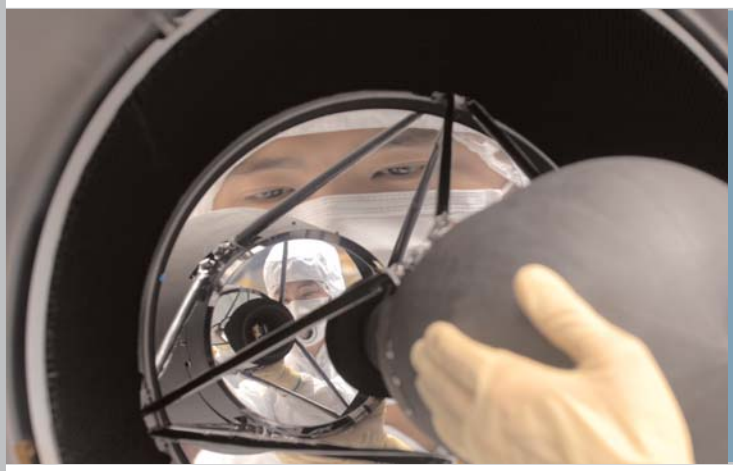
Raytheon

Advanced Responsive Tactically Effective Military Imaging Spectrometer (ARTEMIS)



Flexible, affordable, and quickly launched when needed, ARTEMIS brings new tactical space surveillance capabilities to field commanders.

Benefits

- Quick-reaction optical payload spots hidden targets
- Provides real-time intelligence data to field commanders
- Can be launched as needed
- Designed to be mounted on a satellite, launched, and in orbit within days
- Significantly reduces overall space mission costs

Designed for TacSat3

The goal of the U.S. Department of Defense Tactical Satellite 3 (TacSat3) program is to demonstrate the feasibility of the Pentagon's "responsive space" vision: to give field commanders flexible, affordable options for obtaining real-time tactical surveillance data from space as needed.

The U.S. Air Force selected Raytheon to research and develop the surveillance sensor for TacSat3. This groundbreaking space sensor was to be designed and built in less than 15 months as a rapid development project for the Air Force Research Laboratory's Space Vehicles Directorate. To meet the challenge, Raytheon designed the Advanced Responsive Tactically Effective Military Imaging Spectrometer (ARTEMIS) — a sophisticated hyperspectral imaging sensor.

Realizing the Vision

ARTEMIS makes extensive use of commercial off-the-shelf components and industry standard interfaces to create an affordable, high-performance space-based surveillance option. It also realizes the responsive space vision of fast, flexible launch and use capability.

The innovative ARTEMIS payload covers the visible through short-wave infrared spectrum. Its components include a high-resolution panchromatic imager, telescope, optics, focal plane array, and control/readout electronics. In addition to sensor development and delivery, Raytheon's TacSat3 responsibilities include integration support and assistance during in-flight calibration verification.

Powerful Field Support

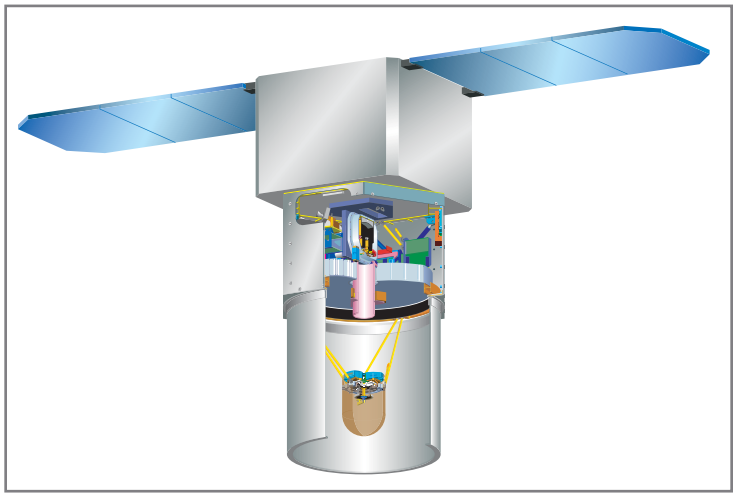
The responsive space approach calls for satellites to be kept in readiness at holding facilities for quick deployment as needed. Upon demand, they would be rapidly assembled, configured, and transported to nearby sites for quick launch into low Earth orbit — some 200 miles overhead. The TacSat3 program envisions deployment of a satellite bearing the ARTEMIS payload within as little as seven days from receiving the request.

Once in orbit, ARTEMIS's quick-reaction optics will enable it to see otherwise hidden targets. The hyperspectral

imager can detect and identify threats on the ground. The ARTEMIS system will enable field commanders to access the intelligence data collected almost immediately, greatly reducing critical response time and enhancing battle assessment capabilities.

The Wave of the Future

TacSat3 and its ARTEMIS payload herald the future of space-based surveillance systems. Launch-on-demand satellites are more flexible and affordable than long-life satellites, with systems that can be tailored for specific missions or to augment existing satellite constellations. Coupled with advanced surveillance, reconnaissance, and communications capabilities such as ARTEMIS, these satellites will enable military commanders to act more quickly and effectively than ever before.



TacSat-3 Mission Objectives

TacSat-3 will demonstrate

- Hyperspectral imaging products
  - Rapid response to a user-defined need for target detection and identification
- Next-generation plug-and-play capability
  - Rapid development of the space vehicle — integrated payload and spacecraft bus — using components and processes developed by the Operationally Responsive Space Modular Bus Program
- Rapid launch within days from alert status
  - Rapid deployment from alert status for launch to theater control (within seven days projected)
- Responsive theater communications
  - Responsive delivery of decision-quality information to operational and tactical commanders by enabling tactical tasking and data delivery
- Low-cost implementation of an objective system
  - Deliver fieldable capability within reasonable cost constraints

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