 2009 and in Afghanistan in December 2009.

MQ-1 Predator

Brief: A medium-altitude, long-endurance unmanned aerial vehicle (UAV), flown remotely, providing joint force commanders with a multimission asset, by combining imagery sensors with strike capability.

Function: Armed reconnaissance, airborne surveillance, target acquisition.

Operator: ACC, AFSOC, ANG.


Production: 186 air vehicles (objective force).

Inventory: 126.
**MQ-9 Reaper**

_Brief:_ A medium-to-high altitude, long-endurance remotely piloted UAV Joint force commander mission munition asset that provides an excellent picture of the battlefield targeting system.

_Function:_ Unmanned attack and ISR aircraft.

_Operator:_ ACC, AFSOC, ANG.


_IOC:_ FY07.

_Production:_ 319 (planned).

_Inventory:_ 35.

_Aircraft Location:_ Cannon AFB, N.M., Holloman AFB, N.M.

_General Atomics Aeronautical Systems._

_Power Plant:_ One Honeywell TPE-331-10GT turbo-prop engine.

**Cabine:**

_Accommodation:_ unmanned system.

_Dimensions:_ length 36.2 ft, span 66 ft.

_Weight:_ empty 950 lb, gross 2,250 lb.

_Ceiling:_ 25,000 ft.

_Performance:_ cruise speed 80 mph, up to 138 mph, endurace 24 hr (460 miles with 16 hr on station).

_Armament:_ Two Hellfire missiles.

**COMMENTARY**

The Predator UAV is a vital asset within USAF’s warfighting inventory. A fully operational Predator system includes four aircraft, a ground control station (GCS), satellite link and, about 55 personnel for 24-hour operations. The aircraft crew comprises a pilot and a sensor operator. DOD can utilize the advanced sensor technology concept demonstration (ACTD) Predator in 1995 to support Provide Promise, USAF took over the Predator program in 1996 and in 1999 deployed the system operationally for surveillance missions over Bosnia and Iraq. The weapons capability was developed in response to lessons learned in the Balkans, and since 2002 Predators armed with laser-guided Hellfire missiles have been used to attack targets in Afghanistan and Iraq. The MQ-1 Predator was converted to MQ-9 to denote the multimission capability for both reconnaissance and strike.

At the end of 2009, 31 of the 39 UAV combat air patrols (CAPs) supporting operations in Southwest Asia were flying MQ-9 Predators. The Predator performs remote split operations by forward deploying and recovery GCS (LRGCS) aircraft and support personnel for takeoff and recovery. USAF took over the Predator program in 1996 and in 1999 deployed the system operationally for surveillance missions over Bosnia and Iraq. The weapons capability was developed in response to lessons learned in the Balkans, and since 2002 Predators armed with laser-guided Hellfire missiles have been used to attack targets in Afghanistan and Iraq. The MQ-1 Predator was converted to MQ-9 to denote the multimission capability for both reconnaissance and strike.

The MQ-9 is the multi-intelligence weaponized Predator II that carries the GBU-38 JDAM targeter. The sensor is capable of very fine resolution in both spotlight and strip modes. The SAR also has ground moving target indicator capability. Reapers form a part of USAF’s increasing CAP capability in Southwest Asia operations.

**OC-135 Open Skies**

Function: Observation aircraft.

_Operator:_ ACC.

_First Flight:_ 1993.

_Delivered:_ 1993-96.

 IOC:_ October 1993.

_Production:_ three.

_Aircraft Location:_ Offutt AFB, Neb.

_Contractor:_ Boeing.

_Power Plant:_ four Pratt & Whitney TF33-5 turbosfans, each 16,000 lb thrust.

_Accomodation:_ seating for 35, incl cockpit crew, aircraft maintenance crew, foreign representatives, and crew members from the Defense Threat Reduction Agency.

_Dimensions:_ span 131 ft, length 135 ft, height 42 ft.

_Weight:_ gross 297,000 lb.

_Ceiling:_ 50,000 ft (basic C-135).

_Performance:_ speed: 500+ mph, unrefueled range 3,900 miles.

**COMMENTARY**

A modified version of the WC-135, used for specialized arms control treaty observation and imagery collection missions with framing and panoramic optical cameras installed in the rear of the aircraft.

OC-135B modifications include one vertical and two oblique KA-91C framing cameras, used for photography approximately 5,000 ft above the ground, and one KA-91C panoramic camera, which pans from side to side to provide a wide sweeps for each picture, used for high-altitude photography up to approximately 35,000 ft. Data is processed and recorded by a recording and annotation system.

**RC-26B**

_Brief:_ Specially configured variant of the Fairchild SA227-DC C-26A configured with surveillance and communications equipment for use primarily in counterdrug efforts but also increasingly for reconnaissance following national and multinational agreements.

_Function:_ Counterdrug-airborne day/night surveillance and C2.

_Operator:_ ANG.

_FIRST Flight:_ not available.

_Delivered:_ (C-26) first delivered 1989.

_IOC:_ not available.

_Production:_ 11.

_Inventory:_ 11.

_Aircraft Location:_ various locations in CONUS.

_Contractor:_ Boeing (airframe); Textron.

_Power Plant:_ two Garrett TPE331-12URJ-701 turbo-props, each 1,100 shp.

_function:_flight crew of two, one mission system operator; room for three law enforcement agents.

_Dimensions:_ span 57 ft, length 59.5 ft, height 16.8 ft.

_Weight:_ max gross T-O 16,500 lb.

_Ceiling:_ 25,000 ft.

_Performance:_ speed 334 mph, range, 2,070 miles.

**COMMENTARY**

The RC-26B is a militarized version of the Fairchild Metro 23, modified as an ISR platform primarily in counterdrug operations. More recently, the aircraft have been used during natural disasters, such as hurricanes and wildfires, to provide real-time, streaming video footage to ground personnel handling the emergency, and during special national events to augment security operations. It also is supporting war on terror efforts abroad for US Central Command and US Southern Command.

Specialized equipment includes state-of-the-art digital cameras and an infrared video camera. An extensive communications suite allows communications from 29 to 960 Hz, including provisions for plugging in 800 MHz handheld radios, and air phone capabilities.

**RC-135**

_Export:_ Specially configured variant of the Boeing C-135 Stratotanker, having an elongated nose and cheeks containing highly advanced electronic signal collection systems. Used to acquire real-time electronic and signals intelligence data for theater and tactical commanders.

_Function:_ Electronic reconnaissance aircraft.

_Operator:_ ACC.

_FIRST Flight:_ not available.


_IOC:_ October 1993.

_Production:_ (converted).

_Inventory:_ 25.

_Aircraft Location:_ Offutt AFB, Neb.

_Contractor:_ Boeing (airframe); L3 Communications; Textron.

_Power Plant:_ four CFM International F-108-CF-201 turbofans, each 24,000 lb thrust.

_Accommodation:_ flight crew of three; 25-35 mission crew.

_Dimensions:_ span 131 ft, length 140 ft, height 42 ft.

_Weight:_ max gross 299,000 lb.

_Ceiling:_ 35,000 ft.

_Performance:_ speed 500+ mph, range, with air refuel-
ing, unlimited.

**COMMENTARY**

The 55th Wing at Offutt AFB, Neb., operates a highly specialized fleet of RC-135s for worldwide reconnaissance missions. All are subject to ongoing modernization, with upgrade of avionics and primary mission equipment to expand capability and maintain effectiveness.

RC-135S Cobra Ball (CB). Cobra Ball collects measurement and signature intelligence (Masint) data, providing the capability to monitor missile and rocket signal activity and to track missiles during boost and re-entry phases of flight. Cobra Ball can deploy anywhere in the world in 24 hours and provides on-scene EO reconnaissance for treaty verification and theater ballistic missile proliferation. Equipment includes wide-area IR sensors, long-range optical systems and an advanced communications suite. RC-135U Combat Sent (CS). Each Combat Sent aircraft has a specifically designed signals intelligence (Sigint) suite used primarily to collect scientific and technical (S&T) electronic intelligence (Elint) data against air-, land-, and sea-based emitter systems. The accuracy of CS data is critical to the effective design, programming, and reprogramming of radar warning receivers as well as jammers, decoys, and anti-radiation missiles and to the development of effective threat simulators.

**RC-135W Rivet Joint (RJ).** Rivet Joint is a self-contained standoff airborne signals intelligence collection system. Its primary role is to exploit the “electronic” battlefield and deliver near-real-time (NRT) intelligence-surveillance-reconnaissance (ISR) information to tactical forces, combatant commanders, and National Command Authorities across the full spectrum of conflict. Onboard collection capabilities encompass rapid search, detection, measurement, identification, demodulation, geolocation, and fusion of data from potentially thousands of electronic emitters. TC-135/S/W. Used for training purposes.

**RC-4 Global Hawk**

_Brief:_ A high-altitude, long-range, long-endurance UAV.

_Function:_ Unmanned surveillance and reconnaissance aircraft.
Operator: ACC, AFMC.
Delivered: seven ACTD (no longer in inventory); seven Block 10, four Block 20, one Block 30 production aircraft.
IOC: Aircraft system was delivered beginning in 2001 in Afghanistan and Iraq. Block 10s currently employed in CENTCOM theater.
Production: 77 (planned).
Inventory: 17.
Aircraft Location: Beale AFB, Calif., Grand Forks AFB, N.D. (planned); three forward operating bases planned for AFCENT, PACAF, and USAFE.
Contractor: Northrop Grumman (prime); Raytheon.
Power Plant: one Rolls Royce-North American AE 3007H turbofan, 7,600 lb thrust.
Accommodation: unmanned system.
Dimensions: (RO-4A) Block 10) length 44.4 ft, height 15.2 ft; span 116.2 ft; (RO-4B (Block 20/30/40)) length 47.6 ft, span 130.9 ft.
Weight: (gross RO-4A) 25,600 lb; (RO-4B) 32,250 lb.
Ceiling: (RO-4A) 60,000 ft; (RO-4B) up to 60,000 ft.
Performance: endurance up to 28 hr. RO-4A cruise speed 340 knots. RO-4B cruise speed 310 knots.
Armament: none.

COMMENTARY
The RO-4 provides high-altitude, persistent (28+ hours) remotely piloted ISR capability. The system consists of an aircraft, GCS, and an integrated sensor suite. The RO-4 Global Hawk is being fielded in four distinctive blocks. Block 10 is in an imagery intelligence (imint) configuration (EO/IIR/SAR) and is basically a derivative of the ACTD aircraft successfully employed in Afghanistan and Iraq. Block 10s are currently performing operational missions supporting overseas contingency operations (OCO). Block 20 (imint) is larger, with enhanced IMINT capability; all six are supporting development testing or joint urgent operational need missions. Block 30 (multi-int) aircraft will add the airborne signals intelligence (SIGINT) capability, to the existing IMINT mission; fielding of the 42 Multi-int systems is projected to start in FY12. Block 40 is also a multimission platform; fielding of the 42 Multi-int systems is projected to start in FY12. Block 40 is also a multimission platform.

U-2S 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 surveillance in direct support of US forces.
Function: High-altitude reconnaissance.
Operator: ACC.
IOC: circa 1956.
Production: 35 (U-2S/ST).
Inventory: 33.
Aircraft Location: Beale AFB, Calif.
Contractor: Lockheed Martin.
Accommodation: one (two for trainer).
Dimensions: span 103 ft, length 63 ft, height 16 ft.
Weight: gross 40,000 lb.
Ceiling: above 70,000 ft.
Performance: speed 475 mph, range more than 4,500 miles, max endurance 10+ hr.

COMMENTARY
The U-2 is the Air Force’s premier high-altitude reconnaissance platform, capable of carrying Multi-int sensors simultaneously, currently making it USAF’s only truly operational multi-intelligence platform, pending the introduction of later-block RO-4 unmanned aerial vehicles (UAVs). Although the U-2 was designed initially in the 1950s, current aircraft were produced primarily in the 1980s, when the production line was reopened to produce the -TR-1, a significantly larger and more capable version than the earlier aircraft. Deliveries ended in October 1989.

U-2R (single-seat) and U-2RT (two-seat) aircraft.

U-2S (single-seat) and TU-2ST (two-seat). The current designations of all aircraft in the inventory. Conversion to a model configuration began in October 1984. Included in the ongoing $1.5 billion improvement program are new F118-GE-101 engines. Each current operational U-2 is now the Block 20 version, featuring a new glass cockpit using multifunction displays (MFDs), a digital autopilot, and a new electronic warfare system. Sensor upgrades include the ASARS-2A SAR sensor, which provides enhanced imaging modes and improves geolocation accuracy; the SYERS-2A EO imagery system providing DOD’s only multispectral and IR capability; enhanced IF-intelligence capability; and new data links, enabling the U-2 to connect in near real time with network-centric hubs as well as line-of-sight ground stations, airborne data relays, and BLOS satellite data relays simultaneously. The optical bar camera (OBC) is also still in use, providing DOD’s sole capability for broad-area synoptic imagery coverage.

NASA has two versions of the U-2, designated ER-2, which are used for high-altitude scientific experiments and atmospheric research, including investigation of global ozone depletion.

WC-130 Hercules

Brief: A high-wing, medium-range aircraft flown by AFRC for weather reconnaissance missions. It flies into the eye of tropical cyclones or hurricanes, collecting weather data from within the storm’s environment.
Function: Weather reconnaissance aircraft.

Operator: AFRC.
First Flight: circa 1959.
IOC: 1959.
Production: no new-build WC-130H. 10 (WC-130J).
Inventory: 10 (WC-130H); 10 (WC-130J).
Aircraft Location: Keesler AFB, Miss.
Contractor: Lockheed Martin.
Power Plant: (WC-130J) four Rolls Royce AE2100D3 turboprops, each 4,500 shp.

Accommodation: six.

Dimensions: (WC-130J) span 132.6 ft, length 97.8 ft, height 38.9 ft.
Weight: (WC-130J) gross 175,000 lb.
Ceiling: (WC-130J) 30,500 ft.
Performance: speed 374 mph at 20,000 ft.

COMMENTARY
The WC-130 is flown by AFRC’s “Hurricane Hunters.” The hurricane reconnaissance area includes the Atlantic Ocean, Caribbean Sea, Gulf of Mexico, and central Pacific Ocean areas.

WC-130E/B. Early version C-130 modified for weather reconnaissance. Now retired.
WC-130H. Later version C-130s modified for weather reconnaissance duties, equipped with two external 1,440-gallon fuel tanks, an internal 1,800-gallon fuel tank, and upgraded Allison T56-A-15 turboprops, each 4,910 shp. The 10 WC-130H aircraft still counted in the inventory have been recycled for other operational uses.

WC-130J. Weather reconnaissance version of the most recent C-130 model, operated by the 53rd WRS. The WC-130J replaces the WC-130H aircraft still counted in the inventory for weather reconnaissance duties, including penetration of tropical storms, to obtain data for forecasting storm movements. Features include improved radar, four Rolls Royce AE2100D3 turboprops, and D-391 six-bladed composite propellers.

An average weather reconnaissance mission might last 11 hours and cover almost 3,500 miles while the crew collects and reports weather data every minute. Results are transmitted via satellite to the National Hurricane Center, Miami.

Tanker Aircraft

HC-130/P

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 (PJ) specialists and/or equipment in hostile environments.
Function: Aerial refueling/transport.
Operator: ACC, AETC, ANG, AFRC.
First Flight: Dec. 8, 1964 (as HC-130H).
Delivered: from 1965.
Production: (converted).
Inventory: 10 (HC-130N); 23 (HC-130P).
Contractor: 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.

COMMENTS

The HC-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 available for immediate implementation when needed. Combat air forces’ HC-130 aircraft are equipped with an integrated GPS/INS navigation package, radar/misile warning, and infra-red countermeasures dispensers. Some aircraft have FLIR systems installed and some are outfitted with personnel locating systems (PLS) compatible with other aircraft. Additional modifications include an improved digital low-power color radar, integrated satellite communications radio, NVG-compatible interior/exterior lighting, and cockpit armor. The HC-130s were removed from the C-130 Avionics Modernization Program (AMP) due to scheduled recapitalization of the fleet with HC-130J aircraft. The new version, using new C-130Js and based on the modified USMC KC-130J, will ultimately replace the existing fleet of HC-130N/Ps.

KC-10 Extender

Brief: A modified McDonnell Douglas DC-10 that combines in a single aircraft the operations of aerial refueling and long-range cargo and aeromedical evacuation transport.

Function: Aerial refueling/transport. Operator: AMC, AFRC (assoc.).


Inventory: 59.


Power Plant: Three General Electric CF6-50C2 turbofans, each 22,224 lb thrust.

Accommodation: crew of four; up to 80 passengers. Dimensions: span 165.4 ft, length 181.6 ft, height 83.3 ft. Weight: gross 593,000 lb. Ceiling: 42,000 ft. Performance: cruising speed Mach 0.825, range more than 7,245 miles.

COMMENTS

The KC-10 combines the tasks of tanker and cargo aircraft in a single unit, enabling it to support worldwide fighter deployments, strategic airlift, strategic reconnaiss- ance, and conventional operations. The KC-10 can be air refueled by a KC-135 or another KC-10, increasing its range and diminishing the need for forward bases, leaving vital fuel supplies in the theater of operations untouched.

KC-10A is a DC-10 Series 30CF, modified to include fuselage fuel cells, an air refueling operator’s station, aerial refueling boom and integral hose/reel/drogue unit, a receiver refueling receptacle, and military avionics. Wing-mounted pods enhance the aircraft’s capabilities. Other modifications include the addition of communications, navigation, and surveillance equipment to meet civil air transport certification requirements.

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

KC-135 Stratotanker

Brief: A medium-range tanker aircraft, meeting the air refueling needs of USAF bomber, fighter, cargo, and body tanks. Eight KC-135Rs are air refuelable. Twenty KC-135Rs have wing-mounted refueling pods for enhanced refueling of USAF A-10 aircraft.

Ongoing modifications are extending the capability and operational utility of the KC-135 well into the 21st century. The Pacer CHARG re-engining program, completed in 2002, installed a new compass, radar, and GPS navigation systems, a traffic alert and collision avoidance system (TCAS), and new digital multifunctional cockpit displays. The Global Air Traffic Management (GATM) modification further improves the avionics, adding communications, navigation, and surveillance equipment ensuring access to reduced horizontal and vertical global airspace. Forty KC-135R/T aircraft have Link 16 capability to relay tactical information beyond line of sight of other aircraft.

Transports

C-5 Galaxy

Brief: A heavy-lift, air refuelable cargo transport for massive strategic airlift over long ranges, including outsize cargo. Supports special operations missions.

Function: Cargo and troop transport.

Operator: AMC, ANG, AFRIC.


Production: 13.

Inventory: 20 (C-5A); 29 (C-5B); ten (C-5L); four (C-5M).


Power Plant: four General Electric TF39-GE-1C turbofans, each 41,000 lb-thrust (C-5M) four General Electric CF6-80C2 turbofans.

Accommodation: normal crew of six (two pilots, two engineers, and two loadmasters), plus rest area for 15 (relief crew, etc.) and seating for 73. There is no piece of Army combat equipment the C-5 can’t carry. Possible loads: six Apache helicopters, two M1 main battle tanks (each weighing 135,400 lb), six Bradley vehicles, three CH-47 helicopters, the 74-ton mobile bridge, a quarter-million pounds of relief supplies, or a maximum of 340 passengers in an Airbus configuration. Air-drop capability for single platforms weighing up to 42,000 lb.

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

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

Ceiling: 45,000 ft.

Performance: max speed at 25,000 ft 571 mph, normal cruising speed at altitude 518 mph (Mach 0.77), T-O run at S/L 8,300 ft, landing run at S/L 2,380 ft, range with max payload 3,434 miles, with max fuel 7,245 miles.

COMMENTS

One of the world’s largest aircraft, the C-5 is able to carry unusually large and heavy cargo for intercontinental ranges at jet speeds. It can take off and land in relatively short distances and taxi on substandard surfaces during emergency operations. Front and rear cargo openings permit simultaneous drive-through loading and off-loading.

Under the Avionics Modernization Program (AMP), all C-5s will be upgraded with a state-of-the-art cockpit and global access navigation safety compliance. C-5A. USAF took delivery of 81 of these basic models between December 1969 and May 1973. A major wing modification was subsequently undertaken, extending the aircraft’s service life by 30,000 flight hours. Additionally, the avionics subsystems developed for the C-5B were incorporated into the C-5A fleet.

C-5B. Generally similar to the C-5A but embodies all the improvements introduced since completion of C-5A production, including the strengthened wings, improved turboshaft, and updated avionics, with color weather radar and triple INS. The first C-5B flew for the first time in September 1985 and was delivered to Altus AFB, Okla., in January 1986. To enhance force protection, a number of C-5Bs have been equipped with an aerial defense system. C-5C. Two C-5As assigned to Travis AFB, Calif., were modified to carry outsized cargo for NASA by extending the cargo bay and modifying the aft doors.

C-5M Super Galaxy. Upgraded version of the C-5 featuring new avionics installed under AMP plus new, higher performance GE CF6-80C2 turbos and additional components installed under the Reliability Enhancement and Re-engining Program (RERP). The first of three production-representative C-5Ms made its debut flight on June 6, 2006. Developmental testing was successfully completed August 2008. The first of these three test aircraft was delivered to Warner Robins Air Logistics Center, Ga., in December 2008 and the other two to Dover AFB, Del., in early 2009. Nearly four months of operational testing and evaluation concluded in early 2010. Program completion is currently scheduled for 2017.

C-9 Nightingale

Brief: A twin-engine, medium-range swept-wing jet aircraft used for DV duties.

Function: DV duties.

Operator: AFRIC.


IOC: circa 1968.
improvements to the passenger communications equipment; GATM, TerraFugia, Enhanced Mode S, and vertical separation equipment.

C-12 Huron
Brief: A twin-engine turboprop that provides diplomatic and special duty support passenger/cargo airlift and test support.

Function: Special airlift.
Operator: AFMC, PACAF.
First Flight: Oct. 27, 1972 (Super King Air 200).
Production: 88.
Inventory: 28.
Aircraft Location: Edwards AFB, Calif., Holloman AFB, N.M., JB Elmdorf, Alaska, Yokota AB, Japan, 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 8,950 lb, gross 16,600 lb.
Ceiling: (C-12J) 25,000 ft.
Performance: (C-12J) max cruising speed at 16,000 ft 307 mph, range with 10 passengers 1,806 miles.

COMMENTARY
The C-12 is a military version of the Beechcraft King Air A200 series. Equipment includes the most up-to-date flight avionics. With uprated PT6A-42 engines, to support special operations low level (SOLL) mission previously supported by the C-141. They have flown numerous operational, humanitarian, and aeromedical evacuation missions since their introduction into the USAF inventory. The first C-17 operational strategic brigade air drop occurred in March 2003, when a formation of 15 aircraft delivered a US Army brigade, complete with equipment, directly into northern Iraq.

C-17 Globemaster III
Brief: A twin-engine turbofan airlifter, the C-17 is able to operate routinely into small, austere airfields (3,000 ft x 90 ft) previously limited to C-130s and provides the only capability to air-land or air-drop large cargo directly to the tactical environment. C-17 aircraft have assumed the special operations low level (SOLL) mission previously supported by the C-141. They have flown numerous operational, humanitarian, and aeromedical evacuation missions since their introduction into the USAF inventory. The first C-17 operational strategic brigade air drop occurred in March 2003, when a formation of 15 aircraft delivered a US Army brigade, complete with equipment, directly into northern Iraq.

Performance: normal cruising speed 484 mph at 35,000 ft or 518 mph (Mach .77) at 28,000 ft, unrefueled range with 160,000-lb payload 2,760 miles, additional 690 miles with extended-range fuel containment system (ERFCS), unlimited with refueling.

FUNCTION
Operational support airlift, special air missions.
Operator: AMC, USAFE.
First Flight: December 1979.
Delivered: September 1983-89.
IOC: circa 1983.
Production: not available.
Inventory: 10.
Aircraft Location: JB Andrews, Md., Ramstein AB, Germany.
Contractor: Gulfstream.
Power Plant: (C-20A/B) two Rolls Royce-Spey MK511-8 turbosfans, each 11,400 lb thrust; (C-20H) two Rolls Royce-Tay MK611-8 turbosfans, each 13,850 lb thrust. 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-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. Five C-20B versions, with advanced mission communications equipment and revised interior, were acquired in the late 1980s.

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 (SAM) requirements. The two C-20H aircraft were reassigned to USAFE to replace retired C-20As.

Upgrade for C-20B/H aircraft includes GPS, vertical separation equipment, GATM, and TCAS.

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

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

COMMENTARY
C-20A. 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. Five C-20B versions, with advanced mission communications equipment and revised interior, were acquired in the late 1980s.

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 (SAM) requirements. The two C-20H aircraft were reassigned to USAFE to replace retired C-20As.

Upgrade for C-20B/H aircraft includes GPS, vertical separation equipment, GATM, and TCAS.
C-130 Hercules (Capt. Andrew G. Hoskinson)

Function: Pilot seasoning, passenger and cargo airlift.
Operator: AETC, AMC, USAFE, ANG.
Production: 84.
Inventory: 56.
Contractor: Gates Learjet.
Power Plant: two AlliedSignal TFE731-2 turbosfans, 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, 10,119 lb, gross 18,300 lb.
Ceiling: 51,000 ft.
Performance: max speed at 25,000 ft 542 mph, range with max passenger load 2,306 miles, with max cargo load 1,653 miles.

COMMENTARY

C-21A aircraft provide operational support airlift for time-sensitive movement of people and cargo throughout the US and European Theaters, including aeromedical missions if required. Upgrades include GATM and TCAS. Older aircraft are being retired.

C-27J Spartan
Brief: A small tactical transport capable of carrying heavy loads into a wide range of airfields, including unprepared strips at high altitude.
Function: Tactical airlift.
Operator: ANG.
First Flight: September 1999 (developmental aircraft).
Delivery: 2010 (planned).
IOC: TBD.
Production: 38 (planned).
Inventory: TBD.
Contractor: L-3 Communications.
Power Plant: two Rolles Royce AE2100-D2 turboprops, rated at 4,637 shp.
Accommodation: two flight crew; up to 68 troops or 24 paratroops, plus two loadmasters, or 36 litters plus 6 stretcher gurneys, or 24 litters plus 6 stretchers.
Dimensions: (basic G.222 airframe) span 94.1 ft, length 74.5 ft, height 32.1 ft.
Weight: gross 70,000 lb.
Ceiling: 30,000 ft.
Performance: T-O run 1,903 ft, range, with 22,046 lb payload 1,000 nm.

COMMENTARY

The C-27J Spartan is a derivative of the Aenia G.222, selected in 2007 to fulfill the Joint Cargo Aircraft (JCA) requirement. Spartan has a digital avionics suite and the cockpit is NVG compatible. Floor strength is equal to that of the C-130, and the cargo bay can accommodate C-130 pallets. Owned and operated by ANG, the C-27J will support ground forces served only by the most basic airstrips, often at high altitude, or for missions where the C-130 is currently operating at half-load capacity.

C-32A
Brief: A modified Boeing 757-200 used to provide backup transportation for the President. It is the primary means of travel for the vice president, Cabinet, Congressional members, and other high-ranking US and foreign officials.
Function: VIP air transport.
Operator: AMC, ANG.
Delivery: June-December 1998.
Production: six.
Inventory: six.
Contractor: Boeing.
Power Plant: two Pratt & Whitney PW2040 turbosfans, 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 5,750 miles.

COMMENTARY

A military version of the commercial Boeing 757-200. The commercial distinguished visitor (DV) interior includes a crew rest area, DV stateroom, conference area, and general passenger area. The passenger communications system provides worldwide clear and secure voice and data communications. Modern flight deck avionics allow operations to any suitable airfield 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-37
Brief: Modified Gulfstream aircraft 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, PACAF, USAFE, ANG, AFRIC.
Delivery: 2002.
Production: 10.
Inventory: 10.
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 transporting senior government officials and regional 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 four C-40Bs. Two are assigned to Andrews and one each to Hickam and Ramstein.

C-40C
The C model has a DV seating area, general passenger seating area, and secure communications capability. Three C-40Cs are operated by ANG’s 201st Airlift Squadron, from Andrews, and three by AFRIC’s 92nd AS at Scott.

C-130 Hercules
Brief: A rugged aircraft capable of operating from rough dirt strips to provide theater airlift and paratrooping of
quaint improvements include updated avionics, improved low-power color radar, and other minor modifications. Night vision instrumentation system was introduced from 1993, TCAS II in new aircraft from 1994. ANG LC-130H aircraft are modified with wheel-skis to support Arctic and Antarctic operations. Two DC-130Hs were modified for UAV control duties. A major AMP for the C-130 includes digital displays, flight-management systems, multifunction radar, new communications systems, and a single air data computer. Planned completion is for 2019. The AMP upgrade includes digital displays, flight-management systems, multifunction radar, new communications systems, and a single air data computer. The AMP upgrade includes digital displays, flight-management systems, multifunction radar, new communications systems, and a single air data computer. The AMP upgrade includes digital displays, flight-management systems, multifunction radar, new communications systems, and a single air data computer. The AMP upgrade includes digital displays, flight-management systems, multifunction radar, new communications systems, and a single air data computer. The AMP upgrade includes digital displays, flight-management systems, multifunction radar, new communications systems, and a single air data computer.
Trainer Aircraft

T-1A Jayhawk

Brief: A medium-range, twin-engine jet trainer version of the Beechcraft 400A. It is used by the Air Force to train student aircrew and tanker pilots and student combat systems operators.

Function: Advanced pilot training.
Operator: AETC, AFRC, USN.
First Flight: Sept. 22, 1989 (Beechcraft 400A).
IOC: January 1993.
Production: 180.
Inventory: 179.
Aircraft Location: Columbus AFB, Miss., Laughlin AFB, Randolph AFB, Tex., Vance AFB, Okla., NAS Pensacola, Fla.
Contractor: Raytheon.

Power Plant: Two Pratt & Whitney Canada JT15D-5B turbfans, each 2,900 lb thrust.
Accommodation: two, side by side, and one to the rear. Two ejection seats are present to ensure the four seats permit to transport maintenance teams.
Dimensions: span 43.5 ft, length 48.4 ft, height 13.9 ft.
Weight: empty 5,200 lb, gross 16,100 lb.
Ceiling: 41,000 ft.
Performance: max speed at 27,000 ft 538 mph, range 2,400 miles.

COMMENTARY
The swept-wing T-1A Jayhawk is a military version of the Beech 400A used in the advanced phase of joint specialized undergraduate pilot training (JSUPT) for students selected to go on to fly tanker, transport, and electronic warfare aircraft. It is also used to train student combat systems officers (CSOs) and naval flight officers in the intermediate stages of their training.
The T-1A has cockpit seating for an instructor and two students. Special mission equipment includes GPS, an electronic flight instrument system (EFIS) avionics system, a single-point refueling system, an additional fuel tank, and increased bird-strike protection in the windshield and leading edges for sustained low-level operation. T-1As typically log 100,000 flying hours a year, supporting all-weather training operations at high and low altitudes.

T-6A Texan II

Brief: A single-engine turboprop aircraft used for training student pilots, CSOs, and naval flight officers in fundamentals of aircraft handling and instrument, formation, and night flying.

Function: Primary trainer.
Operator: AETC, AFRC, USN.
Delivered: From May 2000 (operational aircraft).
Production: Planned: 372 (USAF); 328 (USN).
Inventory: 431 (USAF).
Aircraft Location: Columbus AFB, Miss., Laughlin AFB, Randolph AFB, Tex., Vance AFB, Okla., NAS Corpus Christi, Tex., NAS Whiting, Fla.
Contractor: Hawker Beechcraft (formerly Raytheon).

Power Plant: one Continental IO-360-DB piston engine, 150 hp.
Performance: max speed 130 mph, operational range 2,995 miles.

COMMENTARY
The T-6A is a single-engine version of the T-6B Texan II. It is a former Army-owned training aircraft transferred to USAF in 2004 for use by the 23rd FTS. Two T-6A aircraft are maintained by AFOSC for combat aviation advisor training.

T-38 Talon

Brief: A twin-engine, high-altitude, supersonic jet trainer used in a variety of roles, primarily as a high-speed, supersonic simulator for undergraduate student pilots, pilot instructor training, and introduction to fighter fundamentals training.

Function: Trainer.
Operator: ACC, AETC, AFMC, AFRC.
First Flight: April 1959.
IOC: March 1961.
Production: more than 1,100.
Inventory: 456.
Aircraft Location: Beale AFB and Edwards AFB, Calif., Columbus AFB, Miss., Holloman AFB, N.M., Laughlin AFB, Randolph AFB, and Sheppard AFB, Tex., Vance AFB, Okla., Whiteman AFB, Mo.
Contractor: Northrop Grumman.

Power Plant: two General Electric J85-GE-5A turbojets, each 8,600 lb thrust. Two all-metal, strut-braced high-wing monoplanes. The aircraft is all required communications equipment, and celestial radio and Tacan radio systems, INS, radar altimeter, and backup flight instruments, HUD, hands-on-throttle-and-stick functionality, and integrated avionics computers. The JPATS replaces USAF’s T-37Bs and USN’s T-34Cs in primary pilot training, as well as supporting undergraduate naval flight officer and USAF CSO training.

T-43A

Brief: A short-range, high-wing aircraft used primarily for aerial dynamic and navigation courses.

Function: Training, support.
Operator: AETC.
Inventory: four.
Aircraft Location: US Air Force Academy, Colo.
Contractor: Cessna.
Power Plant: one Continental IO-360-DB piston engine, 210 hp.
Accommodation: two, side by side.
Dimensions: span 36.1 ft, length 26.5 ft, height 8.9 ft.
Weight: gross 2,550 lb.
Ceiling: 16,000 ft.
Performance: speed 182 mph, range 690 miles.

COMMENTARY
The T-43A, a military version of the Cessna 172, is an all-metal, strut-braced high-wing monoplane. The aircraft is equipped with modern avionics, GPS, and other equipment appropriate to its mission. It is used for Aero 456 flight testing, USAF flying team support, and orientation flights.

T-44

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.
Operator: AETC.
IOC: July 1974.
Production: 19.
Inventory: seven.
Aircraft Location: Randolph AFB, Tex.
Contractor: Boeing.

Power Plant: two Pratt & Whitney JT8D-9 turbosfans, 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: max cruising speed 535 mph (Mach 0.7), operational range 2,995 miles.

COMMENTARY
The T-44 is the T-38A derived from the commercial Boeing Model 737-200 and was equipped with the same onboard avionics as most USAF operational aircraft, including mapping radar, VHF omnidirectional radio and Tacan radio systems, INS, radar altimeter, all required communications equipment, and celestial navigation capability. A number of T-44s are configured for passenger and provide operational support to assigned commands. The last aircraft are programmed to retire September 2010.

T-51A

Brief: A short-range, high-wing aircraft used primarily for aerodynamic and navigation courses.

Function: Training, competition.
Operator: AETC.
Delivered: 1970s.
Inventory: three.
Aircraft Location: USAFA, Colo.
Contractor: Cessna.
Power Plant: one Lycoming O-330 E2D piston engine, 150 hp.
**TG-10B/C**  
**Brief:** Sailplane used for cadet orientation and soaring training.  
**Function:** Trainer.  
**Operator:** AETC.  
**Delivered:** May 2002.  
**IOC:** December 2002.  
**Inventory:** 12 (TG-10B); five (TG-10C).  
**Aircraft Location:** USAFA, Colo.  
**Contractor:** Blanik.  
**Accommodation:** Two.  
**Dimensions:** span (B) 55.4 ft, (C) 46.6 ft, length (B) 27.9 ft, (C) 27.6 ft, height (B) 6.2 ft, (C) 6.9 ft.  
**Weight:** (B) 1,168 lb, (C) 1,100 lb.  
**Performance:** speed (B) 142.6 mph, glide ratio (B) 28.1, (C) 26.1.  

**TG-10D Peregrine**  
**Brief:** Single-seat medium-performance sailplane used for cross-country soaring training and high-altitude wave flight.  
**Function:** Trainer.  
**Operator:** AETC.  
**Delivered:** May 2002.  
**IOC:** December 2002.  
**Inventory:** Four.  
**Aircraft Location:** USAFA, Colo.  
**Contractor:** Blanik.  
**Accommodation:** One.  
**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.  

**TG-15A/B**  
**Brief:** Sailplane used for cadet orientation and soaring training.  
**Function:** Trainer/cross-country competition sailplane.  
**Operator:** AETC.  
**Inventory:** Two (TG-15A); three (TG-15B).  
**Aircraft Location:** USAFA, Colo.  
**Contractor:** Discus.  
**Accommodation:** (A) two-seat; (B) single-seat.  
**Dimensions:** span (A) 65.6 ft, (B) 49.2 ft; length (A) 28.3 ft, (B) 32.3 ft.  
**Weight:** gross (A) 1,543 lb, (B) 1,157 lb.  
**Performance:** max permitted speed 155 mph, aspect ratio (A) 24:4, (B) 22:2.

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**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 destroy/defeat air defenses and complicate an enemy’s air defense task.  
**Function:** Strategic air-to-surface cruise missile.  
**Operator:** AFGSC.  
**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, 600 lb thrust.  
**Guidance:** (AGM-86B) inertial plus Terrain Contour Matching (TERCOM); (AGM-86C) inertial plus GPS.  
**Warhead:** (AGM-86B) W80-1 nuclear; (AGM-86C) blast/fragmentation conventional; (AGM-86D) hard target penetrating warhead.  
**Dimensions:** length 20.8 ft, body diameter 2 ft, wingspan 12 ft.  
**Weight:** 3,150 lb (B), 3,277 lb (C).  
**Performance:** speed 550 mph (Mach 0.6), range 1,500+ miles (AGM-86B).  

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**COMMENTARY**  
Both the two-seat TG15A, civilian designation Duo Discus, and single-seat TG-15B, civilian designation Duo 2b, sailplanes are manufactured by Scheppe-Hirth of Germany. They are used for cross-country soaring training and competition.  

**UV-1B Twin Otter**  
**Brief:** Modified utility transport used for parachute jump training.  
**Function:** Paradrop.  
**Operator:** AETC.  
**First Flight:** May 1995 (commercial version).  
**Delivered:** 1977 (two); 1982 (one).  
**IOC:** 1977.  
**Production:** Three.  
**Inventory:** Three.  
**Aircraft Location:** USAFA, Colo.  
**Contractor:** de Havilland Aircraft of Canada.  
**Power Plant:** Two Pratt & Whitney Canada PT6A-27 turboprops, each 620 ehp.  
**Accommodation:** Crew of two and up to 20 passengers.  
**Dimensions:** span 65 ft, 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 2,000 lb payload 806 miles.  

**COMMENTARY**  
The UV-1B, the military designation for the civilian DeHavilland DHC-6 Twin Otter, are used to support various parachuting activities at USAFA and perform general utility missions. They are also used by the USAFA parachute team, The Wings of Blue.
AGM-86A. 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. A SLEP has been ongoing to extend service life to 2030; however, in 2007 USAF announced its intention to reduce the ALCM fleet by more than 600 missiles, leaving 528 nuclear cruise missiles. The ALCM force is to be consolidated at Minot AFB, N.D., and all excess cruise missile bodies destroyed.

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 been widely in combat operations. CALCM provides 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 has proved equally effective for stand-alone, clandestine/punitive strikes and fully integrated theater warfare. From 1986, Boeing converted 622 B5 to the conventional configuration, the first of which was delivered in December 1987. The remaining CALCMs feature Block 1A enhancements with improved accuracy and increased immunity to electronic jamming. Since Iraqi Freedom, few CALCMs remain.

AGM-86D. CALCM Block II penetrator version with a Lockheed Martin AUP (IM) warhead. The CALCM penetrator provides a standoff, outside theater defenses capability against a wide range of hardened, deeply buried targets. The CALCM penetrator was used with success in Iraq Freedom. ACC transferred its nuclear-capable bomber force, with its weapons complement, to AFGSC on Feb. 1, 2010.

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: AFGSC.
Contractor: Raytheon.
Unit Location: Barksdale AFB, La., Minot AFB, N.D.
Power Plant: Williams International F112-WR-100 turbofan.
Guidance: Inertial, with TECOM update.
Warhead: W80-1 nuclear.
Dimensions: length 20.8 ft, body width 2.2 ft, wing span 10.2 ft.
Weight: 3,700 lb.
Performance (approx): range 2,300+ miles, speed 550 mph.

LGM-30 Minuteman III (USAF photo)

LGM-30A/B. Minuteman I version deployed in the early 1960s. The last Minuteman I missiles have been flown from silo at Malmstrom AFB, Mont., in February 1969. USAF had deployed 150 A and 650 B models in 16 squadrons.

LGM-30C/F. Minuteman II incorporated a larger second stage, an improved guidance package, greater range and payload capability, and hardening against the effects of nuclear blast. IOC was reached in October 1965 at Grand Forks AFB, N.D. USAF deployed 450 in nine squadrons.

LGM-30G. The Minuteman III became operational in June 1970, providing improved range, rapid retargeting, and the capability to place three MIRVs on three targets with a high degree of accuracy. USAF initially deployed 550 in 11 squadrons. IOC was reached in 50A at F. E. Warren, Malmstrom, and Minot. Deactivation of a further 50 Minuteman IIIIs was completed in 2008 at Malmstrom. Components of the dismantled missiles are to be used for flight-test operations programs.

In accordance with strategic arms control negotiations, all the three-warhead Minuteman III missiles at F. E. Warren have been downloaded to single re-entry vehicles. An extensive life extension program is ensuring Minuteman III’s viability to 2020.

LGM-30J. LCM-30J is a new, twice the range of LCM-30G. This advanced cruise missile is being developed to carry a stand-off land strike weapon.

LGM-47A/B. A solid-fuel ICBM capable of being fired from silo 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 1969.
Delivered: from August 1972.

Tactical Missiles and Weapons

AGM-65 Maverick
Brief: A tactical, TV- or imaging infrared (IR)-guided or laser 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.

Contractor: Raytheon.
Power Plant: Thiokol TX-481 solid-propellant rocket motor.
Guidance: (AGM-65A/B/K) self-homing, TV-guided system; (AGM-65D/G) IIR seeker; (AGM-65E/E2) laser seeker.
Warhead: (AGM-65A/B/D/H) 125-lb high-explosive, shock-sensitive charge; (AGM-65C/D/B/D-K) 125-lb blast fragmentation; (AGM-65G/K) 298-lb blast fragmentation.
Dimensions: length 8.2 ft, body diameter 1 ft, wing span 3.1 ft.
Weight: launch weight (AGM-65A) 462 lb; (AGM-65G) 670 lb.
Performance: range about 9.2 miles.

AGM-65M. A version with a "scene magnification" TV seeker that enables the pilot to identify and lock on to smaller or more distant targets.

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

AGM-65E. A laser guided version ordered by USAF and USMC. To meet short-term operational requirements, USAF has used missiles from the Navy’s inventory in combat operations. It entered service in 2002.


AGM-65G. Uses the IIR seeker with an alternate 298-lb blast fragmentation warhead for use against hardened targets. Software is modified to include options for targetting ships and large land targets as well as mobile armor. The missile also has a digital autopilot and a pneumatic, rather than hydraulic, actuation system. USAF received its first G model in 1989.

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

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

AGM-88 HARM
Brief: An air-to-surface tactical missile designed to seek and destroy enemy radar-equipped air defense sites, using an advanced guidance system that senses and homes in on enemy radar emissions.

Delivered: 1983-98.
Production: sustainment 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, wing span 3.7 ft.
Weight: 795 lb.
Performance: cruising speed supersonic, altitude limits 50,000 ft, range more than 10 miles.

AGM-88A. A factory-programmed version used to equip the now-retired F-16G Wild Weasel to increase its lethality in air-to-surface combat. No longer operational.

AGM-88B. Incorporated erasable electronically programmable read-only memory, permitting changes to
AGM-88 High-speed Anti-Radiation Missile (USAF photo)

AIM-154 Joint Standoff Weapon
Brief: Joint USAF and Navy family of low-cost glide weapons with a standoff capability.
Function: Air-to-surface guided missile.
Delivered: from 2000.
Production: 6,114 (originally planned).
Contractor: Raytheon.
Guidance: INS/GPS
Warhead: see variants below.
Dimensions: length 13.3 ft.
Weight: 1,065-1,500 lb.
Performance: range 17 miles low-altitude launch, 40+ miles high-altitude launch.
COMMENTS
A medium-range, INS/GPS-guided, standoff air-to-ground weapon, containing tungsten alloy cubes, soft and armored area targets (fixed, relocatable, and movable) during day/night/adverse weather conditions. JSOW enhances aircraft survivability by providing the capability for launch, stand-off to stay outside the range of enemy point defenses. JSOW accuracy and launch-and-leave capability allow several target kills per aircraft sortie. JSOW arms F-15 and F-16 aircraft. Production for USAF terminated FY05.
AIM-154A. The baseline BLU-97 variant for use against area targets.
AIM-154B. The BLU-108 variant provides anti-armor capability; development complete, production deferred.
AIM-154C. The third variant (used by Navy only), JSOW/Unitary integrates an IR terminal seeker and a 500-lb unitary warhead.
AIM-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 8, 1999.
Delivered: through FY19 (planned).
Production: 2,400, plus 2,500 JASSM-ER (planned).
Contractor: Lockheed Martin; Raytheon; Honeywell.
Power Plant: Teledyne Continental Motors; ER, Williams Turbofan.
Guidance: INS, GPS, and IR terminal seeker.
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): max speed more than 2,660 mph (Mach 3.5), range more than 34 miles.
COMMENTS
Early versions. Production of Sparrow has been under way for nearly half a century. Approximately 34,000 early models (AIM-7B/A/C/D/E) were produced. Compared to the F-15E, F-16, and F/A-18, the AIM-9P is a replacement for the AIM-7 Sparrow.
AIM-7 Sparrow
AIM-7M. 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 1983 (AIM-7M).
Delivered: from 1956.
IOC: April 1976 (AIM-7F).
Production: sustenance phase.
Contractor: Hughes; General Dynamics (now Raytheon).
Power Plant: Hercules Mk 58 Mod 0.45 sec boost 11 sec sustain rocket motor.
Guidance: Doppler, solid-state IR homing guidance.
Warhead: High-explosive, blast fragmentation, weighing 86 lb.
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.
Production: sustenance phase (AIM-9M); LRIP from November 2000, with full rate from November 2004 (AIM-9X).
Contractor: Raytheon.
Power Plant: Thiokol Mk 36 Mod 11 solid-propellant rocket motor.
Guidance: solid-state IR homing guidance.
Warhead: high-explosive, weighing 20.8 lb.
Dimensions: length 9.4 ft, body diameter 5 in., finspan 2.1 ft.
Weight: launch weight 190 lb.
Performance: max speed Mach 2+, range 10+ miles.
COMMENTS
Early versions. AIM-9A was the prototype version. The AIM-9B, initial production version, entered the inventory in 1957 and was effective only at close range during day. These shortcomings were eliminated on subsequent AIM-9E/H/J/P versions. The third generation Sidewinder, AIM-9L, added a more powerful solid-propellant rocket motor as well as tracking maneuverability ability. Production and delivery began in 1976; production ended in 1981.
AIM-9M. A joint Navy-USAF project aimed at producing an improved version of AIM-9L with all-altitude, all-aspect, launch-and-leave intercept capability. Can equip: A-10, F-15, F-16, F-16 A/D, and F-18 aircraft. This version has increased infrared counter-countermeasures (IRCCM) capability, improved background discrimination, and a reduced-smoke rocket motor. First flight of prototype was in January 1978. Full flight test in FY81.
AIM-9J/M/A. A modification to improve IRCCM capability of early missiles. Complete.
AIM-9X incorporates advanced technologies such as a focal plane array imaging seeker, high off-boresight sensor (HOBS), and a highly maneuverable jet-vane control system. The missile utilizes the existing AIM-9M rocket motor, warhead, and fuzes. Carrier aircraft include the F-15, F-16, F-22, F-35, and F/A-18.
AIM-120 AMRAAM
Brief: A next generation supersonic, medium-range, active radar-guided air-to-air missile with a high-explosive warhead.
Function: Air-to-air guided missile.
Production: 10,917+ planned for USAF/USN.
Contractor: Raytheon.
Power Plant: Alliant boost-sustain solid-propellant rocket motor.
Guidance: inertial/command, inertial with active radar terminal homing.
Warhead: High-explosive directed 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.
COMMENTS
A joint program between the Navy and USAF, the 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-22, F-35, and F/A-18 fighters. Inertial and command inertial guidance and active radar terminal homing provide launch-and-maneuver capability. Significant improvements in operational effectiveness over the AIM-7 include increased average velocity, reduced miss distance, improved fuzing, increased warhead lethality, multiple target engagement capability, improved clutter rejection in low-altitude environments, enhanced electronic protection capability, increased maximum launch range, a reduced-smoke motor, and improved maintenance and handling.
AIM-120A was the first production version, delivered by Hughes in 1986 to the 33rd TFW at Eglin AFB, Fla. AIM-120B/C/D are upgrades of the AIM-120. The AIM-120C currently in production has smaller, clipped control surfaces to provide for internal carriage in the F-22A and F-35, and involves HOBS launch capability. The latest development (AMRAAM Phase 4) adds an enhanced electronic protection suite, two-way data link, and GPS-aided navigation in the AIM-120D version. Production began in 2006.
CBU-87/103 Combined Effects Munition
Brief: The CBU-87/103 is an area munition effective against light armor, materiel, and personnel and used
by USAF and Navy fighters and bombers for interdiction.

**Function:** Area munition.

**Production:** sustainment phase.

**Contractor:** Aerojet General; Honeywell; Alliant Tech.

**Guidance:** none (CBU-89).

**Dimensions:** length 7.7 ft, diameter 1.3 ft.

**Weight:** 949 lb.

**Performance:** dispenses 72 BLU-91 anti-armor and 22 BLU-92 anti-personnel mines.

**COMMENTARY**

The CBU-89 Gator dispenser holds 94 mines, of which 72 are anti-tank and 22 are anti-personnel. The mines are dispersed over the target in a circular pattern. The anti-tank mines, which can be fuzed for three different time delay settings, have a magnetic influence fuze to sense armor. Gators are available with the WCMC tail kit, improving the munitions delivery accuracy when released from medium to high altitude.

**CBU-103/104 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:** Scatterable mines.

**Production:** sustainment phase.

**Contractor:** Honeywell; Aerojet General; Olin; Alliant Tech.

**Guidance:** none (CBU-89).

**Dimensions:** length 7.7 ft, diameter 1.3 ft.

**Weight:** 705 lb.

**Performance:** dispenses 202 BLU-97 combined effects bomblets over an area roughly 800 ft by 400 ft.

**COMMENTARY**

The CBU-103 Unguided CBU-87 CEMs retrofitted with the Wind-Corrected Munitions Dispenser (WCMC) tail kit. The WCMC improves the munitions delivery accuracy when released from medium to high altitude.

**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:** Scatterable mines.

**Production:** sustainment phase.

**Contractor:** Honeywell; Aerojet General; Olin; Alliant Tech.

**Guidance:** none (CBU-89).

**Dimensions:** length 7.7 ft, diameter 1.3 ft.

**Weight:** 949 lb.

**Performance:** dispenses 72 BLU-91 anti-armor and 22 BLU-92 anti-personnel mines.

**COMMENTARY**

The CBU-89 Gator dispenser holds 94 mines, of which 72 are anti-tank and 22 are anti-personnel. The mines are dispersed over the target in a circular pattern. The anti-tank mines, which can be fuzed for three different time delay settings, have a magnetic influence fuze to sense armor. Gators are available with the WCMC tail kit, improving the munitions delivery accuracy when released from medium to high altitude.

**CBU-97/105 Sensor Fuzed Weapon**

**Brief:** The CBU-97 SFW is an anti-armor munition used by fighters and bombers for multiple kills per pass against moving and stationary land combat vehicles.

**Function:** Wide-area munition.

**First Flight:** circa 1990.

**Delivered:** 1984-2013 (planned).

**IOC:** 1997.

**Production:** 6,500 (planned).

**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 300 ft by 1,200 ft.

**COMMENTARY**

The CBU-97 Sensor Fuzed Weapon (SFW) comprises an SUU-66/B tactical munitions dispenser with an FZU-39 fuze and a payload of 10 BLU-108 submunitions. Each tactical munitions dispenser contains 10 BLU-108 submunitions, and each submunition contains four “skew” 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 skew’s active laser and passive IR sensors can detect a vehicle’s shape and 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 self-propelled targets. It also provides direct attack capability and interdiction against C2 centers.

**CBU-103**

**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:** 1976.

**IOC:** 1976.

**Production:** more than 2,000.

**Contractor:** Boeing; Raytheon.

**Warhead:** Mk 84 bomb (2,000-lb unitary) or BLU-109.

**Dimensions:** length 12.8 ft, body diameter 1.5 ft, wingspan 4.9 ft.

**Weight:** 2,500 lb.

**Performance:** cruising speed subsonic, range about 17 miles, CEP about 10 ft.

**COMMENTARY**

CBU-15 is an air-launched, cruciform-wing glide bomb fitted with a guidance system designed to give it pinpoint accuracy from low or medium altitudes. It also has a standoff capability. Development began in 1974, based on experience gained in Vietnam with the earlier Pave Strike GBU-8 modular weapon program. The CBU-15 is intended for tactical use to suppress enemy defenses and to destroy heavily defended targets. The target-detecting device is carried on the front of the warhead. The control module, with autopilot and data link module, attaches to the rear. The weapon has two modes of attack. In direct attack, the weapon is locked on to the target before launch and flies a near-line-of-sight profile to impact. In the indirect mode, the seeker can be locked on to the target after launch, or the operator can fly the weapon manually to impact, using guidance updates provided through the data link. A “buddy” system may be operated whereby the weapon is launched from one aircraft and controlled by another. The CBU-15 is deployed with the F-15E.

**CBU-15(V1)/I/B.** A TV guided variant, qualified for operational service in 1983.

**CBU-15(V2)/B.** IIR version entered service in 1987.

**CBU-15-I.** Combines accuracy of CBU-15 with the penetration capability of the improved 2,000-lb BLU-109/B penetrator bomb.

**EGBU-15.** GPS guided variant, allowing pilot to select either TV, IR, or GPS guidance over the target, depending on weather and/or threat conditions. Entered USAF service at the end of 1999. USAF initially produced 100 for Allied Force, in addition to the field-level upgrade of more than 1,200 existing CBU-15s.

**CBU-24 Paveway III**

**Brief:** A precise air-to-ground low-level LGB (LLGL) equipped with an advanced guidance kit.

**Function:** Air-to-surface penetrating glide bomb.

**First Flight:** CBU-24A/B in service May 1985.

**Delivered:** from 1986.
GBU-28
Brief: A large 5,000-lb class air-to-ground penetrating warhead (BLU-113/B) equipped with an advanced laser guidance kit, used for striking and destroying hard and deeply buried targets.
Function: Air-to-surface guided glide bomb.
Production: approx 500.
Contractor: Raytheon.
Guidance: laser.
Dimensions: length 19.2 ft, diameter 1.2 ft.
Weight: 2,850 lb (munition); 320 lb (carriage); 1,460 lb (aircraft’s avionics system).
Performance: range more than 11.5 miles.

GBU-30
Brief: rollout of the Enhanced Paveway III system with GPS/INS and laser capability. Entered service and control is provided by an Enhanced Paveway III system.
Function: Air-to-surface guided munition. A joint USAF-Navy INS/GPS guided weapon equipped with an INS/GPS guidance kit to provide accurate all-weather attack from medium/high altitudes. While still aboard the launch aircraft, JDAM is targeted and released against single or multiple targets. JDAM is integrated on A-10, B-1, B-2, B-52, F-15E, F-16, F-22, and MQ-9 and AV-8B and F/A-18C/D/E/F aircraft, with future integration on F-35 aircraft.
GBU-31, Variant that adds an INS/GPS guidance kit to the 1,000-lb general-purpose Mk 82 bomb or the 1,000-lb BLU-109 penetrator. First used in combat March 24, 1999.
GBU-32, Variant that adds an INS/GPS guidance kit to the 1,000-lb general-purpose Mk 83 bomb or the 500-lb BLU-111 bomb. First production deliveries were in 2004 for the B-2.
GBU-39
Brief: Extended-range all-weather, day/night 250-lb class semiactive laser munition, operated as a contribution to the USAF’s Enhanced Paveway III system with GPS/INS and laser capability. Entered production in FY95.
Function: Air-to-surface guided munition.
First Flight: May 23, 2003 (guided).
Delivered: from 2006.
Production: 24,000 munitions and 2,000 carriages (planned).
Contractor: Boeing; Textron; Honeywell.
Guidance: INS/GPS.

GBU-57
Brief: A massive precision guided munition (PGM). Development of the Massive Ordnance Penetrator (MOP) - an air launced air-to-ground weapon with a laser seeker, carried by fighters, providing highly accurate, autonomous, all-weather conventional bomb capability against stationary and moving targets.
Function: Air-to-surface guided bomb.
Delivered: April 2008-2009 (planned).
Production: 400 laser guidance kits (planned).
Contractor: Boeing.
Dimensions: Mk 82 with JDAM 8 ft.
Weight: 552/558 lb.
Performance: range up to 17 miles.

GBU-69
Brief: A joint USAF/Navy INS/GPS-guided weapon equipped with a laser seeker, carried by fighters, providing highly accurate, autonomous, all-weather conventional bomb capability against stationary and moving targets.
Function: Air-to-surface guided bomb.
Delivered: April 2008-2009 (planned).
Production: 400 laser guidance kits (planned).
Contractor: Boeing.
 Dimensions: Mk 82 with JDAM 8 ft.
Weight: 552/558 lb.
Performance: range up to 17 miles.

GBU-24/A
Brief: A joint USAF-Navy INS/GPS-guided weapon equipped with a laser seeker, carried by fighters, providing highly accurate, autonomous, all-weather conventional bomb capability against stationary and moving targets.
Function: Air-to-surface guided glide bomb.
Production: approx 500.
Contractor: Raytheon.
Guidance: semiactive laser.
Dimensions: length 19.2 ft, diameter 1.2 ft.
Weight: 2,850 lb (munition); 320 lb (carriage); 1,460 lb (aircraft’s avionics system).
Performance: range more than 11.5 miles.

GBU-32
Production: 24,000 munitions and 2,000 carriages (planned).
Contractor: Boeing; Textron; Honeywell.
Guidance: INS/GPS.
Dimensions: (Mk 84 with JDAM) 12.8 ft; (BLU-109 with JDAM) 12.4 ft; (Mk 83 with JDAM) 10 ft; (Mk 82 with JDAM) 8 ft.
Weight: Mk 84 2,036/2,056 lb (USAF/USN); BLU-109 2,131 lb; Mk 83 1,013/1,028 lb; Mk 82 652/558 lb.
Performance: range up to 17 miles, CEP with GPS 16 ft, CEP with INS only 98 ft.

GBU-43/B
Function: Semiactive laser-guided bomb used for striking and destroying high-value hard targets. The system can be employed from low, medium, and high altitudes, providing operational flexibility through the use of an adaptive digital autopilot and large field-of-regard, highly sensitive scanning seeker.

GBU-33/A
Production: 24,000 munitions and 2,000 carriages (planned).
Contractor: Boeing.
Guidance: GPS/INS.
Dimensions: length 70.8 in (munition); 126.4 in (carriage) x 143.1 in (carriage with four munitions).
Weight: 285 lb (munition); 320 lb (carriage); 1,460 lb (carriage with four munitions).
Performance: range up to 17 miles.

GBU-39
Delivered: 1996.
Production: 14,000.
Contractor: Boeing; Textron; Honeywell.
Guidance: INS/GPS.
Dimensions: length 30 ft, diameter 3.3 ft.
Weight: 21,500 lb.

GBU-43/B
Brief: A massive precision guided munition (PGM).
Function: Massive bomb.
Guidance: GPS/INS.
Warhead: Massive Ordnance Air Blast (MOAB) Bomb.
Dimensions: length 20.5 ft, diameter 31.5 in.
Weight: 30,000 lb.

GBU-31
First Flight: October 22, 1996.
Production: 213,521 (planned).
Contractor: Boeing; Textron; Honeywell.
Guidance: INS/GPS.

GBU-57
Brief: Rollout of the Enhanced Paveway III system. Under USAF’s rapid-response program, the GBU-28 bunker-busting LGB was developed for Desert Storm for use against deeply buried, hardened C2 facilities. Four of the GBU-28 weapons were used during the war: two for testing and two by F-111Fs against a bunker complex.

GBU-28/B
Function: Semiactive laser-guided bomb used for striking and destroying high-value hard targets. The system can be employed from low, medium, and high altitudes, providing operational flexibility through the use of an adaptive digital autopilot and large field-of-regard, highly sensitive scanning seeker.

GBU-32/A
IOC: 1996.

GBU-33/A
Production: 213,521 (planned).
Contractor: Boeing; Textron; Honeywell.
Guidance: INS/GPS.

GBU-32
Brief: Joint Direct Attack Munition (USAF photo)
Satellite Systems

Advanced EHF (AEHF)
Brief: Joint service satellite communications system that provides global, secure, protected, and jam-resistant communications for high-priority air, ground, and sea assets.
Function: NSF; worldwide, secure, survivable satellite communications
Operator: AFSPC
First Launch: 2010 (planned)
IOC: June 2013 (planned)
Constellation: four satellites
Design Life: 12 years
Launch Vehicle: Atlas V; Delta IV
Operational Location: Schriever AFB, Colo.
Orbit Altitude: 22,000 miles (geosynchronous orbit)
Contractor: Lockheed Martin; Northrop Grumman team

Global Positioning System IIF (Boeing illustration)
Constellation: five (IIF): 14 deployed/eight currently operational.
Design Life: 10 yr (IIF)
Launch Vehicle: Atlas II
Operational Location: Schriever AFB, Colo.
Orbit Altitude: 22,000 miles in geosynchronous orbit
Contractor: Lockheed Martin
Power Plant: solar arrays generating 1,269 watts, decreasing to 980 watts after 10 yr; 1,500 watts (SLEP).
Dimensions: rectangular body 6 x 6 x 7 ft, 38-ft span with solar arrays deployed.
Weight: 2,680 lb; 2,716 lb (SLEP).
Performance: DSACS satellite orbits Earth at about 22,000 miles altitude and employs six SHF transponder channels for secure voice and high-rate data communications

Defense Meteorological Satellite Program
Brief: Satellites that collect air, land, sea, and space environmental data to support worldwide strategic and tactical military operations. Also shares data with civil agencies.
Function: Space and environmental data collection/satellite
Operator: National Polar-orbiting Operational Environmental Satellite System (NPOESS) integrated program office
First Launch: May 23, 1962
IOC: 1965
Constellation: two (primary)
Design Life: 48 months
Launch Vehicle: Delta IV; Atlas V
Operational Location: Schriever AFB, Colo.
Orbit Altitude: approx 527 miles
Contractor: Lockheed Martin; Northrop Grumman
Power Plant: solar arrays generating 1,200-1,300 watts.
Dimensions: length 25 ft (with array deployed), width 4 ft.
Weight: 2,545 lb (including 772-lb sensor).
Performance: DMSPS satellites orbit Earth in polar orbits and scan an area 1,800 miles wide. Each system covers the Earth in about 12 hr.

Global Positioning System
Brief: A US space-based radio-positioning system that provides 24-hour worldwide highly accurate three-dimensional location information and precision timing and timing services to military and civilian users.
Function: Worldwide navigation satellite constellation
Operator: AFSPC
First Launch: Feb. 22, 1978
IOC: Dec. 9, 1993
Constellation: Nominal 24-satellite constellation in six-medium-Earth orbits: max 35 sats; 30 operational.
Design Life: 7.5 yr (I/IIA); 10 yr (IIR-IIR-M); 12 yr (IIF)
Launch Vehicle: Delta IV; Atlas V
Operational Location: Schriever AFB, Colo.
Orbit Altitude: 10,988 miles
Contractor: Boeing (II, IIA, IIF); Lockheed Martin (IIR, IIR-M)
Power Plant: solar panels generating 700 watts (I/IIA); 1,136 watts (IIR-IIR-M); up to 2,900 watts (IIF).
Dimensions: (IIR-IIR-M) 6 x 6.3 x 6.25 ft, space incl solar panels 38 ft; (IIF) 9.6 ft x 6.5 ft x 12.9 ft, space incl solar panels 43.1 ft.
Weight: on orbit, 2,370 lb (IIR-IIR-M); 3,439 lb (IIF).
Performance: GPS satellites orbit the Earth every 12 hr, emitting continuous navigation signals. The signals are so accurate that time can be figured to within one-millionth of a second, velocity within a fraction of a mile per hr, and location to within a few ft. Receivers are used in aircraft, ships, and land vehicles and can also be hand held.

COMMENTARY
Worldwide military operations, such as precision bombing, CASAR, mapping, and rendezvous, are successful in part due to the 24-hour, worldwide position navigation and timing service provided by the Global Positioning System (GPS) satellite constellation. Accurate three-dimensional (latitude, longitude, and altitude) position, velocity, and precise time are provided continuously in real time to support an unlimited number of users around the globe, both civilian and military. Concern over potential enemy denial of GPS is being addressed under GPS modernization efforts. The modified GPS Block IIR-M satellites, launched beginning September 2005, offer a variety of enhanced features for the GPS user, such as new signals, enhanced encryption and anti-jamming capabilities for the military user, as well as a second civil signal. GPS Block IIF satellites will have an extended design

Though not designed to spot and track smaller missiles, the system was highly successful in detecting launches, enabling timely warnings of Iraqi Scud attacks. The Space Based Infrared System (SBIRS) mission control station (MCS), located at Buckley AFB, Colo., became operational in December 2001 and now performs both the strategic and theater missile warning missions.

DSP satellites are a key part of the North American and theater early warning systems, capable of detecting missile launches and nuclear detonations. Warning data are fed to NORAD and US Strategic Command early warning centers at Cheyenne Mountain AFS, Colo. Since the first launch, DSP satellites have provided an uninterrupted early warning capability to the US. The 23rd and final DSP launched in November 2007. America’s early warning capability will be modernized with the introduction of the new SBIRS, the first element of which was declared operational in 2008.
**Milstar Satellite Communications System**  
*(Lockheed Martin photo)*

Milstar is a joint service communications system that provides global, secure, protected, and jam-resistant strategic and tactical communications at all levels of conflict for high-priority air, ground, and sea assets. 

**Function:** Communications satellite.  
**Operator:** AFSPC.  
**First Launch:** Feb. 7, 1994.  
**IOC:** July 1997 (Milstar 1).  
**Constellation:** five.  
**Design Life:** 10 yr.  
**Launch Vehicle:** Titan IV/Centaur.  
**Operational Location:** Schriever AFB, Colo.  
**Orbit Altitude:** 22,300 miles.  
**Contractor:** Lockheed Martin; Boeing; TRW (now Northrop Grumman).  
**Power Plant:** solar arrays generating 8,000 watts.  
**Dimensions:** length 51 ft, width 116 ft with full solar array extension.  
**Weight:** 10,000 lb.  
**Performance:** constellation consists of five satellites in low-inclined geosynchronous orbit, providing worldwide coverage between 65° north and 65° south latitude. The oldest two satellites are still working beyond their 10-yr design life.  

**COMMENTARY**  
The backbone of strategic-tactical communications, Milstar is a joint service communications system that provides secure, jam-resistant worldwide communications through crosslinked satellites, eliminating the need for ground relay stations. Worldwide operations are made possible by this 24-hour capability, ready to support any deployment at a moment’s notice. The Milstar inventory was fully deployed in 2003, and modernization of satellite communications will continue with the Advanced EHF (AEHF) constellation deployment.  

**Operationally Responsive Space-1 (ORS-1)**  
**Brief:** An ISR satellite based on an existing infrared platform to provide essential intelligence gathering capabilities in direct support to US national security interests.  
**Function:** Intelligence collection for specific area of responsibility (AOR).  
**Operator:** AFSPC.  
**First Launch:** late 2010 (planned).  
**IOC:** spring 2011 (planned).  
**Constellation:** one (with possibility of second).  
**Design Life:** one yr.  
**Launch Vehicle:** Minotaur.  
**Operational Location:** Schriever AFB, Colo.  
**Orbit Altitude:** approx 249 miles.  
**Contractor:** Goodrich; ATK (bus).  

**COMMENTARY**  
The ORS-1 satellite is the Air Force’s response to an urgent need validated by USAFRICOM during 2008. The ORS-1 sensor provides the capability for rapid revisit of the AOR, so that timely ISR needs can be adequately met. ORS-1 combines the use of the existing U-2’s imaging technology with the proven TacSat-3 satellite bus. The use of primarily commercial and government products greatly reduces the development timeline, therefore allowing for a much shorter program development timeline. The Multimission Space Operations Center ground system, on which ORS-1 will be flown, will be leveraged as the ground system for future mission-unique space systems. Tasking for ORS-1 will come from CENTCOM, while mission execution will be accomplished by the first SOPs at Schriever Air Force Base.  

**Space Based Infrared System High**  
**Brief:** An advanced, fixed-sensor surveillance system for missile warning, missile defense, battlespace characterization, and technical intelligence. System includes satellites in geosynchronous Earth orbit (GEO) and highly elliptical orbit (HEO).  
**Function:** IR space surveillance.  
**Operator:** AFSPC.  
**First Launch:** (GEO) FY10 (planned).  
**IOC:** December 2001 (Increment 1).  
**Constellation:** four (GEO sats, two HEO sensors) (planned).  
**Design Life:** not available.  
**Launch Vehicle:** (GEO) Atlas V.  
**Operational Location:** Buckley AFB and Schriever AFB, Colo.  
**Orbit Altitude:** Geosynchronous and high elliptical.  
**Power Plant:** solar array, 2,435 watts.  
**Dimensions:** 6 x 7 x 17 ft.  
**Weight:** 5,442 lb.  

**COMMENTARY**  
The follow-on to the DSP is the Space Based Infrared System (SBIRS). The system includes GEO satellites, HEO payloads, and ground assets. SBIRS is being fielded incrementally. Increment 1 consolidated all DSP ground processing in one CONUS mission control station at Buckley AFB, Colo. IOC was declared Dec. 18, 2001. Increment 2 will field the space and ground assets. SBIRS is in the EMD phase led by a Lockheed Martin team. Following initial early on-orbit checks, HEO-1, the first SBIRS payload, was cleared for operational service in late 2008. HEO-2 was cleared for operational service in August 2009. The GEO payloads are the first components of the Increment 2 constellation.  

**Space Based Surveillance System (SBSS)**  
**Brief:** Planned replacement for the Midcourse Space Experiment/Space Based Visible (MSX/SBV) satellite that undertakes tracking and optical signature collection of Earth-orbiting objects.  
**Function:** Space surveillance and object identification.  
**Operator:** AFSPC.  
**First Launch:** 2010 (planned).  
**IOC:** TBD.  
**Constellation:** one low Earth orbit (LEO) satellite.  
**Design Life:** seven years, with 5.5 mean mission duration.  
**Launch Vehicle:** Minotaur IV.  
**Operational Location:** Schriever AFB, Colo.  
**Orbit Altitude:** 390 miles, sun-synchronous orbit.  
**Contractor:** Boeing (system integration, ground segment, operations and sustainment); Ball Aerospace, (satellite).  
**Power Plant:** 750 watts, powered from solar arrays and Ni-hydride batteries.  
**Dimensions:** (approx) height 10 ft; 10 ft x 3.2 ft, plus solar array, 750 lb.  

**COMMENTARY**  
SBSS is a planned follow-on to the advanced concept technology demonstration MSX/SBV satellite to provide tracking and collect optical signatures of Earth-orbiting objects from a space-based platform to avoid terrestrial limitations. The first operational satellite (SBSS Block 10) is due to be launched in spring 2010, and a follow-on satellite is planned for launch in 2016. The single LEO satellite will be commanded and controlled by the 50th Space Wing, Schriever AFB, Colo., using the global Air Force Satellite Control Network.  

**Wideband Global SATCOM (WGS)**  
**Brief:** Satellites that provide high-capacity communications for deployed forces (air, land, and sea).  
**Function:** Communications satellite.  
**Operator:** AFSPC.  
**First Launch:** October 2007.  
**IOC:** April 16, 2008.  
**Constellation:** two sats on orbit; third on-orbit testing, with three more planned.  
**Design Life:** 14 years.  
**Launch Vehicle:** Atlas V; Delta IV.  
**Operational Location:** Schriever AFB, Colo.  
**Orbit Altitude:** GEO.  
**Contractor:** Boeing.  
**Power Plant:** solar arrays generating 9,934 watts.  
**Dimensions:** based on Boeing 702 Bus.  
**Weight:** 13,000 lb at launch.  
**Performance:** approx 12 times the capability of a DSCS satellite.  

**COMMENTARY**  
Wideband Global SATCOM, previously known as the Wideband Gap-filler System, is designed to augment DSCS III and the Navy’s Global Broadcast System (GBS) Phase II. Each WGS satellite provides approximately 10 times the capacity of each DSCS III satellite. WGS is a fully duplicated communications platform offering warfighters a significant increase in capacity, connectivity, and interoperability. It provides two-way services for national leaders, Diplomatic Telecommunications Service, Defense Information System Network, and all military ground fixed and mobile users. In addition, it provides direct broadcast of digital multimedia, high-bandwidth imagery, and video information directly from global and theater sites to deployed warfighters. Based on a commercial product, the satellites feature X-band (DSCS III-like), Ka-band broadcast (GBS Phase 2-like), two-way Ka-band services, and cross-channelization between its X- and Ka-band services. Full operational capability (FOC) is expected in 2012 with launch of the fifth satellite.”