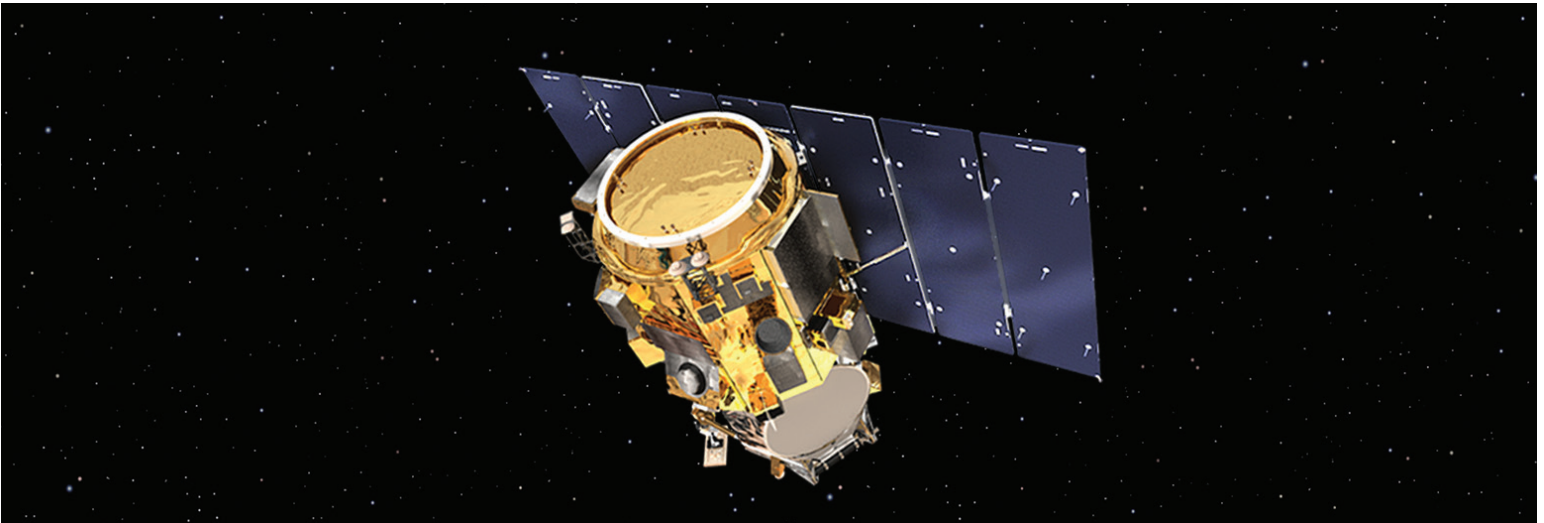# Orbital ATK

GeoEye-1

Highest Resolution Commercial Imager Launched to Date

FACT SHEET

Mission Description

GeoEye-1 is a multispectral, Earth-imaging satellite with some of the highest resolution and most advanced collection capabilities of any commercial imaging satellite launched to date. The satellite orbits the Earth's poles to capture detailed digital images, and can revisit any point on Earth once every three days or sooner. GeoEye-1 offers unprecedented spatial resolution by simultaneously acquiring panchromatic (black and white) and multispectral (color) imagery at 0.41 meter (1.3 feet) and 1.65 meter (5.4 feet) resolutions respectively. This orbiting Earth observatory can collect up to 700,000 square kilometers of panchromatic and up to 350,000 square kilometers of multispectral imagery per day. One thousand gigabits of image data storage is available onboard for "store and forward" operation with a 150/740 megabits per second selectable-rate X-band downlink for stored or real-time imagery data. Ground objects can be geo-located from the satellite to better than five meters without ground control points.

Spacecraft

Orbital ATK was the prime contractor for the design, assembly, payload integration, and test of the satellite. Orbital ATK also administered and managed the subcontract with Exelis for the Electro-Optical Camera Assembly. The spacecraft design is based on Orbital ATK's flight-proven LEOStar™-3 standard modular bus, with additional design heritage from our Coriolis, Swift, and Fermi Gamma-ray Space Telescope spacecraft programs. 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. We continue to provide on-orbit support to GeoEye-1. Availability over the mission date is at 98 percent.

FACTS AT A GLANCE

- High-performance successor to Orbital ATK's Orbview-3 satellite
- Hi-resolution color and black and white imaging with a 1,000 Gb onboard solid state data recorder and a 740 Mbps downlink
- 681 km, 98° (near polar) Low Earth Orbit mission
- Simple, easily integrated design based on Orbital ATK's flight-proven LEOStar-3 modular spacecraft architecture that reduces assembly and test cycle times
- Resolution to 0.41 m (16 in.) and mapping of natural and manmade features to within 5 m (16 ft.) of their actual location on the surface of the Earth without ground control points
- Precision attitude control system and highly agile camera allows daily collection of up to 700,000 sq. km of black and white imagery and up to 350,000 sq. km of color imagery

Customer:
GeoEye, Inc. (now DigitalGlobe, Inc.)

The Partner You Can Count On™

GeoEye-1

Specifications

Spacecraft

Mass:	1,920 kg (4,232 lb.)
Solar Arrays:	Deployable, 7-panel, GaAs cells, 3862 W EOL
Orbit:	681 km circular @ 98°, sun synchronous
Stabilization:	3-axis, Zero Momentum Bias, nadir pointing
Pointing:	75 arcsec control, 0.4 arcsec knowledge
Data Storage:	1,000 Gbits
Data Downlink:	X-band, 740 Mbps or 150 Mbps selectable
Propulsion:	144.5 kg (318.6 lb.) of blowdown monopropellant hydrazine with eight 22N thrusters
Mission Life:	7 year design; 15 year fuel supply

Launch

Launch Vehicle:	Delta II 7420-10
Launch Site:	Vandenberg Air Force Base, California
Date:	September 6, 2008

Instrument

Electro-Optical Camera Assembly

The Optical Telescope Assembly, detectors, focal plane assembly and highspeed digital processing electronics are capable of processing 700 million pixels per second. The agile camera allows for side-to-side extensions of the camera's 15.2 kilometer (9.44 mile)-wide swath or multiple images of the same target during a single pass to create a stereo picture.

GeoEye-1 at its Vandenberg Air Force Base launch site

Mission Partners

Orbital ATK

Prime contractor responsible for spacecraft design and manufacture, administration of camera and optics subcontract, payload integration and system test, development of a Mission Operations Center, launch support, and mission operations support

Exelis

Design, build, and test of the payload camera and optics (the Electro-Optical Camera Assembly)

Agility Means More Imagery per Pass

GeoEye-1 makes 15 orbits per day in its sun-synchronous orbit passing over a given area at about 10:30 a.m. local time every day. GeoEye-1 can "revisit" any point on the globe every three days or sooner, depending upon the required look angle. The entire satellite is able to turn and swivel very quickly in orbit to point the camera at areas of the Earth directly below it, as well as from side-to-side and front-to-back. This agility enables GeoEye-1 to collect much more imagery during a single pass.

GeoEye-1 satellite image of Paris, France
(DigitalGlobe photo)
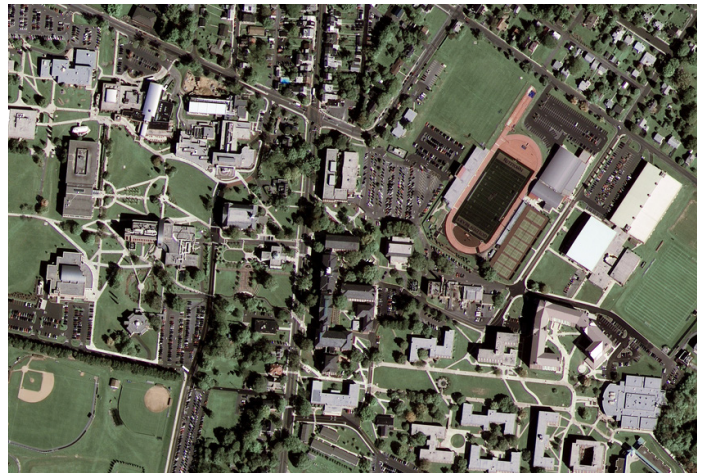
GeoEye-1 satellite image of Kutztown University
(DigitalGlobe photo)