

Doppler/GPS navigation set

AN/ASN-157

A single LRU velocity sensor and navigation set for helicopters and moderate performance aircraft



Description

The AN/ASN-157 Doppler navigation set provides highly accurate 3-D velocity and navigation over the full operational range of helicopters.

Application

The BAE Systems ASN-157 was developed to meet the on-going need of helicopters for avionics with reduced size and weight. The ASN-157 system has an accuracy of 0.15 percent of total velocity, weighs less than 12 lbs., consists of one LRU, and has a predicted MTBF of over 7,300 hours. An important capability of the ASN-157 is providing accurate navigation from Nap-of-the-Earth (NOE) operation to 10,000 feet AGL, including hover and backwards flight.

Heading, pitch and roll for navigation are provided by the aircraft's heading and attitude sensors in standard 400Hz synchro format or via a MIL-STD-1553 data bus. All computations in the ASN-157 are performed in a general-purpose single-chip computer. The use of non-volatile memory enables the computer to retain previously stored destination data during "power-off" periods without the need for a battery. This eliminates the need for periodic maintenance.

Options

- Available as either a velocity sensor or a complete navigation system
- Embedded GPS receiver, permitting GPS tracking with four or fewer satellites by using Doppler aiding
- 50 selectable waypoints (minimum) WGS-84 Datum in navigation system version
- Control display set and steering hover indicator unit available for non-multiplexed aircraft

Features

- Low transmitter power of 25 mW
- Velocity range -50 to 350 knots
- Altitude range 0 to 10,000 ft (0 to 3,050 m)
- Excellent accuracy over land and water
- Beam shaping virtually eliminates overwater calibration shift

Current usage

- AH-64D Longbow Apache for the U.S. Army, Royal Netherlands Air Force and GKN Westland WAH-64D for the United Kingdom
- Current production rate capability is 11/month (larger quantities/month are feasible)

Availability after order

- 13 months ARO
- Earlier delivery available dependant upon quantity and other factors

Interfaces

- Accepts heading, pitch, roll and TAS via a dual MIL-STD-1553 data bus and also in analog 3-wire 400 Hz format
- Outputs 3-D velocity, navigation, heading, pitch and roll via MIL-STD-1553 and also via ARINC 575 data buses

Support/ test equipment

- No unique support or test equipment required
- Built-In Test; both continuous testing and externally initiated end-to-end tests with greater than 95% fault detection capability

Functionality

- Provides accurate 3-D velocity for fire-control, INS aiding, weapons delivery, hover operations
- Provides navigation including left-right steering to waypoints entered via MIL-STD-1553 data bus, distance and time-to-go, accuracy dependant on heading, pitch and roll input data
- Operates with INS and GPS systems to maintain highly accurate navigation when GPS not available

Specifications

Operational performance

Velocity range	-50 knots to +350 knots	
Altitude range	0 to 10,000 ft	
Attitude limits	Pitch	Roll
	Land	$\pm 30^\circ$
Smooth sea (B1)	$\pm 20^\circ$	$\pm 30^\circ$

Physical characteristics

Size	14.56 x 13.48 x 2.25 in
Weight	11.5 lb
Power	< 50W
MTBF	> 7300h

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