EARLY INNOVATION AND RAPID GROWTH

Triton Elics International

The oceans are one of the last frontiers to be discovered. Covering three-quarters of the world, there have been discovered unique ecosystems, found mineral deposits and created charts for safer navigation. Yet there is still the unknown out there. Using technology advancements of the past fifty years - multi-beam and multifrequency sonar, GPS and the use of more powerful computers, data collection is more advanced then ever. Triton Elics provides the ocean community with software technology for imaging and mapping the seafloor.

Triton Technology was founded in 1983 to supply integrated sonar and navigation systems with at-sea testing and training. By 1985, with extensive experience in real-world, complex search/survey operations, Triton recognised that the interpretation of seafloor imagery was in dire need of automation. Conventional paper output from recorders did not permit the detailed analysis of targets. Mosaics were made by hand and were so expensive that they never achieved any degree of popularity. Enter the PC. Within a year, the company released the first PC-based sonar data collection, processing, display and reporting system, Q-MIPS. While modest by today's standards, this DOS machine with extraordinary array processing power and display capabilities was an instant success.
Introduced initially as a peripheral, this new computer-based side-scan acquisition system soon became an essential component in most search and survey systems, functioning as the central workstation controlling and interfacing myriad sensors and input/output devices. Early adopters of these systems included the Navies of New Zealand, Australia, Brazil, US, Finland, Germany, Denmark, Netherlands, Estonia, Japan, and Canada, as well as a host of commercial exploration companies.
Fifteen years later, Triton has built up an installed base of over eight hundred systems worldwide. The customer list spans the marine exploration industry in all sectors: military, commercial, and institutional. Triton products such as ISIS, the successor to Q-MIPS, are household names among marine exploration professionals. Technologies invented by Triton, such as the XTF (eXtended Triton Format) file structure for storing raw image and ancillary data, are now standards.

Triton Today
Today, Triton's main business continues to be conducted from its offices in Watsonville, California. Management, sales and marketing, technical support, accounting, system configuration and integration, testing, shipping and receiving are all conducted from this location. Staff members number thirteen in California, with an anticipated increase in 2004 to seventeen. Engineering offices are in Portland, Oregon. Engineering staff is continuing to grow from the current ten. The primary activities in Portland are new product development and continuing engineering on existing products. Also resident in Portland is our manager of Federal Programs and our marine geophysical and hydrographic experts. There is a worldwide network of agents and representatives that are actively selling Triton products and services.

Philosophy and Strategy
Triton offers a complete solution for acquiring and analysing all forms of geophysical data, from side-scan sonar to multi-beam bathymetry, from seismic/sub-bottom profiler to magnetometer. The existing suite of software and PC workstations supports survey operations from line planning and survey control to data acquisition and processed image analysis/interpretation. A few simple themes run through all Triton activities:

- Maintaining an open system approach - Triton acquisition and analysis systems deliver high quality and performance across a broad range of sensors that allow the customer to select the hardware that suits the requirements of their job and budget. Engineers are continually developing interfaces to new sonar as new devices are introduced, most recent examples being the C3D Sonar Imaging System from Benthos and the Klein 5400 side-scan interferometric bathy option. Here, data fusion capabilities have been of fundamental importance, as both of these devices represent the new generation of multi-modal sonar delivering both side-scan and bathymetric information
- Setting the standard in data fusion Ã Triton imaging technology combines data from different sensors, making the whole worth more than the sum of its parts. Data fusion development has as its aim the creation of an integrated family of acquisition, processing, display and analysis systems. In this unified environment, data from a single area gathered with multiple sensors can, when viewed together, offer a more complete picture and yield otherwise hidden insights
- Ensuring data quality - One of the hardest things to do is collect good data, faster than before and more cheaply. Advancements in sonar technology are enabling us to collect data at higher speeds, make quicker turns and work in rougher conditions. The goal is to maximise the use of the search/survey platform whilst maintaining a high degree of quality control. As with all data collected, nothing is perfect. Often, poor or incomplete data shows up only during processing. Triton has developed software to aid in reducing the time needed for the overall survey. The real-time processing modules for multi-beam and side-scan sonar give the operator a display of processed, geo-corrected data in real-time, showing coverage and data quality while actually surveying. Displaying data holidays, adjusting line spacing and maximising swath coverage are now available options for the surveyor on-line
- Transforming data into solutions - Triton has concentrated upon automated processing of large datasets in minimal time. The old rule-of-thumb in which three to four times the acquisition time is required for processing multi-beam data simply does not apply anymore. Automated processing routines based upon user-defined limits, smart algorithms and artificial intelligence require minimal interaction and one-tenth the time

- Delivering complete systems - As demand increases for multi-sensor survey platforms, integration becomes critical to the successful implementation of complex search and survey systems. To facilitate this, Triton offers workstations that integrate all sensor inputs to form a central acquisition system. Members of the technical staff assist with the selection and procurement of equipment, design custom installations, and develop on-site training programmes. This is followed by installation, integration and testing of all sensor, computer and related hardware, software, and cabling to produce a complete, error-free system

Future Directions

The year ahead holds several new and exciting developments. The first concerns 3D visualisation. Building on its capabilities to acquire and fuse diverse geophysical data types, the company is developing new tools that support viewing of complex datasets as interrelated volumes and vector overlays rather than as individual components. Operators will be able to analyse the fused data products in a 3D perspective environment, in real-time or off-line.

The second area of development is in shallow seismic processing, where Triton has a thirteen-year history of developing and supporting products for the acquisition and interpretation of sub-bottom profiles and shallow seismic records. Based on the valuable lessons learned from these pioneering products, the company is currently developing a third-generation seismic product, due for introduction in 2004, that promises to bring the next level of automation, intelligence, fusion, visualisation, and trouble-free operation to the collection and analysis of seismic data.

In survey/mission management Triton is creating a comprehensive set of new tools that will greatly simplify the creation of survey plans; automatically monitor data acquisition in real-time and adjust survey parameters accordingly. It will also automate large post-mission data analysis and report production jobs with sophisticated workflow management technologies.

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