

# EGNOS

**Demonstrations accomplished so far**

OREGIN Meeting

1 December 2000

*Visit our EGNOS Web site  
on [www.esa.int/navigation](http://www.esa.int/navigation)*

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# EGNOS System Test Bed

## Key Events for Users

- **February 2000** - ESTB Signal In Space from Inmarsat AOR-E Geostationary Satellite
- **June 2000** - EGNOS WEB Site Opened
- **July 2000** - 1st ESTB User Workshop July 2000
- **December 2000** - TBUE (Test Bed User Equipment Receivers) units to be delivered to ESA, with High Accuracy capabilities in GPS/GEO mode
- **December 2000** - ESTB/MTB to be connected and ESTB SIS to be broadcast also from Inmarsat IOR

# EGNOS Test Bed Demo's

- Various EGNOS application demo's performed:
  - **Maritime trials**, Genoa, Italy, Istituto Idrografico dell Marina, February 2000
  - **Aviation landing tests**, Edinburgh, UK, NATS, May 2000,...
  - **Land Mobile car trials**, Turin, Italy, FIAT Research Centre, November 2000
- Coming soon:
  - **Maritime trials**, Patras, Greece, KTI, GALA Pilot Project, January 2001

# Genoa Maritime Trials

## Objectives

- IIM: To give a technical opinion on the possibility to employ a new navigational aid.
  - Reliability.
  - Versatility/flexibility
  - User friendliness
  - Cost-effectiveness
- First EGNOS Trials at Sea
  - Static
  - Dynamic (sea-wall)
  - Hydrographic Survey
  - Port Approach

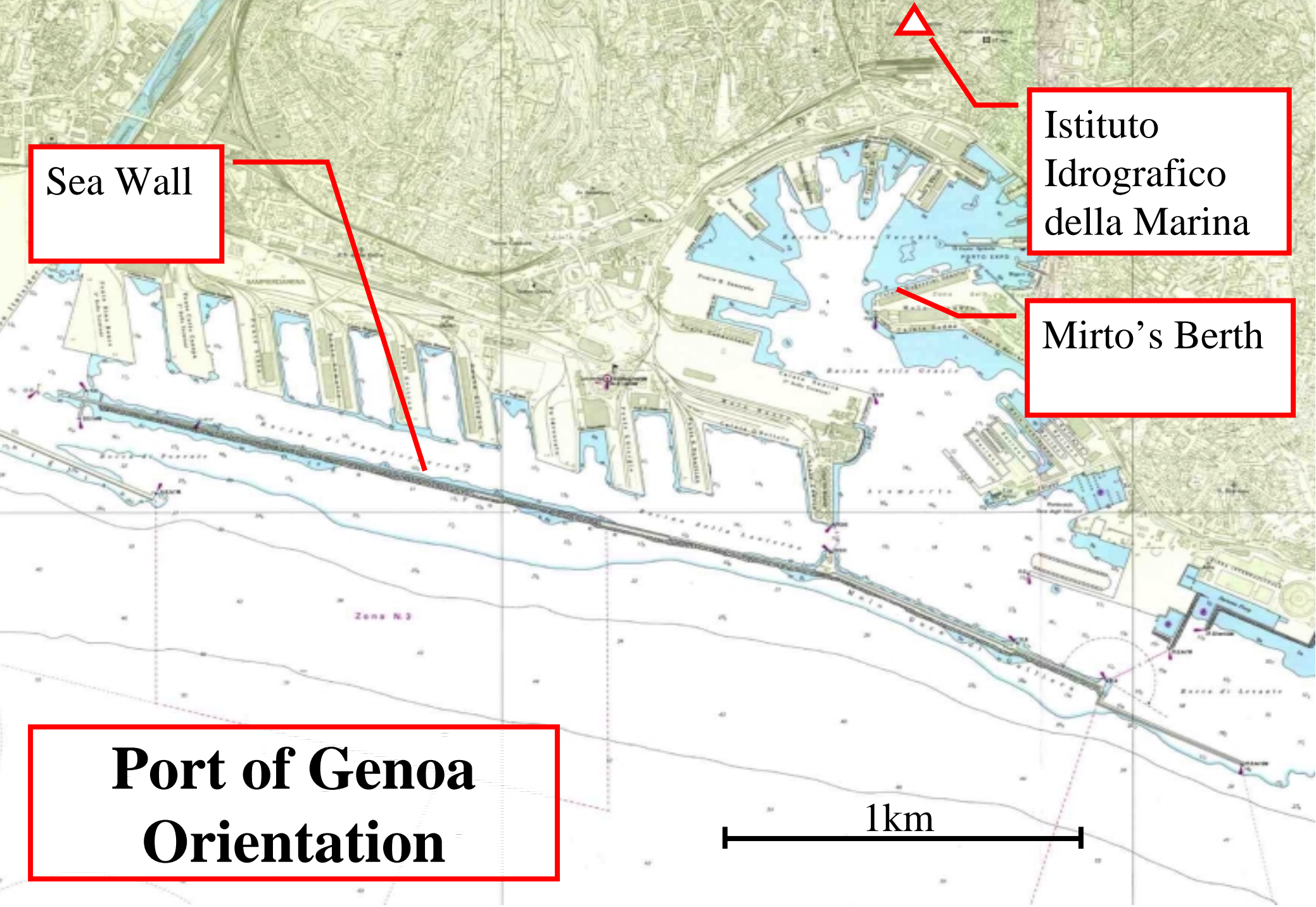
Sea Wall

Istituto  
Idrografico  
della Marina

Mirto's Berth

Port of Genoa  
Orientation

1km



# IIM Ship: MIRTO

- Dimensions
  - Length: 44.1m
  - Width: 8.5m
  - Displacement: 405 tonnes
- Performance
  - 2 x 600 HP Diesel Engines
  - Speed: 10 knots

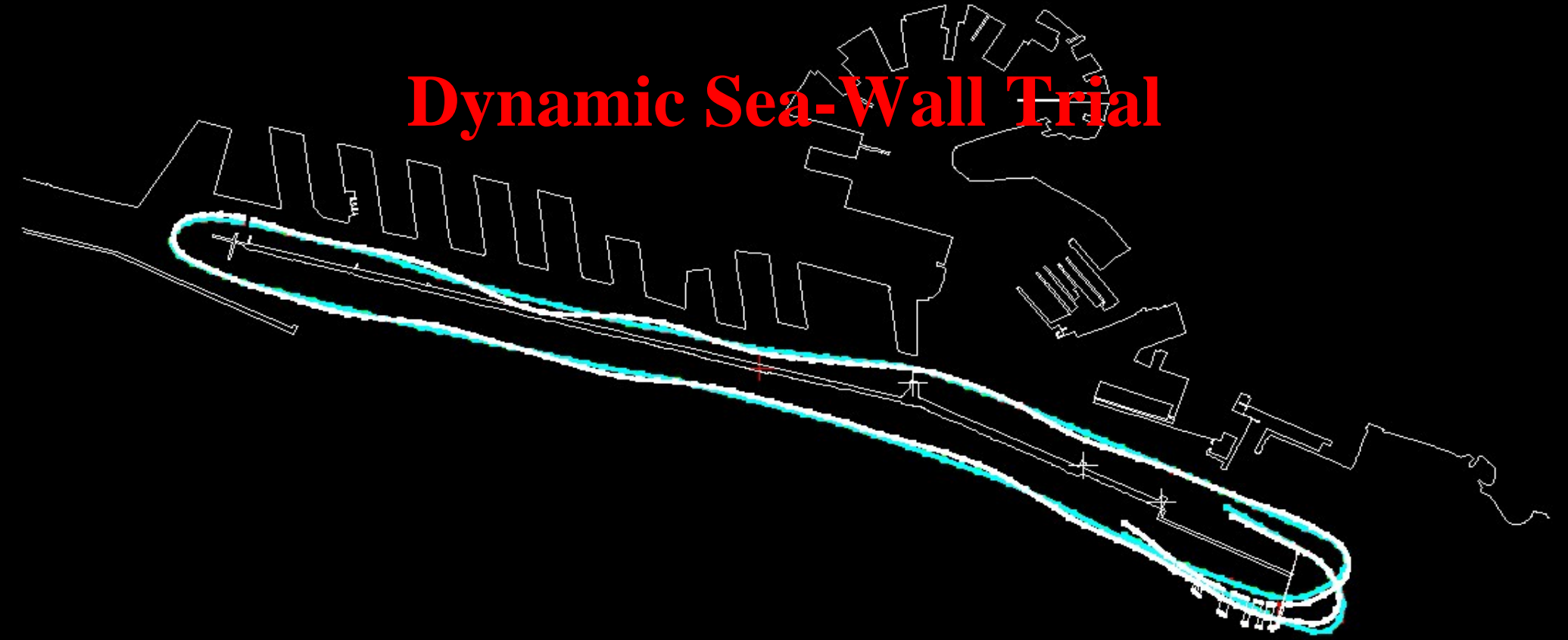


# Trials with IIM: Sensors & Systems

- GNSS
  - DSNP LRK
  - DSNP GPS and EGNOS
  - Trimble DGPS
- Total Station
  - Leica TCA 1101
  - Ring of 18 prisms
- Hydrographic
  - MHYDROS data acquisition system
  - ATLAS KRUPP Deso 20
  - ENC



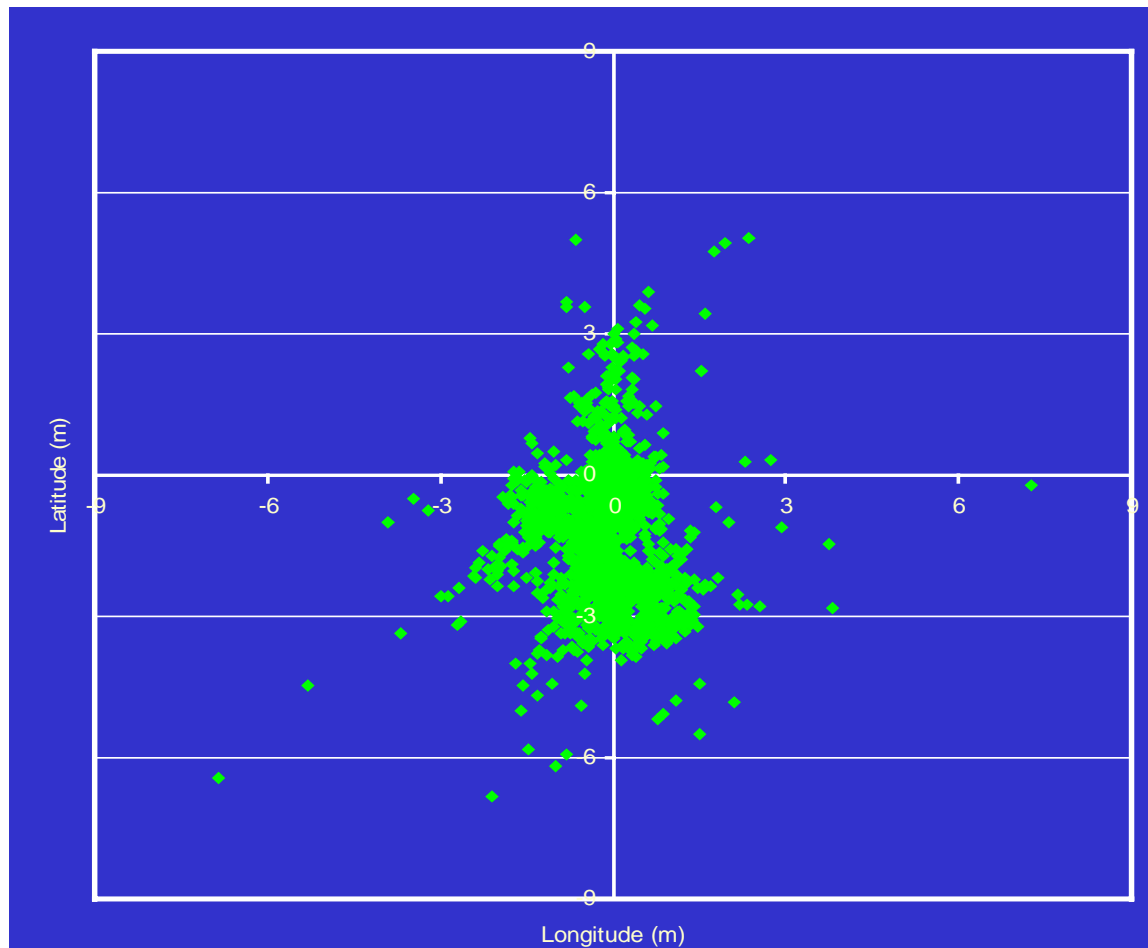
# Dynamic Sea-Wall Trial



- 22nd February 2000
- LRK and Total Station adopted as ground truth
- 8 hours data
- Data sub-sampled at 0.1 Hz



# Dynamic Sea-Wall Trial Results



Latitude  $-1.26 \pm 1.44$  m  
Longitude:  $-0.13 \pm 0.78$  m



# Land Mobile Car Demo

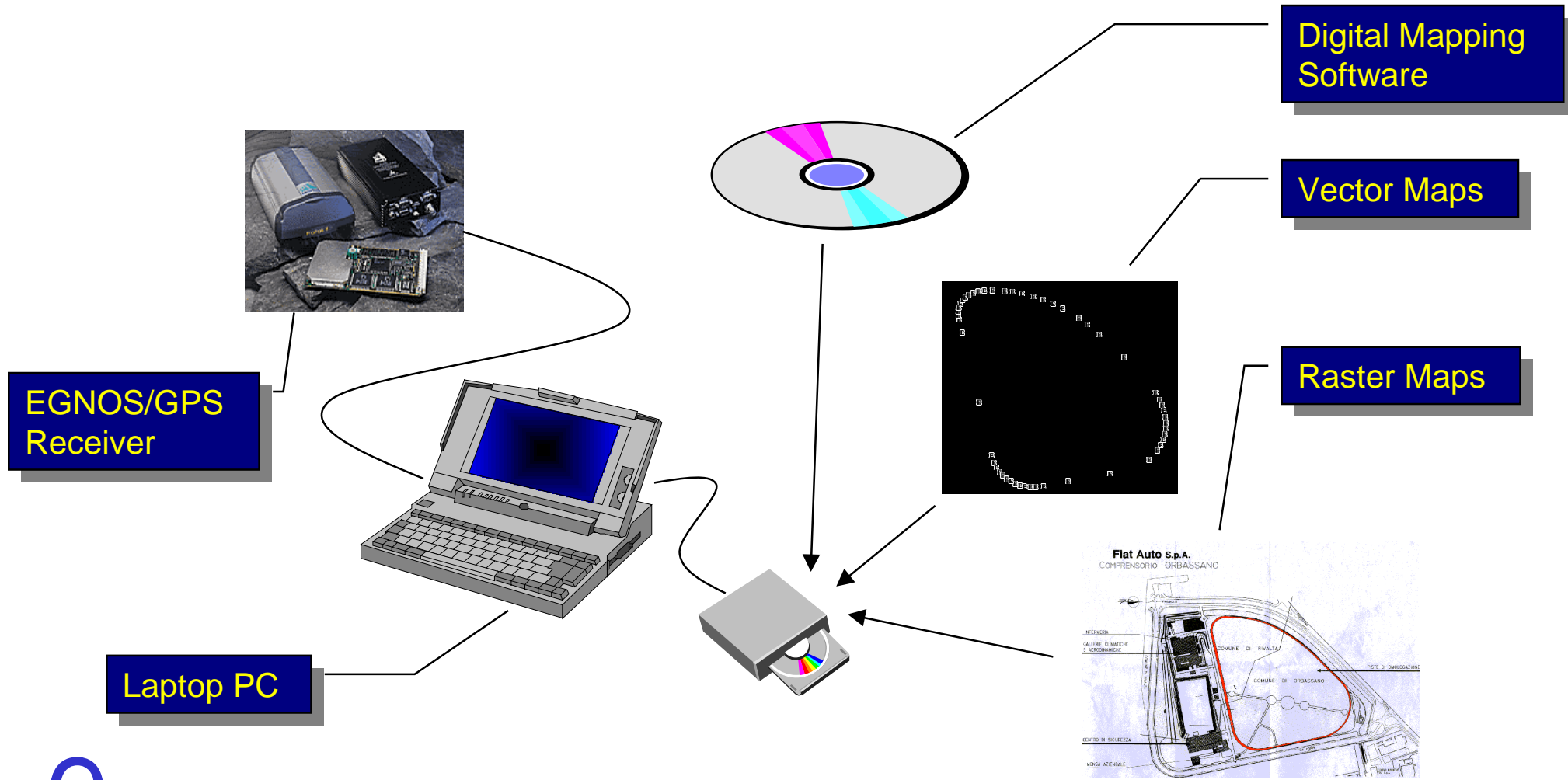
ITS Conference, FIAT Research Center (CRF)

Turin, Italy, November 2000

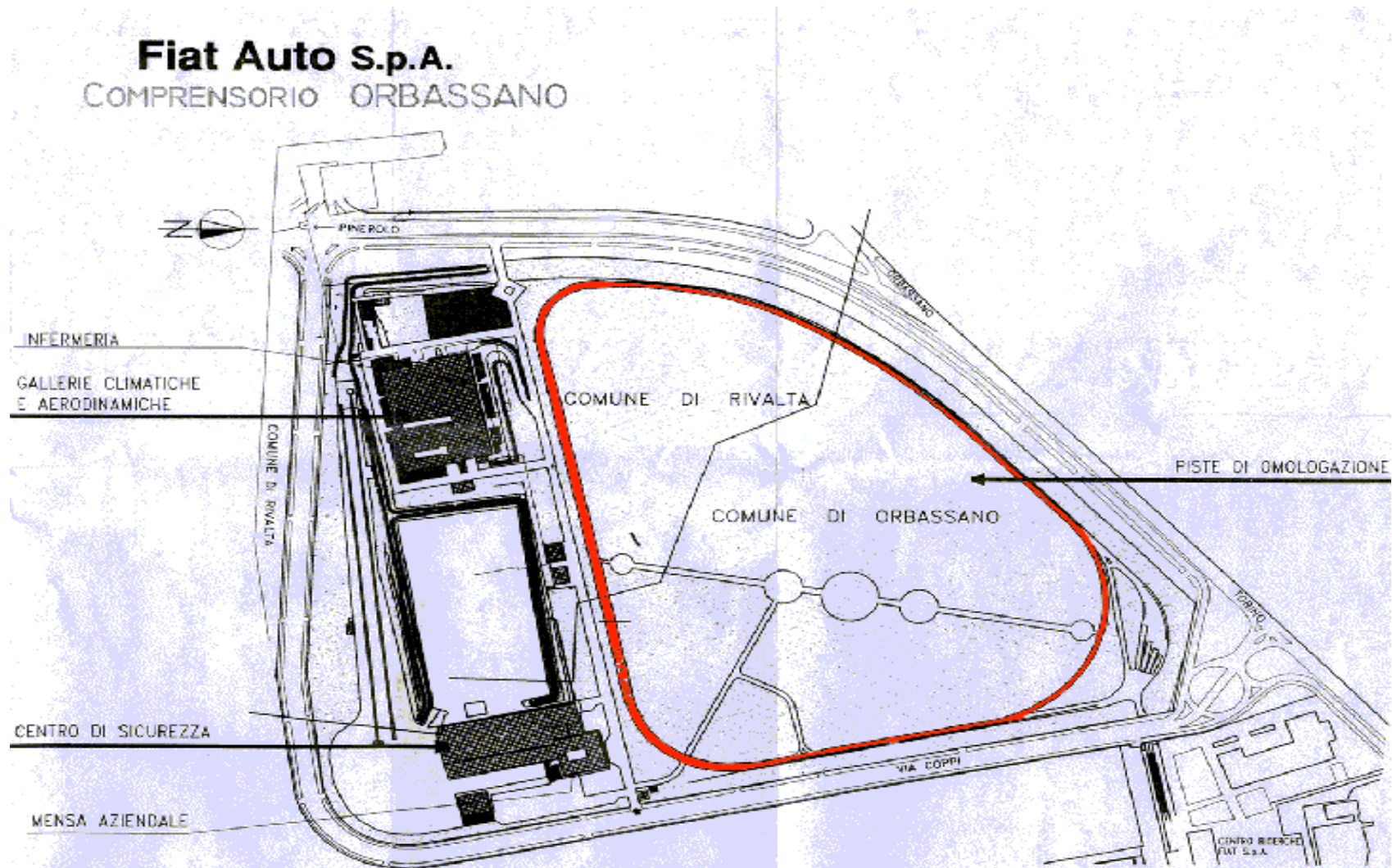


An EGNOS receiver was installed in a FIAT car and linked to a PC running digital mapping software

# Trials with FIAT CRF Systems and Sensors



# The car drove around the test-track, capturing data



# Demonstrated EGNOS benefits for ITS Applications

- Horizontal accuracy performance between 1 - 3 meters confirmed
- High compatibility with GPS demonstrated: a single antenna and receiver can process both the GPS and EGNOS data to deliver enhanced performance
- EGNOS is extremely competitive for markets where the accuracy/cost ratio, integrity and quality become important differentiators
- When local communications links are unavailable, EGNOS effectively provides an alternative “Differential GPS service” all over Europe and free of direct user charges
- Including EGNOS functionality enhances performance with little or no cost impact and is Win/Win for ITS Applications



# Inquires received for future ESTB pilot projects

- River navigation (Germany, Belgium)
- Air based teledetection of agricultural evaluation of soils (Spain)
- ITS applications, i.e. fleet management, route guidance, traffic information, tolling, emergency (UK, Germany, Italy, Spain, France)
- Hydrography, Cartography, Search of Debris , Underwater Archaeology , Oceanography (Italy, Norway)
- Train Localisation for Low Density Traffic Lines (Belgium, Czech Rep.)
- Harbor operations and open sea navigation (Greece, Italy, UK, Spain, Norway)

*.....and many other interesting ideas!*

# Conclusions

- Initial ESTB demo's have raised high interest in professional users
- Pilot projects based on ESTB should promote the development of future EGNOS and Galileo applications for a wider user base
- ESTB should eventually become a much-wanted and much-needed facility to support many user tests/demo's
- ESTB utilisation: key step in order to gather expert user feedback for the Galileo design phase

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