



International Federation of Surveyors
Fédération Internationale des Géomètres
Internationale Vereinigung der Vermessungsingenieure
Commission 5

Positioning and Measurement (2007-2010)

www.fig.net/figtree/commission5

Newsletter - June/July 2007 Edition

MESSAGE FROM Rudolf Staiger COMMISSION 5 CHAIR

Hi Commission 5 Delegates!

It was fantastic to see old and new faces at the FIG Working Week in Hong Kong. For me it was my first as the new Chair of Commission 5 and wish to thank all of the Commission 5 delegates who participated at this event to make it a success.

As I reflect on the proceedings and administrative workings that occurred in Hong Kong, I am now quietly confident that my team will deliver a very 'productive' and 'dynamic' work plan for the FIG Council and family.

Cheers,



Report on FIG Working Week 2007 "Strategic Integration of Surveying Services"

Hong Kong, China SAR

By Chair of Working Group 5.4 - Volker
Schwieger



Introduction

The FIG annual Working Week was held in Hong Kong, China SAR from 12th to 17th May 2007. Almost 500 delegates from 63 countries attended the Working Week. General information, photo galleries and the technical programme as well as all papers are available on the web site <http://www.figww2007.hk/html/>. The whole conference including technical programme, social events and meeting programme was organised perfectly.

General Assembly

The member organisations of the federation meet in the General Assembly on the first and

last day of the Working Week. Highlights of the General Assembly were -

- The admittance of a new full member - the Romanian Association of Private Surveyors, and two affiliate members namely the Agency for Land Management Geodesy under the Government of Tajikistan and the Norwegian Mapping and Cadastre Authority - Norway, into the FIG family.
- Bentley Systems becoming a Platinum Corporate Member
- The School of Public Administration, Renmin University of China, Department of Land & Real Estate Management, China P. R. and ECAM - Haute Ecole Leonard de Vinci, Département Construction, Belgium becoming academic members
- The immediate past President, Holger Magel from Germany, being appointed as a new Honorary President of FIG.
- The adoption of the FIG Commissions Workplans for the period 2007 - 2010 by the General Assembly.



Plenary Sessions

The plenary session dealt with the political issues of the surveying community. The topics were "Responding to the Global Agenda" and "Governing Mega Cities". The present and the former FIG presidents gave interesting lectures on the topics "The Role of FIG in Responding the Millennium Goals and the Global Agenda" and "Governance Makes a City - Lessons Learnt to Promote Local Governance". From a Commission 5 point of view the most

important talk was the contribution of Theo Kötter with the title "Disaster Risk Management - Surveyors Contributions". He summarised all the technical and planning knowledge of the surveyors and emphasised the potential impact of such knowledge and technical skills could have on the field of disaster risk management. His talk was based on the FIG publication No 38 (http://www.fig.net/pub/figpub/pub38/pub38_screen.pdf), which was developed by WG8.4 with involvement from Commission 5.

Technical Sessions

There were 63 technical sessions with more than 260 papers presented and published in the conference proceedings.

Commission 5 coordinated 8 technical sessions, and two joint sessions with Commission 6. In total there were 33 papers. There was also an open forum on 'New Techniques for Positioning' and a summary of this session can be found in this report.

The sessions contain a variety of topics relating to the Commission, with a special focus on GNSS and contemporary positioning techniques. It is to be noted that a session relating to Airborne Surveying was held. The Commission 5 sessions were:

- TS 1B - Adjustment and Calculation
- TS 2B - Quality of Measurements
- TS 3B - Airborne Surveying - Laserscanners and Cameras
- TS 4B - GNSS 1
- TS 5A - GNSS 2
- TS 6C - Forum on New Techniques for Positioning (workshop)
- TS 6F - Terrestrial Laser Scanning I (with Commission 6)
- TS 7C - New Techniques and Sensors for Positioning
- TS 8C - Terrestrial Laser Scanning II (with Commission 6)

The papers and the presentations were of reasonable quality in general. The attendance numbers varied between 30-60 persons and attracted very interesting and interactive discussions. Some of the technical sessions

experienced several 'no shows', that is some presenters did not turn up to present their paper. This problem has been brought to the attention of the FIG Office and Executive and will hopefully be addressed for future conferences.

Recommended Papers

From our perspective the following papers are recommended for reading -

1. Mr. Chan Kin-Kwok and Mr. Li Ben Chi-hung (Hong Kong SAR, China): *The Hong Kong Satellite Positioning Reference Station Network (SatRef) - System Configurations, Services and Applications*
2. Ms. Iu Ka Man (Macau SAR, China): *Macao Geodetic Infrastructure: Permanent GPS Reference Stations*
3. Mr. Neil Weston, Dr. Gerald Mader and Dr. Tomas Soler (USA): *OPUS Projects - A Web-based Application to Administer and Process Multi-day GPS Campaign Data*
4. Prof. Ralf Schroth (Germany): *Large Format Digital Cameras for Aerial Survey of Geospatial Information*
5. Prof. Rudolf Staiger (Germany): *Selection Criteria for Terrestrial Laser Scanners*

Note - Papers (1) and (2) give a very good overview of the GNSS Continuous Operating Reference Stations (CORs) in China. Paper (3) presented a post-processing GNSS service free off charge, Paper (4) detailed a practical operational / production evaluation of large format digital cameras, and Paper (5) provided a summary of the selection criteria for terrestrial laser scanners.

Forum on New Techniques for Positioning

Technical Session TS 6C was an open forum / workshop and had presentations from Mark Burbidge (Leica Geosystems / Ordnance Survey), Prof. Esmond Mok (Hong Kong PolyTech University), Joel van Cranenbroeck (Leica Geosystems), Prof. Chris Rizos (IAG) and Rudolf Staiger. The presentations discussed the various positioning technologies (such as LocataLites, pseudolites, RFID readers/tags, WiFi) and also the potential roles / functions of a new FIG Commission 5 working group.

After the presentations there was a panel discussion which involved the above presenters, Dave Ziloski (NGS USA), Ruth Neilan (IGS), Matt Higgins and forum participants.

From these discussions, the FIG Commission 5 Steering Committee will be proposing a new Special Study Group (SSG) with the title "New Positioning Techniques and Infrastructures". At this stage it is envisaged that this SSG will be part of WG 5.3 and the Vice Chair will be Andrew Hunter. Also, it is expected that a call for work group participants will occur soon and the tasks of the SSG will be discussed within the newly established group.

Commission 5 thank all who participated.

Please note a copy of the discussions and issues that took place in this forum can be found at the end of this report.

Administrative Workings of Commission 5

The Chair, Vice Chairs of the Working Groups of Commission 5 and invited guests officially met for the first time at this conference. This group which is known as the Steering Committee of Commission 5 held two administrative meetings and also facilitated an Open meeting for all Commission 5 delegates.

In summary the Steering Committee primarily finalised their work plans, discussed conference administrative issues and sought active participants for their respective working groups. Refer to website - http://www.fig.net/commission5/steering_committee/steeringcommittee.htm for a copy of the Steering Committee minutes.

Please note more working members are still welcomed so please do not hesitate to contact the WG-chairs if you are interested. The Steering Committee are -

- Commission Chair: Rudolf Staiger, Germany
- Vice-Chair Administration: Rob Sarib, Australia
- Vice Chair and Chair of WG 5.1 - Standards, Quality Assurance and Calibration: David Martin, France

- Vice Chair and Chair of WG 5.2 - Reference Frame in Practice: Mikael Lilje, Sweden
- Co-Chairs of Working Group 5.3 Integrated Positioning, Navigation and Mapping Systems: Andrew Hunter and Naser El-Sheimy , Canada
- Vice Chair and Chair of WG 5.4 - GNSS: Volker Schwieger, Germany

For their contact details please visit - http://www.fig.net/commission5/officers/officers_07_10.htm

Please note, at the various Commission meetings and 'ACCO" Rudolf Staiger also announced and detailed that the FIG has established a 'peer-review system' for papers submitted to FIG conferences. A trial of this system will occur at the Regional Conference in Costa Rica this year. Briefly, the peer-review is voluntary and the full papers have to be submitted earlier than the non-reviewed papers. For Costa Rica the deadline will be the 29th August 2007.

Summary

From a Commission 5 perspective the first Working Week for the term 2007-10 was a success. There were many papers highlighting the innovative and interesting projects that are being undertaken by surveyors in this region, and also emphasised the opportunities for the global surveyor.

Rudolf Stagier, the Commission 5 Chair is very satisfied with the outcomes of the open forum on "New Techniques for Positioning" and is confident that a new working group on this topic will be beneficial to this emerging industry. Andrew Hunter will mostly likely Chair this group and will be seeking 'active' global participants in the near future to formulate strategies and objectives to meet the various user's needs.

The Commission 5 Steering Committee held several meetings and have got off to a 'good' start. In other words, and to use some of the terminology of the FIG President Stig

Enemark, Commission 5 have 'hit the ground running' and are ready to fly high!

Last of all Commission 5 wish to thank **Mr Lesly Lam** for his help in Hong Kong!

See you all in Costa Rica in November 2007!



Comm 4 and 5 Hong Kong Dinner

Discussions and Issues NEW POSITIONING TECHNIQUES FORUM

FIG Working Week 2007, Hong Kong.

A summary of the recommendations (from the presentations) for FIG roles and responsibilities.

Esmond Mok



1. Provide platforms to discuss and share investigation efforts and outcomes, and promote applications of emergent technologies.
2. Coordinate investigation outcomes to provide expert advice on the performance of emergent positioning technologies [accuracy achievement under different site conditions, effective signal transmission

range, sources of errors and interferences, etc.]

3. Develop standard testing and calibration procedures.
4. Establish networks with electronics and information technology professions.

Joel van Cranenbroeck



Now what will be the duty of such a new Working Group?

1. To evaluate the state of the technology and its implications for our surveying world (and have all research, initiatives and communications gathered, shared and analyzed by such a dedicated WG).
2. To establish contact with the new ICT partners of our profession: the telecommunications and IT companies.
3. To organize a dedicated open space (Annual Conference, Forum, Symposium ...) to gather all the actors of the "Positioning Infrastructures" under the surveying perspective, which will fairly contrast with existing organizations such as ION, GNSS
4. To compile and edit a kind of "FIG Document for creating and maintaining Positioning Infrastructure" that could be considered as guidelines covering all elements and sub-elements.
5. To highlight the role of the surveyors in such a new service = create positioning infrastructure (in the past we were in charge of Geodetic and Control Networks).
6. To better define what we understand with a "multiple applications positioning infrastructure" ... what would be the user profile ? What would be the different

business models ? Where do we want to migrate ?

7. To take our 'share' in the near future "Ubiquitous World" as Surveyor.

Rudolf Staiger

Actions within the Special Study Group

1. prepare the creation of a working group - representatives from manufacturers, academics, surveyors, communications industry, Sister-Organizations
2. facilitate forums on this topic and relevant symposiums
3. address standards and best practice guidelines
4. disseminate information - website portal, newsletters
5. instigate and facilitate discussion
6. produce a 'dynamic' publication including a dictionary explaining all the different Technologies

Other Issues raised -

- It is important to establish the relationship of these technologies to a reference frame - Chris Rizos
- be lobby voice to the mobile phone network providers to access data streams - Mark Burbidge
- FIG to create a "cookbook" on this topic - Ruth Neilan



- Ubiquitous Positioning - Esmond Mok
- Examine and monitor AGPS, RFID, WiFi and how CORS assist this infrastructure- Esmond Mok
- Investigate transfer of data via other communication services other than the

navigation types NMEA or RTCM - Joel van Cranenbroeck

- What is the definition of infrastructure? Must consider end user and implementation tools - Dave Ziloski
- Explore participation with 'Ubiquitous Computing' ("ubicom") or CeBit conferences - Chris Rizos
- Who will co-ordinate or geo-reference RFID tags? - Joel van Cranenbroeck and Chirs Rizos



- We need more studies into accuracies and setting of standards - Chris Rizos
- Need to link to the GIS community - Chris Rizos
- Contact Electrical Engineers or similar professional organizations to present at conferences or discuss issues? - Matt Higgins
- Need to promote our interest in these technologies to the ICT community - All
- Need to consider and investigate 'spectrum' protection and management - Larry Hothem
- What are the implications and the relevance of this topic to surveyors? - David Martin
- New working group should look at holding a symposium on this topic - Matt Higgins, Chris Rizos
- Must watch the development of RFID networks and 2-way data transfer - Chris Rizos

Commission 5's Recommendations for the next 'Phase'

- The working group be a sub working group of 5.3 and be called 5.3.?? Special Study

Group - New Positioning Techniques and Infrastructures. Andrew Hunter will be the Chair.

- Rudolf and Andrew to prepare a letter asking for members to participate in this special study group.
- Rob and Mikael to prepare notes from the forum and circulate to panel and Steering Committee.
- Andrew along with the 'new' team to prepare a work plan for this study group.
- A Comm 5.3.?? website will need to be created to disseminate information and promote the workings.
- A 'discussion' website (such as "Blackboard") for the new working group to be created by Andrew Hunter.
- The working group team and the workplan's frame work should be finalised by November 2007 for the 4th International Symposium on LBS and TeleCartography being held in Hong Kong at the HK Polytechnic University. This will allow attending working group members to unveil their new Commission 5 working group.

Report on Joint CIG/ISPRS Conference on Geomatics for Disaster and Risk Management Gi4DM By Prof. Georgia Fotopoulos University of Toronto

The Joint Canadian Institute of Geomatics (CIG) and International Society for Photogrammetry and Remote Sensing (ISPRS) Conference on 'Geomatics for Disaster and Risk Management' was held on May 23-25, 2007 in Toronto, Canada. The conference was a great success with the CIG celebrating its 125th anniversary and more than 200 attendees from various national and international locations. Of particular interest to FIG Commission 5 were the technical sessions on 'Real-time data collection, processing and information extraction methods and software tools' and 'GPS/INS for disaster management'. In addition, the futures dialogue on 'Geomatics powering future disaster management'

addressed pressing issues such as leading edge technologies and their integration for long term solutions. An underlying theme throughout the conference was the need for accurate position information, which can be incorporated into geospatial information support systems and services.



5th International Symposium on Mobile Mapping Technologies

Padova, Italy May 28-31, 2007

The 5th International Symposium on Mobile Mapping Technology was held in Padova from May 28 to 31, 2007. It was organized by CIRGEO - Interdepartment Research Center for Geomatics, University of Padova. Prof. Antonio Vettore, University of Padova and Prof. Naser El-Sheimy, University of Calgary, were the meeting conveners, with the Scientific Committee chaired by Prof. Naser El-Sheimy, and co-chaired by Prof. Dorota Grejner-Brzezinska, The Ohio State University, Prof. Ron Li, The Ohio State University, Dr. Vincent Tao, Microsoft Corp., and Dr. Charles Toth, The Ohio State University.

The meeting was cosponsored by the University of Padova, University of Calgary and The Ohio State University, the ISPRS (IC WG V/I, Integrated Mobile Mapping Systems; IC WG I/V, Autonomous Vehicle Navigation; WG I/3, Multi-Platform Sensing and Sensor Networks; WG I/2, LiDAR and IfSAR Systems; WG II/6, System Integration and Interoperability), the IAG Sub-commission 4.1, Mobile Multi-Sensor Systems, and the FIG WG5.3, Integrated Positioning, Navigation and Mapping Systems, and the following corporate sponsors: Leica Geosystems, Intermap Technologies, SIFET, AIR DATA, Applanix, and Trimble Ltd.

The opening ceremony was chaired by Dr. Naser El-Sheimy, Convenor, and included welcome speeches by representatives of the sponsoring organizations, followed by welcome speeches by representative of the University of Padova (representative of Prof. Vincenzo Milanese - Rector of the University of Padua and Prof. Raffaele Cavalli Dean Faculty of Agriculture). The symposium also includes four keynote speeches by:

- Prof. Armin Gruen - ETH on "Mobile Mapping with UAV Technology"
- Mr. Lionel Garin, Nemerix, on "GNSS and Digital Maps, Symbiosis or Both Sides of the Same Medal?"
- Mr. Eric DesRoche Intermap Technologies on "Terrestrial Mapping for a Mobile World"
- Prof. Vincent Tao on "Opportunities and Challenges in Mobile Mapping for On-line Services and Consumer Applications: A Perspective from Microsoft Virtual Earth"

These keynote speeches linked how mobile mapping technology, user requirements and new applications drive each other, with the users as the major beneficiaries. A one day tutorial on state of the art and future trends, attended by 30 persons, offered provided a stimulating casual environment to recent development in Mobile Mapping, interactive discussions, and information exchange. The tutorial was offered by Dr. Naser El-Sheimy - the University of Calgary Canada, Dr. Mohamed M.R. Mostafa, Applanix Corp, Canada, Dr. Charles Toth and Drs. Dorota Grejner-Brzezinska, Ohio State University, USA.

It was the fifth MMT symposium since 1995, with the first four conferences held in Columbus, at The Ohio State University (1995), in Bangkok, Thailand (1999), Cairo, Egypt (2001), and Kunming, China (2004). The symposium provided a stimulating casual environment to promote scientific presentations, interactive discussions, and information exchange. It brought together 180 participants from 23 countries, who are specialists, engineers, users and those interested in mobile mapping technology, real-time positioning, sensor integration and calibration, feature extraction and 3-D data

acquisition. 88 oral presentations in 18 sessions and 33 posters in one poster session reported most recent R&D and application achievements of mobile mapping. The proceedings of the symposium, edited by Dr. Naser El-Sheimy, have been produced on a CD which can be ordered from the University of Padova (E-mail Prof. Antonio Vettore: antonio.vettore@unipd.it)

The symposium program was structured in such a way that features common to all Mobile Mapping Systems (MMS) were treated first before specific application; new applications, and trends in MMS were considered. Common features included the mathematical framework of direct georeferencing for land and airborne imaging sensors, integrated navigation system, object extraction and recognition, and estimation techniques common to all MMS. Only after these common features had been treated, specific sessions were dedicated to cover the full spectrum of Mobile Mapping Technology.

The 6th International Symposium on Mobile Mapping Technology will be held at the São Paulo State University, Brazil in July 2009. Prof. João Fernando C. da Silva (São Paulo State University) was appointed chair of the Organizing Committee, and Prof. Dorota Grejner-Brzezinska, The Ohio State University, was appointed chair of the Scientific Committee.

Naser El-Sheimy, Convenor and Chair of the MMT Scientific Committee

COMING EVENTS

6th FIG Regional Conference Coastal
Areas and Land Administration -
Building the Capacity

12-15 November, San José, Costa Rica

The 6th FIG Regional Conference is organized by the International Federation of Surveyors (FIG) and the Colegio

Federado de Ingenieros y de Arquitectos de Costa Rica (CFIA)/ Colegio de Ingenieros Topógrafos de Costa Rica (CIT) which is the FIG member association in Costa Rica. As has been the case with the previous FIG regional conferences the conference in San José will be organized in co-operation with other international and regional organizations like the United Nations and its agencies as well as with international and regional spatial information societies. The conference is open to participants from all over the world however with the main focus on Latin America and the Caribbean. To help regional and local participation the conference will be held in English and Spanish. In all previous FIG regional conferences there have been participants from 30-50 countries representing all continents.

As the previous FIG Regional Conferences the focus of the conference is on the region, this time in the Latin American region. Coastal Areas and Land Administration - Building the Capacity has been selected to the theme of the 6th FIG Regional Conference. This theme that is very important for the Latin American region is divided in three sub-themes: coastal areas, land management and capacity building. One plenary session is dedicated to each of these main topics.

All ten FIG Commissions will attend and many of them will also have their administrative meetings. All national delegates should consider attending.

Deadline for submitting abstracts is 31 July 2007 and you can submit your abstract online at

<http://www.fig.net/abstractdb/submit.asp?id=8>

We look forward to meeting you in San José, Costa Rica in November.

Yours faithfully,

Per Wilhelm Pedersen
FIG Office Manager

Invitation and call for papers
http://www.fig.net/costarica/flyer_costarica.pdf

Web site: www.fig.net/costarica

Other Commission 5 COMING EVENTS

2-13 July, Perugia, Italy

IAG/IUGG Conference. IUGG XXIV
General Assembly. Web site:
www.IUGG2007Perugia.it

13-14 September, Hong Kong SAR,
China

*LOCATION ASIA 2007 - Annual
International Conference and
Exhibition on Positioning, Navigation
and Timing.* Organised by GIS
Development and Co-Organised by
Department of Land Surveying and
Geo-Informatics, The Hong Kong
Polytechnic University
Web site:

<http://www.location.net.in/asia/>

29 October - 1 November,
Christchurch, New Zealand

9th South East Asian Survey Congress
incorporating the 119th New Zealand
Institute of Surveyors Conference, the
6th Trans Tasman Surveyors
Conference and CASLE General

Assembly and FIG Commission's 4
(Hydrography) and 5 (Positioning &
Measurement) Workshops. Co-
sponsored by FIG. Web site:
www.surveyors.org.nz/congress2007

8-10 November, Hong Kong SAR, China

*4th International Symposium on LBS
and TeleCartography.* Organised by
Department of Land Surveying and
Geoinformatics of the Hong Kong
Polytechnic University and the Vienna
University of Technology and co-
sponsored by ICA and IAG
commissions.

Web site:

<http://www.lsgi.polyu.edu.hk/LBS2007>

CALL FOR WORKING GROUP MEMBERS for 2007-10

There are four (4) main working groups
proposed for the term 2007-10 and they are -

- Working Group 5.1 - Standards, Quality Assurance and Calibration. Chair - David Martin, martin@esrf.fr
- Working Group 5.2 - Reference Frame in Practice. Chair - Mikael Lilje, mikael.lilje@lm.se
- Working Group 5.3 - Integrated Positioning, Navigation and Mapping Systems. Chairs Naser El-Sheimy and Andrew Hunter, naser@geomatics.ucalgary.ca and ahunter@ucalgary.ca
- Working Group 5.4 - GNSS - Global Navigation Satellite Systems. Chair Volker Schwieger, volker.schwieger@iagb.uni-stuttgart.de

See website for workplan -

http://www.fig.net/commission5/workplans/wp_07_10.htm

If any of these working groups are of interest to you then there are two levels in which you could actively contribute and they are -

- The first level of participation is as a "core member" of a working group contributing directly to discussions, publications, meetings, and facilitate technical sessions etc.
- The second level of participation is as part of a "reference group" to review publications, technical papers, provide feedback on issues and general assistance etc.

People interested in being involved in one of the working groups should contact the Chair of the relevant Working Group and send a copy to the Vice Chair for Administration - robert.sarib@nt.gov.au

All responses should indicate the desired level of participation, either as a "core member" or as part of a "reference group" and also include a one or two paragraph biography of your professional career to date.

LATE NEWS !!!

SUMMARY OF FIG COMMISSION 5 ACTIVITY REGARDING STANDARDS

- *Key standards issues for the Commission and status of each*

Standards issues related to GPS and new or emerging position techniques and infrastructure (e.g. LocataLites, pseudolites, RFID readers/tags, WiFi access points, UWB, LBS etc...) testing and calibration

- *2007-10 Commission plans for activity and outputs related to standards*

Try to reach a (possibly compromise) agreement on testing and calibration procedures for GPS. Look into standards issues with emerging technologies. Try to collate a document concerning the

importance/relevance of testing and calibration procedures related to surveying profession standards in different countries.

- *Relevant current standards and standardisation activity and current links with them*

ISO TC 211, TC 172 6C and ISO 17023

Regards - David Martin

A Reminder



<http://www.intergeo.de/englisch/page/main/index.php>

IAG have ELECTED New officers for the period 2007-11 !

Refer to

http://www.iag-aig.org/index.php?tpl=text&id_c=6&id_t=313

Commission 5 Chair Rudolf Staiger invited to attend IAG/IUGG Conference. IUGG XXIV General Assembly in July, Perugia, Italy

If you would like to circulate Commission 5 NEWS to all our members please email your item for consideration to the Vice Chair Administration - robert.sarib@nt.gov.au