

Navigating Your Way Through

Aviation really, truly, deeply, loves acronyms. The New Southern Sky programme of moving aviation from ground-based to satellite-based navigation is no different. If you're drowning in a sea of ciphers, read on.

PBN

Performance Based Navigation describes the broad range of technologies that are moving aviation away from a ground-based navigation system toward a system that relies more on the performance and capabilities of equipment on board the aircraft.

Instead of ground-based navigation aids emitting signals to aircraft receivers, the onboard PBN systems receive satellite signals that advise the aircraft's position to the crew.

That means shorter, more direct routes between two given points and more efficient takeoffs and landings.

In turn, this reduces fuel burn, airport and airspace congestion, and aircraft emissions.

RNP

Required Navigation Performance allows the aircraft to fly a precise path between two points in space. RNP is particularly helpful where terrain, lack of infrastructure (such as ground-based navigation aids, or surveillance), limits on airspace, or even occasional low visibility conditions at an airport restricts operations.

The RNP technology also monitors system performance, and alerts the pilot when it thinks there is a problem with the satellite signal.

RNAV

An aircraft with aRea NAVigation can fly along a planned flight path using ground-based, satellite-based, or on-board navigation aids, or a combination.

However, RNAV technology does not monitor the navigation performance of the aircraft, so it cannot alert the pilot to any problems.

RNAV1 and RNP1

Keep the aircraft within one nautical mile of the centre line of the flight path 95 per cent of the flight time. But RNP1 also monitors its own performance and notifies the pilot when it thinks it isn't performing as it should.

RNAV2

Keeps the aircraft within two nautical miles of the centre line of the flight path 95 per cent of the flight time.

GNSS

The Global Navigation Satellite System is a general term for a satellite navigation system, including the American GPS network, the Chinese BeiDou, Russian GLONASS and European Galileo systems.

GPS

The Global Positioning System is the Global Navigation Satellite System which is owned and operated by the United States. The New Zealand aviation community currently uses only this system.

RAIM

Receiver Autonomous Integrity Monitoring assesses the 'integrity' of GPS signals in a GPS receiver system.

ABAS

Aircraft-based Augmentation System adds to and/or integrates the information obtained from the other GNSS elements with information available on board the aircraft.

SBAS

The Satellite-Based Augmentation System measures small variations in the GPS signals, and provides regular corrections to aircraft receivers within the specific geographic service areas covered by the system's ground stations. SBAS provides for greater navigation accuracy than GPS on its own – particularly in the vertical plane – to those aircraft equipped to use it.

New Zealand is not currently covered by an SBAS service area.

LNAV

Lateral navigation refers to navigating over a ground track with guidance from an electronic device that tells the pilot (or autopilot) of their lateral deviation from the required track.

VNAV

Does the same as LNAV, but in the vertical plane.



ADS-B

Automatic Dependent Surveillance – Broadcast is a satellite-dependent surveillance system. The aircraft receives data from navigation satellites, then broadcasts information on its identification, position, altitude, speed, intention, and other relevant data up to twice a second. The broadcast system is the ADS-B transponder.

The data received by ground stations are then transmitted to the air traffic management system for display to air traffic controllers who use it to maintain aircraft separation in controlled airspace.

SSR

Secondary Surveillance Radar is a co-operative surveillance system, meaning that it relies on a transmission to, and a response from, an aircraft transponder.

NDB

A Non-Directional Beacon is a ground-based, low frequency radio transmitter used for navigation. NDBs can be used for non-precision instrument approaches to airports and offshore platforms. NDBs are very old technology and will gradually disappear from the New Zealand aviation system.

VOR

The Very High Frequency Omni-Directional Radio Range is the present form of ground-based navigation.

DME

Distance measuring equipment is radio navigation technology that measures slant range distance by timing the propagation delay of UHF radio signals. ■