



## **Test results of the e-Tracker, a new **modular and flexible** Loran-C based goods tracking system**

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Presented by Professor David Last**



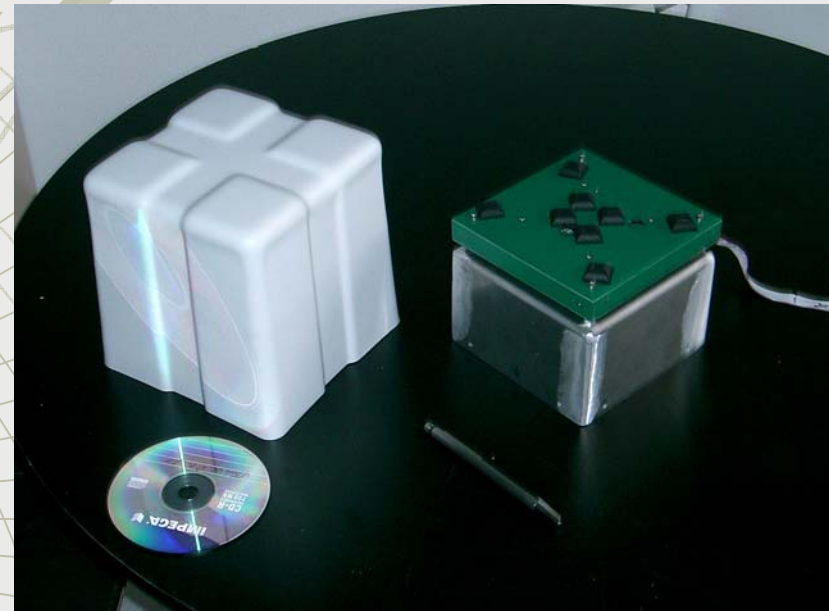
## Elsis logistics tests in 2006

- From April-June 652 test drives were made, covering ~120.000Km
- Area covered from Scandinavia to Greece and Spain to Scotland
- Tests under normal logistics operating conditions (trucks, buildings)
- e-Tracker autonomous without external antennae and battery
- Total of 18,310 position transmissions, of which 7,977 Loran positions because of the actual poor Loran coverage in Europe
- E-Tracker total test results indicate a position availability of 99,4%
- Tests made under the supervision of Fraunhofer Institute, Magdeburg.
- Fraunhofer Institutes, a leading German organisation for applied R&D in Europe with staffing of 12.000 and a 2005 budget of 1,250 M€



## e-Tracker 1. Generation

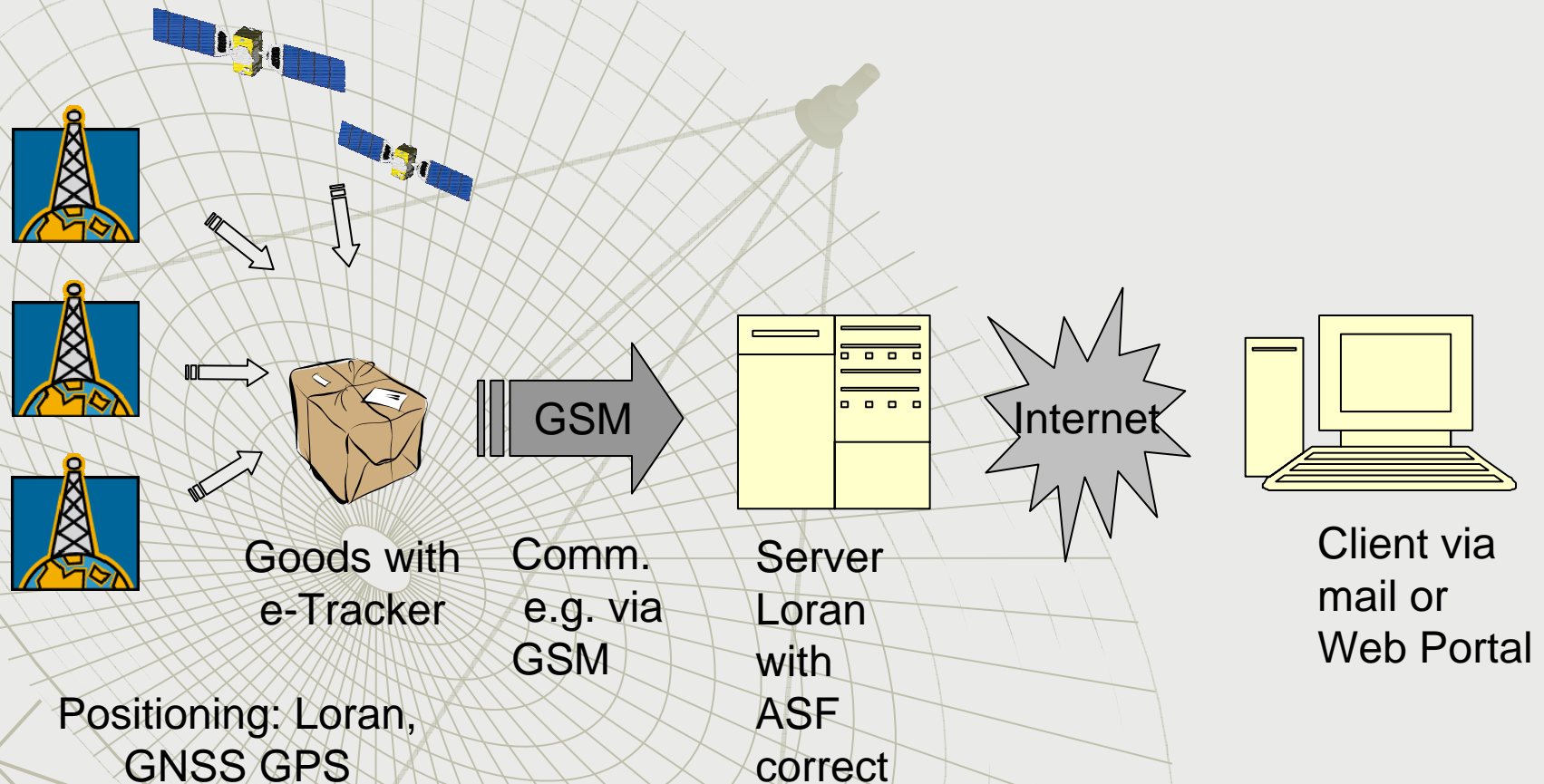
- Reelelektronika Loradd
- Loran H-Field antenna
- GPS Receiver (Sirf III)
- GSM-module
- Batteries
- 1 position/hour transmitted
- Dimensions: 18x18x19cm
- Weight: ~4 Kg



e-Tracker 1. Generation



## e-Tracker operation principle







## Overview of all systems position test results





## Overview of all Loran positions only







## Positions in LONDON area

e-Tracker all systems



e-Tracker only LORAN





## e-Tracker positions Cologne area

e-Tracker all systems



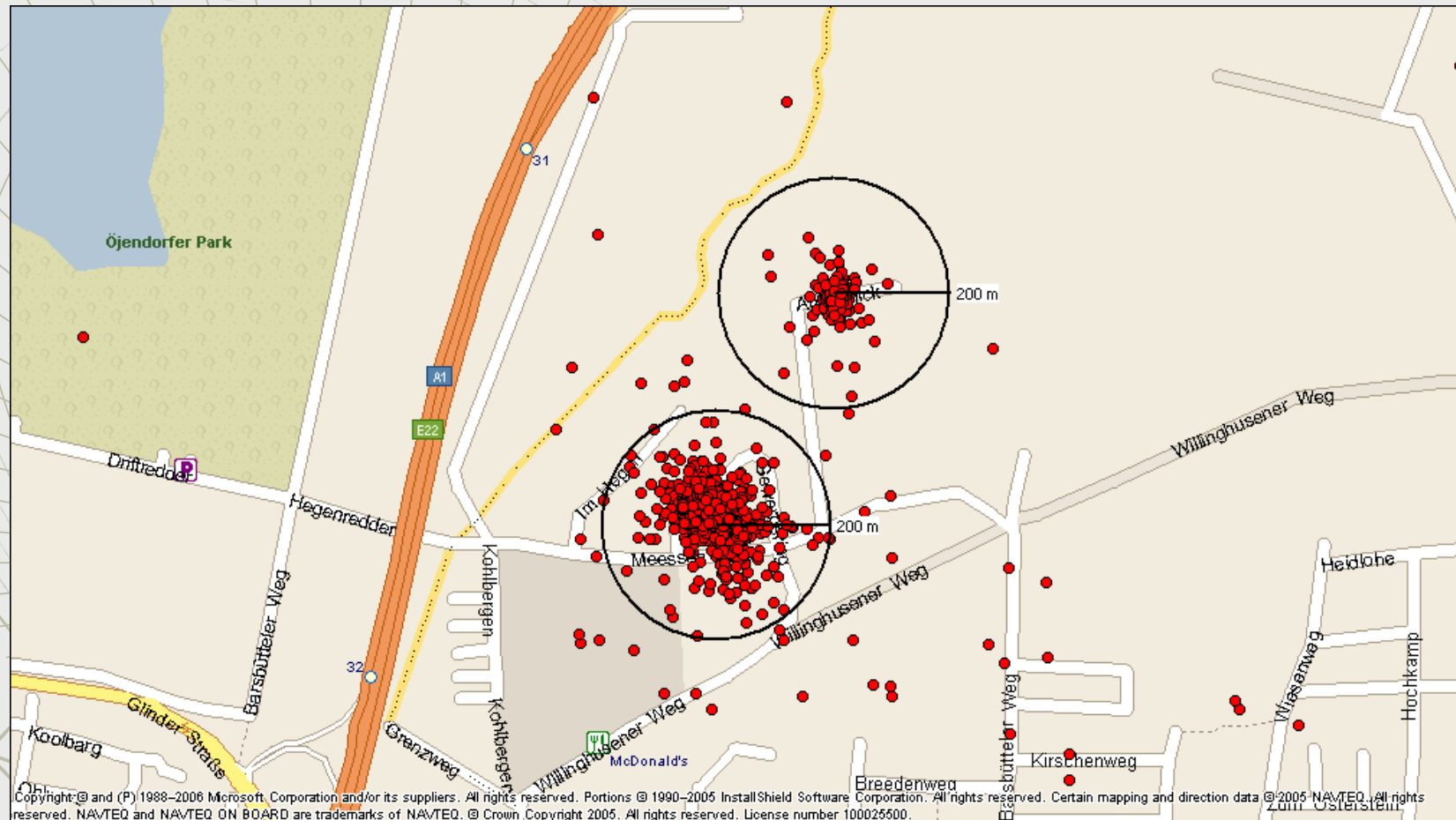
e-Tracker only Loran







## LORAN positions inside a warehouse





## GNSS enhanced with LORAN

Quote from GPS World (1 Oct.06) by Ivan G. Petrovski

**«As new and renovated satellite navigation systems arrive and applications and innovative commercial ideas increase, *the general expectation of GNSS navigation performance will soon conflict with system limitations*»**

**The ELSIS tests clearly show that more than 99% reception of positions can be reached by combining LORAN with GNSS and GSM. Furthermore, LORAN is also the most appropriate GNSS back-up system**



## Main conclusions of the test

- Loran provides good logistics positioning accuracy
- Loran coverage in Europe insufficient for logistics
- Actual Loran receiver costs prohibitive for logistics
- Unsatisfactory Loran coverage hampers demand for low cost Loran receivers
- Market price Loran in logistics applications <120\$
- Strong improvement of Loran coverage imperative and urgent, for land-based Loran applications
- If no Loran coverage improvement happens, Loran may miss the mass market for land-based tracking

**Therefore ELSIS AG adapted their e-Tracker**



## e-Tracker Basic Unit

### Consisting of:

- GNSS Receiver (Supersense)
- 2 GNSS antennae (omnidirect.)
- GSM-module
- Batteries (up to 5 years)
- Monitoring of battery status
- Tracing with low power
- Aviation mode (switch-off)
- Dimensions: 115x115x34 mm
- Weight: 450 grams



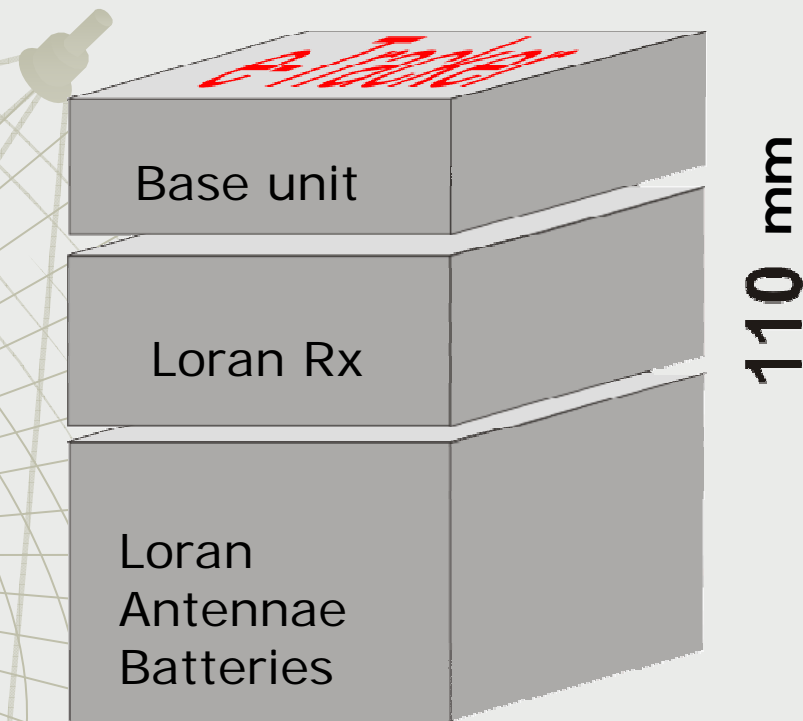




## e-Tracker Modular and flexible

ELSIS is ready to bring out the smallest cheapest and lowest power consuming Loran receiver in the world, as soon as proper Loran coverage is available:

- 2 Patents pending for a Loran receiver and its 3-D antennae
- System modularity allows expansion of equipment, allowing customers to upgrade at any time, in accordance with available technology





## European tracking market: 2 main market segments

Tracking Market



GOODS

ASSETS



## GOODS Tracking

### WHAT?

- Pallets
- Parcels
- Art works
- Collection items
- Dangerous goods...

### WHY?

- Theft
- Just in Time (JIT)
- Temperature
- Acceleration ...







## ASSETS Tracking

### WHAT?

- Trailer
- Container
- Construction equipment
- Automotive (Old-timers)
- Yachts...

### WHY?

- Theft
- JIT
- Monitoring
- Inventories







## Availability of e-Trackers

- A certain amount of e-Trackers 1. Generation (with GPS, GSM and LORAN) are today available for further tests & demonstrations
- Delivery of the 2<sup>nd</sup> generation e-Tracker basic unit with GNSS & GSM starting during 4. quarter 2006
- Delivery of e-Tracker extensions with additional sensor functions starting 1. Quarter 2007
- Availability of Loran units depending on the Loran coverage situation



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