LH Systems' Editors Forum 2001

The fourth in the annual series of Editors Forum meetings took place in Hong Kong between 3rd and 5th October. Previous Forum meetings had been organised solely by LH Systems. On this occasion, there was a much greater involvement of the parent Leica Geosystems organisation and staff. This was perhaps a reflection of the changed status of LH Systems now being a wholly owned subsidiary of Leica Geosystems, instead of the company being a joint venture between Leica and BAE Systems. Thus the morning presentations and the afternoon visits contained a much larger component of land surveying instead of the purely photogrammetric and mapping focus of the previous meetings. Of course, the latter still formed a substantial part of the proceedings.

By Prof. Gordon Petrie

The opening session was particularly interesting. First, Rolf Schaeppi, Regional Director of LH Systems, reviewed in detail the photogrammetric market in South East Asia & Australasia. He made very clear the enormous differences between the two areas.

(a) Australia & New Zealand. In these two countries, there is an open market with few restrictions on flying and taking aerial photography. Furthermore up-to-date map products are widely available both in hard copy form in shops and in digital form either by direct supply or via the Internet. Besides the respective government mapping agencies, there is a large private sector, including 20 mapping companies in Australia, several of which compete in the international market. As in Western Europe and North America, there is a great emphasis on productivity and a substantial investment in digital photogrammetric technology in the shape of numerous DPWs and high-performance film scanners.

(b) South East Asia. By contrast, in the countries of South East Asia, the market is dominated by national mapping agencies, often controlled by the military. Besides which, there are severe restrictions and close control over the acquisition and dissemination of aerial imagery. Furthermore only very few map products are on sale to the public. Over the whole region, only a few private mapping companies exist in the Philippines, Indonesia and Taiwan: these mainly serve local needs. Overall the installed base of photogrammetric equipment is large, but mainly comprises older analogue and analytical stereo-plotting instruments.

(c) China. The second part of the comprehensive market review was given by George Kiu, Managing Director of Leica Geosystems Ltd., which is based in Hong Kong, but also covers China. The company's staff comprises 30 people in Hong Kong and a further 200 people located within China. His account was quite fascinating. He began by outlining the huge size of the Chinese market and gave some idea of the many large infrastructure projects currently being undertaken in China. These include the construction of several thousand kilometres of railway annually; an even longer inventory of new main roads; and the building of large lengths of oil and gas pipeline and power transmission lines and cables. Associated with these developments are several enormous projects concerned with the exploitation of coal and oil and gas deposits and with the development of water resources. All of which has helped to create a buoyant market for survey and photogrammetric equipment and mapping systems. However the market is highly competitive with a large part of it being supplied by Chinese instrument and system suppliers. Thus, although there are approximately 600 DPWs installed in China, 90% of them comprise the locally produced VirtuoZo and JX-4 systems. The industry is still dominated by the state surveying and mapping organisations and the mapping departments of the relevant government ministries. Flying is carried out under strict government control and almost all photo and map data is still classified. A single organisation (Taiyuen) undertakes most of the aerial photography flown in China. It operates two dozen Wild/Leica cameras with a selection of 50 different lens cones!

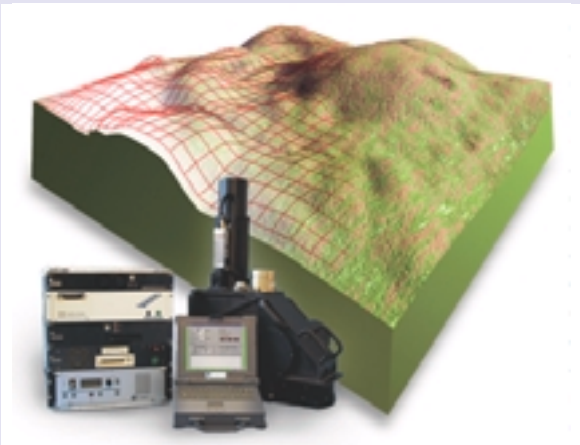

Fig. 1: The new ALS40 airborne laser scanner from LH Systems - with a perspective view of a DEM produced by it. (Source: LH Systems)

Universities

Staff from two of Hong Kong's several universities then gave presentations on their activities in the geoinformatics field, These were followed by visits to their respective institutions.

(a) Hong Kong Polytechnic University. Professor Y.Q. Chen outlined the teaching and research activities of his University's large surveying and geomatics department. It has 17 academic staff and around 300 students. The majority of these are following B.Sc. and technologist (higher diploma) courses, but between 30 and 40 students are undertaking Masters or Ph.D. degree programmes. As we saw during the subsequent visit, the department possesses four major labs - in (i) photogrammetry; (ii) surveying; (iii) geoinformatics; and (iv) geoinformation computing. The major photogrammetric items comprise a mixture of Z/I (Planicomp, ImageStation) and LH (SOCET SET) units. However much of the photogrammetric teaching is carried out on a battery of low-cost 3D Mapper DPWs imported from Western Australia. The

department has a large research income amounting last year to 11 million HK dollars (UK£ 1,000,000). Much of this is derived from cooperative projects with Hong Kong government agencies that are targeted at specific local problems and applications.

(b) Chinese University of Hong Kong. Professor Hui Lin outlined the programme in Geo-Information Science (GIS) at this University. There is no separate department or institute, simply a quite extensive collaboration between a number of departments - including geography, civil engineering, architecture, computing science, etc. - that have common interests in this particular area. This has resulted in the creation of a joint lab for GIS. From his account and the subsequent visit, it seems that there is a considerable emphasis on projects concerned with virtual reality and landscape visualization. There is also a considerable interest in applications of remote sensing, e.g. to create a spectral database of Hong Kong for landscape and geological applications.

Hong Kong Lands Department

The second day of the Forum was mostly devoted to the activities of the HK Lands Department and, in particular, those of its Survey & Lands Office (SMO).

(a) Overview. The introductory overview was given by the Deputy Director, Mr. Chan Hak. The Department handles all matters pertaining to land in Hong Kong. All land is government owned and can only be held by others on a leasehold basis. Besides this major activity, the Department also supplies a myriad of surveying and mapping services to many other departments (planning, civil engineering, highways, drainage services, public housing, water supplies, etc.) of the Hong Kong government and sells map-based data to public utilities, commercial organisations and private citizens. For the future, the government is considering a major change of status, converting the Department to a government-owned corporation.

(b) Supply of Digital Map Data. An account of the provision of digital map data to the private sector was given by Mr. Wong Chang Hung. The available map data, together with the corresponding textual data bases containing names, addresses, etc. has been derived from the standard maps at 1:1,000, 1:5,000 and 1:10,000 scales. The digital map data is supplied in native ARC/Info format with accompanying conversion routines. It is distributed in a variety of ways. (i) The first involves its direct supply by the Land Information Centre, purchasers receiving a simple licence giving the right to use the data on a non-transferable basis. (ii) The second method involves digital map re-sellers who advertise and sell the data to users who purchase the right to use the data. (iii) Value Added Re-sellers (VARs) re-package the data, adding their own data, with the government receiving a 15% royalty from the sale. (iv) An Internet Map Permit allows the use of raster map graphics (but not vector map data) on Web pages, again on the basis of a royalty fee.

Fig. 2: The production version of the new ADS40 airborne pushbroom scanner installed in an aircraft. (Source: LH Systems)

(c) Satellite Reference System. Next Mr. Sair Wing Yip gave an account of the development of Hong Kong's satellite-based spatial reference system. As one would expect, this comprises a network of GPS stations that operate on a continuous (24 hour per day) basis providing a reference system for high precision surveying work. All the stations are connected to a central collection and processing centre. Obviously it provides a valuable resource. However, having regard to the canyon-like character of Hong Kong's streets lying within the territory's extensive areas of skyscrapers and high-rise blocks, there must still be a future for total stations and other more traditional types of surveying instrumentation!

(d) Photogrammetric & Air Survey Section. This section has its own metric aerial camera that is used to take vertical aerial photography at 1:40,000 and 1:16,000 scales of the whole territory on an annual basis. Other larger scale photos are taken within the urban areas using a narrow-angle (f = 30cm) lens. The photogrammetric unit operates a mixture of older Zeiss and Wild analogue and analytical stereo-plotters, together with a number of new LH SOCET SET DPWs, supported by DSW 300 and 500 film scanners. Within Hong Kong's high-rise urban environment, DEMs and orthophotos are not suitable products. Thus much of the photogrammetric work involves manual operator-controlled feature extraction using 3D stereo-viewing.

LH Systems - Organisational Aspects

Which brings up the final session on the Friday in which the CEO, Bruce Wald, gave his state-of-the-company address and his question-and-answer session. He started by outlining LH Systems' new relationship with Leica Geosystems. Following on from all its many recent acquisitions - including Cyra Technologies, Laser Alignment, ERDAS, etc., as well as LH Systems - the parent company has been re-organised into six divisions - surveying and engineering; mapping & GIS; industrial measurement; special (military) products; consumer products; and new products (including Cyra). Each division has its own president who has a lot of autonomy and responsibility. LH Systems is now one of four components falling within the Mapping & GIS Division: the others comprise ERDAS, the existing GPS/GIS group from Leica Geosystems and the land information systems group, also already part of Leica Geosystems.

LH Systems - The Last 12 Months

(a) ALS40. As has been reported previously in GeoInformatics, LH Systems has entered the airborne laser scanning (lidar) business via its acquisition of the Azimuth Corporation in May 2001. Apparently there is no intention of relocating this group from Massachusetts to California where both LH Systems and Cyra Technologies are already based. It is felt that, although both Azimuth and Cyra are involved in laser scanning - the one airborne, the other ground-based - there is less synergy between the two than outside observers would have expected! The first ALS40 airborne laser scanner unit has already been delivered to the Merrick mapping company based in Colorado.

(b) ADS40. The first ADS40 airborne pushbroom scanner has also been delivered to PASCO in Japan, with a second unit due to be delivered soon to the same customer. Deliveries of other ADS40 units to Merrick are scheduled to be made before the end of this year. LH Systems is planning to manufacture a further 12 ADS40 units during 2002.

(c) GDM100 GeoVault Data Manager. LH Systems have also announced the introduction of this product which incorporates some of Oracle's database management technology.

(d) INS/DGPS. Apparently LH Systems had contemplated trying to establish a closer relationship with Applanix - since the latter company's INS/DGPS units lie at the heart of the ADS40 and ALS40 systems. Indeed they would be inoperable without them! However Applanix is also involved in application areas that lie outwith the area of interest of LH Systems. Furthermore there are quite onerous restrictions on the export of the DGPS/INS units, arising from the wish to control the spread of this military developed technology.

(e) OrthoBASE. The matter of the overlap between between the OrthoBASE and Stereo Analyst photogrammetric software produced by ERDAS and LH Systems SOCET SET DPWs was another obvious question - remembering that, with the rival Z/I Imaging joint venture, the Zeiss Phodis DPW was dropped, the new company having decided to concentrate on the ImageStation DPW from the Intergraph side of the partnership. The answer was that OrthoBase and Stereo Analyst will continue to be developed and to be offered mainly to the "non-professional" market. While SOCET SET will be the main product aimed at the "professional" market, including national mapping agencies and commercial mapping companies. Nevertheless one notes that the SOCET SET software still belongs to BAE Systems, which sells it into the military market, While OrthoBASE is the property of Leica Geosystems through its purchase of ERDAS. It will be interesting to see how this particular story develops in the long run.

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