PROJECT

GRAMMAR

Galileo Ready Advanced Mass MArket Receiver

**Funding:** European (7th RTD Framework Programme)

**Duration:** Feb 2009 - Jul 2011

**Status:** Complete with results

**Total project cost:** €2,656,414

**EU contribution:** €1,999,581

**Call for proposal:** FP7-GALILEO-2007-GSA-1

**CORDIS RCN:** 99233

**Background & policy context:**

Building on the success of FP6 projects (in particular the GREAT project), the GRAMMAR project seeks to address the mass market receiver by extending the current state-of-the-art technologies for the mass market segment.

The GRAMMAR project specifically addressing the following gaps, which have been identified as obstacles for producing high-quality mass market receivers:

- No economic solutions for accurate dual-frequency RF and baseband hardware;
- No existing GPS/GALILEO receiver solutions;
- Poor robustness and location availability in indoor and urban environments.

**Objectives:**

The goals of GRAMMAR are:

- The development of a hardware prototype for a mass market receiver using a single chip dual frequency receiver and an FPGA based baseband allowing rapid prototyping of advanced algorithms and techniques.
- The identification, evaluation and simulation of enhanced algorithm concepts for next generation mass market receivers.

**Methodology:**

The project will develop functional prototypes of the receiver and its components, enabling practical testing and demonstration upon completion of the project.

**Related Projects:**

See the GREAT project (FP6). The GRAMMAR project is a continuation of that project.

**Parent Programmes:**

FP7-TRANSPORT - Transport (Including Aeronautics) - Horizontal activities for implementation of the transport programme (TPT)

**Institute type:** Public institution

**Institute name:** The European Commission

**Funding type:** Public (EU)

**Lead Organisation:**
Deutsches Zentrum Fr Luft Und Raumfahrt E.v

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12489 KLN
Germany

Organisation Website:
http://www.dlr.de

EU Contribution: €741,118

Partner Organisations:

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EU Contribution: €526,663

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39011 SANTANDER
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Organisation Website:
http://www.acorde.com

EU Contribution: €731,800

Technologies:

Aircraft design and manufacturing
Guidance, Navigation & Control technologies

Development phase: Research/Invention

Key Results:
The project generated European competence in GNSS receiver technology by initiating R&D activities leading to cooperation between industry, research organisations and universities.

Innovation aspects

The project is a follow-up of the GREAT project (FP6). GRAMMAR focussed on the development of:

- multiple-frequency single chip GNSS radio front ends, designed to address the future plurality of advanced mass-market applications;
- baseband prototyping, implementing advanced features not yet available in mass market receivers;
- prototyping advanced algorithms to determine their suitability for mass market receivers;
- simulations, addressing algorithms and techniques for future receivers. Examples are: complexity reduced multipath mitigation and also non-line-of-sight detection and mitigation;
- suitability of inexpensive sensors and/or assistance from existing wireless networks for improved indoor and urban position solution robustness and availability.

Technical Implications

Pursuing the effort generated in FP6 (project GREAT) in preparing the Galileo market by introducing
Galileo technologies at an early stage, especially in the mass market receiver area. Furthermore, ensure a competitive advantage for European players in the area of Galileo receiver and core technologies.

**Strategy targets**

Innovating for the future (technology and behaviour): A European Transport Research and Innovation Policy

Documents:
- D14 (Other project deliverable)

**STRIA Roadmaps:** Network and traffic management systems

**Transport mode:** Multimodal transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:** Deployment planning/Financing/Market roll-out

**Geo-spatial type:** Other