

NASA Facts

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NASA's P-3B Earth Science Aircraft

The P-3B is a specialized aircraft operated as an airborne "platform" in support of NASA's Science Mission Directorate. The aircraft supports scientific investigations by NASA and visiting scientists from universities, other agencies and organizations worldwide. With instruments installed, the aircraft serves an economical test bed for studying the Earth and for new concepts in satellite design. The aircraft supports scientific studies across all disciplines of Earth Science such as forest ecology, atmospheric, ocean and ice dynamics, land processes and many more. The P-3 aircraft can carry instrument payloads consisting of one to several at once while supporting Earth studies all over the globe.

Scientific instrument installations on the aircraft generally consist of external components such as sensors, antennas or probes while inside the aircraft the supporting control and data analysis computers are installed in specially designed rack modules. Multiple instrument payloads are an economical way for cooperating scientists to intercompare data when studying Earth processes. A diverse mix of engineers, technicians, scientists, pilots and managers all team together to safely complete the aircraft-instrument integration designs and hardware fabrications and conduct the flight portions of studies. Once designed, all components can be quickly and economically removed or re-installed as required.



P-3B Facts

The NASA P-3B is a four-engine turboprop capable of long duration flights of 8-12 hours, large payloads up to 15,000 pounds, altitudes up to 30,000 feet and true airspeeds up to 330 knots. The aircraft has been modified with a "glass" cockpit, or electronic flight instrumentation system (EFIS), and a flight management system (FMS). The FMS integrates redundant laser reference inertial navigation and GPS position data onto composite cockpit displays with weather radar and graphical flight plan overlays. The EFIS outputs flight data to an ARINC 429 data stream for integration into user data systems.

Some of the airborne geoscience-supporting features of this aircraft include numerous zenith, nadir and oblique ports to mount experiments. Most of the ports are contained within the pressurized cabin environment. However, a unique equipment bay is available in the lower section of the fuselage. This roomy and unpressurized equipment bay provides large nadir and oblique ports and combines ease of installation with convenient access during ground operation for the largest antennas or sensors.

Electrical power is abundant throughout the aircraft. Provision is made for standard 110/60 Hz AC, 110/400 Hz AC and 28VDC regulated power hookups, but unique power requirements are easily accommodated.

Flight Performance

	High Altitude 25,000 – 30,000 ft.	Medium Altitude 10,000 – 25,000 ft.	Low Altitude 500 – 10,000 ft.
Endurance (hours)	12	10	8
Range (nautical miles)	3800	3000	2400
Speed (knots)	330	300	270