

“BAE Systems is committed to rapid expansion of the GXP activity!”

Interview with:

Dan London, Vice-President of Sales & Marketing, BAE Systems Geospatial eXploitation Products Group (GXP)

By Gordon Petrie

To the mainly European readership of Geoinformatics, BAE Systems is known principally as a major defence contractor to the U.K. government and as a partner in various European projects such as Airbus, Tornado and Eurofighter. However the activities of BAE Systems North America - which itself is a major company that employs 25,000 people and which appears to operate with a considerable degree of autonomy from the parent company - are much less well known in Europe. Nevertheless the company has come into prominence recently with its decision to sell its SOCET SET and VITec software products directly into the non-military photogrammetric market instead of through a partnership as before. Besides which, BAE Systems North America already possesses the technology and capacity to compete in other sectors of the geoinformatics industry, especially in the airborne imaging sector. Gordon Petrie (GP) took the opportunity to interview Mr. Dan London (DL), who is the Vice-President of Sales & Marketing of BAE Systems Geospatial eXploitation Products (GXP) group in San Diego, to give readers more information on the status of its present software products and to discuss the possibility of BAE Systems developing additional products for use within the geoinformatics area.



Mr. Dan London

GP: Could you outline briefly the main activities of the BAE Systems North America company and those of its Mission Solutions division of which your GXP group forms a part?

DL: BAE Systems North America is one of seven operations in BAE Systems, accounting for around a quarter of its 92,500 employees and £13 billion annual revenue in 2003. BAE Systems North America is a defence contractor, characterized by steady growth and financial stability. The company is strongly motivated to increase its operations in the commercial world. It is well placed to do this, with a wealth of both internally and externally funded research and development programs generating a wide spectrum of technologies, many of which are capable of transfer to the commercial arena. The operation is divided into four sectors, one of

which is Information Systems. Mission Solutions is one of three business areas in that sector. In turn, Mission Solutions is divided into Intelligence Systems, Defense Systems, Geospatial eXploitation Products (GXP), and Homeland Security and Geospatial Data Production.

GP: Could you provide readers with a brief account of the heritage of your GXP group from its beginnings as Helava Associates right through to the present day?

DL: The famous photogrammetrist and "father" of the analytical plotter, Uki Helava, together with some colleagues who worked with him at the Bendix Corporation, formed Helava Associates in 1979. The new company first produced analytical plotters. However, in 1980, it received a contract from General Dynamics (GD) to carry out the photogrammetric work associated with GD's contract to supply workstations to the U.S. Defense Mapping Agency for use with satellite reconnaissance image data. In 1986, GD acquired Helava Associates and moved the company to San Diego in 1991. In 1990, GD decided to sell the SOCET SET digital photogrammetric software produced by Helava Associates into the commercial world and, in 1991, it opened discussions with Leica to distribute the software on a world-wide basis. The agreement to do so was concluded during the ISPRS Congress held in Washington, D.C. in 1992. Later, during the 1990s, GD divested its Electronics Division (of which Helava Associates formed a part) as GDE Systems. GDE and Leica then decided that the distribution of the Helava products could best be handled through a joint venture. This was set up in 1997 as LH Systems. During the mid- to late-1990s, GDE Systems was acquired successively by the Carlyle Group, the Tracor Corporation and Marconi

Integrated Systems. Finally, in 1999, it became part of BAE Systems as part of the global merger of British Aerospace (as it then was) and Marconi. The other main part of the GXP group's heritage is VITec. Originally this was a hardware company located near Dallas, Texas that made graphics cards for image processing, especially for intelligence applications. Later the VITec products became software-based rather than being hardware-based. The company was bought by Tracor in 1997 and came into the hands of BAE Systems via the merger with Marconi.

GP: While BAE Systems and its predecessor companies have always supplied the SOCET SET digital photogrammetric product to the defence market, most readers know about this particular product through the activities of the LH Systems joint venture company - which supplied SOCET SET to the commercial and education markets. In 2001, BAE Systems sold its 50% interest in LH Systems to its partner, Leica. Two years later, it then terminated its distribution agreement with Leica Geosystems in respect of SOCET SET. What lay behind the break-up of what appeared to be a very successful partnership?

DL: In 2001, Leica Geosystems purchased BAE Systems' 50% share of LH Systems and, at almost the same time, acquired ERDAS, the Atlanta-based software house that was the market leader in remote sensing software. While to some extent BAE Systems perceived the newly reorganized Leica Geosystems as a competitor, the important point was that by 2001 BAE Systems had the resources and the will to begin its own distribution of the product. The motivation here was not only to be able to retain a larger percentage of revenues but also to become closer to customers and understand their requirements better. Therefore BAE Systems terminated the agreement for the resale of SOCET SET. All Leica Geosystems' entitlements in this respect ended in June 2004, following a required two-year notice period. Whether there would also have been conflicts in positioning SOCET SET, had Leica Geosystems continued to distribute it, with respect to IMAGINE OrthoBASE® and OrthoBASE PRO®, is a further issue. To focus on the needs of the SOCET SET customer base as well as to adopt a more competitive posture in the commercial world, BAE Systems named the line of business as Geospatial eXploitation Products (GXP), consisting of SOCET SET and VITec. GXP has

been strongly supported by BAE Systems North America and is in the process not only of increasing engineering resources to facilitate major new software developments but also of developing a comprehensive global network of distributors for commercial sales.

GP: Obviously the commercial and educational users of SOCET SET have had the option either to continue to use the product as customers of BAE Systems or to remain with Leica Geosystems (which now offers its own Leica Photogrammetry Suite) or even to shift to some other supplier of digital photogrammetric software. How has this turned out? Have many SOCET SET customers been lost to BAE Systems with the termination of the agreement with Leica Geosystems?

DL: At first sight, one might surmise that the turn of events was unfortunate for customers, who were suffering unsolicited change from which they might not necessarily benefit. We can think of examples, from both our own and other industries, where customers of supplier A and B become disgruntled and prefer to go to supplier C rather than endure the agony of choosing between A and B. However, there is no doubt that customers will benefit in the long run. BAE Systems must ensure continuity of supply of SOCET SET, so it must recognize Leica Geosystems' achievements in sales and support and guarantee that its own activities in these areas are even better. It is also true that some customers, especially those using airborne sensors, may prefer to stay with Leica Geosystems regardless of the comparative merits of the software products, because Leica Geosystems' wide range of

measurement tools suits their business. Furthermore, since SOCET SET and LPS will compete vigorously for these customers, who also have the possibility to go to a number of other very competent suppliers, BAE Systems has committed considerable software resources to product development. We also have an educational task to proselytize the BAE Systems name as a commercial photogrammetric supplier and clarify to prospective customers that we have not taken over SOCET SET from Leica Geosystems - we have made the product all along!

GP: During the period of the LH Systems joint venture, SOCET SET mainly utilized Leica software packages for related operations such as aerial triangulation (using ORIMA) and stereo-compilation (using PRO600). Now, looking at your Web site, you have formed partnerships with GIP (which offers the BINGO triangulation suite) and with Cardinal Systems (which offers its VrOne stereo-compilation software) - presumably with a view to replacing or offering alternatives to the Leica products. How will these alternative products be implemented - via simple data transfer or through some closer integration with SOCET SET?

DL: Yes, it was clear that in order to compete in the commercial marketplace SOCET SET would have to be enhanced with top quality offerings for bundle adjustment and feature collection designed with the commercial market in mind. BINGO and VrOne are leaders in these areas. The implementation is by integration rather than simple data transfer and, indeed, work is currently proceeding to make



Figure 1. SOCET SET running on a PC equipped with a single screen.

the products more tightly integrated still.

GP: Could you outline your present relationship with PCI Geomatics. In this context, one recalls that, in the mid-1990s, PCI helped to implement the Windows version of SOCET SET. In return, PCI obtained a licence that enabled it to utilize parts of the SOCET SET software in certain of its products such as APEX. What is the current situation? Is there still some use of SOCET SET technology in PCI's current Geomatica and OrthoEngine products? One hears too that PCI has been appointed as a distributor and re-seller of SOCET SET now that Leica Geosystems no longer acts in this role. If so, is this arrangement restricted to Canada or can PCI sell the software in other markets where it has a considerable presence?

DL: The agreements with PCI that led to the Windows NT version of SOCET SET – and were beneficial to both companies - have been amicably terminated. No elements of SOCET SET remain within the PCI offerings. PCI has indeed been appointed as reseller of the GXP products in Canada and we are looking at extending this arrangement to some countries in Latin America.

GP: With regard to the geometric models available with SOCET SET - particularly those relating to space imagery - quite a number of these are offered and are listed on your Web site.

(a) Does the GXP group intend to implement additional models to allow SOCET SET to handle imagery acquired from the EROS-A, OrbView-3 and ROCSAT-2 satellites - which are not currently listed as being available either in your literature or on your Web site.

(b) Looking to the future, will SOCET SET be able to handle the imagery from the numerous European high-resolution satellites such as TerraSAR (Germany), COSMO-SkyMed (Italy) and TopSat (U.K.) that are due to be launched over the next year or two and whose imagery will be available to both civilian and defence users?

DL: One of SOCET SET's strengths has always been its rigorous modeling of a large range of sensors, enabling the user to combine imagery from several sensors within the one project. These sensors include not only satellite, both commercial and defense ones, but also airborne. Thus considerable attention is being extended to airborne sensors

as we strive to handle imagery from the new generation of digital sensors, such as the Intergraph DMC, Leica ADS40, Vexcel UltraCamD, Wehrli 3-DAS-1, Applanix DSS, Rollei AIC, Starlabo StarImager®, etc. We plan further to extend our capabilities towards airborne infrared and hyperspectral sensors such as the ITRES range. Clearly, we cannot achieve all these goals at once, so we have to be guided by market demand, which marks out the Intergraph, Leica Geosystems and Vexcel offerings as being top priority. I have tried to answer your specific questions below.

(a) EROS-A is already supported. We are beginning work on OrbView-3. So far we have not been asked for ROCSAT-2, but upcoming User Conference events provide us with opportunities to discuss future requirements in depth with our customers.

(b) Once again, we have not yet received specific requests, but in view of the wide range of our customers' requirements and our commitment that the range of sensor models will continue to be a primary feature of SOCET SET, it is highly likely that we will implement some or all of the sensors you list. Indeed, we are already in discussion about the proposed Sovinform Sputnik DK sensor.

SOCET SET also has the ability to accommodate "plug-in" sensor models, so that users can develop models for the sensors that are most important to them, even if they are not

delivered with the software.

GP: Turning next to your group's VITec products such as Electronic Light Table (ELT), since these are perhaps not too familiar to the European remote sensing and GIS communities, please could you explain briefly their heritage and their capabilities. Please could you also address the following specific points

- Does ELT have the classification capabilities of traditional remote sensing software packages?
- What about the feature extraction capabilities provided by its Feature Analyst module?

DL: VITec began in the mid 1980s when the founders identified a market need for a "digital darkroom", within which it would be possible to edit photographs, so they developed hardware for digital image processing. Strangely, the idea did not take off at that time and the focus moved to the defence market. The hardware was successively refined and increased in performance, but was discontinued in the early 1990s when it became possible to use off-the-shelf graphics cards for the image processing tasks. The VITec company turned its attention to software and its success was reflected in the acquisition by Tracor in 1997. Today VITec PC and VITec ELT are the leading products used by image analysts in the defence world. Their strength is very much in image analysis

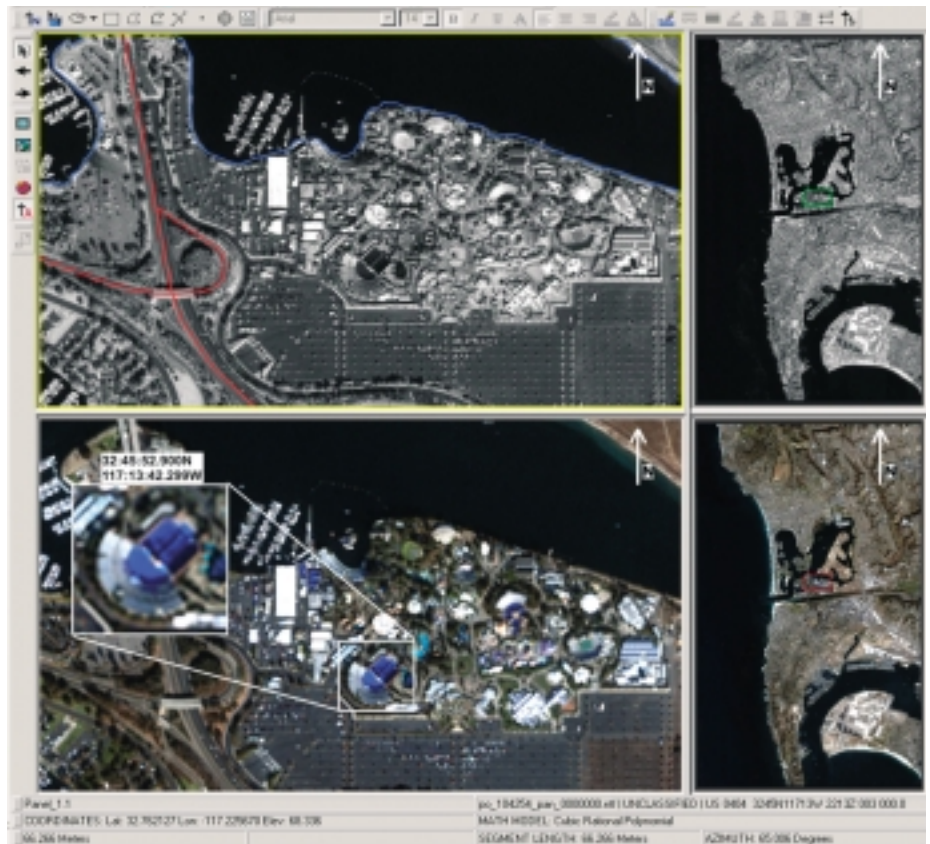


Figure 2. The user interface of the new SOCET GXP product, showing another part of the port of San Diego.

rather than photogrammetry, though this will change as our new SOCET GXP product grows to encompass the functionality not only of both these VITec products but also SOCET SET.

- The VITec products provide a modest set of remote sensing capabilities through the integration of an external product for analyzing hyperspectral imagery. However our newest product offering, SOCET GXP, will contain an extensive set of remote sensing capabilities, including traditional classification and atmospheric correction capabilities. This is an area of functionality that we have been able to expand rapidly owing to the acquisition of companies such as APTI and STI.
- Because feature extraction is traditionally a photogrammetric task, it was not offered as part of the VITec products. However, SOCET GXP will offer the full spectrum of image analysis and photogrammetric capabilities within a single user interface. Therefore VITec customers will soon have easy access to this functionality, if desired. We are working with VLS to include a variant of its Feature Analyst product in order to enhance the power of SOCET SET and SOCET GXP.

GP: One notes the existence of BAE Systems' ADR operation that appears to be a mainstream supplier of photogrammetric and related mapping services to the defence and commercial mapping sectors. What part does ADR play in BAE Systems' overall activities? Does it assist with the development of SOCET SET and ELT, e.g. by acting as a test site for new developments and applications?

DL: ADR was purchased by Tracor in 1996 in order to secure a commercial mapping operation capable of participating in the NIMA Outsourcing project that was about to let a number of very large contracts (now known as NGA GGI!). ADR is now part of BAE Systems' Homeland Security and Geospatial Data Production line of business, which is parallel to GXP in terms of reporting structure, i.e. it is another part of Mission Solutions. ADR is a heavy user of SOCET SET, less so of VITec, but certainly provides an effective test-bed for product developments. The Geospatial Data Production unit has a production capability of its own, located on the same campus as GXP, whereas ADR is in Pennsylvania. Thus there are two production test-beds in addition to all the other BAE Systems projects



Figure 3. BAE Systems' GXP sales and marketing team photographed at the 2004 ESRI International User Conference held in San Diego. Left to right - John Allan, Sales Director, Europe, Middle East & Africa (located in Cambridge, England); Rob Coorey, Sales Director, Asia Pacific (Canberra); Jay Eward, Sales Director Americas (Reston, Virginia); Dan London, Vice President Sales & Marketing (San Diego); Stewart Walker, Director of Marketing (San Diego).

that use SOCET SET.

GP: Now that your GXP group has entered the commercial photogrammetric and mapping marketplace as a direct supplier of software products and systems, one presumes that BAE Systems will want you to grow the business. In this respect, it seems obvious that the company already possesses much of the appropriate technology arising from its existing operations as a defence contractor. Examples include the following:

- **The large-format airborne digital frame camera that is already being supplied to U.S. military customers. A metric version of this camera has been discussed at recent ASPRS conferences.**
- **BAE Systems also manufactures a wide range of gyros, inertial sensors and inertial measurement units (IMUs) that are fitted to numerous types of airborne platform.**
- **The company also manufactures different types of detector and it constructs and supplies airborne infra-red cameras.**

Is it likely that BAE Systems will integrate all of this existing technology with a view to becoming a major player in the commercial airborne imaging systems field?

DL: I can guarantee that BAE Systems is committed to rapid expansion of the GXP activity! Our first priorities, however, have been less dramatic than the directions you suggest. I have already mentioned the strenuous efforts we have made to keep our cus-

tomers satisfied during the split from Leica Geosystems, to build up a sales network, and to proceed with rapid software development. The most dramatic outcome was glimpsed at the recent ISPRS Congress in Istanbul – SOCET GXP, which incorporates a dramatically new architecture, user interface and software development kit. At present SOCET GXP embodies functionality somewhat in excess of the VITec PC product, which it replaces, and additional functionality is being added to take it beyond VITec ELT by the end of the year. Most importantly, SOCET GXP will be the new home for SOCET SET, which will transfer to the new environment late in 2005. Your question, however, requires an answer to a strategic dilemma. How should GXP expand other than by incremental increases in the success of its existing product line? Your question suggests that the answer lies in airborne sensors, yet this is an increasingly competitive marketplace that tends to provide lower profit margins than software. Competing with Intergraph and Leica Geosystems, with their decades of experience of installing and supporting robust systems in aircraft, would not be an easy endeavor. Nevertheless, if we did choose such a maneuver, we do have within BAE Systems some of the elements of a product line. You refer to three such opportunities:

- A BAE Systems line of business in Greenlawn, New York has developed a successful 85-megapixel airborne digital sensor. This originated as a digital back, with integrated, patented forward motion compensation for oblique imagery, formulated as an

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upgrade for KS-87 5-inch film cameras.

- Another part of BAE Systems North America, headquartered in Johnson City, New York, produces a range of gyros, IMUs and related systems. Though developed for specific defense projects, many of these may well have commercial applications.
- Various units in BAE Systems have created hardware and software for multispectral and hyperspectral sensing.

These are not the only technologies available to us. BAE Systems has considerable software not yet embedded in SOCET SET, VITec or SOCET GXP, for example for feature extraction. Stewart Walker and I are making contact with all the various parts of the company with whom we could work to develop new offerings for the commercial marketplace. Remember, however, that most of these products have been developed in direct response to government requirements within the context of particular projects: Commercialization is not always economical! But we are certainly adventurous enough to seize any opportunity that we discover. The other approach to expanding our business is acquisitions, so we are in discussion with several companies to explore joint opportu-

nities. We have no scanner, for example, nor does our software extend as deeply into commercial remote sensing as that of some of our competitors... These are intriguing times!

GP: One notes too that, in May of this year, BAE Systems North America acquired STI Government Services, which has constructed various well-known multi-spectral camera systems (e.g. Space Imaging's DAIS system) and also has considerable experience with hyperspectral imaging and sensor image fusion. Will this add to the prospect of BAE Systems developing a further interest in the (non-military) airborne imaging and remote sensing field? Will this acquisition also impact on the software products being offered by the GXP group?

DL: Yes, indeed. This Hawaii-based company is now part of BAE Systems North America. The products you mention are in addition to those noted in answer (iii) to your question above and its software developments complement some that exist

elsewhere in BAE Systems. Thus STI is part of our analysis of BAE Systems developments that could be economically commercialized to contribute to the rapid growth of the GXP operation. I have indicated my reticence to assume that such commercialization is feasible until we find out a bit more – in such a large company few managers except those at the very top maintain a comprehensive overview of what is going on – but there is no doubt that throughout BAE Systems teams of talented engineers have created systems that are operational and are meeting strenuous requirements on a daily basis. It would be disappointing indeed if we could not leverage this effort into exciting new products for the commercial market. I think your readers can look forward to some most interesting announcements from us in the foreseeable future. There are complementarities between STI's technologies and those that are already being added to SOCET GXP from the another BAE Systems line of business, as noted in answer 10(iii) above.. Together these technologies will help make SOCET GXP a formidable competitor in the remote sensing field. ■

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