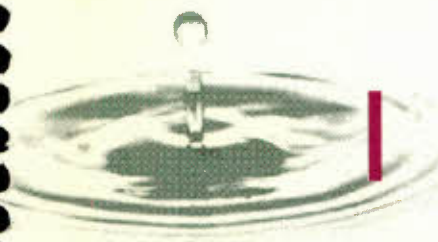# INNOVATION

Ottawa-Carleton Region
Silicon Valley North

Telecommunications and Computing Industry, Leading Companies, and Related R&D Organizations

Highlights of Corporate Capabilities

Preliminary Profiles

April, 1997

Prepared for:
The Regional Innovation Office for the National Capital Region
National Research Council of Canada

In Co-operation with:
The Ottawa-Carleton Economic Development Corporation

Prepared by:
CMG Canadian Marketing Group

For more information/additional copies, contact

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Introduction

This preliminary document *'Highlights of Corporate Capabilities in the Telecommunications and Computing Industry, Leading Companies and Related R&D Organizations in the Ottawa-Carleton Region'* has been prepared for the Regional Innovation Forum Roundtable II through a joint effort between the National Research Council of Canada (NRC), the Ottawa-Carleton Economic Development Corporation (OCEDCO), and CMG Canadian Marketing Group.

This document provides more than 60 corporate profiles of telecommunications and computing companies and related research organizations in the Ottawa-Carleton Region. Emphasis is placed on identifying the key companies, and R&D organizations. Altogether some 120 companies and research organizations were invited to provide a one page summary profile on their activities. It is the intention of the authors to update this document with a view to providing highlights of a number of leading companies in the industry.

We hope that this publication will assist organizations in developing business and R&D linkages, and thus capitalize on the synergies for the continued prosperity of our Region, *'Silicon Valley North'*.
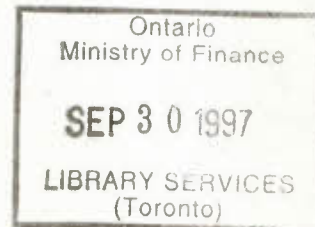
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Research Organization Profiles

Algonquin College

About Algonquin College

Algonquin College has been a major training and education force in the local community for over thirty years. Committed to being the 'trainer of choice', its dedication to the high technology sector is displayed on numerous fronts.

The College provides a steady flow of highly-skilled labour to this burgeoning sector. New graduates, skills upgrading and customized corporate training, are just a few examples of Algonquin's continued commitment to the long-term competitive advantage and economic stability of this valuable sector.

Algonquin is constantly pursuing and obtaining business and industry partnerships to foster mutual growth and innovation. Current formal partners include Silicon Graphics, SHL Systemhouse and Digital Equipment of Canada.

The College is a global provider of training and education. Algonquin's products cover a broad range of disciplines. The College helps organizations achieve productivity and

performance gains by providing timely, hands-on, customized training that responds to current business and industry challenges.

Algonquin College has invested millions to provide state-of-the-art facilities and technology to its industry clients and students. These facilities, coupled with the experience of the faculty and staff, produce a learning environment second-to-none.

As technology changes, so will Algonquin. As a training and education leader, the College's vision is to be at the forefront of the technological revolution, providing leading-edge training and education.

Facilities and Activities

The College boasts several Centres of Excellence including *The Media Centre* and *The Telecommunications Centre*.

The Media Centre has made Algonquin College a leader in new media and non-linear information technology. Advanced industry-standard training in interactive multimedia, digital animation, digital

audio-video editing, and electronic publishing, takes place in a new state-of-the-art 50,000 square-foot facility. Positioned to serve the growing high technology industry, the Centre boasts an impressive list of partners including Silicon Graphics Alias/Wavefront, and Sony Canada.

The Telecommunications Centre offers customized training and educational services in: local and wide area networking; software engineering; systems programming; microcomputer support; electronic design and troubleshooting; voice and data communications; telecommunications cabling; microelectronics manufacturing; surface mount technology; and control systems. The Centre serves the needs of the growing telecommunications industry by offering training needs analysis, curriculum design, prior learning assessment, flexible delivery options and training evaluation.

Contact

Marilyn Stratton Zimmer
Tel: (613) 727-4723 ext. 7770
Fax: (613) 727-7639
E-mail: strattm@algonquinc.on.ca
Website: www.algonquinc.on.ca

CANARIE Inc.

About CANARIE Inc.

CANARIE Inc. (Canadian Network for the Advancement of Research, Industry and Education), an industry-led and managed consortium, was created as an innovative way for the federal government and the private sector to collaborate in stimulating the development of the Information Highway in Canada.

CANARIE's mission is to facilitate the development of Canada's communications infrastructure and stimulate next generation products, applications and services. CANARIE's three core programs include: Technology and Application Development (TAD), Advanced Networks (National Test Network [NTN] and CA* net), and Outreach.

Technology and Application Development (TAD)

The goal of TAD is to stimulate commercial development of new technology and applications in three priority areas: health, education and multi-media applications. TAD is a shared cost funding program with a highly competitive selection process.

Advanced Networks (NTN and CA*net)

CANARIE's National Test Network (NTN) is one of the world's largest highspeed, broadband networks spanning 6,000 kilometers from St. John's, Newfoundland to Vancouver, British Columbia. This network links the Regional Research, Industry and Education Networks across Canada. The NTN is available to researchers and developers in areas such as business, education and health care to test and develop new high speed broadband applications.

CA*net is Canada's research and education Internet backbone. It links regional networks in all provinces and the North. CANARIE has helped facilitate several upgrades of the network. ·

Outreach

The goal of the Outreach program is to develop awareness and communicate the benefits of an information-based economy and society in Canada. There are many initiatives under this program including:

- Establishment of committees on health-care, education and content;
- Planning and sponsorship of seminars related to Telemedecine in Canada;

- Promotion of Canadian information technology and member companies at trade shows and conferences;
- Identifying partnership opportunities;
- Meeting with international delegations;
- Establishment of the Annual IWAY Awards in conjunction with CATA. These awards recognize the accomplishments of individuals who have demonstrated leadership in the development of Canada's emerging information society.

With over 140 fee-paying members, CANARIE is the industry-led consortium spearheading the development of the information society in Canada. Over its full seven year program, CANARIE could generate over $1 billion in economic benefits including over 20,000 person-years of employment.

Contact

CANARIE Inc.
Tel: (613) 660-3065
Fax: (613) 660-3806
E-mail: info@canarie.ca
Website: http:\\www.canarie.ca

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Carleton University

About Carleton University

A research-intensive institution referred to as "High-Tech U", Carleton's research enterprise is tightly interwoven with the area's telecommunications and computing companies.

As the sixth largest research university in Ontario and the 13th largest in Canada, Carleton enjoys outstanding links with research-intensive industries involved in wireless communication, parallel computing applications, electronics, and software development and training applications, to name a few.

Telecommunications and computer research

Carleton University has the sixth largest number of graduate programs in the province and 12th largest in Canada. A master's degree program in Telecommunications Technology Management as well as a Ph.D. in Computer Science are two new initiatives that indicate the importance that the University places on the study of high technology. Carleton is in partnership with five other universities as well as Nortel and IBM in the new Consortium for Graduate Education in Software Engineering (the Consortium was created in response to a shortage of qualified workers at senior levels in the software industry – a major job creator – particulary in the Ottawa-Carleton region).

Industry-sponsored Research Chairs

- Management of Technological Change
- Computer-aided Engineering
- High-Speed Integrated Circuitry
- High-Pressure Die-Casting
- Performance Engineering of Real-time Software
- Applied Parallel Computing

Centres of Excellence participation

- Telecommunications Research Institute of Ontario (TRIO)
- Manufacturing Research Corporation of Ontario (MRCO)
- Institute for Telecommunications Research (CITR)
- Microelectronic Devices, Circuits and Systems for Ultra Large Scale Integration (MICRONET)
- Institute for Robotics and Intelligent Systems (IRIS)
- Intelligent Sensing in Innovative Structures (ISIS).

Research activities

- Last year, Carleton became the recipient of the first Industrial Research Chair in a computer science department in Ontario, co-sponsored by Almerco Inc. of Gatineau, Québec and NSERC. The inaugural holder, Jorg-Rudiger Sack, carries out fundamental research and development in parallel computing, a high-growth area in information technology.
- Systems and Engineering Professor Samy Mahmoud likes the idea of a world without cables. He is working in close collaboration with Nortel, Mitel Corporation, and Newbridge to integrate all wireless communications systems and even wireless email) into one global wireless system.
- "Real-time" software is a specialty research area of Systems and Engineering Professor Murray Woodside. It is aimed at attacking the problems of software performance such as predicting transactions, capacity-per-second, and the delay of each transaction on average, which will be used to train students at Carleton in performance engineering for the local high-tech community.
- Carleton, Mitel Corporation, the University of Ottawa, and the National Research Council have joined forces to launch a pilot project to reskill graduate engineers and scientists for positions in the information technology and telecommunications sectors. Begun in January, 1997, the high technology sector is watching with keen interest and with an expectation that, once successful, it will expand quickly.

Contact

Dr. John ApSimon
Vice-President
External and Research
Tel: (613) 520-3806
Fax: (613) 520-4744
E-mail: john.apsimon@carleton.ca

Communications Research Centre
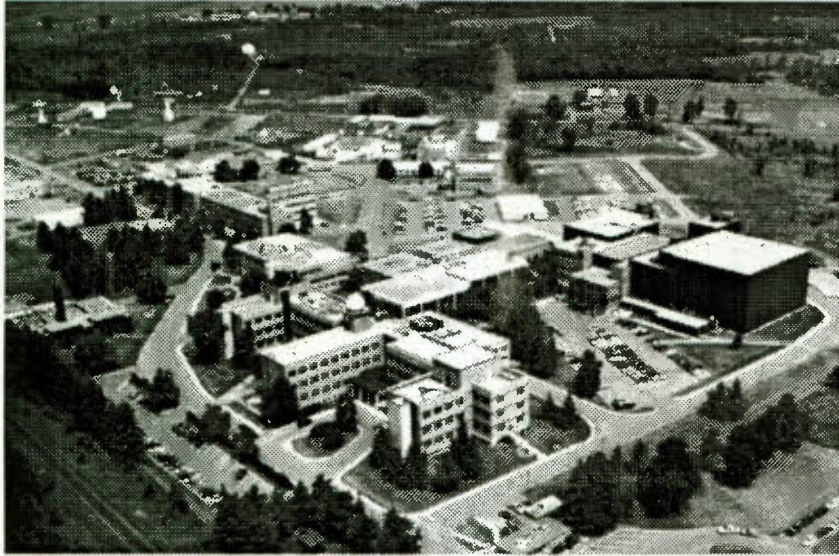
About the Communications Research Centre

The Communications Research Centre (CRC) is an institute of Industry Canada dedicated to basic and applied research in communications and related technologies.

Approximately 250 research scientists, engineers and technicians conduct research and development in satellite communications systems, broadcast technologies, network systems, radiocommunications, radio science and microelectronics and optical communications.

As an institute of Industry Canada, CRC works to assist the private sector in developing new technologies to improve Canada's communications infrastructure, while at the same time assisting Canadian companies to develop innovative products for world markets.

Over the past 40 years, the CRC has been instrumental in the establishment of more than 50 companies through the transfer of communications related technologies. Hundreds more firms have been assisted in product development by licensing CRC innovations.

Key Services and Facilities

To facilitate technology transfer, the CRC Innovation Centre opened in 1994 to assist small and medium-sized companies to access and develop its technologies.

Qualified high technology companies have access to office space, laboratories and research expertise, with a fee structure that is tailored to match individual company needs.

Facilities for contract research include:

*   Broadband Applications and Demonstration Laboratory;
*   Wireless Multimedia LAN Testbed;
*   Microelectronics Laboratory;
*   Optical Communications Facility;
*   Satellite Communications Testbed;
*   Audio Perception Laboratory; and
*   Advanced Television Evaluation Laboratory.

R&D Activities

CRC's core research competencies are founded in satellite communications, radiocommunications, radio science, opto and microelectronics and broadcast technologies.

These communications research disciplines are increasingly being directed to work on inter-related lines of business related to:

*   wireless communications research and development;
*   broadband networking infrastructure; and
*   applications demonstrations.

Contact

Eric Tsang
Chief,
Business Development
Communications Research Centre
Tel: (613) 998-2357
Fax: (613) 998-5355
E-mail: eric.tsang@crc.doc.ca
Website: www.crc.doc.ca

Defence Research Establishment Ottawa

About the Defence Research Establishment Ottawa

DREO is one of five laboratories of the Research and Development Branch of Canada's Department of National Defence. Located on the western outskirts of Ottawa, Ontario, DREO carries out R&D covering various technological thrusts related to the needs, present and future, of the Canadian Armed Forces.

R&D Activities

DREO's major thrusts are as follows:

- Maritime Integrated Above Water Warfare;
- Aircraft Combat Survivability;
- Land Force CCIS and EW;
- National Level Command and Surveillance;
- Information Warfare;
- Military Information Technology Infrastructure;
- Space Systems and Technologies for Defence Applications; and
- Detection & Identification of NBC Agents.

Over the years, DREO has developed many significant and outstanding facilities. In the field of electronic warfare, DREO has the Electronic Warfare Engagement Simulation Facility (EWESF) and the CANEWS 2 Testbed. In addition, there are the Transportable Intrapulse Collection and Analysis Facility and the Electronic Warfare Technology Demonstrator.

In the radar field, there are the High Frequency Surface Wave Radar (HFSWR) in Newfoundland, the Integrated Tactical Air Picture (ITAP) facility and the Experimental Array Radar System (EARS).

In the field of space communications, DREO has the SATCOM ground terminal facilities and the DREO-DFL Antenna Research Laboratory (DDARLing). The SIMLAB and the Signal Processing Demonstrator (SPD) are facilities taken over by DREO from the Spaced-Based Radar Project.

DREO has other installations like the mobile nuclear laboratory and the inertial navigation laboratory.

DREO's key capabilities extend to the following areas:

Radar
- Navigation
- Synthetic Aperture Radar
- Radar Counter-Countermeasures
- Target Classification
- Missile Approach Warning Systems
- Multifunction Radar
- Coastal Surveillance Radar
- Target Tracking

Electronic Warfare
- Radar & Communications Electronic Support Measures
- Electronic Countermeasures
- Electromagnetic Protection

Space Systems
- Space Environment and Electronics
- Space Systems and Simulators
- Space Data Exploitation

Communications
- Satellite Communications
- Advanced Communications Networks
- Wireless Communications
- Speech Coding
- Antennas

Contact

Director General
Tel: (613) 998-2303
Fax: (613) 993-6095
Website: http://www.dreo.dnd.ca

NRC · CNRC

Institute for Information Technology

About NRC IIT

The NRC Institute for Information Technology (IIT) is dedicated to research and development in software and systems technologies. IIT's mission is to assist industry through collaborative research and development projects. The Institute works with companies individually and in groups, with product developers and lead users, with firms both large and small.

R&D Activities
Interaction with Modeled Environments

This program's goal is to develop means of human-computer interaction that are well suited to natural human abilities and limitations. To this end, we pursue basic and applied research in computer-based interpretation of human language, navigation of users through computerized 3-D environments, and user manipulation of objects in those 3-D environments. All of the work contributes to an understanding of how visual/spatial thinking can effectively complement verbal/analytical thinking in the design of interactive systems.

Interactive Information

The Interactive Information program concentrates on understanding and developing new algorithms and software to facilitate computer-based information exchange and retrieval. The program emphasizes the practical application of this research in order to help Canadian companies develop new business products and services.

Integrated Reasoning

This program focuses on the research, development and deployment of applied artificial intelligence technologies to facilitate (and where appropriate, automate) decision-making in complex environments. Such environments require the reconciliation of large quantities of information in diverse forms with knowledge embodied in humans, documents, operating practices, and software. The research effort is split between developing specific reasoning techniques and designing system architectures that support integration of diverse information sources and use of multiple reasoning techniques.

Seamless Personal Information Networking

This program addresses the distributed computing and communication information needs of users, who often work in environments with globally distributed resources. Because many user resources are designed for homogeneous rather than more common heterogeneous environments, users need technologies for seamless computing, communication, and networking. This program aims to apply object-oriented and artificial intelligence technologies to facilitate user interaction in complex environments.

Software Engineering

Software Engineering develops software tools and techniques to assist and improve products and processes in companies whose principal product is software. This research includes practical aspects of developing and supporting software, from project initiation through first delivery, maintenance, and evolution.

Visual Information Technology

This program performs research and development in 3-D digital imaging and modeling, applied to visual communication and industrial automation. This includes the development of advanced algorithms and systems to acquire and process 3-D visual information. New sensors are developed to acquire the geometry of objects and scenes, including full colour acquisition. As well, new algorithms process 3-D digital images to provide complete representations allowing visualization, navigation in environments, geometric modelling for recognition and inspection of 3-D shapes, and real-time object tracking.

Contact

Al Hlady
Manager, Operations and Business Development
Tel: (613) 993-3320
Fax: (613) 952-0074
E-mail: ilo@iit.nrc.ca
Website: http://www.iit.nrc.ca

NRC's Institute for Microstructural Sciences

About NRC IMS

The role of the Institute for Microstructural Sciences is to help keep Canada at the leading edge of the technologies that enable the information revolution. Through the application of novel materials and components to solve the problems posed by the need for advanced hardware, IMS has demonstrated relevance and capabilities.

Committed to the ideals of research excellence, economic relevance and the pursuit of successful partnerships with industry, IMS has an impressive record of achievement. The programs of IMS, listed below, ensure a high level of partnership and interaction with industry in areas crucial to the economic well-being of Canada.

R&D Activities

Optical Communications

Through this program, IMS performs research into the novel use of optoelectronic devices in order to create the next generation of communication hardware using fibre optics.

Wireless Communications

IMS explores the potential exploitation of advanced materials for the next generation of wireless components.

Multimedia Components

The novel application of advanced materials and processes to be used in display and audio technology is pursured by IMS.

Technology Exploitation

This program applies techniques and processes developed at IMS to solve our partners' specific technical problems.

Exploratory

The IMS mandate to promote scientific excellence by providing a knowledge base and international linkages is realized with this program.

Client Services

Assisting economic development by collaborating with industry and government is a principal mission of IMS. The Institute also provides access to special facilities and expertise where equivalent services are not available from Canadian industry.

Client services exist in the following areas:

- Compositional and structural characterization of surfaces, interfaces and thin films, including depth profiling;
- Electrical and optical characterization of semiconductor structures and devices;
- Design and fabrication of optical thin films;
- Focused Ion Beam microlithography and micro-machining;
- Prototype electronic and optoelectronic device fabrication;
- Custom epitaxial growth of GaAs, InP and Si wafer by MBE, CBE and on SiGe by CVD;
- Computer simulation for design of optical multilayer systems, semiconductor waveguides and quantum well laser; and
- Acoustic testing.

Contact

Dr. Winston Tam
Industrial Advisor, IMS/NRC
Tel: (613) 990-7656
Fax: (613) 957-8734
E-mail: winston.tam@nrc.ca

OPCOM
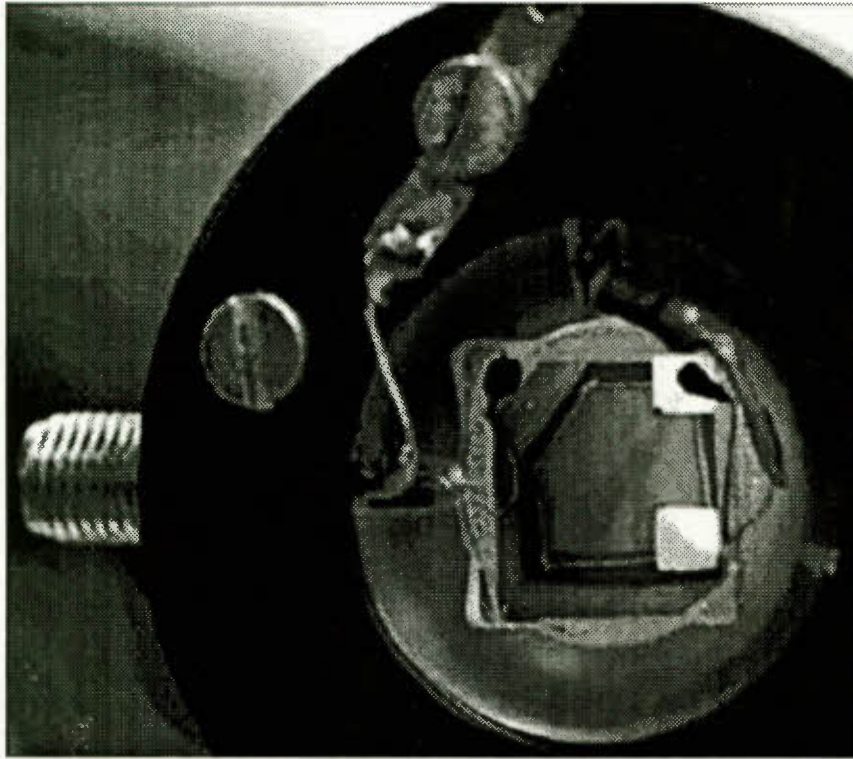
About OPCOM

The Optical Processing and Computing Consortium of Canada (OPCOM) is an alliance between Canadian industry and government research laboratories. Formally, it is a federally incorporated not-for-profit organization, with a budget of $20M over 5 years, that has developed from a joint initiative of the Ottawa Carleton Research Institute (OCRI) and the National Research Council, with funding support from Industry Canada's Strategic Technologies Program. The mission of OPCOM is to accelerate the development of competitive applications in optoelectronic systems.

R&D Activities

Photonics is already a key technology in long-haul communications and storage, and is now gaining a presence in local area networks and in computers at the peripheral device interconnection and backplane level. This thrust towards optical microLANs, connecting multiple processors and specialized devices, results from recent rapid development of new, low cost devices such as laser arrays (VCSELs), plastic fibers and new optical recording media.

OPCOM partners are working on applications of those new components. Switching devices being explored by OPCOM include semiconductor amplifier arrays, polymer switches and pseudo-optical analog arrays.

Optics also appears very attractive in copying/simulating biological information systems, based on parallel analog processing. OPCOM work in this area includes an artificial retina and optical correlators.

Last but not least is optical storage, a key element of processing real-time signals, and high-speed, low latency interfaces are being developed in OPCOM.

Membership

Members of OPCOM range from small to large and come from across Canada. Included are Andrew Engineering (Burnaby, B.C.), Dynatek Automation Systems (Bedford, N.S.), hfOPTEX (Montreal, Que.), National Optics Institute (Quebec, Que.), KOM (Kanata, Ont.), National Research Council (Ottawa, Ont.), OPREL Technology (Nepean, Ont.), Opto-Electronics (Oakville, Ont.), Spar Aerospace (Brampton, Ont.) and OCRI.

Though working together on precompetitive projects, the companies are at the same time developing from their activities products and services that each can commercially exploit. Membership is open to any Canadian company or organization interested in developing technology to advance the goals of the consortium.

Goals

The primary goal of OPCOM itself is to engage its participants in mutually beneficial collaborative activities aimed at building an internationally recognized Canadian R & D team, working in the areas of high-speed distributed computing and image processing.

The specific objectives of the consortium are to develop an experimental optoelectronic, real-time processor for use in high-speed distributed computing and image processing, as well as to build a practical testbed for advanced photonic systems and subsystems.

Contact

S. A. (Alex) Mayman
Tel: (613) 599-6449
Fax: (613) 592-6098
E-mail: amayman@OCRI.ca
Website: http://www.op-com.ca

Ottawa Carleton Research Institute

About The Ottawa Carleton Research Institute

The Ottawa Carleton Research Institute (OCRI) is a not-for-profit research consortium of government, industry and post-secondary academic institutions building on the high technology research excellence in the region.

Focused on microelectronics, communications, computer sciences and bioscience, OCRI activities: foster interaction among people from educational institutions, government and industry to enhance the effectiveness of R&D; increase the resources available for research and development; and promote the development of the region's high technology sector.

Cooperation is an integral element of all OCRI projects from the development of pre-competitive research consortia to industry-sponsored research chairs at local universities to the sponsorship and coordination of seminars, workshops and conferences.

Our Membership

OCRI is primarily funded by its members made up of major corporations such as Bell Canada, Nortel, Newbridge, and Corel and by more than 200 small and medium size high technology companies, law firms and consulting organizations. Additional funding is provided by the region and federal government.

Collaboration

With the highest concentration of research and development in the country, Ottawa is Canada's centre for research and innovation. OCRI has had an excellent record in team building and managing consortia in its short 13 year history. Examples include development of TRIO - Telecommunications Research Institute, the Focused Ion Beam Facility and the Solid State Optoelectronics Consortium of Canada.

At present, OCRI organizes, manages and partners with an extensive number of collaborative programs and services such as OPCOM, OCRInet, PARTNERS, and the NRC - Industrial Research Assistance Program (IRAP).

Building on Strength

The OCRI/TRIO/NSERC Industrial Research Chairs program adds to the world-class expertise of local post-secondary academic institutions. The Chairs identify research that presents unique industrial opportunities and responds to industrial needs.

Current Chairs/Programs are: Real-time Multimedia Distributed Database Systems; Performance Engineering of Real-time Software; High-Speed Integrated Circuits; and, Programs in Advanced Manufacturing Technology.

Networking

The Institute runs a number of technical conferences, seminars, workshops and monthly interest group meetings to provide a forum for the technology community to interact and exchange ideas.

Membership

Become an OCRI Partner, membership is available on three levels:

- Corporate Partner;
- Affiliate Partner; and
- Individual Partner.

Contact

William J. Collins, President
Tel: (613) 592-8160 ext. 228
Fax: (613) 592-8163
E-mail: bcollins@ocri.ca
Website: www.ocri.ca

PRECARN Associates

About PRECARN Associates

PRECARN Associates is a member-owned industrial consortium conducting R&D in intelligent systems and robotics. Its mission is to promote the understanding and exploitation of these technologies by Canadian industry. PRECARN selects and manages projects through its pre-competitive collaborative R&D program. Through this program, PRECARN develops marketable technologies in areas of direct relevance to the business strategies of its members.

R&D Activities

PRECARN is an "institute without walls" in that projects are carried out at the facilities of project team members. Members of these multi-disciplinary teams are from industry, universities, public laboratories as well as government agencies.

The technologies developed under PRECARN projects are commercialized by the member companies who may develop new products or services based on these technologies, or who may exploit the technologies internally to improve their own productivity, environmental safety, or product quality.

PRECARN also manages the Institute for Robotics and Intelligent Systems (IRIS), a federally funded Network of Centres of Excellence. While the PRECARN R&D program is industry-based, IRIS is university-based.

The ultimate goal of both PRECARN and IRIS is to contribute to the economic development of Canada through the exploitation of R&D results. The technologies developed may be commercialized by PRECARN members as well as other Canadian companies.

The innovative technologies developed under the R&D programs are in such areas as intelligent computation, human-machine interfaces, machine sensing and actuation, as well as systems integrating several of these technologies. More generally, projects focus on developing prototype solutions that improve a system's ability to perceive, reason, plan and act.

R&D Investment

Total investment from the PRECARN R&D program will be over $95 million during the period 1990-2000. This program is conducted by the 35 members of the consortium through projects that are selected through a series of Requests for Proposals each year. PRECARN funding can only be applied to expenditures in Canada.

Projects are expected to focus on pre-commercial, developmental research. Accordingly, the commercial potential weighs equally with the technical work. Applicants are encouraged to contact PRECARN staff during the early stages of proposal preparation. Typically PRECARN project teams consist of at least 2 companies and 1 university, often from IRIS.

In addition, IRIS, which brings together over 400 researchers from 23 Canadian universities, will have invested $50 million in research during the period 1990-1998. IRIS projects are also selected through an RFP process that has been conducted every four years. Typically, an IRIS project team consists of at least 2 universities and several companies, often from PRECARN.

Partnering Interests

As a Canadian R&D organization, PRECARN Associates' primary objective is to develop technologies that will improve the competitive position of Canadian companies. In pursuit of this objective, PRECARN seeks partners who are interested in participating in its R&D programs, or partners who have market opportunities suitable for the commercialization of PRECARN developed technologies.

Contact

Manager Corporate Affairs
#300-30 Colonnade Road
Nepean, ON, K2E 7J6
Tel: (613) 727-9576
Fax: (613) 727-5672
E-mail: info@precarn.ca
Website: www.precarn.ca

Strategic Microelectronics Consortium

About Strategic Microelectronics Consortium

The Strategic Microelectronics Consortium (SMC) is a national industry association dedicated to accelerating the sustainable growth and development of microelectronics in Canada. Membership is open to:

- companies whose primary business is the design and/or fabrication of microelectronic components, including compound and optoelectronic devices, or who develop software and/or hardware therefor;
- companies who use microelectronics in their products;
- academic and government institutions involved in microelectronics research, skills training and business development; and
- key individual stakeholders in the microelectronics sector.

The present membership collectively accounts for over 90% of current Canadian microelectronics revenues, and includes Canadian-owned companies ranging from small through large; multinational corporations and their subsidiaries; and national government departments and their laboratories.

A prerequisite for membership is a firm commitment to actively support building the strong Canadian infrastructure essential for microelectronics to be a significant lever for national economic prosperity.

Key Products & Services

SMC's direction and overall program is set by the members, who participate actively at different levels in the program items of their choice.

At the strategic level, SMC provides planning facilitation, program development and program management services for its members, as well as acting as the national public voice for the industry's strategic direction and priorities. At an operational level, SMC facilitates knowledge-sharing and collaboration between members and with other Canadian stakeholders.

R&D Activities

Development programs reflect SMC members' strategic priorities, and include:

- industry support of federal and regional initiatives to attact major foreign investments in Canadian-based silicon fabrication facilities, as part of maintaining broad expertise in state-of-the-art microelectronics technology;
- several short and long term programs aimed at increasing the availability, retention and skills relevance of the high quality people required to sustain Canadian microelectronics industry growth; and
- several common-interest groups aimed at exchange of best-practices information and focused knowledge-sharing.

Goals

SMC's goals are:

- to drive a national consensus on the critical strategic issues and priorities for long term growth of the sector and its contribution to the Canadian economy;
- to articulate the national strategy, priorities, opportunities and contribution of microelectronics to governments and the public, and create programs to move the national strategy forward; and
- to provide a range of networking opportunities for informal knowledge sharing and promotion of collaboration for mutual benefit among members. The breadth of the SMC membership gives even fledgling start-up companies access to the full spectrum of knowledge and experience available across the Canadian microelectronics community.

Contact

Tony Stansby
Executive Director
Tel: (613) 721-9355
Fax: (613) 721-9528
E-mail: info@smc.ca
Website: www.smc.ca

Telecommunications Research Institute of Ontario

About Telecommunications Research Institute of Ontario (TRIO)

TRIO, an Ontario Centre of Excellence, is a telecommunications industry leader in identifying and communicating business opportunities and future trends. It enhances the technological competitiveness of Canadian companies through university/industry partnerships in focused and shared research programs led by Ontario's best researchers.

TRIO unites over 400 leading communications researchers and postgraduate students from its four member universities: Carleton, McMaster and Queen's Universities, and the University of Ottawa.

Research is focused through industrial member interaction, and targets the following "thrust" areas:

- Enterprise Networks;
- Photonic Networks & Systems;
- Antennas & Signal Processing;
- Mobile & Satellite Systems; and
- Protocols & Software Engineering.

R&D Activities

Membership in TRIO provides access to leveraged R&D funds, and members have royalty-free, hassle-free access to all knowledge and technology resulting from over $5 million in annual TRIO-funded research.

TRIO's Industrially Specified Research (ISR) Program enables members to formulate and co-supervise highly leveraged research projects, usually conducted on member premises by a graduate student under the leadership of an Ontario university professor.

Biannual Thrust Interaction Group (TIG) meetings and direct discussions with professors allow member companies to monitor the progress of research being conducted. TIG meetings also provide members with the opportunity to shape research programs by recommending research directions and prioritizing future funding.

Networking & Information Services

TRIO-sponsored events and meetings offer excellent opportunities for members to interact and share common problems and challenges. Members also benefit from extensive linkages with national and international telecommunications organizations and consortia.

The TRIO web site has become a focal point for information on the status of telecommunications research. With over 1000 research papers mounted in TRIO's Telecommunications Technology Alert (TTA) fully interactive electronic database, the site is an extremely useful resource for keeping up to date on current research.

TRIO operates an innovative knowledge transfer program, working closely with members and telecom organizations to match industrial needs with TRIO research projects.

Highly Skilled Graduates

Through involvement in TRIO meetings and events, members get privileged access to Ontario's top telecom graduates. ISR student internships also allow companies to do an on-site, no obligation assessment of candidates for employment.

The annual TRIO/ITRC (Information Technology Research Centre) Researcher Retreat provides member companies with a unique opportunity to interact with and recruit Ontario's top graduates. In 1996, about 300 Master's and Ph.D. students from Ontario's largest research universities took part in the event, and over 275 interviews were conducted by nine organizations.

Contact

Marc Diguer
Director of Operations
Tel: (613) 592-9211 ext. 243
Fax: (613) 592-8163
E-Mail: mdiguer@trio.ca
Website: www.trio.ca

University of Ottawa
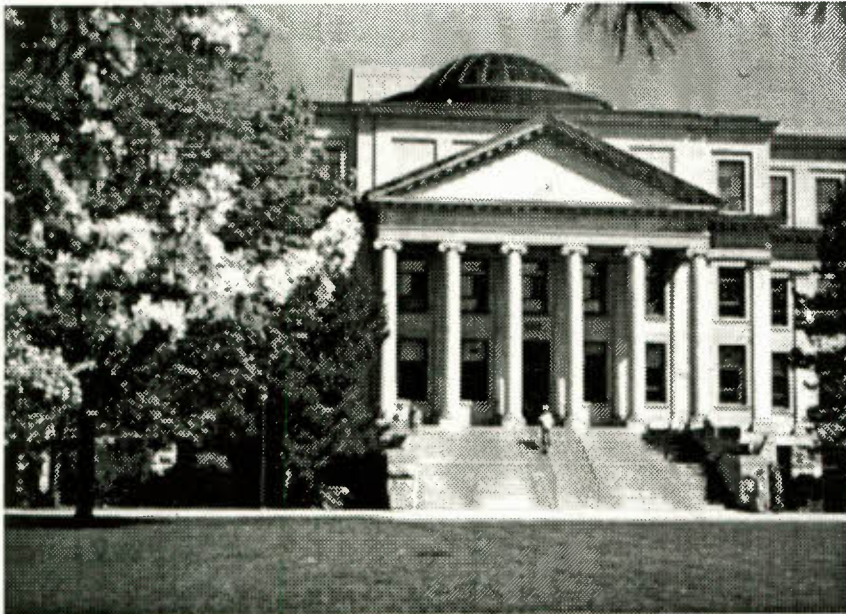
About the University of Ottawa

Established in 1848 as the College of Bytown, the University of Ottawa has served the region for almost 150 years by providing programs and services in both official languages. With about $60 million of funded research, and more than 1,000 full-time professors in 10 faculties offering 200 programs to 25 000 students, the University is today the oldest and largest bilingual university in Canada.

The University, Telecommunications and Computing

The University plays an important role in the telecommunications and computing sectors. It is a major participant in the Telecommunications Research Institute of Ontario and in many industry-sponsored research projects that promote the development of telecommunications and computing at the regional, national and international levels.

School of Information Technology and Engineering (SITE)

Earlier this year, the University of Ottawa announced the creation of the School of Information Technology and Engineering (SITE) within the Faculty of Engineering through the merger of the Department of Electrical and Computer Engineering and the Department of Computer Science.

SITE is the University of Ottawa's centre for leading-edge computer training, currently offering programs in: Computer Engineering; Computer Science; Electrical Engineering; and Information Management.

SITE puts the University of Ottawa at the forefront of information technology training in Canada. In addition to the four existing programs, SITE will soon be launching two new engineering programs. In response to the needs of industry, SITE will be offering Software Engineering as early as September 1998 (starting in 2nd year).

At that time, we anticipate that a small number of Computer Science and Computer Engineering students will be allowed to transfer to the new program.

Finally, the Systems Engineering program is scheduled to start soon thereafter.

From an administrative point of view, the Faculty of Engineering now consists of three departments and one school with more than 1750 under-graduate students and 450 graduate students. By continuing to promote the excellence of our programs and the outstanding performance of our students, we plan to increase significantly the number of co-operative placements in the years to come.
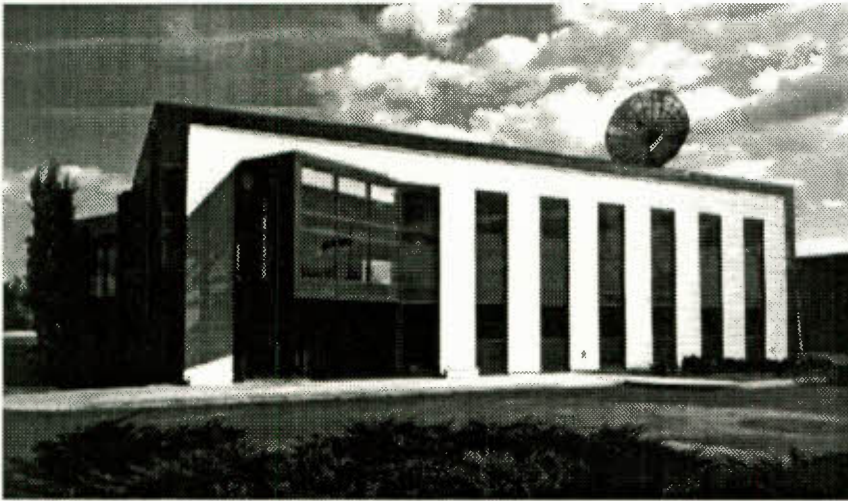
Contact

Dr. Gilles Patry
Tel: (613) 562-5800 ext. 6175
Fax: (613) 562-5174
E-mail: patry@genie.uottawa.ca

Company Profiles

Akran Systems

About Akran Systems

Akran Systems, an award winning company, is one of the leading Computer Systems Integrators in Canada. A Canadian owned and operated corporation, with its 20 000 sq. ft. facilities and head office in Ottawa for the past 11 years, is poised to expand its horizons to gain its market share.

Working with its partners around the world, Akran offers complete systems solutions to small and medium size public and private sector companies with full product procurement, implementation, support and training.

Akran has won numerous awards and recognition by its industry peers and business community. To name a few of the recent ones:

* *Young Entrepreneur Gold Award* (Ottawa-Carleton Board of Trade);
* *Canadian Airlines Foundation Award*;
* *IBM's Thomas J. Watson Customer Satisfaction Award*; and
* *"100 Best Managed" companies* (Financial Post).

Key Products & Services

Akran Systems, with its ISO-9002 certification and the prestigious "Circle-Canada" designation, offers the following services for all of its corporate and government clientèle:

* Internet and Intranet Solutions;
* Local and Wide Area Networks (LANs/WANs);
* Video and Satellite Broadcasting and Conferencing;
* Document Imaging and Mass Storage;
* Computer Telephony Integration;
* Mass Document Faxing and Retrieving;
* Security Access and Controls; and
* Remote Network Management and Support.

R&D Activities

Research and development activities focus on the development of new technologies, including:

* Distant Interactive Satellite Learning (TEN); and
* Direct PC Satellite Internet Solutions.

Philosophy

Service the clients the way you yourself would like to be served as a client.

Objective

Akran Systems' objective is to become the number one Systems Integrator and Total solution Provider across Canada.

Mission Statement

Our mission is to assemble a quality team dedicated to providing true value to our business partners through the delivery of the best products, services and information, that will facilitate and enhance the operation of their business and improve the profitability.

Goals

The goal of Akran Systems is to provide total client satisfaction and to achieve over 50% of forty key accounts' market share in the Ottawa-Carleton Region by the year 1999.

Akran's vision is to bring the world closer together by providing the state-of-the-art technology available in North America to its clients to increase their productivity and efficiency so that they increase their revenues more profitably.

Having established a solid infrastructure, credibility, goodwill and recognition in the marketplace, especially in the National Capital Region of Canada, Akran is now ready to explore further horizons and growth opportunities through joint ventures, strategic alliances, partnerships, etc.

Contact

Dr. K. G. Gupta
Tel: (613) 739-4000 ext. 109
Fax: (613) 739-4444
E-mail: kamlesh@akran.ca
Website: www.akran.ca

AMTEK Software Information Systems

Evidence Tracking

Configuration Management

Fine Art/Museum Artifacts

Asset Tracking

- life cycle costing;
- logistics support;
- operations/user support and training;
- project management;
- conversion to the Windows interface; and
- development of user and system documentation.

R&D Activities

R&D activities focus on developing off-the-shelf materiel management software tools and related design and development techniques, especially in the areas of testing and useability.

Goals

AMTEK Software's goals are:

- to provide small to medium size organizations with easy to use, affordable, off-the-shelf management tools to assist in materiel management; and
- to provide high quality services in all aspects of the software life cycle.

Contact

Lester Sellars or
Rosamund Northey
Tel: (613) 749-3990
Fax: (613) 749-5167
E-mail: amtekcdn@amtekcdn.com

About AMTEK Software

Dedicated to the provision of high quality, reliable software solutions and services, AMTEK Software works with clients in both industry and government. A division of AMTEK Engineering Services Ltd, AMTEK Software specializes in object-oriented, Windows-based development for a variety of applications.

Key Products & Services

AMTEK Software's key product, AMTEK AMS™, provides a highly flexible, cost-effective solution to the problem of tracking and controlling items such as files, uniforms, vehicles, repair histories, equipment, furniture, artifacts, and evidence. Windows-based and easy to use, AMTEK AMS is readily accessible to users who are not computer specialists.

Because the user can readily tailor AMTEK AMS to meet specific requirements, the benefits of a custom-developed solution can be achieved with an off-the-shelf tool. AMTEK AMS operates with or without barcode scanners and RF/ID devices.

AMTEK AMS is available in single or multi-user configurations and runs on a wide variety of networks.

AMTEK Software also offers the following software services:

- feasibility studies;
- requirements analysis;
- prototyping;
- software design and development;
- tailoring of standards;
- verification and validation;
- quality assurance;

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Anjura Technology Corporation

About Anjura

Anjura is a leading-edge technology consulting firm specializing in client-server solutions. We have extensive experience in the successful delivery of technology, strategies and solutions. We have successfully delivered on several large systems integration projects for public and private sector organizations, locally and nationally.

Our goal is to assist you in harnessing computing to the service of your organizational objectives. Where possible, we will help you build systems out of the pieces you currently have, rather than building from the ground up. Specifically selected tools and methodologies, coupled with an impressive team of consultants, ensure we deliver the right solution for your unique needs, while adhering to industry standards.

We're Different, and Here's Why

Why should you choose Anjura over the multitude of IT Consulting firms now operating in Canada ? We suggest that in addition to looking for a firm which offers highly skilled, highly specialized consultants, which Anjura does, you should explore the philosophy under which your IT partner operates. Anjura's philosophy is founded on two core pillars:

Leveraging Architecture & Computing Strategies

Anjura puts its team's knowledge and experience to work on keeping you in the right strategic position. We've learned that success lies in applying proven approaches to technology. Our depth of familiarity with emerging technical options allows us to leverage these approaches. Our full range of re-engineering services are delivered in a manner that simplifies, where possible, to guarantee successful implementation.

Excellence in Client-Server Solutions

Anjura delivers computing infrastructures and systems that do what you expect them to. We will tell you in advance if there is a problem with your expectations. Our team recognizes the business forces that drive technology implementations and reflect that understanding in our service and delivery orientation. Systems, network and application development integration services are Connecting Technology & Your Business Plan.

Business-Focused Technology Implementation

Available for a wide range of technologies. The Right Team for Your Challenge Anjura's principals have worked together since 1983, incorporated in 1992, and has grown to a team of over 45 professionals. We have secured partnerships with the organizations and technologies which will take Canadian enterprises into the next millennium. These include such industry leaders as Microsoft, Novell and IBM/Lotus.

Contact

Anjura Technology Corporation
43 Auriga Drive, Suite 101
Nepean, Ontario K2E 7Y8
Tel: (613) 727-1411
Fax: (613) 727-1412
E-mail: info@anjura.com
Website: http://www.anjura.com

Artech

Artech

Artech studios creates world-class animation products and multimedia titles for international markets.

Founded	1982
First million seller	1983
Titles to date	65
Titles this year	10
Employees	65

Artech is part of the Astral Entertainment Group. Astral is Canada's largest provider of pay, pay-per-view and specialty television services that include the new cartoon channel Teletoon, The Comedy Network, TMN, Family channel and many others.

Awards

Artech has received 11Software Publishers of America (SPA) Awards – Silver, Gold and Platinum for sales in excess of 500 000 units per title. The prestigious Game of the Year Award was received twice! Other numerous commendations include: Bill Board Best Product, Parent's Choice Award, Computer Gaming World, Best Flight Simulator, Compute! Best Children's Software Title, Bill Board Best Graphics and many others.

Artech Clients

Artech clients include the Fox Network, Viacom, Nickelodeon Network, Sega, Hasbro, Kenner, Broderbund, Spectrum Holobyte, Electronic Arts, Atari, Coleco, Accolade, Activision, Sierra, Corel, Intel, Soundblaster and others.

Key Products & Services

Multi Media Entertainment –

includes on line gaming, multiplayer Internet products, racing simulations, strategy and adventure games etc.

Tools and Training –

real-time broadcast, custom & 3-D simulations for training applications, music & audio, virtual controllers, custom drivers and animation solutions.

Learning Products –

Artech were one of the very first to develop learning software for kids including the popular Wizard of Id series: Wiz Math (1983) and Wiz Type (1984) released on the Sierra.

Recently, Artech created a series for the Smithsonian Institute Washington, DC (published through its Broderbund affiliation) and Nick Jr. Playmath for the Nickelodeon Network.

Animation –

Our graphics studio includes classical animation and an SGI group featuring advanced Alias and Softimage film quality production.

Current Activities

The company is currently working on interactive TV and a variety of on-line gaming products and toy controllers.

Artech's real-time Internet broadcast software (ISTV) is used exclusively by the Fox Network for most sports broadcasts as featured recently on the World Series, The Super Bowl and the All-Star Hockey Game.

Contact

Paul D. Butler
Director
Tel: (613) 728-4880 ext. 24
Fax: (613) 728-4523
E-mail: pbutler@artech.ca

Bell Canada

About Bell Canada

As Canada's oldest and largest telecommunications company, Bell Canada has been a household word in Ontario and Québec for over 115 years. But there is a lot more to Bell Canada than telephones, especially in today's rapidly evolving telecommunications industry. A highly competitive company operating in an increasingly dynamic marketplace, Bell is a world leader in providing reliable and innovative voice, data and image communications.

With over 40 000 employees and more than seven million customers in Ontario and Québec, Bell Canada is also a key economic contributor in terms of employment, capital spending, R&D, and product and service development. Through business alliances with companies in related industries - including the software, manufacturing, retail and multimedia sectors - Bell is consistently "pushing the envelope" in delivering advanced, low-cost telecom solutions to customers.

While Bell Canada's corporate headquarters are located in Montréal, the company maintains a large presence in Ottawa. Bell's Ottawa-based operations, for example, include numerous groups devoted to marketing as well as key regulatory and policy issues affecting Canada's telecommunications industry (hotbeds of activity in recent years given the rapid roll-out of competition).

As well, the company's operations in Ottawa work closely on the development of new products and services, tapping the resources of other Ottawa-based technology companies who, collectively, constitute what is commonly referred to in industry circles as Silicon Valley North.

Key Products & Services

In basic terms, Bell Canada currently provides local, long distance and, through its cellular affiliate Bell Mobility, wireless telephone services. Within these broad categories are a large number of specialized services designed to meet the specific needs of individual customers, whether residential long distance users, home-based businesses, or large corporate accounts.

Among these services are 800/888 and 900 long distance services; basic and high-speed Internet access; video and audio teleconferencing; high-speed data transmission services; Wide Area Network (WAN) and Local Area Network (LAN) services; an array of enhanced SmartTouch™ features, including Call Answer and Call Display; and services for customers with special needs.

Supporting all of these products and services are complex technologies not readily apparent to the consumer. Bell's long distance network, for example, is fully served by digital switches, providing an advanced electronic backbone that supports the latest state-of-the-art products and services. Bell's local network is more than 90% digital, and the company plans to be fully digitized by the end of 1997 (July 1998 in the Far North) as part of a major network modernization program.

Community Involvement

Through corporate sponsorship and employee involvement, Bell Canada is committed to supporting the well-being of the communities it serves through numerous organizations and special programs. Since 1990, for example, Bell has contributed more than $4 million a year in sponsorships, touching almost every aspect of Canadian life. The Boys and Girls Clubs of Canada, the Kids Help Phone, and the United Way are just a few of the initiatives Bell sponsors.

Bell Canada also supports a wide range of cultural institutions, including the Stratford Festival (since 1953) and the Governor General's Performing Arts Awards. On the professional sports front, Bell is a sponsor of the NHL's Ottawa Senators as well as the annual Bell Canadian Open golf tournament.

Contact

Communications
Bell Canada
Tel: (613) 785-1427
Fax: (613) 781-4918
E-mail: N/A

CAL Corporation

About CAL Corporation

CAL Corporation, an Electromagnetic Sciences Inc. company (NASDAQ: ELMG), supplies customers with a broad array of satellite-based terminals, antennas and systems for terrestrial, aeronautical and space applications.

CAL's mobile satcom equipment allows users to communicate via telephone, secure telephone, fax or data to and from virtually any location in the world.

Safety and surveillance solutions provide rapid and accurate detection of emergency distress alerts to national and regional search and rescue agencies throughout the world.

Space systems offer state-of-the-art attitude and orbit control star sensors, optical intersatellite communications links, fuel monitoring devices and ongoing space science research involving several instruments which study the earth and the upper atmosphere.

CAL's success is based upon its expertise in electronics, antennas, software, and space systems.

Key Products

Electronics: digital, analog, microwave, power, EMC/EMI design.

Antennas: phased-array, helical, waveguide, deployable space-qualified, fixed and steered.

Software: real-time, embedded, multi-processor systems, graphical user interfaces and simulators

Space Systems: intersatellite links, electro-optical systems, space subsystems

R&D Activities

CAL's research and development activities focus on the development of new products and enhancements to their existing products:
*   Enhancements to its CALQUEST™ family of aeronautical telephone products;
*   Development of vehicle-mounted telephone products;
*   Development of Ku-and Ka-band antennas for DBS reception and delivery of interactive multimedia services to aircraft, trains, buses and other mobile platforms;
*   Enhancements and additions to its world-leading family of satellite-aided search and rescue (SARSAT) products;
*   Development of the CALTRAC™ wide angle, high speed star tracker;
*   Development of optical instruments for space-borne remote sensing and meteorological applications;
*   Development of a high-performance S-band transponder for intersatellite and satellite-ground tracking, telemetry and command applications;
*   Specialized spacecraft antennas for remote sensing and communication payloads; and
*   Specialized mechanical devices for intelligent robotics and spacecraft fuel system monitoring.

Mission

CAL Corporation is a satellite communications company. CAL operates in market segments in which it has clear leadership by reason of its technology, customer relations or geographic coverage.

Contact

Roxy Hamilton
CAL Corporation
Tel: (613) 820-8280 ext. 1108
Fax: (613) 820-1770
E-mail: hamilton@calcorp.com
Website: www.calcorp.com

Cognos Inc.

About Cognos Inc.

Cognos provides businesses with software tools that increase productivity and improve competitiveness. Our tools give decision-makers the ability to access and analyze corporate data—whenever and however they want it—and they enable companies to build systems for automating core business processes.

Founded in 1969 as a consulting organization, Cognos has grown over the past 28 years to become one of the world's premier software companies. During this time, the company has gone through several evolutions – first a consulting company, then an application development company selling the tools it used to create applications, and now, selling a variety of business tools, including both application development and business software intended to provide access to corporate data from every decision-maker's desktop.

Today, Cognos has offices in 12 countries. The company employs more than 1 200 people worldwide, and has headquarters in both Ottawa, Canada and Burlington, MA, U.S.

Key Products & Services
Business Intelligence Tools

PowerPlay, the universal Online Analytical Processing (OLAP) client, presents summarized multidimensional data, and allows managers to explore and do their own ad hoc analysis of all of the factors driving the business.

Impromptu, Cognos' award-winning query and reporting tool, supports business decisions by giving users access to the detail stored in corporate databases, along with the ability to create their own sophisticated queries and reports in an easy-to-use environment.

Scenario™ brings data mining to the entire enterprise, delivering insight into the hidden relationships that lie within corporate data. It's easy to use, so users don't have to be statisticians to uncover trends. And its robust statistical engine provides experts with the data accuracy and integrity that they demand.

Application Development Tools

PowerHouse® is a proven, server-based application development environment that allows business-critical programs to be written quickly and modified easily using a powerful fourth-generation language (4GL). PowerHouse has achieved life-to-date sales of over $1 billion.

PowerHouse Client™ gives end users the ability to access their PowerHouse applications from their personal computers, making the applications more accessible, while retaining the power and robustness of the underlying language.

Axiant 4GL™ is a "visual 4GL" designed for migrating PowerHouse applications to fully distributed client/server environments, and for developing new client/server applications.

RealObjects™ is a component-based development tool that provides a fast and easy way for business unit developers to build and maintain complex applications for the Windows 95 and Windows NT environments.

Cognos Services

Cognos services ensure that every customer can feel confident about their Cognos investment. Specially designed training programs make our customers proficient with Cognos technology in the shortest time possible.

We also provide different levels of support to reflect the diversity of our customers' support needs. From basic TeleSupport to a fully proactive, managed approach to technology issues, we have a support plan that can satisfy the specific requirements of each customer.

Goals

Cognos makes products that give companies a competitive advantage. To do this, we design and deliver functionally rich, high-quality products; establish fruitful, long-term relationships with customers and partners; and effectively manage product life cycles.

Contact

Tel: (613) 738-1440
Fax: (613) 738-0002
E-mail: info@cognos.com
Website: http://www.cognos.com

Computing Devices Canada

About Computing Devices Canada

We are Computing Devices Canada (CDC), a member of the Ceridian group of companies. We have achieved a global reputation for excellence by supplying industry and the Armed Forces of over twenty countries, from NATO to the Pacific Rim, with high performance, leading-edge technology-based solutions.

CDC has extensive experience in the management of complex projects involving large scale systems integration. We have unique systems engineering, software development, integration and project management skills.

Capabilities include advanced manufacturing and full life-cycle support. From our intensive research and development program, concept definition through systems design, integration, test and post-delivery support, we provide the best value solutions tailored to your needs.

Key Products & Services

To remain technically responsive to our customers, we have developed expertise in:

* integrated digital voice and data distribution;
* acoustic signal processing;
* high resolution tactical digital displays;
* C3 systems design and integration; multi-sensor scan conversion;
* all-weather; multi-spectral; surveillance for air, sea or land;
* integrating Commercial Off-The-Shelf (COTS) technology;
* information technologies;
* software development;
* communications engineering; and
* sensor integration.

R&D Activities

With more than 1 100 employees in Ottawa and Calgary dedicated to research and development, advanced design, comprehensive manufacturing and customer service, Computing Devices Canada has the resources necessary to meet market needs.

Our continuous investment in customer-driven research and development has produced a number of world firsts and exciting, techno-logical breakthroughs.

The head office of Computing Devices Canada, located in Ottawa, is over 300,000 square feet. A 140,000 square foot facility in Calgary houses the Communications Systems Division.

These locations include dedicated research and development labs and comprehensive manufacturing facilities.

Our total quality initiatives impact all aspects of our business, from design through production and post-delivery support. We are an ISO 9001 registered company.

Contact

Suzanne Bélanger
Marketing Communications
Computing Devices Canada
3785 Richmond Road,
Nepean, Ontario K2H 5B7
Tel: (613) 596-7059
Fax: (613) 596-7396
E-mail:
suzanne.belanger@canada.cdev.com

Corel Corporation

About Corel Corporation

Corel is the largest software company in Canada and the second-largest vendor of personal productivity applications in the world. Recognized internationally as an award-winning developer and marketer of productivity applications, graphics, desktop publishing and multimedia software, Corel's product line is consistently rated among the strongest in the industry. Products are shipped in over 17 languages through a network of more than 160 distributors in 70 countries worldwide.

The company boasts two major world brands — the Corel Wordperfect product line and the CorelDRAW series. Embraced by 26 million customers, Corel WordPerfect Suite is in a strong number two position in the office suite arena. With an installed base of 5 million users, CorelDRAW is the world's #1 PC illustration software package.

Corel offers complete solutions on multiple platforms for everyone from large corporations to home users. By choosing Corel products, users can tap into the technology they need to evolve and grow in a computing world characterized by constant, but necessary change. Corel has nimbly responded to Java, the latest industry revolution, by developing software to harness the power of this new paradigm. Platform-independent and network-centric, Java is being hailed as the future of computing.

Key Products

Corel develops a wide variety of software solutions for a broad spectrum of users.

- *Corel WordPerfect Suite* — word processing excellence, spreadsheet power, creative presentations, graphics and more
- *CorelDRAW* — sophisticated graphics and illustration tools for the professional illustrator, graphic artist and desktop publisher
- *Corel WebMaster Suite* — everything you need to effectively create and manage your Web site
- *Corel VENTURA* — traditional desktop publishing combined with the power of the online world
- *Corel/CAD, Corel Visual CADD* — professional design and drafting programs
- *Corel/VIDEO* — business communication in a unique video conferencing solution
- *SOHO* - reference, entertainment and educational titles, image libraries and multimedia

R&D Activities

Corel has always prided itself in developing ground-breaking technology and producing market-leading commercial applications ahead of the competition. Some of the Company's present and future R&D focuses include:

- multi-platform development including Windows 3.1x, Windows 95, Windows NT, Windows 97, Macintosh, DOS and UNIX;

- Java applications including Corel Office for Java ;
- tools to optimize users' impact on the Internet; and
- graphics, multimedia, desktop publishing and business communication products.

Corel will continue to invest significant funds in research and development. Investment in 1997 is expected to surpass 1996 R&D expenditure, as the Company leads the industry in innovative productivity applications— applications that allow users to exploit the full potential of today's and tomorrow's technology.

Goals

Corel is committed to delivering cutting-edge software that takes advantage of the very latest technology. As it continues to cater to emerging consumer needs, Corel will maintain its high standard of customer satisfaction and its position as a world-leader in the high-tech arena.

Contact

Media Relations
Corel Corporation
Tel: (613) 728-8200
Fax: (613) 728-9790
Website: www. corel.com

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Digital Equipment Corporation

About Digital Equipment Corporation

Digital Equipment Corporation is a world leader in open client/server solutions from personal computing to integrated worldwide information systems. DIGITAL's scaleable Alpha and Intel platforms, storage, networking, software and services, together with industry-focused solutions from business partners, help organizations compete and win in today's global marketplace. In addition to offices across Canada, Digital Equipment of Canada Limited has a major manufacturing facility in Kanata, Ontario, and a major service and support centre in Hull, Québec.

The company is a subsidiary of Digital Equipment Corporation of Maynard, Massachusetts.

Historical Perspectives

Digital Equipment of Canada is one of this country's computing pioneers. On May 1, 1963, the company opened its doors in Ottawa as a two-man sales outlet for its parent company. In 1971, the company invested in a large tract of land in Kanata and began construction of a 100 000 sq. ft. building to manufacture components for the Canadian market. Over the years, the Kanata complex has been expanded and today it occupies over half a million square feet including five buildings.

Service locations across Canada are linked to a state-of-the-art national Customer Technology Support Centre in Hull, Québec - a facility that alone represents an investment of more

than $20 million. One of 14 worldwide, the Centre houses experts in software, networks and hardware who, in turn, can draw on all the global resources of DIGITAL.

More than 80 percent of DIGITAL's products are distributed through resellers and value-added partners. DIGITAL has formed Strategic Alliances with other industry leaders including Microsoft, Computer Associates, Oracle and MCI - dramatically extending the customer base. DIGITAL's consistent revenue growth can be directly attributed to the market acceptance of its leading edge 64 bit technology family of Alpha products, and DIGITAL consistently ranks in the top five vendors in the Canadian PC market.

Manufacturing

The first DIGITAL manufacturing operation in Canada was located in an old woolen mill in Carleton Place. In 1972, DIGITAL moved to it's current Canadian manufacturing plant in Kanata Ontario, producing computer components for Canadian and worldwide markets. Since then, the site has expanded five-fold from 100 000 to 500 000 square feet and now employs nearly 2 000 workers. Today, the plant has the mandate to build and physically distribute Intel-based personal computers and servers for the Canadian, US, Latin American and Caribbean markets. With exports of approximately $2 billion per year, the facility is the nation's largest manufacturer and exporter of personal computers.

Competing internally in the Corporation for international mandates, the Kanata facility attributes its success to highly responsive and very predictable supply of high quality/high reliability products.

Digital Equipment of Canada employs 3 000 Canadian at locations coast-to-coast. The Kanata plant is located in a rapidly growing cluster of telecommunications and other high technology plants including such international contenders as Bell Northern Research, Newbridge and Mitel.

Digital and the Community

In addition to fiscal performance, DIGITAL measures its success and that of its customers by the general well-being of the many communities in which it operates. Since the company's inception, as part of a worldwide philanthropic strategy, DIGITAL has supported many Canadian groups involved with community and social well-being.

Contact

Ron Catcheside
Director of Communications
Tel: (905) 948-3308
Fax: (905) 948-3311
E-mail:
ron.catcheside@tro.mts.dec.com
Website:
www.digital.com (Corporate).
www.digital.ca (Canadian)

DIPIX Technologies Inc.
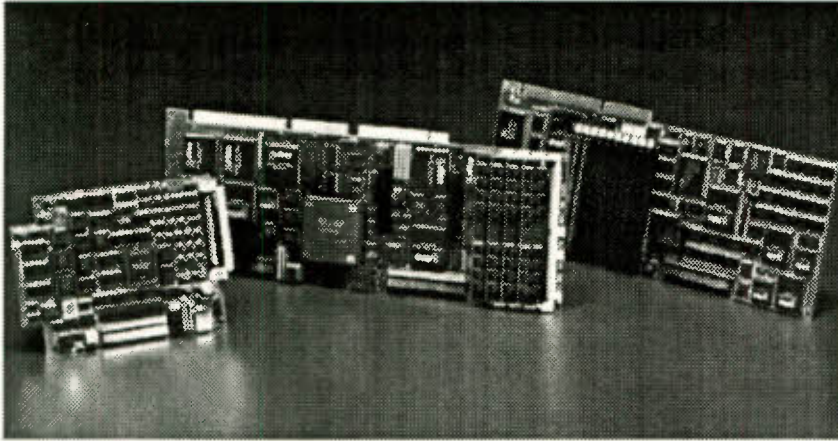
About Dipix Technologies Inc.
Building on its expertise in applying digital imaging technology, DIPIX has concentrated on several product areas serving the vision market through its two divisions — Vision Products & Vision Systems.

The Vision Products Division sells high-performance imaging boards to OEMs and VARs in the fields of industrial inspection, machine vision, bio-medical imaging, non-standard sensor interface, document imaging, scientific imaging and many others.

The Vision Systems Division develops and sells turnkey vision systems, specializing those for the inspection of baked goods for the baking and snack product industry.

DIPIX not only meets the immediate demands of the vision market, it also provides innovative solutions ahead of industry needs.

The combination of its expertise in flexible and high-speed image processing and its application of this technology to solve complex vision problems cost effectively sets DIPIX apart from the competition. From its head office and manufacturing facilities in Ottawa, Canada, the company has established an international network for selling, servicing and supporting its customer base in over 25 countries.

Key Products & Services
Vision Products
The Vision Products Division designs and manufactures high-performance frame grabbers and image processing boards known as Power Grabber™, for OEM, System Integrator, and VAR applications.

Clients that design systems for industrial inspection, machine vision, non-standard cameras, or biomedical, document and scientific imaging look to the division for innovative digital imaging technology to deliver that essential competitive edge.

The company's vision products are successfully incorporated into product development cycles by leading companies and organizations around the world. Also, when clients have application or system integration problems, they are able to draw on DIPIX's extensive hands-on experience and total customer support.

Vision Systems
The Vision Systems Division specializes in On-line Quality Control Units for the baking and snack food industry. This division designs and manufactures a family of machine vision based optical inspection systems called Qualivision™.

These on-line Qualivision™ systems are used to measure parameters such as 3-dimensional size and shape, bake color, and optical density.

The system can trigger diversion devices to reject malformed products, provide direct feedback control for a process, or gather statistical information for presentation to management.

Contact
Mr. Vijay Dube
Tel: (613) 596-4942 ext: 110
Fax: (613) 721-9528
E-mail: vdube@dipix.com
Website: www.dipix.com

DVS Communications Inc.

About DVS Communications Inc.

DVS holds a unique place in the multimedia industry as one of the first companies to promote the linkage of computer visualization and thinking. It has pioneered real-world multimedia business applications in an early-adopter market and today is one of the few true full-service interactive learning companies which can provide Analysis, Design, Development, Delivery and Evaluation of multimedia Technology-Assisted Learning solutions.

DVS Communications' mission is to improve the productivity of client organizations and people through the effective application of multimedia technology, advanced learning principles, managed process and structured creativity.

DVS has completed more than 800 projects for clients in the financial services, sales & marketing, technology, transportation, government, corporate training, and education sectors.

The foundation of DVS is its staff of committed specialists, blending expertise in a number of essential disciplines, including project management, instructional design, creative & graphic design, interactive programming, authoring, and research in multimedia technologies.

With clients across Canada and the United States, DVS has demonstrated the skills, technology and experience to provide a total interactive learning solution.

Key Services

DVS designs and develops customized Interactive Learning solutions for clients, using appropriate multimedia technology to suit their current and future delivery environment. As a full service company, DVS provides front-end consulting services in strategic planning to help clients develop appropriate strategies to migrate to technology-assisted learning. DVS also provides training expertise in capacity building.

DVS can manage all aspects of learning solution delivery from strategic planning, front-end analysis & design, through development and production, to assistance with capacity building and successful implementation and evaluation.

Analysis and Design

DVS maintains a staff of instructional design experts capable of supporting complete needs analysis, content development and instructional design – all the associated up-front analysis required for the development of Technology-Assisted Learning solutions.

Multimedia Development

An experienced staff supports the development of all multimedia elements including graphics, illustrations, photography, video and audio. All these are assembled with tools selected to best support the particular needs of the client including a variety of target platforms, internet/intranet delivery, and data capture and analysis.

Solution Implementation

DVS's experience with training solution implementation can provide valuable support in easing the transition to Technology-Assisted Learning and in gathering the required metrics and data for quantitative evaluation of the results.

Selected Clients

DVS has provided multimedia solutions for clients including:

- SHL Systemhouse;
- Prudential;
- Life Underwriters Association of Canada;
- Industry Canada;
- Canadian Tire; and
- ITP Nelson.

Contact

Carolyn Hurst
President
Tel: (613) 236-0011
Fax: (613) 236-0576
E-mail: churst@jetform.com

Entrust Technologies Inc.

About Entrust Technologies

Entrust Technologies Inc., formerly known as Nortel Secure Networks, is dedicated to ensuring the privacy and authenticity of data communications enterprise-wide. Entrust Technologies has a team of well-known experts in cryptography, security architectures and international standards. Its industry-leading Entrust software family provides affordable security for enterprise-wide applications across multiple platforms, with fully automated key management.

The roots of Entrust Technologies can be traced back to 1978 when a center of expertise in Secure Communications and Cryptography was established at Bell-Northern Research (BNR) by Dr. Whitfield Diffie, a world renowned expert in cryptography. Since then, the organization has built a track record as a major research contributor in the field of cryptography with over 70 published papers.

Entrust Technologies' family of software products is designed to provide customers with public-key infrastructures and technologies for privacy and authenticity of data communications for corporate networks, intranets and the Internet.

Entrust software is widely used by financial institutions, government agencies, high-tech and other corporations, including IBM, Hewlett-Packard, Control Data Systems, and Tandem. In 1996, Entrust software received the InfoSecurity News Readers' Trust Award and was named "Editor's Choice" by Network Computing.

Key Products& Services

Entrust Technologies offers the following products:

- Entrust software combines encryption and digital signature capabilities with fully automated key management. Encryption provides for the privacy of information such as personnel data, business plans and design files. Digital signatures provide strong authentication of the originator and the prompt detection of any data tampering. As a public-key security product, Entrust gives organizations a single security infrastructure to which all applications can connect for their security requirements.
- Entrust/Lite is designed for groups of up to 100 users. Entrust/Lite supports the same applications and platforms as the full Entrust, offering a seamless upgrade.
- Entrust/WebCA enables organizations and individuals offering Web-based services to act as their own Certification Authority (CA) and issue X.509 certificates to all parties with whom they do business over the Internet and intranets.
- Entrust/ICE (Integrated Cryptographic Engine) is the newest addition to the Entrust product family. Entrust/ICE gives desktop and laptop users the ability to automatically and transparently encrypt files.

R&D Activities

Following is a sampling of the research areas in which Entrust Technologies has focused:

- Public-key Infrastructures: Leading efforts internationally to address the challenges of building public-key infrastructures that span multiple security domains.
- Cryptographic Algorithms: Work in the design of cryptographic algorithms for strength and performance.
- Public-key Mechanisms: Defining a public-key-based alternative to the Kerberos mechanism for scalability, ease of administration and use. The new mechanism, called the Simple Public-Key Mechanism (SPKM), will be progressed as an Internet standard.
- Security Protocols: Carrying out extensive research into the strengths and weaknesses of authentication and key management protocol exchanges.
- Key Management Architectures: Developing a new approach to key management for protection of information objects, such as files or messages, regardless of where those objects are stored or communicated in an enterprise network.

Contact

Carolyn Jarvis
Tel: (613) 765-5607
Fax: (613) 765-3520
E-mail: entrust@entrust.com
Website: www.entrust.com

Excalibur Systems Limited

About Excalibur Systems Ltd.

Excalibur Systems Limited specializes in the design and production of simulation systems that stimulate ESM, ELINT, RWR and self contained jammer receiving systems. Excalibur has also developed very cost-effective video output training systems for training in signal recognition and operation of ESM and ELINT equipment.

Incorporated in 1988, Excalibur has already gained an international reputation for the production of high quality, high functionality and cost effective simulation systems. The founding partners are primary participants in the daily operations of the company and are the direct link with the customer. Excalibur relies on recommendations and customer loyalty as a cornerstone to its marketing strategy. Customer references regarding the quality of our systems engineering, our products and our adherence to delivery schedules can be provided upon request.

Excalibur's success is based upon its adherence to the following five key principles:

- Performance to specification;
- Responsiveness to customers' requirements;
- Familiarity with EW and Radar user requirements;
- On-time delivery; and
- Commitment to long-term customer support.

Key Products & Services
TS Series Threat Simulators

Simulation systems are employed in an increasing range of applications due to technological and logistical advantages and cost saving benefits. The TS Series of threat simulators has been designed to satisfy the requirements of EW equipment testing and EW operator training. Excalibur has taken advantage of recent technological developments to produce systems that are affordable within shrinking defense budgets while retaining the very high fidelity performance demanded for current EW applications.

TS Series simulators have been designed with the following objectives in mind:

- Sophisticated Emitter Simulation;
- High Fidelity Performance;
- Modular System Architecture Design;
- RF, Digital and/or Video Outputs;
- Powerful, Comprehensive User Interface;
- Amplitude and Phase Direction (Angle) of Arrival Simulation; and
- Minimized Sparing.

Hard-line RF Injection Simulators for receiver development and test

To generate a realistic RF environment of hundreds of emitters to test and evaluate modern receiver and jamming systems. A simulated environment with very high pulse density levels and synchronized pulse on pulse is easily achieved given the modular system architecture of the simulators. Portable systems are also available.

Radiating Threat Simulators for range and anechoic chamber applications

The simulators can be configured with a wide range of HPAs and antennas to evaluate EW systems under "real" environmental conditions on a range, or to assess receiver performance in a very controlled environment such as an anechoic chamber. Large rack-mounted systems and small man-portable systems are available.

EW Operator Training Systems

These systems provide video channels that can drive a variety of instruments such as oscilloscopes, pulse analyzers and video recorders. Audio outputs can be configured to route specific emitters to each channel for left/right ear audio requirements. Emitter data is digitally transferred to a computerized emulation of a receiver console where students can manipulate receiver controls using a mouse. Video outputs of the signals are produced based on student actions. This is very cost-effective per student station.

Contact

Mr. Maurice C. Herbert
President
Tel: (613) 591-6000
Fax: (613) 591-6001
E-mail: info@excalibur.com
Website: www.excalibur.com

EWA-Canada

About EWA-Canada

Incorporated in June 1988, EWA-Canada is an ISO-9001 registered, Canadian staffed and managed engineering consultancy with current operations in Canada and Australia. In Canada, we provide systems, security and software engineering, technical analysis and related services to various government departments, such as the Department of National Defence, the Communications Security Establishment and Correctional Service Canada, as well as police forces and Canadian industry. In Australia, we provide systems and software engineering services to the Royal Australian Air Force.

EWA-Canada employs highly qualified engineers, systems analysts, programmers and technologists, many with extensive background in government operations, engineering, maintenance and equipment acquisition organizations. Our current strength is 30, including 22 engineers, over half of whom hold post-graduate degrees.

Key Services

We specialize in the application of structured methodologies, supported by state-of-the-art, computer-aided tools to:

- provide "cradle-to-grave" systems, security and software engineering, project management, integrated logistic support and life cycle material management support services; and
- develop, implement and support software programs, software applications and technical database systems.

Specific areas of technical expertise include:

- information technology and information technology security (ITS), including command, control and intelligence (C2I) systems and information operations;
- defence electronics, including electronic warfare systems; and
- environmental monitoring and management systems.

Current Projects

We are currently working on a wide variety of projects, including:

- implementation of an Electronic Warfare Threat Analysis system, a series of threat analyst work stations which will host a major relational database and a variety of analytical tools and purpose-built applications, integrated to achieve efficiencies in using and storing data, performing analyses, capturing analyst expertise and producing output;
- provision of Electronic Warfare Threat Analysis services;
- development of software tools, on-site collection of data and report preparation in support of Trial EMBOW VII, a flare effectiveness and infrared signature measurement trial held bi-annually by NATO's air forces;
- provision of in-country systems engineering support to the Royal Australian Air Force EW Project Office;
- provision of data modelling support to the development of a data warehousing system;

- development of the Systems Security Engineering Capability Maturity Model (SSE CMM), which identifies base practices to be performed by any organization developing or operating ITS products and provides a framework for assessing how well the organization performs critical security engineering processes - EWA-Canada personnel have audited major US and Canadian companies and Government agencies; and
- assessment and recommendation of upgrades to the ITS architecture of a number of major federal and regional organizations.

R&D Activities

EWA-Canada conducts a wide range of R&D, using both contract and internal funding. Projects include:

- development of prototype applications that use interactive 3-D graphics technology to reveal patterns in complex databases (data visualization);
- network security management, including monitoring, testing, intrusion detection, and traffic analysis and content assessment; and
- various projects related to application of commercial off-the-shelf tools to IT security engineering, system configuration management, system and product testing, etc.

Contact

Brian Nix
President
Tel: (613) 230-6067 ext. 211
Fax: (613) 230-4933
E-mail: bnix@ewa-canada.com

Filtran Ltd.
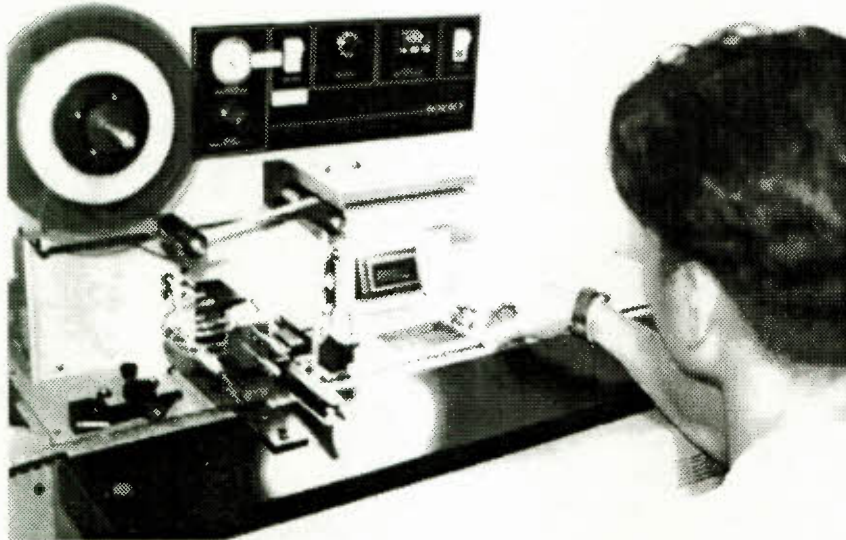
About Filtran Ltd.

Filtran Ltd. is a member of the Filtran group of companies which also includes Filtran Inc., in the U.S., Canadian Dataplex, Filtran Microcircuits Inc. in Canada, and Filtran India.

Filtran Ltd. was formed in 1969 to manufacture filters (Frequency selective networks), transformers, inductors and power supplies. It is now one of the very few companies in North America which still designs and manufactures filters. Although Filtran still produces custom transformers, inductors and power supplies, it now has a range of standard products as well. These have been developed for a variety of applications in the evolving telecommunications technologies. Filtran Ltd. has invested heavily in both manufacturing equipment and automatic test equipment and fully expects to be able to compete against any offshore competition.

Key Products & Services

Filtran manufactures the following types of products:

- Interface transformers and other products for T1/E1, CEPT, ISDN (Primary Rae, U-bus & S-bus), ADSL and HDSL applications.

Many of these parts have been specifically adapted for use with Siemens, Mitel, Crystal, Level One, AT&T, PMC/Sierra, Dallas, Exar, STC, AMD, Intel, National and other integrated circuits.

They are also required to comply with specifications for ITU (formerly CCITT), ANSI, IEEE and Bellcore.

Additional products include:

- Signal Transformers;
- Inductors;
- Switch Mode Power Transformers;
- Linear Power Transformers; and
- Filter Networks (Active and passive).

Filtran products are used by equipment manufacturers worldwide and they are served by a network of distributors and representatives.

Because these parts are used in a number of countries, they must meet the requirements of many different regulatory agencies. These include IEC, EN, VDE, BABT, UL and those promulgated by the Australian & New Zealand regulatory bodies.

Filtran has 17 UL approved insulation systems and blanket CSA approval for all power transformers up to 1 KVA.

R&D Activities

As times have changed, equipment has shrunk in size, while at the same time delivering increase capability and quality. Many equipment manufacturers have achieved this by adopting surface mount technology. Filtran continues to develop surface mount solutions for these companies and, over the last 8 years, has reduced the volume required for T1/E1 interface transformers to approximately 1/20 of the earlier through hole units. Current initiatives focus on:

- Surface Mount technology for Telecommunications Transformers. and small Switch Mode Power Transformers;
- Transformers for T1/E1, T3/E3, HDSL, ADSL applications; and
- Splitting Filters for ADSL on twisted pair telephone lines.

Also Filtran is now working extensively in the area of ADSL (Asymmetric Digital Subscriber Loop) which represents the telephones industry's best chance to deliver low cost data and phone service to their subscribers. It is expected that this very low cost solution will be adopted as a global standard in 1997. Recently, as part of the ongoing R&D activity, Filtran engineers developed a small 125,000 volt oil filled transformer for use in a portable x-ray machine.

Further development is continuing in the realm of small, light, very high voltage transformers.

Contact

Mr. Ian Bolt
Tel: (613) 226-626
Fax: (613) 226-7124
E-mail: ibolt@filtran.com
Website: www.filtran.com

Filtran Microcircuits Inc.

About Filtran Microcircuits Inc.

Established in 1983, Filtran Microcircuits Inc. produces microstrip, bonded stripline and thick metal-backed Teflon (PTFE) circuits for satellite, aerospace, telecommunications automotive, navigation and defense applications worldwide.

Filtran Microcircuits is an innovative, technically strong group which includes some of the most creative scientists in the microwave industry. Serving our diverse clientèle since 1983, we have earned a reputation for producing technically intricate circuits and superior workmanship, as well as for meeting delivery schedules.

Key Products & Services
Precision Circuits

In high-end applications like aerospace, air traffic control, and search and rescue, microwave circuitry must be reliable. Filtran delivers the precision and performance these mission-critical situations require. We've developed equipment and processes to manufacture truly precision circuits with edge resolution of .0005 inches or better.

Innovative Processing

Process engineers recognize the difficulty in achieving reliable plated through holes (PTH) in PTFE circuits because of Teflon's chemically inert nature. At Filtran, we've developed our own Sodium Etch Formulation for PTH and edge plating. It gives us tight control of processing, resulting in:

- Reliable, high performance circuits; and
- Excellent adhesion of copper to PTFE.

Blind Hole Sputtering

Filtran Microcircuits has also successfully pioneered sputtering techniques for PTH applications on thick metal-backed (aluminum, copper or brass) PTFE circuitry. This unique blind hole sputtering process produces PTFE substrates with superior reliability, performance and mechanical strength at a competitive price.

High-Precision Photolithography

The accuracy of Filtran's circuit board imaging approaches semiconductor grade resolution. These remarkable results are achieved through Filtran's specially developed process using liquid photoresists and high-intensity collimated UV exposure techniques. These fine line processes are used for both single and double-sided PTH boards.

Circuit Assembly

Filtran Microcircuits applies exacting production standards to circuits during and after photolithography. Complex board shapes are fabricated using CNC routing, milling, laser machining and special dyes. Filtran also has thermo-compression and ultrasonic wire bonding facilities using gold and aluminum wire or ribbon. Parallel gap wielding equipment adds a greater level of flexibility and reliability to our bonded stripline processing.

Quality Assurance

Filtran's stringent program of in-process inspection results in high yields on the most complex circuits. All production processes are strictly monitored, and our up-front engineering, SPC and final inspection all help to ensure products comply with customer-specified standards.

Contact

Filtan Microcircuits Inc.
Craig Sutton or Lynnann Parsons
Tel: (613) 737-0706
Fax: (613) 737-0495.
E-mail: fmi@ott.hookup.net.
Website: www.filtranmicro.com

International Datacasting Corporation

About International Datacasting Corporation

Since its creation in 1984, International Datacasting Corporation has been providing unique satellite communication solutions for broadcast networks worldwide. The Corporation is a leader in the design and manufacture of satellite digital audio and data broadcast technology, with systems operating in 35 countries.

International Datacasting employs a number of highly qualified engineering and technical personnel, with particular expertise in the design of RF modems, digital circuits including custom integrated circuits, embedded firmware, object-oriented software, mechanical packaging and high density printed circuit boards for satellite-based applications. The Corporation puts a high priority on research and development, annually committing approximately 15% of its expenditures on such activities.

Key Products & Services

International Datacasting's engineering and production personnel, working in unison with a professional management, administrative and marketing team, continues to design and deliver products utilized and acclaimed worldwide.

With the introduction of the Compact Disk (CD) format of music reproduction and distribution in the late 1980's, a significant demand emerged for the upgrade of radio broadcasting to the use of digital technology. The Corporation worked with the industry to meet this requirement and continues to be a leader in the development of products for digital audio broadcasting via satellite.

Digital Audio Products

- CD quality stereo
- satellite delivered via SCPC
- frequency agile
- remotely addressable and controllable
- MPEG and apt-X audio compression
- 64kb/s thru 267 kb/s
- auxilary data channels.

The Corporation's system configurations such as RadioNet, MPEG PRO and FlexRoute have been implemented for audio broadcasters of all sizes — from 10 site regional networks to 1 000 site networks for international broadcaster and multi-thousand site networks for in-store advertisers.

While digital audio products serve the needs of one segment of the broadcast community, satellite data is rapidly becoming a significant player in its own segment of the industry. As more information becomes readily available within industry-specific databases, the demand for faster, real-time data distribution grows. The Corporation has both the technology and products to meet these new challenges of high-speed, point-to-multipoint, satellite data broadcasting.

Data Broadcasting Products

- data rates 1.2 kb/s to 192kb/s
- sync or async data formats
- multiport satellite receivers
- full frequency and data rate agility
- individual, group or global addressing
- dynamic reconfiguration of entire network

International Datacasting's DataNet system configuration is in use by major international data broadcasters where flexibility, dynamic configuration and multi-port capability offer unsurpassed operating advantages.

Multimedia Data Broadcasting Software

EchoCom Plus

- one-way data broadcast system
- distribute any type of PC file — text, graphics, video, audio, animation
- Windows '95 & Windows 3.1 compatible
- individual configuration of up to 10 000 subscribers
- network access controlled by license number
- asynchronous data transmission up to 19.2 kb/s, using PC's internal COM port
- data transmission up to 256 kb/s, using a high speed synchronous interface card
- independent of broadcast channel type — satellite, LAN, FM-SCA, RDS, cable

Manufacturing

International Datacasting manufactures its full complement of products using both in-house and sub-contractor facilities. Printed circuit boards comprising both surface-mount and thru-hole component layouts are fabricated in state-of-the-art, ISO 9000 qualified sub-contractor facilities. Sub-assembly testing, product burn-in and final quality assurance are performed by corporate personnel on all units shipped.

Systems Engineering

The systems engineering staff are available to provide custom network designs and solutions to client specifications. Full field installation and support is available at any system level for worldwide turn-key applications.

Contact

Hugh Mullington
President
International Datacasting Corp.
Tel: (613) 596-4120
Fax: (613) 596-4863
E-mail: N/A
Website: N/A

Ivation Datasystems Inc.

Data published by the State of Food and Agriculture, Food and Agriculture Organization of the United Nations. Beyond 20/20™ displays data in multiple dimensions. Users can pivot and nest dimensions. Sum, group, and subset data. Search and sort data. Select and hide data. Zoom in and out of data. As well, Beyond 20/20's unique ChartBrowse™ and MapBrowse™ features (not shown) make it easy to quickly identify cycles, trends, and geographic distributions.

About Ivation Datasystems Inc.

IVATION is a leader in the development of multidimensional software tools and professional services for delivering statistical data worldwide. Based in Ottawa, Ontario, Canada, Ivation is a privately-owned company. It was established in 1987 by an innovative group of experienced, statistical specialists and technical professionals. Ivation's software and services enable information providers to distribute numbers in an easily accessible, visual format.

Key Products & Services
Software

IVATION develops, markets, and distributes Beyond 20/20™ software, the emerging standard for the dissemination of socio-economic data. Beyond 20/20™ empowers economists, analysts and policy-makers to quickly examine trends, cycles, and geographic distributions in the data from different viewpoints. Customers include some of the world's leading statistical agencies. These organizations use Beyond 20/20™ to manage and distribute large and often complex volumes of numeric information to their customers. Ivation is a recognized Microsoft Solution Provider.

Professional Services

IVATION's Professional Consulting Services Group offers a broad range of complementary professional services for custom applications, for example:

* Demographic, occupational, and financial modeling; and
* Micro and macro economic simulation; time-series, and demographic data management.

R &D Activities

IVATION's Research and Development team is focused on building tools and applications that enhance and simplify the dissemination of socio-economic data. We often work with partners in the information distribution sector or those who service this market in order to build value-added products related to the Beyond 20/20 line. These relationships have helped us to create one of the best software products available for managing, documenting, and delivering statistical data to clients around the world.

Selected Clients

* Statistics Canada
* Organization for Economic
* Co-operation and Development (OECD), Paris
* International Energy Agency, Paris
* Office for National Statistics, UK
* Canadian International Development Agency (CIDA)
* Treasury Board
* National Research Council
* Office of the Superintendent of Financial Institutions
* Human Resources Development Canada
* Indian and Northern Affairs
* Heritage Canada
* Transport Canada
* Canadian Centre for Justice Statistics
* Department of Labour
* Government of British Columbia

Contact

Janet E. Cater
Director of Sales & Marketing
IVATION DATASYSTEMS INC.
265 Carling Avenue, Suite 502
Ottawa, Ontario, Canada K1S 2E1
Tel: (613) 563-3993 ext. 232
Fax: (613) 563-7233
E-mail: info@ivation.com
Website: http://www.ivation.com

JDS FITEL Inc.

About JDS FITEL Inc.

JDS FITEL Inc. pioneered the development of passive fiberoptic technology to address the rapid evolution of optical fiber networks within the telecommunications industry. The company presently designs, manufactures, sells and supports a broad range of fiberoptic components and test instrumentation which addresses specific technology requirements of the fiberoptic market.

Key Products & Services

Critical products pioneered by JDS FITEL Inc. for telecommunications applications include optical switches, wavelength division multiplexers, components for erbium-doped amplifiers, backreflection/loss meters, polarization measurement equipment, and environmental test systems for reliability testing of fiberoptic devices.

JDS FITEL Inc. is a market leader in fiberoptic technology, having built a reputation as a product innovator by identifying emerging market opportunities for fiberoptic components and test instrumentation.

Passive Optical Components

JDS FITEL Inc. is a leading supplier of fiberoptic components to the telecommunications and CATV industry. The company's current product catalogue offers more than 100 different types of components and performance options. This is in addition to the many products developed to customer specifications on an OEM or contract basis. Product development and enhancement activities continue to be part of JDS FITEL's on-going commitment to meeting both customer and market demands.

Test and Measurement Equipment

Originally developed to address the company's own testing needs, JDS FITEL Inc. test and measurement instruments have found opportunities in the telecommunications market-place. In 1986, JDS FITEL Inc. launched one of the first commercial return loss test systems and has continued to see significant growth in sales of return loss measurement instruments. Optical return loss measurements, for example, are now considered part of the standard measurement practice for evaluating components and connector performance.

Fiberoptic Installation Products

JDS FITEL Inc. has identified product opportunities in reselling and distributing outside plant equipment designed for the field maintenance and installation market. The products include the FITEL line of single- and multi-fiber fusion splicers, as well as a range of related accessories. JDS FITEL Inc. is also a leading supplier of optical connectors, cable assemblies, and connector polishing machines.

JDS FITEL Inc. products are sold both directly and through a network of agents, representatives and distributors to customers in more than 40 countries.

The Company

JDS FITEL Inc. has experienced rapid growth since its incorporation in 1981 and currently employs approximately 700 people. The company's headquarters are located in Nepean, Ontario, Canada.

A strong commitment to research, development, manufacturing and customer service has enabled JDS FITEL Inc. to consistently provide innovative solutions for a wide range of fiberoptic applications. Few competitors in the world offer as complete a technology line as JDS FITEL Inc.

The transition of the telecommunications industry from a domestic market focus to an international market focus has allowed JDS FITEL Inc. to build a close business alliance with many leading Fortune 500 companies, including telecommunications companies and fiberoptic equipment manufacturers, as well as research and development laboratories and universities.

Customers have chosen and stayed with JDS FITEL Inc. products because the company has retained a focus on anticipating and meeting customer needs.

Contact

JDS Fitel Inc.
Tel: (613) 727-1304
Fax: (613) 727-8284
E-mail: sales@jdsfitel.coom
Website: www.jdsfitel.com

KOM Inc.

About KOM Inc.

KOM was founded in 1969 in Ottawa, Canada to provide service, support and board level communication components for DEC-based computer systems. In 1984, after pioneering the integration of high capacity WORM (Write-Once-Read-Many) optical disk drives with Digital Equipment computers, the company recognized the enormous potential of optical storage technology and redirected its efforts exclusively into this new field.

Since that time, KOM Inc. has become a leading supplier of optical storage subsystems with over 5 000 installations worldwide. The company's main business is the development of connectivity software - specifically, device drivers for use with all major brands of optical devices (most manufacturers do not provide software with their products).

KOM's drivers are designed for full compatibility with all current operating systems (UNIX, VMS, Windows NT, Solaris, etc.) and have earned the company certification as a Hewlett-Packard Channel Partner, Microsoft Solution Provider, and DEC Business Partner. KOM is also an authorized reseller of all major brands of optical devices, so it can offer clients a total optical storage subsystem, integrating hardware and software components with their particular platform.

KOM Inc. has long been the acknowledged leader for the integration of Write-Once media applications requiring high levels of data integrity and security. That is why OptiFile and OptiServer are the products of choice for many secure installations including the U.S. Department of Energy, U.S. Navy, NASA and several National Defence sites in Canada. KOM's customer list also includes well-known aerospace companies, computer manufacturers, research facilities, universities, banks, and medical centers.

Key Products & Services

OptiFile is KOM's software interface for standalone .5.25", 12" and 14" optical disk drives. OptiFile allows any type of optical disk (WORM, Re-writable or Multifunction) to appear as a standard magnetic drive to users and is totally transparent to the operating system and its application programs.

OptiServer offers the same level of transparent access for multi-platter optical jukeboxes and is one of the most widely-used device drivers in the industry.

Goals

With today's increasing demand for storage intensive applications (i.e., document imaging, data warehousing, storage of engineering/medial records, archiving), optical is rapidly becoming the technology of choice for cost-effective storage and quick retrieval of large volumes of data. KOM's goal is to help companies adopt and manage optical disk storage systems and solutions.

Contact

Mr. Marwan Zayed
General Manager
KOM Inc.
4019 Carling Ave.
Kanata, Ontario
Canada K2K 2A3
Tel: (613) 599-7205
Toll-free: 1-800-668-1777/
1-800-5KOMINC
Fax: (613) 599-7206
E-mail: sales@kominc.com
Website: http://www.kominc.com

Linktek Corporation

About Linktek Corporation

Linktek Corporation is one of the world's leading developers of advanced, client/server financial and material management systems for public sector enterprises. Established in 1984, Linktek currently supports over 10 000 FreeBalance users in over 105 agencies across Canada, the United States and 18 other countries around the world. To ensure users gain maximum benefit from their FreeBalance investments, Linktek backs its software with a complete range of implementation, training and support services through its offices in Ottawa and Washington, D.C.

Key Products & Services
A FreeBalance Solution

Linktek Corporation designs and develops FreeBalance, a Year 2000 ready, client/server financial and material management system specifically built to satisfy the evolving information management requirements of the public sector. Featuring an intuitive and user-friendly design, FreeBalance consists of System Control, Appropriation Management, Expenditure Management, General Ledger, Purchasing, Revenue Management, Asset Management, and FreeBalance PowerPlay. Together, these modules offer fully-integrated, GAAP-compliant functionality that was built for the public sector "from the ground up".

What makes FreeBalance unique, however, is its inherent flexibility. Available "off-the-shelf", FreeBalance is powered by a user-defined Chart of Accounts engine that can be configured to handle a complete spectrum of financial control strategies. In addition, FreeBalance plugs right into your existing desktop and works as an integrated component within your organization's total systems environment, seamlessly connecting with other administrative, operational and central agency systems as well as any forms-based front ends. All of this is possible without the burden of expensive customized programming and its inherent maintenance costs. The result is an affordable, risk-free system solution that can be up and running within weeks. That's the FreeBalance difference.

Advanced Technology

FreeBalance takes advantage of cross-platform, client/server Uniface 4GL technology to deliver superior and well-proven performance. Fully-scaleable, FreeBalance works with any of the major relational databases, supports today's popular GUIs, and runs in a variety of deployment scenarios on any of the standard LAN or WAN networks. With FreeBalance, you have the freedom to build the hardware environment that best suits your long-term IT strategies.

Customer Service

Linktek's Client Services Specialists provide professional implementation and training services to help optimize FreeBalance according to your organization's policies, procedures and structure. Through our Annual Maintenance Support (AMS) service, Linktek provides unlimited telephone hotline support, as well as periodic software and documentation upgrades which further increase the usefulness of your FreeBalance systems.

Client Approval

Some FreeBalance clients include:

- Department of National Defence
- Revenue Canada
- Transport Canada
- University of Manitoba
- U.S. Information Agency
- U.S. Department Of Transportation
- U.S. Department Of Housing and Urban Development

Goals

Working in partnership with our clients, Linktek is dedicated to building the most effective financial and material management systems available to the public sector, and providing first-rate customer service.

Sound financial control is critical to successful program management and delivery. That's why in this era of profound change, FreeBalance is the ideal system for the public sector. We stake our reputation on that claim.

Contact

Bruce Lazenby
VP - Canadian Operations
Tel: (613) 236-8704 ext. 115
Fax: (613) 236-7785
E-mail: blazenby@linktek.ca
Website: http://www.linktek.ca

Microstar Software Ltd.

About Microstar Software Ltd.

As a world-class provider of information management products and services based on international standards, Microstar delivers value-added document and transaction management solutions for its customers. Microstar Software Ltd. was incorporated in Canada in 1983 and is publicly traded on the Toronto Stock Exchange.

Microstar specializes in applications of the Standard Generalized Markup Language (SGML ISO 8879). SGML is the parent of the popular Web protocol HTML. SGML is an open, international information management standard that enables independence from hardware and software by providing non-proprietary interchange of transactions and documents across systems, departments, businesses and industries. Some of the business benefits that Microstar delivers with SGML-based information management solutions include: increased productivity, reduced support costs, faster time to market and improved market positioning.

The Canadian and US defence industries were among the primary adopters of SGML. Now, SGML is used by industries worldwide, including: manufacturing, pharmaceuticals, automotive, publishing, aerospace, and telecommunications. SGML has recently been chosen as a standard for interchange of banking and stock trading transactions. Microstar has pioneered innovative applications of SGML for Electronic Commerce over the Internet.

Key Products & Services

Microstar's experienced professionals have enabled companies, including: Dow Jones Co., Eastman Kodak, and AT&T, to leverage the power of SGML to meet the challenges of large scale information management.

Microstar's services include:

- End-to-end SGML publishing systems;
- Document analysis and DTD design;
- SGML Document Management systems;
- Custom SGML product engineering; and
- SGML theory and product training

Microstar will design and develop SGML software products to meet specific customer requirements. Our Near & Far® products are the most cost-effective tools for SGML document analysis, design and authoring.

R&D Activities

Research & development in new technologies and processes ensures that our clients receive the most advanced solutions. This commitment to customer satisfaction is manifested in our continuous effort to maintain productive dialogue with our customers, industry experts, leading academics, and research groups around the world. Microstar maintains a keen awareness of standards developments by participating in several industry standards bodies and forums.

Contact

Microstar Software Ltd.
3775 Richmond Road
Nepean, Ontario
K2H 5B7
Tel: (613) 596-2233
Fax: (613) 596-5934
E-mail: cade@microstar.com

Milkyway Networks Corp.

About Milkyway Networks

Milkyway is engaged in the development, sale and support of proprietary network security products for computer networks connected to the Internet or which utilize Internet tools and applications for Intranet communications solutions. The Company's objective is to be a world leading supplier of innovative network security solutions for users with medium-to-high level security needs.

The Company's principal product, Black Hole, is a leading network security firewall product providing a high speed of transmission and user transparency without compromising security. Black Hole also provides bi-directional user level authentication, ease of system installation and configuration and extensive auditing features.

The company was founded in May 1994. Milkyway has US Headquarters in Santa Clara, California and maintains ten offices in Canada, the United States and Europe. The corporate office is in Ottawa, Canada.

R&D Activities

The Company places significant emphasis on research and development and will continue to do so. The Research and Development Group is comprised of the Advanced Technology Group, the Business Technology Group, as well as various product development groups. Additional product development groups will be formed for the development and introduction of additional security products.

The Advanced Technology Group is responsible for all research activities undertaken by the Company in order to ensure that the Company remains at the forefront of network security technology. The Business Technology Group is responsible for customizing Milkyway's products to fit each customer's specific requirements. The various product development groups are responsible for the development and/or upgrade and enhancement of their respective products.

Key Products & Services

Black Hole is a secure application gateway that protects your private network from unauthorized access while providing your user base with uninhibited transparent access to the Internet. It can also be set up to provide you with PBX applications as well as virtual private networking over the Internet. In a typical configuration, it is located between the Internet and private network. Milkyway provides ongoing technical support and software upgrades to end-users. Black Hole has been evaluated by the Canadian Security Establishment as an information security product achieving international draft functional specifications and "tested and certified" by the National Computer Security Association in the US. Black Hole has been identified by Network World as the most innovative firewall and, in a separate study, as one of the three leading contenders in the fragmented firewall market.

Red Shift is a security auditing tool that assists organizations in the fight against security breaches by identifying and providing effective solutions to security vulnerabilities. Red Shift can be configured to test your internal security (security practices on your internal network) as well as your perimeter security (your protection from unauthorized access from outside the corporate network). Red Shift can test your network for most of the security vulnerabilities.

Charon secure remote access is the latest addition to Milkyway Network's family of security products. Using the Internet or other public networks, Charon creates a confidential communication channel to ensure privacy and integrity of all interactions between a user and a private network. Charon provides to remote and mobile users access control and authentication capabilities as well as encryption, decryption, and key management support using Nortel's Entrust Public Key Infrastructure (PKI). The product comes complete with all the software components required to configure and manage the client, server and public key infrastructure. Charon is an add-on to Black Hole firewalls or is available as a stand-alone, all inclusive client/server product package that can run beside a firewall.

Contact

Milkyway Networks Corp.
Tel: (613) 596-5549
Fax: (613) 596-5615
E-mail: infogmilkyway.com
Website: www.milkyway.com

Mitel Corporation
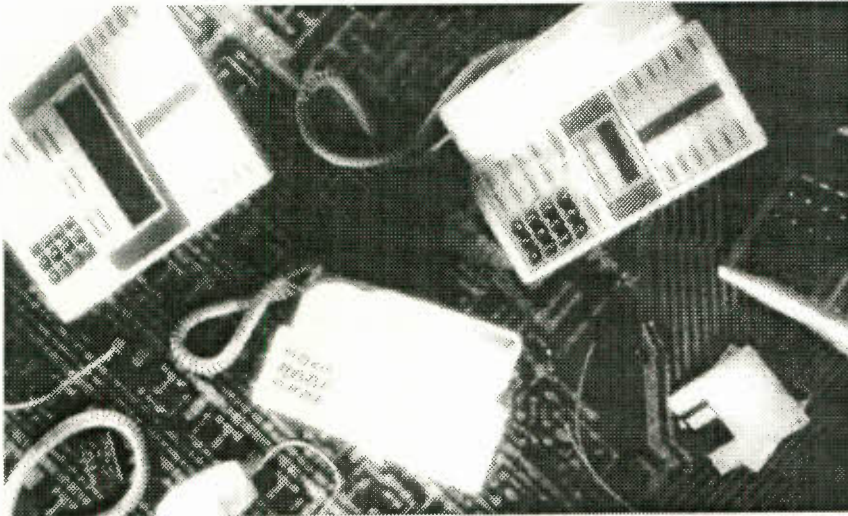
About Mitel

Mitel Corporation is an international communications products supplier. The Company's leadership strategy is centered on advancing people-to-people communications in an open, distributed and standards-based environment. Mitel designs and manufactures systems, sub-systems and microelectronic components for sale to world markets in the telephony, computer telephony integration (CTI) and communications industries.

Mitel has emerged as the industry leader in developing CTI technology. Mitel's vision of CTI consists of a truly integrated, single-infrastructure enterprise solution that converges voice and data. Mitel's products are fulfilling the promise of CTI in open, scaleable solutions that provide competitive and cost advantages for even small to mid-sized businesses.

Mitel is committed to designing products that will converge communications and computing. This growth market offers new opportunities for Mitel as the Company continues to invest in Research and Development on both the Semiconductor and Business Communications Systems (BCS) sides of the business.

Key Products & Services
Semiconductor

Mitel Semiconductor designs and manufactures integrated circuits (ICs) and thick film hybrid microelectronic components in support of the telephony, data communications, and CTI markets. Mitel Semiconductor develops a wide range of products that allow the smooth integration of store-and-forward and multimedia computer data with traditional voice traffic. In fact, this business unit developed the key piece of technology that allowed Mitel to develop jointly with Madge Networks the NeVaDa ™ integrated voice and data backbone. The acquisition of ABB Hafo AB of Sweden (renamed Mitel Semiconductor AB) on March 29, 1996 has expanded Mitel Semiconductor's product offerings and production capacity. Demand for Mitel's semiconductor products continues to grow at a significant rate.

Business Communications Systems (BCS)

Mitel has a track record of developing products with the customers' future in mind. Open platforms, compatibility of peripheral devices and flexibility of applications are the design concepts that drive the BCS Division toward success in multimedia convergence. Mitel products are fulfilling the promise of CTI by simplifying the networking infrastructure required by a company to manage effectively its voice and data communications. Mitel offers CTI technology based on two distinct approaches. In the first, the PBX evolves toward the world of computing. NeVaDa™, the latest step in the continuing evolution of the SX-2000 LIGHT system, uses a Madge Networks switching module to transport voice, video and data traffic over a single, integrated network. The second approach starts on the computing side and adds telephony functions directly to the computer (MediaPath™). Both approaches provide complete computing and telecommunications functionality in one integrated system.

Mitel's BCS Division is positioned to be a major growth engine for Mitel as new products for the small enterprise are developed, sales of the SX-2000 LIGHT continue to grow and the Company capitalizes on the emerging CTI market.

Goals

Mitel's mission is to distinguish itself as a global leader by creating communications solutions that offer customers exceptional value. Mitel will build its future on its core competency in telephony while continuing to explore and expand into new markets. Alliances with world class partners, a commitment to product excellence and a strong leadership position in the CTI market will ensure continued success for Mitel's customers.

Contact

Investor Relations
Tel: (613) 592-2122
Fax: (613) 592-4170
Website: www.mitel.com

MOSAID Technologies Inc.
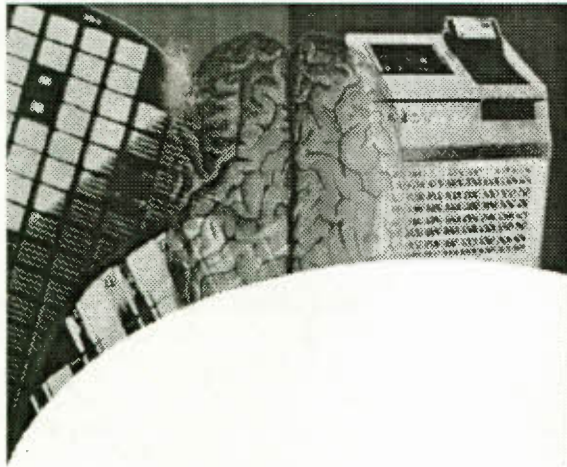
MOSAID Technologies Inc.

The Memory Experts

About MOSAID Technologies Inc.

MOSAID designs and licenses advanced memory integrated circuits (ICs) and designs, manufactures, sells and supports memory test systems for engineering applications. Since 1975, MOSAID has produced and licensed designs for every generation of Dynamic Random Access Memory (DRAM) and numerous Static Random Access Memory (SRAM) designs.

Through its 22 years of experience in the design of memory ICs, its active participation in the memory standards setting body, and its involvement in technical and market conferences, the Company has gained significant expertise in the design and engineering testing of different memory types.

Key Products & Services
Designing Memory

MOSAID's Semiconductor Division focuses on the design and licensing of advanced memory ICs and more recently, memory with embedded logic functions. The Company works with its customers to ensure its designs meet specifications and to adapt specific memory IC designs to the customer's manufacturing process. Recent designs inlcude 64Mb and 256Mb SDRAM & embedded DRAM & HDRAM macrocells.

MOSAID also has specialized technical competence and leading edge technology protected by a growing number of patents. Manufacturers wanting to outsource design work, generally seek out MOSAID because of the Company's expertise and independence.

Since 1989, designs have been licensed to customers, with ownership of the intellectual property being retained by the Company. Customers are granted royalty-bearing licenses if and when the designs actually enter production. MOSAID also retains ownership of the intellectual property resulting from these projects.

Testing Memory

MOSAID's Systems Division designs, manufactures, markets and supports engineering memory test systems. The Company's test systems are primarily purchased for the engineering testing of both standard memory and memory with logic ICs — a market segment it pioneered and continues to dominate. New technologies such as flash memory, etc., are spreading rapidly and MOSAID's systems sales are increasing for the debugging and characterization of these new device types.

MOSAID customers consist primarily of semiconductor manufacturers located throughout Asia, North America and Europe.

R&D Activities
Technological Excellence

MOSAID works on the leading edge of memory technology. The Company works with all the industry leaders at the Joint Electron Device Engineering Council (JEDEC), the industry's standard setting body. MOSAID has been recognized as a centre of excellence for SDRAM the new emerging standard memory and the emerging Application Specific Memory market.

The company has a unique understanding of technology and trends having worked with practically all of the significant players in the memory chip industry.

Addressing the needs of memory industry (beyond SDRAM) into the 21st Century, MOSAID is working with the SyncLink Consortium to examine the feasibility, chip architecture and bus interface of the new standards, as well as to do the demonstration design.

Contact

MOSAID Technologies Inc.
P.O. Box 12579
Kanata, Ontario
K2K 1X6
Tel: (613) 836-3134
Fax: (613) 831-0796
Website: www.mosaid.com

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Newbridge Networks Corporation

About Newbridge Networks

Newbridge Networks is a world leader in designing, manufacturing and servicing a comprehensive family of networking products and systems that deliver the power of multimedia communications to organizations in more than 100 countries throughout the world. Newbridge products are the choice of an expanding range of customers that includes the world's 200 largest telecommunications service providers, as well as more than 10 000 public and private enterprises, government organizations and other institutions.

The company's MainStreet® family of products ranges from high-capacity time division multiplexer (TDM) products to next generation packet technology systems, encompassing frame relay and asynchronous transfer mode (ATM). The Newbridge VIVID™ product family offers a switched routing solution for enterprise environments. The MainStreetXpress™ products, developed by the Siemens / Newbridge Alliance, offers carriers the most comprehensive suite of ATM products and the largest core infrastructure ATM switch.

A Research and Development Leader

The markets for the company's products are characterized by rapid technological change. Therefore, in order to maintain its leadership position in advanced networking technologies, Newbridge is committed to research and development. Approximately 11% of Newbridge revenues and more than 30% of the company's workforce are devoted to research and development. The company's primary R&D centers are in Kanata (Canada); Herndon and Santa Clara (United States); Maidenhead (United Kingdom) and Rennes (France). In 1996, facilities in Halifax and Vancouver (Canada) and France were added.

This commitment to R&D has enabled Newbridge to establish itself as a recognized world leader in the $100 billion plus market for networking technologies.

Leading Edge Manufacturing

Newbridge maintains manufacturing facilities in Kanata, Newport, Wales, Rennes and France from which it ships its products to customers throughout the world.

The Kanata facility manufactures over 85% of Newbridge products. More than 95% of this facility's production is exported, a significant net benefit to the Canadian economy.

Through research and the implementation of new processes, the Kanata facility has optimized assembly and manufacturing operations. Intensive investment in automated methods has increased flexibility and efficiency, and has integrated quality at every step of manufacturing.

Newbridge facilities make wide-scale use of computer-assisted design and highly automated surface-mount manufacturing processes to ensure product quality and integrity. The company's facilities are certified with the ISO 9001 quality standard.

Newbridge also maintains a close relationship with a number of strategic suppliers through a worldwide sourcing program designed to ensure quality, efficiency, reliability and a secure source of supply.

Newbridge Affiliates

Newbridge actively seeks alliances with complementary organizations in order to enhance its strong market position as a total networking solution vendor, and to accelerate the time-to-market for new products and technologies.

By partnering with other players, Newbridge is able to diversify, riding the leading edge of new technology development while minimizing risk and strengthening its networking product line.

Newbridge affiliates include:

- Advanced Computer Communications (ACC);
- Castleton Network Systems Corporation;
- CrossKeys Systems Corporation;
- FastLane Technologies Inc.;
- Cipher;
- Starvision Multimedia Corporation;
- TimeStep Corporation;
- Televitesse Systems Inc.;
- Telexis Corporation;
- Transistemas S.A.;
- Tundra Semiconductor Corporation;
- TNN Networks Ltd.;
- Vienna Systems Corporation; and
- West End Systems Corp.

Contact

Newbridge Networks Corporation
P.O. Box 13600, 600 March Road
Kanata, Ontario, Canada K2K 2E6
Tel: (613) 591-3600
Fax: (613) 599-3673
Website: http://www.newbridge.com

Norpak Corporation
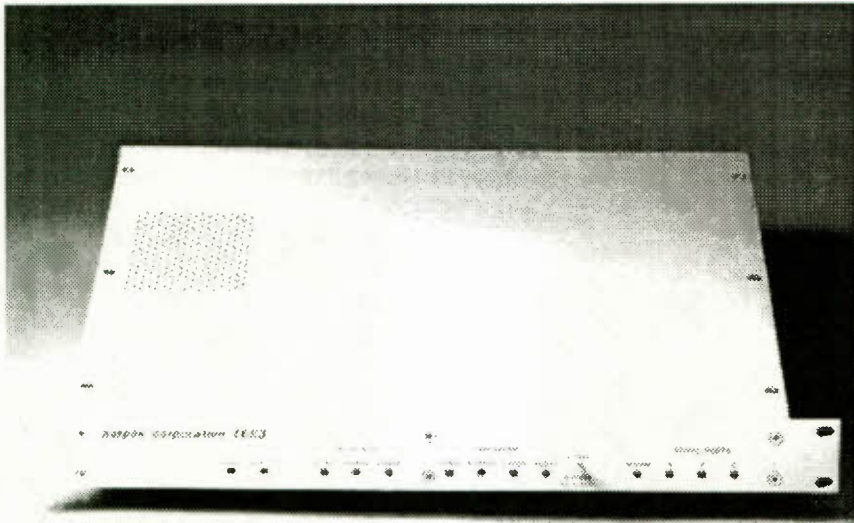
About Norpak Corporation

Norpak Corporation supplies TV Data Broadcast products, systems and software for transmitting data over the vertical blanking interval (VBI) of any standard TV signal. With 19 years experience and over 1 300 systems installed worldwide, Norpak is the world's leader in TV Data Broadcast solutions.

Norpak's major customers include television broadcasters, cable system operators, news agencies, systems integrators and value-added service providers. Typical TV data applications include data transfer, Internet content distribution, news and stock quote delivery, electronic publishing, image transmission and closed captioning.

Key Products & Services

Norpak supplies a complete line of TV data encoders, receivers, bridges, and system-level applications software to meet specific user requirements. Norpak's products operate worldwide in any TV system, including 625-line and 525-line systems with NTSC,

PAL, or SECAM modulation. All Norpak products feature advanced forward error correction (FEC) techniques to achieve error-free data transmission. Norpak's standard products include:

TV Data Headend Products — the TES3 TV Data Encoder, a flexible platform that can encode and insert up to four data streams into a single VBI. Encoder software modules are available for broadcast or bridging of data meeting North American (NABTS), European (WST) or Japanese standards for teletext data transmission, and for EIA 608 Closed Captioning, or for configuring the TES3 as a Test Encoder.

TV Data Receivers — Norpak supplies both internal PC-card and external PC-peripheral TV data receivers that operate based on NABTS or WST Packet 31 standards at data rates up to 115.2Kbps. Norpak's PC card receivers plug into an expansion slot on any IBM-compatible PC. Norpak's PC-Peripheral Receivers connect to a PC serial COM port.

System Software — For end-to-end system solutions, Norpak offers application software packages for basic file transfer (BFT), advanced file transfer (AFT), Internet distribution (VBinet), and weather radar image transmission (VBIRAD). For a commercial, subscription-based service Norpak offers subscription control system (SCS) software as an optional add-on to the BFT, AFT and VBinet system packages.

Internet Distribution System — Norpak's VBinet System enables the scheduled gathering and distribution of Internet content, such as World Wide Web pages, over the VBI directly to PCS. The VBinet Receive software receives, decodes, and stores the content on the receiving PC hard drive. The end user can instantly access and browse the content at any time using any standard Internet browser, without tying up a phone line. The receive software automatically and seamlessly initiates a standard Internet connection for "hotlinks" to any data not sent over the VBI.

R&D Activities

Norpak R&D activities focus on the development of leading-edge products, systems and software for TV Data Broadcast applications.
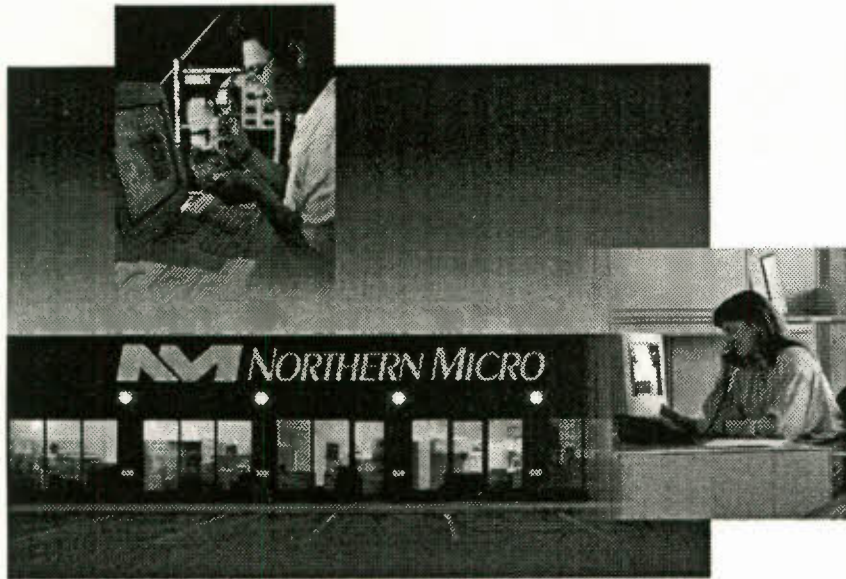
Goals

Norpak's goal is to be the leading supplier of TV Data Broadcast solutions.

Contacts

Dr. James F. Carruthers
President, or
James W. Johnson
Vice President, Marketing & Sales
Tel: (613) 592-4164
Fax: (613) 592-6560
E-mail: sales@norpak.ca
Website: www.norpak.ca

Northern Micro Inc.

About Northern Micro Inc.

Northern Micro Inc. is a computer manufacturer specializing in the supply of customized hardware solutions for designers and users of computer networks. It is a lean, technically strong company founded in 1985 by its owner and president, Herman Yeh.

The company operates from a 9 000 square foot headquarters in the National Capital Region. PC's and servers are manufactured in an 18 000 square foot leased facility. Sales offices are maintained in Vancouver, Halifax and Québec City.

Northern Micro is ISO 9002 certified and is also a certified Circle - Canada personal computer manufacturer.

All Northern Micro Computers have been certified by the Canadian Standards Association (CSA) and the Department of Communications (DOC) which is equivalent to FCC class B in the USA.

Through solid technical expertise, R&D and creativity, Northern Micro has developed PC's and servers which meet the demanding standards set by sophisticated and demanding users.

Key Products & Services

Northern Micro's main product lines are personal computers and servers designed and assembled in its Nepean production facility and sold under the SPIRIT trade name. Most products are custom made to fit customers at the best combination of quality and price.

Northern Micro offers the latest Intel Pentium/Pentium Pro, PCI local bus technologies, EISA/PCI based network servers and a full range of personal computers. Machines built by Northern Micro include only top-quality name brand components such as Intel, Quantum, Western Digital, ATI, ASUS, MATROX, ADI and Panasonic.

Northern Micro will also supply "off-the-shelf" accessories, parts and software to its PC customer base.

R&D Activities

Northern Micro's R&D staff select and test components for assurance and compatibility in Northern Micro SPIRIT systems.

Northern Micro's product research and development efforts enable its products to consistently be among the top three performers in official government benchmark testing performed by National Software Testing Laboratories (NSTL).

Goals

Northern Micro's mission is to provide customized mid-range to high-end and high quality computer hardware products and services to meet the advanced technical needs of highly knowledgeable customers who seek to maximize their productivity.

Northern Micro's objective is to be the personal computer hardware specialist for its customers, governments and small- to medium- sized firms that are its natural marketplace. This is accomplished while focusing on delivering quality and customer satisfaction through reliable, innovative and flexible computing solutions.

Contact

Martin Laide
Tel: (613) 226-1117
Fax: (613) 226-3810
E-mail: m.laide@nmicro.ca
Website: http://www.nmicro.ca

Object Technology International Inc.

Object Technology International Inc.

About Object Technology International Inc. (OTI)

OTI is a world leader in object-oriented (OO) technology. OTI's portfolio of software components, tools, technology and processes enable our customers and alliance partners to develop and deploy innovative, leading-edge object-oriented systems, such as IBM's VisualAge line of products.

With headquarters in Ottawa, OTI has ten labs in seven countries to provide service to customers and to take advantage of the presence of top researchers in these countries. OTI has labs in Victoria B.C. Zurich, London, Darmstadt Germany, Nantes France, Raleigh, Phoenix, Minneapolis, and Sydney.

OTI is a wholly-owned affiliate of IBM Corporation.

Key Products & Services

OTI's technology portfolio represents over 500 person-years of research and development. The company has developed and delivered OO systems for environments ranging from IBM mainframes to embedded real-time systems.

OO Language Technology –

OTI is one of the leading developers of application development environments for languages such as Smalltalk and Java (including virtual machines, compilers, source repositories and class libraries). Based on industry standards including Motif, X Window System and POSIX, OTI Smalltalk provides API-level application portability across all popular platforms. The success of IBM VisualAge for Smalltalk, based on OTI Smalltalk, was affirmed by product-of-the-year awards in Datamation and PC Week magazines.

Component Development Environment –

OTI's ENVY/Developer product is the de facto standard for Smalltalk development environments. It allows teams of programmers to develop and reuse libraries of components. It includes the version control, configuration management and team programming features required for large-scale application development.

Embedded Systems Development –

OTI has pioneered the OO technology required to build embedded object-oriented systems. OTI's embedded OO environments support remote debugging and source code control, headless images, ROMed executables and efficient memory management.

Other Capabilities - OTI carries out research and development in many other areas of OO technology. The company has significant capabilities in distributed OO computing, client/server architectures, testing tools, expert systems, CASE technology, persistent object storage, drawings tools and packaging technology.

Services

OTI provides highly skilled and product-knowledgeable engineering resources to select OTI alliance partners and IBM customers. Projects range from end-of-cycle product QA, packaging optimization, architectural review and performance tuning to specialized component engineering. For example, desktop application deployment frameworks, business objects, constraint drawing frameworks, and client/server persistent object management systems are recent examples of highly successful component-engineering consulting engagements.

R&D Affiliations

OTI participates in leading edge research at university, government and industrial research labs in Europe, Asia and North America. The company's involvement in these R&D efforts maintain important links to new and innovative research that is taking place at these institutions.

Contact

Peter Tanner
Tel: (613) 820-1200
Fax: (613) 820-1202
E-mail: Peter_Tanner@oti.com
Website: www.oti.com

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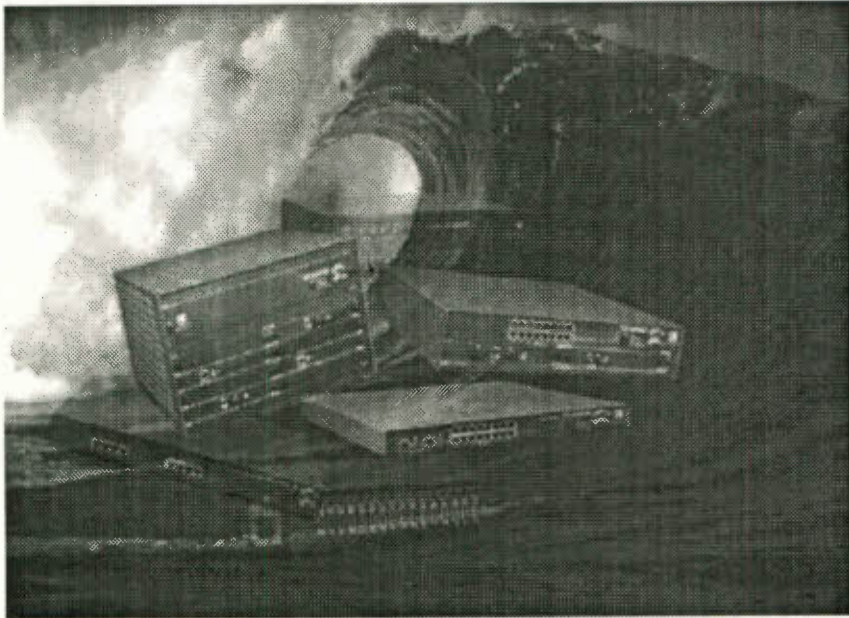
Plaintree Systems

About Plaintree Systems

A Switching Pioneer Plaintree Systems founded in 1988 and centered in Stittsville, Ontario, was a pioneer in the introduction of Ethernet switching prociucts in 1993-94, and is once again leading the industry into switch-based solutions using Fast Ethernet and Gigabit Ethernet.

The WaveSwitch™ 9000 family, which made its debut in 1997, is the result of two years of intensive R&D into gigabit-rate frame switching. Development was initiated when hype about ATM was at its peak and conventional wisdom was predicting that ATM would dominate both wide-area-networking and campus networking. Plaintree bet otherwise, however, and is now poised to reap the rewards of being positioned in the right market, with the right product at the right time.

The WaveSwitch 9200 is Plaintree's flagship product. It sets new standards for campus-wide internetworking that is *simply powerful* - powerful because of modular high-capacity switching hardware, and simple because of advanced software that facilitates easy migration and automates daily operations.

A Hot Industry

The LAN switching industry is one of today's hottest technology segments boasting compounded annual growth rates over 50% and estimated global revenues of C$10 billion in 1997.

This growth is fuelled by the never ending demands for more network bandwidth - the result of more users being attracted to online computers by the ease of Internet/Intranet access and also the result of deploying graphical images applications or real-time audio/video to the desktop.

LAN Switches are about to take on a new and dramatically expanded role in campus networks. Up to now, they were sandwiched between hubs and routers, as network managers segmented LANs into smaller and smaller pieces. This segmentation process helped the stackable-hub and backbone-router markets to grow, but it is now running out of steam. The next phase of growth will see LAN switches replacing hubs in the wiring closets and replacing routers in the network center - switches like Plaintree's WaveSwitch family.

Key Products
WaveSwitch Product Line

9200 Backbone or wiring closet modular switch, with non-blocking capacity up to:
  - 384 10Base-T ports
  - 128 100Base-TX/FX ports 64
  - FDDI-SAS/3 5-DAS ports
  - 16 Gigabit Ethernet ports

4800 FDDI/Fast-Ethernet modular switch, with eight 100 Mbps slots for FastLinxTM interface modules

1216 Workgroup switch, with 16 fixed 10Base-T ports and two option slots for FastLinx interfaces

1019 Workgroup switch with 16 fixed 10Base-T ports and two fixed 100Base-T uplinks,(1 TX, 1 FX)

1018 Workgroup switch, with 16 fixed 10Base-T ports and two fixed 100Base-TX uplinks

NextWave Switching

NextWave SwitchingTM is in all of the above products — a set of advanced Layer 3 functions that automate and simplify network operations, including:

- **SmartVIPS**™ – auto virtual IP subnets;
- **SmartSAP**™ – SAP/RIP grooming in IPX networks;
- **ChannelCast**™ – IP multicast tree pruning; and
- **VLANs** – Broadcast domains at Layer 2, based on Layer 1, 3, or 3 information.

Contact

Paul F Weiss
VP Marketing
Tel: (617) 965-5811
Fax: (617) 965-2466
E-mail: pweiss@plaintree.com
Website: www.plaintree.com

PRIOR Data Sciences Ltd.

About PRIOR Data Sciences Ltd.

PRIOR provides software engineering and systems integration expertise in real-time performance-critical systems to the air traffic management, communications, defence and Internet/Intranet marketplace.

Two decades of excellence has positioned PRIOR as a leader in the provision of software development, and systems integration for complete ATM and defence systems.

The company is combining its extensive application knowledge with new technologies to provide proven, business-driven solutions, as demonstrated by its entry into the complementary high growth internet and computer telephony markets.

PRIOR's strength lies in its rigorous and structured engineering development process and proven project management expertise carried out by 230 engineers from locations across Canada.

Key Products & Services

1996 marked PRIOR's entry into the high growth Internet products and services market. The company specializes in web server integration and tailored software solutions for transaction systems and secure access applications. PRIOR's electronic commerce and data warehousing provide highly secure solutions for clients including NASA, the Canadian Space Agency, Statistics Canada, and the Ontario Ministry of Education.

The Aerospace and Defence sector is an important component of PRIOR's business. The company currently has a large share of the Armed Forces software support market in Canada. An example of a higher profile project in the Aerospace and Defence business involves command, control, and communications (C3) technology.

The company is also developing a communication management system for the Canadian Army's tactical communication system, a fully integrated voice and data communications system providing secure seamless voice and data connectivity over radio, telephone, cellular and satellite links. By employing commercial technology with higher levels of integration, the Canadian Land Forces will have access to a secure and rapidly reconfigurable communication system.

PRIOR's experience in the Air Traffic Management business spans almost 20 years. During this time, PRIOR has developed considerable expertise in Oceanic Air Traffic Management systems, including the Gander Automated Air Traffic System (GAATS), a functionally advanced system managing all North Atlantic air traffic. The company is developing

the GAATS workstation, integrating and enhancing the previously developed situation display with the electronic flight strip component currently under development.

The company's software engineering consulting services draw on the latest technologies and methods including current language skills, such as C/C++, Ada, and Java; Embedded and Workstation Operating Systems, Open Systems and Proprietary Development; and Client/Server, Object-Oriented & Graphical User Interfaces.

R&D Activities

Research and development activities focus on software product development for the internet and communications industry including:

* Development of a Computer Telephony application featuring automatic speech recognition, personal scheduling and messaging; and
* Development of an Internet Order Desk System.

Selected High Technology Clients
* Atomic Energy of Canada
* AlliedSignal
* Hughes Aircraft
* IBM
* Ontario Hydro
* NAV CANADA
* Newbridge
* Nortel

Contact

Terry Woods
VP Marketing & Sales
Tel: (613) 591-7235
Fax: (613) 591-0343
E-mail: terry.woods@prior.ca
Website: www.prior.ca

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ProMIRA Software

About ProMIRA

The founders of ProMIRA were pioneers in the advanced planning and scheduling market over 10 years ago and have hundreds of years of combined experience in complex product manufacturing industries. ProMIRA's products have evolved from the first PC-based interactive planning system in 1992 to the current Windows NT based supply chain planning and scheduling suite of products for complex product manufacturers.

ProMIRA is the only supply chain planning and scheduling vendor to focus on the special needs of complex product manufacturers. ProMIRA is the leader in this market with more complex product manufacturing customers than anyone in the business.

Key Products & Services

REFLEX is ProMIRA's flagship software product. It is designed specifically to enhance the time-based competitiveness and supply chain planning effectiveness of manufacturers of complex products. REFLEX is a Windows NT based suite of supply chain planning and scheduling applications that uses a constraint-based scheduling engine and sophisticated analytical tools to support real-time order promising and on-time delivery, product change and global supply chain management, and other asset optimization analyses.

Complementary products by ProMIRA include SupplyNET, which is an Internet-based collaborative supply chain planning and communications system, and the Smart BILL, a Java-based "virtual bill of material" engine that identifies parts and design substitutions. Both SupplyNET and the Smart BILL help resolve materials shortages, thereby improving order promising and delivery performance.

Selected Clients

Customers include leading companies such as Compaq, Alcatel, DEC, Farinon division of Harris Corporation, Vickers, Megatest and many other complex manufacturers, located worldwide, who have to deal with short product life cycles, complex product structures with many parts, complex supply chains with many suppliers, and a high degree of end product variability.

Publications

Our Vision Newsletter is published periodically and focuses on the experience of leading manufacturers of complex products who have achieved dramatic improvements in time-base competitiveness and return on assets with the help of advanced planning and scheduling systems. Our White Papers detail innovative approaches to Supply Chain Management for Complex Product Manufacturers.

Contact

ProMIRA Software
Tel: (613) 596-3344
Fax: (613) 596-2422
E-mail: info@promira.com
Website: www.promira.com

Provenance Systems Inc.

About Provenance Systems Inc.

Provenance Systems Inc. produces the ForeMost® application software for the management of corporate electronic and paper records. Founded in 1989, Provenance's solution is found in government, large corporations, and regulated industries. ForeMost is used to capture, store, and manage electronic and paper documents.

Provenance has produced a number of industry-firsts:

- First records management product designed for records in electronic form;
- First to incorporate full-text technology in a records management product; and
- First Developer's Toolkit for records management.

ForeMost provides practical tools to apply consistent, uniform practices across both electronic and paper documents. Organizations can apply formal corporate retention and disposition to all documents, in any form, and ensure that any legislative, legal, or policy obligations are applied, identify documents of greatest value, and clearly identify and protect sensitive documents.

With ForeMost, users can participate in the accountability process without becoming records managers, and Information Technology Managers have the means to integrate records management within existing environments.

Provenance also has joint product offerings with leading industry providers of document management, forms management, and groupware applications, bringing total records management accountability to these solutions. The company is well-known in the document and records management industry as a leading records management provider.

Key Products & Services

Provenance offers three main lines of product services:

ForeMost Product
- Formal retention/disposition of electronic and paper documents.
- Legal/legislative capability.
- Repository storage and destruction of electronic documents.
- End-user filing, retrieval, classification tools.

Application Gateways
Filing, classification, and retention/disposition management for:

- Electronic Mail;
- Document Management;
- Electronic Forms management; and
- Groupware.

Professional Services
Provenance has a professional consulting division providing a range of supporting services:

- Legacy system conversion;
- Implementation project management;
- Site management; and
- Records system design/planning.

R&D Activities
Provenance is heavily development-oriented, devoting much of its resources on application development:

- Advanced C-language application development;
- Application Programmer's Interface;
- Development of new records management tools/techniques; and
- Third-Party integration technologies.

Goals
Provenance's products will continue to set the standard for technical innovation and quality, will be flexible for easy incorporation within an organization, and provide superior records management functionality. This will be done by providing innovative, industry-leading software products designed for today's open desktop environment.

Contact
Bruce Miller
Tel: (613) 723-6519
Fax: (613) 723-8187
E-mail: foremost@provsys.com
Website: www.provsys.com

PSSoftware Solutions

About PSSSoftware Solutions

PSSoftware Solutions is a records and documents software development company located in Ottawa, Ontario, Canada. PSSoftware offers the leading Recorded Information Management System (RIMS) as well as a team of professionals experienced in both records management and leading edge technology.

PSSoftware's team of professionals have accumulated more than 10 years of experience through direct contribution to records management technologies, as software developers, records management consultants, trainers, technical consultants, and project managers for the Canadian Federal Government, Fortune 500 Corporations, financial institutions and international organizations.

Key Products & Services

PSSoftware's RIMS has been chosen as the records management component of a Treasury Board initiative, RDIMS (Records and Document Information Management System), to become the standard for the Federal Government. RIMS already boasts the largest installed base of records management software within the Canadian Federal Government with an 80% market share.

PSSoftware has supported RIMS branches such as the Department of Justice to deliver RIMS to 2 000 users in 40 sites across Canada.

PSSoftware has also made inroads into the private sector with such clients as Microsoft, the largest software company in the world. Microsoft conducted a worldwide survey of over 45 suppliers of records management software, after which, PSSoftware was chosen by Microsoft.

RIMS has been in production at Microsoft headquarters since January 1996 and will be rolling out to the 200 offices worldwide. Microsoft is part of an illustrious client base which boasts over 12 000 users at approximately 200 sites in the U.S., Canada, and Europe.

RIMS is currently installed in a wide variety of industries including financial institutions such as the Federal Reserve Bank of Minneapolis and European Bank for Reconstruction and Development in London, as well as International Organizations such as the OECD Organization for Economic Co-operation and Development in Paris.

PSSoftware is uniquely qualified to respond to the challenges of organizations looking toward an integrated electronic work environment, due to our commitment to technology initiatives over the past 10 years.

R&D Activities

PSSoftware released the DOS version of RIMS in 1988, which was quickly embraced by the Canadian Federal Government.

In 1992, PSSoftware introduced RIMS for Windows: the first open architecture, client-server, and Windows-based records management software application to be developed and brought to market.

PSSoftware recognized the power of its open architecture and began exploiting its technological superiority by developing a seamless integration with other information management applications.

The existing family of RIMS integration capabilities includes the seamless integration with Electronic Document Management Systems, Correspondence Tracking systems Imaging systems, Workflow packages, Report Writers, and Full Text Searching.

PSSoftware is also actively involved in the Canadian Strategic Software Consortium's research activities to design and implement a multi-database system supporting text and relational data.

Also, PSSoftware is currently developing solutions to incorporate Intranet and Groupware technologies.

Contact

Joseph Gomes
Tel: (613) 226-5660 ext. 284
Fax: (613) 226-5447
E-mail: gomesj@pssoftcom.

QNX Software Systems

About QNX Software Systems

Founded in 1980, QNX Software Systems is the industry leader in high-performance realtime operating system software for the x86 platform. Our company is also the fifth largest software firm in the Ottawa-Carleton region, thanks to a rate of growth that far exceeds the industry average. Along with our headquarters in Ottawa, we have a division in London, England, that supports our European distribution network. Our distribution partners cover close to 100 countries worldwide.

The Leading Realtime OS for PCs

Since we released the QNX® realtime OS in 1981, we've built an impressive track record of technological innovation. Microkernel architecture, distributed processing for PCs, and built-in fault-tolerant networking are among the technologies we've pioneered. Our tradition of innovative products continues with the award-winning Photon microGUI®, a full-featured yet fully embeddable windowing system, and with QNX/Neutrino®, the first standards-based realtime microkernel for deeply

embedded systems. With these and other leading-edge technologies, such as our comprehensive suite of Internet tools, we are poised to take full advantage of the fast-growing markets for Internet appliances and other embedded devices.

We lead the realtime industry in experience, with 16 years on the x86 platform. We also lead in market share. According to a recent Emerging Technologies report, "QNX Software Systems has the largest realtime OS market share in the Intel x86 marketplace."

Markets

We've established a firm base in many vertical markets, including industrial automation, telecommunications, point of sale, and medical instrumentation. More recently, our product offerings have expanded to support markets such as consumer electronics (Internet phones, web-enabled devices, set-top boxes), automotive technology (navigation, engine monitoring and control), and hand-held computing, to name but a few.

Key Products & Services

QNX Software Systems offers:

- **QNX Realtime Operating System**
  Based on a lean microkernel, QNX is highly scalable, allowing you to build an entire range of products using just one OS.
- **Photon microGUI**
  A full-featured windowing system that fits in less than 400k of memory, Photon is also based on a scalable microkernel architecture. Photon offers seamless connectivity to the desktop: Look into—and control—your remote PBX server or consoleless embedded device from a PC running QNX, Windows 95, or NT.
- **Internet Appliance Toolkit (IAT)**
  Available now, our IAT contains all the software tools a developer needs to create an Internet appliance with its own unique look and feel. The package includes demos and source code to enable full customization of the included web browsers, dialer, email and news clients, and personal information manager (PIM).
- **POSIX and Win32 APIs**
  With its choice of industry-standard APIs, QNX offers you reduced training and development time and ensures that your applications are portable.

The QNX Advantage

At QNX Software Systems, we work closely with AMD, Intel, National Semiconductor, and a host of other industry leaders that focus on our existing and emerging markets. As a result, our support for x86 processors, peripherals, and chipsets is unequaled by any other realtime OS.

Contact

QNX Software Systems
175 Terence Matthews Crescent
Kanata, ON, Canada K2M 1W8
Tel: (613) 591-0931 / 800 676-0566
Fax : (613) 591-3579
E-mail : info@qnx.com
Website : www.qnx.com

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Semiconductor Insights Inc.

About Semiconductor Insights Inc.

Semiconductor Insights Inc. is a worldleading microelectronics engineering consultancy. It specializes in the analysis of the design and process technology used in semiconductor devices and microelectronic systems, in specific areas of design consulting, and in the technical analysis of semiconductor patents.

Key Services

Its services result in the provision of technical analysis reports and design contracts and is organised as four operating departments:

* Design Analysis - extraction of circuit schematics;
* Structural Analysis - evaluation of process technology;
* Intellectual Property Services - patent infringements; and
* Design Services - IC or system design consulting.

Established as an independent, private, company in 1989, the organization has provided industry-leading insights to an impressive array of major semiconductor and information technology companies all over the world. The company is employee-owned, which helps to provide a strong focus and ensures complete independence in performing all consulting work.

Staff

Semiconductor Insights has a staff of more than 75 engineers, physicists, technical specialists and support personnel. Many of the analysts have advanced degrees at the M.Sc. or Ph.D. level. The expanding engineering team can apply their years of circuit and process experience to a wide range of products and technologies, including:

* DRAMs, SRAMs, (EE)PROMs, Flash and specialty memories;
* Microcomponents, ASICs, FPGAs, PLDs and Logic ICs;
* Analog, Mixed-signal and Telecom circuits;
* Smart Cards, electronic subassemblies and systems; and
* CMOS, BiCMOS, NMOS, bipolar, GaAs technologies.

Laboratory

The Laboratory analyses that can be provided include:

* Scanning Electron Microscopy;
* Transmission Electron Microscopy;
* Focused Ion Beam Microsurgery;
* Energy Dispersive x-ray Analysis;
* Auger Analysis;
* Secondary Ion Mass Spectroscopy;
* Scanning Probe Microscopy;
* Spreading Resistance Probe; and Measurement.

Commitment

SI is committed to excellence in customer service and continual improvement in all internal processes. Every member of staff is computer-linked to a common network, allowing access to hundreds of external databases and technical resources. This allows them to perform market, product or other technical research quickly, thus serving clients in the fastest, most efficient manner possible. Analysts are available to provide after-delivery technical support to answer any questions that may arise, and all recent reports are also available in electronic format.

Facility

Semiconductor Insights operates today from a 15 000 square foot facility in Kanata, Ontario, the core of Canada's high technology community. A move and facility expansion, planned for later this year, will result in 30 000 square feet of working space.

Contact

Doug Smeaton
President
Tel: (613) 599-6500
Fax: (613) 599-6501
E-mail: info@semiconductor.ca

Senstar Corporation
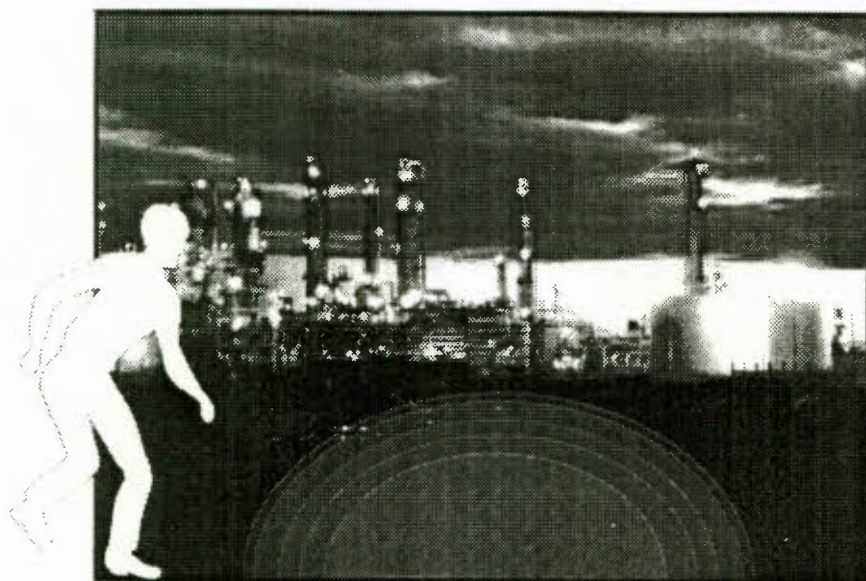
About Senstar Corporation

Established in 1981, Senstar Corp. is the world's leading supplier of outdoor perimeter intrusion detection products for commercial, government, military, corrections, airports and estate residence applications.

The company specializes in providing early warning of intrusions into secure areas, reducing the risk of theft, vandalism, harm, sabotage, kidnapping and escape.

Senstar's high performance products reduce end-user operating costs and liability risks, and provide a significant return on investment.

Senstar's products are used to protect some of the most prominent people and facilities in more than 55 countries worldwide. Some of our clients include the US Air Force, US Dept. of Energy, NASA, General Electric, NATO and numerous celebrities and heads-of-state.

Senstar has operations in Canada, the United States, the United Kingdom and Germany.

Key Products & Services

Senstar offers the following products for high security applications:

*   PERIMITRAX - Buried Cable;
*   Sensor DAVID 300 - Video Intrusion Detection Sensor;
*   REPELS - Rapidly Deployable Sensor;
*   StarLED 200 - Infrared LED II luminator;
*   SENSTAR 100 - Alarm Monitoring & Control System; and
*   SENNET - Alarm Data Communication Networks.

In addition, Senstar provides design assistance, site surveys, installation support, technical support, documentation, training, warranty repair and on-call service.

R&D Activities

Senstar continues to develop new sensor technologies to meet increasing worldwide demand for high performance outdoor sensors.

The company's background in high-tech has provided it with core capabilities in the following areas:

*   digital signal processing;
*   real-time software development;
*   communications;
*   remote sensing; and
*   ruggedized electronics.

Senstar was the first company to use microprocessors for intrusion detection in the harsh outdoor environment and continues to invest heavily in product refinement and development.

Goals

Senstar's goal is to provide high performance security products that provide the highest probability of detection, the lowest false and nuisance alarm rates and the lowest vulnerability to defeat of any outdoor sensor. These products are applied at high security locations worldwide, regardless of the environment, to provide an unparalleled level of intrusion detection to protect people and valuable assets.

Contact

Mr. Julian Romeskie
Tel: (613) 839-5572
Fax: (613) 839-5830
E-mail: romeskie@senstar.ca
Website: www.senstar.ca

SHL Systemhouse, an MCI Company

About SHL Systemhouse
Who we are
SHL Systemhouse, an MCI Company, is a single-source provider of innovative information and technology services that help customers realize their business objectives. Canadian-based and managed, Systemhouse has grown into a $1.7 billion company with more than 7 000 professionals in over 120 offices worldwide.

Acquired by MCI Communications Corporation in 1995, Systemhouse has grown into one of the world's top 10 IT solution providers. Combining the global networking and resource strengths of MCI with more than two decades of experience in information and systems development, Systemhouse continues to strengthen its leadership role in the rapidly converging arena of communications and computing.

Systemhouse offers a powerful combination of integrated networking, telecommunications and systems-based technologies helping corporations, businesses and governments maximize their success.

A Canadian Company
Since its start-up in Ottawa in 1974, Canada and Canadians have continued to play a vital role in the company's operations. Employing more than 3 500 IT professionals, half of the company's global work-force, in over 40 offices across Canada, Systemhouse continues its long tradition of attracting the best and brightest in the business. Today, Canadians are spearheading many of Systemhouse's global operations.

In Canada, Systemhouse operates a number of world-class technology centres that provide customers with a broad range of capabilities and resources. With strong representation in Ottawa — including our Global Development Centre, expanding business activities in Toronto and Québec markets, and solid regional presence across Canada, Systemhouse continues to make major investments in the Canadian marketplace.

What We Do
In today's competitive business environment, organizations are wrestling with how to incorporate complex and rapidly converging technologies into systems that will reduce cost, streamline business processess, result in a desirable return on technology investment, and improve access to – and exchange of – information.

Systemhouse provides its clients, whether small domestic firms or large multinationals, with leading-edge solutions from an enterprising, dedicated and dynamic team of technology experts. We offer a broad range of innovative yet flexible services ranging from project planning and implementation, management, maintenance and support, as well as ongoing training and education.

Whether putting in place a standardized solution or tailoring leading-edge technologies to meet specific business objectives, Systemhouse ensures that customers no longer have to rely on multiple vendors to develop, deploy and manage their computing networking systems. As a sole-source provider, Systemhouse is able to leverage its breadth of technology awareness and extensive resources so that customers are able to focus more of their time and resources on what they do best: running their business.

Key Services
Systemhouse provides its clients with a diverse range of advanced and innovative technology solutions developed by experienced project teams using proven methodologies.

Focused directly on servicing the technology, solution or application-specific needs of new markets, Systemhouse's National Practices concentrate the required resources and delivery expertise within one project-based centre. More mature markets are serviced regionally through the company's Regional Core Competencies; services which include systems and network integration, deployment and outsourcing.

National Practices
- Year 2000
- Imaging and Data Processing
- Enterprise Resource Planning
- Global Development Centre
- Intranet Application Solutions
- Security Engineering
- Oracle Database Support
- Data Warehousing
- Corporate Administrative Solutions

Regional Core Competencies
- Technology Life Cycle Management
- Strategic Consulting
- Application Development
- Microsoft Technology Deployment
- Distribution Services
- Enterprise Systems Management
- Technical Services
- Training Services
- Application Systems Management

Systemhouse is committed to providing exceptional services to organizations across Canada and around the world. Whether it's a narrowly-defined support issue or an enterprise-wide transformation, Systemhouse brings to the customer an understanding of technology that not only fulfills a client's need today but which also helps anticipate dynamic future changes in global market conditions.

Contact
SHL Systemhouse
Tel: (613) 236-9734
Fax: (613) 236-8984
E-mail: N/A
Website: N/A

Siemens *Telecom Innovation Centre*
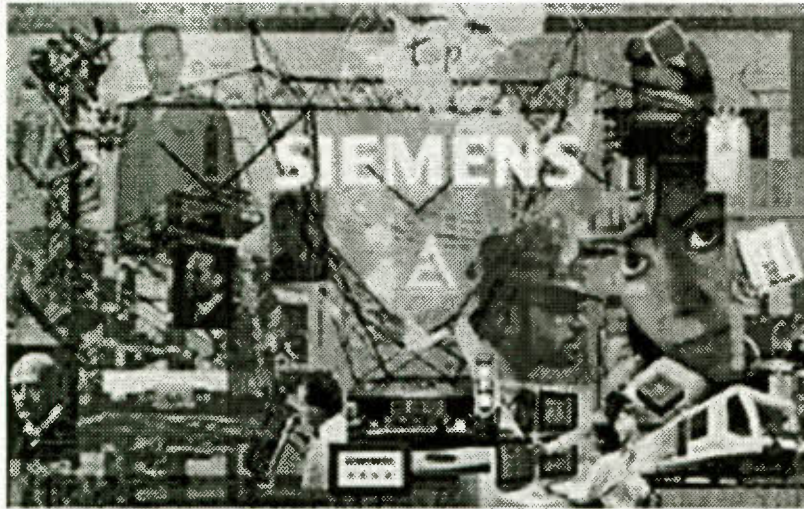
the current of life.

Connecting Canadians in

About Siemens Telecom Innovation Centre

In March of 1996, Siemens AG's Public Communication Networks business group formed a global ATM alliance with Newbridge Networks Corporation. Since the establishment of this alliance, Siemens and Newbridge jointly plan, design, and develop a complete ATM product portfolio, MainStreetXpress, to satisfy the rapidly growing communications needs of the global marketplace. As a result of this alliance, Siemens Electric Limited, Siemens AG's wholly-owned subsidiary in Canada founded the Telecom Innovation Centre in Kanata, Canada's Silicon Valley North.

Siemens chose this location for its proximity to Newbridge, but also because of the availability of very qualified resources in the area.

Centre's Initial Mission

Our initial mission consists in conducting the necessary SR&ED (Scientific Research & Experimental Development) that will support the evolution of the joint ATM portfolio.

Also, because of our close ties with both Newbridge and Siemens AG, we also facilitate the cooperation between the development groups of both organizations.

Centre's ultimate Vision

Innovation is the cornerstone of our vision for the Telecom Innovation Centre.

Canada is a world leader in the development of telecommunication technologies. Our Kanata location provides us with the opportunity to tap into the breadth of knowledge and expertise available in this country.

Our goal is to become a highly entrepreneurial source of telecom innovations, contributing economically to both Canada and to Siemens Electric's Communication Systems Division (CSD).

We foresee realizing our vision by working with creative Canadian Small and Medium (S&M) enterprises to jointly develop products which would then be sold through Siemens' global distribution network.

Key Products & Services
Siemens in Canada

In Canada, Siemens consists of three companies: Siemens Electric Limited, Siemens Hearing Instruments, and OSRAM SYLVANIA Ltd. It is coast-to-coast with 3 900 employees providing products, systems, and services in the fields of communications, information, components, health care, industrial

systems, power generation, lighting, automotive, and energy & automation.

In fact, Siemens got involved in Canadian telecommunications for the first time in 1875, when it connected Canada to Great Britain with the first Trans-Atlantic communications cables.

In the late 1950s, Siemens was instrumental in the establishment of Canada's first national telex network.

Today Siemens offers Canadian telecom service providers, turnkey solutions to face the growing challenges of competition and convergence.

Sales of Siemens Electric Ltd. totaled DM891 million in fiscal year 1996. With its thirteen manufacturing plants, Siemens in Canada is a net exporter.

Siemens Worldwide

Siemens is one of the largest and most diversified companies in the world, with locations in 181 countries and 379 000 employees. For over 150 years, innovation has been at the root of our success. Half of total sales are from products that are less than five years old.

Our Centre's team is an integral part of Siemens' seamless worldwide network of about 44 500 R&D staff, working together to offer innovative solutions to our customers in the future.

In fiscal year 1996, we spent about DM7.3 billion on R&D, which corresponds to about 8% of net sales, or almost DM35 million per working day. In that same year, sales for Siemens AG reached DM94.2 billion

Contact

Jacques Bissinger, ing.
Vice President - CSD
Tel: (613) 591-8745
Fax: (613) 591-8731
E-mail: jacques.bissinger@siemens.ca
Website: www.siemens.ca

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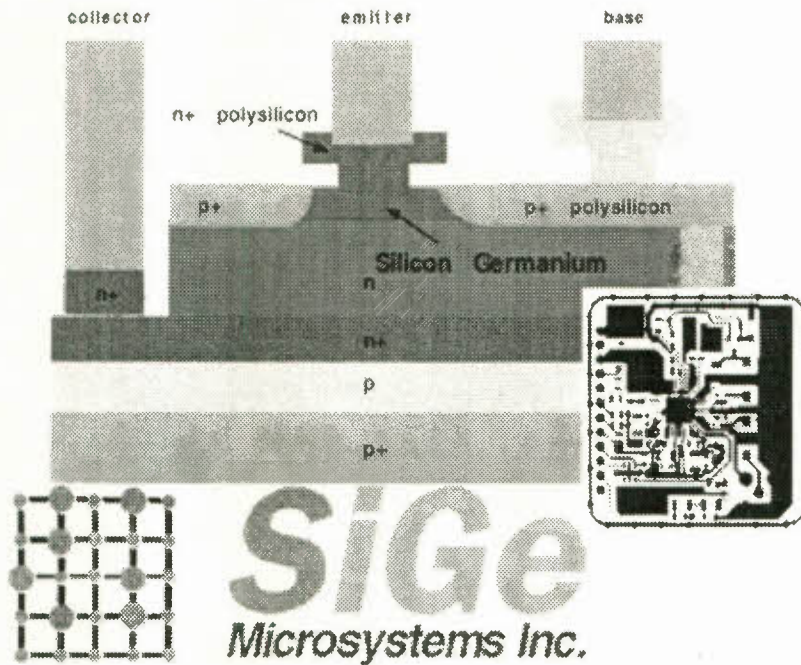
SiGe Microsystems

About SiGe Microsystems

A pioneer, SiGe Microsystems is dedicated to the commercial application of Silicon Germanium (SiGe) technologies through the design and development of SiGe enhanced integrated circuits (ICs) and contract processing of wafers. The concept behind SiGe is to re-engineer the base of an npn bipolar transistor to increase speed, reduce noise and reduce power consumption.

In the mid 1990s, SiGe has clearly emerged as the leading technology to improve the speed/power ratio of both Bipolar and BiCMOS circuits for analog and mixed signal applications at much lower cost than gallium arsenide.

SiGe is a low cost solution which doubles circuit speed, while simultaneously reducing power consumption and improving noise performance. These special features make SiGe based ICs most suitable for high performance radio frequency (RF) digital personal communication, high speed digital transmission and all hand-held wireless communication devices.

As an enhancement technique, the adoption of the technology requires minimal capital cost and minimal change to other aspects of the Bipolar silicon process technology.

Key Products & Services

SiGe Microsystems offers the following services for semiconductor companies:

- SiGe custom deposition services;
- Technology transfer of SiGe process and product design expertise;
- Technical training on the application and the benefits of SiGe technology;
- Sales, installation, training and support of LEYBOLD SIRIUS SiGe Reactor Systems; and
- Characterization and quality control of specialized ICs and components.

SiGe Microsystems is also developing a range of subassemblies for applications where the benefits of SiGe enhancement are highest. The first product is a Global Positioning System (GPS) RF module which will shortly incorporate a SiGe enhanced proprietary IC.

R&D Activities

SiGe Microsystems has an extensive collaboration agreement with the Institute for Microstructural Sciences of the National Research Council of Canada, a world-renown R&D facility in microelectronics.

Research and development activities focus on the development of integrated circuits utilizing SiGe wafer technologies, including:

- Development of new applications for SiGe silicon wafers;
- Development of GPS, PCS, cellular, LMDS, active antenna, A/D and D/A circuits for RF and wireless communications markets;
- Design and development of proprietary tile and special purpose chips, modules, and ECL arrays; and
- WDM optoelectronic components on Silicon platform.

Goals

SiGe Microsystems' goal is to assist semiconductor and telecommunications companies in the adoption of SiGe, the next generation of semiconductor technology for ICs, while building a sub-assembly product business incorporating SiGe enhanced ICs.

Contact

Dr. Derek Houghton
Tel: (613) 748-1334
Fax: (613) 748-1635
E-mail: derek@sige.com
Website: www.sige.com

Simware Inc.

About Simware

Simware Inc. develops, markets and supports software products that allow organizations to build Web-centric and remote enterprise applications, and software products that automate LAN administration tasks.

At Simware, we believe that users should not require detailed knowledge of computing or communications technologies to successfully do their jobs. Simware's solutions provide intuitive and easy access to business applications, independent of the enterprise computing or communications environment.

These tools have been created by a company with over 14 years of experience in helping customers meet their networking challenges. Simware has provided solutions for organizations such as Atlas Van Lines, Chevron, Levi Strauss, Citibank, TNT, California State University and the U.S. Departments of Justice and Commerce.

Simware is headquartered in Ottawa, Canada, with European offices in the United Kingdom, Germany and Belgium. Simware's common shares are listed for trading on the Nasdaq Stock Market under the symbol SIMWF.

Key Products

One of the areas that is exploding as a result of the intuitive access it provides to information, is the Web, which provides new opportunities to connect people and strategic information. Simware's Salvo bridges the gap between the Web and enterprise systems, uniting the central management capability of enterprise servers with the intuitive "GUI" interface users demand. While enterprises are using Web servers to distribute static information to Web-connected users, Salvo extends this capability through a secure framework, providing interactive access to vital enterprise information in real-time.

The first product to offer customizable access to strategic information, Salvo is also the first to offer a framework for the development of Web-centric applications. Its unique Information Object technology allows organizations to find, extract and consolidate information, and present it on a browser giving Salvo a "commanding lead" in bridging the gap between the Web and enterprise systems, according to the Aberdeen Group.

Simware also believes that Information System managers should have the tools they need to automate complex and repetitive manual procedures. Simware's REXXWARE gives them "virtual eyes and virtual fingers" to automate and schedule time-consuming labor-intensive tasks - the chief component of the total cost of LAN ownership. Simware's RMT

(REXXWARE Migration Toolkit) automates the upgrade process for those wanting to move to Novell's IntranetWare.

Another software solution from Simware is A2B, a communications engine that efficiently feeds data into applications. A2B is the premier solution for building real-time, remote applications integrating clients and servers with end-to-end security over the Internet or Intranet. A2B's unique patented SplitSecond software dramatically improves network response time by significantly reducing the bandwidth required during interactive sessions. The A2B product line consists of client, server, and value-added options, including an interface to Entrust's security software. A2B also provides ActiveX controls (OCXs) to aid in building client/server applications that rely on information access from legacy mainframe systems.

Goals

The only constant facing our technology, industry and company is change. At Simware, we constantly develop and acquire new ideas, technologies and solutions which will improve the productivity of Simware and our customers.

Contact

Simware Inc.
Tel: (613) 727-1779
Fax: (613) 727-8797
E-mail: marketing@simware.com
Website: www.simware.com

Spar Applied Systems

ADAAPS image courtesy of Airborne Data Technologies Ltd.

About Spar Applied Systems

Spar Applied Systems is a global leader in the design and supply of flight safety systems and complex naval communications for military and commercial aviation organizations around the world.

Its Advanced Manufacturing Services of low-volume, highly complex electronic assemblies and systems to stringent military and space specifications are at the forefront of the industry.

In February 1994, Spar Applied Systems became one of the first defence operations in Canada to be certified to ISO-9001, the highest international standard for a quality management system. The company is also certified to military specification AQAP-1 and, in June 1995, was awarded Preferred Supplier Certification by the McDonnell Douglas Corporation.

Key Products & Services
Naval Communications Products

The Naval Communications products provide integrated digital shipboard naval communication systems designed to meet the rigorous command, control and communication requirements of modern naval ships. These proven systems deliver outstanding mission performance, reliability and survivability, coupled with simplicity for the user. Advanced switching technology is utilized to increase communications system security and flexibility.

Flight Safety Products

The Flight Safety products include deployable and crash survivable flight data/cockpit voice recorders and crash position locators (known as aircraft "black boxes") which survive crash impact, provide crash location information and give investigators detailed data about the incident. They also provide aircraft health and usage monitoring systems to collect, monitor and analyze aircraft flight information to improve safety and system performance. In addition, the company has the capability to transform actual flight data into virtual reality with the ADAAPS (Aircraft Data Acquisition, Analysis and Presentation System). ADAAPS was developed by the National Research Council of Canada (NRC) for accident/incident investigation. Spar has a licence from the NRC to promote ADAAPS to commercial customers worldwide.

Advanced Manufacturing Services

The Advanced Manufacturing services focus on complex low volume customer requirements where quality and responsiveness to schedule are critical.

Spar Applied Systems is a division of Spar Aerospace Limited, a leading Canadian advanced technology company. Building on the technologies of its aerospace heritage, it now embraces the complementary high growth international communications and software markets. Spar is Space, Communications, Aviation and Defence, and Informatics. It is Research and Development, Software and Hardware, System Design, Manufacturing and Customer Support. Above all, Spar is Customer Satisfaction.

Contact

Carol Landgraff
Tel: (613) 592-3430
Fax: (613) 592-4486
E-mail: clandgra@spar.ca

SR Telecom Inc.

About SR Telecom

SR Telecom (SRT) is the pioneer and world leader in the design, manufacture and provision of Point-to-Multipoint (PMP), Time Division Multiple Access (TDMA) Digital Microwave systems. Its products provide cost-efficient, reliable, fixed wireless telecommunication solutions to some of the most isolated regions and populated urban centres in the world. SRT has installed thousands of systems in over 80 countries, serving requirements in telephony (urban and rural), business networks (voice and data) and industrial (SCADA) markets.

SRT was founded in 1981 and became a public company in 1986. Today, it employs over 900 people in 20 countries. SRT's corporate head office, research and development and manufacturing facility is in St. Laurent, Québec. It has a second manufacturing and research and development facility in Kanata, Ontario. Project and regional sales and service offices are located strategically around the world.

Technology

Using TDMA, SRT systems bring telecommunications services, such as telephone, fax, telex, data and ISDN, to subscribers via point-to-multipoint digial microwave radio in bands from 1.3 to 2.7 Ghz, 3.5 Ghz or 10.5 Ghz. Sixty 64 kbps channels are available on a demand-assigned or dedicated basis to connect subscribers from as many as 511 sites to one central location. The 60 channels allow a single system to support 670 subscribers generating an average busy-hour traffic of 0.07E for a 1% grade of service.

Products

SR Telecom offers a variety of wireless products and options to address different market and customer requirements:

SR500-s

The latest model in the family of SR500 PMP-TDMA microwave systems, the SR 500-s offers a high-capacity central station and a full range of remote stations.

10.5 Ghz SR500-s System

Operating at a much higher frequency than other SRT products, the 10.5 Ghz system enables the SR500-s to distribute advanced digital telecommunication services directly to buildings or to serve as a radio entrance link between urban and rural settings.

ISDN

This interface module allows the SR500-s to transport basic rate ISDN services, such as high-speed internet access, videoconferencing, telecommuting and group 4 fax.

SR500-s Wireless Loop Subsystem

In a telephone network, the connection between the distribution point and the subscriber's premises is made by copper wire. The Wireless Loop (WL) subsystem replaces that "last mile" of copper wire by radio technology. The WL now allows telephone companies to avoid the expensive maintenance and installation costs associated with wired connections.

Contact

Marketing Department
SR Telecom Inc.
425 Leggett Drive
Kanata, Ontario
K2K 2W2
Tel: (613) 599-2233
Fax: (613) 599-2255
Website: http://www.srtelecom.com
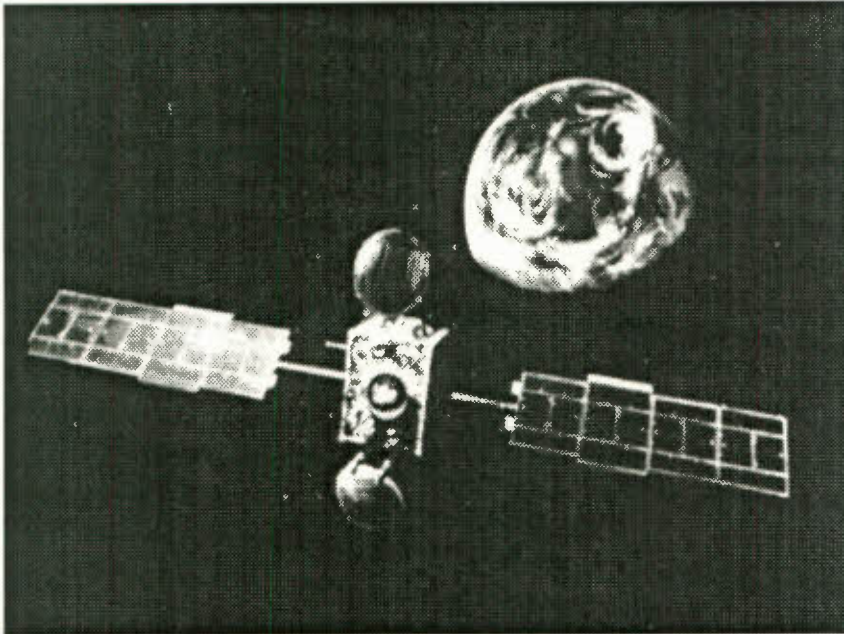
Telesat Canada

About Telesat Canada

As Canada's national satellite communications company, Telesat Canada provides telecommunications and broadcast distribution services in North America via its fifth generation Anik E satellites.

Since the creation of the company in 1969, the name Telesat has become synonymous with high-quality satellite communications the world over. Telesat ushered in the age of satellite communications with the launch of Anik A1 in 1972 - the world's first domestic communications satellite placed in geostationary orbit.

Telesat's Corporate headquarters are based in Gloucester (near Ottawa), and where the majority of its more than 400 employees are located.

Key Services
Broadcasting Industry

Given that geostationary satellite technology offers the most cost-effective way to distribute TV signals to multiple sites, most of Canada's national and regional television broadcasters use Telesat to deliver their programming across the country. Telesat offers distribution of more than 55 TV broadcast signals on a full-time basis.

The Company is also a leader of Canadian activity in the field of Digital Video Compression (DVC) services — a technology which not only provides a significant cost savings on space segment to customers, but is also making new ventures such as Direct-to-Home (DTH) and regional programming viable.

Satellites for Private Business Networks

Telesat serves a growing number of business customers who use satellite to transmit voice, data and image information. With private satellite networks, businesses can interconnect their offices for efficient and flexible communications. Private telephone lines and rapid data transfer between computers are common uses.

Connecting to the Information Skyway

In the nineties, the land-based Information Highway is being replaced by the high-speed, satellite-based Information Skyway. DirecPC™—a digital satellite service from Telesat—can deliver news clips, live video feeds, software or training applications to a desktop computer over a 12 megabits per second satellite link. DirecPC is also the fastest Internet connection, built for surfers with a need for speed, at 400 kilobits per second – it's almost 30 times faster than conventional modems.

Network Management

Telesat's comprehensive network management systems allow the company to dynamically monitor and control all aspects of service. A team of highly qualified and experienced technologists and engineers operate, control, maintain and repair a coast-to-coast network of over 3 500 telecommunications earth stations. Through a network of regional operations centres across Canada, Telesat provides both the best possible access to satellite services and comprehensive, in-depth operational, maintenance and support services.

International Consulting

Almost 30 years of engineering and technical experience has led to the company's emergence as a leading consultant for other satellite operators and for countries interested in establishing, operating or upgrading their satellite systems. This expertise has also led to the construction of earth segment ground facilities for several large global satellite ventures.

In addition to consulting services, Telesat has become a world leader in providing transfer orbit services to the satellite industry, and is well on the road to becoming a major operator of third party satellites.

Contact

Telesat Canada
Tel: (613) 748-0123
Fax: (613) 748-8723
E-mail: info@telesat.ca
Website: www.telesat.ca

Telexis Corporation

About Telexis Corporation

Whether it's a video signal, a telephone signal or any other kind of signal, our equipment captures it, processes it, transmits it, presents it and stores it. At Telexis, we develop, manufacture and sell video, audio, image-processing and multimedia products to Fortune 1 000 companies worldwide. Telexis is a team of highly motivated technology specialists, entrepreneurs and telecommunications experts. We are organized into three business units.

Telexis Corporation was founded in 1986. Both Newbridge Networks Corporation of Kanata, Canada, and Comverse Technology Inc. of New York, U.S.A., have acquired significant equity ownership in Telexis. Newbridge, a manufacturer of advanced telecommunications equipment, has annual sales of more than $1 billion, while Comverse, a world leader in digital voice-mail and digital voice-logging systems, has annual sales of more than $200 million.

Key Products & Services
Video and Imaging Unit

We are experts in networked video solutions. This unit develops, manufactures, sells and supports a family of video systems for remote monitoring. ViaNet™ our digital video transmission and logging system, lets you capture, compress, transmit, view and store high-quality video images. Typical applications include banking, energy, wholesale and highway traffic monitoring. The ViaNet product includes the Video Management System and both the corresponding Newbridge 2611 MainStreet, Video Transmission Unit (VTU) and the Telexis VTU family. With these systems, you connect to video cameras in geographically dispersed locations and monitor them in real time. You save time and money. Because the Telexis platform is network-ready, it deploys over a wide range of existing telecommunications services without additional infrastructure costs. Telexis products also accommodate network upgrades with no new equipment, thus extending product life cycle.

Technology Services Unit

With a long string of successes in innovative design and R&D, plus a solid reputation in hardware and software integration, this unit delivers custom solutions for the telecommunications industry and government agencies. Telexis uses a broad range of technologies including high-speed DSP and ASIC design to do the following: develop data acquisition, processing and logging systems; produce advanced interface boards that meet proprietary bus standards

(VME, SUN, PC); and provide RF and microwave communications solutions. This unit also provides turnkey systems and engineering support for commercial clients and other groups in the company.

OEM Products Unit

This unit acquires, manufactures, sells and supports telecommunications-based products that complement our core technologies. Telexis is the Canadian supplier for Comverse, one of our parent companies. Products include voice recorders and loggers that telemarketers, E911 centres, financial institutions and trading centres use worldwide. These products are highly modular, fully integrated multimedia recording solutions that use open system networking and client/server architecture. Our market-tailored products include UltraNet™ Mentor™, Verify™, SafeNet™, FaxNet™ and Tradeshield™. In Canada, Telexis also supplies audio/fax/modem monitoring equipment for law enforcement through Comverse's AudioDisk™, Scout™ and Ranger™ products.

Contact

David Rothwell, Ph.D.
Vice President
Business Development
Tel: (613)738-2434
Fax: (613)738-0750
E-mail: rothwell@telexiscorp.com
Website: www.telexiscorp.com

Thomson-CSF Systems Canada

About Thomson-CSF Systems Canada

Thomson-CSF Systems Canada is one of Canada's leading defence companies specializing in the areas of Command, Control, and Communications (C3), and Countermines. The company's areas of expertise include navigation, radar, robotics, command and control, communications, countermines, real-time software, and integrated logistics support. The company is ISO 9001 certified, has achieved SEI CMM Level 2, has a staff of 80, and has annual sales of $12 million.

Key Products & Services
Command, Control, and Communications (C3)

Within the C3 Area, Thomson Systems is one of the combat systems integrators for the Maritime Coastal Defence Vessel (MCDV) project and is developing the Tracking and Management Unit for the Navy's Active Phased Array Radar (APAR) project. Thomson Systems is also the prime contractor for the Army's Light Communication Terminal (LCT) project, and is working with other Canadian companies and another division of Thomson-CSF to provide the Army with a state-of-the-art Land Forces Command System (LFCS).

For Thomson Systems, the MCDV project involves integration of interior and exterior communications, sensors, navigation systems and minesweeping payloads, as well as the associated integrated logistics support.

In the Active Phased Array Radar project, Thomson Systems' Tracking and Management Unit provides operator control of the radar, and performs track formation and radar management functions.

The LCT project involves design, development, fabrication, integration, test, and delivery of high frequency (HF) communication terminals for installation into mobile shelters.

LFCS is an open architecture system based upon the French Army's SIC-F product line. Thomson Systems will adapt the existing product to meet Canadian Army and life cycle support requirements.

Countermines

The countermines Area addresses the problem of clearing land mines for assault and peacekeeping operations.

Thomson Systems is working with the Defence Research Establishment in Suffield (DRES) to develop a high-speed Tactical High-explosive Ordnance Remover, (THOR), that uses enhanced blast explosive technology to destroy land mines. The lethality of the explosive technology has been proven by DRES against the world's toughest mines, and Thomson Systems has completed flight trials to demonstrate the practicality of launching the explosive array by rocket.

Thomson Systems is also developing MINER for non-tactical mine clearing operations. MINER, which is based on the THOR explosive technology and is deployed using CERBERUS, a mobile robotic vehicle, destroys individual mines or explosive devices.

CERBERUS is an electrically-driven wheeled vehicle which features a three-armed turret with on-arm controllable devices such as a manipulator (grappler), video camera, and water cannon, and a second on-vehicle camera.

Goals

Thomson Systems, a C3 and Counter-mine systems integration company, is a subsidiary of Thomson-CSF, and has access to a wide range of military/aerospace technology and also has the ability to respond to defence requirements throughout the world.

Contact

Ken Bowering
Manager, Business Development
Tel: (613) 723-7000
Fax: (613) 723-5600
E-mail: kbowering@thomson-csf.ca
Website: thomcsf@thomson-csf.ca

Time ICR

About Time ICR

Time ICR specializes in providing large voice processing systems, both as a Service Bureau or as an equipment supplier. Time ICR offers telecommunication services including Voice Mail, Fax Broadcast, FaxMail, Interactive Voice Response, Audiotext and Automated Attendant.

Key Products & Services

Voicemail

Time ICR offers a feature rich Call Answering/Voice Messaging service to Government and Commercial users across Canada. Time Voice Messaging Service is a powerful business and management tool that enables you to be more productive.

- No investment in equipment.
- Very large platform, even for smaller users.
- You never miss a call.
- Messages are accurate and detailed, in the callers voice capturing the tone and emotion.
- Messages are available from anywhere 24 hours a day.

Fax Broadcast

- Allows you to send a fax to 1 or 1 000 locations with ease. You can store up to 1 000 names and fax numbers either together or in groups. Faxes can be sent to one group, several groups or all groups.
- Allows you to delay transmission either to control time sensitive material, i.e. a press or product release or to save long distance charges by sending after hours.
- Automatically retries busy or no answer numbers and sends a complete transmission report directly to you.

- Can be used to send faxes anywhere in the world and can be controlled from any fax machine or fax modem equipped PC.

Personal FaxMail

- Is ideal for travelers, teleworkers, faxmodem users, small business.
- Allows you to receive your faxes anywhere, anytime. Your faxes won't be lost or misplaced and are confidential.
- Gives you complete control over your faxes and you can be alerted when you have a new fax through your Time Voice Mail or a pager.
- Gives you a telephone number which you can publish as your fax number, so you do not need to have your own fax telephone line.

Never Busy Fax

- Is ideal for busy office fax machines and ensures that incoming faxes always reach your fax machine.

Interactive Voice Response

Time ICR's IVR Service offers corporate and institutional customers a flexible service that makes a wide array of audio and fax information instantly available to their callers. Callers interact with the system over the telephone to either:

- retrieve information from a database;
- enter information into a database;
- listen to prerecorded information; or
- some combination of the above.

Audiotext (Bulletin Boards)

Time ICR's Audiotext service offers customers a flexible service that makes a wide array of audio information instantly available to your callers.

- Relieve staff from the task of dispensing repetitive information.
- Present this information 24 hours per day, 7 days a week.
- Your callers are able to leave messages or be transferred to specified telephone numbers for more assistance.
- Subscribers can easily create and administer their application and any changes take effect immediately.

Automated Attendant Service

- Designed to supplement or replace many of the functions performed by telephone receptionist.
- Allows easy access to everyone 24 hours per day.
- Enables your organization to cope with high incoming call volumes that would be impractical or uneconomical to support with live agents.
- Callers hear an introductory message followed by a menu of choices.

Goals

Time ICR provides quality, integrated telecommunications solutions to the private and public sector. Our goal is to improve your customer service, boost your personal productivity, expand your business boundaries, improve your cost structure, and help you generate new revenues. Our people have the skills and experience to deliver innovative and timely solutions to your business challenges whether they be marketing, customer service, or public relations related.

Contact

Botho von Hampeln
Tel: (613) 798-1500
Fax: (613) 798-1505
Website: www.timeicr.ca

TimeStep

About TimeStep Corporation

TimeStep Corporation enables businesses to communicate over the Internet securely. Using encryption and authentication, TimeStep's PERMIT™ technology allows corporations to take advantage of the convenience and cost savings available from using the Internet instead of leased lines and direct dial remote access for their network infrastructure.

PERMIT makes the Internet safe. Using PERMIT, businesses can send sensitive data across the Internet confident that it will travel safely—unseen, unchanged, uncopied, and in tact. By encrypting and authenticating data at its source and decrypting it at its destination, PERMIT ensures the privacy, confidentiality and integrity of the data whether it travels across the hall or across the globe. In doing this, PERMIT transforms the Internet into a company's secure virtual private network (SVPN).

TimeStep developed the PERMIT SVPN™ technology in response to increasing demands on the Internet to serve as a secure vehicle for business communications. Network service providers use the PERMIT solution to secure their Internet business service offerings. Technology-savvy Fortune 500 companies eager to take advantage of the Internet's worldwide point of presence use PERMIT to secure their branch office communications where leased lines are impractical and too expensive. And Government and financial firms who deal with highly sensitive information require PERMIT for all communications.

Since its inception, TimeStep has focused on developing network security solutions that are simple, powerful and compatible with past, present and future networking technologies. An early adopter of the notion that the Internet is the network infrastructure of the future, TimeStep is leading the security industry in producing security solutions that make the Internet an attractive and viable means of communicating for any corporation.

Key Products & Services

The PERMIT product suite is the most robust SVPN solution on the market today. PERMIT is a centrally-managed, transparent plug and play solution that marries well with current corporate needs. Adding PERMIT to a corporation's existing network infrastructure is easy and requires no costly upgrades. Once implemented, PERMIT is easy to administer and it does not affect network performance.

Nor does PERMIT affect employee performance. Employees can send information securely without changing the way they communicate. With the exception of a one-time password required for set-up, PERMIT secures communication invisibly to employees. Consequently, there is little or no cost associated with training employees and they don't have the burden of having to secure each communication manually.

PERMIT is a flexible security solution that grows and adapts to most network infrastructures. Because of it's scalable architecture, PERMIT is able to secure transparently one or one-thousand sites for any number of applications.

R&D Activities:

TimeStep's research and development team focuses on products based on SVPN technology. This includes development of:

- both hardware and software for platform-independent security gateways with throughput from 2 to 100 Mbps;
- government standards compliant security hardware;
- workstation client security for standard operating systems
- a centrally-managed secure network management system (SNMS);
- a software developers' toolkit that encapsulates emerging Internet security standards (IETF IPSec); and
- porting firewall technology into security gateways.

Goals

TimeStep Corporation envisions a future where all organizations will send information over networks with complete security. By forming alliances with customers, other network equipment vendors, and network service providers, TimeStep is leading the network security industry towards compatible secure virtual private networking. TimeStep is also working closely with standards organizations to define emerging standards.

Contact

Sarah Miller
Tel: 613-599-3610 ext. 4563
Fax: 613-599-3610
E-mail: smiller@timestep.com
Website: www.timestep.com

TMI Communications

About TMI Communications

TMI Communications is the only Canadian company to own and operate a satellite-based mobile communications network. The MSAT® Network uses the world's most powerful mobile telecommunications satellite to transform Canada, the United States (including Alaska and Hawaii), Mexico, Central America, and most of the Caribbean into a single communications cell. TMI has taken the MSAT Network from concept to commercial service in just under a decade and has developed innovative wireless communications products and capabilities that answer today's needs while anticipating tomorrow's.

Key Products & Services

The MSAT Network puts modern communications services within reach of all Canadians, everywhere—on land, sea or in the air.

Services currently available on the network include:

- voice;
- voice mail;
- circuit-switched data;
- one-way messaging facsimile;
- facsimile;
- aeronautical; and
- marine.

The following new services will be launched in 1997:

- packet data;
- differential global position system (DGPS); and
- dispatch radio.

Because of its advanced digital technology, the network provides users complete privacy and secure transmissions.

The power of the MSAT Satellite means users can access the network with compact satellite phones called MSAT Communicators® that were developed by leading manufacturers: Westinghouse Electric Corporation, Mitsubishi Electric Corporation, and Narrowband Telecommunications Research Inc. Other network-related equipment manufacturers include Calian, Cal Corporation and TRANSYS .

Companies operating in the transportation, oil & gas, mining, forestry, emergency services/public safety and utilities will greatly benefit from MSAT Communicators® Services, whether it be:

- to extend the reach of their communications capabilities into remote areas;
- to improve employee safety;
- to transmit information securely; and
- to provide sales & service personnel with much needed communications that are cost-effective.

The full-range of MSAT Services and equipment, including installation and after-sales services, are available across Canada through our Service Providers:

- Glentel;
- Mobility Canada Satellite;
- Infosat; and
- Government Telecommunications and Informatics Service (GTIS).

R&D Activities

TMI Communications strives to anticipate and continually exceed customers' needs.

TMI works closely with our Service Providers and supports application developers, systems integrators and value-added resellers in developing integrated business solutions over the MSAT Network.

Goals

At TMI, our goals are to provide a reliable and dependable satellite communications network that provides cost effective communications solutions to meet today's business environment.

Contact

Diane Dekuysscher
Tel: (613) 742-0000
Fax: (613) 742-4120
E-mail: ddekuysscher@tmi.ca
Website: www.msat.tmi.ca

TTS Meridian Systems Inc.

About TTS Meridian Systems

TTS Meridian Systems Inc., a wholly owned subsidiary of Northern Telecom (Nortel), is the largest national interconnect company in Canada. TTS is a single source provider of telecommunications products and services. We have the people and knowledge needed to seamlessly integrate multiple technologies on various platforms into one business solution. TTS services customers in a variety of industry sectors across Canada with 13 regional offices in major centers nationwide. Recognizing the strong reputation and presence of TTS in the Canadian marketplace, Northern Telecom acquired TTS in 1993.

Corporate Mission

"Keeping Your Business Connected" is the TTS corporate philosophy. The company's stated mission is to design, implement and service telecommunications systems and applications which anticipate, and exceed, customer requirements and expectations, making TTS the undisputed leader in innovative business communications solutions.

Service Commitment

For over a decade, TTS has provided the industry leading service on a national scope. TTS's premium level of service, 24 hours a day, 7 days a week, ensures that your communication systems are always working for your business. We offer a full spectrum of services including: flexible maintenance programs, ongoing consultation; and a variety of seminars, workshops and newsletters to keep you continuously informed about current technologies.

Demonstrating this powerful commitment to customer service, TTS has positioned over 80 percent of our national employees on the "front-line". This service commitment is augmented by TTS's support of an extensive dealer network throughout Canada.

Product Portfolio

TTS provides the industry's most comprehensive range of products and applications for business communications. TTS specializes in Nortel solutions including:

* Meridian Telephone Systems (2 - 10 000 lines);
* Voice Processing and Unified Messaging;
* Automatic Call Distribution (ACD) Reporting and Administration Tools;
* Computer Telephony Integration (CTI) Interface;
* Skills-Based/Custom Routing;
* Interactive Voice Response (IVR);
* Wireless Communications Systems;
* IBDN Cabling System;
* Telemanagement Tools; and
* Desktop Video and Software Solutions.

The Nortel product portfolio is enhanced by a full complement of CTI products and advanced call centre solutions. We have built strong partnerships with Nortel business affiliates such as: Davox, Genesys, AAC Corporation and Dees Corporation, to deliver superior solutions for your business.

These complements include:

* Inbound Call Centre Automation;
* Outbound/Blended Predictive Dialing;
* Softphone and Telephony Server;
* Agent Monitoring and Evaluation Tools; and
* Reader Boards and Agent Display Tools.

As a Nortel IVR and CTI Value-Added Developer (VAD), TTS offers fully integrated, innovative applications, merging voice and data communications for today's electronic business environment. Custom applications have been developed for many industry sectors including: Finance, Insurance, Hospitality, Retail, Utilities and Manufacturing.

TTS builds strong partnerships with Canadian businesses by offering customers the most advanced telecommunications services and solutions in the industry. We work with you to provide the dynamic tools required for your competitive positioning in a continuously changing marketplace.

Contact

Donna Roberts
Tel: (416) 496-6744
Fax: (416) 496-6767

Tundra Semiconductor Corporation

About Tundra Semiconductor Corporation

As Tundra enters its second year as a privately-held, international fabless semiconductor corporation, we have expanded our efforts to design, develop, and deliver bus-bridging components. Our mission is simple. We're committed to providing high-quality components that enable embedded systems designers to get to market faster with a more competitive product.

Key Products & Services

Tundra continues to offer the leading family of VMEbus-bridging components, and has expanded its line of embedded PCI Bus-bridging chips. The latest addition to our PCI Bus Bridge family is the Eighty-X™, specifically designed as the Texas Instruments™ 'C8x DSP-to-PCI Bus Bridge.

Tundra also has the broadest selection of hardware-based DES (Data Encryption Standard) solutions available on the market today. And our 8000 Series Family provides a secure supply of industry-standard 8-bit integrated circuits that support x86 Intel® microprocessors and match the functionality of similar products sold by other vendors, some of which are exciting this diverse, well-established market.

Our People

We offer you a highly experienced design and development team dedicated to technology innovation and quality in VMEbus and PCI Bus bridging components, and encryption devices. Our engineering staff use the latest Cadence and Synopsis development tools in the design of superior digital ICs, and our management team has been working together for over four years.

To better meet your needs, we've long embraced the "lead customer" partnership model for chip development. Tundra invites one or more customers to participate in the definition, design, test and early silicon supply phases of product development. In this way, each product is designed to meet and exceed your requirements by addressing performance, functionality, ease of use, cost and flexibility issues.

These strategic partnerships have led to the development of a number of successful bus-bridge and encryption products.

Tundra's strategic partnerships with Motorola® Inc. and Texas Instrumentst®, for example, have resulted in enabling technologies allowing direct access to the PCI Bus.

Our experience in designing bus-bridging applications is strengthened by our detailed application knowledge of users' systems, which allows us to optimize the total solution for our customers. Tundra is well known for providing truly superior levels of support through our Customer Service and Application Engineering groups.

We make this boast only because our customers tell us it's true. Our extensive documentation and application notes are a cut above the rest, and our technical teams provide you with excellent Application Engineering support. We pride ourselves on responding immediately to any issues that arise.

Tundra markets and supports its products worldwide through direct sales personnel, and representative firms.

Our Company

As a fabless semiconductor company dedicated to product and service innovation and quality, all our components are manufactured by suppliers meeting ISO requirements. In our corporate headquarters we maintain clean room facilities for wafer probing, device packaging and testing.

A Newbridge Affiliate

Tundra is owned by its employees, private investors and Newbridge Networks Corporation, a world-leader in communications networking equipment. As a Newbridge Affiliate, Tundra benefits from access to both senior management advice and a broad range of advanced infrastructure services, such as a world-class MIS system. The Affiliate structure allows Tundra to better leverage its technology resources and expertise while maintaining its independence.

On the Web

A key element of our service delivery is making it easy for our customers to do business with us. To that end, we offer up to date documentation and support, such as application notes and white papers, on our web site. Bookmark http://www.tundra.com to get the latest information on products and services.

Contact

Dr. Adam Chowaniec
Tel: (613) 592-0714
Fax: (613) 592-1320
E-mail: inquire@tundra.com
Website: www.tundra.com