INTRODUCTION TO
SPACE TECHNOLOGY INSTITUTE (STI)

Hanoi, August 20th, 2009
CONTENTS

- Space Technology of Vietnam until 2020
- Organization structure
- Departments’ activities
- Hoa Lac Space center
STRATEGY FOR RESEARCH AND APPLICATION OF SPACE TECHNOLOGY OF VIETNAM UNTIL 2020

Promulgated on June 14th, 2006
STRATEGY FOR RESEARCH AND APPLICATION OF SPACE TECHNOLOGY OF VIETNAM UNTIL 2020

Objectives of the strategy

Form the national policy and legal frame for research, application and international cooperation on space technology, human resource policies;

Coordinate the research and application operation at government level;

Build the initial infrastructure for space technology including: ground station and center for satellite image processing, satellite based positioning system;

- to adopt the small satellite technology transfer;

- to accomplish and operate the corresponding ground stations.
Objectives of the strategy

Manufacture and launch earth observation small satellites

Apply the space science and technology to reality, and satisfy the need of service, education, environment, health etc.

- Expand and commercialize the products applied space technology.
ESTABLISHMENT, VISION & MISSION

MAIN OBJECTIVES

- Establishment of the national space program for research and development
- Establishment of a remote sensing database center
- Develop and launch 01 pico-satellite
- Develop and launch 01 Earth observation remote sensing micro-satellite
- Application of RS, GIS and GPS for environment and disaster management
- Promote space education to schools and universities
STI ORGANIZATION STRUCTURE
DEPARTMENTS’ ACTIVITIES
DEPARTMENTS’ ACTIVITIES

DEPARTMENT OF RESEARCH AND DEVELOPMENT OF SATELLITE TECHNOLOGY

• Research and development of Earth observation small satellite technology:
  - Develop bus functional simulation SYSTEM for small satellite
  - Conduct the preparedness of the VNSAT Project (Vietnam Earth observation small Satellite)
  - Organize the training course and seminar on EO satellite technologies

• Design and manufacture of meteorological satellite receiving stations

For training: Built a teaching aids model of KoDSAT’s satellite, which was manufactured on CNC machining machines with high accuracy. It is the real scale.
Design and manufacture of meteor-satellite receiving systems

• To receive WEAFAX images from GMS-5 satellite orbited at 36,000km, 1400E
• To receive NOAA/APT images from polar satellite NOAA orbited at 800km
DEPARTMENT OF REMOTE SENSING APPLICATIONS

• To conduct the research on new application of RS and GIS
• To promote the use of RS and GIS for natural resources assessment and environmental monitoring
• To develop the software applying newly developed image processing techniques
Land-use Map of Mekong Delta 2000
DEPARTMENTS’ ACTIVITIES
DEPARTMENT OF REMOTE SENSING TECHNOLOGY, GIS AND GPS

Develop Remote sensing technology, GIS, GPS for natural resource and environment management, make natural resource maps, support the territorial planning and establish database on resources and environment.

Natural Hazard Monitoring – Assessment - Management

Urbanization study in Hanoi

Flood Monitoring
Integration of Remote Sensing Data into the model for River basin
General environmental Management

DEPARTMENTS’ ACTIVITIES
DEPARTMENT OF REMOTE SENSING TECHNOLOGY, GIS AND GPS
• Design and manufacture of passive microwave radiometers (L, C, X bands).
• Utilizations of MW radiometers and passive MWRS methods to determine SMC, biomass, SST, SSS, etc.
• Conduct and promote Space education for junior students and children (water rocket, space drawings competitions, etc.)

DEPARTMENTS’ ACTIVITIES
DEPARTMENT OF INSTRUMENT RESEARCH AND DEVELOPMENT

Data process in the Microwave Laboratory

To measure soil moisture content (SMC) on crop fields

To determine biomass on corn field

Software for RDM data receiving and processing

L band microwave Radiometer
Radiometer calibration with Blue sky

Receiving data on ship board

Measure wind speed & coordination by GPS receiver

Comparing SST with MODIS image
DEPARTMENTS’ ACTIVITIES
DEPARTMENT OF AEROSPACE DYNAMICS & PRECISION MECHATRONICS

- **Aerospace Dynamics & Structural Dynamics**
  - Hypersonic flow, unstructured grid computation, aeroacoustics
  - Engineering materials and structures

- **Flight Dynamics & Control**
  - Study dynamic behavior of flight systems
  - Develop key technologies in flight control

- **Micro & Nano Mechatronics**
  - Design & develop Nano positioning & Nano measuring machine

- **Robotics**
  - Design & develop intelligent mobile robot for education, research, service, etc.

Robot Kit

SACR

HEXAPOD

Wind/solar power station
VAST Cubesat Project

Research, Design, Simulation & Manufacturing of Pico satellite (~1kg)

- Duration: 2007 – 2008
- International partner: JAXA
HOA LAC SPACE CENTER
PROJECT OBJECTIVES

- Space science & technology research
- Basic space science and Space technology application
- Space technology transfer center for socio-economic development
- Promotion of international cooperation projects in space science & technology
HOA LAC SPACE CENTER

LOCATION

30km west of Hanoi

6-lane highway in construction
HOA LAC SPACE CENTER
MAIN SECTIONS

Office of HLSC Administration

Research Area
- Science & technology research
- Key laboratory of space technology

Development & Application Area
- Observatory
- Ground Station
- Data base & satellite image processing center
- AIT

Education Area
- Technology service & transfer center
- Exhibition & Library
In cooperation with French:
Launch: 2012
Mission: EO
Sensor: Optical
Live: 5 years

In cooperation with Japan:
Launch: 2013
Mission: EO
Sensor: Radar/Optical
Live: 5 years
<table>
<thead>
<tr>
<th>Area</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest cover</td>
<td>• Forest cover mapping</td>
</tr>
<tr>
<td></td>
<td>• Forest cover change monitoring</td>
</tr>
<tr>
<td></td>
<td>• Carbon and biomass monitoring</td>
</tr>
<tr>
<td>Natural resource management</td>
<td>• Land management and agriculture suitability analysis</td>
</tr>
<tr>
<td></td>
<td>• Water resource management</td>
</tr>
<tr>
<td></td>
<td>• Forest management and planning, biodiversity monitoring (National</td>
</tr>
<tr>
<td></td>
<td>biological reserve, national park)</td>
</tr>
<tr>
<td></td>
<td>• Study in environment and oceanic resource</td>
</tr>
<tr>
<td></td>
<td>• Sustainable planning</td>
</tr>
<tr>
<td></td>
<td>• Soil erosion</td>
</tr>
<tr>
<td>Environment management</td>
<td>• EIA research for road and hydropower plan construction</td>
</tr>
<tr>
<td></td>
<td>• Vulnerability analysis and impact of the climate change</td>
</tr>
<tr>
<td>Urban planning</td>
<td>• Urban growth monitoring</td>
</tr>
<tr>
<td></td>
<td>• Regional planning</td>
</tr>
<tr>
<td>Coastal zone management</td>
<td>• Coastline change monitoring</td>
</tr>
<tr>
<td></td>
<td>• Coastal zone environment</td>
</tr>
<tr>
<td></td>
<td>• Integrated coastal zone management</td>
</tr>
<tr>
<td></td>
<td>• Coastal environmental risk</td>
</tr>
</tbody>
</table>