

MONARCH GPS SPACEBORNE RECEIVER

Precise Positioning with Unsurpassed Flight Heritage

Features

- Qualified and tested for the space environment: pyrotechnic shock, random vibration, thermal-vacuum, EMI/EMC, natural radiation, and SEU/SEL
- Modular design allows for multiple configuration options
- Provides near real-time position, velocity and time measurements for superior user performance
- Relative navigation capability allows for differential position, velocity and time determination between co-orbiting spacecraft.
- Precision time stamping allows unprecedented accuracies in space
- Pps key management supports all Selective Availability Anti-spoof Module (SAASM) unique keying
- Single or dual antenna capability allows the spacecraft user installation flexibility and performance
- Uses the radiation hardened Key Data Processor (KDP)
- Available In LEO, MEO or GEO configurations
- Granted the navstar Global Positioning System (GPS) Joint Program Office (JPO) SAASM security approval



General Dynamics' Monarch Precise Positioning Service, Global Positioning Service (PPS-GPS) receiver is designed to meet demanding requirements for any Earth-orbital missions in sight of the GPS constellation.

Our use of advanced digital signal processing technology has set a new standard for spaceborne receiver pseudo-range and carrier phase performance, while affording significant improvements in reliability, radiation hardness and power dissipation. A modular approach to the mechanical design, combined with software/firmware flexibility, allows easy customization for user-specific applications.

Monarch GPS Spaceborne Receiver

Performance Characteristics

General

- Type of Service: Precise Position Service (PPS)
- Number of Simultaneous Antennas: 1 or 2
- Frequencies: L1 & L2
- Signal Power: L1 C/A -135 dBm min.
L1 P(Y) -138 dBm min.
L2 P(Y) -138 dBm min.
- Number of Channels: 12
- Reference Oscillator*: Internal OCXO (user supplied optional)
- Interface*: MIL-STD-1553B or NASA STD
RIU (optional 100 record history buffer)
- Pseudo-range: 25 cm (1); 15 cm typical
- Pseudo-range Bias: < 5 cm (1); 3 cm typical
- Carrier Phase: 0.35 cm (1 sigma/1 sec); 0.15 cm typical
- Carrier Phase Integrity: 0.001 (prob of disruption/hr)

Navigation** (10 sec update)

- Absolute Position: 8.5 m (1); 3 m typical
- Absolute Velocity: 2 cm/s (1); 0.7 cm/sec typical
- Clock Offset Solution Error: 20 ns (1); < 5 ns typical
- Relative Position: 0.5 m (1); 0.25 m typical
- Relative Velocity: 0.005 m/s (1)
- Relative Clock Offset: 4 ns (1)

* Consult factory on options available, including Selective Availability Anti-Spoof Module (SAASM)

** No remote Low Noise Amplifiers or filters required to meet system performance. The GPS system is controlled,

maintained and operated by the U. S. Department of Defense. GPS receivers are subject to degradations of

position and velocity accuracies under Department of Defense imposed Selective Availability.

*** Firmware configurable to unique user dynamics.



Manufacturer reserves the right to change specifications to reflect latest changes in technology and improvements at any time without notice.
Export is subject to U.S. Government regulations

Time Tag Measurements

- Coarse Time Transfer TTL In/Out: 100 ns (1)
- Precision Time Transfer ECL In/Out: 20 ns (1); 5 ns typical
- Relative Time Transfer: 4 ns (1)

Startup Time

- Cold: 35 minutes (Pf > 90%, typ 15 minutes w/key data)
- Warm: 25 minutes (Pf > 90%, typ 3 minutes w/key data)

Physical Characteristics

- Envelope Dimensions: 8.06"L x 7.85"W x 5.52"H
- Weight: 8.2 pounds nominal
- Power: 25 W max; 19 W steady state typ

Environmental Capabilities

- Radiation: 100 krad
- Single Event Upset: < 1 per year
- Single Event Latchup: Immune
- Reliability: 0.91 @10 years, 35°C baseplate, 100% duty cycle
- Random Vibration: 16.6 Grms
- Pyro Shock: 3000 G
- Temperature: -34 to +71°C
- Orbital Dynamics: LEO, MEO, GEO***

GENERAL DYNAMICS

Advanced Information Systems

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