OPTECH INCORPORATED

Lidar-based Survey Solutions

Optech Incorporated focuses on the development, manufacture and support of advanced, lidar-based survey solutions. Established in 1974 as a privately held, Canadian-owned research and development firm, Optech was originally an offshoot of research into light detection and ranging ('laser radar') conducted by its founder, Dr Allan Carswell, at York University in Toronto.

In the 1980s Optech airborne lidar systems produced the world's first nautical charts based on airborne lidar data. In the early 1990s, ground-based Differential Absorption Lidar (DIAL) systems were installed at several Arctic sites to monitor stratospheric ozone. At the same time, the company developed the compact, versatile laser rangefinder at the heart of current process control and airborne terrestrial mapping instruments. Rapid growth in the mid-1990s spurred a move to a larger facility and, in 2001, expansion into adjacent buildings. Also in 2001, we created our first US-based subsidiary, Optech International, Inc., located in Kiln, Mississippi, at the Stennis Space Center. Our facilities include offices, laboratories, test-ranges and other special integration and test areas, as well as aircraft-to-flight-test airborne systems.

The Lidar Business
Over the last ten years Optech has become increasing involved in airborne lidar solutions for digital terrain mapping and water depth measurement, with two pre-eminent commercial pro-ducts:

- ALTM: Airborne Laser Terrain Mapper
- SHOALS: Scanning Hydrographic Operational Airborne Lidar Survey.

These systems use time-of-flight ranging to produce dense, rapid and highly accurate measurements of terrain elevation/ topography or water depth/ sub-surface features. We also manufacture a ground-based, tripod-mounted laser imaging system, ILRIS-3D (Intelligent Laser Ranging & Imaging System). While the data from all three systems stands on its own, lidar data from ALTM and SHOALS can be combined with ILRIS-3D data to create even denser 3D datasets and elevation models. We also design and manufacture industrial and mining equipment such as level monitors and the CMS (Cavity Monitoring System) used in mines around the world. Current development efforts include work with the Canadian Space Agency, the European Space Agency (France) and NASA (USA) in two key areas:

- 3D range-imaging for autonomous space docking and landing
- space-based lidar for the measurement of atmospheric constituents such as ozone and water vapour.

The company benefits from experience as an Original Equipment Manufacturer (OEM) by cultivating strategic alliances with leading firms whose well-established global distribution networks support the worldwide delivery of its products. Optech systems are installed on mobile platforms ranging from cranes to fixed-wing aircraft and helicopters, and operate in environments ranging from tropical to arctic.

Company Style
Optech employs more than 225 people across its offices in Canada and the United States. The family is a mix of scientists, engineers and technical and marketing specialists, management and administrative staff, all working in concert to provide their best products and service to customers. We have five major divisions: Terrestrial Survey, Marine Survey, Laser Imaging, Industrial Products and Space, and Atmospheric. Each division represents a speciality but all five share a common mission: to design and manufacture precision measurement instruments that utilise pulsed lidar. In addition, our Technology Division continues to research and develop core company expertise in lasers, engineering, physics and software.

Global Scale
Optech has clients around the globe and systems operating on six continents. Its systems range in value from US$ 5,000 for a basic laser rangefinder, to US$ 5,000,000+ for a combination hydrographic/topographic lidar mapper with digital camera and multispectral imaging capabilities. More than 95% of our sales are international, only a few systems being sold within Canada, and the company continues to focus on introducing lidar to new markets and areas. The companyâ€™s revenue surpassed CN$ 40 million in 2004. The broad product range leads to a diverse client base, ranging from government organisations to universities, from small mining companies to large multinational corporations. The company actively seeks new challenges leading to new products, and new markets leading to new opportunities.
We also partner with leading technology companies, such as Z/I Imaging and MDA to bring complementary technologies and solutions to market with our own. In addition to an own dedicated sales force, the company partners with distributors around the world who use local expertise to help sell products in their respective marketplaces. Finally, in order to foster new opportunities we actively embrace the delivery of custom-designed systems to meet the demands of emerging markets. Over the past decade we have averaged approximately 15% annual growth and have doubled our staff size over the past three years.

Market Developments

Each of Optechâ€™s five divisions responds to sales challenges in different ways but our focus on a single technology stream â€“ time-of-flight lidar solutions â€“ is what drives all our development. The falling US dollar has led us to re-examine many of our processes. In order to hold prices in US dollars we have re-focused our manufacturing and development processes into stronger, more efficient models. This has led to a further growth in sales volume, particularly outside the United States. There are enormous regional differences in the ways our divisions market products. The ALTM has already had significant sales in both the United States and Japan, but there is a disparity between sales in these markets and the rest of the world. We have recently sold the first airborne lidar system to China and we continue to focus on system sales in the region, as many areas of China remain poorly mapped.

We also expect strong interest in SHOALS from China and Southeast Asia, where the many island archipelagos face a significant coastal-mapping need. We are currently leveraging ILRIS-3D onto niche markets such as open-pit mining, landslide imagery and dam monitoring. These are difficult applications for which 3D imaging is ideally suited, and we embrace the challenge. In many instances the company offers solutions custom-suited to the requirements that these appli-cations demand. The companyâ€™s Industrial Products division has already seen strong sales of its latest product offering, the Sentry SR, in China, Europe and South America, and continues to focus on selling it globally. The CMS has long been the 3D-survey system of choice for underground mines around the world, and recent advancements â€“ including wireless control â€“ have continued to bolster sales.

Finally, we focus not only on planet Earth but also on space. We are working with the worldâ€™s leading space agencies to develop lidar solutions for space, including 3D topographic maps of the moon and, eventually, Mars, as well as for space-borne rendezvous and docking, and planetary landing.

The Future

From its very inception, Optech has always kept a clear focus on the future, not only that of the company but also of lidar technology itself. We place a strong emphasis on R & D and continually use our years of experience and expertise to bring new and better lidar solutions to market. The companyâ€™s focus on R & D keeps it ahead of the competition, from both a technology leadership and a sales perspective. Our key goals in all future developments are to introduce more features and improve performance of existing products, to investigate new applications and develop new products and to seek new markets and applications for which lidar solutions are ideally suited.

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