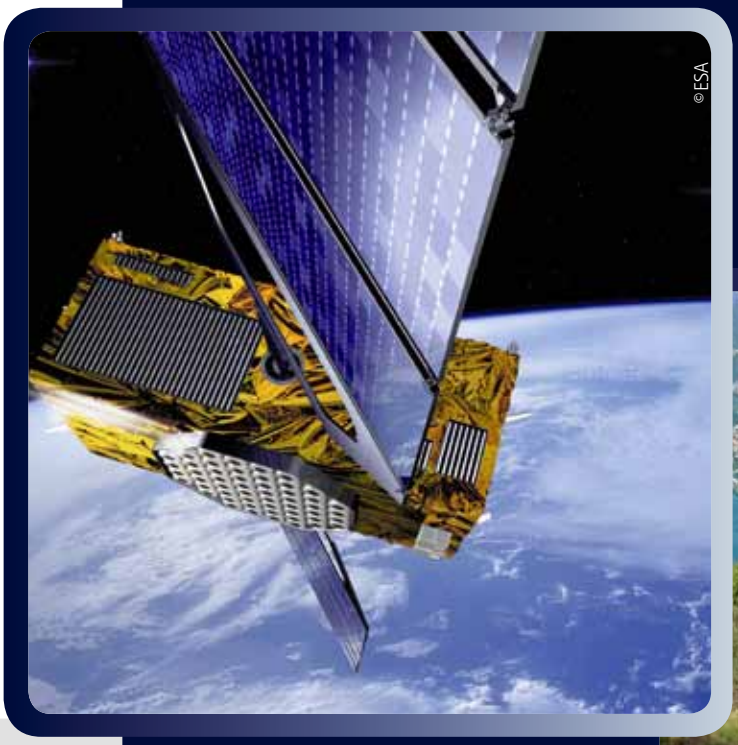
SAT NAV-*Forum*

Forum für Satellitennavigation

Regional SatNav Initiatives in Germany



Innovative satellite-based solutions, products and services for the future

supported by

Federal Ministry
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Content

Galileo – Regional SatNav Initiatives in Germany

Imprint

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Foreword

Dr. Peter Ramsauer, Federal Minister of Transport, Building and Urban Development

Ladies and Gentlemen,

Satellite navigation is one of the most important cutting-edge fields providing a crucial impetus for growth and employment. This is especially true for the development of new and innovative products and services that are based on satellite navigation and in particular on the European satellite navigation system Galileo.

We need technological innovations like these to ensure safe, environmentally-sound and efficient mobility also in the future. At the same time, this is also about the competitiveness of our companies in a high-technology market that is growing rapidly worldwide. Only those setting the right course and making viable investments will continue to play a leading role in the future. The growth market satellite navigation offers excellent opportunities particularly for the innovative capacity of small and medium-sized enterprises and for developing important foreign markets.

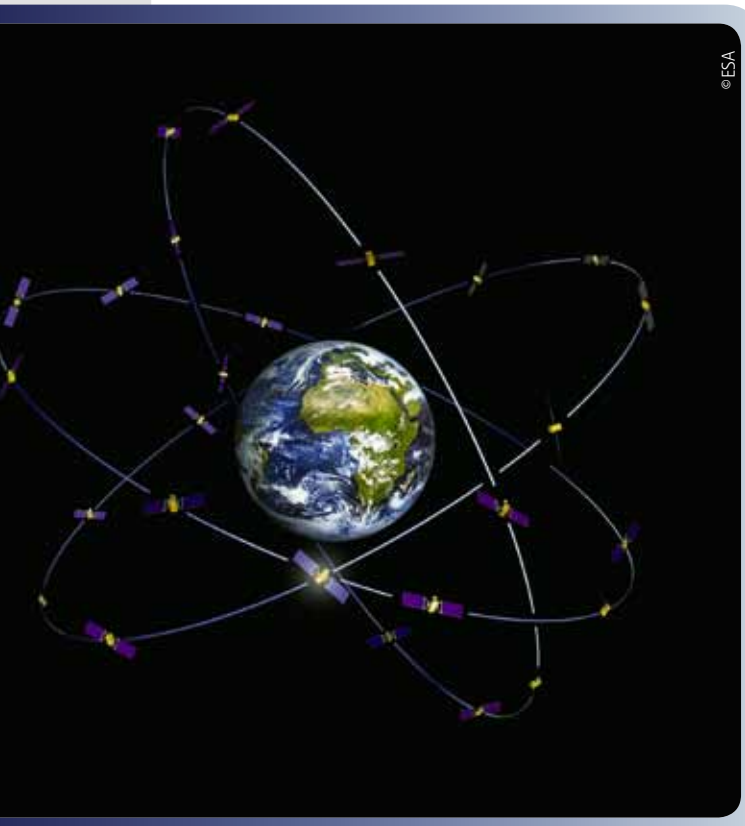
The Federal Ministry of Transport, Building and Urban Development (BMVBS) has therefore been supporting the nationwide cooperation between the existing regional initiatives and its members since 2006 with the "Forum for Satellite Navigation". In this context, the BMVBS sees itself as a facilitator and patron. The "network of networks" provides businesses, the scientific community, trade associations and public administrations with a platform for broad-based exchange, cooperation and the pooling of joint interests. Feedback from the circle of users is taken up with interest by the BMVBS and can thus be considered in the political decision-making at the European and national level.

With this brochure, I would like to tell you more about the possible applications of satellite navigation and in particular about the "Forum for Satellite Navigation" and the participating regional initiatives. The innovative capacity and the commitment of the businesses and people in Germany is one of our crucial locational advantages in global competition. On this basis, let us shape the future together – for growth and employment in Germany.

Dr. Peter Ramsauer
Federal Minister of Transport, Building and Urban Development

Galileo

Europe's Answer to GPS and GLONASS



The Galileo satellite navigation system will comprise 30 satellites, which will guarantee global coverage (ESA)

What is Galileo?

The Galileo satellite navigation system will provide users with three-dimensional positioning and timing services worldwide and at any time. A specially developed, comprehensive range of services will take into account the different needs of various user groups in terms of accuracy and reliability of the system.

Galileo will comprise 30 satellites positioned at regular intervals on three intersecting orbits at an altitude of approximately 24,000 kilometers. Together with the ground control segment, it will guarantee global coverage. Regional and local components will complement the system in order to also meet special requirements.

Why Galileo?

The Galileo satellite navigation system was jointly designed by the European Union EU and the European Space-Agency ESA for civil purposes. It will ensure that Europe is independent of the two systems which are under military control, the American GPS and the Russian GLONASS. If GPS were to fail for only two days, Europe would suffer a loss of approximately 220 million euros in the transport sector alone.

Moreover, Galileo will give German and European companies a better position in the field of satellite navigation products and services, thereby enabling them to share in the attractive economic growth. In addition, they will acquire new skills and become more competitive.

What are the advantages of Galileo compared with GPS and GLONASS?

The so-called Walker satellite constellation of the Galileo system will provide better signal availability at high latitudes and in areas where there is a high degree of masking, such as urban canyons and narrow valleys. Where signal masking is unavoidable, it will be possible to insert additional regional and local elements to ensure highly accurate and safety critical navigation.

The high level of continuity of the Galileo signals means that it will be possible to give guarantees of operation on some of the services. In contrast, there is no such guarantee for the signal availability and quality of GPS and GLONASS for civil applications. Both the USA and Russia reserve the right to manipulate the signals of their navigation systems without prior warning if they believe their security interests are at risk. This may be done for example by means of distortion or local jamming.

It will be possible to complement the Galileo navigation signal with an integrity message. Within a defined time period, the so-called "time to alarm", the user will be informed directly of occurring errors. This will make the positioning information more reliable.

The interoperability of Galileo and GPS and its combination with add-on systems (at European level: EGNOS – European Geostationary Navigation Overlay Service) will make it possible to provide more efficient services and new applications.

The autonomously operated Galileo system will guarantee users better accuracy down to four meters horizontally and eight meters vertically in real time. By incorporating additional regional and local components, Galileo will be able to provide highly accurate navigation in the centimeter range.

Launch of the Soyuz rocket carrying the GIOVE-A satellite (ESA)

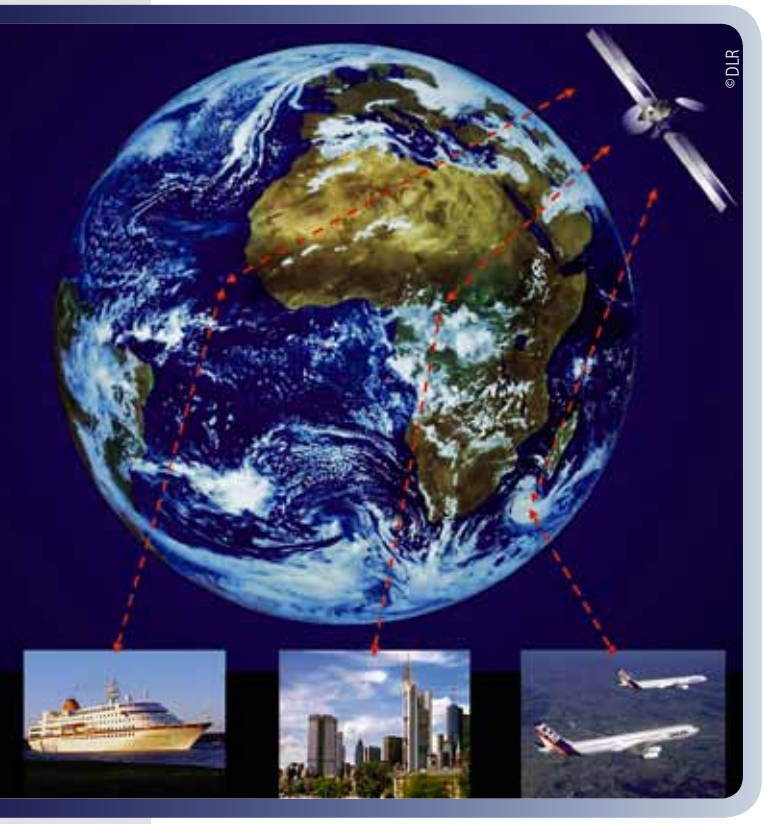
GIOVE-A on the launch pad (ESA)

Galileo Services

Worldwide Positioning and Time Synchronization

New prospects for innovative applications for citizens, businesses and public authorities

Galileo will have a service concept that provides several satellite signals with different properties. Users will be able to use these signals which are transmitted on different frequencies (E1, E5 and E6) for various navigation services:



The free-of-charge **Open Service (OS)** will be tailored specifically to the needs of mass-market applications. It will provide two frequencies (E1 and E5) for positioning. If users determine their position with only one frequency, they will achieve a similar level of accuracy to that provided by GPS. If they use a multi-frequency receiver to combine the signals, they will achieve a higher level of accuracy than with conventional GPS receivers.
Typical users: Transport and logistics, passenger and freight transport, leisure industry (hiking, visiting cultural assets), environment, surveying, construction industry, urban development, agriculture (arable farming and animal husbandry, fishing), industrial production, guiding persons with reduced mobility, research

The chargeable **Commercial Service (CS)** will provide guaranteed signal availability for commercial purposes, unlike the Open Service. Additional signals (frequencies E1, E5 and E6) will provide users with a higher data throughput and improved accuracy. Because of the high level of continuity, the service provider will be able to offer guarantees for his services. In addition, provision will be made in the CS for a specific transmission capacity for messages from service centers to users.
Typical users: Telecommunications and power distribution networks, energy sector (petroleum, gas), mining, construction industry, surveying, fleet management providers

The chargeable **Safety-of-Life Service (SoL)** will be set up on the frequencies E1 and E5. In addition, SoL will provide integrity information that will warn users if a malfunction occurs. It will offer a guarantee in terms of accuracy, availability and continuity. SoL will be of great importance in areas where safety requirements have to be met.
Typical users: Aviation, shipping and railways

The **Public Regulated Service (PRS)** will only be available to authorized users. These users perform statutory functions and place stringent demands on the accuracy and continuity of a service. Accordingly, the navigation signals will include encrypted codes and data.
Typical users: Fire brigades, police forces, border police, disaster control, civil defence

The **Search and Rescue Service (SAR)** will augment the existing COSPAS SARSAT system and enhance its efficiency. The signals emitted by distress beacons can be forwarded via the Galileo satellites to the COSPAS SARSAT centers. Galileo will introduce a new SAR function with the return link. It will be possible for the SAR operator to send confirmation of the emergency call to the distress beacon.
Typical users: Rescue services and present COSPAS SARSAT user

The **time signal** will be used worldwide for synchronization and authentification in e-banking and e-commerce or for automation, and for SoL and PRS services.

Galileo will enhance its potential by integrating other technologies from the fields of communications and earth observation and by incorporating new regional and local add-on services. New ranges of service in the sphere of individual mobility will emerge in the mobile telephony sector, for instance through the installation of Galileo receiver chips in mobile phones. The combination of local information with high-resolution aerial and/or satellite images will make it possible to provide rapid and optimized relief in the event of disasters. By upgrading the signal, for instance with the integrity message, and extending the accuracy services, it will also be possible to provide commercial safety-of-life applications. New indoor navigation technologies will improve positioning and navigation inside buildings and in outdoor areas where reception is seriously impaired through masking and other effects.

SAT NAV-Forum
Forum für Satellitennavigation

Forum for Satellite Navigation

Galileo in Germany

The network of regional German initiatives in satellite navigation

There is a considerable market potential for satellite navigation applications. In order to ensure opportunities in this growth market in particular for innovative small and medium-sized enterprises in Germany, numerous regional initiatives, application centers and associations have emerged in the German federal states.

The prime objective of these initiatives is to provide information on satellite navigation and its potential applications and to broker cooperation and contacts. They also provide financial and logistical support on a case-by-case basis to those setting up a business. These regional initiatives develop a multiplicity of activities to market the ideas of their members. However, because of their orientation, their action is usually limited to a specific region.

In order to be equipped for the competition on the applications market, link-ups that are as wide-scale as possible, i.e. nationwide, are required. For this reason, the Federal Ministry of Transport, Building and Urban Development (BMVBS) launched the "Forum for Satellite Navigation" (SatNav-Forum, previously known as the "Galileo Network") in 2006 which supports the activities of the regional initiatives and creates nationwide link-ups between them.

The Forum for Satellite Navigation provides a platform for a wide-scale exchange of information and experience. It strengthens the link-ups between the initiatives and supports the contacts between businesses, the scientific community, trade associations and users.

However, the regional initiatives are to retain their importance, because they can respond better to the requirements and needs of their members in any given case. The initiatives act as a multiplier for the information and services provided in the SatNav-Forum as well as for requirements and suggestions from their members.

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Federal Ministry
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Activities

The SatNav-Forum meets four times a year, with the meetings hosted by one of its members on a rotating basis. At these meetings, regional and local firms have the opportunity to locally present their ideas and projects. The members discuss a coordinated approach on how to present themselves to the outside world and participate in tenders. They identify and use synergies and discuss new processes of business and project development.

To better develop the markets for satellite navigation applications, a National Galileo User Conference is staged once a year. Four times already, this event provided an opportunity for information and discussions on the potential and key applications of Galileo.

An important component of the Forum consists in the demonstration of competency at trade fairs. In March 2010, the Forum presented itself for the forth time already at the IT trade fair CeBIT, the internationally leading trade fair for mobility-oriented information and communication technology in Hannover. The network also exhibited at the international level, for example at the "Space Show" in Toulouse. The participation in trade fairs and congresses will be further developed and extended.

For the future, the Forum plans to strengthen its contacts with European networks. It aims to give German businesses the opportunity to contribute its capabilities to European funding projects and clusters.

The BMVBS supports these activities as a facilitator and patron of this forum. The Federal Ministry of Economics and Technology (BMWi) is also involved. The German Aerospace Center (DLR) supports the activities as coordinator of the SatNav-Forum on behalf of the BMVBS.

Locations of regional German SatNav initiatives (DLR)

SatNav-Forum at a glance

- 14 regional initiatives in Germany
- Platform for the exchange of experience and information
- German nationwide networking
- Development of ideas for Galileo application
- Four Forum meetings per year
- National Galileo User Conference held annually by the BMVBS
- Presentation of a common outward appearance / trade fairs

www.satnav-forum.de

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NAVISAT
NRW. Nordrhein-Westfälischer Anwenderverbund für integrierte Satellitennavigationslösungen e.V.

NAVISAT e.V.
Serving the Economy

NAVISAT is the North Rhine-Westphalian association of users for integrated satellite navigation solutions. It pools the skills that exist in North Rhine-Westphalia in the fields of navigation applications, geoinformation, remote sensing, Global Monitoring for Environment and Security (GMES), information and communications technology (ICT) and telematics.

North Rhine-Westphalia is home to over 500 companies involved in satellite navigation. Moreover, the most populous federal state is home to the German Aerospace Center, which has some of the most important basic research establishments. NAVISAT wants to pool these skills in the federal state. Thus, the association promotes the industry in expanding its activities in the field of satellite navigation and spurs the link-up with other space based technologies and sectors. Additionally, it seeks to support a cross-sectoral exchange of ideas, knowledge and information among its members.

The focus of NAVISAT's activities is on the provision of support to commercial services and applications on the basis of existing and future satellite navigation systems (GPS, GLONASS and Galileo) by incorporating satellite positioning technologies into concrete applications.

NAVISAT currently focuses on the following sectors:

- Logistics and transport
- Energy/public utilities, mining
- Agriculture and forestry
- Construction industry
- (Geo)Information and communications technology and mobile industries
- Automotive
- E-Government
- Regional marketing and tourism
- Environment

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bavAIRia e.V.

Aerospace at the Heart of Europe

bavAIRia
Europe's heart of aerospace and navigation

The Bavarian state government commissioned bavAIRia e.V. with the management of the "aviation and aerospace" and the "satellite navigation" clusters in 2006. bavAIRia's goal is to pinpoint Bavarian expertise in aviation, aerospace and satellite navigation and to intensify the networking between expert companies. In this way the global competitiveness of these sectors is to be preserved and enhanced.

Together with the industry and the research community bavAIRia develops measures to achieve this goal. These measures concern the fields of technology, funding, strengthening the skills base and internationalisation, and their implementation is supported by bavAIRia.

bavAIRia offers its members, among other things, national and international contacts, project management, advice for start-up businesses, brokerage of business contacts, participation in booths at trade fairs worldwide, access to supra-regional networks, participation in a professional location marketing strategy and a competitive edge due to a sector-specific advantage in knowledge.

Priorities within the satellite navigation cluster

- Identification and implementation of user requirements in innovative projects and applications in the bavAIRia GNSS (Global Navigation Satellite Systems) user forums
- Showcasing the satellite navigation potentials for small and medium-sized enterprises within the framework of the Galileo Roadshow
- International link-up of the Bavarian industry and research sector with ESA, GSA and the European Commission within the framework of EU projects

Galileo Control Center (GCC) at the DLR research campus Oberpfaffenhofen

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GATE

Germany's first Galileo Test and Development Environment

GATE office and test vehicle

GATE transmitter station Grünstein

GATE[1] is a unique Galileo Test and Development Environment where already today navigation is possible with realistic Galileo signals on all three frequencies – E1, E5 and E6 – at the same time. With currently six terrestrial transmitter stations (GTS), so-called pseudolites, GATE emits Galileo navigation signals into the test area Berchtesgaden. Moreover, GATE provides several operational modes tailored to different users. In this way, an unmodified or commercial satellite receiver within the test area can directly use the Galileo signal for positioning and navigation.

The test area has been optimised particularly for testing land mobile applications such as logistics, vehicle and pedestrian navigation. By providing functional integrity information, GATE is also suitable for safety-of-life applications such as helicopter approaches.

Since the summer of 2008, the GATE test infrastructure is available to all users. The number of transmitter stations within the test area will increase to eight by the end of 2010. By then, the certification of the operating processes will also have been completed. Thus, GATE users are given an opportunity to enter the market with the right products and services in good time.

GATE offers interested Galileo users:

- Advice on, planning and implementation of customer-specific Galileo experiments within the GATE testbed
- Provision and analysis (optional) of measured data
- On-site support and service in the GATE office Berchtesgaden as well as support with a fully equipped test vehicle

[1] Commissioned by DLR with funds from the Federal Ministry of Economics and Technology (BMWi) according to a decision of the German Federal Parliament (No. 50 NA 0802).

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The GATE testbed, view from Kehlstein (GTS 5)

Initiative Satellite Navigation Berchtesgadener Land

The Network for Innovative Navigation Applications

The Initiative Satellite Navigation Berchtesgadener Land exists since 2005 and comprises regional small and medium-sized enterprises and institutions from the area of development and application of navigation solutions. At the moment, its focus is on the Galileo project.

In the Galileo Test and Development Environment (GATE) in the Berchtesgaden area, businesses can develop and test devices and applications in a real-life environment even before the availability of the European Galileo satellites. In cooperation with businesses and scientific institutions, the initiative plans and implements projects in the fields of tourism, safety and security, logistics and healthcare.

Today, 38 institutions, one fifth of them from Austria, are members of the cross-border Initiative Satellite Navigation Berchtesgadener Land. Among the members are eight scientific institutions, eight user organisations, seven public administrations and 15 companies.

The initiative offers everything necessary for the development of application-oriented solutions:

- Finding ideas and planning
- Development and implementation
- Project planning and controlling
- Public relations

Project examples:

SafeNav – Realisation of a modular core system for SatNav applications for dangerous goods transport as well as for emergency and information management for emergency response services

G2real – Galileo based real-time support for security and rescue forces

Galileo Search and Rescue Avalanche – easier and faster rescue of avalanche victims by means of satellite navigation

Test flight in the GATE testbed

Field test of Galileo SAR

AlpenRanger guides hikers in the Berchtesgaden National Park

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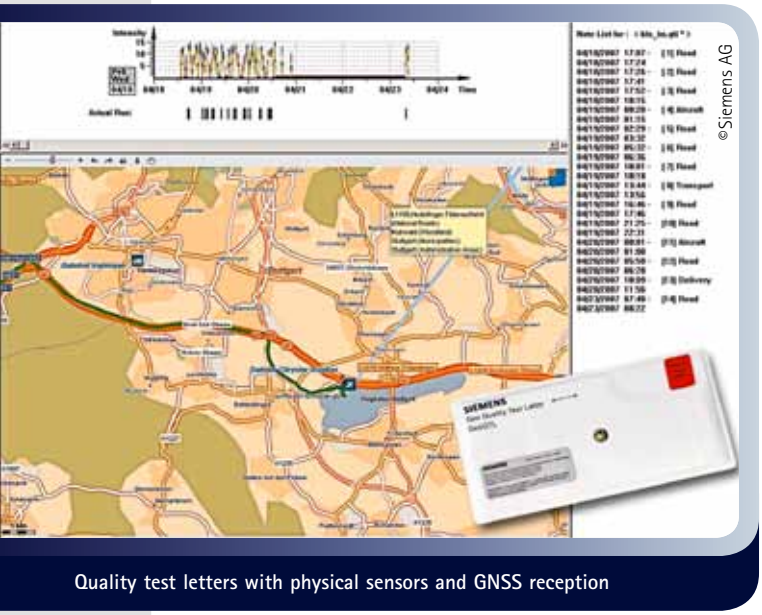
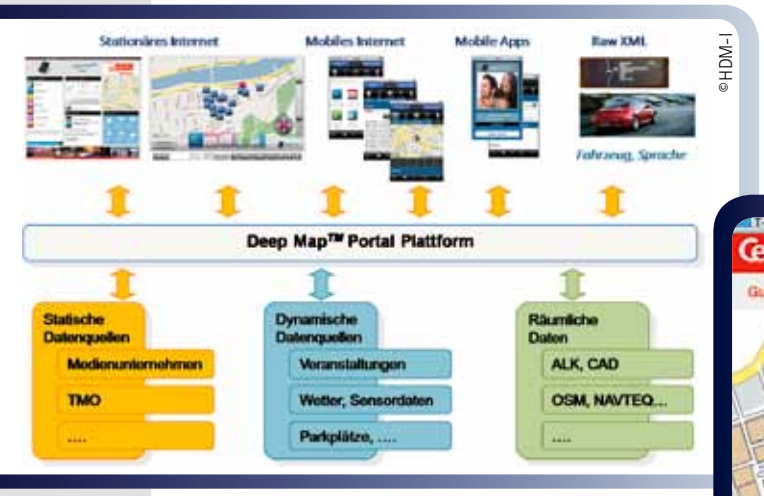
Forum SatNav MIT BW e.V.

Forum for Application-related Satellite Navigation and Mobile IT Baden-Württemberg e.V.



Quality test letters with physical sensors and GNSS reception



At the end of 2008 the association Forum SatNav MIT BW e.V. emerged from the SatNav Initiative of the Ministry of Economics of Baden-Württemberg. The goal of the Forum is to establish satellite navigation and mobile IT in the technologically strong Federal State of Baden-Württemberg, and make it accessible to a large number of people in the business and scientific communities.

The association brings together approximately 30 members from the industry (large scale industry and SMEs), the scientific and research community as well as regional business development organisations. Supporting small and medium-sized enterprises by means of infrastructure and business developers is an avowed focus of the association. It contributes to pooling and linking up the players in order to implement innovative applications, services and products. Moreover, it represents the interests of its members vis-à-vis the federal state, the Federal Government and at the international level.

In 2009, the association won the qualifying competition of the Ministry of Economics of Baden-Württemberg for setting up the cluster "Application-related Satellite Navigation and Mobile IT". Thus, it can apply for EU funding. With these funds, the association can support pilot projects and the link-up of the players as well as provide a sound financial basis for the management of a cluster in Baden-Württemberg.

Mobile range of information "CeBIT 2 go" for the CeBIT 2010, delivered by Heidelberg mobil International GmbH in cooperation with Deutsche Messe AG

The association currently focuses on working parties which are interested in active user participation:

- Mobility sector
- Safety
- Tourism
- In the near future: transport and logistics, mobile processes, agriculture and forestry, satellite communication, aviation and aerospace as well as shipping

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Saarland Navigation and Geodata Working Group

Prospects for Future Satellite Applications

Saarland
Arbeitskreis Navigation und Geodaten

The Navigation and Geodata Working Group is an initiative facilitated by the Ministry of Economics and Science of the Saarland to link up and pool skills in the field of navigation technologies and geodata. It was launched in 2007 and since 2010 it has been coordinated in cooperation with X-Lane, which also represents the interests of the Saarland in the national Forum for Satellite Navigation.

The working party supports the exchange of ideas and information between companies, research institutions and authorities based in the region. At the same time, it serves as the connecting link to nationwide projects and initiatives. With a view to the navigation systems of the future, cutting edge applications as well as research and development activities are discussed and cooperation is initiated.

When it comes to selecting the applications to be addressed, the working party deliberately does not confine itself to specific fields. The location of the Saarland, which borders Lorraine and Luxembourg, has resulted in link-ups with other partners and initiatives within the Saar-Lor-Lux Euregio.

Due to the composition of its members, the focus of activities is on the following topics:

- Geodata: processing of geodesy and geobase data, visual display of 3D laserscan data
- Development of mobile applications: navigation in buildings, use of navigation technology in the tourism sector, application potential of pseudolites
- Certification: trialling of appropriate test procedures
- Networking: transfer of knowledge between the involved partners

Navigation through the labyrinth of possibilities

Navigated shopping

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cesah
Centrum für
Satellitennavigation
Hessen

cesah GmbH
Centrum for Satellite Navigation Hessen

The "Centrum for Satellite Navigation Hessen", cesah, is a competence, information and business start-up center for satellite navigation. It is sponsored by the State of Hessen, the city of Darmstadt as well as renowned industry and research institutes. cesah was founded due to a joint initiative of the European Space-Agency (ESA) and the State of Hessen. The objective was to establish a center for satellite navigation in Darmstadt in the immediate vicinity of the European Space Operations Centre (ESOC).


© ESA

As partner of the ESA Business Incubation Initiative, cesah is the direct contact point for innovative business concepts in the field of satellite navigation. As such, it supports young entrepreneurs and new businesses as regards the technical development, realisation and commercialization of new products and services.

cesah organizes both specialist and applications-specific events on the subject of satellite navigation. The Centrum is the regional contact point for companies from Hessen which are interested in participating in the European Satellite Navigation Competition. A major factor contributing to the success of cesah is the integration into an ESA network of experts and the close cooperation of the cesah members with regional and international partners.

Thematic focus of cesah:

- Transport and logistics
- Location based services
- Indoor navigation
- High-accuracy satellite navigation applications

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Hessen-IT

Satellite Navigation as Catalyst for the IT Sector

Hessen IT

Hessen-IT is a programme launched by the Hessian Ministry of Economics, Transport and Regional Development. It is targeted to the information technology and telecommunications market in Hessen.

Hessen has great potential for the development of satellite based navigation applications. On the one hand, the federal state has an excellent IT and transport infrastructure and a diverse and innovative IT landscape. On the other hand, Hessen is strong in the transport, logistics, automotive, banking and insurance sectors. With the topics "Ambient Mobility", "e-Health" and "Transport Telematics", Hessen-IT sets priorities with a high usage potential for high accuracy position and time signals.

© Fraport AG

As an information and communication platform, Hessen-IT ensures

- the education, awareness-raising and information as well as targeted mobilisation of users and providers of satellite navigation
- that the capabilities of Hessen are showcased at national, international and EU level

Hessen-IT

- supports cesah in organizing events and workshops in the field of satellite navigation
- supports public relations activities in Hessen and the provision of information by articles in newsletters and the publication of guidelines, brochures and provider lists
- brings together providers and users


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GAUSS

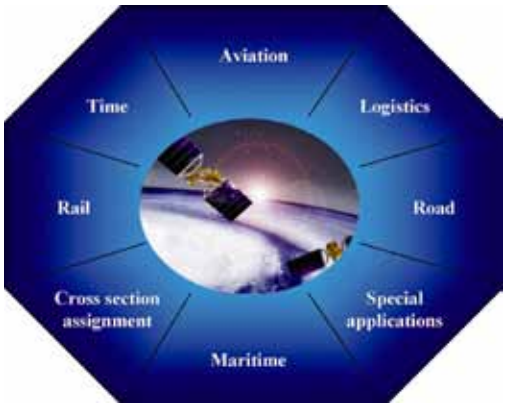
Certification of Safety Critical SatNav Applications and Products

GAUSS, the Galileo Center for Safety Critical Applications, Certifications and Services, was founded as part of the satellite navigation initiative of the State of Niedersachsen in 2006. It is a constituent part of the ITS Niedersachsen network.

At the largest German Research Airport in Braunschweig, GAUSS pools the skills of its members – national and international – in the field of certification of safety critical applications. Due to the realisation of the "Support to Galileo Certification" project of the European GSA and the certification of the GATE test area, GAUSS and its members have built up a sound knowledge base. This enabled them to achieve a strong position in Europe. Moreover, GAUSS supports the implementation of the pan-European emergency call system "eCall" as regards certification matters. This on-board automatic emergency call means a new telematics infrastructure in new cars with which further applications can be initiated.

Tower simulation at the Braunschweig Research Airport

The Galileo test area "aviationGATE" which is set up at the Braunschweig Research Airport (within the framework of the "UniTaS IV" research programme) by the Institute of Flight Guidance (IFF) of the Technical University of Braunschweig further strengthens the cluster. Moreover, the same institute works towards setting up a test laboratory for Galileo. The German Aerospace Center (DLR) in Braunschweig adds to the capabilities at the location by providing its large-scale research infrastructure. This infrastructure offers multi-modal applications.



GAUSS focuses on the following:

- Certification and assessment
- Consulting and qualification
- Projects
- Events
- Networking

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CEON

Centre for Communication, Earth Observation and Navigation Services

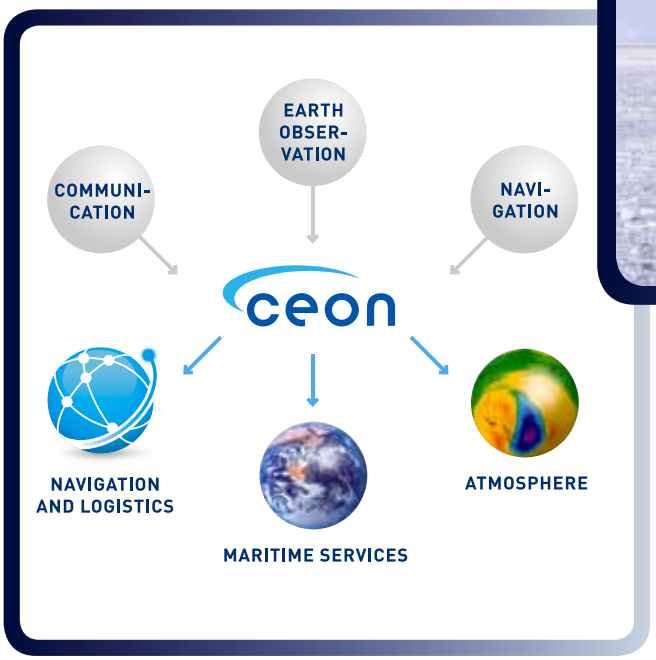
Centre for Communication, Earth Observation and Navigation Services

CEON is a non-profit organisation of the Free Hanseatic City of Bremen and was founded in September 2009. The main tasks of CEON are the coordination of the activities of the federal state of Bremen within the field of integrated applications and the initiation and realisation of demonstration and research projects for satellite-based environment and security services. CEON works together with partners from the industry and the scientific community.

Drawing on the scientific and economic capabilities in the region Bremen/Bremerhaven, CEON is to be permanently established as a user-oriented expert and research center within the European network of GMES and Galileo services.

CEON focuses on:

- Maritime applications (security and environment)
- Monitoring of climate change gases and air quality
- Logistics and navigation (container safety and security)
- Civil protection (port security, protection of coastal areas and dikes)
- Renewable sources of energy (offshore wind farms)



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Forschungshafen Rostock

Rostock Research Port

Maritime Applications

Rostock Research Port is an initiative launched by the Federal State of Mecklenburg-Vorpommern. In close cooperation with regional companies and research establishments, an innovative infrastructure was created here. It will enable the development and testing of products and services in the field of maritime navigation and logistics. Thus, before the launching of the Galileo satellite navigation system in 2014, it will be possible to offer applications that are commercially mature to a wide range of users.

In the seaport of the Hanseatic City of Rostock, the two test environments **SEA GATE** and **ALLEGRO** were installed which are unique worldwide, in order to test maritime applications under realistic conditions.

Within the framework of the **SEA GATE**[1] project, a maritime Galileo Test and Development Environment was set up for the use of Galileo-conformable signals. SEA GATE comprises three segments: the transmission segment with the so-called pseudolites for emitting Galileo-conformable signals, the monitor and control segment, and the user segment in the form of the Scandlines ferry Mecklenburg-Vorpommern.

Within the framework of the **ALEGRO**[2] project, algorithms were developed in order to perform a quality evaluation of signals of already existing navigation satellites such as GPS and to provide the relevant correction data. The ALEGRO software has already been prepared for the use of future Galileo signals.

Both ground-based additional systems will decisively increase accurateness, reliability and safety. This is necessary for the highly accurate positioning and localization of cargo and passengers as well as the safe and efficient navigation of vessels.

[1] Commissioned by DLR with funds from the Federal Ministry of Economics and Technology (BMWi) according to a decision of the German Federal Parliament (No. 50 NA 0616).

[2] Setting up of a local maritime supplementary system to support highly accurate Galileo applications and services in the Rostock Research Port. A project supported by funds from the European Regional Development Funds (ERDF) in connection with funds provided by the Federal State of Mecklenburg-Vorpommern.

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Network for Maritime Applications

Development of Products and Services with Highest Demands on Accuracy and Reliability

The network is a pillar in the Rostock Research Port in Mecklenburg-Vorpommern for maritime applications[1]. Nine partners pool their competences in the field of maritime product development on the basis of the satellite navigation technology. It comprises the following members: AXIO-NET GmbH, DATEN + DIENSTE GmbH, German Aerospace Center (DLR), EADS RST Rostock System-Technik GmbH, Germanischer Lloyd AG, Hafen-Entwicklungsgesellschaft (port development company) Rostock mbH, the Wismar University of Applied Sciences Technology Department of Maritime Studies, Septentrio NV and the University of Rostock Institute of Automation. These partners form a heterogeneous structure along the value creation chain.

The aim of the network is the identification and development of maritime applications on the basis of satellite navigation. Processes in the port area, especially navigation and intermodal transport, are to be optimized. In the future, new products and services such as vessel and pilotage assistance systems as well as the optimized consignment tracking will make the processes in the ports safer and more time, cost and emission efficient.

[1] Supported by the Ministry of Economics, Labour and Tourism of Mecklenburg-Vorpommern by funds from the European Social Fund.

Network for
MARITIME APPLICATIONS
satellite based navigation and logistics

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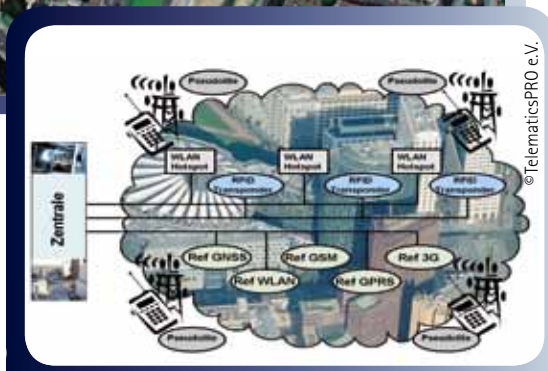
METRONAV
METROPOLITAN NAVIGATION

MetroNAV – Metropolitan Navigation

Investigation of Satellite Technology in the Urban Environment



Potsdamer Platz, Berlin – Satellite-based mobile application in the city

MetroNAV is the German center for mobile positioning services and communications in the urban agglomeration Berlin-Potsdam. The service platform for promotion and test applications was developed and is managed by the experts IAGB mbH, SITQ Systems GmbH, the industry association TelematicsPRO e.V. and the Association of the Geoinformation Industry in Berlin/Brandenburg, GEOkomm e.V.

MetroNAV intends to test and present the technological and application-specific operational functions for different positioning and navigation technologies (Seamless Navigation) in real-time operation of a major city. In this respect, the capital region of Berlin-Brandenburg provides a wide range of advantages: international attention, existing metropolitan applications as well as a high concentration of institutions, undertakings and scientific facilities. The urban metropolitan region offers an attractive demonstration area for current technological applications in the public eye. These complex urban structures include, inter alia, Berlin's transport hubs such as the Potsdamer Platz, open spaces for major events and vast areas accessible to tourists such as the Park Sanssouci in Potsdam.

On the one hand, MetroNAV supports industry in its constant efforts to provide proofs of quality. On the other, the professional public receives, via its showroom, a practical overview of the equipment and services provided for use. By means of its platform, MetroNAV supports the quality services of the product and service providers of navigation services which are important to the market.

Orientation concept of MetroNAV:

- Creation of market opportunities for new SatNav applications
- Verification of products offered by market tests
- Check of the functionality of already existing seamless technologies and systems

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SANASA e.V.
Satellite Navigation Saxony-Anhalt

As an information and communications platform, SANASA e.V. concentrates on the strengthening of the network of excellence. It establishes the GNSS in special Galileo-based developments in the application area as an innovative growth core.

The aims are on the one hand the initiation of collaborative projects at European and national level with the participation of the federal state. On the other, a Galileo satellite navigation center will be set up in Central Germany with the existing start-up potential from the universities and the research institutes.

The Galileo test area Saxony-Anhalt

The Galileo test area Saxony-Anhalt is based on the initiative of the state "Applied Transport Research/Galileo Transport" and is the future center of excellence of the federal state for innovative transport and logistics systems.

The latest satellite-based applications for the transport and logistics industries, local public transport, telematics and radio-based communications can be tested in this test area and can be further developed. The distinctive feature in this connection is the intermodal orientation. The aim of the Galileo test area in this respect is the interlinking of the different technologies and the setting up of intelligent and environment-oriented transport systems for Saxony-Anhalt and the Central German region. Future issues such as electric mobility, satellite-based logistics or radio co-existence – with regard to positioning, navigation and communications technologies – will be advanced using innovative approaches.

Orientation of the Galileo test area Saxony-Anhalt:

- Network of excellence in transport and logistics
- Intermodality/interlinking of transport modes with positioning, communications and navigation technologies
- Industrial, urban and virtual test environment for GNSS-based applications
- Projects and events

Interactive VR model of the Galileo test area Saxony-Anhalt in the Magdeburg Science Port

3.5-tonne track with intelligent swap body for logistics

GALILEO-TRANSPORT
Sachsen-Anhalt

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