



RQ-4 NASA Global Hawk

*High-Altitude, Long-Endurance
(HALE) Unmanned Aerial
Reconnaissance System*

THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

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The NASA Global Hawk Project Office at the Dryden Flight Research Center (DFRC) is managing Advanced Concept Technology Demonstration (ACTD) RQ-4 Global Hawk air vehicles in partnership with Northrop Grumman Corporation. These preproduction Global Hawk air vehicles were acquired by NASA from the U.S. Air Force to be used to support NASA science customers and other customers who need access to a high-altitude, long-endurance (HALE) system. DFRC and Northrop Grumman have entered into a five-year Space Act Agreement that includes the stand-up and operation of the NASA Global Hawk system. Northrop Grumman is providing technical, engineering, maintenance, and operations support and will share access to the air vehicles with NASA.

Environmental Science Capability

In April 2010, NASA Global Hawk completed the first UAS flights for science research. These flights over the Pacific and Arctic Oceans were part of the Global Hawk Pacific (GloPac) mission, a joint project between NASA and the National Oceanic and Atmospheric Administration (NOAA), with Northrop Grumman support. In August 2010, NASA Global Hawk examined hurricanes, their formation process, and the possibility of improving hurricane forecasts.

In the Spring of 2011, NASA flew winter storm (WISPAR) missions over the Pacific and Arctic, observing among other weather phenomena, an “atmospheric river” which sometimes causes flooding on the West Coast. They also flight tested payloads for Hurricane and Severe Storm Sentinel flights planned for 2012.

In Fall 2011, Airborne Tropical Tropopause Experiment (ATTREX) flights over the Pacific studied the composition of the tropopause by climbing and descending between 65,000 feet and 45,000 feet.

The Global Hawk air vehicle provides a unique combination of high altitude and long endurance performance capabilities that can meet many demanding payload and mission requirements. The air vehicle provides the customer with an unprecedented long endurance flight capability through the troposphere into the lower regions of the stratosphere. Thus, the NASA Global Hawk is an excellent platform for hosting research instruments and sensors, and for conducting HALE airborne research.

Autonomous Aerial Refueling

Northrop Grumman is leveraging its synergistic partnership with NASA Dryden to execute the DARPA KQ-X program, which has demonstrated technologies that should enable autonomous high altitude fuel transfer between two Global Hawks, extending flight endurance. The engineering and development effort resulted in the first HALE formation flight, a dual-ship close formation with one UAV flying 30 feet from the extended refueling drogue of the other UAV. Northrop Grumman is responsible for all engineering and design/modification of both aircraft.

System Development

During the stand-up of the program, the air vehicles were modified with new command, control, and communications for worldwide access and to allow rapid configuration changes for new payloads.

Global Hawk Operations Center (GHOC) is configured to support air vehicle and payload operations independently.

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Airborne science research and autonomous aerial refueling.

The Flight Operations Room, contained within the GHOC, consists of the workstations occupied by the personnel controlling various payloads. NASA has completed a portable ground control station, which can be used in support of upcoming Earth Science deployments.

Environmental Science Mission Categories

- Calibrate satellite sensors and develop or validate data algorithms
- Collect in situ measurements for Earth science process studies
- Develop and test new instruments and future satellite mission concepts

Specifications

Wingspan	116.2 ft (35.4 m)
Length	44.4 ft (13.5 m)
Height	14.6 ft (4.2 m)
Gross Take-off Weight	26,700 lbs (12,110.9 kg)
Internal Payload Capacity	1,500 lbs (680.4 kg)
Pod Payload Capacity	700 lbs per side (317.5 kg)
Ferry Range	11,000 nm (20,372 km)
Maximum Altitude	≤ 65,000 ft (19.8 km)
Loiter Velocity	343 knots True Air Speed (TAS)
Maximum Endurance	31 hrs

For more information, please contact:

Northrop Grumman Aerospace Systems
Unmanned Systems
Jessica Burtness
858-618-6931 • jessica.burtness@ngc.com

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