



GEOSTAR™-1

A Compact Agile Spacecraft Bus Designed for Five to Eight Year GEO Missions; Adaptable to MEO

Northrop Grumman's GEOSTAR-1 spacecraft bus is a compact, flexible, high performance platform for a wide variety of defense and civil missions including weather, Earth observation, overhead persistent infrared (OPIR), intelligence surveillance and reconnaissance (ISR), space situational awareness (SSA), position, navigation, and timing (PNT), and tactical communications. The platform is optimized for GEO missions (adaptable for MEO) for launch aboard Minotaur, Falcon, and EELV launch vehicles. The avionics architecture has been configured for single-string, selective, or full redundancy, supporting missions with durations up to eight years. GEOSTAR-1 can accommodate 200W payload power, which is expandable to

700W with expanded solar arrays and additional battery modules, and 1.5 kW with increased bus size. The spacecraft can support payloads up to 150 kg. GEOSTAR-1's precision pointing, knowledge, and agility combined with a large delta-v capacity make it a premier spacecraft for small GEO missions.

PAYLOAD ACCOMMODATIONS

Northrop Grumman's state-of-the-art spacecraft assembly, integration, and testing facilities in Dulles, Virginia and Gilbert, Arizona can accommodate a wide variety of GEOSTAR-1 payloads. Both facilities offer unclassified and classified integration and test areas. Class 10K clean rooms and stringent contamination control processes provide assurance that contamination sensitive payloads are protected. Northrop Grumman has demonstrated parallel GEOSTAR-1 integration and testing operations optimizing the total mission schedule for multi-spacecraft launch missions.

FACTS AT A GLANCE

- Compact 500 kg "mini" GEO bus
- Supports 150 kg payload
- Compatible with Minotaur, Falcon, and EELV launch vehicles for either single or multiple spacecraft launches
- Integrated GPS receiver and star tracker provides precision guidance, navigation, and control for remote sensing missions
- Bi-propellant propulsion and large fuel tanks for up to 1000 m/s delta-V capacity
- Motorized Lightband low shock separation system
- 5 spacecraft delivered through 2016
- Single string, selective, or full redundancy
- All assembly, integration and testing performed at one of Northrop Grumman's two secure 135,000 sq. ft. satellite manufacturing facilities
- Classified and unclassified AI&T facilities
- Class 10K clean rooms

GEOSTAR™-1

SPECIFICATIONS

CORE BUS FEATURES

Spacecraft Mass:	500 kg (w/ propellant)
Redundancy:	Single string (selective and full redundancy available)
Orbit Options:	Optimized for GEO, adaptable to LEO and MEO
Design Life:	5-8 years (>3 year mean mission duration)
Delivery:	24-36 months ARO
Launch Vehicle Compatibility:	Minotaur, Falcon, and EELV

PAYLOAD ACCOMMODATION

Payload Mass:	150 kg
Payload Power:	200W orbit average
Optional Payload Power:	700W with expanded solar arrays and additional batteries, 1.5kW with increased bus size

PROPULSION SUBSYSTEM

Repositioning:	Bi-propellant (310 ISP)
Stationkeeping:	Mono-propellant
Total Delta-V:	750 - 1000 m/s (dependent upon P/L mass)

ATTITUDE CONTROL SUBSYSTEM

Stability Mode:	3-axis
Total Pointing Error:	<0.4 milli-radians (<0.023°) (1°)
Bus Jitter:	<1μ-radian (1°)
Positional Knowledge:	<50 m (3°)
Slew Rate:	1.0°/s
Attitude Determination:	Star Tracker and Gyros
Attitude Control:	High Torque Reaction Wheels
Orbit Determination and Timing:	Integrated GPS Receiver

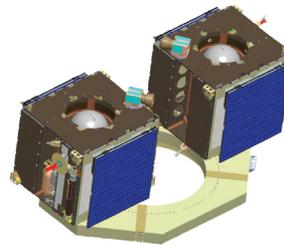
COMMUNICATIONS

Payload Data Downlink:	Up to 100 Mbps with Ka-band option
X-band downlink	
Command Uplink:	S-band, X-band, or Ka-band

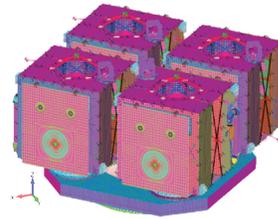
MISSION SERVICES

Customers can procure a GEOStar-1 spacecraft bus alone or as part of a “turn-key” service that includes mission analysis and design, payload definition and procurement, payload integration, full satellite system environmental testing, launch site operations, early orbit checkout, and mission operations.

Northrop Grumman offers fully integrated GEOStar-1 ground segment solutions including remote ground terminals, wide area data delivery networks, spacecraft and payload operations centers, and spacecraft command and control systems.



GEOStar-1 is compatible with single or multiple spacecraft launch configurations



GEOStar-1 spacecraft bus in Northrop Grumman's Dulles, Virginia satellite manufacturing facility

MORE INFORMATION

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