

Laser work includes the design and development of CO₂ continuous wave lasers (1-20 watt range, > 10,000 hours lifetime, sealed off) and CO₂ waveguide lasers with wide bandwidth and good tunability (sealed off, 10,000 hours lifetime). They have a capability with iodine lasers in conjunction with mode locking experiments, and have conducted laser spectroscopic studies. They have also been involved with heterodyne detection techniques in conjunction with optical fiber hydrophones that can measure 1/500 of a fringe (phase shift: 360/500°). A program is in place for the development of far infrared lasers, a FIR heterodyne receiver breadboard, and the construction of advanced FIR detector packages including reflector mounts. They are involved in a program on the application of lasers to satellite communications (MILSATCOM) and have developed a laser communications test bed and propagation measurement facility for a Canadian Government laboratory. Current work involves development of a 1 GHz bandwidth communications system based on solid state lasers, and waveguide lasers with ceramic envelopes. A spin-off from this work has been a land based laser communications system.

In the area of electromagnetics and radar technology, MPB has carried out research with synthetic pulse radar for airborne measurement of sea-ice thickness at VHF and UHF, and in the area of radar/chaff interaction from 8 to 80 GHz, target RCS enhancement and reduction at 6 to 18 GHz. They have been involved with communications analysis (cross polarization effects, earth and satellite communications), and mine detection using electromagnetic techniques and antenna research (wide-band VHF antennas). The company recently delivered an airborne C-band scatterometer for measurements of ice surface roughness and a 6 channel millimeter wave radiometer (from 20 to 60 GHz) for remote sensing of the atmosphere. Further developments include a 60/90 GHz airborne radiometer, a 35 GHz doppler fragmentation measuring radar, and a 90 GHz coherent radar. The company is involved in projects related to target augmentation and to deployment of chaff including the NATO MACE Trials. In the digital electronics area, MPB has expertise in electronic graphics, displays, training systems, and graphic composition. They have also been involved with special purpose communication terminals (transcontinental telex operator communications) and special purpose data recorders (based on microprocessor technology).

In the area of instrumentation, MPB is involved with a Space Shuttle experiment (wave injection facility), where their main responsibility is the software for the control electronics and the system test equipment. Their contribution to the Tokanak de Varenne experiment include the plasma pre-ionization, diagnostic instrumentation – probes, lasers, microwave interferometry, and software development (controls and on-line data analysis), and the complete control and data acquisition system.

MPB products include the VISTA 80 Graphics System, a versatile character generating system which utilizes a standard keyboard for message composition, and a magnetic diskette system for bulk storage of messages. The system is based on microprocessor technology. Primary use is for presenting alphanumeric information in news, weather, sports & election programs, and for tiling & credits. The company recently introduced their VISTA 90 electronic graphics and composition system for applications to business and science. The system permits the composition of picture quality graphics by various input devices and hard copy through a choice of 35mm slides, printer, or video tape. Their laser communications system is capable of video, multiple voicechannel, or high bit rate digital transmission. The system has a video signal to voice ratio greater than 60 db and is immune to RF interference. They have made major sales to the US of their sealed-off CO₂ lasers that are long lived (greater than 38,000 hours) and have power ranges from 3 to 12 watts TEMs and 1 to 18 watts multimode. Suggested uses are optical communications, atmospheric research, spectroscopy, far infrared laser excitation, materials processing, surgery, etc. MPB has recently introduced a number of new laser products which include a 100 watt cw CO₂ laser, a low voltage mirror translator with control electronics and a low-cost closed-looped cooler for use with the family of CO₂ lasers. Their final product is a High Intensity Light Source. It is a long (450mm) self-starting vortex stabilized arc discharge. It has a continuous radiation spectrum, can be started instantaneously and can deliver a hundred times more light output than a high power mercury arc lamp light-head of comparable dimensions.

AVERAGE WORK FORCE: PhDs – 30
Engineers – 55
Others – 45

GROSS SALES: 1986 – \$ 5.4M
1987 – \$10.0M

PLANT SIZE: 30,000 Sq Ft (Dorval)
18,000 Sq Ft (Pointe Claire)
5,000 Sq Ft (Ottawa)

EQUIPMENT: Equipment includes hydrogen oven for high temperature ceramic band seals; Tempest secure computer room; millimeter wave instrumentation to ASIC design center based in Mentu Graphics CAE systems; prototype center from 140 GHz; circuit board and MIC fabrication; reliability test laboratory for IC's and electronic devices; laser materials processing and test facilities; scientific glass center; extensive electromagnetics measurement facilities for antenna test (20 MHz to 18 GHz) to include EMC test cell, anechoic chamber, and high power microwave sources.

EXPERIENCE: MPB's typical clients include the Canadian Government (Dept of National Defense, Communications Research Center, National Research Council), AFOSR, CBC, SPAR Aerospace Ltd, Telesat Corp, Teleglobe Canada, plus others. Recent US customers have included the Department of Energy (Nevada Div), Hughes Aircraft, RCA Astroelectronics, AT&T, USAF (Hanscom Field), USA (Ft Belvoir) and National Oceans & Atmospheric Administration. More than 50% of MPB's business originates from outside of Canada.

KEYWORDS: Antennas; CO₂ Lasers; Communications Analysis; Displays; Electromagnetics; Fiber Optics Communications; Graphics; Instrumentation; Laser Communications; Lasers; Laser Instruments; Microwave Instruments; Optical Instruments; Radar; Satellite Communications; Sealed-Off Lasers; Synthetic Pulsed Radar; Training.

REVISED: February 88

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HISTORY: Originally known as Erie Technological Products, the company merged with the US Murata/Manufacturing Co Inc to form the present Murata Erie North America Ltd, with headquarters in Smyrna, GA. The Trenton & Mississauga, Ontario, Canada, operations are committed to the manufacture of EMI low-pass filters and high-voltage power supplies, respectively. Both operations have the exclusive mandate to manufacture and export these products for world markets.

CAPABILITY: The Trenton operation is totally involved in the design, manufacture and testing of EMI filter products. Many of its products are manufactured to QPL specifications which include MIL-F-15733 and MIL-C-39014. Its main strength is the employment of its product and ceramic engineering capabilities to meet unique customer specifications, mostly on US and NATO military programs. EMI filters are custom design to fit in military circular connectors such as MIL-C-38999 and MIL-C-26482 connectors. Recently, the company introduced a new line of commercial filtered connectors with envelope dimensions the same as the military version. Murata Erie has complete process control of each manufacturing operation – mixing the slurry, drawing the tape, punching and stacking, firing, and the final termination. The Quality Control department audits in process manufacturing, as well as final assembly testing while the Quality Assurance department performs all environmental testing done within the facility.