

Reporter 53

The Global Magazine of Leica Geosystems



■ SmartStation justifies customer confidence

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■ Leica T-Probe: the missing link at Airbus

>> page 08

- when it has to be right

Leica
Geosystems



" – when it has to be right"

I am proud to present our customer magazine, the "Reporter", in its new image. The magazine has now been redesigned to reflect the new corporate image of Leica Geosystems. It projects what our market leading company stands for: precision, accuracy, reliability and innovation. " – when it has to be right" our customers trust their projects, their jobs and even their whole business to Leica Geosystems.

This is the reason Leica Geosystems is successful as market leader in spatial information technologies. During the press conference after the Business Report for FY 05, an increase in full year sales of 12.2% was reported, marking this one of the most successful years in the history of the company.

Our customers all around the world have made this success possible by placing their trust in solutions provided by Leica Geosystems. The main success factors according to the Customer Needs and Satisfaction Survey 2004 are the closeness of the company to our customers, the solutions we provide, and the positive experiences our customers make on a daily basis with our employees worldwide. That is why our magazine is dedicated to the people who place their trust in Leica Geosystems.

The following pages contain reports on customers who were successful with our instruments and solutions. We report on the first positive experiences made by customers with our SmartStation, which is a revolutionary combination of a Total Station and a GPS receiver. There is also a report about employees of Airbus in Broughton (UK), who use Laser Trackers and T-Probes made by Leica Geosystems. These instruments make an important contribution towards the success of the Airbus A380. I would like to thank all our customers for the trust they place in our company and therefore in us.

Sincerely,
Hans Hess,
CEO Leica Geosystems

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Impressum

Reporter: Customer magazine of Leica Geosystems

Published by: Leica Geosystems, CH-9435 Heerbrugg

Editorial Office: Leica Geosystems, CH-9435 Heerbrugg, Switzerland, Tel: +41 71 727 3386, reporter@leica-geosystems.com

Contents responsible: Nicholas Bloch (Head of Corporate Communications and Public Relations)

Editor: Gernot Bilz

Publication details: The Reporter is published in English, German, French and Spanish, four times a year.

Reprints and translations, including excerpts, are subject to the Editor's prior permission in writing.

© Leica Geosystems AG, Heerbrugg (Switzerland), July 2005
Printed in Switzerland

Editorial deadline for next issue: 26 August 2005

Picture front page: Peter Glembotzky, Surveying specialist, SAG Netz- und Energietechnik



The SmartStation has a potential of savings between 30 and 40%

SmartStation justifies customer confidence

Our revolutionary, new and unique surveying system combines a high-precision Total Station and a high-performance GPS receiver in a single instrument. Its amazing multifunctionality and efficiency have already been confirmed by the first customers to have acquired a SmartStation. Now, only a single instrument with integrated GPS has to be positioned, then measurements and stake offs can be performed immediately – saving time and increasing productivity.

by Gernot Bilz

Thomas Henze, the Executive Director of GEO-METRIK was one of the first SmartStation customers in Germany. He was already enthusiastic about the new tool after using it for the first time. GEO-METRIK has its headquarters in Halle (Saale) and subsidiaries in Saxony, Saxony/Anhalt, Berlin, Hessen, Bavaria, in the Czech Republic, Slovakia and Australia. 210 of its employees are dedicated to survey related work for customers in the field of constructing power supply lines, traffic and waterways, flood protection, buildings and in property management.





GEO-METRIK AG

Headquarters: Halle

Subsidiaries: 18 subsidiaries, 12 in Germany
Czech Republic, Slovakia and Australia

Employees: 210

Providers of: Geodata management, consulting, geographic information systems, surveys, photogrammetry, traffic information systems, applied geology, environmental planning, ecological expertise, project management, CAFM, IT-services, financial services, personnel services

Leica Geosystems products: Total Stations TCA1800, TPS1100, TPS1200; GPS500, GPS1200; SmartStation

Further information: www.GEO-METRIK.de



Justified confidence

"Our 40 teams are all fully equipped with Leica Geosystems instruments", Detlef Henneick, the Manager of GEO-METRIK-Engineering in Stendal states. "Our close cooperation with Leica Geosystems over the years since 1985, their excellent services and support – even for investments – have justified the ever growing confidence we have in the company. Now we are placing our confidence in the SmartStation. The integration of TPS and GPS in a single instrument has made us much more flexible, giving us a significant advantage over our competitors." Thomas Henze also explains the commercial advantages of the SmartStation. "The SmartStation makes surveying so much more efficient. One has to keep in mind, that surveys are only budgeted with 0.5–1.5% of the total cost of a construction project. Therefore, we need all the support we can get to keep personnel costs as low as possible. There is nowhere else service providers can save."

The sky is the limit

The clever entrepreneur from Halle thinks the sky is the limit, when it comes to the range of suitable applications for the SmartStation. "Generally, we think the SmartStation can be used in all our current projects. For GPS applications, reflectorless measurements or for normal single-handed automatic tachometric measurements as required in flood protection projects, the construction of traffic ways and power supply lines."

The first field tests of the SmartStation were very positive says Mr. Detlef Henneick: "We have a contract with a power supplier to survey their 350 km long power supply line. This is an application optimally suited for reflectorless measurements. An employee of ours has already single-handedly surveyed the first 80 km. Compared to conventional tachometric surveying, this method has a potential of saving between 30 and 40% of time and money."

These early successes are not completely surprising to Mr. Henze. He was involved with the development of the SmartStation from the start by bringing in practical experiences of his field teams. "Our partnership with Leica Geosystems works very well. I always have someone to talk to and I am never left alone with problems. This is a major difference between Leica Geosystems and other providers. It is also one of the reasons we are planning to acquire additional SmartStations."



Enthusiastic reception of our Total Station with integrated GPS

Investing in the future

Fred Mitzkatis is equally enthusiastic about the possibilities of the SmartStation. He is the Manager for Surveys and Documentation at SAG "Netz- und Energietechnik", a regional provider within the RWE Solutions group of companies of market surveys, planning, construction and documentation from a single source. SAG "Netz- und Energietechnik" is a provider for gas, water, power and telecommunication companies. "Whatever concerns pipes and cables or everything that has to be laid underground", Fred Mitzkatis explains. Altogether, there are five divisions tasked with the survey of construction sites, the location of cables and with documentation.

"Surveying is our core business, We have to be up-to-date technologically and invest in future-oriented technologies", says his colleague Andy Rothe, confirming his confidence in Leica Geosystems. "Just about a year ago we started from scratch: new Total Stations, new control systems, new processes for field and office work and new technologies such as the reflectorless measurement. To succeed, we need a reliable partner like Leica Geosystems."

A reliable partner

"Last year we bought TPS1200 Total Stations and a GPS1200, therefore stepping up to the SmartStation was easy. It was important to us being able to work with the same hard- and software at all sites: the instruments are then interchangeable and every surveyor can operate them." Fred Mitzkatis was first impressed by the technology of the SmartStation. Now he sees the expanded range of applications it provides enabling his company to offer their customers new applications at lower prices.

SAG Netz- und Energietechnik – Survey and Documentation

Headquarters: Iserlohn

Subsidiaries: 5 offices in Iserlohn, Meerbusch, Coswig, Suhl, Schneeberg

Providers of: Surveys, processing of existing project plans, location of cables, documentation, surveys for open drainage channels, creation of emergency plans, pipe and cable laying surveys.

Leica Geosystems products: Totalstations TPS1200; GPS1200, Smart-Station

Further information: www.sag.ne-technik.de

"We like the idea behind the SmartStation: Leica Geosystems provides a Total Station on which we can just plug in an antenna", says Fred Mitzkatis. "Currently we are using five new SmartStations – one for each office – eight TPS1200 and one GPS1200. We are now involved and can influence new developments as partners of Leica Geosystems. We want to be technological leaders in our branch." In his view, the investment in the SmartStations will have paid for itself in about two years: "80% of our business are small scale projects, therefore we have to be fast and flexible every day. The wide range of applications of the SmartStations support us optimally. Our surveyors can decide the best suited survey method on-site and are well prepared to meet unexpected challenges."

There is also a very humane aspect that helped in the decision to acquire the SmartStations: "Our employees understand that the SmartStations are an investment in their future. Innovative technology has to expand our business."



Photo by
Sergio García Dills

by Alexander Klimchouk

For years now, Leica DISTO™ laser distance meters have been increasingly appreciated by practicing cavers for use in cave surveying because of the many advantages that these meters have over the tape method used in the compass-tape-clinometer – the standard cave surveying technique. Therefore Dr. Alexander Klimchouk, the “Call of the Abyss” project leader and President of the Ukrainian Speleological Association asked Leica Geosystems to sponsor the Call of the Abyss expeditions in 2004. The company responded immediately and positively to his request. So for the first time in human history, the depth of the first cave that passed the magic 2000 m mark was measured using a Leica DISTO™ lite5 laser distance meter.

The environment of caves

Surveying caves is difficult and demanding on the equipment and the team due to many peculiar features of cave environments. It is even more so in deep caves in high mountains. Features that make cave surveying tough are: darkness, cold (2 to 7

degrees Celsius in Krubera and Kuzgun), 100% humidity, water in various forms (running streams, waterfalls, spray, pools, siphons), mud, and the complex internal cave relief. The latter is very variable and includes barely accessible passages but also vertical pits and shafts which sometimes drop hundreds of meters deep, squeezes, “bottomless” rifts, boulder chokes, etc. In the super-caves deeper than 1000 m, exploring teams work up to 20 days underground at a time.

DISTO™ advantage in the toughest of conditions

The Leica DISTO™ has numerous advantages, as compared with tape, in surveying caves: It makes surveying in muddy conditions MUCH easier, it greatly increases survey precision and drawing wall and ceiling outlines, as supplementary measurements are also easy and fast. The Leica DISTO™ also allows a quick and precise measurement of the depths of pitches, a common source of problems when using tapes or calibrated ropes and it allows measurements without crossing the area, which is important when working in a fragile area or areas with a complex relief. Surveying with Leica DISTO™ can be performed by one person, which is particularly important on the far edge of extreme explorations.

All the above advantages together nearly revolutionizes cave surveying. It makes surveying much faster and physically less

The “Call of the Abyss” project:

Leica DISTO™ goes underground

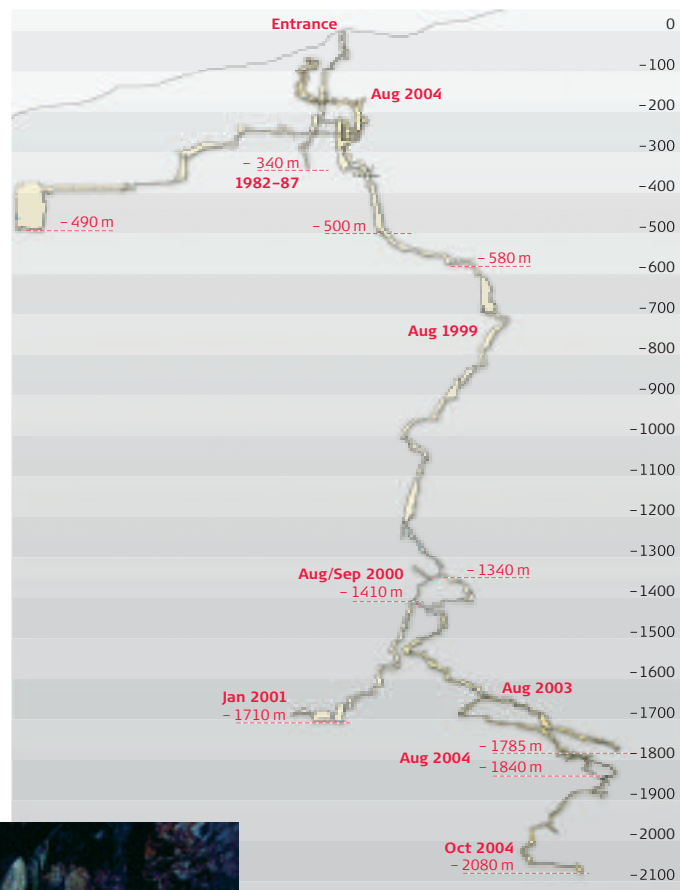
demanding. Also very important for deep caves: the environment of remote and deep parts of caves is extremely hostile to humans, the above mentioned advantages of the DISTO™ greatly increase the overall safety of exploration.

The use of DISTO™ instruments in the Krubera Cave had one specific target: to measure the exact depth of the deepest cave in the world. The depth figure obtained from surveying in this case is extremely important, because it is widely referred to as the world record and because it has become a globally accepted geological fact. Due to an error inherent to standard cave surveying, the precision of total depth figures is commonly estimated to be within 0.5 to 1.5%. Using the Leica DISTO™ makes the depth reported for the deepest cave in the world more precise than if it had been obtained with the standard tape method.

Leica DISTO™ in the world's deepest cave

The Leica DISTO™ is a great instrument for cave surveying, with many important advantages over traditional tape-based surveying. It is indispensable for surveying in extremely difficult and harsh environments such as in the far reaches of super-deep caves. Using the Leica DISTO™ not only increases the precision and efficiency of surveying but also the safety of deep cave exploration.

"The use of the Leica DISTO™ in the Krubera Cave in the historic season of 2004 gives Leica Geosystems a possibility to state that this instrument application on earth ranges from the top of the highest summit to the bottom of the deepest cave", says Dr. Alexander Klimchouk.



**Profile of Krubera Cave,
Arabika Massif, Western
Caucasus**

© Ukrainian Speleological
Association, 1999–2004,
A. Klimchouk

Photo by A. Klimchouk

"The Call of the Abyss" is a multi-year project aimed at the exploration and study of deep caves in the two outstanding limestone massifs: the Aladaglar massif in the Eastern Taurus (Turkey) and the Arabika massif in the Western Caucasus (Abkhazia). An ultimate goal of the project, officially adopted in 2000, was to discover, explore and study the first 2000 m+ deep cave on earth. The project is run by the Ukrainian Speleological Association, and it involves institutions, individual cavers and karst scientists from several countries. The expedi-

tions of the Project in 2004 have been supported by the National Geographic Society, USA.

Kuzgun Cave, Turkey: The total morphometric data of the cave obtained during the July expedition from surveys with the Leica DISTO™ are as follows: Depth: 1400 m, Length: 3187 m, Total vertical length of the survey network: 2080 m

Krubera Cave, Abkhazia: The survey with Leica DISTO™ during the August and October expeditions encompassed the part beyond the first siphon at -1440 m, to the current bottom of the cave at -2080 m. The depth of the newly

surveyed post-siphon part is 640 m, and the total length is 2489 m. Along with some other parts of the cave explored at various depth intervals, the total length of the added surveys in the Krubera Cave is 3415 m and the total vertical length of the survey network is 1443 m.

More details on expeditions/results:

www.speleogenesis.info/spotlights/krubera.php
www.speleogenesis.info/spotlights/kuzgun.php
magma.nationalgeographic.com/ngm/0505/feature4

The missing evolution in tooling operations



by Neven Jeremic

The Airbus site in Broughton near Chester, UK, manufactures every single wing variant in the Airbus product line, including the mother of all flagships, the new A380. Providing work for more than 7,000 people, Airbus is the largest employer in town. Over 100 Leica Laser Trackers are used by the 16 production facilities in France, Germany, Italy, Spain and the UK, and the Broughton site alone relies on 7 Leica Laser Trackers to perform recertification and modification jobs. The newest addition to their Leica Metrology arsenal is the T-Probe, Leica's armless/wireless hand-held Walk-Around CMM. However, technology aside, it is the Leica Geosystems' unparalleled quality of service and support that has made all the difference to day-to-day sustainability of Airbus operations.

Few things arouse as much awe and admiration as flying does. Nothing captures our love affair with airplanes better than the brand-new A380, the largest passenger aircraft ever built. With 73 m (239 ft) in length, a wingspan of 80 m (262 ft) and a height of more than 24 m (80 ft), its sheer size instantly earns both respect and affection. When it goes into service next year, the A380 is poised to redefine long-distance air travel as we know it.

A perfect fit

The wings on any aircraft are probably the single most complex and crucial element in the entire construction. Not only the number of complex parts going into the assembly of a wing but also the need to maintain unforgivingly tight tolerances of about 0.25 mm (one tenthousandth of an inch) over the entire length of the wing put tremendous requirements on the tooling.

ary link



The assembly takes place in large jigs that may reach the height of several stories. Individual jigs may have hundreds of tooling points that have to be in perfect alignment with each other.

Saving time, saving money

Graham Tudor, Tooling Operations Manager at Airbus, explains: "Leica equipment has taken us away from the conventional tooling business and has made recertifications and modifications our core competence. We are using Leica Laser Trackers plus the new Leica T-Probe for that innovation and are registering savings in the region of 30 to 50% in both time and money."

"Recently, we had to rework an A340 wing. We were requested to move the wing back into the jigs to repair the fault, which had never been done before. We had recertified the jigs using the Leica laser technology



Leica T-Probe helps to assemble 40 m long wings in huge jigs with tolerances of about 0.25 mm.

and were able to put the wing into a different jig other than the one in which it was originally built. Bringing the wing into a different jig with absolutely no modifications or adjustments was only possible because of the tolerances we had achieved when we did the recertification."

Keeping promises

Honouring delivery dates is paramount. Graham Tudor explains: "One hour of equipment downtime may only cost me 45 pounds in labor costs, but one hour of downtime to a major airline is worth many thousands of pounds due to the lost revenue if the aircraft is not in service."

Proximity is everything

Relying on dependable service and support is another element of the Leica experience. "What I get from Leica Geosystems is a true turnkey package. Leica's Technical Sales Engineer Steve Shickell lives locally and is always on hand to offer support and expertise. There



Hundreds of tooling points are aligned with the T-Probe.





is always an instant, rapid response because Steve and his team understand the implications of not delivering. I receive regular updates on products, launches and new technologies that allow me to view your latest products first hand. For example, we were one of the first companies in the UK to start using the Leica T-Probe.”

Leave nothing to chance

“When I want a Laser Tracker, I think of Leica above anyone else because of the package I receive and not just because of the price of the product. Sure, I might save money somewhere else, but when it breaks down, where do I go for help? How long is it before that help gets to me? In this business, the risk of failure is simply too high to leave anything to chance. With Leica Geosystems there are no open questions.”

Charting the change together

Over the past decade most of the Airbus tooling has been designed using a 3D CAD package. This has allowed the company to go gaugeless and recertify these tools using a non-contact measurement system like the Leica Laser Tracker. Alan Minshul, Airbus Tool

Engineer, provides the final food for thought: “One of the frustrations has been that our legacy tooling still has to be checked using conventional methods. With the introduction of the Leica T-Probe, we can go gaugeless there as well, thus allowing us to recertify these tools up to 50% quicker. In a way, the Leica T-Probe is the evolutionary missing link that we have been waiting for all along.”

Leica's Steve Shickell (left) supports Alan Minshul and Graham Tudor at Airbus in Broughton



It's all about trust

The Customer Needs and Satisfaction Survey 2004 has confirmed it again: Leica Geosystems understands and meets customer demands. The delightful results of this representative survey have just come in. Customers, non-customers and even employees have given Leica Geosystems the highest ratings as a reliable supplier: in overall satisfaction, quality and performance. Reason enough for Nicholas Bloch, Head of Corporate Communication and Public Relations and Lara Mezentseff, Customer Survey Project Manager, to give a very upbeat Q&A.

Why does Leica Geosystems enjoy so much confidence among the customers and non-customers surveyed?

Lara Mezentseff: Many of our successful products are less than a year old. Leica Geosystems continuously and very successfully launches innovative products that really meet customer demands and are preferred by users. The customer survey confirms this: Leica Geosystems understands what professionals want in order to collect and analyse spatial data and always offers the appropriate solution.

From customers' and non-customers' points of view, what are the success factors of Leica Geosystems?

Lara Mezentseff: Well, the high quality, precision and reliability of our instruments play a large role. But where we really excel and out-perform our competitors is our technical support, the consultations we provide and our After-Sales-Service. Customers are most impressed by our worldwide presence, we can be reached easily and quickly anywhere in the world. We provide solutions to problems and reply to enquiries very promptly.

Well then, so Leica Geosystems has a lot of loyal and satisfied customers?

Nicholas Bloch: Exactly! Thanks to the high level of satisfaction with our products and the excellent work of our employees worldwide, we do have many loyal customers who would be hard to sway into buying a different brand. Our customers place their trust in the

Leica Geosystems brand. That is why they tend to recommend us and prefer buying our products to other brands.

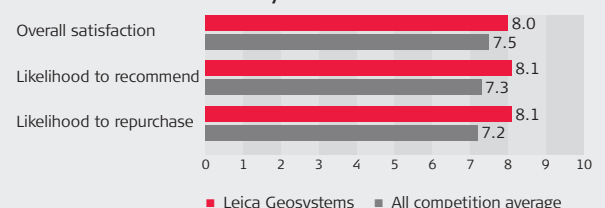
What part does this trust play in the new Leica Geosystems' Corporate Identity?

Nicholas Bloch: Trust is the essence of our brand. Whether building a house or a bridge, a map or an aircraft, you need reliable measurements. That's why more companies trust Leica Geosystems to collect, analyse and present spatial information. Reason enough for our new Corporate Identity to centre around the people who place their trust in us – when it has to be right". Our communication, our Corporate Identity, the culture within the company including the behaviour of our employees – all of it has to be right.

Customer Needs and Satisfaction Survey 2004

On average Leica Geosystems possesses advantages in each of the top four attributes that drive our customer's overall satisfaction (reliable products, high quality technical support, responsive to requests and provides repairs/replacements promptly). The Leica Geosystems' brand scored the highest result for overall perceived quality and is considered the most top of mind brand amongst our customers. Leica Geosystems' performance in the last two years remains ahead of the competition. We recorded a high KPI score, which measured our performance against 15 attributes relating to customer needs. The company continues to perform well in the top attributes that customers state are important to them and those that drive their overall satisfaction.

Performance on three key measures



Total Station to map crime scene

Taken from an article by Marc Cheves (American Surveyor)

Imagine the scenario: It's about 2:00 a.m. Tina Perruzzi is at her desk catching up on paperwork when the phone rings. There has been another homicide – a shooting victim in an apartment building courtyard. Time to go to work...

Tina Perruzzi is an evidence technician with the Forensic Services Division of the Prince George's County Police Department, in the Maryland suburbs of Washington, DC. As she heads for the door, she grabs her tools – briefcase, laptop, digital camera, and a robotic Total Station – which she will use to create accurate digital maps of the crime scene. Arriving at the scene, she observes a body is on its right side with multiple gunshot wounds. Blood stains have seeped through the victim's shirt. Five 9-mm shell casings lie on the pavement about 15 feet away. Behind the body two slugs are embedded in the concrete. A technician is already photographing the scene. There are three cigarette butts on the ground near the shell casings, a bag of half-eaten french fries and a soda cup on the ground next to a bank of shrubs. There are several cars in the adjacent parking lot. Perruzzi walks around the crime scene, apparently at random, taking it all in. Then she opens the case and starts setting up the Total Station...

A few hours later she's back at her desk working to produce 2D and 3D diagrams of the crime scene.

Can you tell us about your job? What is a typical work day like for you?

Perruzzi: My day might include anything from taking a few photographs or fingerprinting a car to processing a large homicide scene. As evidence technicians, we are called to the scenes of major felonies, most notably homicides, sexual assaults, and robberies. We also respond to calls relating to unattended deaths such as suicides and industrial accidents. We attend autopsies and testify in court. One of the best things about my job is that I have learned so many new skills. Also, while there are some routine aspects to the job, every day is different and you never know what the next call will bring.



How did you become interested in using the Total Station for crime scene mapping?

Perruzzi: Actually, the department had purchased the Leica TCRA1105 robotic Total Station system before I joined the team here, but it was not being used much. About a year and a half ago, I pulled it out of the closet and decided to give it a try. I eventually figured out how to shoot some points but could not produce a diagram because I did not yet understand the concept of backsighting. After realizing that I was totally over my head, I called Bill Murphy, our Leica Geosystems representative. He was more than happy to come to headquarters and show me how to get started.

Murphy: It helped that Tina is a quick learner. Once I introduced her to the basic concepts, she quickly picked up the rest of it.

Perruzzi: Once I mastered the basic concepts of the Total Station, my next hurdle was trying to learn the software. We had a CAD-based software program that was very difficult for me to learn. I kept at it, however, and a few months later I was able to produce a basic diagram. At that point, I started taking the Total Station out on jobs with me. I would map a scene and then download my points into the CAD program before I left the scene so I could make sure that I had all the information I needed for my final diagram. I now use the Total Station regularly for outdoor scenes. I have mapped homicides, shootings, death investigations and even a bank robbery.

Can you describe a typical job?

Perruzzi: The first thing I do when I get to the scene is walk around the entire area. From there, I try to figure out where to set up the Total Station so that I can shoot as much of the scene as possible without moving it. I also try to locate a backsight point that will be visible. I usually shoot curbs and roadways first. We also capture any bits of evidence, that may be useful in recreating the crime scene. I try to shoot reflectorless whenever possible. I have adopted Bill Murphy's suggestion of using the pole to create an outline of the victim using the robotic feature. I often find it is quicker and easier to work alone using the robotic mode.

Murphy: Tina is a real artist when it comes to creating crime scene maps. She uses the robotic pole almost like a paint brush in outlining the body, roadsides, curbs, cars, trees and other evidence.

Perruzzi: Bill taught me how to shoot from one location, then move the instrument forward to the next.

The other night I had a shooting death in a long parking lot and I had to move the Total Station several times to get the whole scene.

Murphy: Traversing is something surveyors understand instinctively, but it didn't come naturally to Tina.

Perruzzi: I use the Total Station mostly for outdoor crime scenes, and sometimes for indoor work if it is a large open space. For houses with smaller rooms, I use the Leica DISTO™ laser distance meter instead to measure distances. The DISTO™ is very easy to use – just point, aim and click.

Murphy: We have programmed into the total station a code library specifically for Tina's crime scene forensics application. The instrument automatically produces log files, which are saved in case they are needed for legal evidence.

Do you have any advice for other law enforcement departments that may be considering this technology?

Perruzzi: I can't overemphasize the importance of technical support and training. Bill was a very patient instructor.

The tools used

The TCRA is a "jack-of-all-trades" out of the TPS1100 Professional Series. It brings together all of the survey options needed to carry out a wide range of very diverse tasks: measuring without a reflector, automatic targeting, measuring from the target area. The Leica DISTO™ is the innovative hand-held laser meter for fast and easy distance measurements of length, squares and volumes with the press of a button.

Bill Murphy, Leica Geosystems' technical sales representative in Maryland, brought this unusual application for robotic Total Station technology to our attention. To find out more, Marc Cheves conducted an interview with Tina Perruzzi at the

Prince George's County Police Headquarters in June. Bill Murphy joined us. Together, they staged a re-enactment of a typical crime scene in an outdoor courtyard at the headquarters building. Bill graciously offered to be the "body."





Total Station

by Enver Celik

Working in the most deserted place on earth – in potentially the worst weather and the roughest site conditions – makes equipment selection one of the top priorities in the expedition's preparations. It is therefore no coincidence that during the selection process of the topographic survey equipment Leica Geosystems was contacted by the International Polar Foundation (IPF). Leica Geosystems and the IPF came to an agreement in using the Leica GPS1200 system on Antarctica for the Belare Site Survey of 2004.

The equipment designed and built to the toughest specifications provides the highest standard of accuracy, flexibility and user friendliness required for this mission. The results, being most successful during the first site

surveying expedition in November 2004 at Antarctica, strengthens both parties' conviction to extend future collaboration and use Leica equipment and know how to support the design and construction process of the new Antarctic base in the next years.

In 2004, the Belgian government commissioned the International Polar Foundation to design and construct a new research base in Antarctica, to become operational during the International Polar Year at the end of 2007. The project is being developed in cooperation with other Antarctic Treaty countries, (such as Japan, Sweden, Germany, and Norway), which have offered their expertise in logistics and various technical areas.

Belgium has a long history of scientific activity in Antarctica, dating back to the first over-wintering in 1897, from which the Belgian Antarctic Expedition returned with an important scientific harvest. Belgium next returned to the Antarctic sixty years later to build the Baudouin Station, which operated until 1967. This was

in Antarctica!



The Leica Solution: GPS1200 Surveying Systems with a new, ultra-precise GPS measurement engine, new, fast, self-checking RTK algorithms, and a comprehensive, self-explanatory user interface. LEICA System 1200 receivers provide all the flexibility, power and performance needed for every type of GPS application.



part of Belgium's celebrating the 1957–58 International Geophysical Year (IGY), a key event for international scientific collaboration which led to the signing of the Antarctic Treaty in 1959.


The new station will house twenty people during the summer season, and will be based between the Russian station Novolazarevskaya and the Japanese Station, Syowa, in the Dronning Maud Land region. The first site survey expedition was carried out in November 2004 and during this mission Leica Geosystems' surveying equipment has been used for intensive topographical studies. By doing so a lasting place for the construction of the Ice Station was determined.

The International Polar Foundation will use the development and construction process to pursue the objectives of the Foundation: to educate and inform on research

in the polar regions, on climate change and on sustainable development. Sponsors and technology partners, like Leica Geosystems, have been sought to equip the station with cutting-edge materials and technologies.

The International Polar Foundation

The International Polar Foundation (IPF) aims to inform the public about research carried out in the Polar Regions and its contribution to understanding climate change. It also seeks to raise awareness of the Polar Regions' fragility and the need to protect them – both for science and as humankind's common heritage. The IPF is currently developing an international network of Polaris Centres – initially Brussels, Toronto and Tokyo – to provide, across all time zones, communication platforms on science in the Polar Regions and climate change. It is headquartered in Brussels. For more information on IPF's Belare "Ice Station at Antarctica" project: ipf.polarfoundation.org/

An aerial photograph showing a coastal town with a grid of streets, houses, and a large beach. The ocean is visible on the right side of the image, with a long pier extending into the water. The sky is clear and blue.

Aerial photograph proves its efficiency

by Wendy Watson

The U.S. Department of Agriculture's (USDA) Farm Service Agency (FSA) is quickly fulfilling its goal of obtaining digital content for its National Agriculture Imagery Program (NAIP). The Leica ADS40 Airborne Digital Sensor is key to the success of this project.

NAIP annually acquires current and accurate imagery of all agricultural lands of the continental United States. The imagery is used for several purposes, including crop management and determining farm and tract boundaries. The USDA adheres to two strict requirements in the imagery acquisition process: It must be provided to service centers quickly for mandated annual compliance review and it must become the updated image base layer for the USDA's Geographic Information Systems (GIS) when orthorectified.

Since its formation in 2001, NAIP used traditional film methods to obtain farmland imagery. NAIP leaders believed digital sensors offered a faster turnaround time as well as more-efficient and flexible production processes.

Nebraska Pilot

NAIP contracted North West Group and team members Horizons and EarthData, to carry out the largest digital ortho project completed to date. The team was tasked with airborne digital acquisition of 90,000 square miles. The Nebraska project required the delivery of one-

meter resolution, color images delivered as DOQQ sheets and county mosaics. NAIP set a deadline of 90 days – 60 days for image acquisition and 30 days for image processing – to be completed during the flying season of July through August. Timing was critical, because the team needed to obtain the imagery of the types and amounts of crops planted.

Two Leica ADS40 Airborne Digital Sensors were mounted into two propjets. Flying at an average height of 26,000 feet above ground level the flight crews acquired the 120 flight lines to cover the entire state in less than 21 days. Because digital sensors don't require film processing or scanning, the team was able to begin processing imagery immediately after flight. The required deliverables were completed within the 90-day time frame. The result was imagery with much higher detail that provided a uniform radiometric balance across the state.

Texas, Idaho & Louisiana

Following the success of the Nebraska pilot project, the FSA again contracted with North West Group and its team members to acquire imagery over approximately 380,000 square miles of land in the states of Texas, Idaho and Louisiana. The team employed five Leica ADS40 sensors to collect imagery. About 10.1 trillion pixels or 10 Terabytes of raw data was collected for this project, as both color and color infrared products. "The main advantage of the ADS40 is its push-broom technology," said Salah Ezzaoudi of LandAir Mapping. "By creating a wide pixel scan, there are fewer image blocks to handle. This saves us time, allowing us to deliver excellent quality imagery to our clients much faster than in the past."

How to measure trees faster

In an equally successful project, a Leica Geosystems customer has been using aerial photography to sample forest plots as part of an annual inventory, in an effort

to determine whether the accuracy and cost effectiveness of photo interpretation is comparable to that of ground crew estimates. The Forest Service Remote Sensing Applications Center (RSAC), Interior West FIA and Red Castle Resources Inc. set out to determine the accuracy and cost effectiveness of using large scale digital aerial photos to sample FIA plots as part of its annual inventory. The project analyzed the precision of tree-height measurements from aerial photos and compared the cost of using ground crews to the cost of using aerial photos.

The aerial photos of the FIA plots, obtained from a private contractor equipped with a Leica RC30 Aerial Camera System, were required to meet specifications of sun angle, overlap and scale. Three photos were collected for each plot within the Fishlake National Forest in Utah to allow stereo viewing from two different perspectives. A second contractor scanned the photos, resulting in digital images. Next, a block file was created using Leica Photogrammetry Suite and stereo pairs were generated via the triangulation process. ERDAS IMAGINE was used to process the images; the Stereo Analyst® Add-On for IMAGINE was used to view the images in stereo, and to establish tree height measurements.

"The ability to measure a tree's height using Stereo Analyst® is remarkably precise. While some differences occur, they are within an allowable 10 percent of true tree height as measured in the field. So one of this project's goals is accomplished," commented Kevin Megown, reference for the U.S. Forest Service RSAC.

Cost-Effective

An analysis of cost versus precision for a pinyon-juniper forest demonstrates that over one third of the sampling costs can be saved by combining photo analysis and ground-plot sampling methods without affecting accuracy.





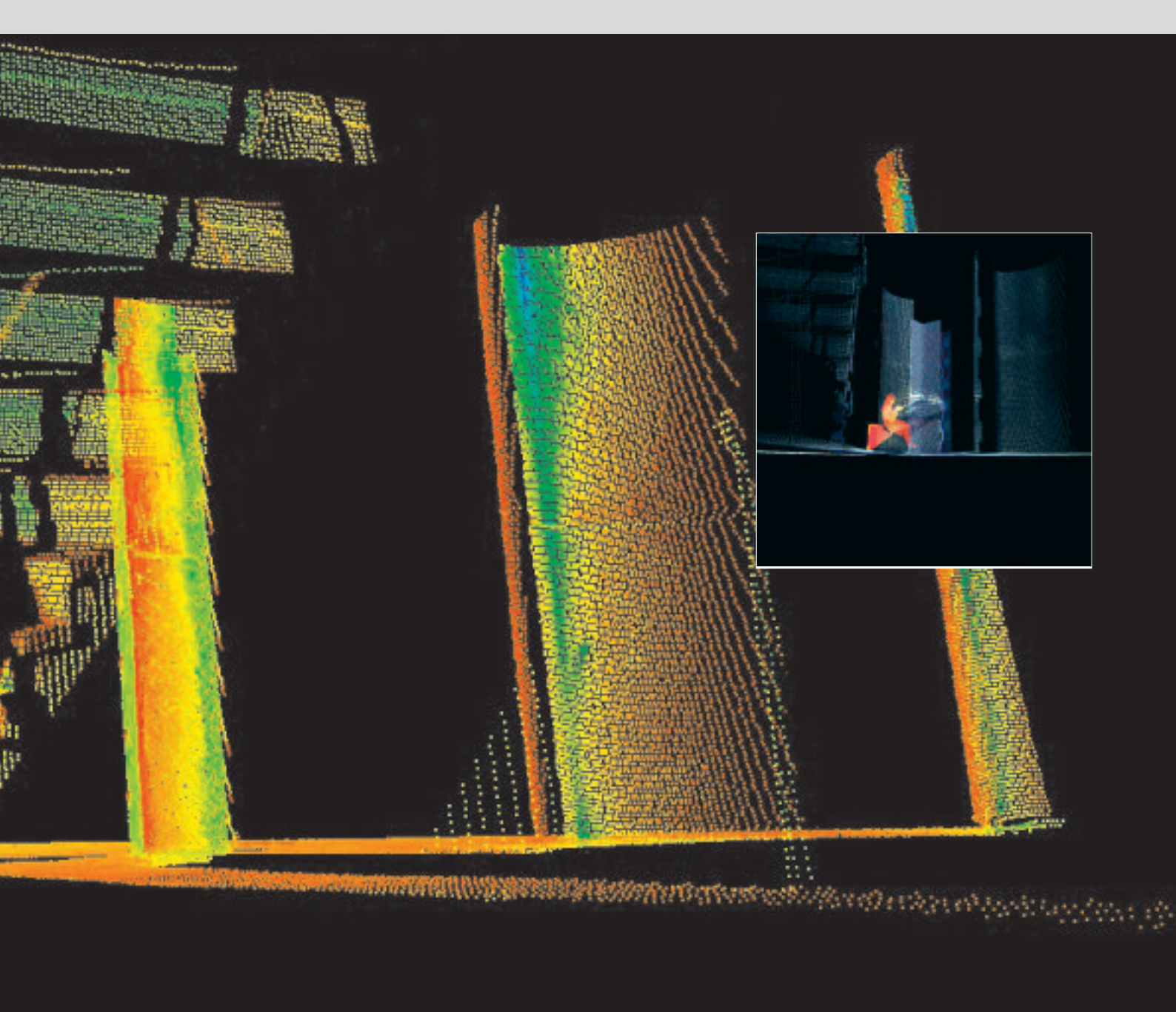
Tech Art with Laser Scanners
made by Leica Geosystems

Art in Cyberspace

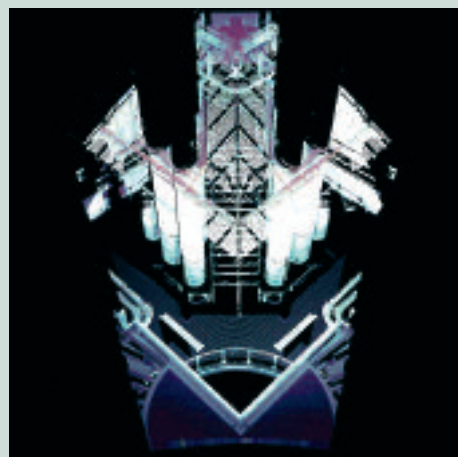
"I am creating realities
I couldn't even imagine in my
wildest fantasies!"

by Gernot Bilz

The internationally known musician and artist Martin Hämmerle, creates worldwide unique images combining survey technologies with his artistic touch. In collaboration with Clemens Denier of Terradata, a Swiss company, and using a Leica HDS3000 Laser Scanner,



Martin Hämmerle creates point cloud images of rooms and buildings. The people in his pictures are the link to reality. Colours are created by varying materials, surfaces, view angles and distances. By linking the millions of points, he forms transparent objects of light enabling the viewer insight into the object itself and therefore into a fourth dimension. Fritz Staudacher initiated this unique art project and the internationally renowned artist Gottfried Bechtold played an important role in its implementation. As a premiere, during the "Bregrenz Festival" in Austria on the Lake of Constance, an exhibition based on the transmission of live-scans is in the works.





The Leica Total Station tracks the prism, performs automatic measurements every 0.5 sec and sends data via radio modem to the PC on the boat.

Leica System1200 – a boost in hydrographic surveys

by Gregor Bilban, Geoservis, d.o.o.

It is a widespread belief that the GPS is the “normal” positioning system for hydrographic surveys as there are usually no obstructions on the water. But Slovenia’s terrain is very versatile – obstacles of all kind often block GPS signals. And: hydrographic measurements are also an essential tool in determining the water level at the time of the measurement as well as detailed survey of both river banks – a difficult task with GPS. The Ljubljana based company “Geodetski biro Iztok Slatinšek” therefore decided to invest in the remotely controlled Total Station Leica TCRP1203.

The measuring system for hydrographic surveys consists of a motor boat, an echo sounder, a laptop with

the Hypack software, movement sensors and the positioning device. Irrespective of the positioning system used, the position is available in real-time down to a centimetre level. The current depth, the coordinates and other sensors’ data are sent on-line to the PC. The survey results in a list of points, cross-sections or in a complete 3D model of the river bottom. The data obtained provides the basis for different calculations (e. g. area and volume calculations), for making models of the river flow.

“Geodetski biro Iztok Slatinšek” has specialized in engineering and hydrographic surveys since its beginnings in 1995. All the positive experiences with the Leica System1200 now encouraged them to try out Leica Geosystems’ new SmartStation.

Leica Geosystems wins major contract with University of Nottingham

Leica Geosystems has won a contract to supply surveying equipment to University of Nottingham’s Institute of Engineering Surveying and Space Geodesy (IESSG). The equipment consists of eight Continuously Operating Reference Stations (CORS), one HDS3000 3D Laser Scanner with software, and Photogrammetric instrumentation. This top of the range suite of surveying equipment will be used for research applications at the IESSG. The CORS receivers will be used to create a regional network of Real-Time Kinematic (RTK) reference stations.



Saves time and money with one-man surveying

JCK Limited is striving to become one of the Isle of Man's leading Civil Engineering Contractors with activities spanning the complete building life cycle from quarrying to demolition and everything in between. The company is now using a Leica TCR407power to carry out a wide range of surveying operations quickly and easily using only one operator.

"We are up against local companies as well as some of the mainland's larger construction and infrastructure companies. To help us compete we had to find a more cost-effective way of handling all our surveying tasks", states Derek Clarkson, Contracts Manager at JCK.

Complete confidence in Leica Geosystems

Derek's solution was to acquire a TCR407power, the long-range Total Station from Leica Geosystems. He says, "I chose Leica equipment because I had complete confidence in it. I'd already used the TCR407 on Falkland Islands Government and British Antarctic Survey contracts and it had performed very well indeed. It was easy to use and easy to transition between engineers. It undoubtedly saves us time and money. If you are producing as-builts and need to pick up various points throughout the building or the landscapes, the TCR407power comes into its own in terms of productivity, range and speed."

Help from above: GPS for machine guidance improves safety at Borax mine

Taken from "Mining Engineering"

U.S. Borax's mine in California's Mojave Desert is the source of nearly half the world's supply of refined borates. These minerals are used in hundreds of products, including essential plant nutrients that increase crop yield and quality, and safe building products that protect homes from insects and the elements. Two years ago, Borax began investigating GPS-based machine guidance technology to bolster its safety system. The company's goal was to improve the shovel operators' ability to maneuver their machines in and around high-risk areas.

The Leica Dozer 2000 system consists of a rugged, high-precision GPS receiver, radio data receiver and touch screen computer running on specialized software supplied by Leica Geosystems. The Dozer 2000 compares the actual GPS position to a computer-generated model of the desired finished terrain and provides visual guidance to the operator. "At the Borax mine, Leica Geosystems worked with their partners, Carlson Software, to implement an innovative new digital compass solution. This was done to determine the position of the rotating shovel accurately relative to the working face," said Rod Eckels, Vice President, South West Region, for Leica Geosystems. "The system gives operators the tools they need to work safely in potentially hazardous areas," stated Tim Cotton, Borax's manager of mine technical services. "Achieving design grade is also more efficient with this system than with survey stakes." Based on the successful test pilot Borax ordered three further Leica Dozer 2000 systems.

A Leica Dozer 2000 GPS receiver is mounted on the cab of a P&H 4100A electric shovel. (Photo courtesy of U.S. Borax)



New facilities in Singapore

Leica Geosystems, the worldwide leading provider of spatial data recording instruments officially announced the opening of new product facilities in Singapore. The "Surveying & Engineering" division of Leica Geosystems and its subsidiary, Leica Geosystems Technologies (LGT) Pte Ltd headquartered in Woodlands, will invest \$ 6 million in the new facilities. Singapore will become the main production facility for instruments used for levelling and alignment. A division of expertise for the development and construction of digital and optical levelling instruments is also planned.

Brisbane research hub drives global innovation

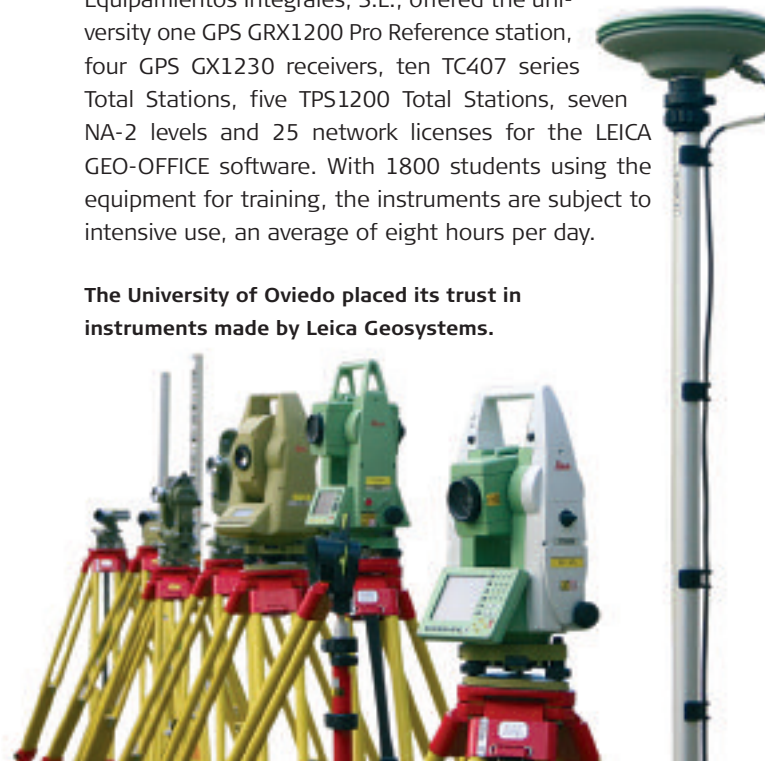
Leica Geosystems has chosen Brisbane as the home of its global research and development headquarters for machine automation solutions. Leica Geosystems' multi-million dollar investment in research and development in Brisbane will focus on pioneering technology for the mining and construction industries.

The President of Leica Geosystems' Surveying and Engineering Division, Mr. Clement Woon, said the Brisbane headquarters would drive Leica Geosystems' expansion plans for machine automation. "We could have chosen anywhere in the world for this site, but Queensland was the stand-out choice," Mr. Woon said. "Queensland's reputation for innovation and investment in technology, and this state's highly skilled workforce, were key drivers in our decision. Queensland is also a key hub for mining and construction activity in the southern hemisphere." It will be the largest research and development center in Australia for geospatial technology solutions for the mining and construction industries. Leica Geosystems expects to inject in excess of \$A20 million into the Queensland economy over the coming years as it doubles its current workforce to meet demand for its technology. Leica Geosystems products are used in the operations of some of the biggest names in the world such as BHP, Rio Tinto, Anglo Coal, and Xstrata, as well as most of the world's construction companies.

Spanish university trusts Leica Geosystems products

The opening of the Scientific and Technological Faculty in Barredo in 2002 is the most recent milestone in the history of the 150 year old university of Oviedo in Mieres, Spain. In order to fully equip this university complex, it was first of all necessary to invest heavily in teaching equipment. Leica Geosystems products were first choice. The local Leica distributor, Lógica Equipamientos Integrales, S.L., offered the university one GPS GRX1200 Pro Reference station, four GPS GX1230 receivers, ten TC407 series Total Stations, five TPS1200 Total Stations, seven NA-2 levels and 25 network licenses for the LEICA GEO-OFFICE software. With 1800 students using the equipment for training, the instruments are subject to intensive use, an average of eight hours per day.

The University of Oviedo placed its trust in instruments made by Leica Geosystems.



News >>

SolutionTRACKER



MC1200

Leica Geosystems launches its new MC1200 universal machine control system for earthmoving machines. Built to operate in the harshest environments, and cope with the toughest earthmoving tasks, MC1200 is the first next generation 1D/2D machine control system. Combining a state-of-the-art user interface, CAN-bus architecture and industry-leading sensors, MC1200 is ready for use on all types of earthmoving equipment. As a foundation for 3D control, MC1200 is ready with plug-and-play support for Leica's class-leading GradeStar TPS or GPS 3D system.



LISCAD 7

Leica Geosystems has released version 7 of LISCAD Surveying & Engineering Software. LISCAD, designed for Microsoft Windows, is a complete field-to-finish system which interfaces with all popular surveying instrument brands as well as all popular surveying, engineering and CAD software systems.



MNS1200

Leica Geosystems has announced the introduction of the Leica MNS1200. The Leica MNS1200 is an extremely robust and stable machine navigation sensor for the most precise and dynamic GPS based machine control systems. Embedded in the Leica GPS1200 SmartTrack system technology, it assures fast capture of satellites and receives strong signals even under trees or near other "obstacles".

Calendar of Events

July 2005

July 5-8, 2005

Beijing, China P.R.

Modern Railways 2005

July 25-29, 2005

San Diego, USA

ESRI User Conference

October 2005

October 4-6, 2005

Düsseldorf, Germany

INTERGEO

October 4-6, 2005

Jonkoping, Sweden

Nordic Rail

October 5-7, 2005

Brussels, Belgium

European Rail Forum

October 12-16, 2005

Bologna, Italy

SAIE 2005

September 2005

September 7-9, 2005

Shanghai, China P.R.

Metro China 2005,

Intex Shanghai

September 7-11, 2005

Kortrijk, Belgium

MATEXPO 2005

September 12-15, 2005

Quingdao, China P.R.

FIG

September 13-15, 2005

Manchester, United Kingdom

Infrarail '05

September 13-16, 2005

Long Beach, CA, USA

ION GNSS

September 14-15, 2005

Sargans, Switzerland

IUT'05

September 25-28, 2005

Chicago, Illinois, USA

AREMA Conference &

Exposition

September 26-28, 2005

Dallas, Texas, USA

APTA Expo 2005

November 2005

November 7-9, 2005

Milan, Italy

eurailSpeed 2005

November 7-10, 2005

Paris, France

Batimat

November 22-24, 2005

London, United Kingdom

Civils 2005

November 23-25, 2005

Sydney, Australia

AusRAIL PLUS 2005

Nov 30 - Dec 2, 2005

Barcelona, Spain

3rd International Rail Forum

December 2005

December 7-9, 2005

Basel, Switzerland

Eisenbahn-Technologie ET05

December 12-15, 2005

Dubai, United Arab Emirates

MENA Rail

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Leica Geosystems hardware can capture everything from individual points at a survey site to mass data from airborne sensors and 3D laser scanners.

Leica Geosystems delivers a range of tools to work with spatial information such as photogrammetric analysis of imagery or engineering projects.

Leica Geosystems delivers advanced software solutions to present spatial information – often in 3D – such as city models, as-built models of structures, site surveys and preservation projects.

capture

reference

measure

analyze

present

Leica Geosystems offers hardware and software solutions that reference measurements against a wide range of data sources, including building plans, GIS databases, topographical maps and CAD/CAM systems.

Leica Geosystems specializes in software to extract visual features from aerial imagery and identify deviations from design.

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- when it has to be **right**

Leica
Geosystems