

The state and development direction of the geodetic VLBI station in Korea

Contents

1

Introduction

2

Korea Geodetic Datum

3

The state of Korea VLBI for geodetic

4

Future Plan

5

Conclusions

1. Introduction - Korea

Location



1. Introduction - Korea

- Official Name : Republic of Korea(commonly referred to as South Korea)
- Location : The Korean Peninsula(the northeastern region of the Asian continent)
- Area : 223,170 (Korean Peninsula), 100,032 (South Korea)
- Capital City : Seoul
- Population : 48.91 million
- Language : Korean(Writing system : Hangeul)
- National Flag : Taegeukgi



1. Introduction - NGII

Organization

Minister of Land, Transport and Maritime Affairs

National Geographic Information Institute

President

Planning & Policy Div

- Law & regulation
- International relation
- Planning & coordination
- Map museum management

General Service Div.

- General affairs
- Accounting
- Customer service

Geodesy Div.

- Geodetic surveying
- **Space geodetic section(VLBI)**
- Geophysical survey

Geospatial Imagery Div.

- Remote sensing
- Photogrammetry

Geographic Info. Div.

- Spatial data
- GIS standard
- Geographic information detection

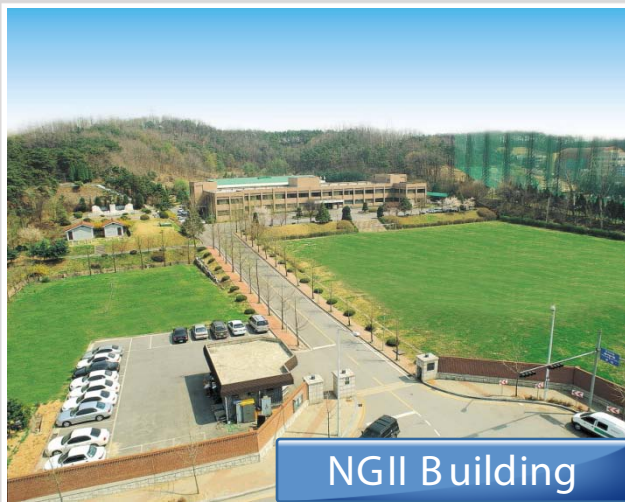
National Land Surv.Div.

- Land survey
- Information & management

1. Introduction - NGII



Map museum



NGII Building

Vision

- Realization of intelligent digital land data management in the 21st century

Main Mission

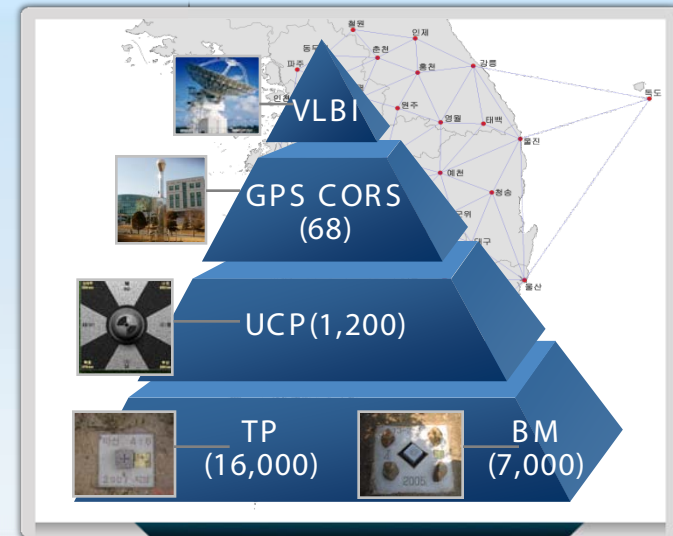
- To establish surveying standard and implement surveying policy
- To maintain national control points
- To produce national base map
- To construct national geospatial database
- To publish geographic book and land survey results
- To operate geographical names committee
- To develop surveying and GIS technology
- To strengthen relationship with overseas organizations

www.ngii.go.kr

2. Korea Geodetic Datum



UCP(Unified Control Point) : longitude and latitude
+ elevation + gravity + imagery reference point



1910-2002	Period	2003 ~ Present
Local datum	Coordinates system	ITRF2000 (epoch2002.0)
Bessel	Reference Ellipsoid	GRS80

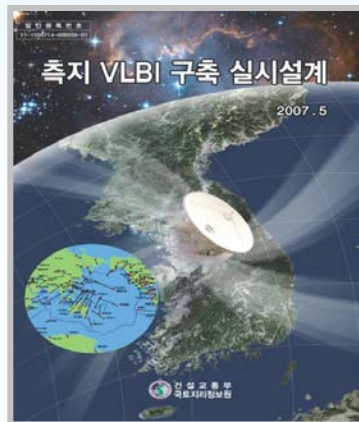
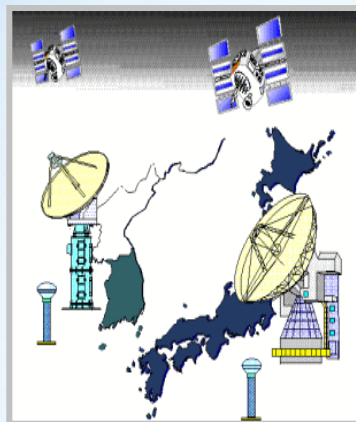
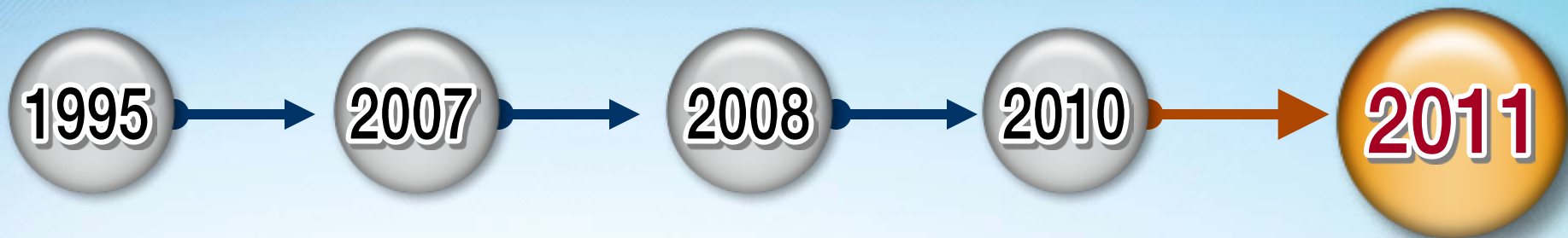
3. The state of Korea VLBI for Geodesy

 Bird's-eye view



3. The state of Korea VLBI for Geodesy

Overview



First geodetic VLBI between Korea - Japan

Conceptual design of KVG was fixed

Antenna site was fixed

KVG system development started

KVG system construction will be completed

3. The state of Korea VLBI for Geodesy

Budget

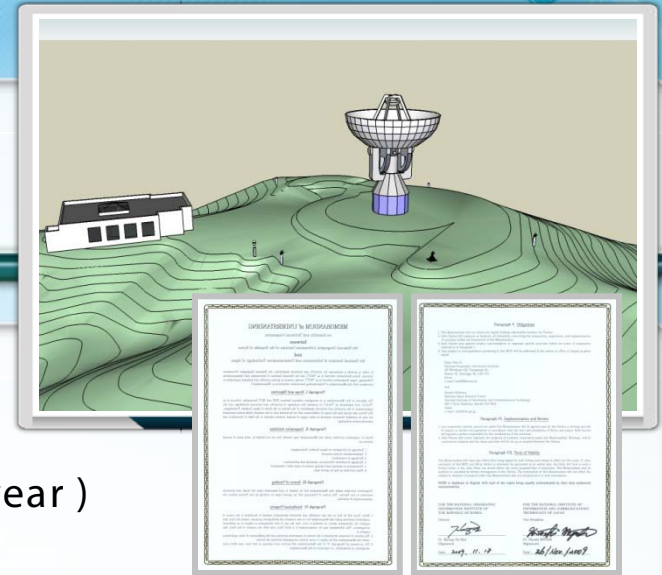
- System : 10.7 million USD

Construction period

- System : 2008/10 ~ 2011/12 (3 year)
- Observatory & Road : 2010/3 ~ 2011/12 (2 year)
- Total Period : 2008/10 ~ 2011/12 (3 year)

Collaboration

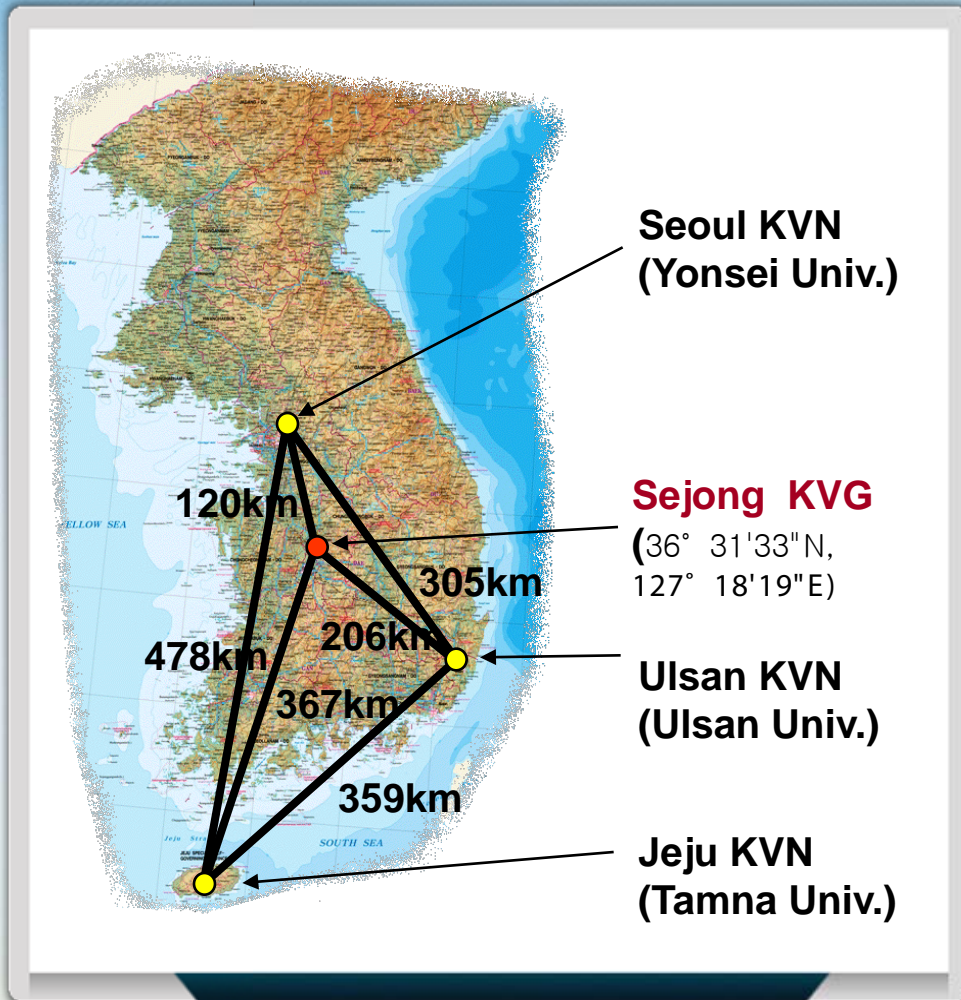
- Domestic collaboration : Ajou Univ. , High gain Antenna Co.,Ltd. , GigaLane Co.,Ltd.
- International collaboration : Japanese institutions
 - National Institute of Information and Communications Technology (NICT)
 - Geographical Survey Institute (GSI).



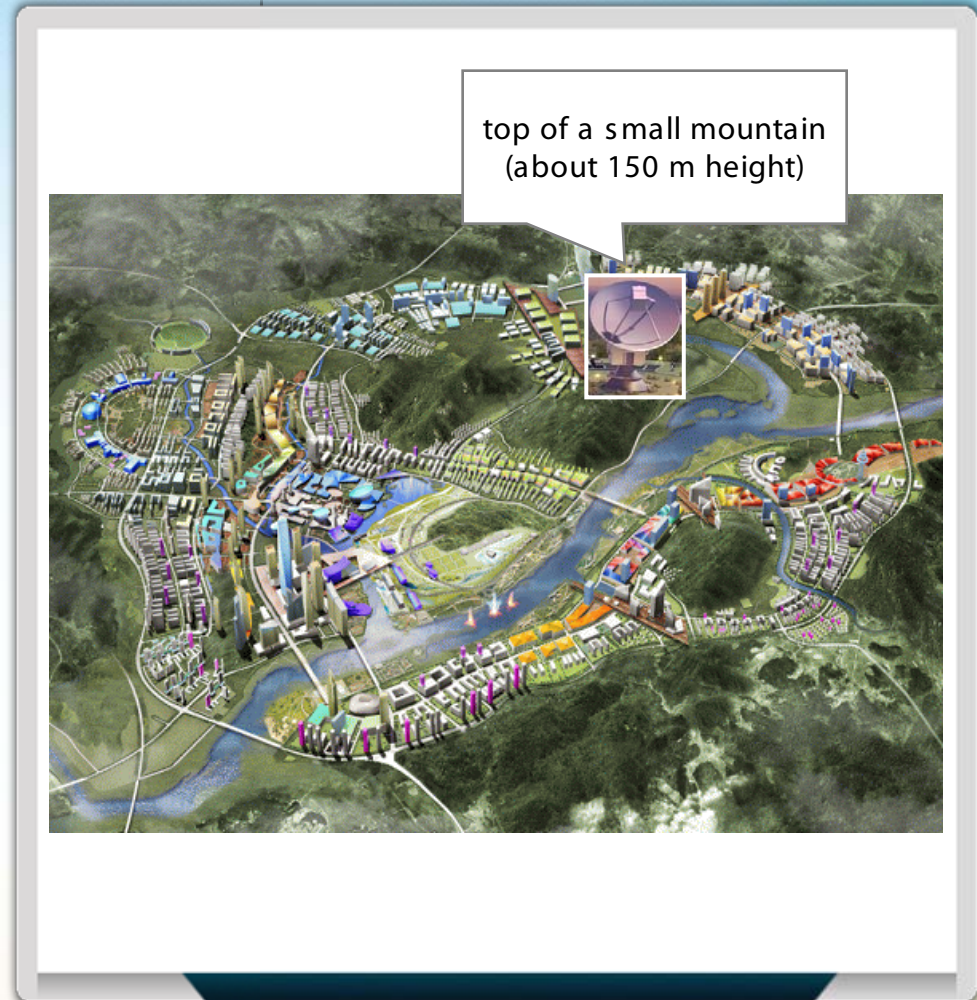
MOU between NGII and NICT

3. The state of Korea VLBI for Geodesy

Antenna site



KVN : Korea VIBI Network (for astronomy)



Sejong is a Multifunctional Administrative City

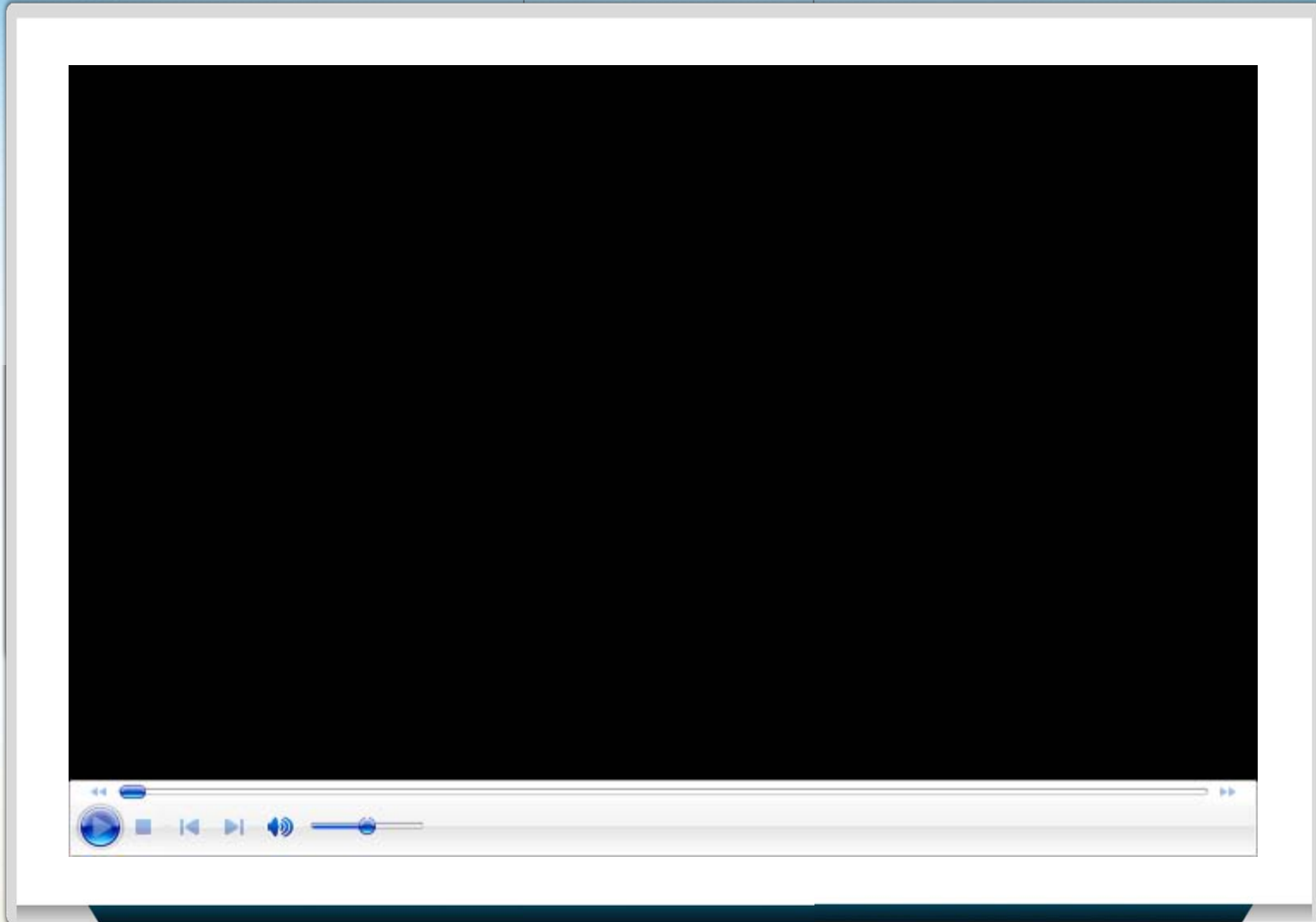
3. The state of Korea VLBI for Geodesy

Antenna site



3. The state of Korea VLBI for Geodesy

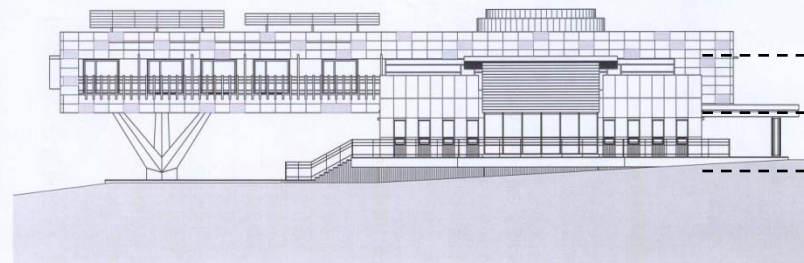
Antenna site



3. The state of Korea VLBI for Geodesy

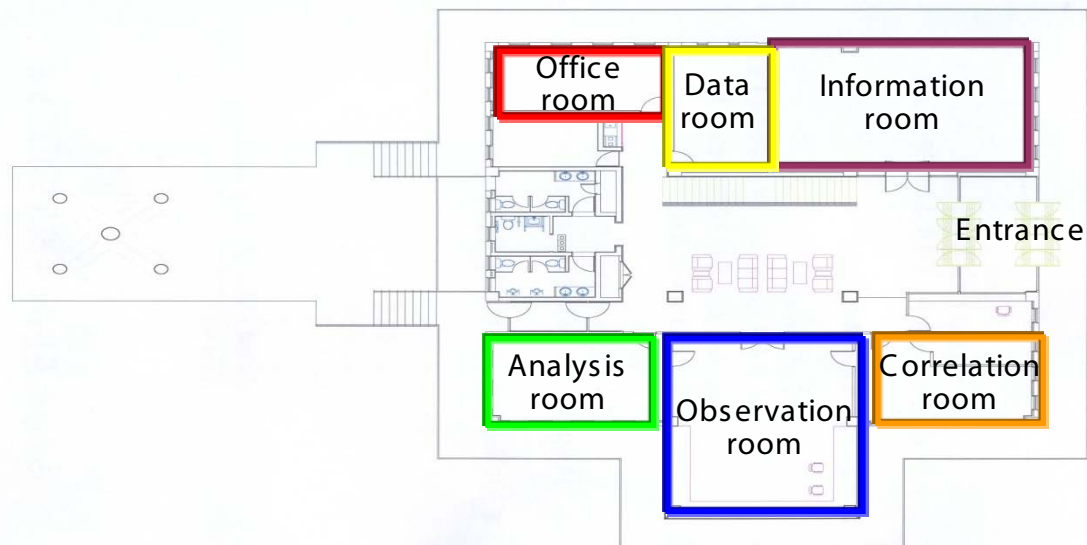
Observatory Building

Side view



- Two-story building
- Second floor
- First floor
- First basement

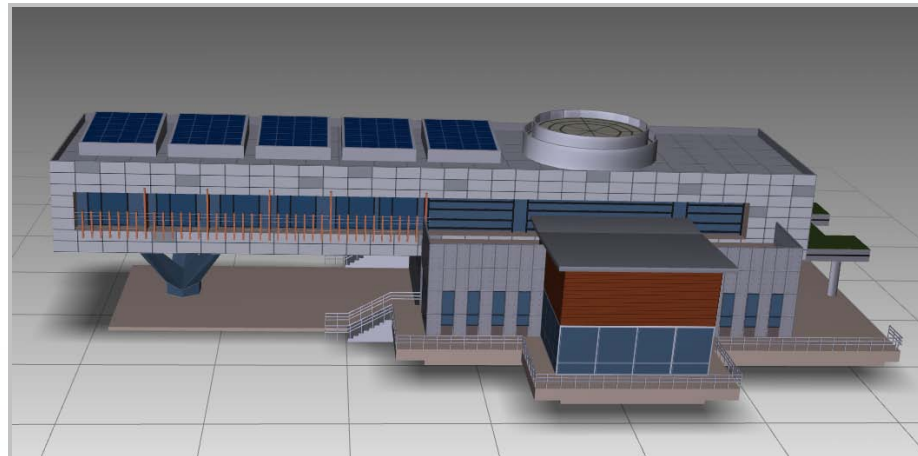
Plan view



3. The state of Korea VLBI for Geodesy

Observatory Building

**3D
Model**



3. The state of Korea VLBI for Geodesy

System Specifications

Antenna

- Diameter : 22 m
- Slew rate : Az > 5 deg/s, El > 5 deg/s
- Structure : to assure the visibility of an AZ-EL cross point.

Receiver

- Frequencies: 2, 8, 22, 43 GHz (simultaneous receiving)
2-18 GHz in future
- Polarization: RHCP and LHCP (switching)

Backend

- Analog Base Band Converter and K5/VSSP32
- Digital BBC (ADS3000+) in future

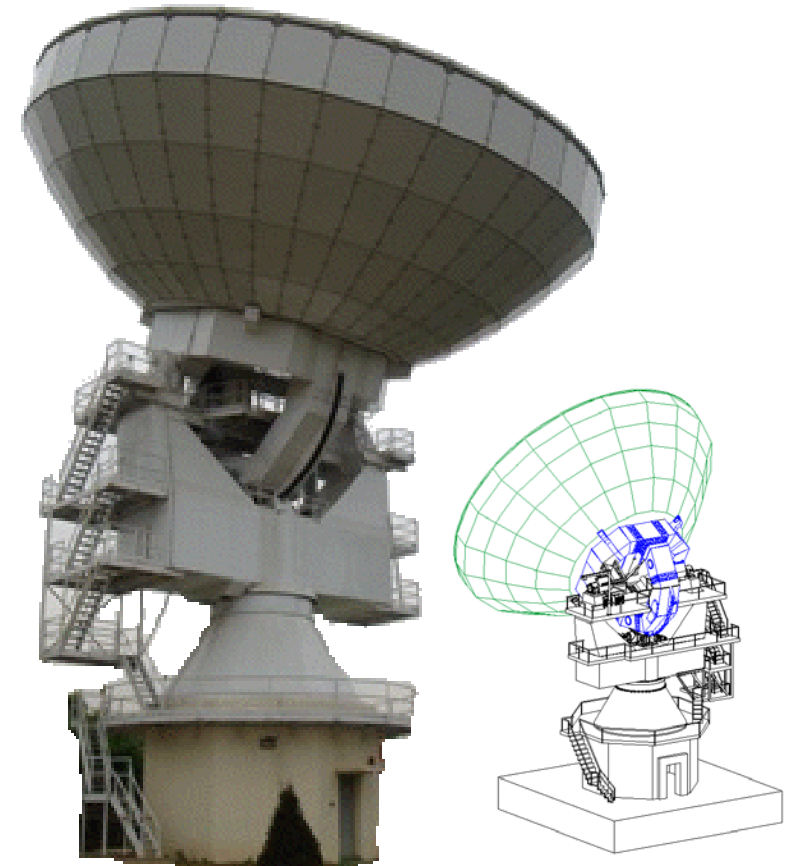
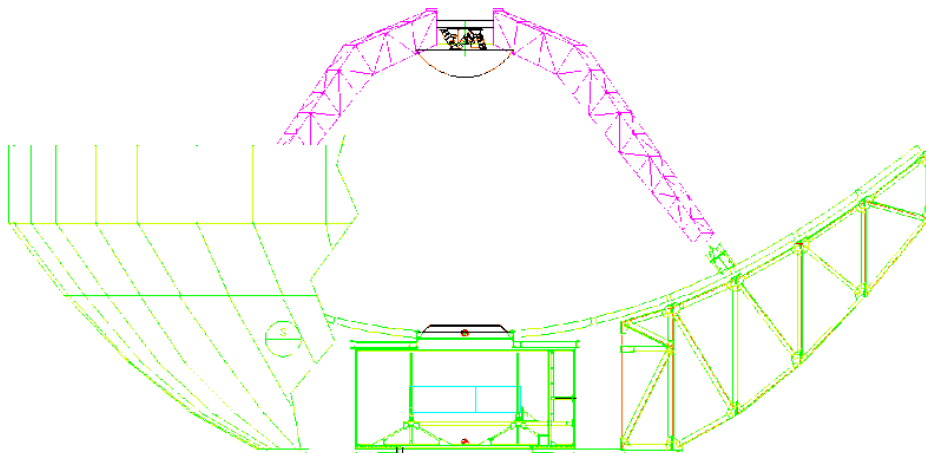
Correlator

- Software correlator

3. The state of Korea VLBI for Geodesy

Antenna

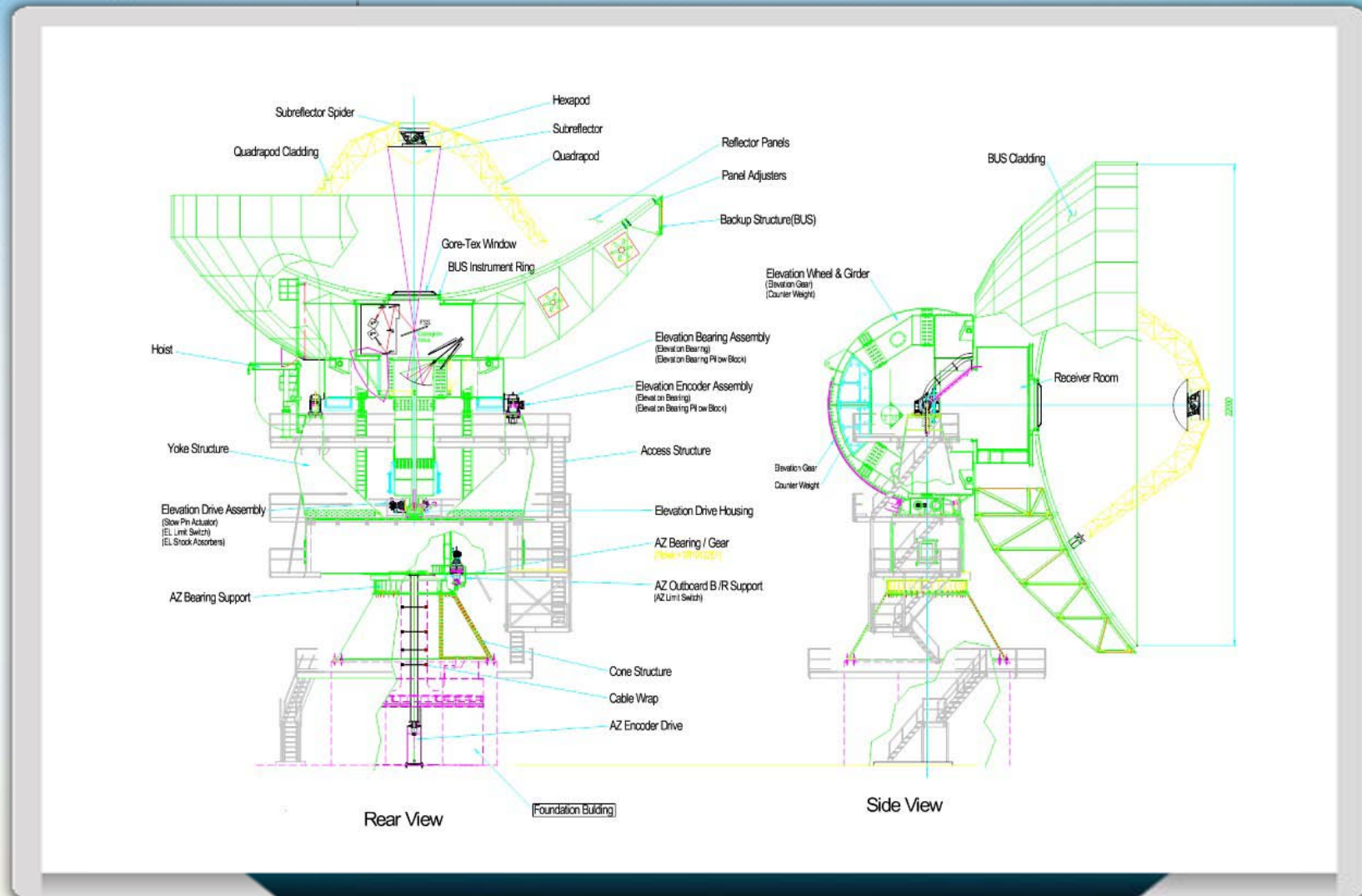
- Diameter : 22 m
- Slew rate
 - Azimuth : Max 5° / sec
 - Elevation : Max 5° / sec
- Slew range
 - Azimuth : $\pm 270^{\circ}$
 - Elevation : $0^{\circ} \sim 90^{\circ}$



KVN 21-m antenna

3. The state of Korea VLBI for Geodesy

Antenna



3. The state of Korea VLBI for Geodesy

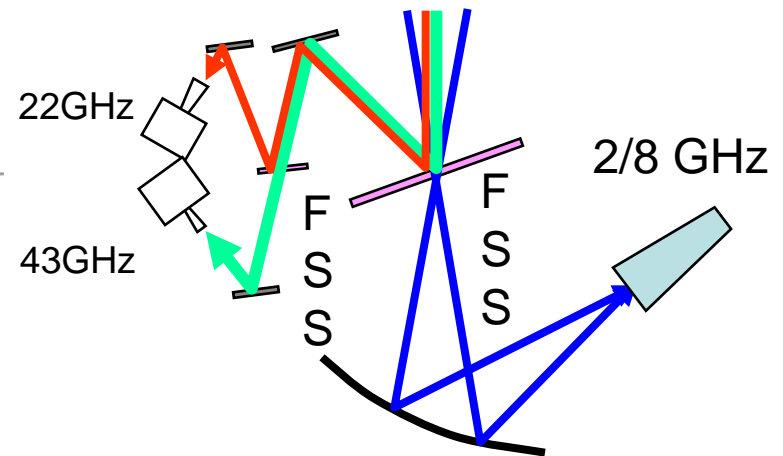
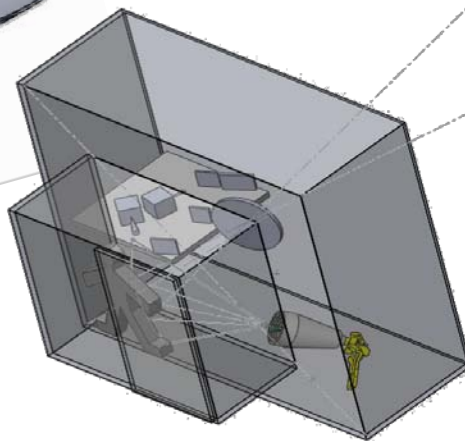
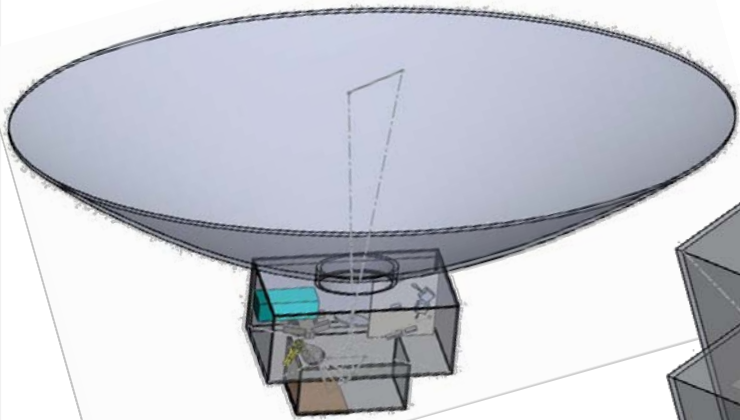
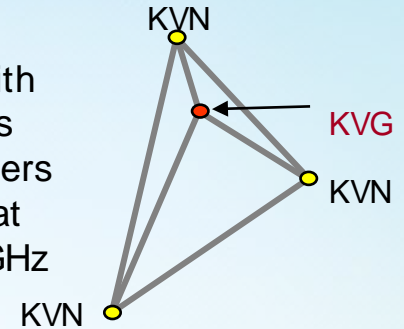
Receiver

- Frequencies
 - 2, 8 GHz
 - 22, 43 GHz

simultaneous receiving

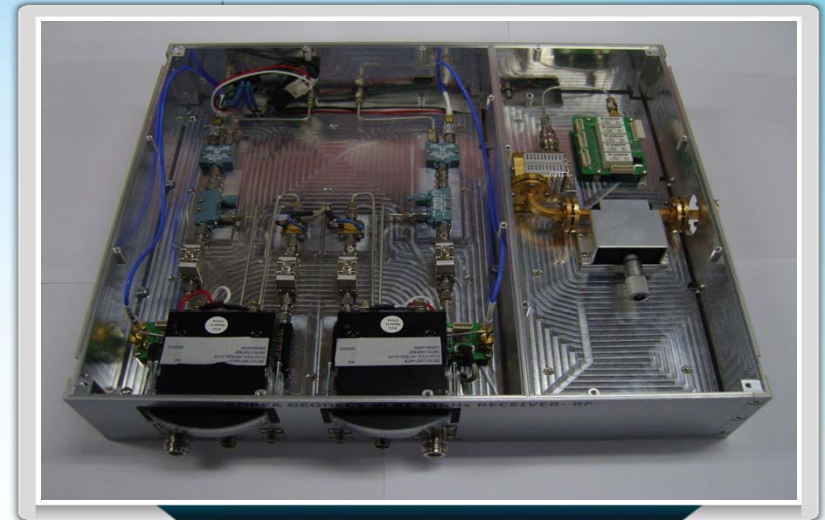


In order to carry out geodetic VLBI observations not only with current geodetic VLBI stations equipped with 2/8 GHz receivers but also with KVN stations that will be equipped with 22/43 GHz receivers in future.



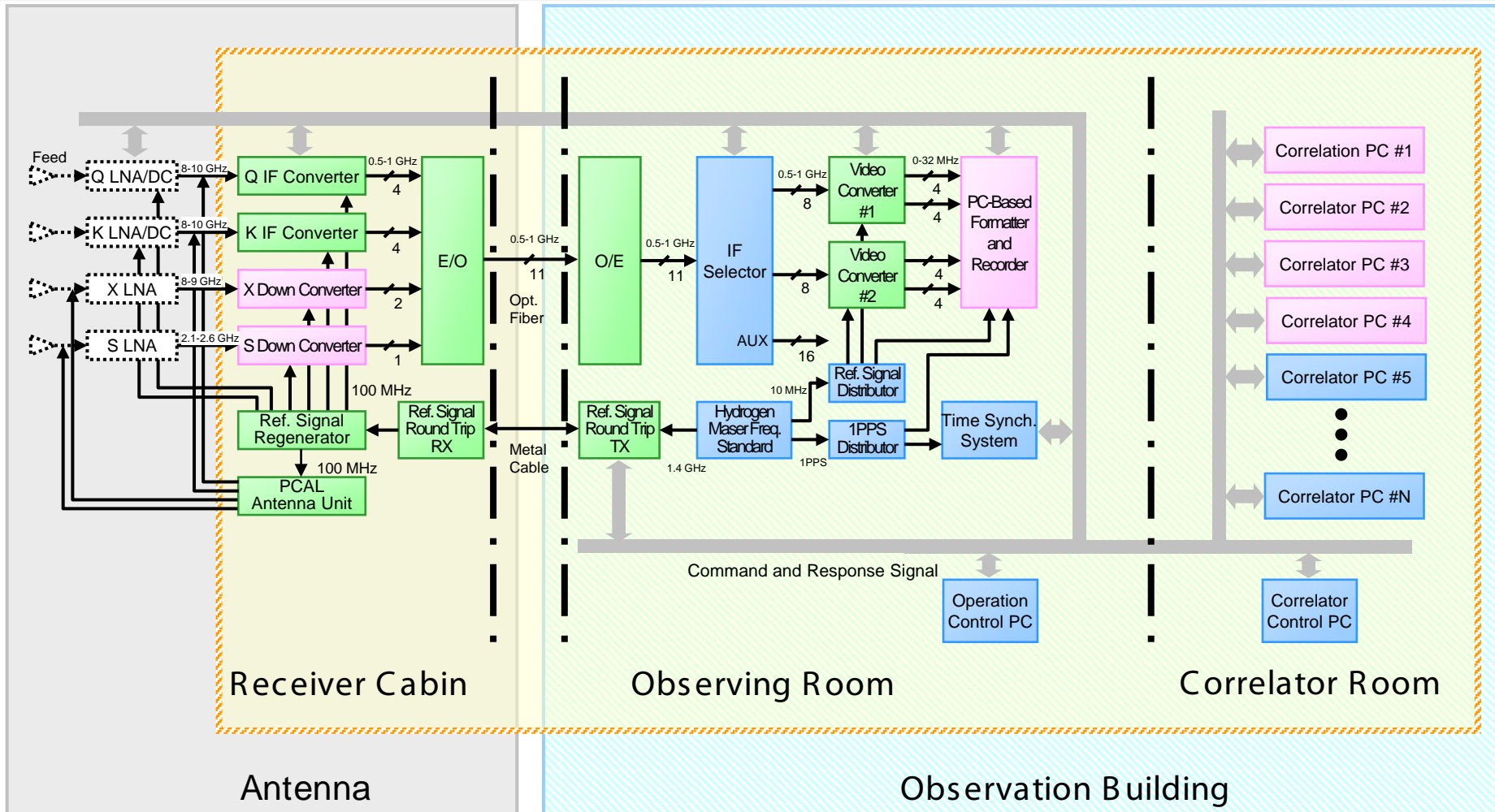
3. The state of Korea VLBI for Geodesy

Receiver



3. The state of Korea VLBI for Geodesy

Backend



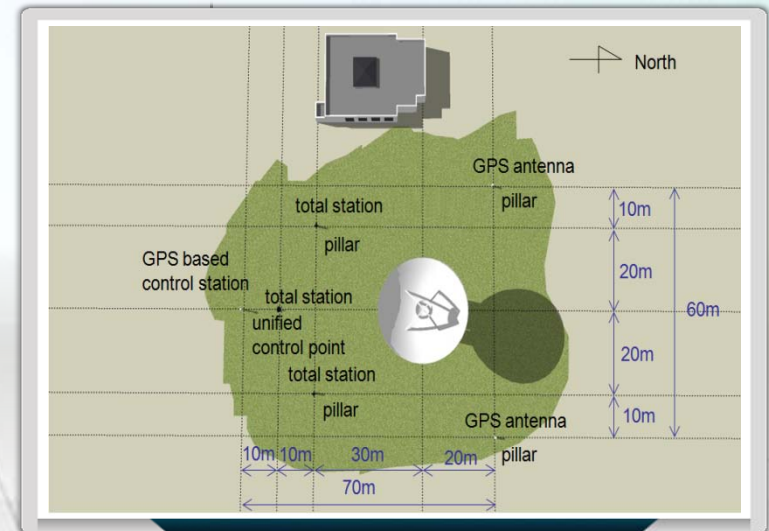
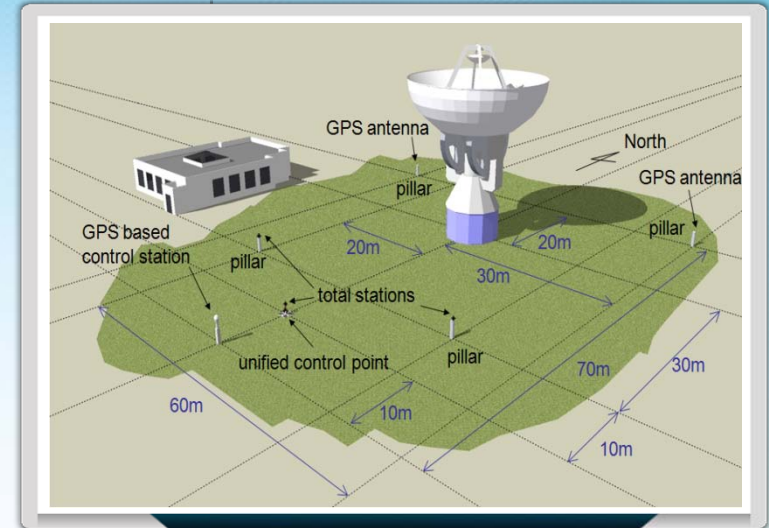
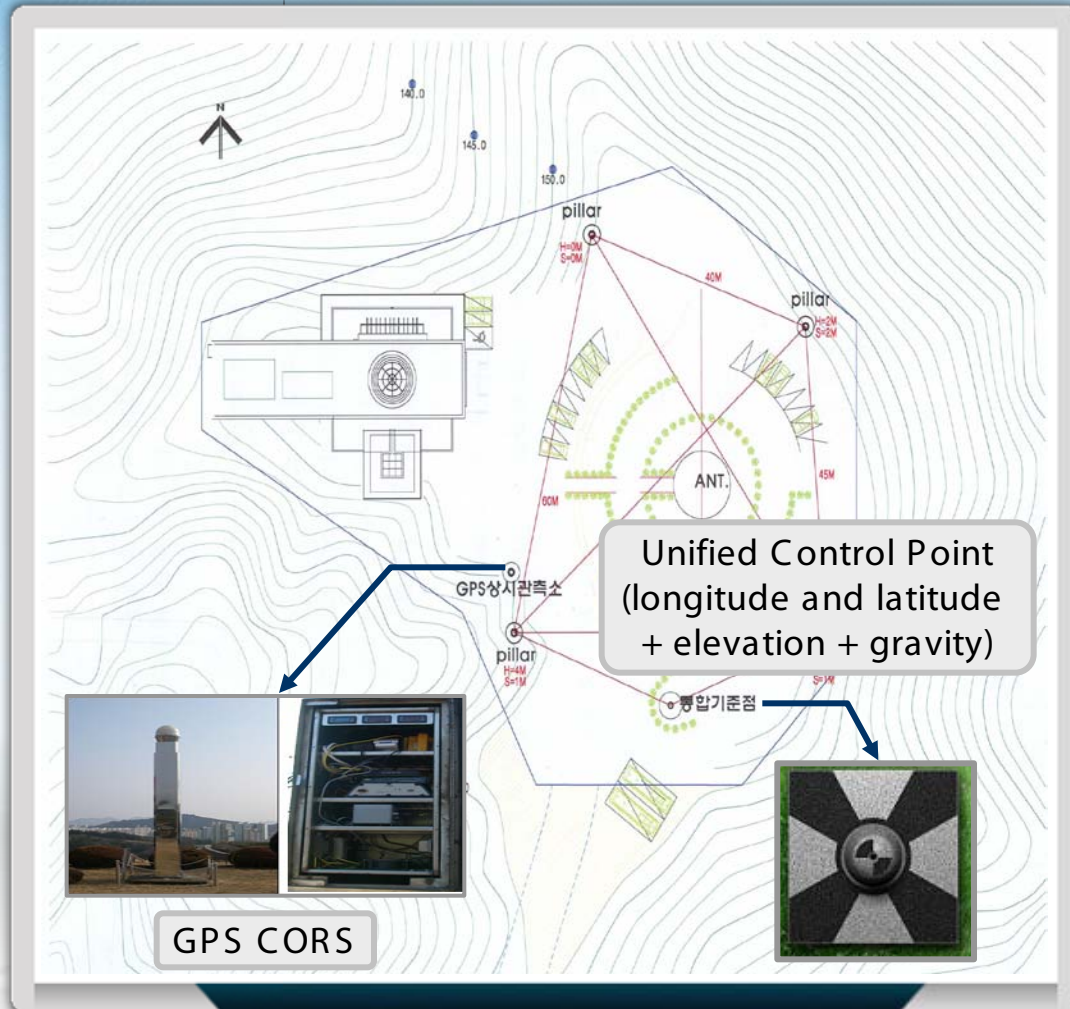
3. The state of Korea VLBI for Geodesy

Backend



3. The state of Korea VLBI for Geodesy

Observatory Layout



Korea VLBI for Geodesy



- complete in 2011

- establish Korea geodetic datum

- develop space geodesy center

- enhance international partnership

5. Conclusions

- Hoping to participate in IVS after construction of KVG
- Desiring to be active as one of network stations after participation in IVS
- Looking forward to interchanging various information with IVS members continuously

THANK YOU

