MILAGRO

Megacity Initiative - Local and Global Research Observations

MIRAGE-Mex

MAX-Mex

MCMA

INTEX-B

MARCH 1-31
2006

AIRCRAFT MEASUREMENT

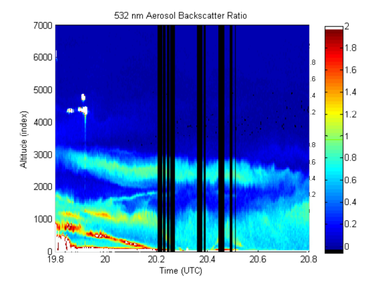
During the MILAGRO Campaign six aircraft will be flying out of Veracruz airport, with the exception of the DC8 which will be based in Houston.

The Twin Otter aircraft is owned and operated by the U.S. Forest Service, and its deployment in MILAGRO is funded by the National Science Foundation.

The aircraft will measure chemical and physical properties of smoke from agricultural and forest fires in the region surrounding Mexico City. The Twin Otter Biomass Burning Group plans measurements of fire emissions and their interaction with the Mexico City plume, clouds, and regional air.

A suite of new sensors to study atmospheric aerosols will be flown on the NASA Langley Research Center King Air B200 aircraft during MILAGRO. The airborne suite of measurements will be used to map out the vertical and horizontal distribution of aerosols and study how aerosols scatter and absorb sunlight.

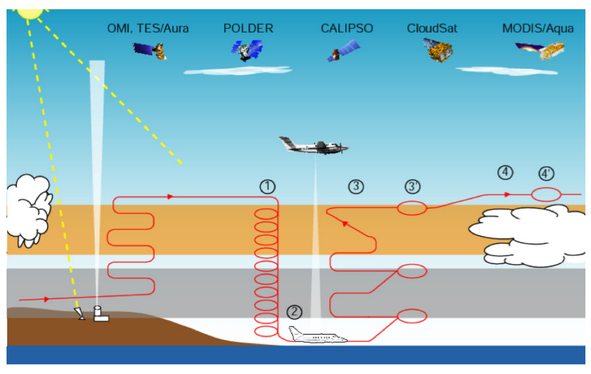
In addition, it will help direct the other aircraft to sample the aerosols, evaluate aerosol measurements acquired by instruments on the ground, other aircraft, and on NASA satellites, as well as evaluate and hopefully improve how aerosols are represented in computer models that are used to assess aerosol impacts on weather and climate.



Lidar de alta resolución espectral en el avión King Air B200 de la NASA
El lidar de alta resolución espectral proporciona la distribución vertical y horizontal de los aerosoles, y mide las propiedades ópticas de ellos. La grafica de arriba corresponde a mediciones hechas en el océano Atlántico al este de Norfolf, Virginia, el 17 de febrero del 2006.

The Jetstream-31 (J-31) aircraft is owned and operated by Sky Research Inc. The U.S. National Aeronautics and Space Administration (NASA) funds its operation in MILAGRO through the University of California.

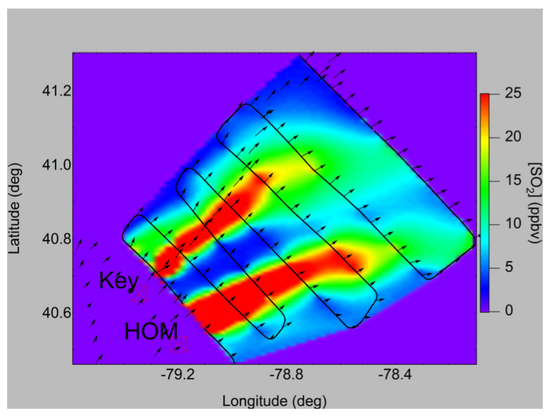
The J-31 will measure the properties and radiative effects of aerosols, water vapor, clouds and surfaces, as a means of better understanding their impacts on climate and advancing spaceborne and airborne measurement science. This aircraft will help to validate measurements made from satellites and other aircraft. The following diagram shows the flight trajectories and satellites to be validated.



The Gulfstream-1 (G-1) aircraft is owned by the U.S. Department of Energy and is operated by Battelle.

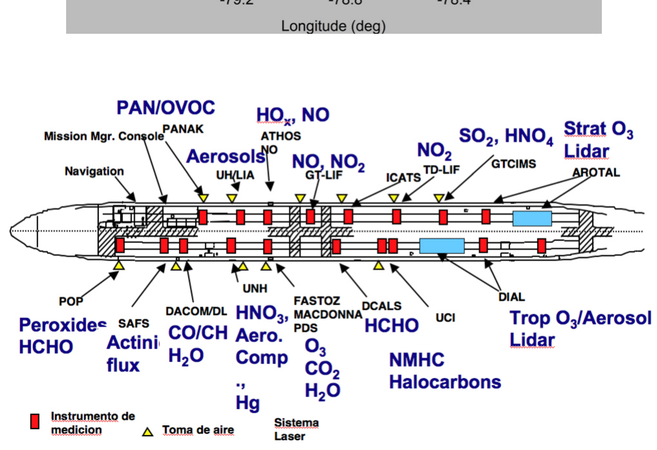
The primary area of interest for the G-1 aircraft is the Mexico City urban area and the Mexican Plateau. The morning flights are designed to observe buildup of emitted pollutants and the afternoon flights to observe the effects of chemical processing. The objectives are to study ozone and aerosols -- the impacts on air quality and the effects of aerosols on global climate.

The figure shows the sulfur dioxide plumes from the Homer and Keystone Power Plants in Pennsylvania, U.S. observed by the G-1.



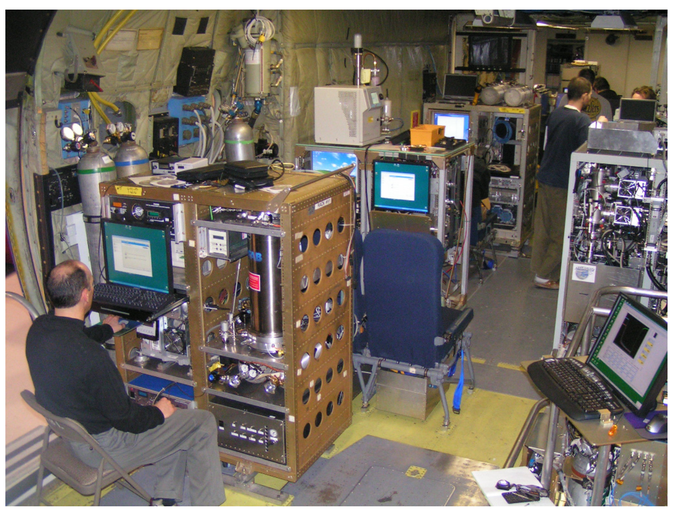
The DC-8 aircraft is owned and operated by the U.S. National Aeronautics and Space Administration (NASA).

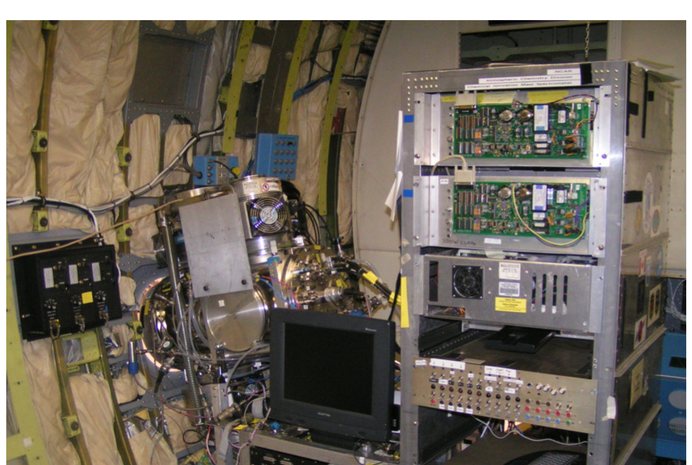
NASA DC-8's flight paths will conduct sampling upwind and downwind of Mexico City and over the Gulf of Mexico. The following figure indicates the chemical compounds to be analyzed as well as the distribution of instruments inside the aircraft. The DC-8 will conduct extensive profiling of the atmosphere and provide information to validate data for the satellites from different pollutants.



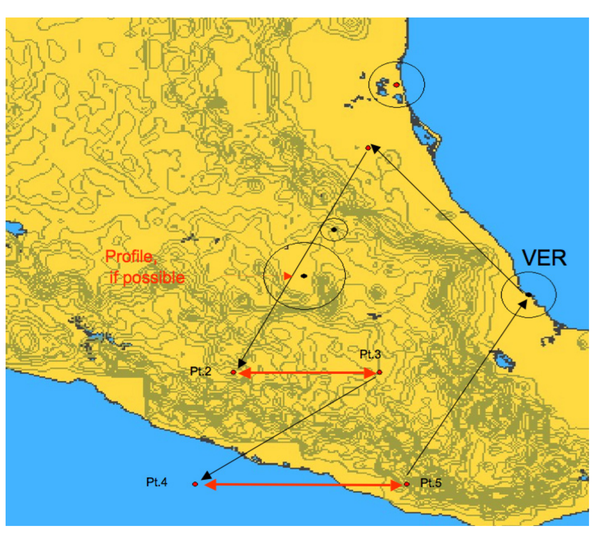
The C-130 Hercules aircraft is owned by the U.S. National Science Foundation and is operated by the National Center for Atmospheric Research.

The C-130 will make measurements of many pollutant gases, aerosol chemical, physical, and optical properties, and atmospheric state parameters.

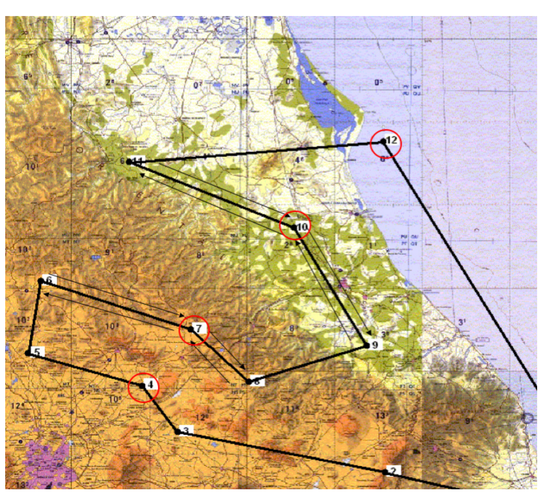




The Chemical Ionization Mass Spectrometer (CIMS) is one of many instruments on the C-130 aircraft. The aircraft will be equipped with state-of-the-art technology to study the composition of the atmosphere, particularly of the reaction of aerosols and gases which, in turn, produce new aerosols.



The aircraft flight paths will follow the plume of pollutants from Mexico City. These figures show the flight trajectories planned for the C-130 Hercules aircraft.



Molina Center for
Energy and the Environment
http://mce2.org