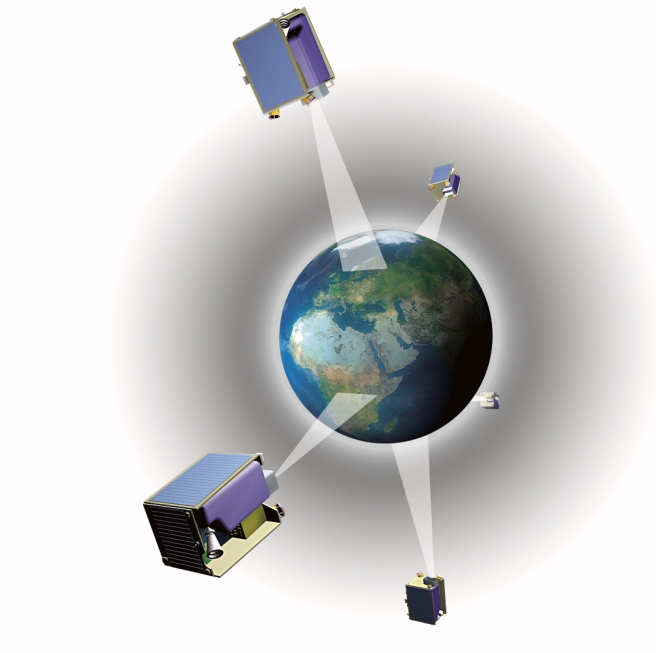
MACDONALD DETTWILER®

RapidEye Mission

RapidEye is a small satellite commercial mission being developed by MacDonald Dettwiler & Associates (MDA). This unique system will enable unprecedented global monitoring of the Earth's surface.

The mission will provide rapid delivery of land information products and services to the agricultural industry for crop monitoring and mapping, yield predictions and natural disaster assessment.

MDA is the prime contractor for the mission responsible for the design and implementation of a turnkey system, including space and ground segments, launch, in-orbit commissioning, calibration of the spacecraft constellation, and establishing the mission operations infrastructure.



MISSION OVERVIEW:

A constellation of five satellites is scheduled to be launched in 2007. The satellites will be placed in a single sun-synchronous orbit of 620 km, equally spaced 19 minutes apart, ensuring consistent conditions for imaging of a particular area.

The RapidEye system can image any area on Earth within a day and cover the entire agricultural areas of North America and Europe within an average of five days. RapidEye will generate 1,500,000 square km of ortho images from the raw data, providing users with high-quality, timely imagery tailored to their specific needs.

Orbit	**620 km, sun synchronous**
Number of Satellites	**5**
Spacecraft Mass	**150 kg each**
Image Data Downlink	**>60 Mbps**
Onboard Data Storage	**>1500 km of image data**
Max. Spacecraft Roll Angle	**± 25 degrees**
Payload Type	**Push broom Optical Imager 5 Optical bands**
Swath	**78 km**
Nadir Pixel Ground Sampling Distance	**6.5 m**
Global Revisit Time	**1 day**
Average Repeat Period (Europe and North America)	**<5 days**
DEM Generation Capability	**Yes**
Mission Life	**7 Years**

SPACECRAFT:

These small satellites, each measuring less than 1 metre cube and each weighing only 150 kg. provide a high degree of reliability and performance.

The spacecraft comprises two primary subsystems - the bus and payload.

Bus:

The spacecraft bus is based on flight proven hardware that has evolved over many missions. The compact, yet robust design provides a reliable, low risk platform for the RapidEye mission.

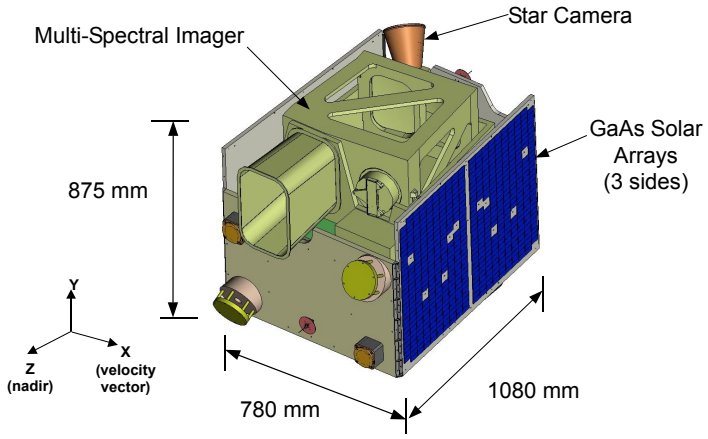
The bus houses the computers, propulsion, communications and electrical power equipment.

Key elements include:

- Redundant spacecraft onboard computers to perform all bus housekeeping functions
- Launch vehicle interface
- The spacecrafts attitude control system employing four reaction wheels for 3-axis stabilization for accurate pointing at the Earth. A star camera provides high accuracy attitude information
- The cold gas propulsion system using a resistojet thruster and redundant actuation system to ensure the satellite stays in its orbit.
- On-board GPS to provide accurate orbit knowledge and time synchronization with the payload
- Redundant S-Band communication systems and X-Band downlinks
- The power system consists of three GaAs solar panels providing 100W of power generation in the sun. NiCd battery packs, multiple battery charge regulators (two per panel) and power distribution and switching electronics

Payload:

The payload on each spacecraft includes a Multi-spectral Imager and a Payload Electronics Unit. The Multi-spectral Imager is a pushbroom style imager which images the Earth in five spectral bands. The imager can scan a 78 km swath at 6.5m resolution at nadir. Image data is stored in 35 gigabits of mass memory storage before being transmitted to ground stations.



GROUND SEGMENT:

Building on our 25-year heritage of delivering fully-operational ground stations around the world, MDA will develop the ground segment featuring commercial off-the-shelf hardware and MDA proprietary software that has been selected for its performance, maintainability and expandability.

The ground segment consists of:

- A dedicated Spacecraft Control Centre to control the spacecraft constellation
- A ground segment that provides the data processing, archiving facilities and customer interface
- Commercial data downlink sites
- An interface to RapidEye AG s product processing facility that uses the image data from the ground segment to generate the information products needed by customers.

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