E-SIGI
Enhanced Space
Integrated GPS/INS

- Integrated global positioning/inertial navigation system (GPS/INS) and Mission Computer that meet rigid criteria for reliability, performance, space radiation tolerance and cost
- Mission Computer features PowerPC 603e and VxWorks for hosting application software such as guidance and control
- 12-channel all-in-view GPS receiver with SPS/PPS capability
- Highly accurate navigation-grade inertial sensors
- Triple navigation solutions: pure inertial, GPS-only, and blended GPS/INS
- Differential GPS option for precision landing
- Expansion slot accommodates application-specific inputs/outputs
- Navigation system qualified to launch vehicle, on-orbit and re-entry vehicle environments
- Based on existing high-volume military production line
- Flexible hardware and software system architecture adaptable to varied missions including:
  - Reusable Launch Vehicles
  - Expendable Launch Vehicles
  - Space Transportation Vehicles
  - Rendezvous and Docking
  - Re-Entry Vehicles
  - Target Vehicles
  - Range Tracking
System Characteristics

Form Factor........................................7 x 7 x 9.8 inches
Weight..................................................< 21 lbs
Power Requirements*
+28 Vdc operation.................................34 to 45 watts
Thermal Operating Range*
Ambient air.........................................-54°C to +71°C
(+95°C 30 minutes)
Space vacuum, cold plate interface.....-54°C to +55°C
MTBF*.......................................................20,000 hours

Navigation Performance

Overall Performance.........................better than 0.01 deg/hr
GPS and GPS/INS Blended Performance (SA off)*
Position accuracy......................(SEP) better than 50 m
Velocity accuracy (RMS).................better than 0.3 m/sec
Alignment Time*
Gyrocompass..........................4 minutes

Operating Ranges
Altitude...............................................600 nautical miles
Angular Rate........................................+±360 deg/sec
>±600 deg/sec*
Linear Velocity..............................±12000 meters/sec
Angular Acceleration...............±171 deg/sec²
Linear Acceleration.........................±10g
>±100g*
Jerk.................................................±100 meters/sec³
Interfaces..............................Nav 1553B (RT or BC)
RS422 Serial Data Bus

Mission Computer Performance

Processor
Motorola MPC 8240
>100 MIPS
Memory
32MB SDRAM memory (4Mx64)
8MB Flash memory (2Mx32)
128K x 8 EEPROM history memory
Operating System
VxWorks
Tornado Development Environment
Interfaces............MC 1553B (BC or RT)
7 RS422 Serial Data Bus
8 discrete inputs
8 discrete outputs

* Mission specific -
PowerPC is a registered trademark of Motorola.
VxWorks is a registered trademark of
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