

## NASA P-3 Orion Airborne Science Laboratory



The NASA P-3 Orion Airborne Science Laboratory Program at the NASA Wallops Flight Facility operates a P-3 Orion aircraft to acquire data for airborne science research. The aircraft has been extensively modified to support a wide variety of experiments and scientific investigations by NASA and visiting scientist from universities and organizations worldwide. The aircraft and its complement of on-board sensors provide a readily deployable remote sensing platform that supports scientific research throughout the world.

The P-3 is a four-engine (T56-A-14) turboprop aircraft designed for endurance and range. The aircraft is capable of long duration flights of 8-14 hours, large payloads up to 14,700 pounds, true airspeeds up to 400 knots, and altitudes up to 28,000 feet. Some of the science features include zenith ports, three nadir ports and seven P-3 and DC-8 style windows for experiments, along with a tail cone, nose radome and ten mounting locations on the wings. Most of the fuselage ports are contained within the pressurized cabin environment. The unpressurized cargo area can be converted into experimenter ports via a custom fairing. This fairing creates two large nadir ports and several oblique ports for installation of large sensors and antennas. The P-3 is capable of precision flight line navigation by means of integrated inertial and GPS navigation systems from which flight line profiles are provided to the pilots. The P-3 also contains an onboard aircraft data system with an integrated satellite communication system that provides inflight uplink and downlink capability for experimenter use.

Aircraft Characteristics	Remarks
Aircraft Registration Number	Tail number: N426NA Call sign is "NASA 426"
Overall Dimensions	Length: 116 feet, 10 inches Vertical tail height: 34 feet, 3 inches Horizontal stabilizer height: 17 feet Ground clearance height: 4 feet Wing tip height: 10 feet Wingspan: 99 feet, 8 inches Distance between main landing gear: 31 feet, 2 inches Turning radius of nose wheels using one main landing gear as pivot: 33 feet 8 inches Clearance radius using one main landing gear as pivot: 75 feet 5 inches
Aircraft Weights	Maximum landing weight: 114,000 pounds Maximum gross take-off weight: 139,760 pounds
Range	3,800 nautical miles
Fuel Volume	62,000 pounds
Minimum Runway Dimensions	Minimum length: 7,000 feet Minimum width: 100 feet

<b>Ground Support</b>	<b>Remarks</b>
Air Start Cart	The NASA P-3 has an onboard auxiliary power unit for engine start-up. However, an air start cart may be required if the APU fails.
Aircraft Parking	Require easy access for aircraft. Aircraft ramp to parking area must have no sharp turns, must be clear of debris, and must allow aircraft to taxi in and out without being towed.
Aircraft Ground Power Unit	Require reliable, late model Hobart-86 power unit (or equivalent) with 90 KVA rating.
Boarding Stairs	Require a truck or stand mounted stairs adjustable to 10 feet in height.
Fuel	Require JP 4, 5, or 8. Or Jet A or B. Require delivery to the aircraft.
Work Stand	Require a platform with railings capable of reaching aircraft wing tips. Two work stands are required.
Fire Extinguisher	Require a large capacity Halon (or equivalent) fire extinguisher for aircraft engine start-up.
Man-Lift	Require a man-lift capable of lifting a man to the top of the aircraft fuselage for servicing of antennas and windows. Require a man-lift or adjustable stairs/work stand to reach horizontal tail.
Aircraft Axle Jacks	Require jacks for nose gear and main landing gear.
Towing Vehicle	Require a vehicle capable of towing a 139,760 pound aircraft.
Gaseous Nitrogen	Require a source for high (3,000 PSI) and low (1,500 PSI) pressure nitrogen for aircraft landing gear and tires.
Aviation Breathing Oxygen	Require a source for breathing oxygen to service the cabin emergency oxygen system.
Liquid and Gaseous Nitrogen	Require a source for liquid and gaseous nitrogen to service the experimental equipment aboard the aircraft.
De-Ice	Require access to de-ice facilities depending on climate and on-board instrument requirements.
Air Conditioner	Require NR-8 or equivalent air conditioner cart depending on climate and on-board instrument requirements.
Heater	Require Herman Nelson or equivalent heater cart depending on climate and on-board instrument requirements.
<b>Crew Support</b>	<b>Remarks</b>
Airport Access	Require easy but secure access to aircraft parking area for aircraft crew.
Briefing Room	Require space at airport for pilot flight planning and weather briefings.
Ground Crew Waiting Room	Require space at airport where ground crew can wait for aircraft to return from flights.
Internet and Telephone Access	Require a stable, at least minimum 3MB/s, internet connect and telephone access near the aircraft for maintenance and flight planning purposes.
Storage	Require an area for storage of aircraft spare parts (tires, engine, propeller, etc.).