

# ■ Remarks for Special Issue on Space Systems

Our lives and how they relate to the frontiers of space are entering a period of dramatic change. With the enactment of the Basic Space Law in 2008, we are rapidly transitioning from “Space for development activities” to the “utilization of space”. In every imaginable field from telecommunications, the earth observation from space and global positioning to meteorology, disaster prevention and the environmental surveys, the utilization of space is moving forward and increasingly touching the lives of people in diverse ways. Also in our mid-term growth plan announced in 2010, space systems are identified as one of the industrial areas where we intend to make advances in the future. We are committed to transforming our space-related business into an industry that makes even more contributions to society.

In NEC Group Vision 2017, we set forth our aim to “to be a leading global company leveraging the power of innovation to realize an information society friendly to humans and the earth”, and immediately launched a variety of activities. In order to make this vision a reality, the “Cloud Society” - a world where people around the planet can use ICT (information and communications technology) services via advanced networks anywhere and anytime - will be indispensable, and advances in the utilization of space will play a vital and effective role in dramatically expanding the menu of cloud services for this new society.

Against this background, NEC Space Systems is furthering development of related technologies, increasingly aware of the necessity to transform our company into an enterprise that can contribute even more towards building an affluent society friendly to humans and the earth.

Beginning with our leadership in the development of Japan’s first satellite Ohsumi launched in 1970, the story of the growth of NEC Space Systems has mirrored the history of Japan’s exploration and development of space. Recently NEC has been in the spotlight for its work in the development and manufacturing of the asteroid probe, “HAYABUSA”. Other NEC pioneering space developments in the news include satellites such as the Advanced Land Observing Satellite (ALOS) “DAICHI” which serves as a space eye on the earth for advanced applications ranging from mapping to resource surveys, and the super high-speed Internet tel-

ecommunications satellite “KIZUNA” which relayed high-definition broadcasts of the Beijing Olympic Games. Currently NEC is in charge of the development of an advanced small-satellite, “ASNARO” (Advanced Satellite with New system ARchitecture for Observation). With this positioned as a core product, NEC is setting its sights on developing global markets. I, myself, have headed missions to South America (August 2010) and Asian countries (February 2011) to promote the export of infrastructure and advanced systems in the space industry, and found an enthusiastic reception and an abundant need for our space system solutions. Now packages centered on small-satellites (satellite manufacturing, launch, ground station systems, satellite exploitation services, related human resource development, etc.) that respond to the space-utilization needs of such emerging countries are the focus of increasing attention.

As a leading company in the space industry, NEC is multiplying efforts to answer these and other needs. Guided by the two key phrases “globalization” and “providing solutions”, we are tackling the development of the above-described packages and promoting various standardization methods. On a platform of space technologies honed to a cutting edge over the history of Japanese space exploration and development, NEC aims to answer the expectations of users by providing “space system solutions” that will make a contribution in markets around the world.

This special issue will describe our vision for NEC’s space system business, our roadmap to its achievement, and details of the activities and programs that will lead us to our destination. These pages will also introduce the reader to the various space-related products that will provide a launch pad for our business as well as the platform technologies behind them.

I hope that you enjoy this in-depth look at our space solution business and the promising future it holds, and you will continue to provide us with encouragement and invaluable support in the future.

**NISHIMURA Tomonori**  
Senior Vice President



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## Vol.6 No.1 Space Systems

Space Solutions for a Better Society

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)

### ◇ NEC Information

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2010 C&C Prizes Ceremony

NEC C&C Foundation 25th Anniversary Memorial Award



Vol.6 No.1

April, 2011

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