



The NOAA P-3: A Flying Chemical Laboratory

SE Nex – Southeast Nexus

Studying the Interactions Between Natural and Anthropogenic Emissions at the Nexus of Air Quality and Climate Change



Wing Pods and Instruments on the Fuselage

Improved Whole Air Sampler with Immediate Analysis System and Nucleation Mode Aerosol Size Spectrometer-Under Starboard Wing
 Aerosol Low Turbulence Inlet-Outside Port Side Forward
 Carbon Monoxide-Under Port Side Wing
 Cloud Probes-End of Port Side Wing

Starboard Aft

Sulfur Dioxide Pulsed Ultra Violet Fluorescence
 Carbon Dioxide and Methane Cavity Ring Down Spectrometer
 Multi-Acids Chemical Ionization Mass Spectrometer
 Airborne Cavity Enhanced Spectrometer (ACES)
 Nitric Acid Chemical Ionization Mass Spectrometer
 Ammonia Chemical Ionization Mass Spectrometer

Starboard Forward

Nitrogen Oxides and Ozone Chemiluminescence Instruments

Port Side Forward

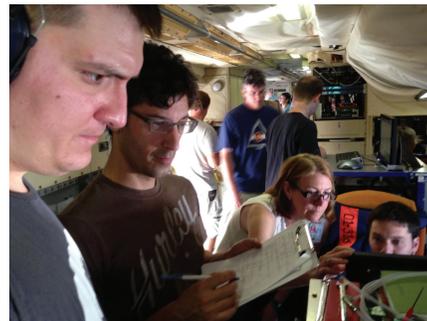
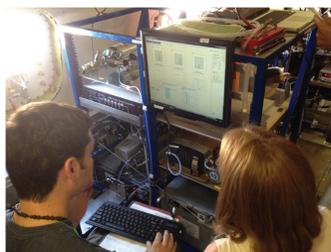
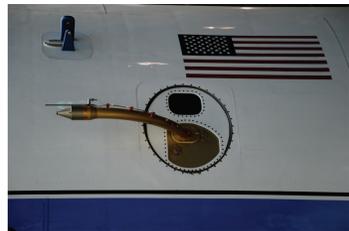
Water Vapor Tunable Diode Laser Spectrometer
 White-Light Optical Particle Counter
 Cloud Condensation Nucleus Counter
 Aerosol Extinction Cavity Ring Down Spectrometer
 Particle Soot Absorption Photometer
 Particle Photoacoustic Absorption Spectrometer
 Ultrahigh Sensitivity Aerosol Size Spectrometer

Port Side Aft

Filter Radiometers (Up and Down Looking)
 Oxides of Nitrogen Cavity Ring Down Absorption Spectrometer
 Proton Transfer Reaction Mass Spectrometer
 Formaldehyde Laser Induced Fluorescence Spectrometer

Port Side Midsection

Single-Particle Soot Photometer
 Aerosol Mass Spectrometer
 Peroxyacyl Nitrates Chemical Ionization Mass Spectrometer



Two of the world's premier research aircraft, the renowned NOAA WP-3D Orions, participate in a wide variety of national and international meteorological, oceanographic, and environmental research programs in addition to their widely known use in hurricane research and reconnaissance. These versatile turboprop aircraft are equipped with an unprecedented variety of scientific instrumentation, radars, and recording systems for both in-situ and remote sensing measurements of the atmosphere, the earth, and its environment. Obtained as new aircraft from the Lockheed production line in the mid-70's, these robust and well maintained aircraft have led NOAA's continuing effort to monitor and study hurricanes and other severe storms, the quality of the atmosphere, the state of the ocean and its fish population, and climate trends. The P-3s are excellent aircraft for the research work they do. The structural design enables them to carry a wide variety of instrumentation. Besides locating instruments inside the aircraft, instrumentation can be hung in pods from the P-3's wings and fuselage. A typical flight will carry 5-7 flight crewmembers and five scientists and a payload of over 20 instruments for studying atmospheric chemistry and meteorology.