

GALILEO
Masters



GALILEO MASTERS 2005 THE RESULTS

SYSTEMS
IT, Media, Communications
24-28 Oktober 2005

...
ANWENDUNGSZENTRUM
Oberpfaffenhofen



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Intro

Now that the second Galileo Masters is over, the winner having been selected and the award ceremony held, we can be pleased to look back at a very successful event comprising the leading European high-tech regions. In the end, seven regions took part to make our competition such an outstanding award.

We received a large number of good and innovative ideas. Thanks to our highly qualified team of more than 35 experts from all over the seven regions from the United Kingdom, Netherlands, Czech Republic, Göteborg, Nice - Sophia Antipolis, Varese and Munich, we were able to nominate the best ideas. They had the opportunity to represent their innovation with a stand at the SYSTEMS trade fair at our Satellite Navigation area.

In 2005 all winners from the seven regions succeeded in stepping up their efforts to realize their ideas, by making very promising contacts at the tradeshow SYSTEMS.

Our outstanding forum enabled us to catch the interest of the public interests and attract a high number of visitors to the Satellite Navigation area. All the highly qualified spokesmen and representatives of the many companies did their part in making the area truly unique.

We were visited by representatives from all around the world who discussed and explained issues concerning Telematics, LBS, GIS, Galileo and many other topics.

They ensued a lively contribution to our area, thanks to their qualified teams and the interest in each co-exhibitor. We also encountered tremendous approval from each exhibitor. All of them were able to win - as did our finalists - a variety of new contacts and potential business partners. Many of the exhibitors intend to join us again at the SYSTEMS and Galileo Masters 2006.

Here, we would like to thank the German Aerospace Center (DLR), and the Munich Trade Fair Organisation for its great support. Furthermore, we would like to thank our main sponsor Thales and our other sponsors Cobra, Billing Components, ESA, EBN and Galileo Industries.

Thank you very much for your outstanding cooperation. Without the support of so many companies and individuals the whole adventure would not have been realized as successfully as it was. In particular, our personal thanks are due to the regional organizers in every country. Mrs. Sonia Lorenzani from France, Mrs. Ulrike Firniss from Sweden, Mr. Adam Tucker from UK, Mr. Dr. Carlo Mazza from Italy, Mr Niels Eldering from the Netherlands, Mr. Jirri Fuchs from the Czech Republic - without their professional support, this competition would not have entered the European stage.

We are looking forward to launching the Galileo Masters 2006 with more European regions and to navigate your business towards success in emerging markets.

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GALILEO MASTERS 2005 OVERALL WINNER - FRANCE / NICE SOPHIA ANTIPOLIS

Is there any rational justification for driving a 100-horsepower (75 kW) one-ton petrol-powered saloon carrying a single 70 Kg person for a 20-minute urban trips? Whereas a light, silent, urban and clean vehicle of 2KW can do the same job.

The potential impacts of Satellite navigation services on urban congestion, road network saturation, energy and environment issues are the starting point of our project.

The emerging multimodality paradigm represents a real shake-up to the traditional segmentation of the transport business : mass versus individual, public versus private. Information systems offer travelers a larger range of solutions: walking, roller skating, Segway, biking, on-demand transport, taxis, buses, tramways, railway and private cars. As the ability to undertake personal travel is regarded as an important indicator for quality of life, VU Log is developing services to accelerate this movement from uni-modal to multimodal traffic behavior.

VU Log is both an information system and a new mobility tool focusing on short distance trips (50% of the total trips in most European cities). It provides instantaneous and highly accurate information on the position and availability of small shared electric cars organized in fleets.

VU Log technology simplifies individual vehicle usage : pay-as-you-drive, no maintenance, no refueling. Moreover, having analyzed the numerous car sharing initiatives of the 90's, VU Log software will take advantage of the Galileo Satellite Navigation System to tangibly improve our environment and enhance energy efficiency while increasing citizen mobility.

How it works ?

People living and working in city centers or large of significant activity and registered at VU Log service, just have to connect

to our web services. They access the car using a smart card and then start their trip.

Background?

The background of VU Log partners lies in information and control technologies in combination with extensive experience gained in European research projects such as CyberCars (IST) & CyberMove (EESD). They belong to **INRIA** and the **Rainbow** team of **I3S in Sophia Antipolis**.

The feature of these projects was to bring together IT technologies experts, urban designers and city authorities in a user-oriented evaluation and experimentation program.

Project plan

VU Log is focusing on a small number of pilot projects in order to introduce these and confirm the environmental and energy impact of its technology and prepare for diffusion in coherence with the Galileo program.



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GALILEO MASTERS 2005 REGIONAL WINNER - SWEDEN / GÖTEBORG

Tracking system for stolen bicycles

Bicycles are stolen everyday in cities all around the world, a fact which entails more administrative police work. Not to mention the problem it creates for people going to work or school.

My idea basically consists of a positioning chip, a unit able to send information through the GSM/3G, an antenna, battery supply and a computer system capable of receiving the information, interpreting and converting it to a position that is understandable on a map. The idea is that this positioning information could be provided by a mobile service based on the 3G net which you activate yourself, or a service rendered by an operator.

A program sender chip which sends signals to the signal receiver. Demands small amount of energy. Like emergency signals, a special frequency could be reserved on the 3G net. The components making up the system would be placed in the frame of the bicycle within a casing making it "theft-proof".

This system would be possible to apply to the Galileo system because it provides a position exact enough to determine the position of your stolen bicycle. In regard to the police work needed for solving these minor crimes, you can see that this idea has, in my opinion, a wide market.

This idea would have several uses:

- Retrieving stolen bicycles
- Decreasing administrative police work
- Creating a "new" insurance industry

All components of the system currently exist, except for the unit transmitting the signal to the computer. The function would be the same as in a mobile phone except that it must use much less battery power and be much smaller.

Imagine that you could always obtain a map showing the whereabouts of your bicycle and an x that marks the spot. This application could be applied to many other areas, not only bicycles.

Enabling this service to be accessible from a 3G-mobile or a web-based system would solve many problems.

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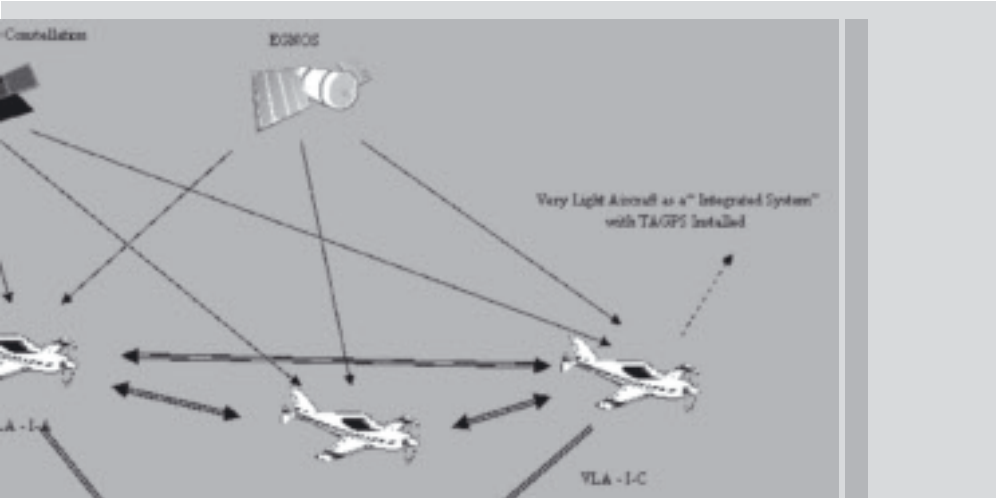


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GALILEO MASTERS 2005 REGIONAL WINNER - ITALY / VARESE

TAGPS Transponder AGPS – EGNOS

In the recent years, we have helped in the expansion and diffusion of light aviation, in particular that of very light aircraft (VLA) and sport aviation. This growth is mainly due to the low costs involved in flying and maintaining these airplanes. Light aircraft that are available in assembly kits, as well as bureaucratic procedures and costs for training and obtaining the pilot licenses are small. A new movement in support of aeronautics has consequently generated a market demand. Small start-ups have been born, revitalizing a sector that has been untapped for years, in conjunction with multinational company strategies. Unfortunately, the increase in aircraft and their performance, along with the fast growth rate, and the limited experience of pilots has led to a decrease in security levels. It is therefore necessary to support secure flight conditions, by technologically advanced solutions.

In order to obtain this result, GPSAeroborne is developing a system called TAGPS, able to support pilots and air fields in situational awareness, collision avoidance and air traffic control. TAGPS, based on GPS/GALILEO/EGNOS satellite systems, will be reproduced on aircraft cockpit main air navigation instruments. These data will be sent to the other aircraft operating in the same area and to the airfield control base, by means of a SRD (short range device) within the available radio band. The TAGPS system is composed of a flight segment and one on the ground. Aircraft will be able to exchange information on their mutual position and the system will generate a proximity alarm as well as visualize, with the moving map, the position of the other aircraft flying simultaneously.

At the same time, a ground station receives the same data and the TAGPS system visualizes the current positions and trajectories of the aircraft and provides a forecast of their next path (air traffic control).

This ground segment will be a portable air traffic control. TAGPS will be very useful during the approach and landing

phase with low visibility conditions or during high intensity traffic; web integration is being studied. Moreover, operational data recording on the ground segment will constitute traffic; web integration is being studied. Moreover, operational data recording on the ground segment will constitute an optimal training tool. TAGPS can show and analyze maneuvers of the VLA. This remote black box can be helpful for ascertaining the cause of accidents.

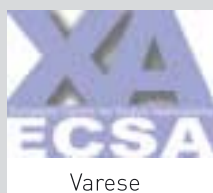
The capacity of the system in terms of reception and transmission of the data is in the order of some km, which is compatible with the performance of VLA aircrafts.



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GALILEO MASTERS 2005 REGIONAL WINNER - CZECH REPUBLIC / PRAGUE

Personal Watcher – GPS/EGNOS/GALILEO outdoor/indoor personal localization unit

There are many groups of people who can benefit from precise localization in difficult conditions. It provides more safety or even enables them to move independently in specific areas. The most pertinent examples are blind, handicapped or elderly people or professionals such as soldiers, policemen, firemen and other search and rescue squads. A very specific, but from a commercial point of view very interesting group comprises children. Probably all parents have at times dreamt of knowing the exact position of their daughter or son who is walking somewhere outside in a potentially dangerous world.

Personal Watcher is a device designed for personal protection. It continuously monitors certain live parameters and transmits them together with the precise position to the command / surveillance center at regular intervals or, in event that an emergency condition is detected, immediately. Emergency conditions are:

- Emergency Alert from panic button,
- Fall-Down Alert from inertial sensor,
- Technologic Alert (such as low battery),
- Area & Proximity Alert triggered by crossing preset boundaries or close to defined points

The ICE company involved in the EU project SCORE (Service of Coordinated Operational Emergency & Rescue using EGNOS) used particular project outputs and patented indoor localization algorithms of another consortium member ALCATEL ALENIA SPAZIO, combined it with its own non-GPS positioning methods based on inertial motion sensors and magnetic compass and integrated it in handy battery-operated device equipped with wireless communication capabilities covering GSM, GPRS, WiFi and radio-beacon. ICE PERSONAL WATCHER is the first commercial product on the market using core EGNOS technology and providing real A-GNSS. The main advantages of the A-GNSS compared

to conventional GPS receivers are:

- Short time to First Fix
- Precise localization under difficult conditions (urban canyons, indoor)

As the position is calculated from raw satellite data, there is a possibility of software switching between different satellite networks (GALILEO, NavStar, GLONASS)

The device features an emergency call button sending location information and establishing two-way voice communication to predefined numbers.

A 433 MHz radio beacon provides location in deep underground places and other environments with poor or no coverage of the standard networks. An integrated inertial motion sensor is able not only to determine that the person is moving, but even whether the tracked person is breathing. It is possible to connect supplementary sensors for essential live parameters.

The combination of the measurements can recognize the following basic states of the bearer:

- Active standing (normal condition)
- Active lying (normal condition)
- Breathing lying (suspicion of injury)
- Steady lying (suspicion of death)

All information from the unit is accessible through an internet-based GIS server.



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GALILEO MASTERS 2005 REGIONAL WINNER - UNITED KINGDOM / LONDON

Tracker«Back»™ – Satellite Guaranteed Delivery Authentication

GPS/Web/Mobile Technology Provides Duty of Care Records Anywhere - Worldwide

Protecting and improving our environment is a significant task. Currently it is estimated that the UK produces over 400 million tonnes of waste each year, in addition to this there is a staggering 450,000 tonnes of used tyres produced by the UK alone (enough to stretch from London to Sydney!).

Current legislation prohibits the disposal of whole tyres at landfill sites, a law set to cover shredded tires in the near future. So where do all these tyres go? More importantly how can we trace their movements and ensure that they are disposed of or reused safely and correctly?

Current secondary uses for waste tyres include:

- Tyre Bailing for flood defense
- Children's playground surfacing
- Trialing for race horse exercise circuits
- Railway sleepers

Richard White, the inventor of Tracker«Back»™ has worked closely with the Environment Agency through the Waste Tyre Recycling Forum and wanted to address some of the issues that they face, in particular the issue of tracking tyre disposal.

Tracker«Back»™ has been developed to track consignments of waste which are illegally disposed of and would harm the environment. This system will also support numerous other industries and sectors, thus increasing efficiency and, in the case of tyres, protecting the environment and saving the tax payer money!

Tracker«Back»™ enables the user to collect and review up-

to-the-minute data on any waste contained, collected or delivered to your door using GPS/GNSS and web technology.

Until now, being able to demonstrate that the tyres have been correctly disposed of at the correct location has been difficult, with no way of proving delivery or tracking the consignments. Introduction of the Tracker«Back»™ system, using the enabling technology Galileo and GNSS, will combat these issues.

The signals received from the Galileo Satellite determine accurate positions in 3 dimensions. This may allow height measurement within a few centimeters which raises the prospect that there is a potential to provide information regarding the weight of vehicles.

Tracker«Back»™ ensures that the vehicle is identified as authorized to carry the type of consignment and a duty of care authorized transfer sign-off is given at a pre specified location. Providing this up-to-the-minute data collated from GPS / GNSS signals, together with the security identification keys at the correct location, ensures absolute proof that the consignment / waste has been collected and disposed of in the approved manner.



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GALILEO MASTERS 2005 REGIONAL WINNER - NETHERLANDS / NOORDWIJK

IY (Do It Yourself) GNSS kit

Currently, ready made products with GPS/Galileo technology are not so well suited to study and experimentation because the hardware and software is "closed" and not accessible for research, study, modification and/or adaptation. A do-it-yourself kit can offer start-up and small or medium-sized companies in particular the edge to already start working with prototype applications without having to wait for time-consuming outsourced development and production of tailor-made Galileo functionalities. With the DIY kit, companies can create their own Galileo functionalities and integrate them in their overall product (development). This not only improves time-to-market, but also lowers the barrier for awareness that Galileo is already a workable technology to implement in new product and service development. Besides the use for SMEs, the do-it-yourself Galileo kit is a good educative tool for engineering schools (and schools in general) as well as an interesting "edutainment"-kit for the interested hobbyist market.

Moreover, because it is a do-it-yourself kit, it enables the user to become familiar with the technology by fully documenting the functionality of to the electronic circuit and component level (as well as by constructing it). The main key advantages of this innovation are: open design, collaboration and knowledge diffusion via the internet, time-to-market for new product ideas using GNSS, as well as increased awareness of GNSS. These advantages are brought to the potential user via documentation and the internet.

The application areas for the DIY Kit depend on the user. The applications are therefore wide and versatile: e.g. navigation on a laptop, precision timing in computer networks but also, for instance, in sports, tracking and tracing within a wireless network, etc. The extensive documentation makes

it possible to adapt the design to any specific needs.

Manufacturers of GNSS receiver OEM modules can use this kit - custom adapted to their products - to speed up the development phase concerning applications using their products, and thus reduce time-to-market."

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GALILEO MASTERS 2005 REGIONAL WINNER - GERMANY / MUNICH

Satellite-based system for collision avoidance and traffic management in aeronautical and maritime applications

Satellites have revolutionized business communications in the sky. Navigation satellites are used in aviation and shipping. However, too many accidents still occur because navigation and communication systems are not utilized to their full extent.

The main idea is to simulate the airspace or water surface with vehicles (aircraft or ships) as precisely as possible with a prediction capability based on information transmitted from individual vehicles. The simulation centers maintain a permanent data connection with the vehicles via satellite or, alternatively, via terrestrial radio links. Relevant simulation parameter vectors contain satellite navigation data, position, orientation, (angular) velocity, (angular) acceleration, the intended route as well as controller settings and other data (weather, wind, machine parameters ...). In this way, a very detailed simulation can run in large computing centers, including current and near-future behavior. When collecting all these data, nonlinear predictions can also be performed, and not just linear paths according to the position and velocity of vehicles, as is currently the case.

The system will be supported with additional radar surveillance data, so as to also include vehicles which do not transmit their position and existence (military, sports ...). This allows additional redundancy and verification capabilities.

A second computer system will use the air/sea simulation states and predictions to operate an expert system for automated collision prediction and warning message generation. This could have prevented the accident in Konstanz-Überlingen where the human air traffic controller was not aware of the situation. It is quite usual for traffic control staff to experience high levels of stress. Next to traffic control, machine monitoring is also very important. On-

board machine diagnostic today is limited and the pilot cannot attend to technical details too much as he has to concentrate on flying. Expert teams on the ground can be very useful for handling critical situations if they receive large volumes of machine-specific data via a broadband satellite link. Machines should correct or warn about dangerous human decisions. One example in Vienna in July 2000 can be cited, when the pilot made mistakes in calculating the remaining fuel reserve. He suddenly ran out of fuel and crashed the airplane with an emergency landing. Automated and remote machine monitoring can prevent many such problems.

Another application for this kind of air/sea simulation system is the automated monitoring of no-fly-zones (nuclear power plants) or dangerous maritime zones (reefs, sandbanks), to detect possible violations at an early stage and generate warnings. The "network-centric black box" can be realized by recording the simulation data for better accident analysis and instant support for the rescue teams.



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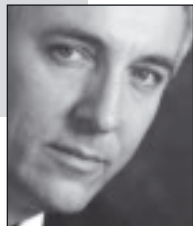
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