

GeoEye-1 Earth Imaging Satellite

world's highest resolution commercial satellite

The GeoEye-1 satellite is a next-generation earth-imaging platform with the highest resolution and most advanced collection capabilities of any commercial imaging satellite developed to date.

Under contract to GeoEye (Dulles, VA), General Dynamics is providing mission system engineering, design and manufacture of the spacecraft bus, procurement and integration of the camera and optical telescope assembly, EMI/EMC and environmental testing of the integrated satellite, and on-orbit checkout. The camera and optical telescope assembly is being developed by ITT Corporation (Rochester, NY).

General Dynamics' spacecraft design is based on our SA-200HP standard modular bus, with additional design heritage from our Coriolis (USAF/USN), Swift (NASA), and Gamma-Ray Large Area Space Telescope (NASA) spacecraft developments. The fully redundant GeoEye-1 spacecraft has a design life of seven years and a sophisticated attitude control system to provide a highly stable, while also highly agile imaging platform.



Features

- Launch Mass: 1955 kg (4310 lbm)
- 3862 W EOL Solar Array
- Orbit: 684 km (369 naut mi) Polar, Sun Synchronous
- Data Downlink: 150 or 740 Mbps, X-Band
- Revisit Time: < 3 Days
- Design Life: 7 years (15-yr Fuel Supply)
- Maximum Pointing Knowledge Error: 0.133 arcseconds rms (0.4 at 3σ)
- Maximum Attitude Jitter: 7 milli-arcsec/sec rms, 25 - 2000 Hz
- Slewing: to 2.4 deg/sec with acceleration to 0.16 deg/sec².
- Image Resolution:
 - 0.41 meter panchromatic
 - 1.65 meter multispectral
- Satellite Daily Collection Capacity (nadir to 40°):
 - 700,000 sq km panchromatic
 - 350,000 sq km multispectral
- Launch: 2007 on Delta II 7420-10 from Vandenberg AFB

Performance Characteristics*

General	Dimensions, Stowed: 14.27 x 8.86 ft dia (4.35 x 2.7 m) Orbit: 684 km (369 naut mi) @ 98° inclination Thrusters: (8) @ 5 lbf (22.2 N) each Propellant Onboard: 144.5 kg (318.6 lbm) - 15 yr supply Reliability/Life (predicted): 0.75 @ 7 years Launch Date and Vehicle: 2007 on a Delta II 7420-10
Mass & Power	Launch Mass: 1955 kg (4310 lbm) Bus Mass: 1260 kg (2778 lbm) Solar Array: Deployable, 7-panel, GaAs, 3862 W EOL Battery: 160 amp-hr NiH ₂ CPV
C&DH	Standard cPCI backplane/bus, RAD750 CPU, block redundant with automated handover to backup MIL-STD-1553B data bus 1000 Gbit (1 Tbit) bulk storage for image data, ancillary data, and stored SOH data
ADCS	3-axis stabilized, (8) high-performance RWAs, ZMB Dual-head star tracker, scaleable space IRU, 10-cell coarse sun sensor, (2) GPS receivers, (3) EM torque rods, and a TAM Bi-axial gimbal drive for antenna pointing Pointing Accuracy (3 σ): 75 arcsec Pointing Knowledge (3 σ): 0.4 arcsec Attitude Jitter: 0.007 arcsec/sec rms (25 - 2000 Hz)
Structure & Thermal	An optical bench, attached to the spacecraft through kinematic mounts, provides precise thermally controlled alignment of the instruments Compatible with standard Delta model 6306 payload attach fitting Passive cold-biased thermal system, thermostatically-controlled heaters
Comm Links	X-band imagery downlink; rate selectable to 740 Mbps or 150 Mbps S-band command uplink at 64.0 kbps X-band telemetry/SOH downlink at 59.7 kbps
Camera/Imaging	Line scan imaging system with time delay integration Three-mirror anastigmat telescope with two fold-mirrors 1.1 m clear aperture; 13.3 m focal length Field of View: > 1.28° Resolution at Nadir: 0.41 meter panchromatic; 1.65 meter multispectral Satellite Daily Collection Capacity (nadir to $\pm 40^\circ$): 700,000 km ² panchromatic 350,000 km ² multispectral Revisit Time: < 3 days

*Data reflects actual performance, or current best estimates, as of: 10/13/06, Rev A

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