

An Interview with Ken Spratlin

Trimble's New GeoSpatial Division

Since 2007, Trimble has acquired four companies – INPHO, Geo-3D, Rollei Metric and TopoSys – which now form the company's GeoSpatial Division. Ken Spratlin – who is the general manager of this new division – is asked about the strategy that lay behind these recent acquisitions and the paths that he sees this newly formed division following in the future.

By Gordon Petrie



Fig. 1 – Ken Spratlin, the general manager of Trimble's GeoSpatial Division, on the left, and Eric McCuaig of 3D-Geo on the right – at the Intergeo trade fair held in Bremen.

Introduction

Ken Spratlin received his education at two of the U.S.'s most prestigious technological universities – Georgia Institute of Technology (“Georgia Tech”) and Massachusetts Institute of Technology (“MIT”), obtaining his Master's degree at the latter in 1987. He was employed first as an engineer and then as a section chief at Draper Laboratory, which originally was part of MIT and is famous for its research and developments in navigation, guidance and advanced control systems, including integrated GPS/INS systems. After which, he joined Trimble, where he has held a number of senior managerial positions. These include serving as general manager of the company's Military & Advanced Systems Division – where he patented several new developments in GPS technology. He then served as Chief Operating Officer of Nikon-Trimble, a joint venture of the two companies within the field of surveying instrumentation. Following which, he became Trimble's director for new market development, during which time Trimble acquired the four companies (INPHO, Geo-3D, RolleiMetric and TopoSys) that form the basis of its new GeoSpatial Division. Now Ken Spratlin has been appointed as the general manager of the GeoSpatial Division, charged with the responsibilities of ensuring that it becomes a leader in the area of geospatial imaging and a commercial success.

GP – Please could you outline the thinking that lay behind Trimble's acquisition of the four companies and the formation of the GeoSpatial Division? How does the new GeoSpatial Division fit into Trimble's overall (global) business strategy?

KS - Trimble focuses on four major market segments: Engineering and Construction; Precision Agriculture; Mobile Resource Management (fleet management and mobile workers); and Advanced Devices (GNSS chipsets, boards, and technology licensing). We see a significant opportunity to apply geospatial imaging to the first three of these markets, where the use of imagery is largely under-penetrated at the present time. The two most significant hurdles to its adoption today are: (1) cost of the systems or data, and (2) the age of the information, since typically it can take months from initiating data collection to the delivery of the information. Trimble intends to address both of these hurdles with purpose-built systems for these markets.

Trimble expects the convergence of the land survey, mapping and GIS, and aerial mapping segments to accelerate, and is one of the drivers of this trend. Imaging, largely a tool for the aerial mapping segment in the past, is increasingly a part of land survey and GIS solutions today. With this in mind, Trimble's Connected Site solutions foster this convergence now and offer a vision for the future.

The Connected Site creates seamless working relationships among Trimble products, technologies, services and their end users. It enables, for example, surveyors to choose from a broad range of options, including surveying techniques, communications channels and facilitating services such as GNSS infrastructure, within a single fully-integrated and interoperable solution. Surveyors benefit from data compatibility and transfer with field and office software; increased flexibility in using the best tools and techniques for the job; the adaptation of specialized technologies to fit the ideal survey workflow; and localized solutions to address specific market needs globally.

For example, the Trimble VX Spatial Station combines optical, scanning and metric camera capabilities to measure objects in 3D and produce 2D and 3D data sets for spatial imaging and traditional surveying projects. With recent

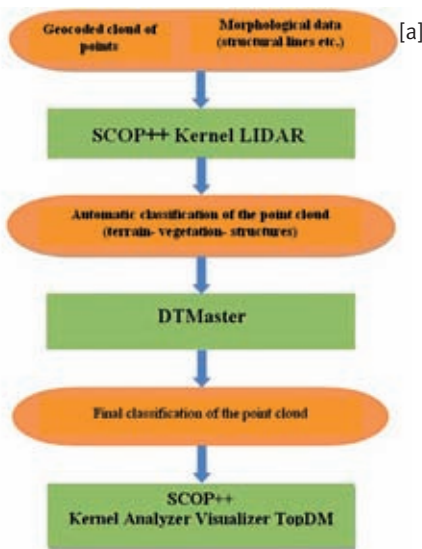
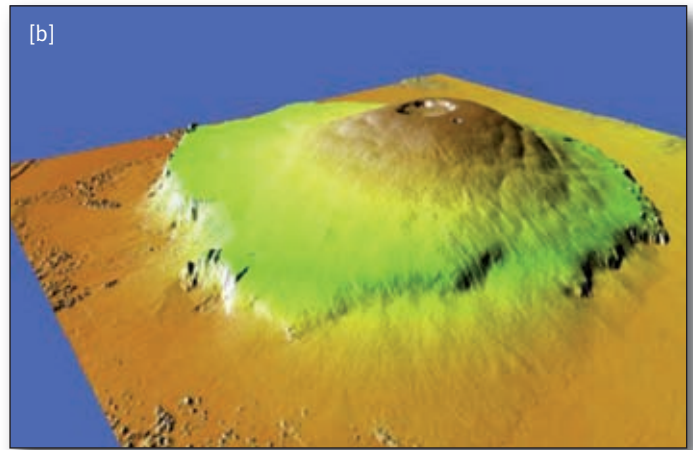


Fig. 2 – (a) Flow diagram showing the steps in processing airborne lidar data using the SCOP++ and DTMaster software packages that have been developed by INPHO in partnership with the Institute of Photogrammetry at the Technical University of Vienna. (b) A perspective image of the Olympus Mons volcano on Mars based on Mars Orbiter Laser Altimeter (MOLA) elevation data acquired by the NASA Mars Global Surveyor mission and HRSC image data from the ESA Mars Express mission using the SCOP++ package. (Source: Institute of Photogrammetry, Technical University of Vienna)



advances in the geospatial information industry, more opportunities for spatial imaging data are being identified for transportation and civil engineering, utilities and communications, natural resources management and government. Many applications use airborne information, but can also benefit from ground-based positioning and imaging.

Trimble has participated in the aerial mapping segment since the mid-1980s, providing GPS receivers to georeference aerial imagery. In 2003, Trimble acquired Applanix, extending our georeferencing capability with GPS/INS systems, and later the Applanix Digital Sensor System (DSS). The acquisition of these four new companies represents a significant expansion of Trimble's commitment to the mobile mapping segment, and a natural progression of our strategy, given our intent to continue driving the convergence of the three segments that I mentioned previously.

GP – Please explain to readers how the new GeoSpatial Division is being organised and structured internally.

(i) Where is the head office of the Division located and who do you report to as the general manager of the GeoSpatial Division?

(ii) Who are the persons that are responsible for the day-to-day running of the four formerly independent companies that now make up the Division?

KS - Trimble's organizational philosophy is centered on the concept of the "division." The functions relating to business strategy, market planning, product development, sales, and financial management are all functions typically embedded within the division. This philosophy is applied as well to the recently formed GeoSpatial Division.

Internally, the divisions are then organized into six "sectors," with the seventh sector being the company's corporate strategy and business development function. These sectors are managed by vice presidents, and report to the CEO. Multiple divisions and sectors address the four major markets. Mark Harrington, Sector Vice President, manages the sector comprised of the following divisions: Agriculture; Mapping and GIS; GeoSpatial; Mobile Computing; Applanix; Infrastructure; Advanced Public Safety / Visual Statement; Power, Process and Plant; and Trimble Outdoors. I am located in the Trimble Rockies office located in Westminster, Colorado, near Denver, and report directly to Mark.

The internal organization of the GeoSpatial Division actually changed in mid-May to integrate and leverage our full capabilities. When we acquired INPHO and then Geo-3D, we left these entities largely to operate as-is while we focused on completing the other acquisitions. With the completion of the RolleMetric and TopoSys acquisitions in the fall of 2008, we began to

plan for the GeoSpatial Division to function as an integrated entity. As of mid-May, GeoSpatial is now organized internally by function – marketing, engineering, operations, sales, and customer support. The transformation is not yet complete, but the direction is clear.

GP – INPHO was the first of the companies (acquired in February 2007) that now make up the GeoSpatial Division. It is already well known for its digital photogrammetric and terrain modelling software products and is the only one of the four acquisitions that does not develop and sell hardware systems and solutions.

(i) How do INPHO's software products fit into Trimble's spatial imaging initiative and in which direction(s) can we expect them to develop in the future?

(ii) Will INPHO continue to offer the Summit Evolution DPW which it sources from DAT/EM in Alaska?

KS - INPHO has earned an excellent reputation internationally for developing highly accurate and precise aerial photogrammetry solutions, working closely with users to continually improve their solutions and provide training and technical support. Early in their company history, they also developed solutions for close range (terrestrial) photogrammetry. So INPHO was the obvious foundation for the GeoSpatial Division. We plan to continue to develop the aerial photogrammetry and LIDAR software products (Fig. 2), and will also leverage their capabilities into other applications for geospatial imaging in our markets.

INPHO and DAT/EM have enjoyed an excellent, long-term and complementary relationship. Trimble and DAT/EM have continued that relationship, and actually converted what was formerly a "handshake" into a formal relationship. So, yes, we will continue to offer the Summit Evolution DPW (Fig. 3).

GP – In January 2008, Geo-3D was acquired by Trimble. The company is known as the developer and supplier of its series of Trident-3D (road) and Atlas-3D (rail) mobile mapping systems and of its complementary Cyclop-3D aerial mapping system. However, in the past, Geo-3D has also acted as a service provider supplying geospatial data to clients via mapping contracts.

(i) Will it continue to operate in this latter role when it is in danger of competing with its own customers who have bought one or more of its systems?

(ii) Can we expect Geo-3D to expand its product offerings in the mobile mapping sector for road asset inventories and 3D urban mapping – since these appear to be application areas with an obvious future growth potential?

KS – At the time of its acquisition, Geo-3D was predominantly supplying products and solutions to its customers. The service portion of the busi-



Fig. 3 –The Summit Evolution Digital Photogrammetric Workstation (DPW) that is used for feature data collection employing 3D stereo-viewing techniques.

ness was and remains a very small portion of the business, operated in the province of Quebec, Canada. This service business has functioned as a “test track” for the development of the products and solutions business. Trimble predominately provides products, solutions, and services-for-service-companies to its customers. We are committed to this role, and will operate the GeoSpatial Division similarly.

Of the four acquired companies, Geo-3D has progressed the furthest toward addressing a specific vertical market – that being the transportation segment – with converged roadway asset management and pavement management solutions (Fig. 4). Our focus is to see these converged systems achieve high market penetration, and continue to automate the detection and recognition of more types of assets.

GP – Trimble acquired RolleiMetric from Rollei GmbH in September 2008. This appears to have resulted in a quite different situation to that of the other acquisitions – in that Rollei continues to operate as a separate brand in the consumer camera market and remains quite independent from Trimble.

(i) Is this the reason for the change of title of the RolleiMetric operation to be the “Metric Imaging Department of Trimble Holdings GmbH” that now appears on its Web site?

(ii) Does this mean that the RolleiMetric name will now disappear?

KS – Yes, that is correct for both questions. Trimble acquired the metric imaging business (technology and product lines) of Rollei and employed all the metric imaging staff. The metric imaging business operated under the name RolleiMetric. The Rollei business for professional medium format and consumer cameras continues under the Rollei brand. Trimble acquired the right to use the RolleiMetric brand name for a transition period, but immediately began re-branding the RolleiMetric products under the Trimble brand (Fig. 5). We will refer to the RolleiMetric brand name in some of our communications during the transition period to highlight the strong technical history of what is now the Metric Imaging Department within the GeoSpatial Division.

GP – The current RolleiMetric line of AIC modular digital mapping cameras – which is available in single, dual, triple and quadruple configurations – would appear to be one of the strongest assets of the new GeoSpatial Division with considerable potential for commercial sales. Can we expect to see further development of this particular product line – for example, resulting in a really large-format digital aerial frame camera?

KS – We will proceed in the opposite direction; toward the development of smaller cameras that are purpose built for high-precision work on engineering scale projects – with rapid turnaround of information to allow rapid decision making (Fig. 6). The large-format camera market exhibits smaller

growth, inhibited by the very high cost of these cameras. And there are already three competitors chasing this slower growth, high-cost camera segment. As you observe, the RolleiMetric product line, and the staff that developed it, are a very strong asset to Trimble – one that we pursued to increase our depth in metric imaging to apply towards our strategy.

GP – With regard to TopoSys, which was also acquired in September 2008, it seems that a similar situation has arisen to that of RolleiMetric in that the TopoSys company’s main product is now being offered by Trimble as the “Trimble Harrier Corridor Mapping System”.

(i) Does this mean that the TopoSys name will also disappear?
(ii) Will the TopoSys Falcon line of airborne laser systems – which were of great technical interest, but were not a commercial success – now be dropped from the Division’s product line?

KS – Trimble’s brand is recognized worldwide, especially in the markets that the GeoSpatial Division will focus on, so we will operate under the Trimble brand. Your observation regarding the Falcon II product is correct, with the underlying LIDAR technology being well over 10 years old, and the product itself being about 10 years old. The Falcon II product has been discontinued since several of its subsystems were no longer in production due to their use of now obsolete components. But the technology, expertise, and know-how developed with the Falcon II are now part of our DNA. Going forward, we will focus on the Harrier systems (Fig. 7), which are seeing increasing adoption in the market.

GP – To most outside observers, it does seem quite remarkable that the Applanix company, (which Trimble acquired in 2003), does not form part of the new GeoSpatial Division. On the one hand, the Applanix GPS/INS products have often formed integral parts of the airborne and terrestrial mapping systems offered by Geo-3D, Rollei Metric and TopoSys. On the other hand, Applanix also offers products that compete directly with those being offered by these three companies that form part of the GeoSpatial Division. Examples of this competition are (a) the Applanix DSS cameras that compete directly with the RolleiMetric AIC airborne digital cameras; (b) the Applanix LandMark vehicle-based mobile mapping system that competes with the similar Geo-3D Trident-3D system; and (c) the Applanix airborne systems that couple the DSS camera and the POS AV GPS/IMU unit with a Riegl laser scanner (e.g. as supplied to Limitless LLC) and compete with the Trimble/TopoSys Harrier system with similar components. Please could you explain this situation of Applanix not forming part of the GeoSpatial Division and outline how these actual and potential overlaps and competitions between products are being resolved and managed within Trimble.



Fig. 4 – The Trimble Road Asset Inventory System is based on the Geo-3D Trident mobile mapping system.

Fig. 5 – The Trimble Aerial Camera, formerly sold as the RolleiMetric AIC (Aerial Industrial Camera).



Fig. 6 – A Nikon D3 small-format digital frame camera that has been calibrated for photogrammetric applications by Trimble's Metric Imaging Department. The camera can be connected via a suitable adapter to an appropriate GPS receiver to allow it to acquire geo-coded images.

KS – Referring back to my earlier description of Trimble's organizational philosophy, Applanix operates as one of our divisions within Trimble with a defined focus on integrated GNSS/INS systems for mobile mapping, as well as solutions for the rapid response market. We work together closely, on a daily basis, to supply the underlying technology for both divisions for use in our respective areas of focus, as well as to ensure that we make the right solutions available to meet each customer's needs.

With regard to perceived or actual overlap in products, I would offer several observations. First remember that the motivation for these acquisitions was to increase the depth of our technical and market capability for what is a quite challenging and long-term commitment to solve complex problems in geospatial imaging. So in that respect – the people aspect – there is no overlap.

Second, with regard to the Trimble Aerial Camera (RolleiMetric AIC) and the Applanix DSS, the overlap is largely perception – but a perception that does indeed exist in the marketplace. We investigated this exhaustively during the RolleiMetric acquisition. What we found was initially surprising but not unexpected upon further reflection. The Aerial Camera is a camera, while the DSS is a camera system (comprised of camera, GNSS/INS,

Fig. 7 – (a) The Trimble Harrier Corridor Mapping System – which comprises a full waveform airborne laser scanning system; an Applanix POS-AV position and orientation system; and an optional imaging system.

(b) A pseudo-coloured image of an open-cast mine located near Havelsee, in Brandenburg, Germany, produced from data acquired by a Trimble Harrier Corridor Mapping System.



flight management system, etc.). While we found that potential customers contacted both Applanix and RolleiMetric when first considering the purchase of an aerial digital camera, these customers rapidly self-selected into two groups – (1) those that wanted a camera to perhaps integrate into an existing LIDAR system or to replace a film camera in an aircraft that was already equipped with a flight management system, and (2) those that needed a turn-key imaging or imaging/LIDAR system. So we found that, in reality, perhaps only 10 percent of the time, were Applanix and RolleiMetric still competing when the customer was ready to make a purchase decision. With both products now within Trimble, we can meet the needs of both types of customers.

Today, we have a compelling airborne product portfolio from cameras (Trimble Aerial Camera) to camera systems (Applanix DSS) to integrated imaging/LIDAR systems (Trimble Harrier). In the future, we plan to expand this portfolio with more configurations to provide customers with greater choices and purpose-built systems to focus on their specific applications.

GP – You mentioned earlier in the interview the convergence of the land survey, mapping and GIS, and aerial mapping segments. What is Trimble's perspective on these industries over the next five to ten years?

KS – Trimble's focus is to provide robust and ubiquitous information solutions that meet the needs of our defined market segments. As I mentioned before, over the next 5-10 years, we see traditional industry boundaries blurring between land survey, mapping and GIS, and aerial mapping. The field and the office are overlapping as data processing and engineering expertise move closer to projects. Surveyors are adding data management abilities to their skills portfolio. Engineering and spatial data are being tracked with project timeline and accounting data. Survey instruments are combining GNSS, optical and imaging capabilities. And construction machinery is utilizing GNSS and lasers to enable 3D machine control that puts design surfaces, grades and alignments in the cab, allowing automatic, accurate real-time positioning for earth-moving operations. Put simply, everything is converging...connecting. Trimble's Connected Site solutions foster this convergence now and offer a vision for the future, to ultimately improve productivity and transform the way in which work is done.

Gordon Petrie is Emeritus Professor of Topographic Science in the Dept. of Geographical & Earth Sciences of the University of Glasgow, Scotland, U.K. E-mail - Gordon.Petrie@ges.gla.ac.uk

