

# NASA begins science flights with robotic jet

April 14 2010, By JOHN ANTCZAK , Associated Press Writer

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A NASA Global Hawk robotic jet sits in a hangar at Dryden Flight Research Center in Edwards Air Force Base, Calif., on April 13, 2010. The Air Force turned over to NASA three Global Hawks, which were designed for military reconnaissance but equipped with science sensors for conducting atmospheric research over the Pacific. The space agency will use them for unmanned, long-duration, autonomous research flights.(AP Photo/John Antczak)

(AP) -- One of NASA's newest research jets soared high over the Pacific Ocean Tuesday on a 24-hour mission to study Earth's atmosphere.

Its pilot remained seated in an office chair in a windowless room in the Mojave Desert, monitoring the autonomous flight of the Global Hawk via an array of computer screens.

Global Hawks were designed to perform high-altitude, long-endurance reconnaissance and intelligence missions for the Air Force, which has turned over to NASA three versions built in the developmental process.

This month, NASA has begun putting one to work for the first time with flights over vast areas of the Pacific to demonstrate the scientific usefulness of the [unmanned aircraft](#).

"It's never been used by a civilian agency, and it's never been used for Earth science," said David W. Fahey, a research physicist with the [National Oceanic and Atmospheric Administration](#).

Distinguished by its bulbous, whale-shaped nose, top-mounted engine and V-tail, the Global Hawk is 44 feet long and its wings span 116 feet - almost the wingspan of the latest Boeing 737s.

Able to carry more than 1,000 pounds of science instruments, a Global Hawk can operate at altitudes up to 65,000 feet and stay aloft for 30 hours while flying a distance of more than 12,600 miles.

This will allow Global Hawks to sample remote regions of the atmosphere such as the equatorial regions of the oceans and the arctic and Antarctic, Fahey said.

"Given its range and duration, you can be away from these locations and effectively operate this platform to do the kind of sampling we're interested in," he said.

The Global Hawk is effectively a hybrid between a satellite and an aircraft, said Paul Newman, senior scientist in NASA's Atmospheric, Chemistry and Dynamics Branch at Goddard Space Flight Center in Greenbelt, Md.

"This plane naturally flies in the stratosphere, so it's a perfect platform for ozone-depletion science," he said.

In the fall, a Global Hawk will be tested for its ability to contribute to

hurricane research in the Atlantic.

Acquisition of the Global Hawks marks the latest conversion of military technology to civilian use by NASA.

The space agency, for example, flies a converted high-altitude U-2 spy plane that has been redesignated ER-2, and a Predator B unmanned aircraft that has been given the Native American name Ikhana. In the 1990s, NASA used two Air Force SR-71 Blackbird spy planes for high-speed, high-altitude research.

One of NASA's immediate goals is to expand the envelope of the Global Hawks, Newman said.

"The military typically flies at a constant altitude. They turn their instruments on when they get to a target, and they turn them off when they leave a target," Newman said.

Scientists, however, want to turn on their instruments on the ground and turn them off only when the aircraft is back on the ground to acquire a "vertical profile of information," he said.

Various problems prevent that for the time being.

Also, for now the Federal Aviation Administration allows the Global Hawks to operate only over oceans while the safety of unmanned aircraft in the nation's airspace is studied.

The Global Hawk that departed Edwards on Tuesday was expected to fly north off the Pacific coast of North America, turn west along the Aleutian Islands and then south.

Below the Hawaiian islands, the craft was to turn east and fly below the

orbital path of a cluster of Earth-observing satellites known as the A-Train.

This was to allow actual sampling of the particles of the atmosphere that the satellites measure remotely from space. One instrument aboard the aircraft is a laser identical to one in orbit.

"So we can prove that those satellites are working correctly," Newman said.

The Global Hawk was expected to return to California at about 7 a.m. Wednesday.

The first flight in the [Global Hawk](#) Pacific campaign occurred April 7 and lasted 14 hours. Three more flights are planned.

**More information:** NASA Global Hawk interactive:  
<http://bit.ly/bvoVo9>

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