

# STRIVING FOR INNOVATION IN SONAR DEVELOPMENT

## Imagenex Technology Corp

Imagenex Technology Corp, headquartered in Port Coquitlam, just outside Vancouver, specialises in advanced acoustic underwater sensors in combination with graphic visualisation tools. The Canadian firm endeavours to apply a unique approach to everything it does, from corporate structure to products.

Company president Willy Wilhelmsen's business card offers a revealing insight into the philosophy of Imagenex Technology Corp, based in British Columbia, Canada, and a producer of high-resolution sonar equipment. The president purposely omits his title from his business card. He feels the company should not look as if it belongs to him; it belongs to the employees. From managing director Gordon Kristensen to an assembler, on a day-to-day basis it's the whole group that makes the company work.

### Outside the Box

This kind of unconventional approach has guided Imagenex since it was founded in 1988. From the start, innovation has been both goal and methodology, fed by a design team that consists of pioneers in the development of high-resolution imaging and profiling sonar. The first product in 1990 set the stage: an imaging sonar-head for the commercial underwater industry that was the size of a coffee mug and rated for 300-metre depth.

The company sees itself as being technically-driven rather than driven by the market, according to Wilhelmsen, whose personal interest in electronics and scuba diving led him to the underwater-acoustics industry more than four decades ago.

Over the years, Imagenex followed up its initial product offering with a series of underwater sensors, frequently breaking new ground for depth capability, size, imaging quality and functionality. The company has gradually grown to about 25 employees, including electronics assemblers and technicians, electrical and mechanical engineers, and marketing and administration staff. The introduction of marketing manager Mitch Henselwood in 1996 is credited with significantly increasing the company's international profile and market-share.

As product line and staff have grown Imagenex has slowly acquired more space in the industrial building it has called home since 1991. The company ensures quality control by centralising almost all of its product development and production functions at the Port Coquitlam site. One important exception is testing: after on-site bench and tank tests, all products are field-tested at company's floating test-facility in nearby Vancouver Harbour. Some equipment is also tested and demonstrated on the company's 26-foot survey boat. Sea tests and market comparisons for all Imagenex products are considered a crucial factor in the company's ability to achieve its performance objectives.

The company's president continues to take a hands-on role in the development of new products, leaving much of the day-to-day administration to Kristensen and vice-president Jeff Patterson. This flattening of corporate structure is echoed in the open-plan design of the office development area, allowing for free exchange of ideas. This kind of synergy, the key to the company's creative approach, is difficult to achieve in larger companies with traditional structures.

### Underwater Advances

Led by the twin goals of superior imaging quality and cost-effectiveness, Imagenex has continued to advance sonar technology with new products that push forward the barriers of function and cost. For example, 1995 became a significant year in the company's history when it introduced the first digital, colour-imaging sonar that could be operated from a customer's computer without the need of a dedicated processor. It has since become an industry standard for scientific operations.

The late 1990s brought another major milestone for Imagenex, when it was appointed as an OEM supplier of fishing-related sonar to Japan's Furuno Electric Company. The company also brought its creative approach to these net-mounted systems, which feature sensors for temperature, depth, pitch/roll and amount of catch, and communicate the information via an acoustic telemetry link. In 2000 the

company also introduced a side-scan sonar with revolutionary price/performance ratio that has since evolved to offer greater depth rating, Ethernet communications and optional data output in XTF format.

One of the most significant achievements, however, is the development of high-quality, cost-effective multi-beam sonar with imaging or profiling configurations and optional depth ratings to 6,000 metres. Although the sonar-head is often used in a hull-mounted configuration, it is small enough to fit on most underwater vehicles for obstacle avoidance, navigation and mapping applications. According to the company, industry feedback has classed the performance of this product comparable to that of much more expensive products. Like many other innovations, the idea for the new multi-beam sonar percolated for years until technological advances made possible its realisation. The combination of size, price, quality and function are one of the few truly revolutionary changes the company has seen hit the sonar industry in decades.

#### Sonar in Action

Original thinking has resulted in growing penetration of Imagenex products into the scientific market, including universities and research institutions such as the Woods Hole Oceanographic Institution, the world's largest independent non-profit oceanographic research institution. Reduced cost combined with high-quality imaging and functionality has put sonar, particularly multi-beam varieties, within reach of many facilities for the first time. The company's sonar are also increasingly used worldwide in commercial applications and their cost-effectiveness has opened the door for recreational users. Whenever there is a need to find shipwrecks, downed aircraft, pipelines, cables, anchors or lost cargo, search tools like side-scan and sector-scan imaging sonar are indispensable. Other applications include inspection, underwater engineering and construction, offshore oil & gas exploration support, underwater archaeology and environmental surveys. Southeast Asia and the North Sea are among the company's current targets for market growth.

Imagenex does not as a rule develop custom products, but from time to time takes up such a challenge if the economics are sound. For example, the company recently developed a 'mud sonar' that has wide application possibilities for buildings or bridges with underwater foundations. The sonar operates in drill mud (a heavier-than-water substance placed in the holes for underwater foundation footings) and is used to help confirm hole stability, diameter and other factors.

The company also steers away from the post-processing of data gathered from its sonar, although it encourages compatibility with existing software. For example, Imagenex equipment is now compatible with hydrographic surveying software by Caris, Hypack, OIC and others. These marriages with industry-standard software provide greater flexibility for Imagenex product users, while allowing the company to focus on its core objectives.

#### Looking Ahead

Simply put, the company's future plans are to continue to build better sonar whilst increasing affordability. The new multi-beam technology is expected to play a growing role in achieving this vision. Hybrids using multi-beam and conventional sonar are currently under development. As Imagenex products continue to find new applications at international level, the company will keep moving forward with advances that anticipate the changing needs of the marketplace. Ingenuity will continue to be the guide for a company that doesn't include the word 'problem' in its corporate vocabulary, instead choosing to view obstacles as 'challenges to be overcome'.