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# Fact Sheet

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## The Predator Unmanned Aerial System



Predator is a long-dwell UAV operating in excess of 24 hours. That's equivalent to flying 400 nautical miles, hanging out for over 14 hours, and then flying home the other 400 nautical miles. It operates usually around 15,000 feet, although it can fly as high as 25,000 feet. The payload is about 450 pounds. Predator is flown manually by a pilot with a stick that controls the aircraft.

### **Predator RQ-1 / MQ-1 / MQ-9 Reaper Unmanned Aerial Vehicle (UAV)**

RQ-1 Predator is a long endurance, medium altitude unmanned aircraft system for surveillance and reconnaissance missions. Surveillance imagery from synthetic aperture radar, video cameras and a Forward Looking Infra-Red (FLIR) can be distributed in real-time both to the front line soldier and to the operational commander, or worldwide in real-time via satellite communication links. MQ-1, armed with AGM-114 Hellfire missiles, is the multi-role version which is used for armed reconnaissance and interdiction. A contract was awarded to General Atomics Aeronautical Systems in January 1994 to execute the Tier II, Medium Altitude Endurance Predator Program. The Predator system first flew in 1994 and entered production in August 1997.

Predators are currently in production for the US Air Force and are operational with the USAF 11th and 15th Reconnaissance Squadrons. Over 125 Predators have been delivered to the USAF. Six Predator UAVs are in service with the Italian Air Force. Italian company Meteor was responsible for assembly of five of the six. The Italian system was deployed to Iraq in January 2005.

Predator UAV's have been operational in Bosnia since 1995 in support of NATO, UN and US operations and as part of Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom, flying over 100,000 flight hours. The MQ-1 Predator achieved Initial Operating Capability (IOC) in February 2005.

General Atomics is the prime contractor and the main subcontractors include: Versatron / Wescam for the electro-optical Skyball Gimbal; Northrop Grumman for the synthetic aperture radar; L3 Communication for the wideband satellite communications link; and Boeing for the intelligence workstation and mission planning system.

In February 2001, the Hellfire-C laser-guided missile was successfully fired from a Predator air vehicle in flight tests at Nellis air force base, Nevada. In November 2002 in Yemen, a Predator UAV was used to drop a Hellfire missile which destroyed a civilian vehicle carrying suspected terrorists. A Northrop Grumman Bat submunition was successfully dropped and a FINDER mini-UAV launched from a Predator UAV in August 2002.



### **PREDATOR B - MQ-9 REAPER HUNTER/KILLER**

In May 1998 General Atomics was awarded a Block 1 Upgrade contract to expand the capabilities of the Predator system. System upgrades include development of an improved Relief-On-Station (ROS) system which allows continuous coverage over areas of interest without any loss of time on station, secure air traffic control voice relay, Ku-band satellite tuning and implementation of an Air Force Mission Support System (AFMSS).

The upgrade also covers a more powerful turbocharged engine and wing de-icing systems to enable year-round operations. The upgraded Predator, the MQ-9 Reaper Hunter/Killer, has been operational in the Balkans since April 2001. In March 2005, the USAF awarded a further contract for the System Design & Development (SDD) of MQ-9. 15 MQ-9 have been ordered and eight delivered to the USAF. A decision on full-rate production is expected in 2009.

The Predator B has an operational ceiling of 50,000ft and maximum internal payload of 800lb and external payload over 3,000lb. Predator B has been flight tested with Hellfire II anti-armour missiles and can carry up to 14 missiles. The MQ-9 will also be able to deploy the GBU-12 and EGBU-12 bombs and 500lb GBU-38 JDAM (Joint Direct Attack Munition). MQ-9 flight trials have also taken

place with the General Atomics Lynx SAR (Synthetic Aperture Radar) payload. Lynx also features ground moving target indicator technology. The Predator is to be flight tested with a L-3 Communications Tactical Common Datalink (TCDL).

The USAF has also ordered two versions of Predator B with turbofan jet engines, to be known as Predator C. First flight of the Predator C is expected in early 2007.

In August 2005, a version of Predator B, called Warrior, was chosen for the four-year System Development and Demonstration (SDD) phase of the US Army's Extended Range / Multi-Purpose (ER/MP) UAV program. 11 Warrior systems, each with 12 air vehicles, and five ground control stations. Initial operating capability is planned for 2009.

In September 2006, the UK requested the Foreign Military Sale (FMS) of two MQ-9 Reaper systems with Lynx SAR, multi-spectral targeting systems and one ground station.

### **SYSTEM COMPONENTS**

A typical Predator system configuration would include four aircraft, one ground control system and one Trojan Spirit II data distribution terminal. The Predator air vehicle is 27ft in length and has a 49ft wingspan. The system operates at an altitude of 25,000ft and at a range of 400nm.

The endurance of the air vehicle is more than 40 hours and the cruise speed is over 70kt. The air vehicle is equipped with UHF and VHF radio relay links, a C-band line-of-sight data link which has a range of 150nm and UHF and Ku-band satellite data links.

### **PAYLOAD**

The surveillance and reconnaissance payload capacity is 450lb and the vehicle carries electro-optical and infrared cameras and a synthetic aperture radar. The two-colour DLTV television is equipped with a variable zoom and 955mm Spotter. The high resolution FLIR has six fields of view, 19mm to 560mm.

The Raytheon Multi-spectral Targeting System (MTS-A) is fitted on the MQ-1/9 Predator. The MTS-A provides real-time imagery selectable between infrared and day TV as well as a laser designation capability. MQ-1 can employ two laser-guided Hellfire anti-armour missiles with the MTS.

The Northrop Grumman TESAR synthetic aperture radar, which provides all-weather surveillance capability, has a resolution of 1ft. Other payload options, which can be selected to meet mission requirements, include a laser designator and rangefinder, electronic support and countermeasures and a Moving Target Indicator (MTI).

### **GROUND STATION**

The UAV ground control station is built into a single 30ft trailer, containing pilot and payload operator consoles, three Boeing data exploitation and mission planning consoles and two synthetic aperture radar workstations together with satellite and line-of-sight ground data terminals.

### **OPERATION**

Predator follows a conventional launch sequence from a semi-prepared surface under direct line-of-sight control. The take-off and landing length is typically 2,000ft. The mission can be controlled through line-of-site data links or through Ku-band satellite links to produce continuous video.

Video signals received in the ground control station are passed to the Trojan Spirit van for worldwide intelligence distribution or directly to operational users via a commercial global broadcast system. Command users are able to task the payload operator in real-time for images or video on demand.

SOURCE: <http://www.airforce-technology.com>

The fleet of MQ-1 Predator unmanned aerial systems achieved a milestone of 200,000 flight hours in July 2006. According to the manufacturer, General Atomics, more than three-quarters of that time

spent in combat for a total of 10,961 combat missions. According to Thomas J. Cassidy, Jr., president, Aircraft Systems Group, General Atomics Aeronautical Systems, Inc. "the Predator aircraft have flown nearly 100,000 flight hours over the past two years and are currently flying more than 6,000 flight hours per month while maintaining the highest operational readiness rates in U.S. Air Force inventory."

