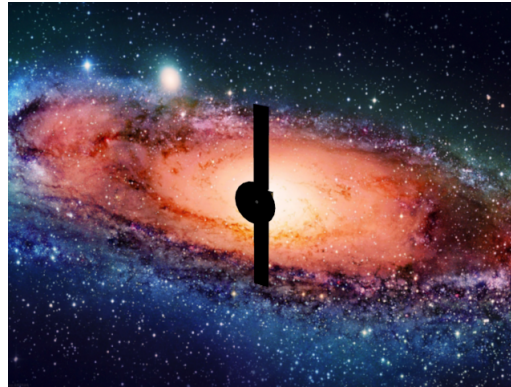


GEO Microsat (GMS)



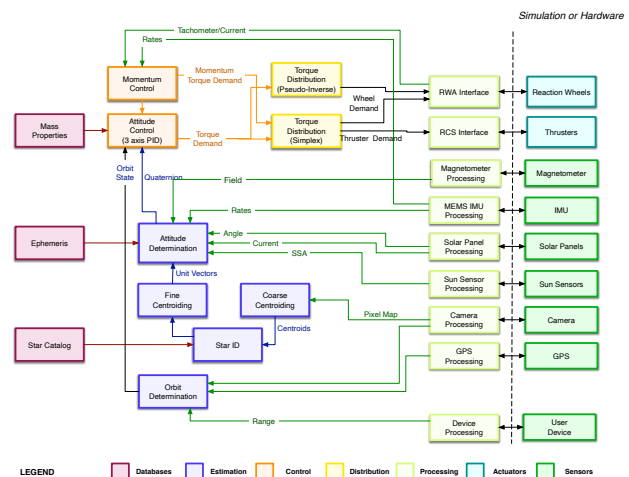
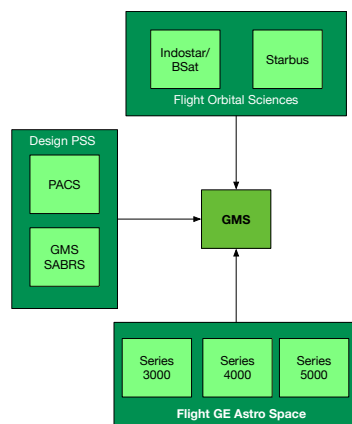
GeoMicroSat (GMS) is a new fully radiation-hard satellite for GEO Internet service and Earth observation. It uses L3 Harris monopropellant hydrazine thrusters for stationkeeping and stationkeeping attitude control. Twelve MR-103G engines and two Hall thrusters provide a combination of high efficiency and high thrust for orbit maneuvers.

Four Honeywell reaction wheels with a Sodern dual-head star camera and Honeywell MEMS IRUs provide attitude control during normal operations. Rotating quad junction solar wings provide 4 kW of power. The flight and technology heritage is shown below.

A New Paradigm in GEO Spacecraft

The diagram in the next column shows the attitude control system architecture. Databases are to the left and hardware interfaces to the right.

The software is written in C++ using the Princeton Satellite Systems ControlDeck™ class library. Modules connect by message passing. The modular ControlDeck class library makes it easy to add your own software.



The satellite is fully autonomous with onboard optical navigation. An Earth-pointing imager is used for optical navigation. Range and range rate are incorporated into the navigation solution when available. Machine Learning algorithms predict the Remaining Useful Life for all components.

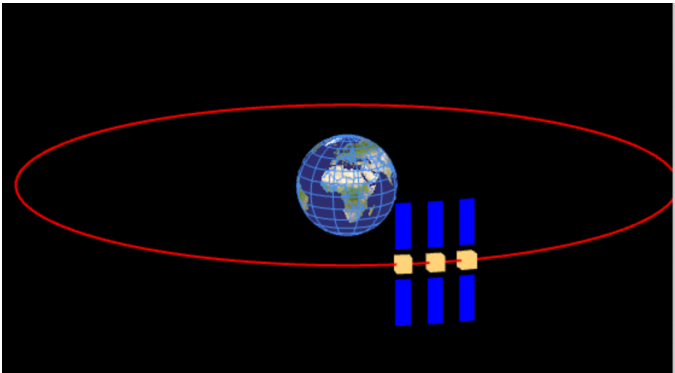
North/South stationkeeping and formation flying with other GMS spacecraft can be performed. The cross-links let the spacecraft coordinate operations.

The GMS properties are shown in the table. Your payload can be added internally or externally. The baseline model is configured for Internet from GEO. This includes a 4-meter C-band antenna and Ka-band crosslinks. Additional sensors can be added to the nadir face to meet your needs.

The spacecraft uses a simple RS-422 bus making it compatible with most space hardware. The S-band communications systems is compatible with all ground stations.

The spacecraft is three-axis stabilized. It can mix reaction wheels and thrusters for reorientation or attitude control.

Formation flying software is included at no extra charge. This lets you fly a constellation of GMS satellites in one geosynchronous slot.



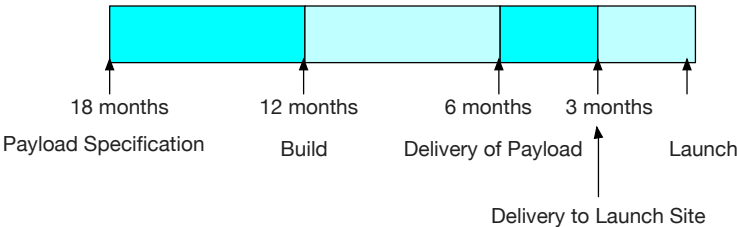
This enables synthetic aperture radiometry for ground water sensing. Both active and passive radiometry can be employed.

We also provide a high-fidelity verification simulation that you can use for operator training, anomaly investigations or the development of your own flight software.

The communications system is fully compatible with 5G OFDMA. The C-band system has 3 kW of power. Ka-band cross-links allow multiple satellites to work together to provide Internet service. The time lag is less than 0.25 s.

GMS is the most advanced geosynchronous satellite you can buy. Its combination of heritage hardware and sophisticated algorithms make it the first choice for geosynchronous satellites.

Dimensions	150.0 x 100.0 x 150.0 cm
Number of thrusters	12
Power Bus	3300.00 W
Power Solar	4401.86 W
Power Hall	826.87 W
Power Communications	3000.00 W
Lifetime	10.00 Years
Hydrazine	6.56 kg
Xenon	8.82 kg
RWA	Honeywell HR04
Star Tracker	Hydra
Processor	BAE Endura 3U
S-Band	L3 Harris C/TT-520
Battery	56.11 kg
Number of Batteries	52.00
Telemetry	S Band Omni
IRU	Honeywell HG4934SRS IRU
Databus	RS-422
Dry Mass	291.96 kg
Solar Panels per Wing	5.00
RWA Torque	5.43 mNm
RWA Momentum	0.98 Nms
180 Deg Maneuver	6.00 min
Data rate phone	1.09 Gbps
Data rate 50.0 cm antenna	368.92 Gbps



Company Information

Founded in 1992, Princeton Satellite Systems is an innovative engineering firm pushing the state-of-the-art in aerospace, energy and control. We help our customers implement control systems that are easy to use and understand. We were an integral part of the control system development for the Indostar-1 Communications Satellite, NASA ATDRS, the GPS IIR satellites and the Prisma space rendezvous robots. Our extensive satellite operations experience includes AsiaSat, Telstar and Koreasat.

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