

# LH Systems' Editors Forum 2000

This was the third in the series of Editors Forum meetings which have been organised and hosted by LH Systems. Previous fora have been held in Dublin (in 1998) and Zürich (in 1999). On this occasion, the venue was Calgary in Western Canada. More than a dozen editors (or their representatives) participated in the event which was held over the three day period between 27th and 30th September.

By Prof. Gordon Petrie

The main purpose of the Forum is, of course, to hear and discuss the latest developments in photogrammetry with the top management of LH Systems. A secondary objective is to see and hear about the operations of some of LH Systems customers - in this case, two local companies - North West Group and The Orthoshop - and a national mapping organization - Ordnance Survey Ireland. Besides which, on this occasion, presentations were given by a group of invited speakers from outside organizations involved with the new airborne imaging technologies for mapping - in radar (Intermap Technologies), lidar (TerraPoint) and forestry applications (Alberta Research Council). Finally, as in Zürich, there was a visit to a leading academic institution in the geoinformatics area - the University of Calgary. The result of this varied and interesting line-up was a first-class meeting.

## Geomatics Engineering

The opening session was held at the University. First the Departmental head, Professor Gerard LaChapelle, gave an overview of its educational programme and its research activities, both of which have grown strongly over the last decade. He was followed by Professor Elizabeth Cannon, who gave an interesting account of the programme of research into positioning and navigation being carried out in the Department in collaboration with a large number of industrial and government partners. Of especial interest was the integration of GPS, not only with INS, but also with low-cost sensors such as those used in Anti-lock Braking Systems (ABS). Then two of the younger staff members gave presen-

tations on their research work. Dr. Naser El-Sheimy spoke about his development of mobile multi-sensor systems. These comprise a set of sensors (cameras, GPS, INS, ABS) mounted on a common (airborne, shipborne or land vehicle) platform, all synchronized to a single common time-base and used in a kinematic mode. Finally, Dr. Vincent Tao dealt with his photogrammetric research. This included map-guided extraction of transportation objects; airborne InSAR work to achieve a "bald earth" DEM; the use of rational functions to carry out orthorectification; and a demonstration of his GeoEye Web-based browser. All four presentations were of the highest quality, confirming the current perception that this Department is now one of the leading academic institutions in the surveying and mapping field in North America.

## North West Group

First there was the presentation of the activities of this specialist aerial photographic company at the Forum. Later there was a visit to see its laboratories and aircraft in its premises at Calgary International Airport. Much of its work has been carried out in the U.S.A., where it is a major contractor within the National Air Photo Program (NAPP) and has completed the state-wide aerial photographic coverage of Florida, Georgia, South Carolina and Colorado. Within Canada, it is now engaged in a project (Terra 2000 Alberta) to produce high-quality colour orthophoto coverage of the whole of the province of Alberta - somewhat along the same lines as the UK Perspectives and Millennium Map projects in the U.K., though at a much smaller scale (1:50,000). The orthophoto processing is being carried out by the Pixxures company, based in the Denver area in the U.S.A. The on-line distribution of the digital data is being executed by a local (Calgary) company, Boyd Geomatics, which is now owned by Pixxures. The highlight of the visit was the chance to inspect at first hand two of the company's Cessna aircraft, each equipped with an LH Systems RC30 camera. One of them was also fitted with a new AeroScan airborne laser

scanner from the Azimuth Corporation for operation from high altitudes, complete with an integrated GPS/INS system from Applanix.

## The Orthoshop

Another visit was paid locally to this large photogrammetric service provider. It also works extensively in the U.S.A. and Mexico, in both of which, it has established subsidiary companies. The aerial data acquisition is carried out exclusively by outside contractors. One of the company's main activities is the generation of DEMs and orthophotos for clients, both in the U.S.A. and Alberta, using DPWs powered by LH Systems SOCET SET software. Besides the delivery of the orthophotos both in digital form and in hard copy form (using a high-resolution Linotronic film plotter), vector line data was also being extracted from orthophotos for mapping in Calgary city using a CAD system. However, as in many European mapping companies, most vector line data is still being extracted from stereo-pairs using analytical plotters, taking advantage of their excellent viewing optics. In the case of The Orthoshop, a mixture of upgraded Wild AC-1, BC-2 and BC-3 analytical instruments is being used for this task.

## Airborne Laser Scanning

A presentation was made by Dan Cotter of the TerraPoint company, which is based in Houston, Texas. This company both manufactures its own scanners and provides a service producing DEMs for its customers. Of especial interest was his survey of the field world-wide. Currently 43 commercial airborne laser scanning systems are operational, of which 13 are mounted in helicopters. Three manufacturers dominate the field - Optech (Canada) with 20 systems; TopEye (Sweden) with 9; and Azimuth (U.S.A.) with 8. Of the remainder, TerraPoint has built 3 systems in-house and Fugro FLI-MAP 2, with the single remaining system being unspecified. TerraPoint's own experience is that flood plain mapping forms by far the biggest part of its business.

## Airborne SAR

Dr. Bryan Mercer of Intermap Technologies spoke about current trends in airborne SAR technology and applications. Most of his presentation was (understandably) devoted to DEM generation from his company's STAR-3i SAR system mounted on a Learjet. Examples included the flood plain mapping of the Red River in North Dakota and the "bald earth" DEMs generated for the Morrison area in Colorado. He

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The Forum participants during the visit to the University of Calgary. Professors LaChapelle and Cannon are in the centre of the front row with Dr. El-Sheimy and Dr. Tao to each side. (Source - LH Systems).

felt that DEMs generated from InSAR lie in an intermediate position in terms of accuracy and pricing between those comparatively inexpensive but less accurate DEMs generated from space sensors such as SPOT and RADARSAT and the very accurate but expensive DEMs produced by airborne laser scanners and aerial photogrammetry.

#### Alberta Research Council

Dr. Ahmed Mohamed outlined the photogrammetric and mapping research work being carried out by this organisation - which is heavily related to forestry. This includes the development of DORIS (Differential Ortho-Rectification Imaging System). This uses either small-format Kodak digital cameras or the ITRES CASI-2 hyperspectral scanner in conjunction with an integrated GPS/INS for data acquisition. In turn, the rectified image data is input to FIMS, a forest mapping system, and thereafter to the Council's integrated Natural Resource Inventory & Information System (INRIIS).

#### OSi and Euro Mapping

As a major LH Systems customer, Richard Kirwan of Ordnance Survey Ireland (OSi) is an ever-present at these fora. At this meeting, he first gave an update on his organisation's

progress in re-mapping the Republic of Ireland. OSi now deploys more than 40 LH Systems DPWs on the task. Kirwan is also the current chairman of CERCO, the organisation that represents European national mapping organisations, especially in respect of their relationship with the EU. In this particular context, he announced the merger of CERCO with MEGRIN: the title of the new organisation has still to be decided.

#### LH Systems - Current Status

Bruce Wald, the company's CEO, outlined the current status of LH Systems. The company now has 135 employees and an annual turnover of \$37 million and has consistently grown and been profitable since its formation three years ago. Revenue from hardware and software is roughly balanced at the 50:50 level. Interestingly, while the Americas generate 30% of the company's revenue and Europe, the Middle East & Africa 25%, Asia and the Pacific area generate the remaining 45%, with Japan and Korea contributing just under half of this. The introduction of the ADS40 airborne pushbroom scanner at the ISPRS 2000 Congress is a major step for the company. The ADS40 production line will start up in Q4/2000 with first deliveries to PASCO in Japan in Q2/2001. Third-party information kits have already been issued to LH Systems' competitors in the DPW

field to encourage them to develop software that can handle the ADS40 linescan imagery.

#### LH Systems - Road Map for the Future

LH Systems' future plans envisage a growth of revenue at an even higher rate than at present. Besides extending its present product line, future developments will include digital data management and archiving systems. Bruce Wald also mentioned that LH Systems is examining various acquisition opportunities for late 2000 and 2001. Needless to say, this intriguing news immediately sparked off plenty of private speculation among the Forum participants. I have put most of my money on the airborne laser scanning field with a small side stake on integrated GPS/INS: what is your bet?

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