

Space Solutions for a Better Society

Japan Aerospace Exploration Agency (JAXA) is the research and development organization that leads Japan's aerospace initiative with responsibilities ranging from the research, development and utilization of satellites to research and development of rockets, the space station and aircraft, and space science and exploration.

The relationship between JAXA and NEC is long and marked by numerous impressive milestones. They include the February 1970 launch of Japan's first satellite "OHSUMI" by the Institute of Space and Aeronautical Science (University of Tokyo) – one of the predecessors of JAXA; the launch of "KIKU-1" – the first satellite developed by the National Space Development Agency of Japan which is another forerunner of JAXA; and the Geostationary Meteorological Satellite "HIMAWARI". More recent achievements such as "DAICHI" (Advanced Land Observation Satellite) which performs highly detailed land observation and is making a large contribution to the production of maps, disaster surveys and other purposes; the "KIZUNA" telecommunications satellite for ultra-high speed Internet communications with expanded capacity; and Japan's first large-size lunar explorer, the SELENE: SELEnological and Engineering Explorer "KAGUYA" were developed by NEC. They also played a major role in the development of the Asteroid Explorer "HAYABUSA" which stirred the imagination with its epic journey to collect samples from an asteroid and return them to the earth. From observation sensors, telecommunications equipment and electronic components to ground station systems, NEC is engaged in diverse areas that support the space program, and indeed could be described as a leading company supporting the Japan's development of space.

Even among diverse areas of development and utilization of space pursued by Japan, satellites and other systems that utilize space is particularly indispensable to the lives of our citizens and global society, providing meteorological information, telecommunications and broadcasting, GPS and other vital services. JAXA's Space Applications Mission Directorate which I head is charged with the development, operation and promotion of the development of business to utilize land observation satellites, telecommunications satellites, GPS satellites and other satellites that support our lives, but recently we not only drive the advance of these activities but also are expected to open up new frontiers for space utilization.

Also, the Basic Space Law enacted in May 2008 and the Basic Plan for Space Policy which was formulated in June 2009 and provides a fundamental roadmap for Japan's development and practical of the space environment, pave the way for a shift from an R&D-driven policy to one advanced by practical utilization of space, and demand our maximum exploitation and utilization of hitherto untapped potential in a variety of fields.

Accordingly, it is necessary for our future space activities put an unprecedented focus on practical



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utilization of space. For example, in the case of satellite-based space systems, while making advances in utilization that contributes to the solving of planet-wide issues such as global warming and climate change, regional issues including food, water management and disaster observation and other social issues, we believe that it is vital to target new space utilization areas in response to the needs of society and to create new missions.

Even higher expectations from citizens and the government for the future development and utilization of space that benefits society demand that we exploit the fruits of heretofore technological R&D and address global environmental problems and other issues that people everywhere have in common. At the same time, while we cannot expect national investment in the space program amid the current financial challenges facing the nation, the expansion of both hitherto limited space utilization by the government and public agencies and demand from overseas and the private sector are expected.

In order for us to effectively respond to this situation, we must not only tackle lowering the cost of high-performance satellites and other hardware and provide them in a shorter time frame, but also cooperate with both domestic and overseas satellite users, identify and define potential needs that these users are currently not aware of, and then develop concrete responses – in other words, a major issue for JAXA is improving our capability to provide solutions. For this purpose, it is important to build a cooperative system that brings together the government, users, space agencies and corporations. It can be said that there will be especially high expectations for the integrated strengths of corporations to contribute to the development of solutions.

In unison with government agencies and the private sector, the government is currently advancing a strategy to promote overseas business in not only areas such as high-speed rail and nuclear power, but also space systems. The government is pursuing a package-type overseas strategy - a policy to promote the sales and provision of satellites, rockets, ground station facilities and other system solutions to overseas clients as a total package. While offering a level of technology on a par with overseas competitors, Japan's space agency's record of achievements does not compare favorably and requires reinforcement from the private sector. JAXA is committed to aggressively tackling this issue.

NEC is both a leading company and long-time partner in our country's space development and utilization initiative, and has been active in a broad range of areas. We anticipate even further contributions from NEC in the coming years.



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Remarks for Special Issue on Space Systems

The Business of Space: Our Vision and Roadmap

NEC Tackles the Global Business of Space Solutions

◇ Papers for Special Issue

Progress with the implementation of NEC's Roadmap

Fusion of Space Technologies and IT/Network Technologies

Strategies aimed at the Entry of Space Systems Business Enterprise to the Global Market

Promotion of Service Oriented Businesses for Space Utilization

Development of the ASNARO, an Advanced Space System

Technologies/Products supporting roadmap implementation (Satellites/Space station)

Development of the Japanese Experiment Module (JEM), KIBO for the International Space Station

Development of the Venus Climate Orbiter PLANET-C (AKATSUKI)

Development of Small Solar Power Sail Demonstrator IKAROS

Development of the KAGUYA (SELENE), a Lunar Orbital Spacecraft

Development of the Earth Observation Satellite "DAICHI" (ALOS)

Development of the Wideband InterNetworking Satellite WINDS (KIZUNA)

Small SAR Satellite Technology Promotes Dissemination of a Comprehensive Space Utilization System

Technologies/Products supporting roadmap implementation (Satellite ground system)

Ground Systems Supporting Satellite Operations

Data Processing System for Advance of Earth Observation Data

Technologies/Products supporting roadmap implementation (Satellite Bus)

NEXTAR Standard Platform for Quick Startup of Remote Sensing Operations

Standard Components of Satellite-borne Equipment

Technologies/Products supporting roadmap implementation (Communication)

Communications Technologies Supporting Satellite Communications

Satellite Transponder Equipment in Active Worldwide Use

Technologies/Products supporting roadmap implementation (Observation sensors)

Optical Sensor Technology Supporting the Greenhouse Gases Observing Satellite (GOSAT, or IBUKI)

Radio Frequency Sensor Technology for Global Rain and Cloud Observation

SAR Image Processing Technologies are Improving Remote Sensing Data

An Industrial Waste Monitoring System Based On the Use of Satellite Images

Technologies/Products supporting roadmap implementation (Fundamental technologies)

Fundamental Space-Supporting Technologies and Their Development Process

Element Technologies for Trajectory Design for Lunar/Planetary Exploration

Development of a Radiation-Hardened POL DC/DC Converter for Space Applications

Qualification Situation and Future Deployment of PWBs for Space Development Use

Technologies/Products supporting roadmap implementation (Guidance control computer)

Guidance Control Computer for Launch Vehicle

Asteroid probe MUSES-C (HAYABUSA)

Results Achieved from the Development and Operation of the Asteroid Probe MUSES-C (HAYABUSA)

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NEC C&C Foundation 25th Anniversary Memorial Award



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April, 2011

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