**Unmanned Aerial Vehicles (UAVs)**

Unmanned Aerial Vehicles (UAVs) are remotely piloted or self-piloted aircraft that can carry cameras, sensors, communications equipment or other payloads. They have been used in a reconnaissance and intelligence-gathering role since the 1950s, and more challenging roles are envisioned, including combat missions. Since 1964 the Defense Department has developed 11 different UAVs, though due to acquisition and development problems only 3 entered production. The US Navy has studyied the feasibility of operating VTOL UAVs since the early 1960s, the QH-50 Gyrodyne torpedo-delivery drone being an early example. However, high cost and technological immaturity have precluded acquiring and fielding operational VTOL UAV systems.

By the early 1990s DOD sought UAVs to satisfy surveillance requirements in Close Range, Short Range or Endurance categories. Close Range was defined to be within 50 kilometers, Short Range was defined as within 200 kilometers and Endurance as anything beyond. By the late 1990s, the Close and Short Range categories were combined, and a separate Shipboard category emerged. The current classes of these vehicles are the Tactical UAV and the Endurance category.

**Pioneer:** Procured beginning in 1985 as an interim UAV capability to provide imagery intelligence for tactical commanders on land and see at ranges out to 185 kilometers. No longer in the Army inventory (returned to the US Navy in 1995).

**Tactical UAV** : Designed to support tactical commanders with near-real-time imagery intelligence at ranges up to 200 kilometers. Outrider Advanced Concept Technology Demonstration (ACTD) program terminated. Material solution for TUAV requirements is being pursued through a completive acquisition process with goal of contract award in DEC 99.

**Joint Tactical UAV (Hunter)**: Developed to provide ground and maritime forces with near-real-time imagery intelligence at ranges up to 200 kilometers; extensible to 300+ kilometers by using another Hunter UAV as an airborne relay. Training base located at Fort Huachuca, with additional baseline at Fort Polk to support JRTC rotations. Operational assets based at Fort Hood (currently supporting the KFOR in Kosovo).

**Medium Altitude Endurance UAV (Predator)**: Advanced Concept Technology Demonstration now transitioned to Low-Rate Initial Production (LRIP). Provides imagery intelligence to satisfy Joint Task Force and Theater Commanders at ranges out to 500 nautical miles. No longer in the Army inventory (transferred to the US Air Force in 1996).

**High Altitude Endurance UAV (Global Hawk):** Intended for missions requiring long-range deployment and wide-area surveillance (EO/IR and SAR) or long sensor dwell over the target area. Directly deployable from CONUS to the theater of operations. Advanced Concept Technology Demonstration (ACTD) managed by the US Air Force.

**Tactical Control Station (TCS)**: The Tactical Control Station is the software and communications links required to control the TUAV, MAE-UAV, and other future tactical UAV's. It also provides connectivity to other C4I systems.

**Micro Unmanned Aerial Vehicles (MAV)**: DARPA program to explore the military relevance of Micro Air Vehicles for future military operations, and to develop and demonstrate flight enabling technologies for very small aircraft (less than 15cm/6in. in any dimension).

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| **Unmanned Aerial VehicleName** | **Endurance(Hours)** | **Payload Weight(Pounds)** | **Altitude Capability(Feet)** | **STATUS** |
| [**AQM-34N Firebee**](http://www.fas.org/irp/program/collect/aqm-34n.htm) | hr. | lbs. | ft. |  |
| [**Aquila**](http://www.fas.org/irp/program/collect/aquila.htm) | hr. | lbs. | ft. |  |
| [**Arcturus T-16**](http://www.arcturus-uav.com/index.php) | 16 hr. | 20 lbs. | 17,000 ft. (gas) - 40,000 ft. (electric) |  |
| [**COMPASS ARROW**](http://www.fas.org/irp/program/collect/compass_arrow.htm) | hr. | lbs. | ft. |  |
| [**COMPASS BIN**](http://www.fas.org/irp/program/collect/firebee_2.htm) | hr. | lbs. | ft. |  |
| [**COMPASS COPE**](http://www.fas.org/irp/program/collect/compass_cope.htm) | hr. | lbs. | ft. |  |
| [**COMPASS DAWN**](http://www.fas.org/irp/program/collect/compass_dawn.htm) | hr. | lbs. | ft. |  |
| [**Condor**](http://www.fas.org/irp/program/collect/condor.htm) | hr. | lbs. | ft. |  |
| [**CR-TUAV**](http://www.fas.org/irp/program/collect/cr-tuav.htm)  | hr. | lbs. | ft. |  |
| [**CR-UAV**](http://www.fas.org/irp/program/collect/cr-uav.htm)  | hr. | lbs. | ft. |  |
| [**Darkstar**](http://www.fas.org/irp/program/collect/darkstar.htm) | 8 hrs. | 1,000 lbs. | 45,000 ft. |  |
| [**Dragon**](http://www.fas.org/irp/program/collect/dragon.htm) | hr. | lbs. | ft. |  |
| [**Eagle Eye**](http://www.fas.org/irp/program/collect/eagle-eye.htm) | 8 hrs. | 300 lbs. | 20,000 ft. |  |
| [**Exdrone**](http://www.fas.org/irp/program/collect/dragon.htm) | 2.5 hr. | 25 lbs | 10,000 ft. |  |
| [**Firebee**](http://www.fas.org/irp/program/collect/firebee.htm) | 1.25 hrs. | 470 lbs. | 60,000 ft. |  |
| [**Global Hawk**](http://www.fas.org/irp/program/collect/global_hawk.htm) | 42 hrs. | 1,960 lbs. | 65,000 ft. |  |
| [**Gnat 750**](http://www.fas.org/irp/program/collect/gnat-750.htm) | 48 hrs. | 140 lbs. | 25,000 ft. |  |
| [**Hunter**](http://www.fas.org/irp/program/collect/hunter.htm) | 12 hrs. | 200 lbs. | 15,000 ft. |  |
| [**Model 324**](http://www.fas.org/irp/program/collect/model-324.htm) | 2.5 hrs. | 200 lbs. | 43,000 ft. |  |
| [**Model 410**](http://www.fas.org/irp/program/collect/model-410.htm) | 12 hrs. | 300 lbs. | 30,000 ft. |  |
| [**MR-UAV**](http://www.fas.org/irp/program/collect/mr-uav.htm) | hr. | lbs. | ft. |  |
| [**MRE**](http://www.fas.org/irp/program/collect/mre.htm) | hr. | lbs. | ft. |  |
| [**Outrider**](http://www.fas.org/irp/program/collect/outrider.htm) | 4 hrs. | 160 lbs. | 15,000 ft. |  |
| [**Pioneer**](http://www.fas.org/irp/program/collect/pioneer.htm) | 5.5 hrs. | 75 lbs. | 12,000 ft. |  |
| [**Pointer**](http://www.fas.org/irp/program/collect/pointer.htm) | 1 hr. | 2 lbs. | 3,000 ft. |  |
| [**Predator**](http://www.fas.org/irp/program/collect/predator.htm) | 29 hrs. | 700 lbs. | +40,000 ft. |  |
| [**SEA FERRET**](http://www.fas.org/irp/program/collect/sea_ferret.htm) | hr. | lbs. | ft. |  |
| [**SENIOR BOWL [D-21]**](http://www.fas.org/irp/program/collect/d-21.htm) | hr. | lbs. | ft. |  |
| [**VT-UAV**](http://www.fas.org/irp/program/collect/vtuav.htm) | hr. | lbs. | ft. |  |
| [**VT-UAV Dragonfly**](http://www.fas.org/irp/program/collect/crw.htm) | hr. | lbs. | ft. |  |
| [**VT-UAV Vigilante**](http://www.fas.org/irp/program/collect/vigilante.htm) | hr. | lbs. | ft. |  |
| [**VT-UAV Guardian**](http://www.fas.org/man/dod-101/sys/ac/row/cl-327.htm) | hr. | lbs. | ft. |  |
| [**MQ-8B Army Fire Scout**](http://www.is.northropgrumman.com/systems/mq8bfirescout_army_gallery.html) | hr. | lbs. | ft. |  |
| [**MQ-8B Navy Fire Scout**](http://www.is.northropgrumman.com/systems/mq8bfirescout_navy_gallery.html) | hr. | lbs. | ft. |  |

**Sources and Resources**

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* [Joint Unmanned Aerial Vehicles - Joint Test & Evaluation](http://www.juav.jte.osd.mil/), official home page
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* [EE-1 Video Server Testbed](http://www.fas.org/irp/program/collect/ee1.pdf), to make UAV data available via web browser in real time, Defense Information Technology Testbed, Center for Army Lessons Learned, 14 July 2000
* [UAVs: DoD Press Briefing](http://www.fas.org/irp/program/collect/uav_103101.html) October 31, 2001, Briefing Slides:
	+ [UAV Evolution - Where are we?](http://www.fas.org/irp/program/collect/011031-D-6570X-012.jpg)
	+ [Army Tactical Unmanned Aerial Vehicle.](http://www.fas.org/irp/program/collect/011031-D-6570X-013.jpg)
	+ [Brigade Shadow 200 UAV.](http://www.fas.org/irp/program/collect/011031-D-6570X-014.jpg)
	+ [Hunter TUAV Today's Workhorse.](http://www.fas.org/irp/program/collect/011031-D-6570X-015.jpg)
	+ [Evolving TUAV Capabilities Include...](http://www.fas.org/irp/program/collect/011031-D-6570X-016.jpg)
	+ [Predator UAV (Air Force).](http://www.fas.org/irp/program/collect/011031-D-6570X-017.jpg)
	+ [Global Hawk (Air Force).](http://www.fas.org/irp/program/collect/011031-D-6570X-018.jpg)
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	+ [Army Science Board Briefing](http://www.fas.org/irp/program/collect/docs/990609-asb_gust/index.htm) 9 June 1999
	+ [Team C4IEWS - Business Opportunities](http://www.fas.org/irp/program/collect/docs/apbi_web/index.htm) 18 May 1999
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	+ [Executive Steering Group Meeting](http://www.fas.org/irp/program/collect/docs/ESG-99Feb24/index.htm) -- 24 Feb 1999
	+ [Executive Steering Group Meeting](http://www.fas.org/irp/program/collect/docs/OctFlagBinder/index.htm) -- 16 Oct 1998
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* [SPECIAL OPERATIONS FORCES AND UNMANNED AERIAL VEHICLES: SOONER OR LATER?](http://www.fas.org/irp/eprint/howard.htm) STEPHEN P. HOWARD School of Advanced Airpower Studies JUNE 1995

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| **Unmanned Aerial VehicleName** | **Endurance(Hours)** | **Payload Weight(Pounds)** | **Altitude Capability(Feet)** |  |
| [**A160 Hummingbird**](http://www.globalsecurity.org/intell/systems/a160.htm) | 24-36 hr. | 300 lbs. | 30,000 ft. |  |
| [**AQM-34N Firebee**](http://www.globalsecurity.org/intell/systems/aqm-34n.htm) | hr. | lbs. | 65-70,000 ft. |  |
| [**AQM-91A Firefly**](http://www.globalsecurity.org/intell/systems/compass_arrow.htm) | hr. | lbs. | 78,000 ft. |  |
| [**Aquila**](http://www.globalsecurity.org/intell/systems/aquila.htm) | hr. | lbs. | ft. |  |
| [**BAMS**](http://www.globalsecurity.org/intell/systems/bams.htm) | hr. | lbs. | ft. |  |
| [**Battlefield Air Targeting MAV**](http://www.globalsecurity.org/intell/systems/batmav.htm) | hr. | lbs. |  |  |
| [**COMPASS ARROW**](http://www.globalsecurity.org/intell/systems/compass_arrow.htm) | hr. | lbs. | 78,000 ft. |  |
| [**COMPASS BIN**](http://www.globalsecurity.org/intell/systems/firebee_2.htm) | hr. | lbs. | 51,300 ft.  |  |
| [**COMPASS COPE**](http://www.globalsecurity.org/intell/systems/compass_cope.htm) | +24 hr. | lbs. | + 55,000 ft. |  |
| [**COMPASS DAWN**](http://www.globalsecurity.org/intell/systems/compass_dawn.htm) | hr. | lbs. | 50,000 ft. |  |
| [**Condor**](http://www.globalsecurity.org/intell/systems/condor.htm) | hr. | lbs. | + 65,000 ft. |  |
| [**CR-TUAV**](http://www.globalsecurity.org/intell/systems/cr-tuav.htm)  | 4 hr. | lbs. | 10,000 ft. |  |
| [**CR-UAV**](http://www.globalsecurity.org/intell/systems/cr-uav.htm)  | 3 hr. | lbs. | ft. |  |
| [**Cypher**](http://www.globalsecurity.org/intell/systems/cypher.htm) | 3 hr. | 40 lbs. | 8,000 ft. |  |
| [**Cypher II**](http://www.globalsecurity.org/intell/systems/dragon-warrior.htm) | 3-5 hr. | 25-35 lbs. | ft. |  |
| [**Desert Hawk**](http://www.globalsecurity.org/intell/systems/desert-hawk.htm) | hr. | lbs. | 500 ft. |  |
| [**Dragon**](http://www.globalsecurity.org/intell/systems/dragon.htm) | 2.5 hr. | 25 lbs. | 10,000 ft. |  |
| [**Dragon Eye**](http://www.globalsecurity.org/intell/systems/dragon-eye.htm) | .5-1 hr. | lbs. | 300-500 ft. |  |
| [**Dragon Warrior**](http://www.globalsecurity.org/intell/systems/dragon-warrior.htm) | 3-5 hr. | 25-35 lbs. | ft. |  |
| [**Eagle Eye**](http://www.globalsecurity.org/intell/systems/eagle-eye.htm) | 8 hrs. | 300 lbs. | 20,000 ft. |  |
| [**Exdrone BQM-147**](http://www.globalsecurity.org/intell/systems/dragon.htm)  | 2.5 hr. | 25 lbs | 10,000 ft. |  |
| [**FCS HALE UAV**](http://www.globalsecurity.org/intell/systems/fcs-hale.htm) | 24 hrs. | 450 lbs. | 25,000 ft. |  |
| [**FCS OAV**](http://www.globalsecurity.org/intell/systems/fcs-oav.htm) | 15-25 min. | 1-7 lbs. | 8,000 ft. |  |
| [**FCS SUAV**](http://www.globalsecurity.org/intell/systems/fcs-suav.htm) | 2-6 hrs. | 40-75 lbs. | 500-1500 ft. |  |
| [**FCS TUAV**](http://www.globalsecurity.org/intell/systems/fcs-tuav.htm) | 5-6 hrs. | 60-200 lbs. | 15,000 ft. |  |
| [**Firebee**](http://www.globalsecurity.org/intell/systems/firebee.htm) | 1.25 hrs. | 470 lbs. | 60,000 ft. |  |
| [**Gnat 750**](http://www.globalsecurity.org/intell/systems/gnat-750.htm) | 48 hrs. | 140 lbs. | 25,000 ft. |  |
| [**Micro Air Vehicle (MAV)**](http://www.globalsecurity.org/intell/systems/mav.htm) | 20-120 min.  | -  | - |  |
| [**Micro Air Vehicle ACTD**](http://www.globalsecurity.org/intell/systems/mav-actd.htm)  |  | 17 lbs.  | 100-500 ft. |  |
| [**Model 324**](http://www.globalsecurity.org/intell/systems/model-324.htm) | 2.5 hrs. | 200 lbs. | 43,000 ft. |  |
| [**Model 410**](http://www.globalsecurity.org/intell/systems/model-410.htm) | 12 hrs. | 300 lbs. | 30,000 ft. |  |
| [**MQ-1B Predator B**](http://www.globalsecurity.org/military/systems/aircraft/mq-1b.htm) | hr. | lbs. | ft. |  |
| [**MQ-8B Fire Scout**](http://www.globalsecurity.org/intell/systems/mq-8b.htm) | + 5 hrs.  | 3,150 lbs.  | 20,000 ft |  |
| [**MQ-9B Reaper**](http://www.globalsecurity.org/military/systems/aircraft/mq-9.htm) | 29 hrs. | 700 lbs. | +40,000 ft. |  |
| [**MQM-105 Aquila**](http://www.globalsecurity.org/intell/systems/aquila.htm) |  |  |  |  |
| [**MR-UAV**](http://www.globalsecurity.org/intell/systems/mr-uav.htm) | hr. | lbs. | 40,000 ft. |  |
| [**MRE**](http://www.globalsecurity.org/intell/systems/mre.htm) | hr. | lbs. | ft. |  |
| [**Pointer FQM-151**](http://www.globalsecurity.org/intell/systems/pointer.htm)  | 1 hr. | 2 lbs. | 3,000 ft. |  |
| [**SEA FERRET**](http://www.globalsecurity.org/intell/systems/sea_ferret.htm) | 2 hr. | lbs. | ft. |  |
| [**SENIOR BOWL [D-21]**](http://www.globalsecurity.org/intell/systems/d-21.htm) | hr. | lbs. | +90,000 ft. |  |
| [**RQ-1 Predator**](http://www.globalsecurity.org/intell/systems/predator.htm) | 29 hrs. | 700 lbs. | +40,000 ft. |  |
| [**RQ-2 Pioneer**](http://www.globalsecurity.org/intell/systems/pioneer.htm) | 5.5 hrs. | 75 lbs. | 12,000 ft. |  |
| [**RQ-3 Darkstar**](http://www.globalsecurity.org/intell/systems/darkstar.htm) | 8 hrs. | 1,000 lbs. | 45,000 ft. |  |
| [**RQ-4 Global Hawk**](http://www.globalsecurity.org/intell/systems/global_hawk.htm) | 42 hrs. | 1,960 lbs. | 65,000 ft. |  |
| [**RQ-5 Hunter**](http://www.globalsecurity.org/intell/systems/hunter.htm) | 12 hrs. | 200 lbs. | 15,000 ft. |  |
| [**RQ-6 Outrider**](http://www.globalsecurity.org/intell/systems/outrider.htm) | 4 hrs. | 160 lbs. | 15,000 ft. |  |
| [**RQ-7 Shadow**](http://www.globalsecurity.org/intell/systems/shadow.htm)  | 4 hr. | lbs. | ft. |  |
| [**RQ-8 Fire Scout**](http://www.globalsecurity.org/intell/systems/vtuav.htm) | + 6 hr. | 2-300 lbs. | ft. |  |
| [**RQ-11 Raven**](http://www.globalsecurity.org/intell/systems/raven.htm) | 80 mins. | 4.5 lbs. | 1000 ft. |  |
| [**Tier II Plus**](http://www.globalsecurity.org/intell/systems/global_hawk.htm) | 42 hrs. | 1,960 lbs. | 65,000 ft. |  |
| [**Tier III**](http://www.globalsecurity.org/intell/systems/tier-3.htm) | 42 hrs. | 1,960 lbs. | 65,000 ft. |  |
| [**Tier III Minus**](http://www.globalsecurity.org/intell/systems/darkstar.htm) | 8 hrs. | 1,000 lbs. | 45,000 ft. |  |
| [**VT-UAV Dragonfly**](http://www.globalsecurity.org/military/systems/aircraft/x-50.htm) | hr. | lbs. | ft. |  |
| [**VT-UAV Vigilante**](http://www.globalsecurity.org/intell/systems/vigilante.htm) | 16 hr. | 83-183 lbs. | 13,000 ft. |  |
| [**VT-UAV Guardian**](http://www.globalsecurity.org/military/world/europe/cl-327.htm) | 6.25 hr. | 231 lbs. | 18,000 ft. |  |
| [**Warrior**](http://www.globalsecurity.org/military/systems/aircraft/warrior.htm) | 36 hr. | lbs. | 25,000 ft. |  |
| [**YQM-94A B-Gull**](http://www.globalsecurity.org/intell/systems/compass_cope.htm)  | +24 hr. | lbs. | + 55,000 ft. |  |
| [**YQM-96A R-Tern**](http://www.globalsecurity.org/intell/systems/compass_cope.htm)  | +24 hr. | lbs. | + 55,000 ft. |  |

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| **1990s to Today** |  | **RQ-4 Global Hawk (USA)** |

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Though it is still considered experimental, Global Hawk was rushed to Afghanistan for deployment during the first weeks of the recent U.S. war there. A product of one of the world's most successful UAV manufacturers, Teledyne Ryan, Global Hawk is the third installment of the DARPA "dream team" that includes Predator and DarkStar. With its 116-foot wingspan, Global Hawk is designed to take off from a base in the U.S., fly autonomously to a country of interest, collect and transmit surveillance data at heights of up to 65,000 feet, and then return to its base without refueling.  |  |

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| **1990s to Today** |  | **RQ-1 Predator (USA)** |

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Having demonstrated its worth in the skies over the Balkans and most recently in Afghanistan and the Middle East, the General Atomics Aeronautical Systems RQ-1 Predator is a fixture in the U.S. Air Force, which has more than 60. Within a 450-mile range, Predator can provide 14 to 16 hours of surveillance via high definition color television, infrared cameras, and synthetic aperture radar (SAR) before returning to its base. A ground team from a remote control station controls the plane either by a line-of-sight radio connection or via a satellite link. Though Predator was designed purely for reconnaissance use, several of these UAVs have been equipped with Hellfire antitank missiles and have successfully hit their targets.  |  |