BAE SYSTEMS

Airborne SAASM Receiver

Big performance in a small package

Precise satellite tracking and navigation with jam resistance

Photo courtesy of Oshkosh Defense, LLC.

Supporting both NAVWAR and Global Air Traffic Management (GATM) requirements, the BAE Systems Airborne SAASM Receiver (ASR) is a 12-channel, all-in-view, dual frequency GPS receiver. ASR incorporates BAE Systems' third generation of Selective Availability Anti-Spoofing Module (SAASM) and is designed in accordance with GPS Receiver Application Module (GRAM). Specifically designed to meet small package requirements, the ASR provides GRAM-S performance in less than half the volume of a SEM-E receiver.

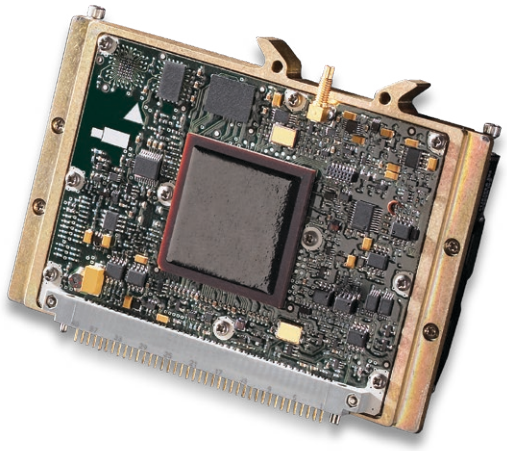
To resist the effects of jamming, the ASR incorporates field proven techniques used on all BAE Systems receivers including advanced software algorithms, dual frequency (L1/L2) operations, fast direct-Y acquisition and inertial aiding.

The ASR's flexible I/O supports open systems architectures. Industry standard interfaces include RS-422 (serial) in accordance with ICD-GPS-155, plus a RS-422 instrumentation port, a RS-232 PLGR Hot Start and various discrete signals. Antenna interfaces support AE-1, GAS-1, and both active and passive FRPA installations.

Building upon the GPS Embedded Module (GEM™) legacy that began in 1990, the ASR incorporates numerous advanced features. Additional functions and features are continually being added to an already vast list of capabilities and user-configurable software options.

Key features and benefits

- All-in-view satellite tracking for optimized geometry and satellite drop-out immunity
- Fault Detection and Exclusion (FDE) per DO-229 providing navigation solution integrity
- Switchable SPS/PPS function to facilitate civil airspace interoperability
- Carrier phase measurement outputs enabling precision navigation solutions
- GPS Directorate-approved SAASM (KDP-II, OPSW 1.01)
- 12-channel, all-in-view tracking and navigation (dual frequency)
- SPS/PPS switchable operation for use in civil air space
- Fast direct-Y code acquisition
- Ultra low-power time maintenance
- Stand-alone (unaided) or integrated (aided) operation
- Field reprogrammable through serial port
- Fault Detection Exclusion (FDE) per DO-229 (A, B, C)
- Supports enroute, terminal and NPA per TSO-C129a
- PLGR Hot Start (RS-232)
- 10 Hz pseudo range and carrier phase measurements
- LOS outputs unclassified even when keyed
- 65 dB J/S



GRAM-S performance in less than half the volume

System characteristics

Receiver	L1 frequency, C/A and P or Y code L2 frequency, P or Y code
Dynamics	Velocity: >1,200 m/s Acceleration: 10 g maximum SPS velocity: 1,000 knots
TTFF1	<80 seconds (prob >.95)
PLGR Hot Start	5 seconds (direct-Y)
Time accuracy	PPS: <30 nanoseconds RMS SPS: <45 nanoseconds RMS
Position accuracy	PPS: <5.6 m RMS horizontal SPS: <6 m RMS horizontal (per DoD policy)
Velocity accuracy	PPS: <0.1 m/s RMS steady rate SPS: <0.3 m/s RMS steady rate
Altitude	80,000 feet
Position update rate	Unaided: once-per-second pseudorange based, 5 Hz delta range based, 10 Hz propagated INS-aided: once-per-second pseudorange based, 4-25 Hz dependent on aiding rate
MTBF	>20,000 hours @ 55° C (MIL-HDBK-217)

Interfaces

- 1 PPS time input and output
- Enhanced accuracy HAVE QUICK output
- Active RF antenna support (AE1, GAS-1, FRPA)
- Passive RF antenna support (FRPA)
- ICD-GPS-155 compatible interface (high-speed serial)
- ICD-GPS-150 instrumentation port
- DS 101/102 crypto-variables
- ICD-GPS-153 PLGR Hot Start (RS-232)

Physical characteristics

Power	<2.0 W
Weight	<0.6 lb
Size/volume	4.9 W x 3.2 H x 0.80 D in. max
Temperature range	-54° C to 85° C (continuous) -62° C to 95° C (storage)
Shock	Operating: 15 g Service crash: 35 g
Random vibration	12.6 g/RMS

The ASR has been granted the NAVSTAR Global Positioning System GPS Directorate Security Approval.

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