

Where do you Start? - INTERGEO 2014



UAVs as platforms or systems were very much to the fore at this year's INTERGEO. But so was software, reports editor Stephen Booth.

In one of the six exhibition halls of the German INTERGEO, there is a display tracing the history of the event. Beginning in 1986, a splendid poster board of wood and other materials (what I think the art world calls an installation) for each year marks appropriate technologies and locations. He literally pulled all the stops out for Leipzig (2007) with a musical tribute to JS Bach and an organ keyboard! Chatting to one of the organisers' staff he told me it is an annual labour of love by a retired employee. Respect! Too many companies ignore their history in the digital age, perhaps believing that whatever is recorded on disk will stay around forever. Forget it! Unless an employee is given the job of properly archiving data it will gradually disappear as staff come and go and computers fail or are replaced.

I have been coming to INTERGEOs for more than a decade. The event is a moveable feast that changes, alighting on a new German city each year. Frankfurt, Munich, Bremen, Karlsruhe. . . I was beginning to think that the list was almost endless but this year we returned to Berlin, last visited 14 years ago. Like Ikea, even if the displays change each Messe (exhibition) centre looks the same, so much so that I was chatting with some colleagues who regularly attend and none of us could remember where we had been the previous year! A check with the organisers revealed it was Essen, a perfectly pleasant town in the Ruhr but perhaps too small to have stuck on the personal radar.

Many venues too often involve a route march from a station or bus stop. Hanover was particularly bad. Fortunately, this year it was an easy step from the S-Bahn (regional train station) to the entrance. It is after that the challenge can begin. My best advice (which too often I forget!) is to grab a coffee, sit down and study (intensively) the plan and try to understand how the various halls are linked before setting forth.

Enter any of the six halls in use this year and you're immediately in a busy, bustling scene of demos, enthusiastic stand personnel thrusting leaflets and trinkets on you. As well as gaggles of people. Worst are those who insist on holding ad hoc meetings in the middle of an aisle!

This year marks the 20th anniversary of Intergeo. The event that began in 1986 as "Geodatentag" – the German Geodesy Day – has become a three-day event with a conference, over 500 exhibitors and attracting over 17,000 visitors from more than 30 countries.

Once Again it's up in the Air

Last year we reported that UAVs seemed to be everywhere. Impossibly, this year they seemed even more prevalent. The Intergeo TV channel constantly broadcast an interview with an operator demonstrating his helicopter UAV in the main entrance; his job title proudly proclaimed "Ascending Technician". A possibly useful title in case the second coming should begin during our sojourn.

Fortunately, the market for this ubiquitous technology is beginning to settle between those who offer an end-to-end system, like SenseFly or Aibotix and those who sell the device as a platform with a specified payload leaving you to choose your sensors: the system integrators choice. And there are plenty of players in the sensor market. UK supplier OxTS is typical. They make a number of very neat small combined GNSS and inertial navigation units that can keep a UAV stable and on course. The xNAV weighs in at 365 grams thereby not eating too much into a typical UAV payload budget of 5-10kgs. Their xOEM500, which is just an OEM board, is even lighter at 120 grams.

Bio Inspiration for UAV

At last year's Intergeo SenseFly launched the eBee fixed-wing UAV with a choice of integrated sensors including RTK GNSS. This year they've entered the helicopter drone sector with the eXom. My view is that it is this area that surveyors are more likely to find regular work – close-up inspections of inaccessible or expensive to reach structures like high-rise buildings or the underside of bridges, are obvious apps.

Talking to SenseFly CEO Jean-Christophe Zufferey, he is intrigued by insects. They may have small brains but they are incredibly manoeuvrable and totally focused on what they do. The eXom is therefore "bio inspired". Indeed there is more than just a hint of the insect world in its design. A large multi-sensor "eye" at the front uses a combination of thermal camera, HD video and hi-res still images that are fed back live to the ground. Position is maintained by ultrasound and photogrammetry from the video and still imagery. Propulsion comes from four rotors within protective carbon-fibre bands.

SenseFly is rapidly growing since being acquired by Parrot two years ago, a company with hitherto no presence in the geo sector. From a standing start in 2009 Jean-Christophe now leads a company of 80 employees.

Leading Players

The major players – Trimble, Leica, Topcon – each approach Intergeo in different ways. For Leica, the event is always pitched towards the German market sector (over 80% of visitors will come from the German-speaking world). This year marked a stronger focus on this demographic for Trimble too, whose German dealer HHK's stand was close by. Neither Trimble or Leica held press conferences and in both cases it was not easy to get press kits (not a unique problem as I was to experience with a Chinese survey equipment supplier who had invited me to his stand in advance but was totally unprepared). There seems an excessive reliance on emails and downloads.

Topcon was a different matter. They held an interesting press conference presided over by Ian Stilgoe, a Brit who has risen in the company to Director of Geomatics. This year the focus was on the "democratisation" of data, which according to Stilgoe is where we are heading from the old world of point capture, 2D and visualisation. I'm sure his analysis is correct but how much data will be democratised remains to be seen.

Topcon's strategy is on improving workflows through its cloud offering, MAGNET, and a closer relationship with Autodesk and its BIM strategy, aimed at reducing waste in construction by 30%.

One product that should contribute to this is a little trumpeted device launched last year just after the 2013 Intergeo (delays in production?). The LN-100, which looks like a small tube-like laser scanner, maybe the next or perhaps the last incarnation of the total station. "That's what all total stations will look like one day!" quips Stilgoe. Topcon's is a very different strategy to Leica's. This is not a combined scanner, GNSS and total station but an EDM based device aimed at the internal construction trades to maintain line, level, position and angle. The LN-100 is self-levelling and ranges to prisms (usually stuck on). Watch out for it on a site near you!

There is a growing dichotomy between those who see the miniaturisation of the laser scanner as the way forward and those who believe imagery and a photogrammetric solution is the right path. Topcon is in the latter category and their latest imaging total station, the DS-200i is the fourth generation that uses the company's visualisation technology. Meanwhile, their scanner is updated to the GILS-2000 along with further improvements to the Hybrid range of GNSS receivers. The mass data collection mapping system, the IP-S3 HDI (first adopted by Google for their StreetView imagery) is now in its third generation. Topcon of course also owns Sokkia, however we were assured that the dual branding will continue in many markets. Indeed, this is not just branding as Sokkia continues to make its own range of survey products, the latest of which is the GNR5 which utilizes 452 channels optimized to track the full GNSS spectrum and can assign any visible signal to any available receiver channel.

Topcon was also showing the latest version of their UAV, the fixed-wing Siriuspro is a cooperation with MAVinci GmbH whose precision timing technology with Topcon's GNSS (sub-centimetre grade L1/L2 GPS/GLONASS RTK) offers 2-5 cms accuracy without ground control.

Around the Stands

On the show floor as you wander from hall to hall there is much to see and too much to take in, even over two or three days. So friends and colleagues are useful in alerting you to something interesting.

The BBC News Channel is currently plugging a series on China and whether it can become an innovator as well as a producer of technology. An interesting proposition. Before you can innovate however I would argue that you need to master sales and marketing. Too many of the Chinese exhibitors at Intergeo do not present an inviting front to visitors. They sit at tables engaged in intense conversation with each other rather than stand and invite contact with the strolling visitor. Nevertheless, the snappily named MiLESEEEY company manufactures a range of laser distance meters, the latest of which includes what they claim is a world first, a green laser pointer in addition to the red dot EDM beam. Presumably, someone was waiting for it.

Cracks Show from this Total Station!

Amongst the major suppliers Leica Geosystems announced a range of updates and new products. The UAV department, Aibotix now has a drone that can be kept in position and tracked without GNSS via the Leica Nova MultiStation. Why do I think that's a bit of a sledgehammer? Admittedly they suggest this is a solution for inspection inside large buildings like aircraft hangars but that's a lot of expensive technology. Surely the UAV ought to have some form crash avoidance system?

It seems amazing that it is now 15 years since I was in Heerbrugg and had a sneak preview of what was coming for the millennium year. The first airborne digital camera system was incredibly expensive and processing was slow. But it began a long journey to today's systems like the Leica RCD30 80Mpx camera and the ALS80 LiDAR mapping solution with a scanning pulse rate of 1MHz. For hydrographic applications this was the first Intergeo outing for the Chiroptera topo-bathy LiDAR system that simultaneously captures the full waveform in both the 35kHz bathymetric channel and a 500kHz topo channel. It can penetrate depths to 15 metres and also integrate with the Leica RCD30 camera. UK based Pelydryn Ltd which specialises in the acquisition of airborne bathymetric LiDAR worldwide is one of the first to buy the Chiroptera.

Other updates announced included a GNSS, the Leica Viva GNSS Unlimited allowing for easy upgrade of the sensor as the satellite segment continues to grow; new versions of the point cloud software Cyclone and a web-based real-time version of the monitoring software Leica GeoMoS Now! Also announced was a range of updates to the Leica iCON construction instruments range.

One of the more interesting debuts however was Leica Viva TS11 KUMONUS, a concrete crack monitoring tool built around a total station equipped with a concentric crack scale reticule. Ideal for building façades, dams and other surfaces subject to potential deformation. Existing owners can have the reticule retrofitted.

Security remains a serious issue in many market sectors. Leica has introduced a security label for all its original accessories - prisms, tribrachs, poles and tripods and electrical equipment like batteries, cables, memory cards and even USB sticks – so users can be assured an item is genuine. The label allows customers to confirm the authenticity of an accessory at purchase, wherever they are, via the Leica Geosystems' portal "myWorld".

Strong Software Focus for Trimble

Moving on, Topcon we have mentioned but what of Trimble? The company introduced a range of new products across its portfolio, mainly focused on software, of which the announcement of a new version of its laser scanning software RealWorks version 9.0, is probably the most significant. This latest version transforms scanned data into “compelling 3D deliverables” and features revised tools and a new edition for the inspection and calibration of vertical storage tanks.

RealWorks version 9.0 supports data from virtually any laser scanner, allowing users to benefit from the powerful management, automation and analytical capabilities of the software. A new Advanced-Tank Edition reduces the time required to create inspection reports and volume filling tables from scan data. The reports can also be used in text and spreadsheet editing software for additional customization.

This version of RealWorks is claimed to enhance smart drawing tools and real-time communication with SketchUp Pro and rapidly create point cloud-based models.

A new application for surveyors who collect asset data on oil and gas pipelines is Trimble Access Pipelines. The software automates common pipeline survey tasks, saving time by simplifying attribute and inventory collection and integrating all the data into one easy-to-use data collection workflow.

Meanwhile, eCognition Essentials, a basic version of their image recognition package, performs land cover mapping tasks using satellite imagery and offers an intuitive image analysis solution that allows users of all levels to quickly produce high-quality, Geographic Information System (GIS)-ready deliverables.

A new version of Trimble’s mobile data analysis software, Trident version 7.0 is designed to efficiently manage, interpret and extract features from digital images and point cloud data collected via land mobile systems. Enhancements significantly reduce the time required for users to transform sensor data into relevant geospatial information used in civil engineering, transportation and GIS mapping. In these applications, Trimble Trident can be used for surface modelling, roadway sign and pole detection, lane marking detection, edge and breakline detection, road geometry and clearance measurements.

Also announced was a new version of the photogrammetric software suite, Inpho. Version 6.0 provides highly automated workflows to process thousands of airborne images with high precision. New automated and interactive tools and satellite triangulation functionality increase efficiency and improve the quality of deliverables.

Enhancements to the Trimble V10 Imaging Rover, an integrated camera system that precisely captures 360-degree digital panoramic images for visual documentation and measurement of the surrounding environment, include additional integration options and high-dynamic range (HDR) imagery that helps users document site conditions and perform measurements in the office. The V10 Imaging Rover now seamlessly integrates with Trimble’s R-Series GNSS receivers and TSC3 controller.

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