

# **Present Situation of Radionavigation System in Japan**

Masao Shinozaki  
Japan Coast Guard



# Major Radionavigation System

## Positioning System

- ✓ **LORAN C**
- ✓ **Differential GPS** -----
- ✓ **Radar Beacon • RAMARK Beacon** |

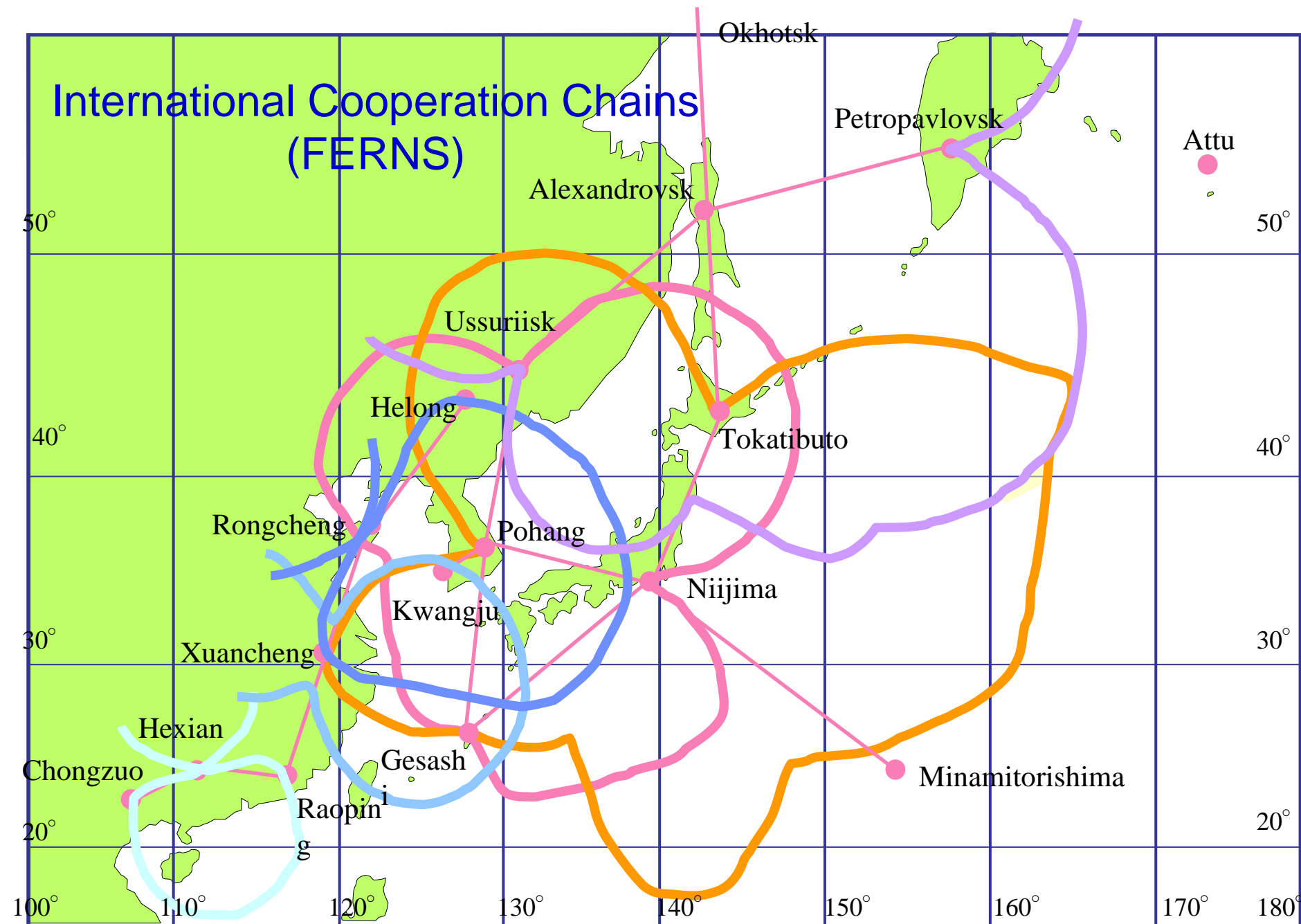
## Information provision System

- ✓ **MICS**  
**(Type 16)** <-----
- ✓ **VTs**

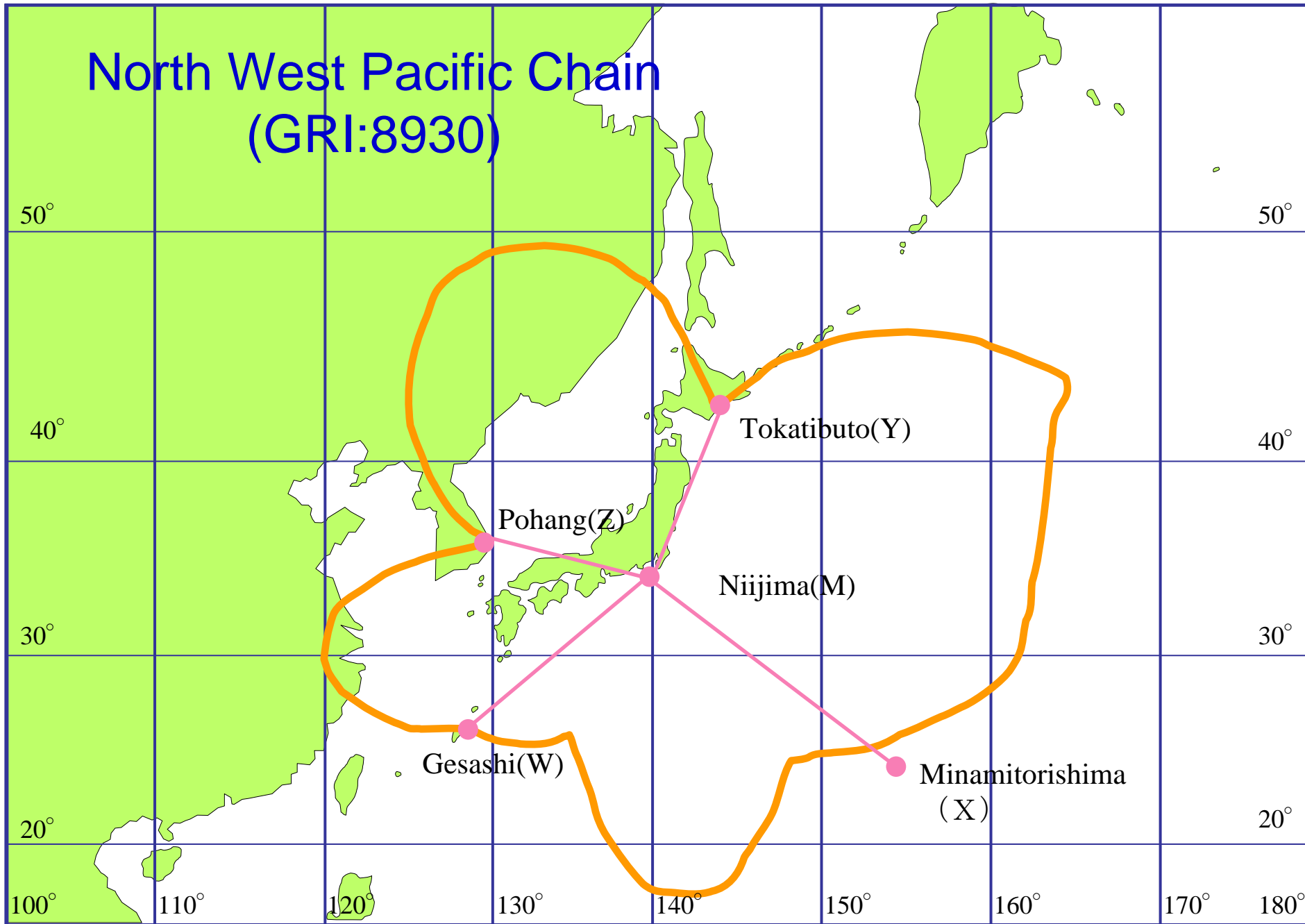
# LORAN C



# International Cooperation Chains (FERNs)



# North West Pacific Chain (GRI:8930)



# Korean Chain (GRI:9930)

50°

50°

40°

40°

30°

30°

20°

20°

100°

110°

120°

130°

140°

150°

160°

170°

180°

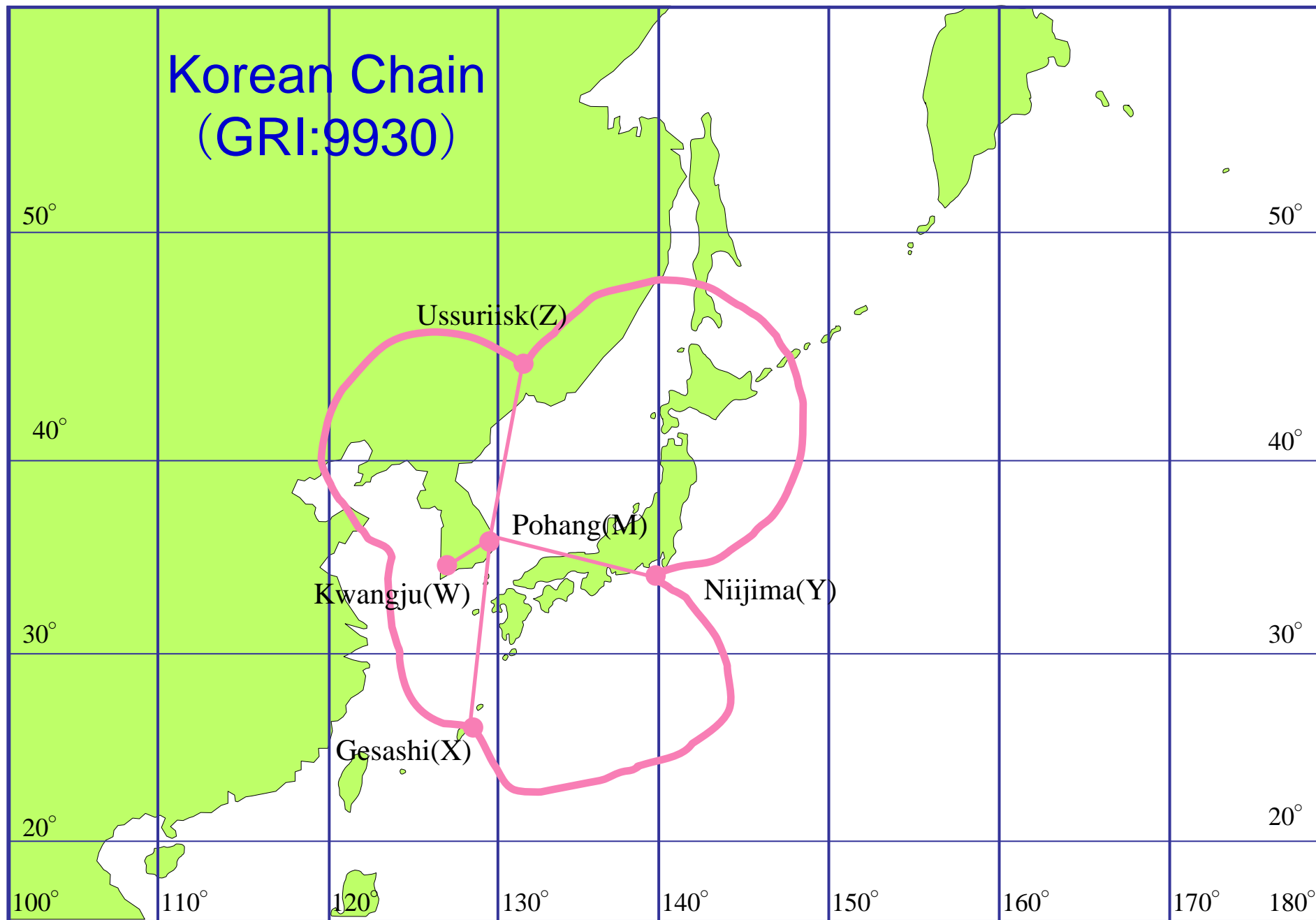
Ussuriisk(Z)

Pohang(M)

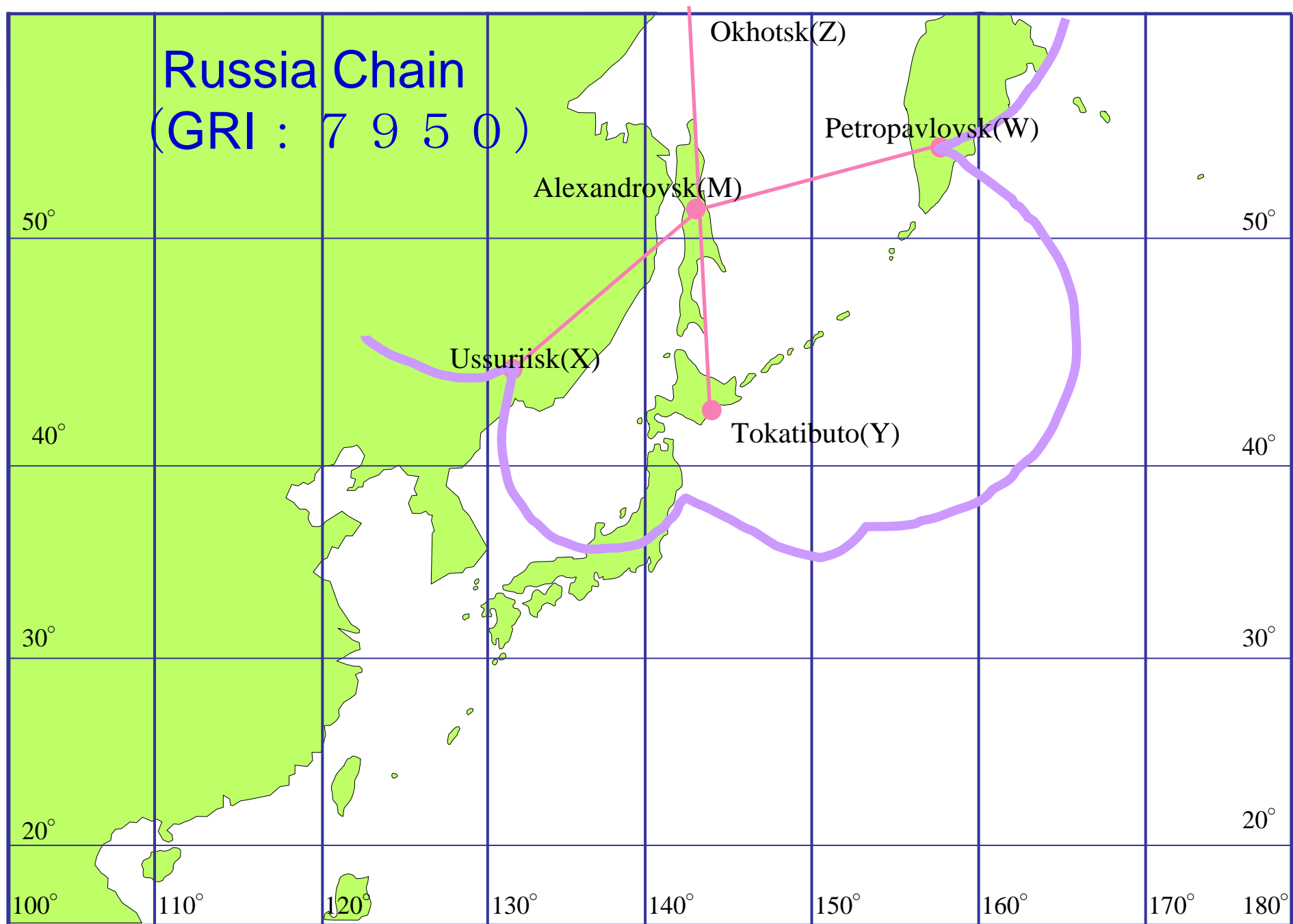
Kwangju(W)

Niijima(Y)

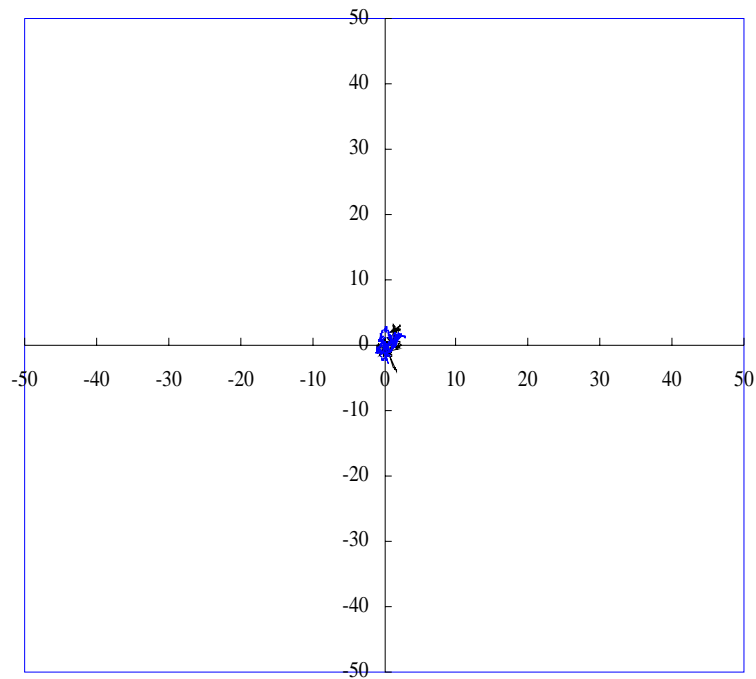
Gesashi(X)



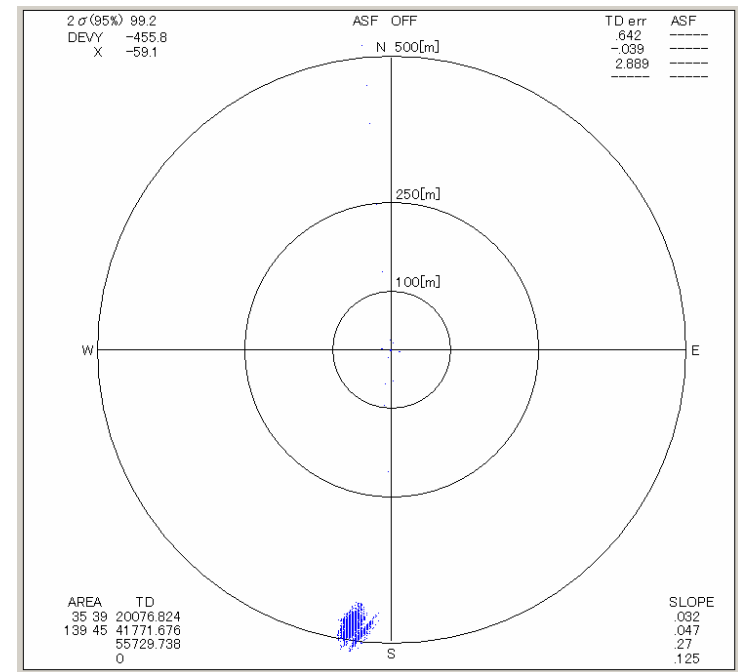
# Russia Chain (GRI : 7 9 5 0)



# Position Accuracy and Recurrence Accuracy

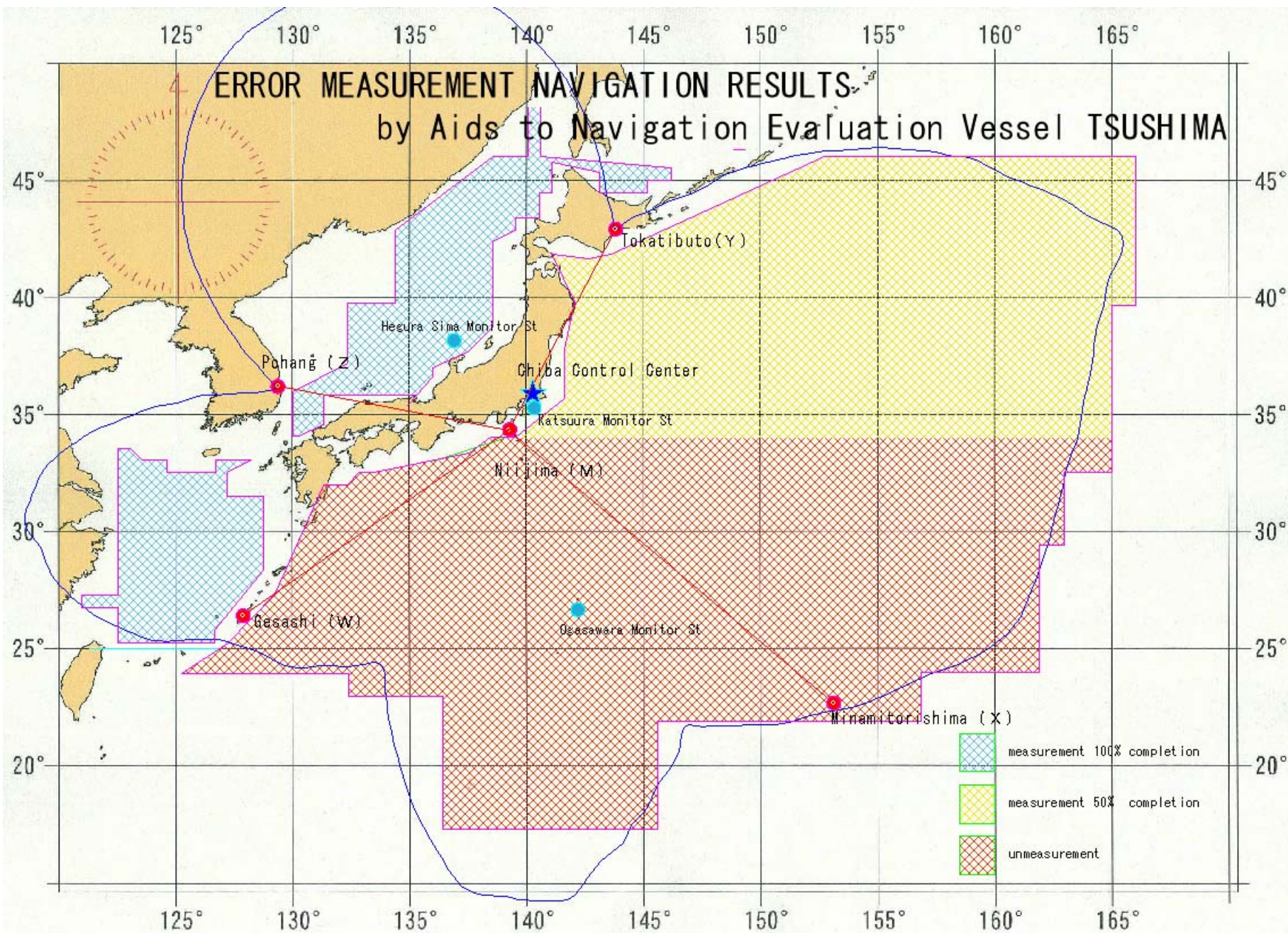


GPS



Loran C

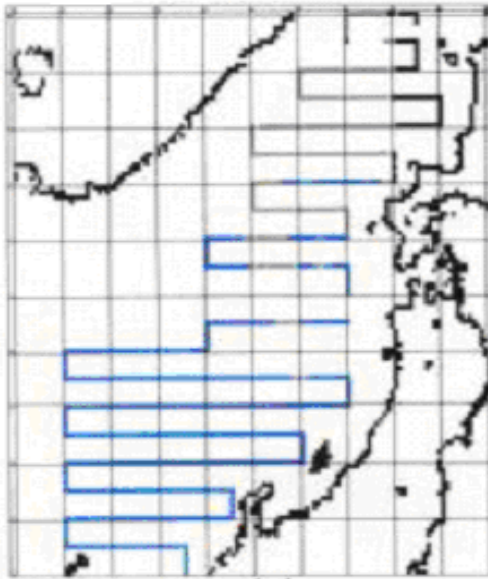




# Positioning accuracy comparison chart

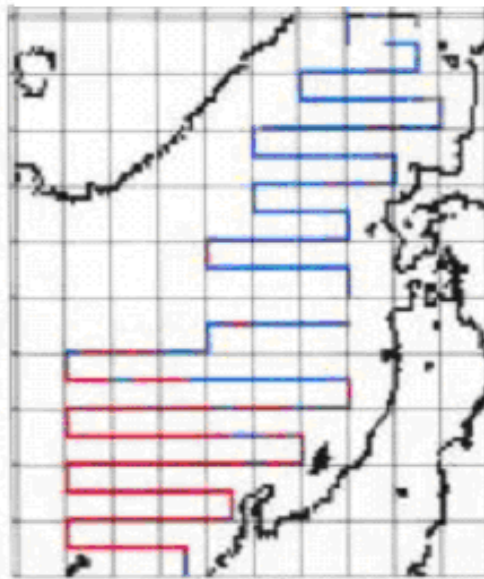
## ( 1 )

Measurements  
(no correction)



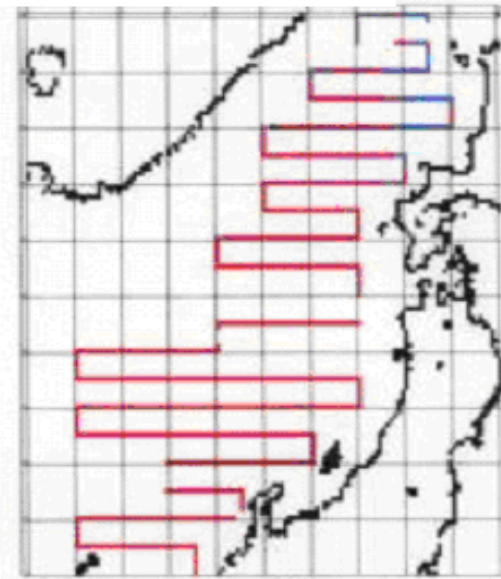
( a )

ASF correction

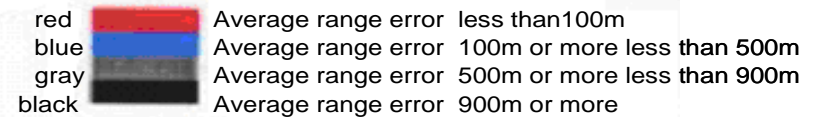


( b )

Error correction

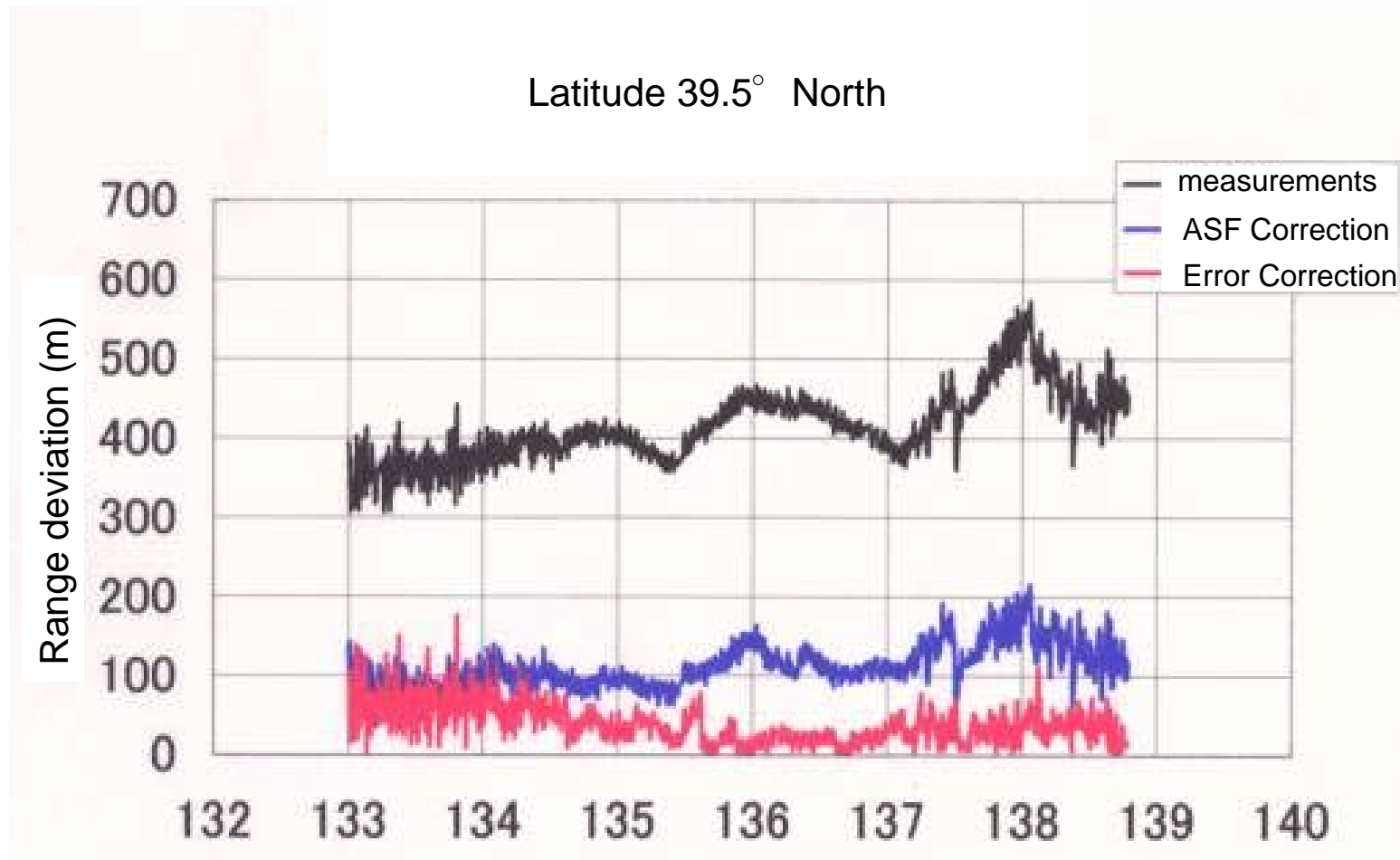


( c )





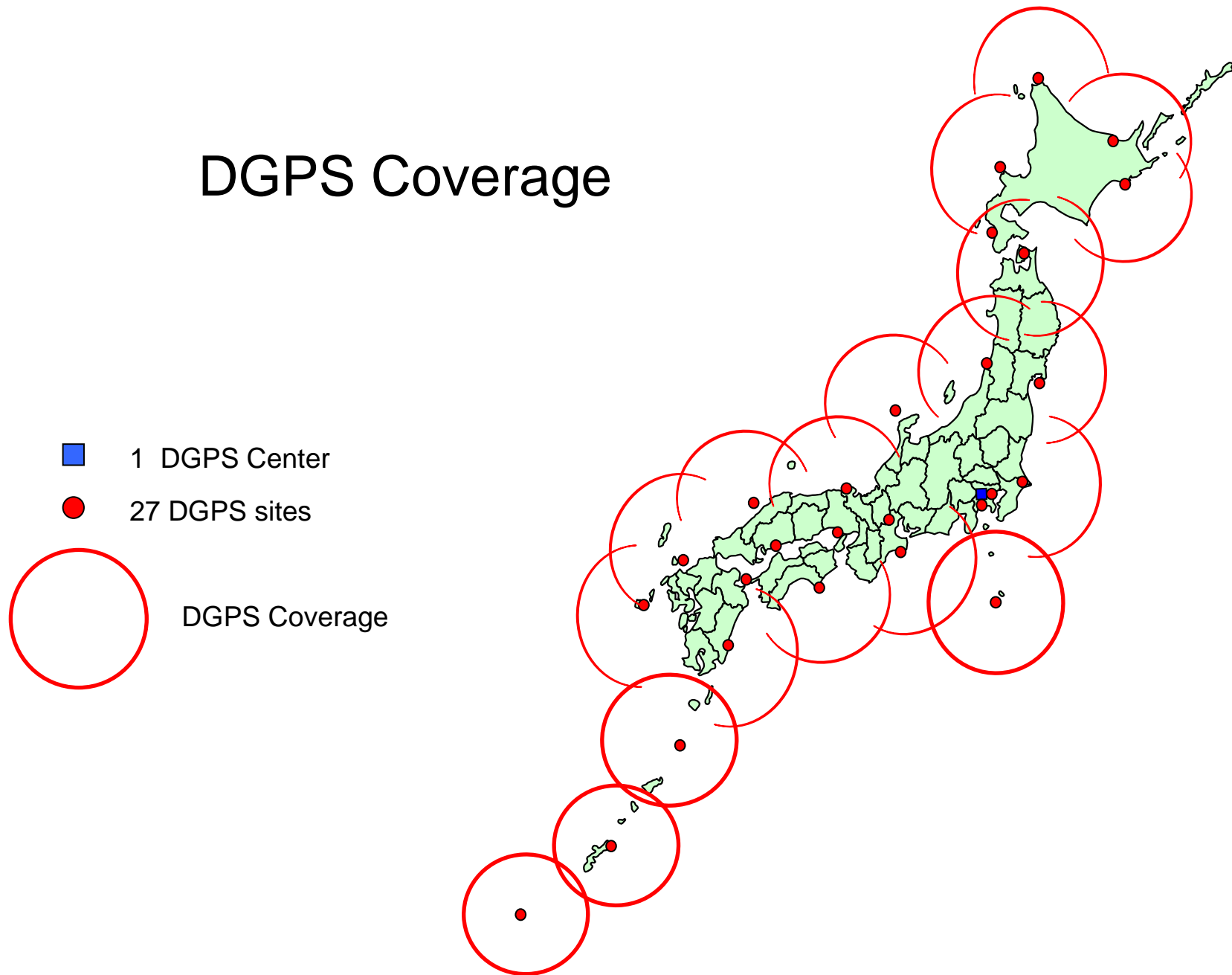
# Positioning accuracy comparison chart ( 2 )



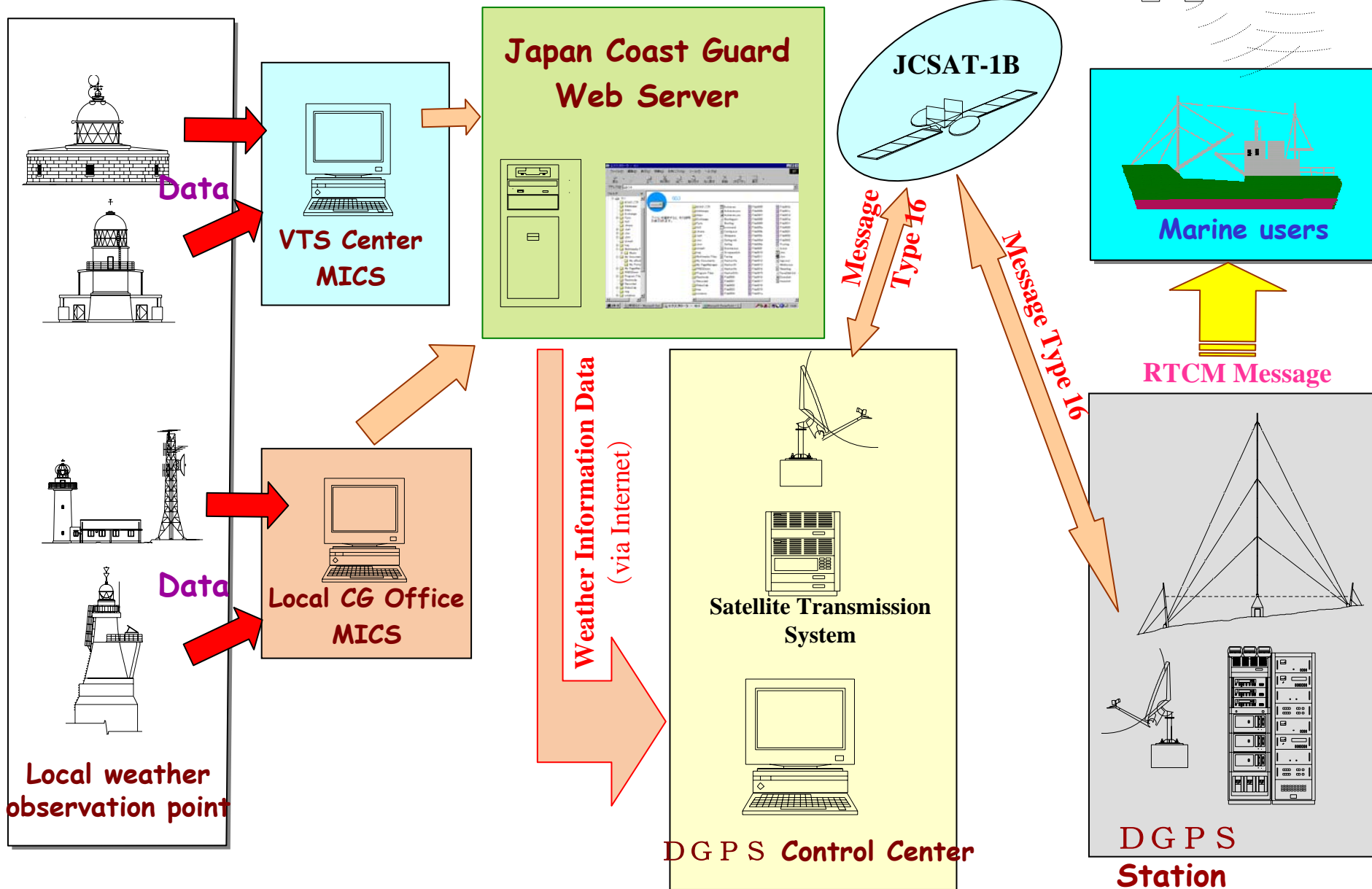


# Differential GPS

# DGPS Coverage

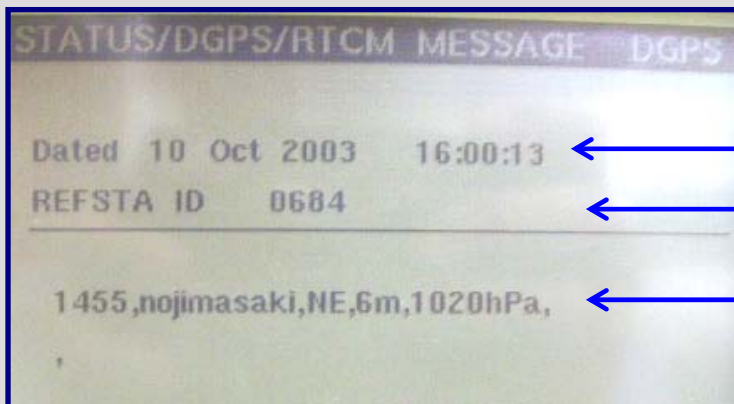


# Local Marine Weather Information



# Display sample of Type 16 message

## Conventional Receiver



Date (Day, Month, Year) , Time (HH,MM,SS)

Reference Station ID Number

Time (HH,MM), St.name, Wind direction,  
Wind Speed, Atmospheric pressure

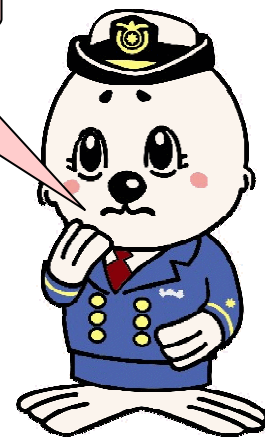
## Prototype Receiver



Display changes  
when pushed a button



Sorry, Japanese  
character only !





# Radar Beacon & RAMARK Beacon

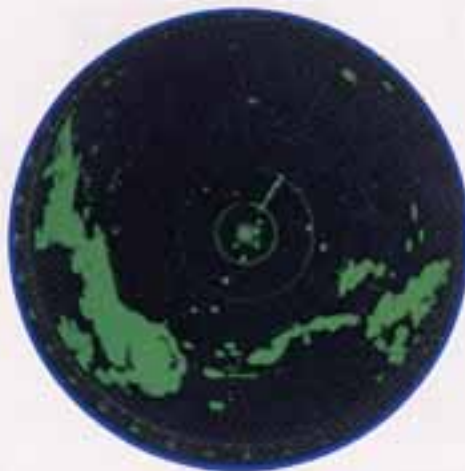


# Radar Beacon & RAMARK Beacon

レーダー ビーコン  
Radar Beacon

レーダービーコンは、局の後方に位置が特定できる信号を表示します。この信号の前線が局の位置です。

RADAR beacon signal emerges as dashes and dots from the station (an obstacle point) toward the edge of PPI.



レーダー上の信号の  
現われかた  
Signal Appearance

レーマーク  
RAMARK Beacon

レーマークビーコンは自船から局の方向に破線を表示します。

RAMARK beacon signal emerges as a dots line, running from your position toward the edge of PPI through the station.



写真の  
説明図  
PPI Representation





**M I C S**

**(Maritime Information and  
Communication Services)**

# list of offices and centers providing the MICS service

(As of April 1, 2004)



# Concept of MICS

Information from vessels

CG Offices and VTS Centers

Information from marine offices concerned

View Cam image from L.H.

Weather data or marine data from observation sites

Editing & sending to

Electric message board

Radio

Cellular Phone

Internet

Phone / FAX

Providing

Fishery cooperative /home

Ships

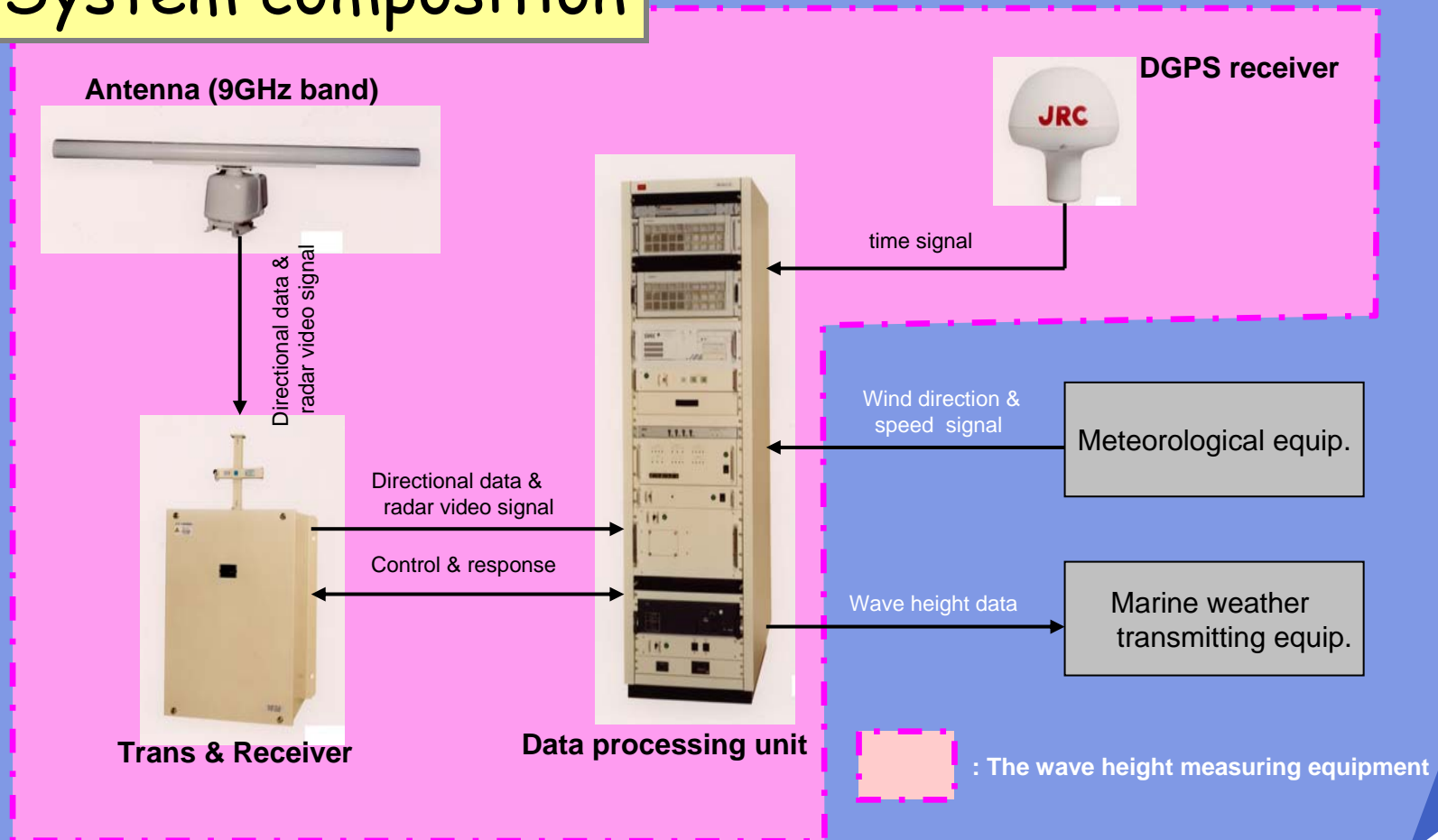
Pleasure boats

Marine users

Remote operation is available

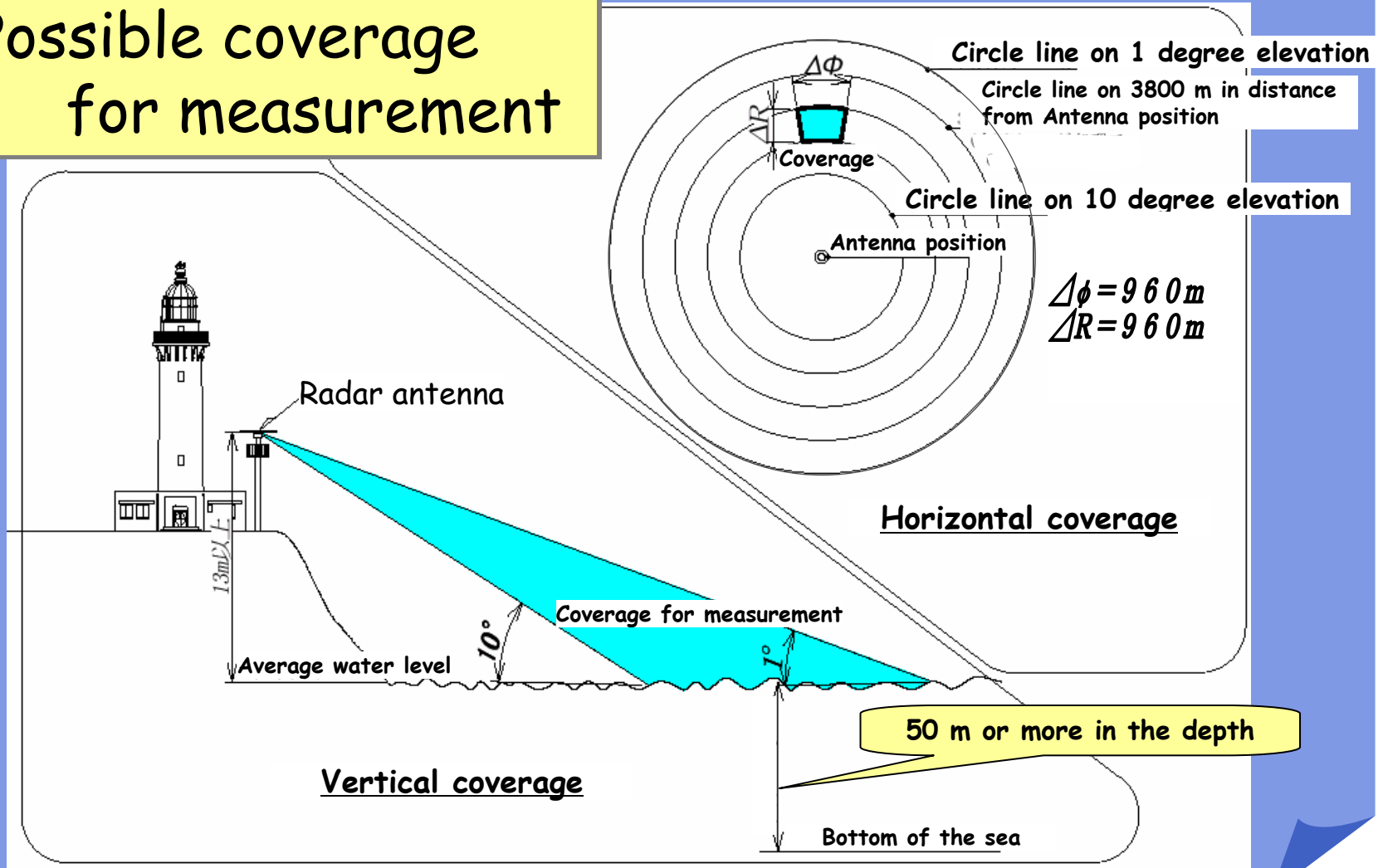
# Wave height measuring equipment used radar

## System composition



# Wave height measuring equipment used radar

## Possible coverage for measurement



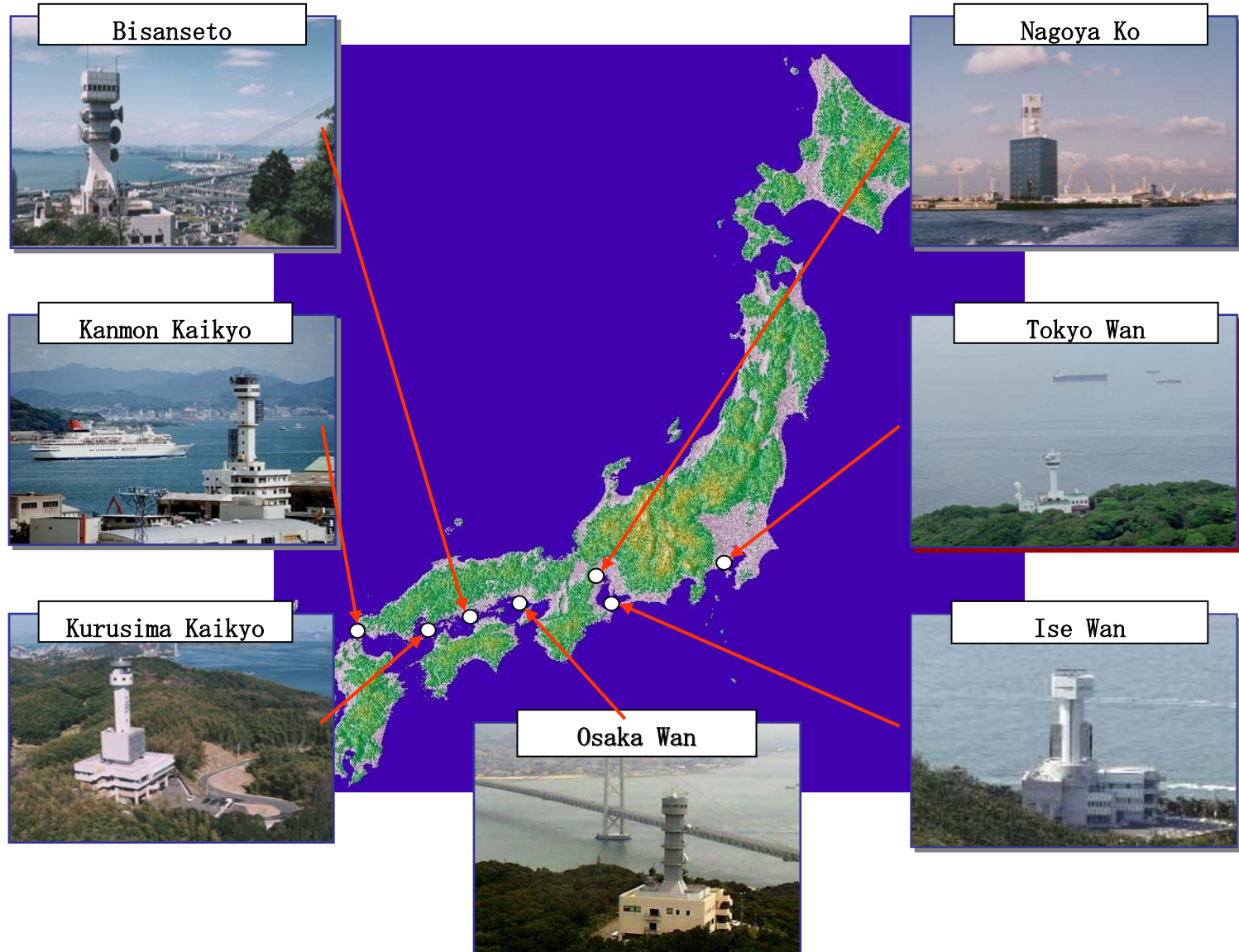


**V T S**

**(Vessel Traffic Services)**

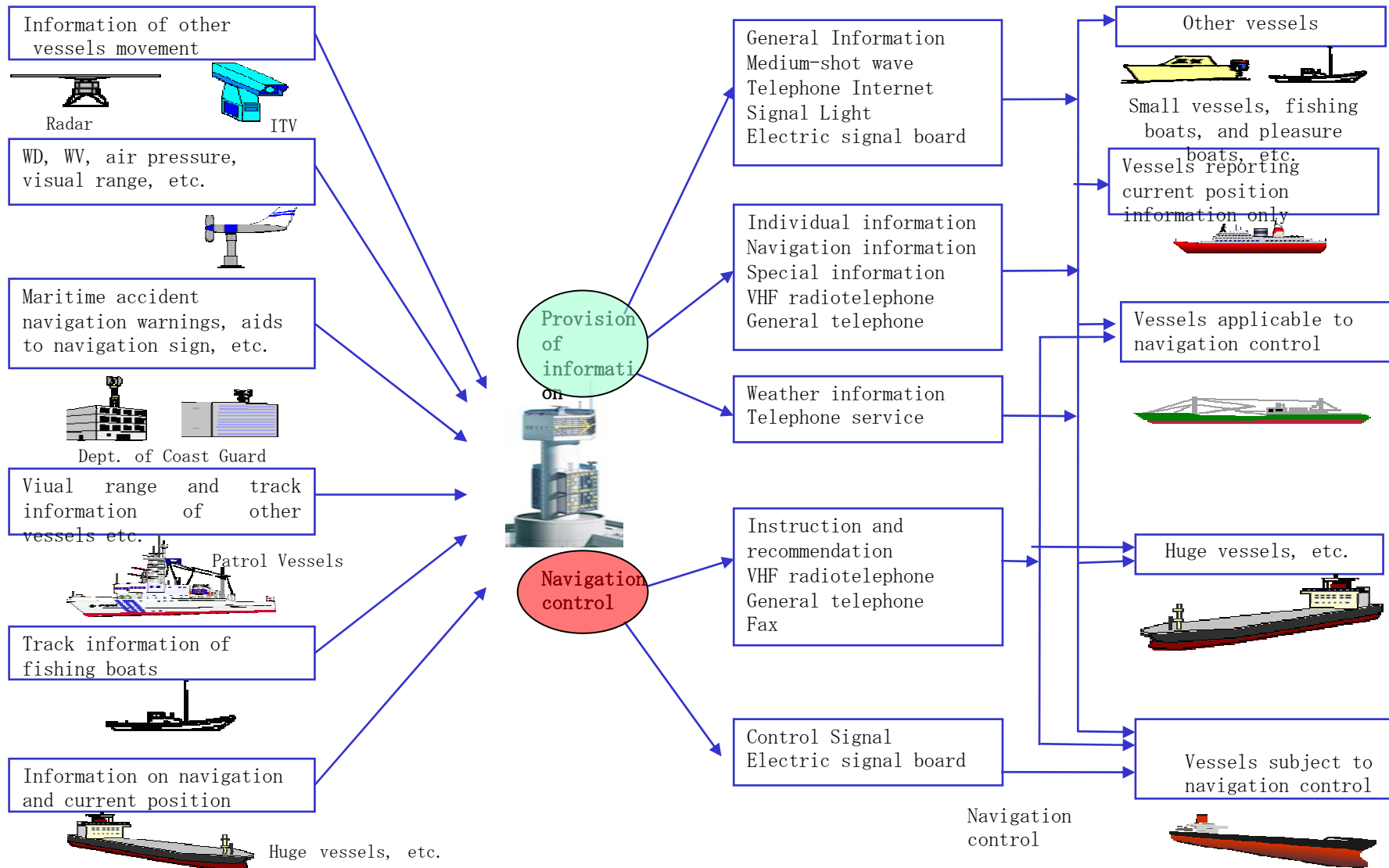


# Vessel Traffic Advisory Service Senter

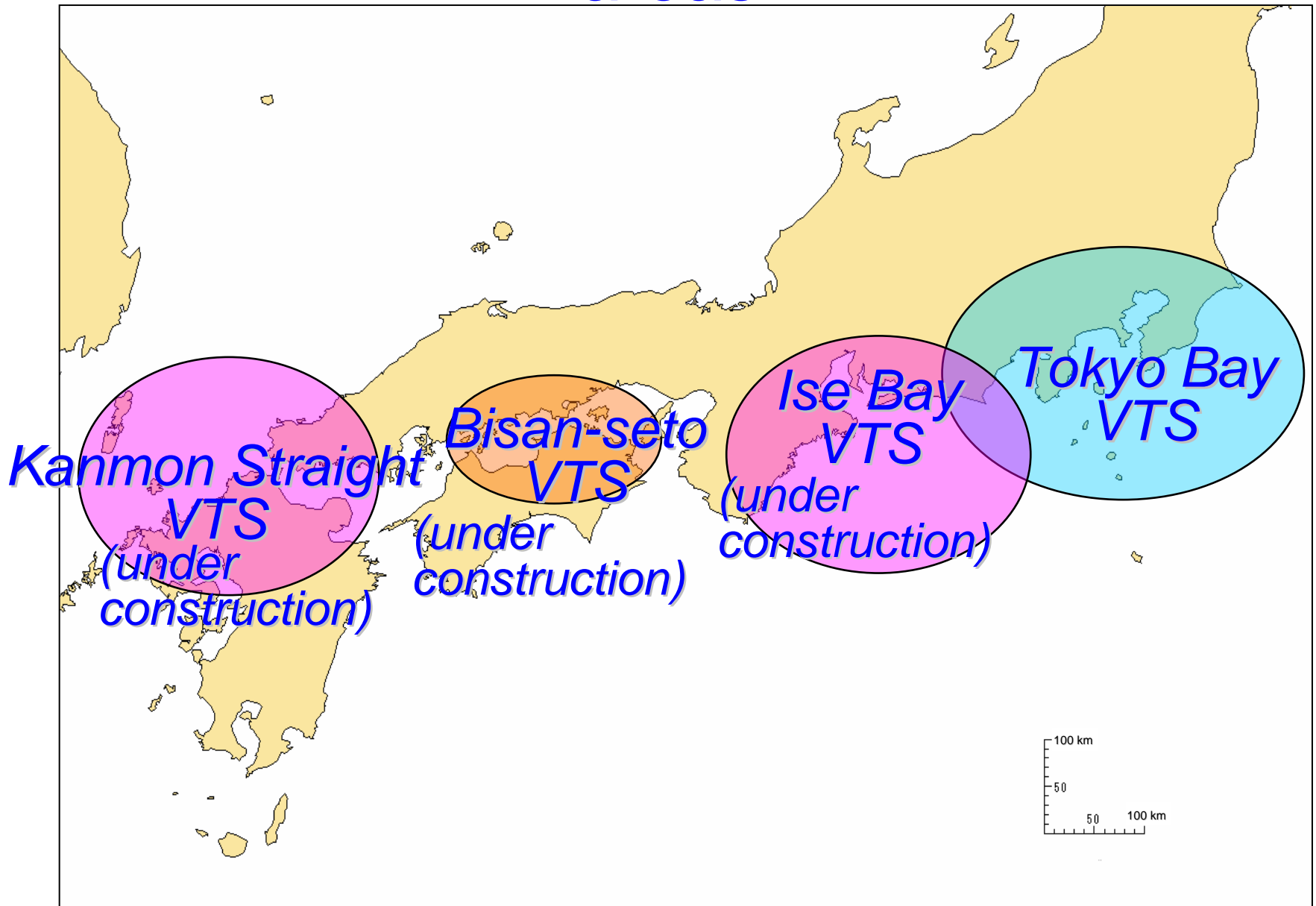




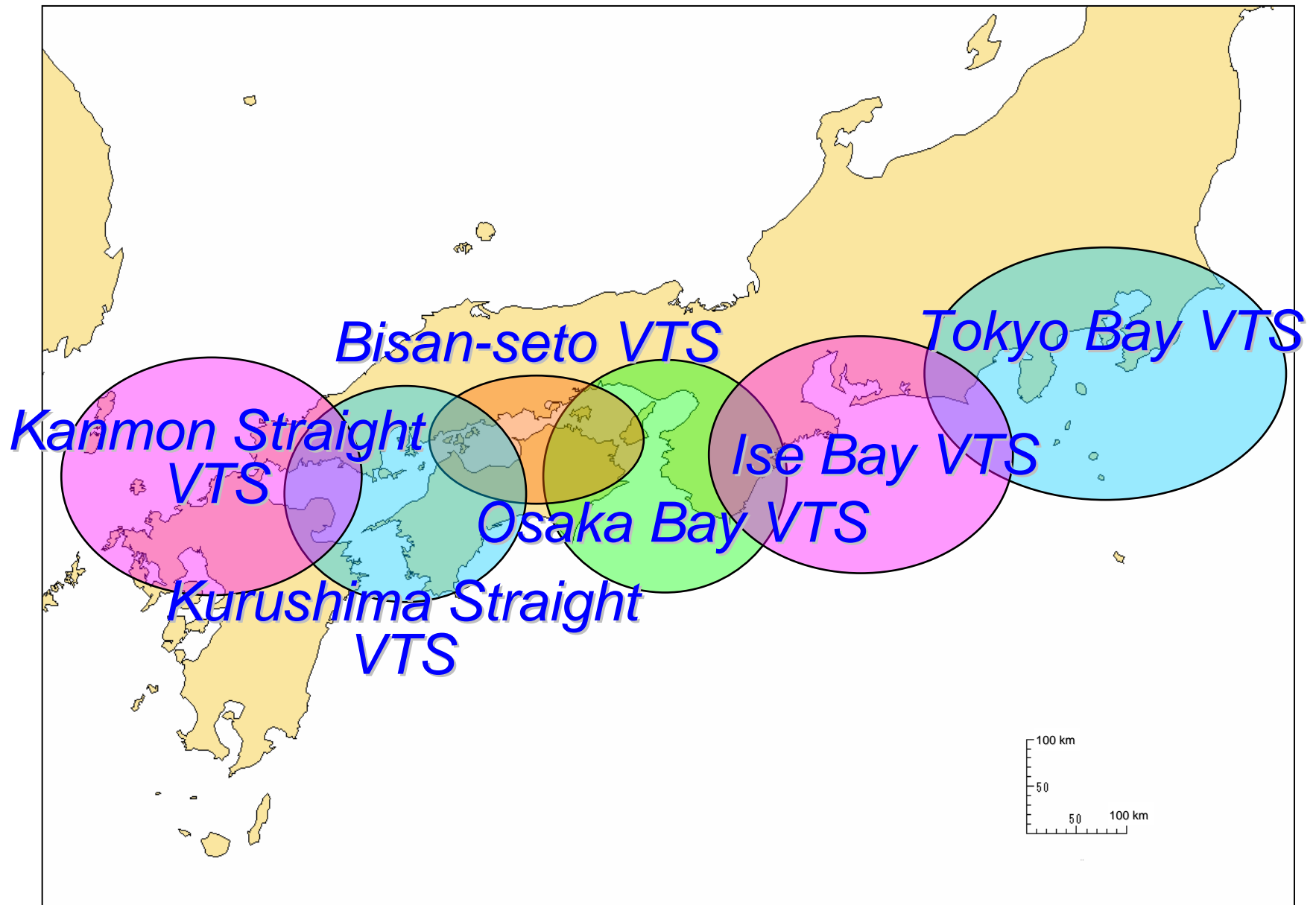
# Outline of Service at Traffic Advisory Service Center



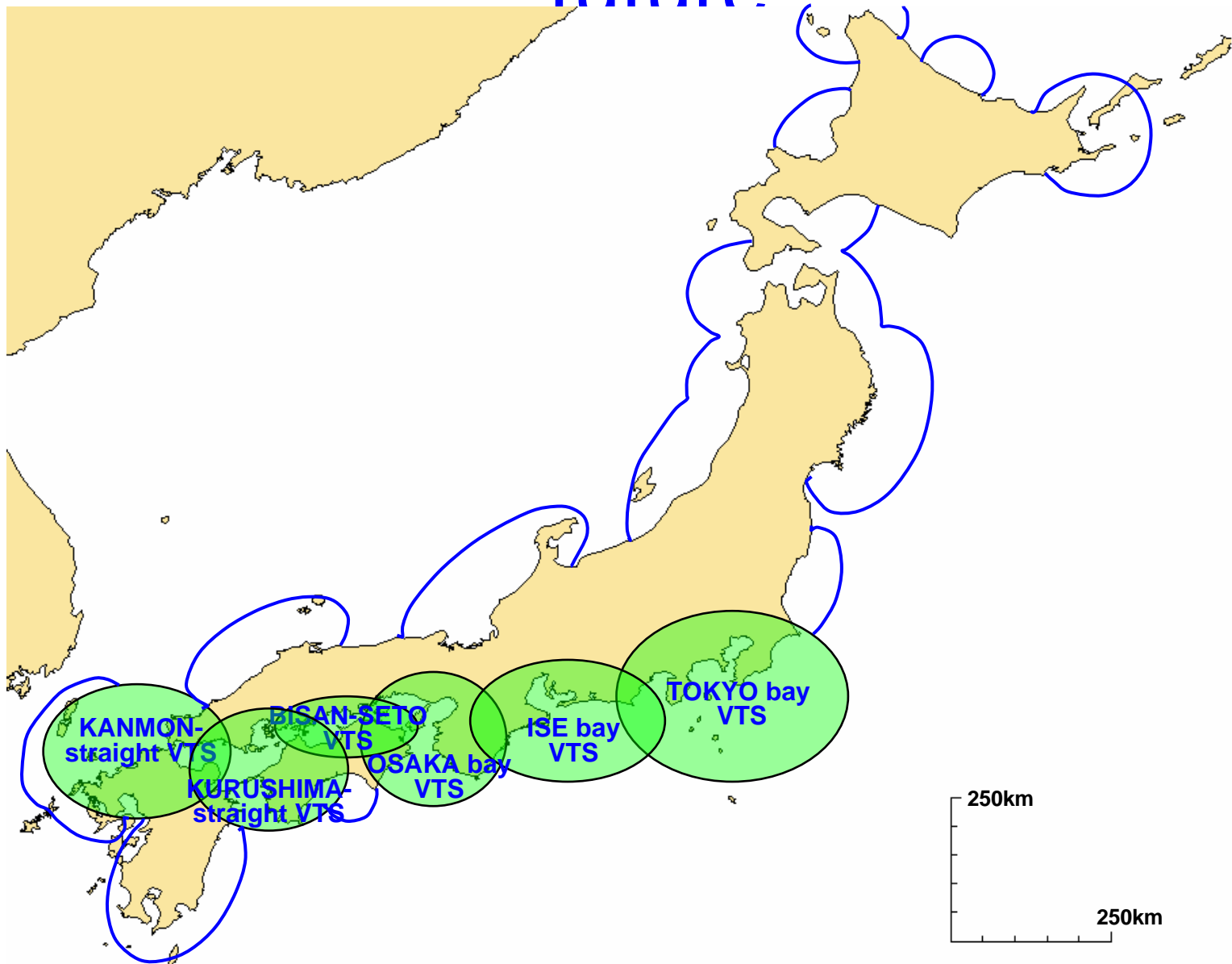
# Current A T S service areas



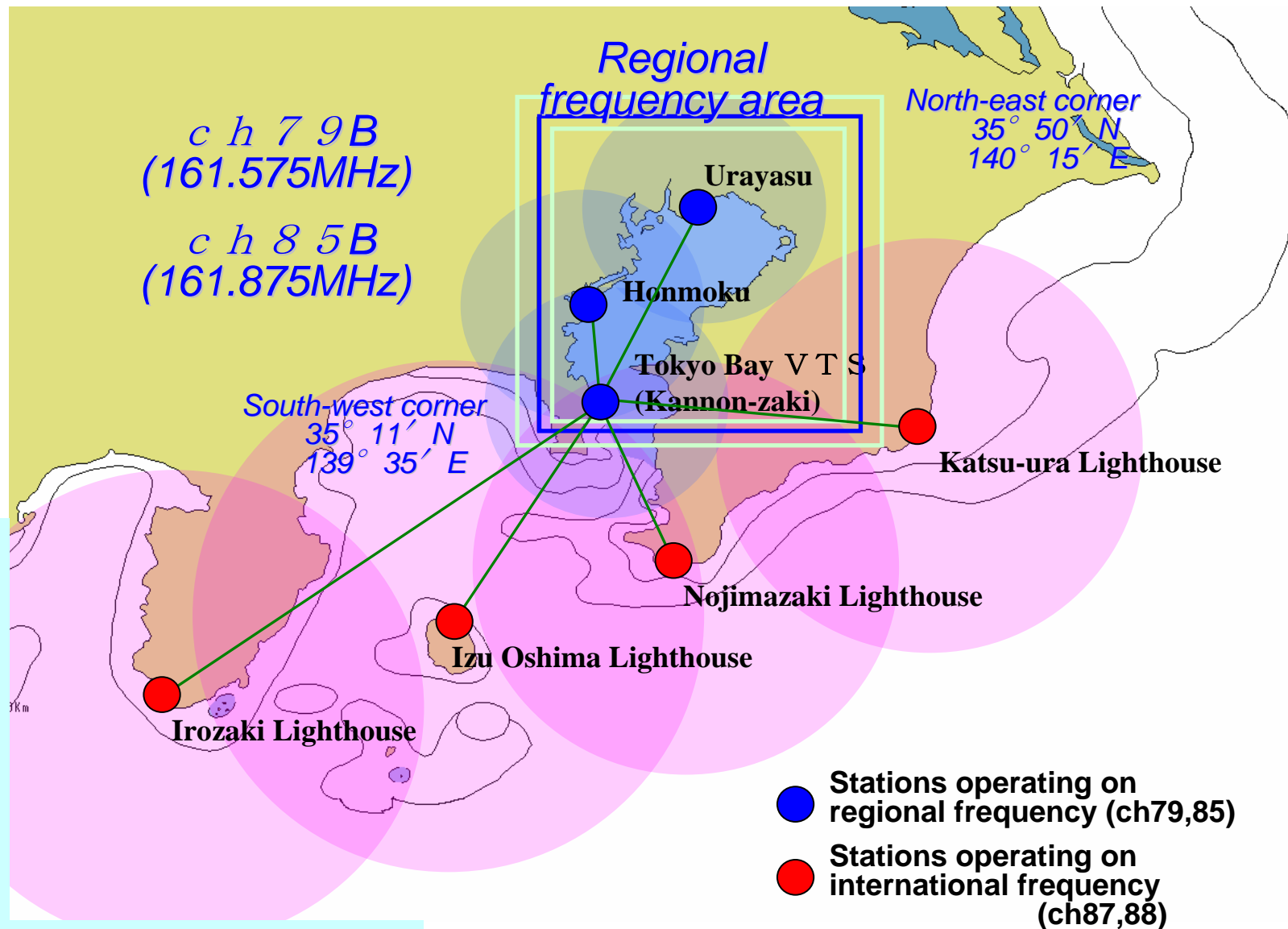
# A I S service areas in 2007



# A I S service areas in the future

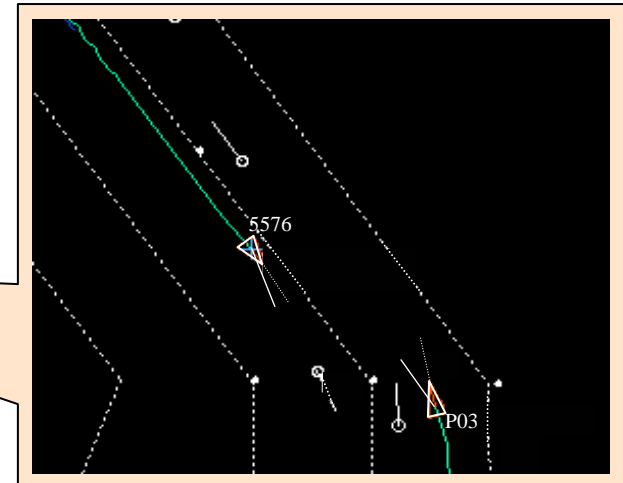
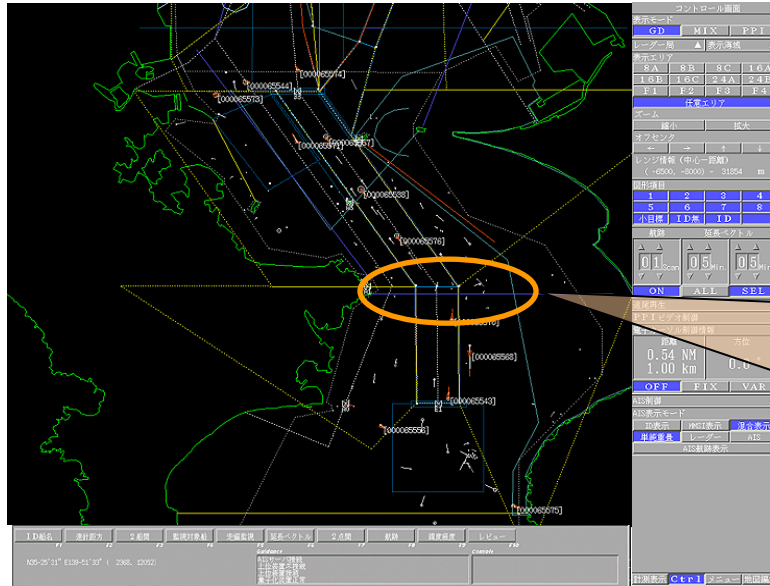


# AIS on-shore stations and regional frequency of Tokyo Bay VTS

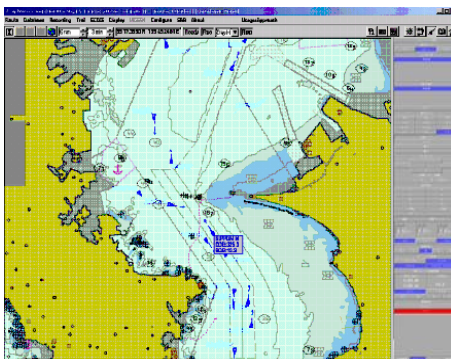


# Display on V T S

## Radar operation desk



## AIS operation desk (Switched between 3 screens)



Graphic screen



Static and dynamic data screen



Message input screen