

Swissphoto: from aerial survey to geomatics

By Stephen Booth, Editor.

Survey companies in the UK and other parts of the world without bread-and-butter cadastral work face serious challenges in the future. The demand for consultancy survey services may continue for some time to come but is bound to diminish as rapid data-gathering sensor develop and aerial imagery products become increasingly available. The challenge will be to develop a market-driven product-oriented company.



The work of survey companies has been changing in many countries around the world. Software introduced during the last decade has had a profound impact not just on the day-to-day business of surveying but upon the very nature of the work itself. With the arrival of digital photogrammetric and image processing systems survey companies have the opportunity of offering clients a much wider range of services. Indeed it can be argued that we're beginning to see a refocusing of the industry from service to product orientation.

In the UK the MAPS venture of Simmons Mapping and NRSC is beginning to follow the path already charted by Switzerland's Swissphoto, a company which began life as an aerial photography and mapping service provider.

SW visited Swissphoto's headquarters in Regensdorf near Zurich last autumn as part of the annual Editor's Forum organised by LH Systems. The company is a major user of LH Systems' SocketSET photogrammetry software from which it generates a range of mapping, modelling and GIS products.

Originally a subsidiary of the national airline Swissair, the company can trace its roots back to the 1930s when pioneer Walter Mittelholzer saw a wider market for aerial photography and under his leadership a unique archive of aerial photos of Switzerland totalling over 100,000 individual scenes was created, an archive which today exceeds 150,000 oblique and vertical photos.



The CyberCity Modeller package has been used to create an accurate virtual reality model of the neighbourhood around Swissphoto's headquarters in Regensdorf, near Zurich.

Today's company, Swissphoto Vermessung AG, was founded in 1997 following a management buy-out from the airline. It is a partnership with Grünenfelder und Partner AG, a surveying company with roots even deeper than Swissphoto's. It regards Geomatics as its core business and interestingly defines this in way which others would do well consider.

They do not attempt an academic definition, instead they see it as a series of activities driven by spatial data:

- acquisition
- modelling
- analysis
- management
- representation, and
- visualisation of graphic data

These activities result in the delivery of both products and services by the company, as we shall see.

With over 125 employees working on five sites in Switzerland, two in Germany and at Pittsburg in the US where they are in co-operation with ADR, the company prides itself in offering customer-oriented services founded on a team spirit culture. "We look upon our clients as partners" explains General Manager Dr Roland Stengele.

This culture of partnership clearly comes from the top. "We take the permanent changes of the market, the environment and the client's needs as a challenge and an opportunity" declares Thomas Grünenfelder, a rare third generation surveyor and the company's CEO and President. Grünenfelder does not believe in too high a management pyramid. "Our decision processes are very short because of a lean structure and organisation." The company philosophy can be summarised through a culture which aims to develop innovative and motivated staff with the desire of each employee to improve him or herself. Such a strategy is seen as crucial in delivering high quality services and achieving client satisfaction.

Defining the goals

Goals and mission statements are too often regarded with a hint of cynicism. But without them it can mean that a company becomes distracted from its core business (as many UK water companies did following privatisation a decade ago). Swissphoto has a clearly-defined goal: to be one of the top European providers of sophisticated international geoservices. To help achieve this it has astutely defined its strengths and weaknesses. Top of the strengths is what it describes as 'inter-cultural' competence, arising from its location in a small country which can only continue to thrive through its encouragement of respect by the individual for its four different language and ethnic groups, together with several different religious and cultural traditions.

The next strength is international experience; a highlights being one of the largest mapping projects ever undertaken in the Middle East. Between 1977 and 1988 they mapped, at 1:50 000 and 1: 250 000 scales, the whole of the Eastern and Northeastern provinces of Saudi Arabia for that country's Ministry of Petroleum and Mineral Resources. Some 750 map sheets were produced derived from aerial photography.

In Portugal a recent major engineering surveying project has seen Swissphoto's surveyors using robotic total stations to set up a monitoring scheme for Lisbon's Ponte de 25 Abril suspension bridge. While in the former eastern bloc they have helped renew Lithuania's cartography, procuring equipment, providing production management and training of local staff; and for Russia's Center LARIS they have provided training in Switzerland on cadastral technology.

But perhaps the Swissphoto's most prestigious project came in 1985 when they were asked to provide a 1:50 000 map of Mount Everest based on aerial photography for the National Geographic Society in Washington DC. Over 12 million copies were printed in full colour and distributed by the society.

The third strength is that of know-how developed over 60 years and implemented by a young and energetic staff (80 percent have been with the company less than five years) with close academic links to the nearby and superbly equipped Swiss Federal Institute of Technology Zurich (ETH). These contacts mean that the company has benefited from the image recognition algorithms being developed at the university.

On the other side of the coin for Swissphoto they say that they are a small company on the international scene, although there are relatively few on the international scene who employ more in today's software-intensive environment. Two other factors clearly are significant for them. Switzerland has notoriously high labour costs (as witnessed by the young professionals of many nationalities working in the Regensdorf headquarters) and is not a member of the European Community. This latter factor is the consequence of the country's avowed policy of neutrality for over a century but one which means fluctuating exchange rates, exclusion from many EC-funded projects within western Europe.

A brand name too

Let's now take a closer look at the company's portfolio of products and services. Important aspects of these two are mutually dependent. In 1995 Swissphoto (also a brand name) began a project to fly the whole Switzerland in colour generally at 1:25000. The photos were scanned at 1000 dpi (1 pixel = 62.5 cm on the ground) for mapping from 1:2500 up to 1:10000. A digital elevation model for the whole of Switzerland is being created with an accuracy for the DEM of 3–5m in the lowlands and 7–10m in the Alps.

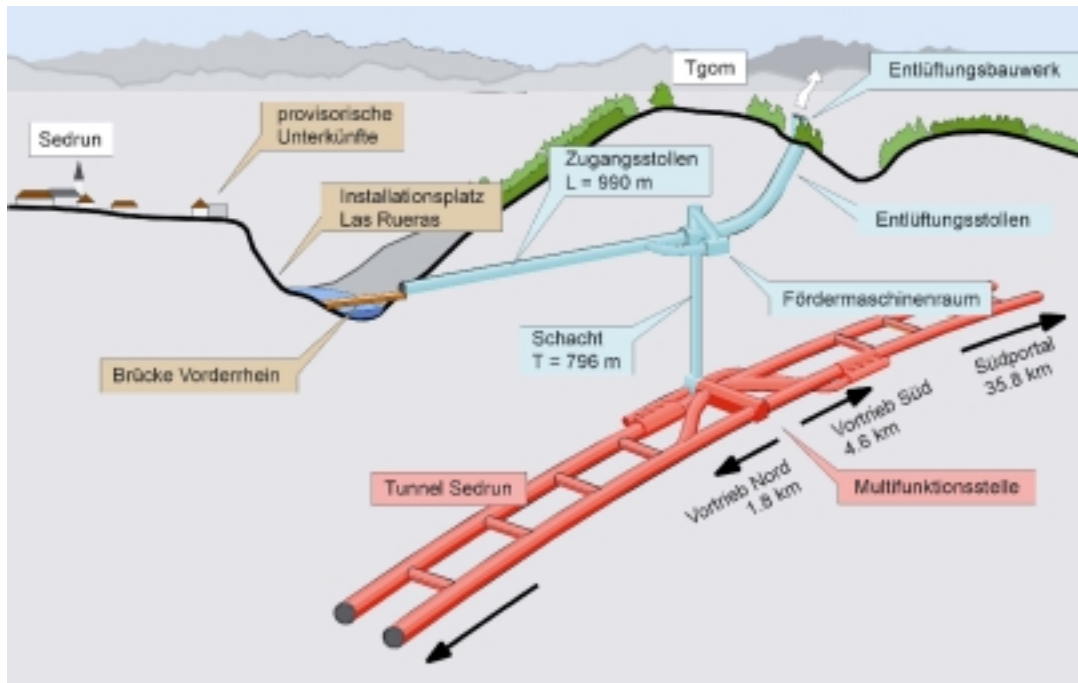
The Swissphoto project was a massive investment for a survey company and was only possible through outside investors. Their stake has paid off. Already they are responsible for updating a third of the country and many local communes don't only just buy their data from Swissphoto: the company has set up and maintains GISs for them. Add to this the telecoms and other utilities and you can see a busy market place for this data for topographic mapping, planning and an emerging market for 3D city models where ETH Zurich's CyberCity Modeller package has been used to spectacular effect to create a virtual reality model of the company's home area, Regensdorf. Created from orthophotos, they report a 95 percent success rate in automatic generation of the basic model.

Working with map publishers, Swissphoto has produced a range of city and locality maps at scales beginning at 1:10 000. Examples of these maps may be more suited to European tastes: personally I don't like street or area maps based on orthophotography. To my eye they seem to clutter the view with so much extraneous information making orienting oneself more difficult than with a traditional diagrammatic map. But perhaps I overvalue the artistry in traditional cartography.



Swissphoto has also begun to exploit the potential of CD-ROM based products. The Helveticus package comprises a series of road maps, aerial photos and panoramic photos of selected areas of Switzerland, with an interactive query function. You can pan and zoom and there are several simple map-making tools including the ability to print and export. I can't see many travellers using it in its current state but perhaps its strength is really as a teaching aid because there is an interface for GPS.

On the consultancy side, Swissphoto offers the full range of surveying services. Apart from cadastral survey (bread and butter for so many European surveyors) they are extensively engaged on the massive 57km St Gotthard Rail Tunnel where dimensional control on the tunnelling is $\pm 3\text{cm}$) and where tunnelling is proceeding in two directions from a massive 800 metre deep shaft – a plumbline challenge if ever there was. They also maintain land and utility information systems for clients such as the Swiss Federal Railways.



Swissphoto's surveyors are engaged on monitoring and maintaining dimensional control on the world's longest railway tunnel project, the 57km St Gotthard Tunnel.

A further project where they will face stiff international competition is air navigation charts. At present the market is dominated by Jeppeson but Swissphoto sees the potential of GIS and is already providing flight support for around 100 customers including their former owners, Swissair. As air charts need very regular updating this could be an exciting area for surveyors to become engaged in as GIS becomes more portable and its benefits become more widely understood.

Conclusion

The transition from traditional survey work to geomatics in all its manifestations has been managed well by Swissphoto. They have demonstrated that it is possible for survey companies to develop product lines and to move away from the reactive service-based consultancy. It requires drive, imagination and inevitably substantial investment. One or two farsighted UK survey companies have already recognised this. We look forward to turning the spotlight on them too in the near future.

For more information about Swissphoto and Grünenfelder und Partner take a trip to their excellent and informative English (or German) website at: www.swissphoto.ch