

MQ-1 Predator Unmanned Aerial Vehicle (UAV) System

The Predator medium altitude endurance unmanned aerial vehicle (UAV) system is a theater asset intended to provide a cued and non-cued reconnaissance, surveillance, targeting acquisition, and limited strike capability. Its long dwell capability is intended to provide the theater commander with continuous imagery coverage of any area of interest. Additionally, beginning in 2002, all MQ-1 Predator air vehicles will be equipped with two Hellfire missiles and a multi-spectral targeting sensor including a laser designator. Originally designated RQ-1, multi-role systems capable of reconnaissance, surveillance, and limited strike are designated MQ-1.

The Predator system contains both air and ground segments. The air segment consists of four full composite air vehicles powered by turbo-charged Rotax 914 engines. The air vehicle can simultaneously carry Electro-Optic, Infrared (EO/IR) and Synthetic Aperture Radar (SAR) sensor payloads. Four EO/IR payloads and three SAR payloads will be provided for each of four air vehicle systems. The air vehicle can also carry one Hellfire missile under each wing; however, the SAR payload cannot be operated when the air vehicle is configured to carry and fire Hellfire missiles.

The system will be required to operate in less than ideal weather conditions, and a glycol weeping-wing de-icing system was developed to provide the capability to transit through moderate icing conditions. Two sets of weeping wings will be provided for each system with four air vehicles. The weeping wings are not internally configured for weapons carriage.

The ground segment consists of a shelter containing the Ground Control Station (GCS) and a Predator Primary Satellite Link for satellite communications between the air vehicle and the ground station. Data link systems between the air vehicle and the ground system include C-band line-of-sight (LOS), and Ku-band satellite for operations beyond LOS. Dissemination of imagery, both video and still image files, beyond the GCS is the responsibility of the supported commander. A typical deployment detachment consists of one Predator system and 55 personnel. United States Air Force 11th, 15th, and 17th Reconnaissance Squadrons at Indian Springs Air Force Auxiliary Field, Nevada, currently operate Predator systems. The Air Force had already procured its original planned force structure of 12 Predator systems when Initial Operational Test and Evaluation (IOT&E) took place in October 2000. Predator system number six was the first system retrofitted with all baseline capabilities and was used for initial operational testing. In response to the war on terrorism, funding for additional Predator assets and improvements was provided. The Predator fleet will be expanded by three squadrons beginning in FY04. Additional MQ-1 systems are being procured along with the development of a follow-on system, the MQ-9, also known as Predator B.

TEST & EVALUATION ACTIVITY

During operations in Kosovo in 1999, a few Predators were equipped with a laser designator for designating targets for laser-guided weapons released by fighters. The following year, the Air Force began to test Predators armed with Hellfire missiles, and the basic capability had been demonstrated prior to September 11, 2001. Armed and unarmed Predators have been used extensively in operations in Afghanistan.



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AIR FORCE PROGRAMS

Detachment 4 of the 53rd Test and Evaluation Group continues to support Predator block upgrades. FY02 testing included the ability to transfer control of the air vehicle from one GCS to another, a demonstration of moving target indicator on the SAR, and an upgraded GCS software version.

Another capability developed during wartime operations is the Rover system that allows Predator EO/IR imagery to be received as streaming video onboard the AC-130 gunship. Voice communication between the gunship's tactical controller and the UAV operator viewing the same picture should improve Predator's ability to talk the gunship onto a target.

The Defense Threat Reduction Agency is conducting experiments using a Predator air vehicle with the chemical combat assessment system. The experiments involve removing the Predator's SAR and installing the Predator Infrared Airborne Narrowband Hyperspectral Combat Assessor, which acts as a remote sensor. Additionally, mini-UAVs might be attached to the Predators wings. The mini-UAVs, called Flight Inserted Detection Expendables for Reconnaissance contain a Spectrometric Point Ionizing Detector Expendable/Recoverable point sensor, and a sample collector. The Predator could be used to release the mini-UAV once it reaches the contaminated site.

TEST & EVALUATION ASSESSMENT

Formal testing this year has been limited by test article availability due to Operation Enduring Freedom. Testing that has been conducted consisted primarily of demonstrations of new capabilities proposed by the Air Force Battlelab. DOT&E is working with the Air Force Test and Evaluation Center and the 53rd TEG-Detachment 4 to plan tests for upgrades to the deficiencies reported on during IOT&E. Test plans for the MQ-1, armed Predator are also being developed.