

**Munich Satellite Navigation Summit**  
**21-23 February 2006**  
**Munich, Germany**

This was the 5<sup>th</sup> in the series of Munich SatNav Summits organised by the Institute of Geodesy & Navigation, Federal Armed Forces University. The convenor of these summits is Prof. Günter Hein.



This conference is not a technical GNSS symposium in the conventional sense. Rather the conference is intended to provide mainly information on the status and policies of Galileo (although information on other GNSS & augmentation systems was also provided). The speakers were drawn mainly from industry and government agencies, with relatively few academics attending. Hence the conference was an excellent opportunity for participants to mix and network with each other. The maximum number of conference participants was approximately 350 (constrained by the size of the venue, in Der Residenz – the Munich city palace).

Australia was represented by the following: Chris Rizos (AGCC, UNSW), Keith McPherson (AGCC, AirServices Australia), and Werner Enderle (AGJU, QUT). This “exposure” is extremely valuable.

Each session of the Summit consisted of invited speakers that were part of a “panel”. The panel chairman moderated the session. The speakers made their 5-10 minute presentations, and questions were asked of the speakers by the chairman and by the audience. Details of the program, eventually with session summaries and presentations, can be found at <http://www.munich-satellite-navigation-summit.org/Program.htm>. Both Keith McPherson and I were invited to be presenters/panelists at this conference. My presentation was in the Panel 4 “New Players in the Galileo Concert”, and I spoke as a member of the Australian GNSS Coordination Committee (AGCC), and gave an overview of the current engagement with the EU regarding Galileo and Australia’s “attitude to or interest in” Galileo. I gave a positive message. Keith made a presentation in Panel 5 “Perspectives of Galileo/GNSS for Aviation”, where he cautioned that aviation was a slow adopter of technology, and that the Galileo Safety of Life service (intended to give high integrity service to mission-critical applications) would not be adopted for use in aviation until a lot more was learned about it.

Compared to last year, the Europeans are seeing some progress in Australia’s negotiations with Galileo. A delegation from the EU did visit Canberra on 16 February, immediately

following the Galileo Information Forum in Brisbane, 14-15 February (see below), although I do not know the outcome. However, the Australian GNSS Joint Undertaking (AGJU), based at QUT (& including the Qld Government and CSIRO) have submitted a proposal to ESA to host a Sensor Station at Cairns, North Queensland. (This is basically a ground tracking station for the Control Segment.) Whether this can go ahead without an Australia-EU MoU on Galileo is not clear.

The most important news at the conference was that GIOVE-A (Galileo In-Orbit Validation Experiment) had been launched, and had been transmitting signals (since 12 January 2006). The other big news was that negotiations with the Concessionaire, the organisation that will be responsible for operating Galileo, are proceeding. At the Summit last year there were two consortia, and around mid-2005 the final Concessionaire was announced as being a consortium that included organisations from BOTH the previous contenders. It is expected that the negotiations on the terms of the “public-private partnership” would be concluded by the end of 2006. Now there is an admission that Galileo may not be operational before 2010-2011.

Galileo will offer five services, but it is the Commercial Service (CS), the Safety of Life service (SoL), and also the Public Regulated Service (PRS) that will require the engagement of non-European partners, including Australia. Given the strong feeling that the Aviation community will only support services that are endorsed by The International Civil Aviation Organisation (ICAO), it seems that only the CS will be of interest to Australia in the short term. The CS will require CORS networks, hence it is certainly feasible that an Australian state or national agency, or a private company (Omnistar?), could become interested in partnering with Galileo. The PRS is an interesting service, and for the first time panelists at the Summit talked of Galileo as a “dual-use” system, in other words that it could be used by the military for a range of applications. (This raised a smile on the faces of several U.S. participants, who wondered out loud what had happened to the claim that Galileo was a “civilian service”?) The PRS therefore is a service from which the Concessionaire could derive considerable revenue. *Watch this space!*

Several countries have “signed up” to Galileo, and will invest varying amounts of cash and in-kind. The largest non-European investor is China, but there is also India (who is also supporting Glonass), Israel, and Korea. Claims were made that discussions were underway with at least a dozen other countries.

For information on Galileo, seek out the following web sites:

[http://europa.eu.int/comm/dgs/energy\\_transport/galileo/index\\_en.htm](http://europa.eu.int/comm/dgs/energy_transport/galileo/index_en.htm)

<http://www.galileoju.com/>

<http://www.esa.int/esaNA/galileo.html>

### **Other GNSS Developments**

Not to be outdone, the U.S. delegation talked up the modernization of GPS (first L2C equipped satellite launched 26 September 2005), while the Russians announced that the date for FOC for Glonass would be “fast-tracked” with 24 satellites in orbit before 2008! The only other augmentation system discussed was the Japanese QZSS (Quasi-Zenith Satellite System). The first QZSS satellite would be launched around 2008, transmitting all proposed GPS signals (L1, L2C, L5), as well as some others.

### **GRAS Developments (so far)**

AirServices Australia has been developing over many years an innovative augmentation system (to improve accuracy and integrity, though not availability) for aviation users that combines the best of SBAS (Space-Based Augmentation System) and GBAS (Ground-Based Augmentation System). This is known as the Ground-based Regional Augmentation System (GRAS). See

[http://www.airservicesaustralia.com/pilotcentre/projects/gnss/gnss\\_gras\\_ion2000\\_paper.pdf](http://www.airservicesaustralia.com/pilotcentre/projects/gnss/gnss_gras_ion2000_paper.pdf).

ICAO has adopted GRAS as another augmentation system (on par with SBAS, GBAS, etc.). Australia has been developing a plan to implement GRAS both in Australia and in up to 35 other countries for several years. The project has seen many stops-and-starts. However, Keith did tell me (off the record) that the Minister of Transport would be making an announcement “soon” (a matter of weeks away) about the next major phase (worth tens of millions of dollars).

### **GRAS & CORS in Australia**

As GRAS in Australia will have the requirement for a nationwide CORS network similar to a SBAS such as the Wide Area Augmentation System (WAAS), the implication is that the company selected to manage the GRAS infrastructure will operate the largest CORS network in Australia. In addition, there is a proposal going up to the National Collaborative Research Infrastructure Strategy (NCRIS) committee to develop a National Geospatial Reference System (as part of the “Structure and Evolution of the Australian Continent” research capability). The NGRS will comprise several VLBI and SLR stations, as well as several hundred GNSS CORS stations across Australia to support geodesy and downstream applications. How NGRS and GRAS will fit together is unknown at this stage. A CRC-funded workshop will be held at UNSW on 9 April 2006 to discuss CORS networks in Australia, and a proposal for a demonstrator project from Omnistar.

### **Australia’s Position on Galileo**

For some time the AGCC has been trying to facilitate the development of an “official position” by the Australian federal government as far as Galileo is concerned. The outcome is more than a MoU between Australia and the EU. It would be in the form of a “cooperation agreement”. A Galileo Interdepartmental Committee (GIDC), chaired by the Dept. of Foreign Affairs & Trade, is currently negotiating the terms of the agreement. Let’s hope that it can be completed by the end of 2006. There has already been a face-to-face meeting of the GIDC with delegates of the EU in Canberra on 16 February.

### **Galileo Information Forum – Brisbane, 14-15 February 2006**

This was the first such event, organised by the AGJU and fronted by Matt Higgins (Qld Dept. of Natural Resources & Mines). There were over 200 attendees, and the main speakers were drawn from an EU delegation invited by the Queensland Government. Other speakers were mainly from Qld government or universities. It was clear that Galileo is likely to offer opportunities for increased accuracy, availability and reliability for machine automation applications, in agriculture and open-cut mining. The question that is still unanswered is what can be done in Australia in the coming years to ensure we can take advantage of Galileo? The CRC for Spatial Information will be supporting a proposal from the Qld Govt for an extension to the CRC to include Galileo-related research, to be headquartered at QUT.

Chris Rizos  
6 March 2006