空へ挑み、宇宙を拓く

Small Demonstration Satellite-1

（SDS-1）

Japan Aerospace Exprolation Agency

(JAXA)

Outline of SDS-1

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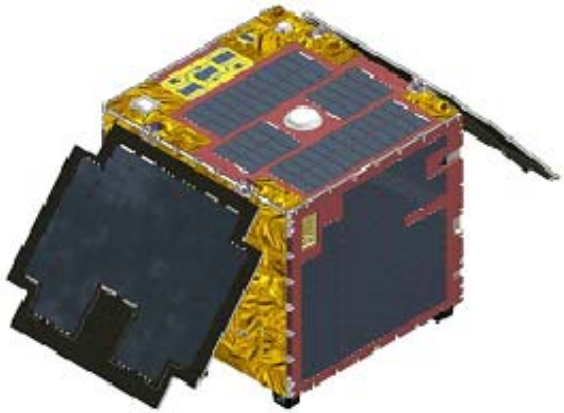
Objectives

As part of our efforts to improve the reliability of satellites, we verify our new technologies at the part, material, or component level in space by using a small satellite to improve our technological achievements.

We will carry out operational experiments on new technologies in space to apply them for future satellite development.

Major Characteristics:

Dimensiont: 70cm × 70cm × 60cm
Mass: about 100kg
Power generatoin: about 140W
Altitude: 660km



Spin axis (3rpm)
40 degreees against the Sun light

Sun syncronous orbit
Inclination = 98.06 degrees

SDS-1 Onboard Mission Equipment

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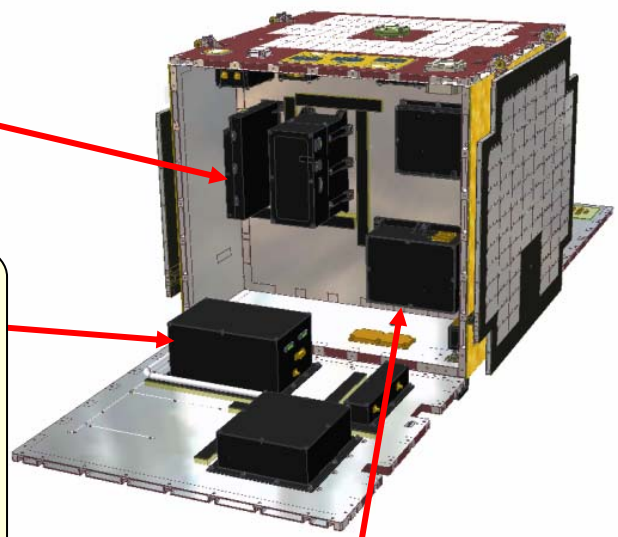
Space Wire Demonstration Module *1

By using the high speed MPU*2 developed for space by JAXA, we will verify new-generation network type data processing technology, which is improved technology based on the current international standard of the space wire.



Multi-mode Integrated Transponder

Four types of communication functions that are scheduled to be used for future satellites have been made smaller and lighter so that they can be placed in a conventional transponder size box.

- USB function (Telemetry and command function that is the same as that of the conventional satellite bus system)
- QPSK function (Faster transmission speed)
- CDMA function (Interference avoidance function for the operation of a multiple number of satellites at the same time, and simultaneous tracking)
- SSA function (Inter-satellite communication function)

Advanced Microprocessor In-orbit Experiment Equipment

The in-orbit functional experiments on the high performance computer board consist of JAXA develpped componetns including the 320MIPS class 64 bit MPU SRAM, DC/CD convertor, and the Power MOSFET.

*1 Space wire: a communication network device that is loaded onto space equipment such as a satellite

*2 MPU: Micro Processor Unit
Data processing chip that is the core of the computer

SDS-1 Development Schedule

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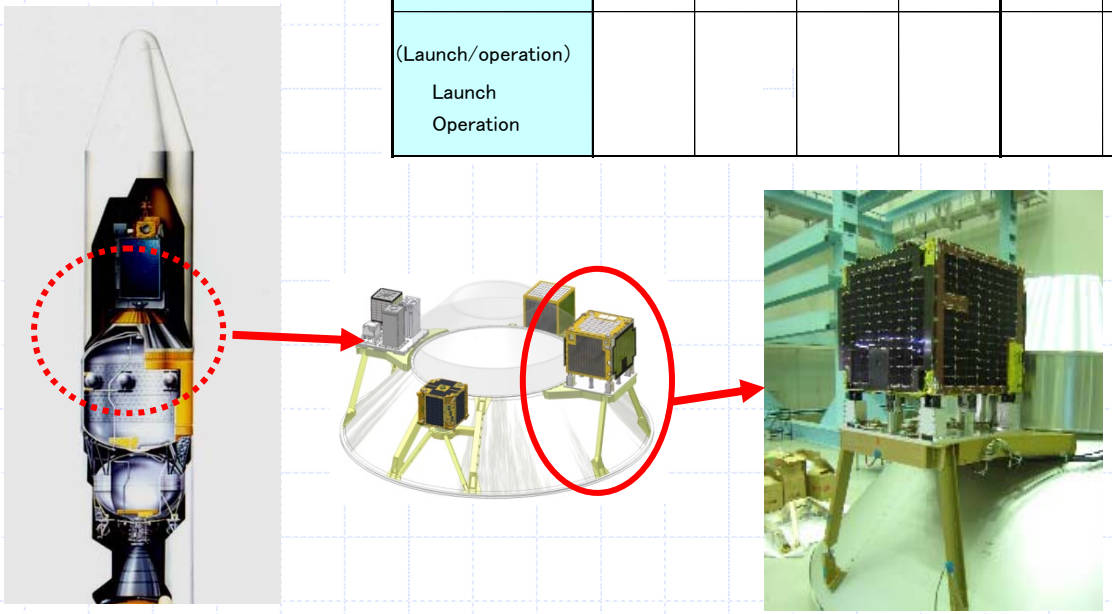
Japan Fiscal Year	JFY 2006	JFY 2007	JFY 2008
Milestone	△ System requirements confirmation review; △ System definition confirmation review; △ Plan review	△ Design confirmation review	△ Development completeion review; △ Launch
(Design) Preliminary design / Design	Conceptual design; Design (basic, detailed)	Maintenance design (manufacturing/test)	
(Manufacturing Tests) BBM / PFM equipment / PFM system	BBM equipment/system; Flight equipment manufacturing/tests	System assembly tests	
(Launch/operation) Launch / Operation			Launch site operations



Inhouse Satellite by JAXA Young Engineers

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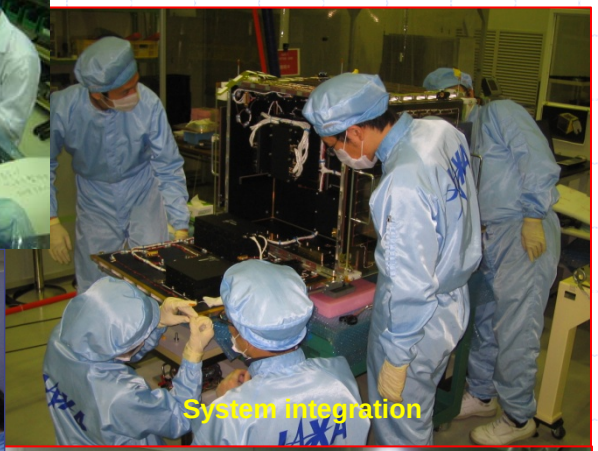
Design confirmation review

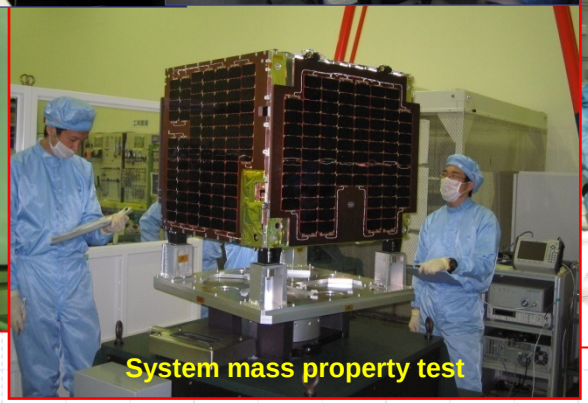

Environmental tests of the equipment


Battery assmbly


System integration


Various review meetings


System thremal vasuum tests


System mass property test

System vibration test