



SWARM ON ROCKOT

Facts and Figures

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ESA Earth Explorer Opportunity Mission from Plesetsk in 2013

Contract Award

Following the two successful launches of the Earth Explorer satellites GOCE and SMOS on Rockot in 2009, the European Space Agency (ESA) awarded a follow-on contract to Eurockot for the joint launch of the three Swarm satellites. Swarm is the third Earth Explorer Opportunity Mission within ESA's Living Planet Programme.

Mission Objectives

The Swarm mission will explore the Earth's magnetic field and its change over time with unique accuracy and detail. Swarm is a constellation of three satellites, each weighting approximately 500 kg. Each of the identical satellites is equipped with new generation scalar and vector magnetometers, an accelerometer and an electric field instrument. In combination they will provide simultaneous observations of different Earth regions. These data are required to model various sources of the magnetic field. Additionally, information about the interaction of the magnetic field with other physical parameters (e.g. ocean circulation) will be provided.

Launch Specifics

Rockot will place the three Swarm satellites into a polar orbit of approximately 500 km altitude and inclination of 87,6°. The satellites will then move into different polar orbits of similar altitudes, using their own propulsion systems.

To ensure the precise separation of all three satellites and to exclude the risk of collision with each other, a special adapter/-dispenser system was developed by Khrunichev, using a point fixation system with a pyro-technically activated mechanical lock system.

The contract between Eurockot and ESA includes the following specific features:

- Spacecraft point attachment using a pyro-technically activated mechanical lock system
- Simultaneous separation of all three spacecraft
- Magnetically clean interfaces crucial for the highly sensitive equipment on the spacecraft

Mission Partners

The industrial prime contractor for the three Swarm satellites is EADS-Astrium GmbH in Friedrichshafen, Germany. The propulsion and structure subsystems are subcontracted to EADS-Astrium Ltd in Stevenage, UK. The Canadian Space Agency develops the electric field instrument and the French Space Agency CNES provides the absolute scalar magnetometer.

Nominal Launch Characteristics

The Swarm spacecraft will be launched from the Plesetsk cosmodrome, Northern Russia, where Eurockot maintains its own preparation and launch facilities.

The Swarm mission has the following launch parameters:

Launch Vehicle	Rockot/Breeze-KM
Launch Site	Plesetsk Cosmodrome, Russia Located at 63°N, 40°E
Launch Pad	Eurockot Pad LC133
Payload	Swarm (3 satellites)
Payload Mass	approx. 1500 kg (approx. 500 kg per satellite)
Injection Orbit Altitude	approx. 500 km
Injection Orbit Inclination	87,6°
Injection Orbit Eccentricity	0
Planned Lift-Off Date	2013

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