

SASKE R&D program

Small Advanced Satellite for Knowledge of Earth

March 4th, 2009

Norihiko SAEKI

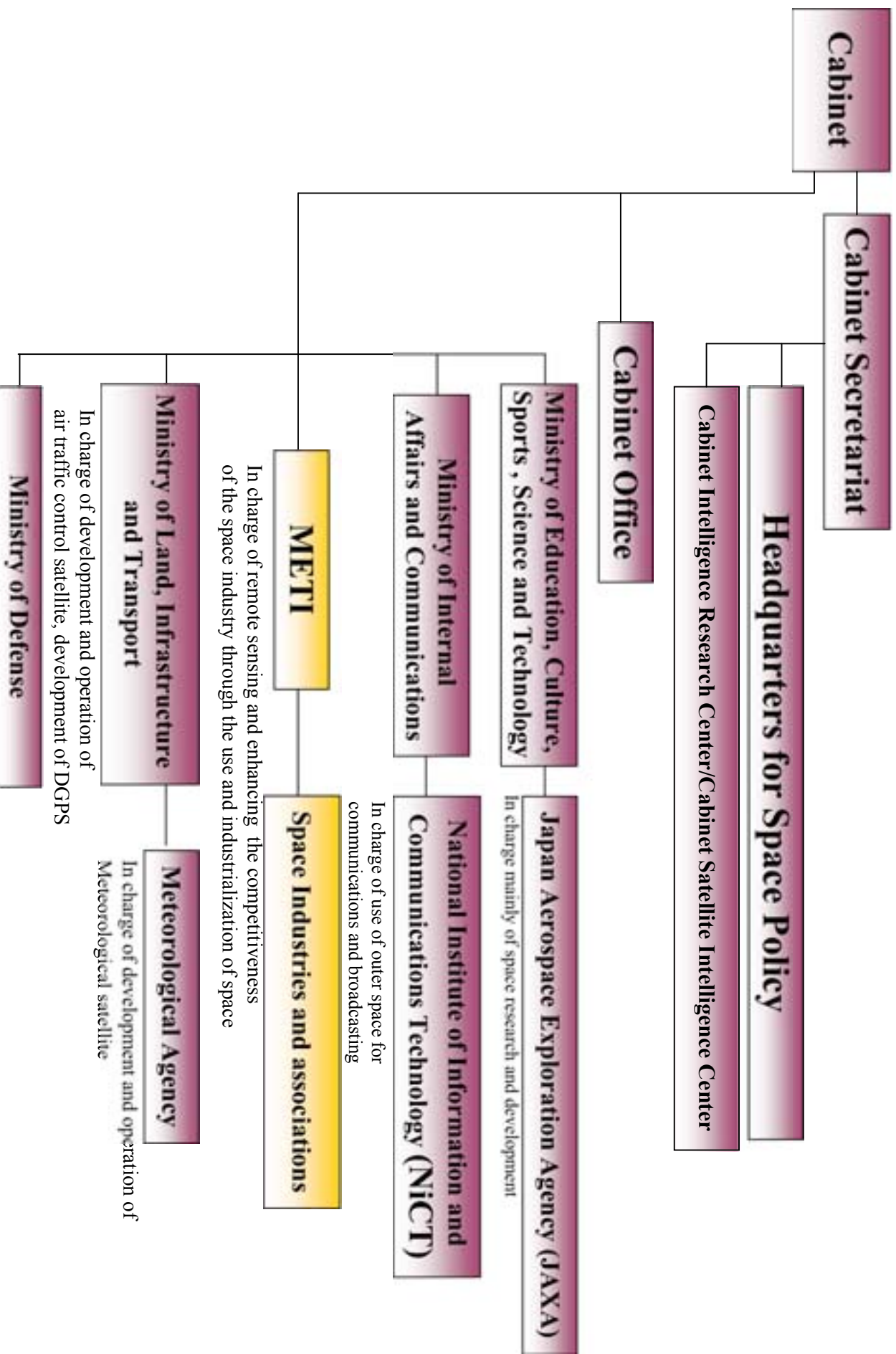
Visiting Scholar of Johns Hopkins University

Deputy Director, Aerospace and Defense Industry Division, METI

saeki-norihiko@meti.go.jp

Cell: 202-556-8881

1. Role of METI



(Reference) METI's Remote Sensing Projects

JERS-1 Project

<Japanese Earth Resources Satellite-1>
[JAXA (former NASDA)]
(1981-2003)



Courtesy of JAXA

OPS

<Optical Sensor >



SAR

<Synthetic Aperture Radar>



<OPS>

VNIR: 3band, 18x24m@60X60km
NEC
SWIR: 4band, 18x24m@60x60km
NEC

<SAR>

L-band SAR, 18m@75x75km
Polarimetry: HH
Mitsubishi Electric

ADEOS Project

<Advanced Earth Observing Satellite>
[JAXA (former NASDA)]
(1989-1997)



Courtesy of JAXA

IMG

<Interferometric Monitor for Greenhouse Gases>



Fourier Transform Infrared Radiometer
based on Michelson interferometer
for Metan gas
Toshiba

TERRA Project

[NASA]
(1987-)



Courtesy of NASA

ASTER

<The Advanced Spaceborne Thermal
Emission and Reflection radiometer>



<VNIR>

3band, 15m@60X60km
NEC

<SWIR>

6band, 30m@60x60km
Mitsubishi Electric

<TIR>

5band, 90m@60x60km
Fujitsu

ALOS Project

<Advanced Land Observing Satellite>

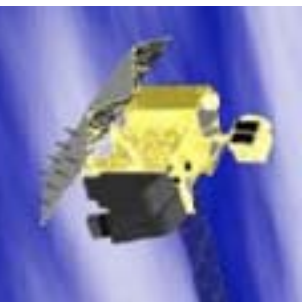
[JAXA]
(1987-)



Courtesy of JAXA

PALSAR

<Phased Array type L-band Synthetic Aperture Radar>



< L-band SAR >

10-100m@70x70km-350x350km

Polarimetry (HH, VV, HH+HV, VV+VH,

HH+HV+VH+VV)

Mitsubishi Electric

Disaster Monitoring Project

[JAXA]

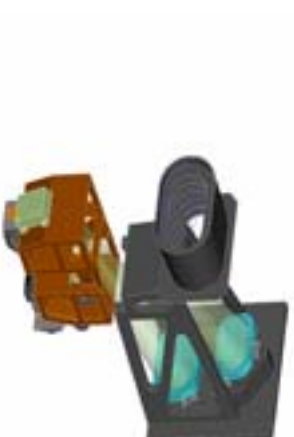
(2008-<T.B.D.>)



Courtesy of JAXA

Hyper Spectral Sensor

(2006-)



<Hyper Spectral Sensor>

185 band (400~2500nm), 30m@30x30km

NEC

<Multi Spectral Sensor (VNIR)>

4 band, 5m@90x90km

NEC

2. SASKE - Specifications

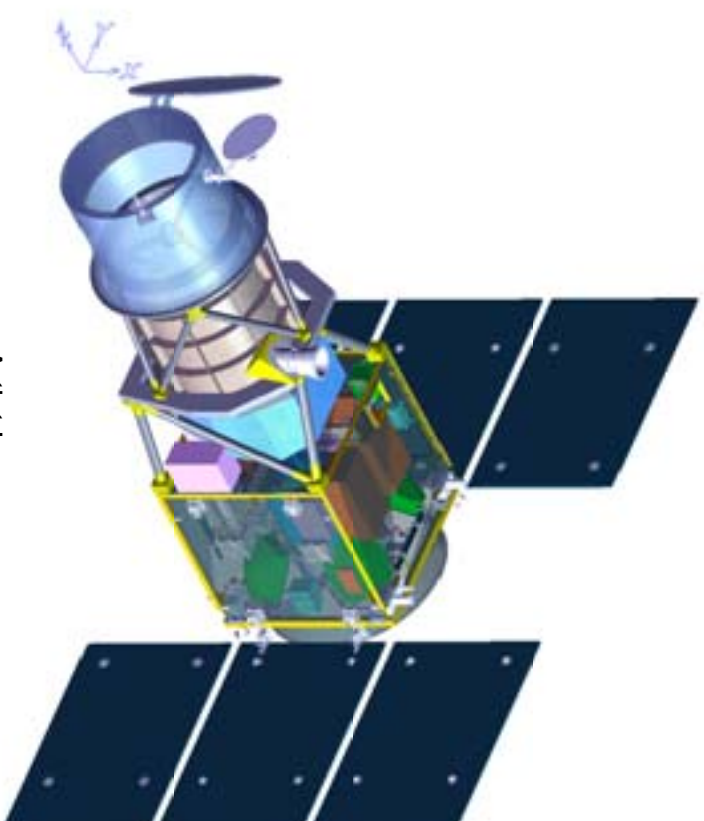
SASKE R&D program:

Small Advanced Satellite for Knowledge of Earth
named after Japanese famous Ninja “Sarutobi Sasuke”



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Specifications	
Ground Sample Distance	Pan < 0.5m, Multi < 2m
Swath Width	10km
Spectral Resolution	6 bands (Multi)
Data Transmission Rate:	800Mbps
Agility	45deg/45s (Ave. 1deg/s)
Launch Schedule	2012 (tentative)
Orbit	SSO
Height	504km
Inclination	97.4 degree
Life time	3 years (5 years expected)
Total mass	450 kg
Size	2.5m X 3.5m X 3.2m (in orbit)
Electrical power	1300 W (3 years)
Target Cost	< 30 mil dollar



Artist Image

2. SASKE – expected imagery



Resolution < 0.5m



Resolution < 1m

(reference) World remote Sensing Satellites (Optical)

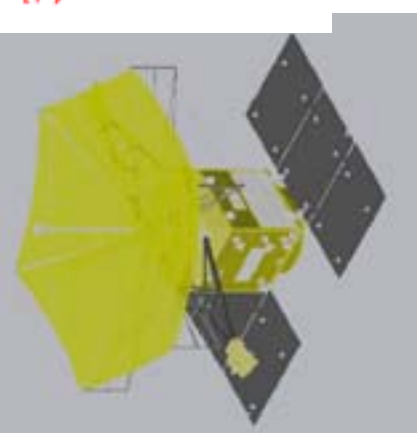
Satellite	Mode	GSD (m)	Swath Width (km)	Band(s)	Weight (kg)
GEOEYE-2(US)	Pan	0.25	-	-	1
	Pan	0.41	15.2	-	1
GEOEYE-1(US)	Multi	1.64	-	-	-
	Pan	<0.5	10	10	1
SASKE (Japan)	Multi	<2	10	6	450
	Pan	0.46	16.4	1	2800
WorldView-2 (US)	Multi	1.5	16.4	8	2500
	Pan	0.5	17.6	1	955
WorldView-1 (US)	Pan	0.6	16.5	1	955
	Multi	2.4	16.5	4	1000
Pleiades-1 (Fr)	Pan	0.7	20	1	1000
	Multi	2	20	4	1000
Pleiades-2 (Fr)	Pan	0.7	20	1	350
	Multi	2	20	4	350
EROS-B(Israel)	Pan	0.7	14	1	350
	Pan	0.7	11	1	350
EROS-C(Israel)	Multi	2.8	11	4	-
	Pan	0.7	-	-	1
KOMPSAT-3(Korea)	Pan	0.7	-	-	1
	Pan	0.7	-	-	1

(a) Integrated and Movable Ground Station



- Integrated
Satellite Based data
Aerial Based data
- Movable
providing solution

(b) SAR (Res<1m)



- High resolution < 1m
- Low cost, short delivery

2. SASKE - Manufacturer

NEC

<http://www.nec.com/global/solutions/space/>

- World sophisticated satellite manufacturing company
- Great expertise in satellite systems, space-based remote sensing and data handling
- Ground station for remote sensing satellite



President
Kaoru Yano

(note) Satellite development is promoted under supervision of NEDO, USEF and in corporation with ISAS JAXA

Company Name	NEC Corporation
Head Office	7-1, Shiba 5-chome, Minato-ku, Tokyo 108-8001, Japan
Date of Establishment	July 17, 1899
President	Kaoru Yano
Consolidated Net Sales	¥4,215.6 billion (Fiscal year ended Mar. 31 2009)
Major Operations of the NEC Group	IT Service, IT Products, Network Systems, Social Infrastructure, Personal Solutions, Electron Devices
Employees	143,327 (Including consolidated subsidiaries as of Mar. 31, 2009)
Consolidated Subsidiaries	328 (As of Mar. 31, 2009)

2. SASKE - Distributor



Measure the Earth, Here and Beyond

URL:<http://www.pasco.co.jp/global/english/>

- World Largest Aerial Photogrammetry Company
- Distributor of TerraSAR-X imagery*
- *PASCO has the exclusive distributorship of TerraSAR-X for Japanese markets while having the non-exclusive right for overseas markets.
- Great expertise in sensor technology, data processing and advanced technology of imagery
- Ground station for remote sensing satellite
- Global network



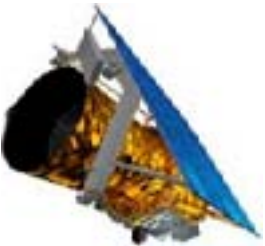
President and CEO
Yoichi Sugimoto

Corporate Name	PASCO
Date of Establishment:	October 27, 1953 (Registered date: July 15, 1949)
Amount of Capital:	JPY8,758 million (as of March 31, 2009)
President and CEO:	Yoichi SUGIMOTO
Net Sales:	JPY40.3 billion (consolidated basis, F.Y. ended March 31, 2009)
Head Office:	1-1-2 Higashiyama, Meguro-ku, Tokyo 153-0043, Japan
Number of Employees:	2,256(consolidated basis as of March 31, 2009)

- PPP schemes have been adopted in the commercialization of Satellite Remote Sensing.

examples

OClear view/ Next View



Commercial
Distribution Right
→



OTerraSAR Series



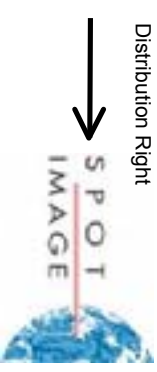
Commercial
Distribution Right
→



OSPOT Series



Commercial
Distribution Right
→



3. Data Policy under the Basic Plan for Space Policy

Chapter 3 Measures that the Government should take comprehensively and systematically for the use and R&D of space

2. Promotion of specific measures in each area

(1) Promotion of the use and R&D of space to support realization of a secure, pleasant and affluent society

1) Building the satellite data utilization system

(c) Creating of standard data policy

For a preparation of the satellite data distribution system, it is necessary to examine the way to provide data in consideration of a balance between the method of data provision from a viewpoint of usage promotion and the market deployed globally on a commercial basis and also in consideration of usage purposes, image resolution as well as a use fee.

Further, it is necessary to organize the way of thinking to process information by secondarily adding other information to the provided satellite data and providing data to the third party, in collaboration with the movement of the related areas such as "Basic Plan for the Advancement of Utilizing Geospatial Information".

Besides the above, it is necessary to create and publish guidelines as standard data policies for provision of satellite data including preparation and standardization of metadata and security policies such as preventions of database falsification, and to prepare an environment for a safe use by showing requirements for the data use.

The concerned parties of relevant government agencies and private companies will examine these measures and summarize them into a standard data policy *within one or two years*.

3. Data Policy under the Basic Plan for Space Policy (cont'd)

Chapter 3 Measures that the Government should take comprehensively and systematically for the use and R&D of space

2. Promotion of specific measures in each area

(2) Promotion of the use and R&D of space to reinforce the security of Japan

2) Data management for national security

As commercial imaging satellites already reached high resolution ability, other countries have set rules to regulate general use of high resolution image information, such as "shutter control" (a regulation of shooting, distribution and sales of images of important facilities for security purpose) and sales restriction of images which exceeds certain levels of resolution.

Taking into consideration the future advancement of the research and development of higher resolution imaging satellites, Government will examine to create necessary rules from the viewpoint of national security in collaboration with the Committee on the Advancement of Utilizing Geospatial Information.