F-15E STRIKE EAGLE

Current as of February 1, 2023

MISSION

The F-15E Strike Eagle is a dual-role fighter designed to perform air-to-air and air-to-ground missions. An array of avionics and electronics systems gives the F-15E the capability to fight at both medium and low altitude, day or night, stand-in or long range stand-off, in all weather.

FEATURES

The aircraft uses two crew members, a pilot and a weapon systems officer (WSO). Previous models of the F-15 are assigned air-to-air roles; the "E" model is a dual-role fighter. It has the capability to fight its way to a target over long ranges, destroy enemy ground positions and fight its way out.

The aircraft's navigation system uses an Internal Navigation System and a Global Positioning System to continuously monitor the aircraft's position and provide information to the central computer and other systems, including a digital moving map in both cockpits.

The F-15E can have one of two RADARs: the APG-70 Mechanically Scanned Array or the APG-82 Active Electronically Scanned Array. The radar systems allow aircrews to detect air and ground targets from long ranges. One feature of this system is that after a generating high resolution maps of a target area, the crew freezes the air-to-ground map then goes back to air-to-air mode to clear for air threats. During the air-to-surface weapon delivery, the pilot is capable of detecting, targeting and engaging air-to-air targets while the WSO finds the ground target and manages systems to precisely guide the weapon(s) to impact.

The low-altitude navigation and targeting infrared for night (LANTIRN) system allows the aircraft to fly at low altitudes, day or night and in any weather conditions, to attack ground targets with a variety of precision-guided and unguided weapons. The system consists of two pods mounted externally on the aircraft: a navigation pod and a targeting pod. The navigation pod contains a terrain-following radar which allows the pilot to safely fly at a very low altitudes following cues displayed on a heads up display. This system also can be coupled to the aircraft's autopilot to provide "hands off" terrain-following capability.

The targeting pod contains a laser designator and a tracking system that mark an enemy for destruction at long ranges. Once tracking has been started, targeting information is automatically handed off to GPS or laser-guided bombs. The LANTIRN or SNIPER target pod gives the F-15E unequaled accuracy in weapons delivery day or night.

One of the most important additions to the F-15E is the rear cockpit and the weapons systems officer. On four screens, this officer can display information from the radar, electronic warfare or infrared sensors, monitor aircraft or weapons status and possible threats, select targets, and use an electronic "moving map" to navigate. Two hand controls are used to select new displays and to refine targeting information. Displays can be moved from one screen to another, chosen from a "menu" of display options.

In addition to three similar screens in the front seat, the pilot has a transparent glass heads up display (HUD) at eye level and a Joint Helmet Mounted Cueing System (JHMCS) that displays vital flight and tactical information.

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The pilot doesn't need to look down into the cockpit, for example, to check weapon status or aircraft parameters. At night, the HUD is even more important because it can display a video picture similar to a daylight view of the world generated by the forward-looking infrared sensor.

The F-15E is powered by two Pratt & Whitney F100-PW-220 or 229 engines that incorporate advanced digital technology for improved performance. For example, with a digital electronic engine control system, F-15E pilots can accelerate from idle power to maximum afterburner in less than four seconds, a 40 percent improvement over the previous engine control system. Faster engine acceleration means quicker takeoffs and crisper response while maneuvering. The F100-PW-220 engines can produce 48,000 pounds of thrust (24,000 each) and the F100-PW-229 engines 58,000 pounds of thrust (29,000 each).

Each of the low-drag conformal fuel tanks mounted to the F-15E's fuselage can carry 750 gallons of fuel. These conformal fuel tanks also hold weapons on BRU-46A (500lb weight class) or BRU-47A (5000lb weight class) bomb racks, reducing drag and further extending the range of the Strike Eagle.

Combat load-outs can include nearly any air-to-ground weapon in the Air Force inventory as well as any array of air-to-air missiles and a 20mm gun loaded with over 500 rounds.

BACKGROUND

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

The first flight of the F-15A was made in July 1972. In November 1974, the first Eagle was delivered to the 58th Tactical Fighter Training Wing at Luke Air Force Base, Ariz., where training began in both F-15A and B aircraft. In January 1976, the first F-15 destined for a combat squadron was delivered to the 1st Tactical Fighter Wing at Langley AFB, Va.

The single-seat F-15C and two-seat F-15D models entered the Air Force inventory in 1979 and were first delivered to Kadena Air Base, Japan. These models were equipped with production Eagle package improvements, including 2,000 pounds of additional internal fuel, provisions for carrying exterior conformal fuel tanks, and increased maximum takeoff weight of 68,000 pounds.

The first production model of the F-15E was delivered to the 405th Tactical Training Wing, Luke AFB, Ariz., in April 1988.

Characteristics

Primary function: Air-to-ground attack aircraft

Builder: McDonnell Douglas Corp.

Power plant: Two Pratt & Whitney F100-PW-220 or 229 turbofan engines with afterburners

Thrust: 24,000 - 29,000 pounds each engine

Wingspan: 42.8 feet (13 meters)

Length: 63.8 feet (19.44 meters)

Height: 18.5 feet (5.6 meters)

Speed: Mach 2.5 plus

Maximum takeoff weight: 81,000 pounds (36,450 kilograms)

Service ceiling: 50,000 feet (15,000 meters)

Combat ceiling: 35,000 feet (10,500 meters)

Range: 2,400 miles (3,840 kilometers) ferry range with conformal fuel tanks and three external fuel tanks

Armament: One 20mm multibarrel gun mounted internally with 500 rounds of ammunition. Up to eight air-to-air missiles including AIM-9M/X Sidewinders and AIM-120 AMRAAMs. Almost any air-to-surface weapon in the Air Force inventory from 250 lb class to 5,000 lb class conventional and nuclear.

Crew: Pilot and weapon systems officer

Unit cost: $31.1 million (fiscal 98 constant dollars)

Date deployed: April 1988

Inventory: Approximately 217 (total force)

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