NASAfacts

Global Hawk High-Altitude, Long-Endurance Science Aircraft

The two yellow-and-black pods under the wings of NASA Global Hawk No. 872 house atmospheric measurement probes. Thirteen instruments were installed on the autonomously operated aircraft for the 2014 Airborne Tropical Tropopause Experiment over the western Pacific Ocean. (NASA/Tom Miller)

NASA's Armstrong Flight Research Center operates one developmental-model Northrop Grumman Global Hawk unmanned aircraft for high-altitude, long-duration Earth science missions. Acquired from the U.S. Air Force, this autonomously flown aircraft is the sixth built under the original Global Hawk Advanced Concept Technology Demonstrator development program sponsored by the Defense Advanced Research Projects Agency.

The ability of the Global Hawk to autonomously fly long distances, remain aloft for extended periods of time and carry large payloads brings a new capability to the science community for measuring, monitoring and observing remote locations of Earth not feasible or practical with piloted aircraft, most other robotic or remotely operated aircraft, or space satellites.

The aircraft's 8,500-nautical-mile range and 24-hour endurance, together with satellite and line-of-site communication links to the ground control station, allow for worldwide operation. Dedicated satellite communication links provide researchers with direct access to their onboard instrument packages during missions. Researchers have the ability to monitor instrument function from the ground control station and evaluate selected data in real time.

Northrop Grumman Aerospace Systems in Rancho Bernardo, California, and NASA Armstrong created a partnership to operate Global Hawk missions from Armstrong. NASA and Northrop Grumman share use of the ground control station, maintenance facilities and the NASA Global Hawk aircraft.

NASA's Science Mission Directorate supports NASA research activities on the aircraft. The Science Mission Directorate has teamed with

the National Oceanic and Atmospheric Administration and the Department of Energy to investigate unmanned aircraft systems, specifically the Global Hawk, for Earth observation research.

Initial operational capability for Global Hawk science missions from NASA Armstrong was achieved in 2010. A portable ground control station is functioning and has supported operations originating outside the continental United States. In addition to one at Armstrong, a permanent ground control station is located at NASA's Wallops Flight Facility in Wallops Island, Virginia, and was used to support the Hurricane and Severe Storm Sentinel multi-year study from 2012 – 2014 over the Atlantic Ocean. Future hurricane studies supported by partner NOAA are planned in both the Atlantic and Pacific oceans using the Global Hawk.

The 44-foot-long Global Hawk has a wingspan of more than 116 feet, a height of 15 feet, and a gross takeoff weight of 26,750 pounds, including a 1,500-pound payload capability. A single Rolls-Royce AE3007H turbofan engine powers the aircraft. The distinctive V-tail, engine cover, aft fuselage and wings are constructed primarily of graphite composite materials. The center fuselage is constructed of conventional aluminum, while various fairings and radomes feature fiberglass composite construction.

NASA has two additional Advanced Technology Demonstrator, the first and seventh Global Hawks built, and two Block 10 aircraft transferred from the U.S. Air Force. These aircraft are being used to provide parts for the flying Global Hawk and could be used for future missions.

Flight crew and scientists occupy the Global Hawk Operations Center at NASA Armstrong during the Genesis and Rapid Intensification Processes hurricane study in the fall of 2010. (NASA/Tom Tschida)

National Aeronautics and Space Administration

Armstrong Flight Research Center
P.O. Box 273
Edwards, California 93523

www.nasa.gov

FS-2015-04-098 AFRC