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Company background. Optech Incorporated has been operating since 1974 in the field of applied laser and electro-optical technology. The Toronto-area company specializes in laser radar systems and has designed and built a variety of such systems for industrial, government and university users.

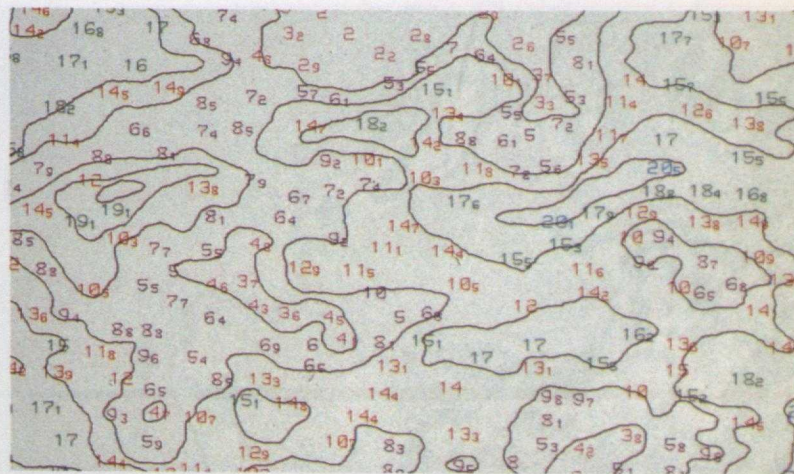
Optech offers a number of standard manufactured units and also will develop customized systems to meet particular requirements. Employing its extensive capability in modern laser technology, the company has built systems using solid state, injection and gas discharge lasers, including excimers. Having extensive experience with computers and microprocessors, Optech can provide fully computerized systems when required. In addition, company personnel have many years of experience in the development of ruggedized laser systems for field use in vehicles and aircraft.

Laser radar systems have been delivered to customers in several countries and are now being used for a variety of tasks including atmospheric diagnostics, pollution monitoring, hydrographic surveys in coastal waters and water depth sounding, terrain profiling, wave height measurement and range finding.

Products and services. The company offers these products and services:

- laser radar systems manufacturing
- custom electro-optical systems
- consulting and design services
- R&D and engineering services

Laser radar systems. Laser radar, often termed lidar, is a recently developed application of laser technology in which the scatter of light pulses is used to measure properties of a remote target. Lidar (light detection and ranging) operates on the same principle as radar but uses laser



An enlargement from the world's first commercially produced hydrography chart using airborne laser technology. Laser by Optech; operation by Terra.

light waves in place of radio waves. In lidar, a laser source emits a very short, high-intensity light pulse and a telescope sighting along this beam picks up any of this light that bounces back from objects in its path. Various electronic devices measure and record the backscattered light signal.

With the wavelength of the laser light radiation being hundreds of times shorter than the wavelength of radio waves used in conventional radar, lidar is able to detect particles hundreds of times smaller than those detectable with radar. Consequently, for atmospheric measurements, lidar is capable not only of detecting the microscopic pollutant particles but also of measuring the presence of various molecular species in the air. For distance measurement, the ultra-short pulse length and very narrow beam dimension permit spatial resolution much better than is possible with other methods.

Lidar techniques also can be used to probe under water. Light returned to the telescope can be

used to accurately measure water depth and to indicate the turbidity or clarity of water to help determine water quality. As these systems can be operated from aircraft as well as ships, lidar offers a unique capability for high speed and large area coverage of water resources.

Projects and activities. Optech is active in many varied projects that include the following:

- development of airborne laser instrumentation for altimetry, terrain profiling and water depth measurement;
- assessment of atmospheric monitoring from satellites;
- evaluation studies of laser absorption systems for detection of atmospheric pollutants;
- design and construction of a two-channel ultraviolet lidar system for Raman and differential absorption measurements of maritime atmospheres;
- analysis of atmospheric perturbations on infrared ranging and imaging systems.

Optech's LARSEN, a newly developed Canadian laser-based, powerful, fast and cost-effective tool for hydrographic surveying of shallow coastal and inland waters.

