ANS | 510-A

AIRBORNE INERTIAL NAVIGATION SYSTEM

#Navigation

0.8 NM/HR PERFORMANCE
EMBEDDED RECEIVER GPS OR GNSS

aselsan

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AIRBORNE INERTIAL NAVIGATION SYSTEM

ANS 510-A is a navigation grade airborne inertial navigation system with embedded GPS/GNSS receiver which is intended for application to air vehicles.

ANS 510-A has an open architecture and hardware/software flexible unit which can be adapted to various air platforms including rotary-wing, fixed-wing and unmanned aerial vehicles.

ANS 510-A consists of strapdown inertial measurement unit, system processor unit, power supply unit, Embedded GPS/ GNSS Receiver (EGR) and chassis. EGR is capable of tracking space vehicles simultaneously and transmitting the line-of- sight (LOS), position and velocity information to the system processor. The system processor combines the GPS/ GNSS data with the inertial data from IMU using Kalman filter. ANS 510-A is capable of using either SAASM compliant GPS receiver or commercial SPS GPS receiver or Multi Constellation GNSS receiver as embedded receiver.

ANS 510-A also has capability to operate with an external GPS receiver. In case of external GPS, system processor combines the GPS data with the inertial data in a loosely coupled mechanization.

ANS 510-A supplies linear acceleration, linear and angular velocity, position, attitude and heading to the host vehicle systems continuously. ANS 510-A provides a hybrid (inertial + GPS) navigation solution, inertial only navigation solution and a GPS only navigation solution simultaneously. ANS 510-A is also capable of using external pressure altitude data to complement hybrid and inertial only navigation solutions.

System Interfaces

- MIL-STD-704 Compliant 28VDC Power Interface
- RS422 Asyncronous Serial Interfaces
- Test Port Serial Interface, User Port Serial
- MIL-STD–1553B Interfaces, dual redundant
- ARINC 429 Interfaces
- External GPS Interface
- Have Quick and 1PPS Interface
- KYK–13 Interface
- Active and Passive RF Antenna Interface
- Discrete Interfaces

System Operational Modes

- Leveling
- Alignment
  - In Flight Alignment (IFA)
  - Gyro Compass (GC) Alignment
  - Stored Heading Alignment
- Directional Gyro (DG)
- Navigation
  - Hybrid Navigation (HNAV)
  - Inertial Navigation (INAV)
- Initiated Built In Test (IBIT)

System Functions

- Hybrid, Free Inertial, EGR Only Navigation Solution
- Magnetic Variation, Wind Speed and Direction Calculation
- Motion Detection Function
- Zero Velocity Update, Position Update
- Vertical Channel Hold
- Flight Control Filters
- Alignment Progress Status
- EGR Lever Arm, Reference Point Lever Arm Correction
- Start-Up BIT, Periodic BIT, Commanded BIT
- Field Programmable Software

Navigation Performance

	Free Inertial	Hybrid (INS+EGR)
Position		
Horizontal	0.8 nm/hr CEP	10 m (CEP)
Altitude	< 45 m(1)	16 (PE)
Velocity		
North, East	0.8 m/s (rms)	0.03 m/s (rms)
Vertical	0.6 m/s (rms)	0.03 m/s (rms)
Attitude		
Roll, Pitch	0.05 deg (rms)	0.02 deg (rms)
Azimuth	0.07 deg(2) (rms)	0.02 deg(3) (rms)

1- With Baro Aiding. %1.5 (rms) for Altitude>3 km.
2- With 4 minute ground alignment at 45 degree Latitude.
3- With sufficient aircraft maneuvers.

Alignment Durations

Ground Alignment Mode	In-Flight Alignment Mode	Stored Heading Mode
4.0 min	10.0 min	30 sec

Environmental Conditions

- MIL-STD-810 Compliant

Electromagnetic Conditionss

- MIL-STD-461 / DO-160E Compliant

Dimensions and Weight

- ~ 26cm x 19cm x 15cm (including connectors)
- Less than 6.2 kg with EGR

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