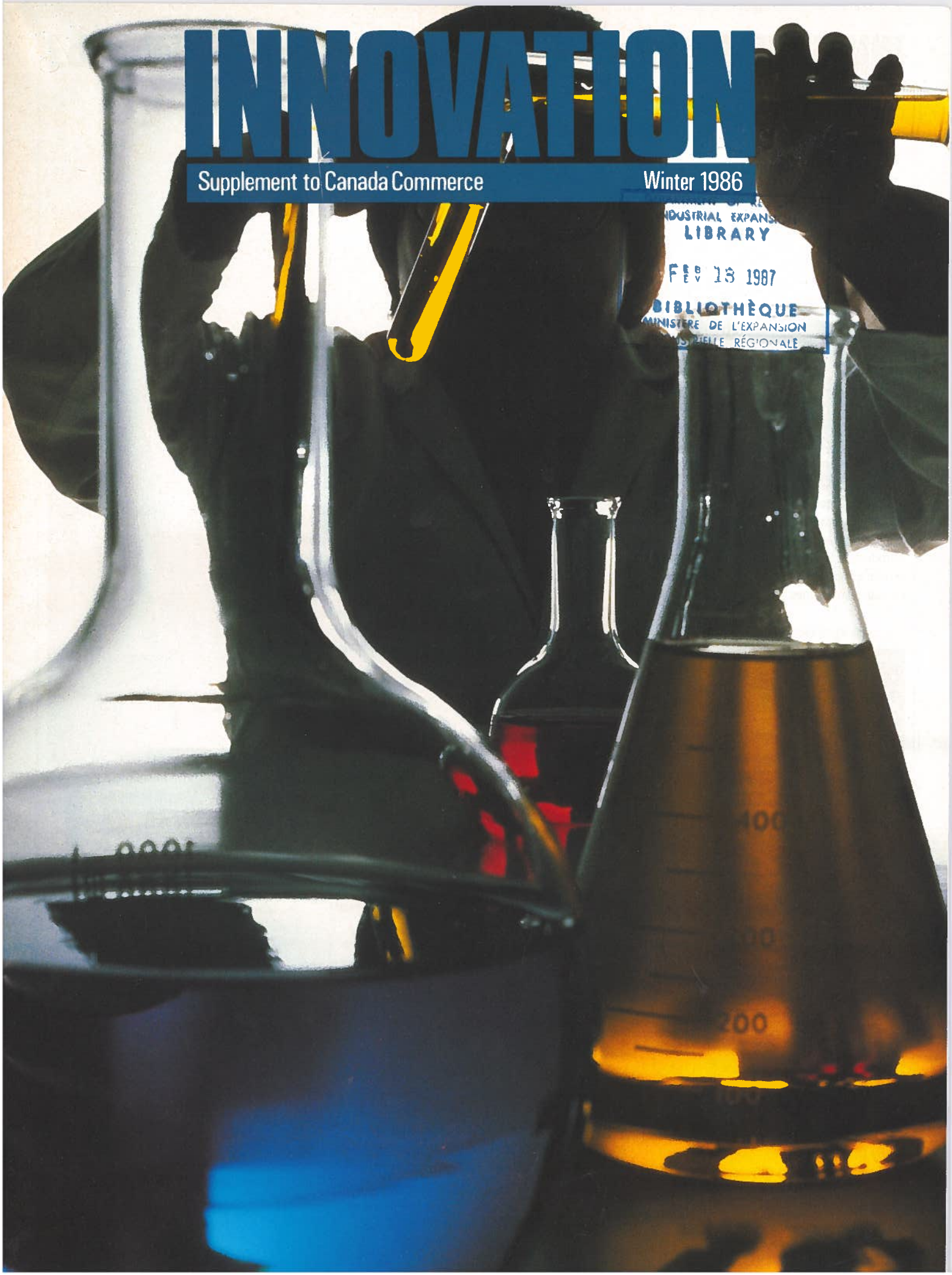
INNOVATION

Supplement to Canada Commerce

Winter 1986



INNOVATION

Contents

Innovation Supplement
This is a reader's magazine, open to ideas and information from its readers. Offers and requests of technology transfers must come from our readers in Canada to match those supplied from abroad. Ideas for articles and information, even finished articles, will be welcomed.

We invite you to become a part of *Innovation* with your comments and ideas. You can contact us at:

Innovation
Technology Transfer Services (EOII),
Office of Industrial Innovation,
Department of Regional Industrial Expansion, 235 Queen Street,
Ottawa, Ontario K1A 0H5;
Tel: (613) 954-3474.

Photo credits
Masterfile

Dan McCoy p. 1
Mark Tomalty p. 21

Hon. Michel Côté
Minister of Regional Industrial Expansion
Hon. Bernard Valcourt
Minister of State (Small Businesses and Tourism)

Editorial

THIS issue of *Innovation* takes a look at one of the new ideas in the federal government's continuing efforts to encourage small and medium-sized Canadian companies to adapt new, more efficient technologies and operating procedures. It is fitting that this concept, implemented by Harwill Technologies International Inc., of Ottawa, should be supported initially by the Industrial Research Assistance Program (IRAP) of the National Research Council.

Over the years IRAP has been considered one of Canada's most successful grant programs, promoted not only by NRC's Technology Advisors but also by the regional offices of the Department of Regional Industrial Expansion from coast to coast.

The Harwill idea, in a nutshell, was to provide expertise to small and medium-sized companies at every stage of the productivity improvement process, expertise which these companies did not have or could not spare from their day-to-day operations. The story starts on page 2.

Japanese management techniques are often touted as the answer to all the problems that Canadian companies face. On the other hand, the social differences between the two cultures are great and it is often doubted whether the Japanese management style could be transferred to Canada. The efforts of one Canadian company in melding the two management cultures is told by an officer of the company, beginning on page 6.

Although much of the Canadian economy was, in the past, based on agriculture, the relative importance of this sector has been declining rapidly in concert with most other basic industries. In fact, Canada is fast approaching the time when the value of imports of fruits and vegetables will be equal to our exports of grain and other agricultural products.

A new trend, however, is emerging. Specialty growers are taking a new approach to food production. One such firm is Greens Alive whose story starts on page 10.

To round out this issue, we continue our series of provincial research councils, taking a look at both Saskatchewan and British Columbia, on pages 12 and 15.

R&D Notes

Industrial Research Assistance Program

All five finalists in the Technology Transfer category of the 1986 Canada Awards of Excellence received grants from the National Research Council's Industrial Research Assistance Program (IRAP), an indication of IRAP's importance to Canadian industry.

In addition, 17 of 37 finalists in the eight categories also benefitted from IRAP grants. The categories included Productivity, Marketing, Entrepreneurship, Technology Transfer, Labour/Management Co-operation, Innovation, Invention and Industrial Design.

The five Technology Transfer category finalists were:

- **Lab-Volt (Québec) Ltée** of Québec for its ANALOG Communications Training System;
- **Sci-Tec Instruments Inc.** of Saskatoon for its Brewer Ozone Spectrophotometer;
- **Almax Industries (1980) Ltd.** of Lindsay, Ontario, for the transfer of ceramic technology for manufacturing high-performance transducers;
- **Export Packers Company Ltd.** of Bramalea, Ontario, for transfer of technology to extract lysozyme from egg albumen efficiently; and
- **Canadian Farm Tec Systems** of Waterloo, Ontario, for one component in the transfer of technology for its computerized dryer control system for drying grain.

Harwill Technologies International –

An Interview

A successful combination of private enterprise and government expertise is opening doors in technology transfer for small and medium-sized Canadian companies.

Harwill Technologies International Inc. is an Ottawa firm created by a group of consulting engineers to expedite such transfers.

When the company was seeking ways to make its services known and help finance initial contacts, it seemed natural to approach the Industry Development Office of the National Research Council and the Office of Industrial Innovation of the Department of Regional Industrial Expansion, both key elements in technology transfer.

To investigate how Harwill's technology transfer program started and is progressing, *Innovation* brought together the main players for a round table discussion.

Participating in the discussion were (in order of appearance): Harvey Goodwin, president, Harwill Technologies International Inc.; Douglas Horne, vice-president, Harwill Technologies International Inc.; Dr. Don Cox, element manager, Industrial Research Assistance Program, National Research Council; Veli Dagpinar, chief, technology transfer, Office of Industrial Innovation, Department of Regional Industrial Expansion; David Younger, vice-president, Harwill Technologies International Inc.; William Lemmon, vice-president, Harwill Technologies International Inc.; Claus Hafner, manager, European operations, Harwill Technologies International Inc.

Here are the results of that mini-conference.

Innovation: Mr. Goodwin, what prompted you and your colleagues to start Harwill Technologies?

Harvey Goodwin: Basically, each of us at Harwill had spent many years either at major corporations or as consultants to major corporations involved in the transfer of technology. We were familiar with all the steps required to make technology transfer successful.

Frankly, we were tired of working for the big company. At the same time, we felt that smaller companies needed services we could provide to make their operations more efficient.

Innovation: But surely, even small companies have or could hire this expertise on staff?

Douglas Horne: Even if they have the expertise, for the most part small business managements are so burdened down with day-to-day operations that they cannot find time for implementing the changes required. Or they are distracted by other problems at crucial times and waste precious time and dollars on lost opportunities.

Innovation: We can see the need and why it would be cheaper for a small business to hire an outside consultant, but how did you come to form a sort of partnership with NRC and, more specifically, IRAP?

Douglas Horne: Well, of course, in our former work we had a lot of exposure to NRC's Industry Development Office. We realized that our service would be a good extension to the work carried out by its Industry Technology Advisors and that they would be excellent contacts with the business community, in particular the businesses we saw as our clients.

In conference at Harwill, left to right: William Lemmon, vice-president; Douglas Horne, vice-president; David Younger, vice-president; Harvey Goodwin, president; Claus Hafner, manager, European opearation.

Harvey Goodwin: And, of course, we had to live until our billings started to come in. We are not wealthy and so we approached Dr. Cox with the proposition that IRAP would finance our initial contact with a client and, once an assessment of the situation was made, further negotiations for services would be between the client and Harwill Technologies.

Innovation: We can see how this arrangement would be advantageous to Harwill but Dr. Cox, how does it fit in with the IRAP and the Industry Development Office (IDO) mandates?

Don Cox: The IRAP and IDO mandates provide for the transfer of technology and the enhancement of productivity for Canadian industry.

The IRAP record in this regard has been very good. However, those of us in the field know that too often our Industry Technology Advisors (ITAs) spend a considerable amount of time and effort with clients without any visible results.

While some of this is due to the fact that a satisfactory solution to the problem could not be found, probably more is due to the fact that other pressing problems have diverted management's attention.

To us this was a double waste – a waste of our ITAs but also a waste of our clients' time since they lost an opportunity to upgrade their opera-

Interview continued

"...What better way to ensure business gets on with its task of making itself competitive on world markets than by bringing both private enterprise and government expertise to bear on solutions."

tions. It seemed sensible to try to avoid this in any way possible.

The proposal that Harwill brought us seemed to be a possible solution. At least it was worth a try and, while the jury is still out, I would say that it seems to be working. Those clients we have introduced to Harwill seem willing to pay for the extra service – service the ITAs are unable to provide.

And, if the results are as promising as they now appear to be, there is no doubt in my mind that other firms will be willing to enter the field. It is an excellent way to fulfil the government's desire to increase private sector involvement in areas formerly dominated by government agencies.

Veli Dagpinar: Speaking for the Office of Industrial Innovation, I might add that this idea works in well with our mandate to bring technology transfer, productivity and innovation to the attention of Canadian industry. What better way to ensure business gets on with its task of making itself competitive on world markets than by bringing both private enterprise and government expertise to bear on solutions. And it is a solution that is aimed at small business.

In our dealings with this sector of the Canadian economy, too often the term "technology transfer" conjures up visions of uncontrolled expense, red tape, paper burden and a host of other negative images. I would like to know whether this will be a problem with this program.

David Younger: I must admit that the attitudes you have described do exist. I think, however, that we can cut through these misunderstandings. A good place to start would be to define technology simply as "know-how". Furthermore, technology transfer takes place on a far more prosaic basis than is commonly imagined.

Douglas Horne: While this is true, at the same time technology transfer should be viewed as a powerful option for corporate growth. With the speed of change in industry today, companies cannot afford to stand pat, regardless of how secure their particular niche appears to be.

A company has two basic choices if it wants to maintain or enhance its position. Either develop new know-how through in-house research and development efforts, or acquire it from others. Certainly, there are advantages and disadvantages to both approaches but for small to medium-sized companies, it usually makes sense to acquire a proven technology.

Innovation: But surely an enormous array of technological data and government services currently are available to assist interested companies in acquiring technology. In addition to NRC and DRIE, represented here today, Energy, Mines and Resources, Agriculture, External Affairs and a host of other agencies both federal and provincial all have major assistance programs available to industry.

Canadian Patents and Development Ltd. and our own *Innovation* have long lists of technologies available for purchase or sale. Other countries are eager to buy or sell technology and some are very well organized to do it.

Given all these positive factors, why are so many Canadian companies still behind technologically or in need of even more assistance?

Harvey Goodwin: I suspect there are three main reasons. First, lack of knowledge as to how to access the system. Perversely, the sheer volume of data, services and programs available often daunts companies.

Second, people often are reluctant to deal with perceived government red tape.

Third, and by far the most important factor, is simply lack of time. The president of a small to medium-sized business is generally so busy managing the business, fending off bankers, solving production line problems, acting as chief labour negotiator and assisting with marketing that he or she has no time to address the issue of better technology even if the source of that technology is known.

The hard realities are that, even given a corporate need and adequate sources of supply, the transfer of technology must follow a sequential process and must be supported at each stage by a variety of very specialized services.

Harwill Technologies International was established specifically to provide all these specialized services to Canadian industry.

Douglas Horne: Generally there are four distinct stages in technology acquisition – identification, contracting, transfer and implementation. With the decision to acquire technology, the first step is to prepare a technology requirements specification. This documents in detail the specific requirements, operating parameters, process outputs and similar data.

This specification is then circulated to our correspondent network in Canada and other countries. Sources of technology are identified and analysed, and selected technologies presented to the client for consideration.

If a decision is taken to proceed further, we will advise and assist in negotiating an appropriate contract for technology acquisition.

William Lemmon: We then will manage the technology transfer process. Typically, this consists of assisting the technology source prepare working drawings, equipment specifications and operating procedures. Usually this work is carried out by our correspondent in the source country. The technology package is then "Canadianized" to meet Canadian codes and standards and to incorporate Canadian equipment where possible.

The final stage, which we will also manage, is the construction or modification of a facility to produce the product.

Harvey Goodwin: We think our approach is unique in Canada, in that all services – from definition of need to final production – are available from one source. And the way we address the problem of technology transfer, assistance can be provided to a wide range of industries.

Claus Hafner: Practically, many companies cannot undertake the entire transfer process. They require only partial assistance, typically with definition of markets, productivity improvements, a business plan or a review of available technologies which might complement existing or lead to complementary lines. Often the most difficult part of the process is defining actual and practical requirements for technology.

We recognize these needs for partial services and have structured the firm to provide them. But our main purpose in the process is to provide that extra push that will ensure success to the whole project.

Don Cox: And that is NRC's main reason for supporting Harwill in the initial stages of the process. The rest is up to the client. While other funds may be available under IRAP, the client is expected to pay for other services provided by Harwill.

"...there are four distinct stages in technology acquisition – identification, contracting, transfer and implementation."

"...While other funds may be available under IRAP, the client is expected to pay for other services provided by Harwill."

Murata Erie North America Limited

A Canadian experience with Japanese ownership

By Bruce N. Cox
Manufacturing Engineering Manager
Murata Erie North American Limited

IN 1980, the former Erie Technological Products Company was acquired by Murata Manufacturing Company of Kyoto, Japan. A significant component in the acquisition was the Canadian operation located in Trenton, Ontario, and out of this, together with the later addition of a facility in Mississauga, Ontario, was formed Murata Erie North America Limited. The experience of Japanese ownership has been, and continues to be, interesting, invigorating and rewarding.

One of the most important results has been the joining of Japanese expectations of quality with Canadian innovative flair in product design and manufacture. It is fair to say that this combination contains useful and hopeful experience for many medium-sized Canadian companies with a broad product mix.

It is a generalization, which nevertheless appears to be true, that Japanese managers spend a lot of time investigating, consulting, planning and revising before acting. But, when action comes, it is swift and effective.

This contrasts to some extent with the North American concepts of "getting things done". Murata Erie in Trenton (METR), has combined the two philosophies into a management style which has less to do with Japanese ownership per se than with a sensible and effective appreciation of problems and how to solve them.

METR manufactures electromagnetic interference (EMI) filters, filtered connectors, power suppliers and special filtered circuits for the suppression of electrical "noise". The technology is based on ceramics, a dielectric material which has complex formulation and processing needs.

Both Murata and Erie were experts in this technology, but their market specialties differed, as did their approach to manufacturing. The Murata product line is aimed at low-cost, high-volume production to satisfy commercial markets. The Erie product line is aimed at aerospace and high-technology communication needs. The Erie catalogue offers a diverse product line subject to stringent MIL (military standards) requirements and order quantities tend to be relatively low. The two organizations are, therefore, complementary.

The success of METR in its market may be judged by steady and sustained growth over some 40 years into a company which now employs nearly 900 people and has an annual business turnover in excess of $40 million.

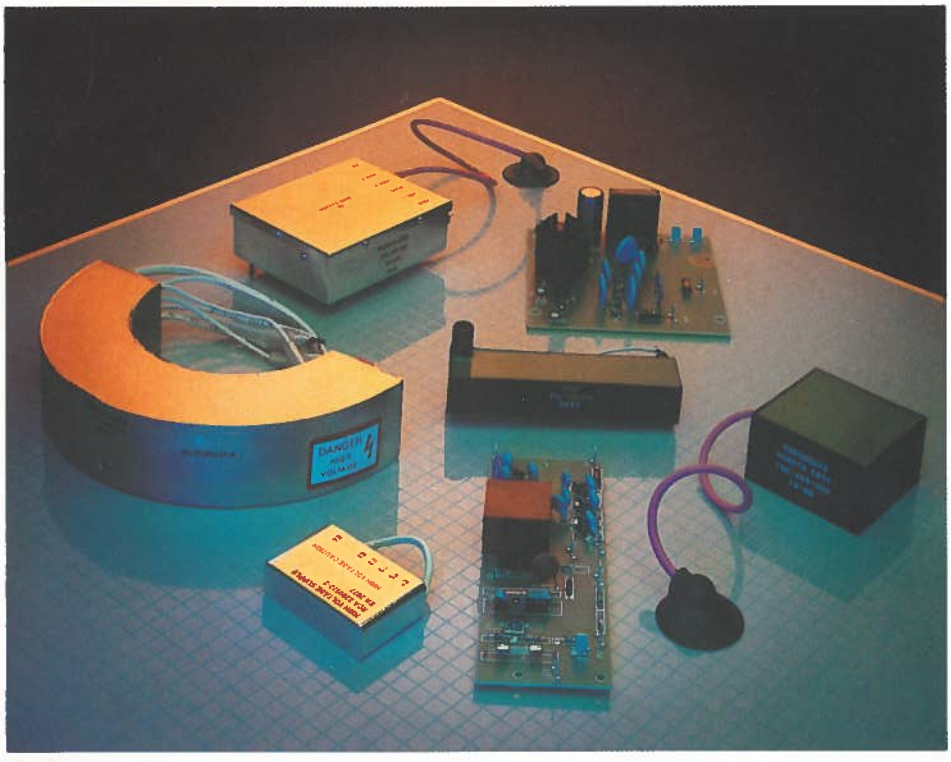
By the mid to late 1970s, when many of the Canadian electronics companies of similar size were forced out of business, METR maintained its momentum by concentrating on what it knew best and by responding to market needs in an innovative way. This is a major reason why Murata acquired the company.

It was two years after acquiring Erie before Murata Manufacturing began encouraging the major management changes needed to develop the business. Peter Briscoe, who had managed a group of similar facilities for ITT in the United Kingdom, became president of Murata Erie North America Ltd. and several other staff changes were made.

The management team was made up of some of the original Erie management, several managers promoted from within the company plus new members. All areas of the company then came under scrutiny, from customer service to shipping.

The emphasis everywhere was on quality: quality of systems, quality of environment, quality of product, quality of service and quality of people. Timeliness, however, was not discarded. On the contrary, a new sense of urgency and responsibility was created to produce effective and lasting results. The effect of planned change can be seen throughout the company.

Typical high-voltage power supplies from Murata Erie.



Japanese managers spend a lot of time investigating, consulting, planning and revising before acting. But, when action comes, it is swift and effective.

"...New processes or product ideas suggested by any company employee are dissected at a brainstorming session."

- Paperwork operation, monitoring and control systems have been streamlined to provide better control and more information. Computers have been used as tools in this improvement. The changes were based on the needs of the business and the way people really work, rather than on an abstract understanding of what computers do.

- A full-scale upgrade of the total facility is about 70 percent complete and provides a clean, pleasant and high-tech environment in which to manufacture precision products capable of high performance. A clean room area was part of this upgrade so that ceramic components could be produced free of airborne contamination.

- Upgrading the facility was matched by a re-equipment program to ensure that work stations and process equipment were of the highest quality and reliability possible.

- New product designs and new process methods were developed to further improve quality and productivity.

- A training facility was built and a personnel training program initiated at all levels.

A major factor in the company's success has been the application of Murata Erie's own knowledge of its product, its market, its technology and its people. Ability and experience combine to seek simple solutions to complex problems. The magic words "robotics" or "automation" are seldom heard and the use of consultant "experts" has been deliberately avoided.

While robotics, automation, computers and experts have their place, the more diverse the product and the smaller the production run, the more difficult it is to justify their implementation.

Murata's Japanese plants use all these tools and are highly competitive in their chosen markets. Very efficient and reliable machines routinely turn out 360 finished components per minute, 24 hours a day. If it were possible to adapt METR's product to this approach, the entire market production would be satisfied in two months by one machine with scarcely any human input.

The approach to quality and productivity at Trenton has been to develop product designs that can be manufactured by controlled processes. Equipment used for manufacture is designed to be efficient, yet flexible. User-friendly equipment is based on modular components and process data are handled by simple micro-computer systems. Since the product processes demand human intervention at some stage in their use, machines are used only for those parts of the process which benefit from their precision. Simple tooling aids are used elsewhere.

Flexibility is achieved, along with productivity, by processing from 10 to 100 or more parts at one time by means of "matrix" tooling. Supervisors and support personnel are encouraged to contribute and comment on new equipment to attain a satisfactory interaction of person with machine.

Murata Erie's capacitor production unit in a clean room.

All operators are responsible for achieving and maintaining a quality standard and are reminded of this by a display of "quality highlights" at their work stations.

New processes or product ideas suggested by any company employee are dissected at a brainstorming session from which a feasibility study is commissioned. If the study is favourable, research and development work is undertaken. Every R&D project is reviewed each day by senior management to ensure that projects do not stagnate when problems occur, and that proper resources are provided.

With successful completion of R&D, the project moves to the new process group where the equipment and methods to be used in production are commissioned, operator training occurs and the run-up to "zero-defects" implemented. Reviews here are weekly.

Before a new product process or major improvement is transferred to full production control, strict criteria must be met.

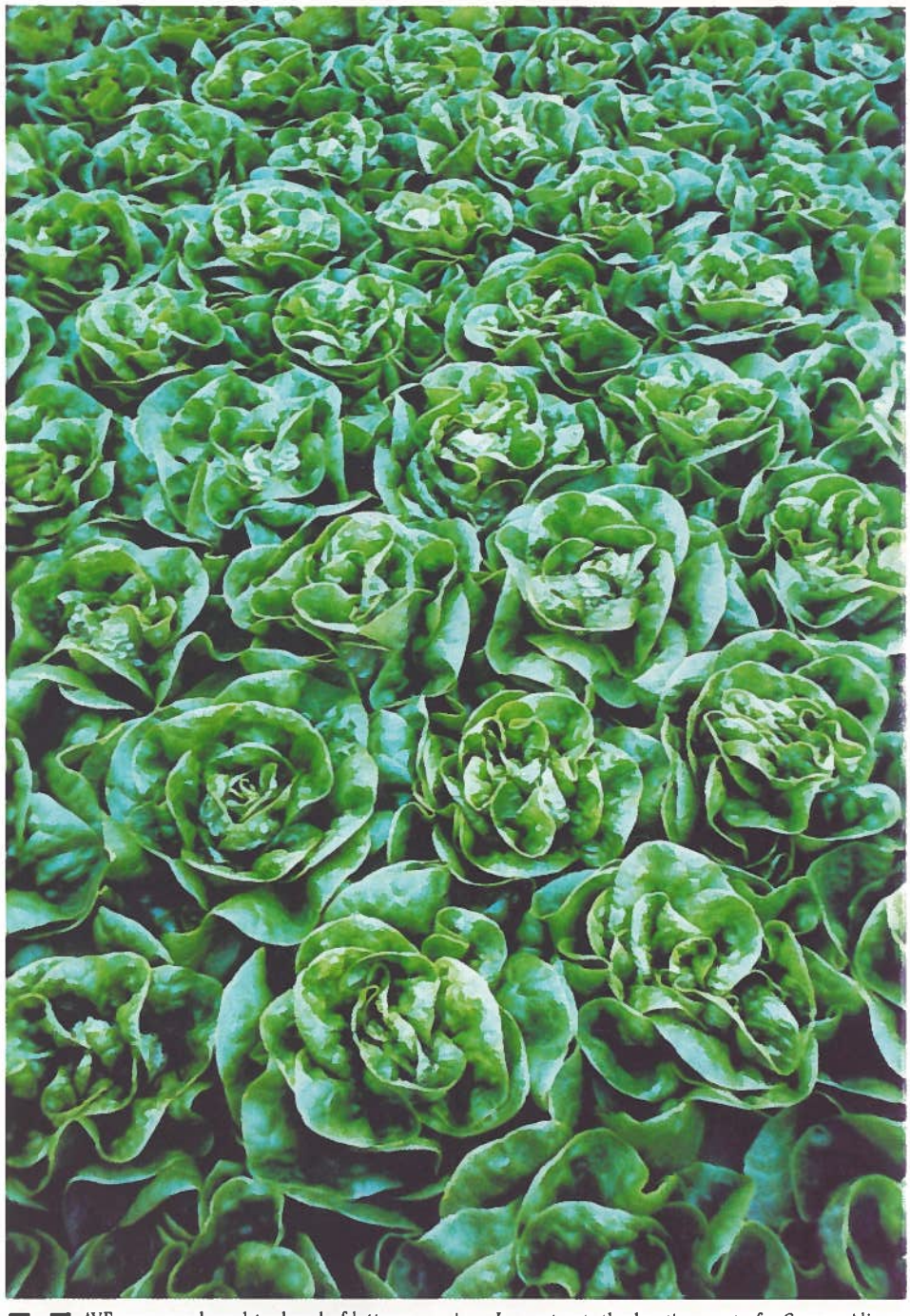
- First-time yield must be a minimum of 99.5 percent with "zero-defects" being attainable.
- Productivity targets must be met.
- All known problems must be solved.
- Equipment must have demonstrated 1000 hours minimum MTBF (mean time between failures) and less than half-hour average MTTR (mean time to repair).

Even though a speedy, large injection of capital enabled the pace of improvement to be rapid, the main contribution has been the application of available talent – using brain power to solve problems.

Automation is used, although in a limited way with computers and CAD systems, but is never substituted for human thought processes. Talent is actively sought and developed at all levels in the company. The production controller is a former data-entry clerk; one of the process managers used to be a line technician. There are many examples of this to be found in all departments.

Many Canadian companies could shed the spectre of foreign competition and the trauma of poor productivity by depending less on outside agencies and more on the application of their own strengths. However, this will only work if management is fully committed to improvement and works as a coherent team. No owner, of whatever nationality, will dismantle success or interfere unduly with a management that is clearly managing success.

"Salad Technology" by Greens Alive



Perfect salad greens approaching the harvest.

HAVE you ever bought a head of lettuce with a warning on the package *not* to wash it? Thanks to the innovative spirit of inventor Helmut Julinot, president of Greens Alive of Aurora, Ontario, you now have the opportunity.

Growing plants without pesticides, herbicides, fumigants, dirt and insects, the firm's greenhouse structures and hydroponic growing systems are energy efficient and highly productive, and the technology is transferable.

Research and development of the Greens Alive system started in 1973 as the energy crisis loomed on the horizon and fuel costs became, and remain, the major expense in year-round greenhouse operations. Agriculture Canada reported that, in 1983, the cost of heating a Canadian greenhouse was $20 per square metre, per year, typically devouring 30 to 50 percent of the sales dollar.

In contrast, the heating cost of a Greens Alive greenhouse in the 1985-1986 season in Canada was $2.84 per square metre, per year! This reduction, combined with a far higher productivity per square metre, resulted in heating costs of only 1.6 percent of sales revenue.

The Greens Alive growing system increases productivity by raising the growth rate and final plant weight through the use of computer-optimized nutrient formulations, hypertonic feeding, supplementary lighting and articulated shading and energy curtain systems, all under automatic environmental control.

The lettuce plants speed from seed to salad in eight weeks. Each week, all year long, seeds are planted and lettuce heads are harvested. On a walk through the greenhouse, visitors can see eight crops of lettuce at different stages of growth.

Ninety percent of all the work in a Greens Alive greenhouse is directly productive and takes place at the three work stations – seeding, transferring and harvesting. The salad greens are seeded at one end of the greenhouse and move through it on plant conveyors to be harvested at the other end.

Greens Alive increases its operators' efficiency and productivity by providing powered plant conveyors, automatic wash tanks, fixed work stations, proprietary plant containers and a rationalized packaging system.

As Julinot puts it: "A modern greenhouse needs to be more than a plot of land with a roof over it."

Only two days a week are there more than three people in the greenhouse. On Mondays and Thursdays, a crew of four comes in to set up supplies and boxes. A switch is flipped to have the conveyor deliver the salad greens for harvesting at a convenient waist-high level.

In seven hours, the harvesting is finished and 300 cases of lettuce are in the truck for delivery to restaurants and greengrocers.

There need be no rush to eat the lettuce because it is still alive and growing in its distinctive package. It has been harvested with roots on and given a squirt of nutrient as a "box lunch for the road" to keep it crisp and fresh for at least 10 days.

The Greens Alive greenhouse and operating system is a combination of high-tech hardware, sophisticated software, an extensive set of specification manuals and ongoing operational support.

Thirty years ago, such an installation would have been provided to the customer as an outright purchase-and-sale. Today, the greatest fear of purchasers of sophisticated production equipment is being left to fend for themselves after the deal has been made.

Based on 21 years of success in franchise systems, Stephen MacKneson, Greens Alive chairman, is convinced that the vehicle of licensing, usually called franchising, is the one best suited to transferring this innovative technology to customers on an ongoing basis.

"A turn-key package from Greens Alive provides almost instant expertise in site selection, layout, operations, growing, hiring and training, purchasing, promotion, marketing and administration," says MacKneson.

Innovation in the age-old field of food growing, achieved by removing the hit-or-miss uncertainties of weather, insects and diseases, now comes as a transferable package of technology, bringing food production with high productivity and low energy consumption to all corners of the world.

For further information, contact: Greens Alive Inc., P.O. Box 366, Aurora, Ontario L4G 3L5
Tel: (416) 773-6021

Harvesting takes place twice weekly at the end of the conveyors.

Saskatchewan Research Council

Reshaping technology for the needs of small manufacturers

The Saskatchewan Research Council is taking CAD/CAM technologies to the shop.

The program goes beyond the typical demonstration facility by placing CAD/CAM technology in the hands of end users.

WHEN small manufacturers look beyond local markets or want to expand product lines, they face increased technical demands and higher levels of marketplace competition. Some of Saskatchewan's small, short-line manufacturers, operating in rural and small urban locations, are now trying new methods of product design with the help of an innovative technology transfer program at the Saskatchewan Research Council (SRC).

SRC's CAD/CAM Robotics Centre functions as a "technology centre without walls" by placing CAD/CAM design stations in a client's plant and using telecommunication links to Saskatoon for access to a library of CAD/CAM applications programs and to technical support.

The program goes beyond the typical demonstration facility by placing CAD/CAM technology in the hands of end users. Manufacturers apply it to their own design and production problems, making gains in efficiency and losing little time in system start-up.

Companies participating in the program lease CAD/CAM hardware from SCR and receive technical advice from the centre's engineering staff.

Saskatchewan manufacturers in the program are using CAD/CAM in a variety of ways.

They are designing new products and components, modifying existing ones and producing drawings both for production staff and for clients.

Throughout the process and before building a prototype, the product can be stress-tested with finite element analysis and visualized with solids modelling.

Design engineers can explore an array of "what if?" questions efficiently and produce line-plots and three-dimensional modelled drawings of various options. This capability has helped several explore new product designs or modifications in focus-group marketing ventures.

The focus groups, composed of management, designers and a cross-section of customer end users, can identify useful product innovations with the help of outputs from the CAD/CAM design stage.

Computer technologies available through the CAD/CAM Robotics Centre are not limited to design but can be integrated into the manufacturing process as well.

An SRC pilot project in material requirements planning has helped a small company manage its parts inventory effectively. Costs have been reduced, stock outages minimized and management can now plan future production with a forward-looking inventory record.

The ability to integrate a variety of CAD/CAM functions into one system is an essential element in the centre's service to clients. More than 100 applications packages are available to allow individual manufacturers with a wide spectrum of products to tap into the system.

Saskatchewan's manufacturing profile shows that most operations are small to medium-sized and many (typically farm implement manufacturers) are located in rural communities, away from major centres. These businesses are eager to take their products to a wider market and view

CAD/CAM technologies as keys to remaining competitive.

In the past, high capital costs and lack of trained operators held many companies back. The CAD/CAM Robotics Centre recognizes both problems and adopts a dual strategy of educating potential users and making the required equipment readily available on a subsidized lease basis.

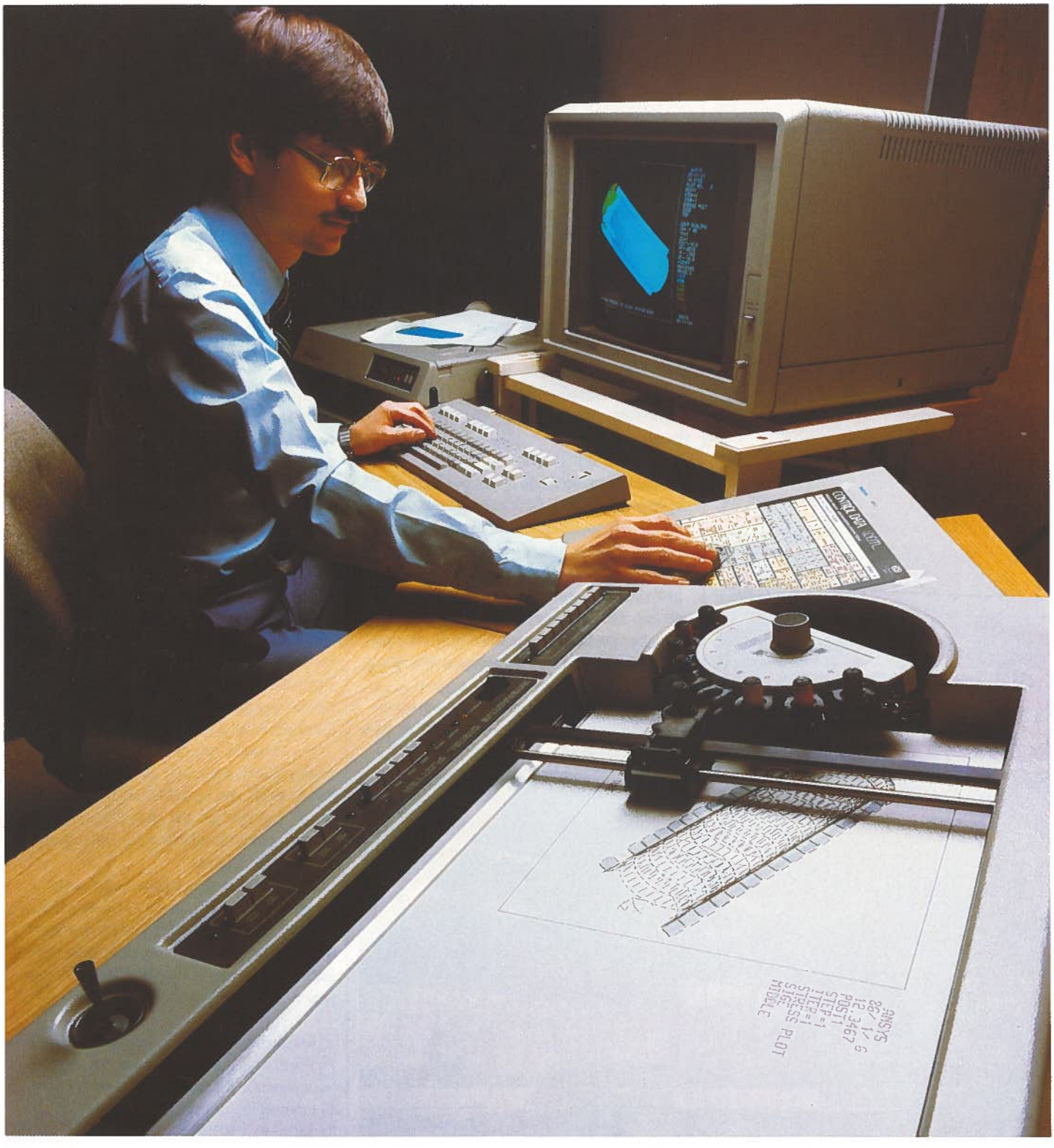
Management and labour are encouraged to examine the implications of the new technologies and develop applications that are specific to their own manufacturing process.

To speed the introduction of CAD/CAM, hands-on training is provided for design engineers and plant operators. Partial funding for training programs is provided by the Canada Employment and Immigration Commission.

With design stations installed and running, a company can turn to the staff at the centre for ongoing technical support and advice.

With the help of SRC's CAD/CAM Robotics Centre, Saskatchewan manufacturers are discovering the potential of integrating computers in all phases of product development and production. Their gains are already evident – new and better products going to expanding markets.

Don Florizone, of SRC's CAD/CAM Robotics Centre, operates a design station to draw, modify and test machine components and entire products.



PROFILE

Innovative Problem-Solving at the Saskatchewan Research Council

FOR almost 40 years, innovation has been an essential ingredient in the work of the Saskatchewan Research Council (SRC). The key goal hasn't changed – applying good ideas to Saskatchewan's resources and products.

In 1937 and 1947, acts of the Saskatchewan Legislature first created and then reactivated the Saskatchewan Research Council. Entirely government-funded in the early years, SRC functioned as a granting agency for applied research in the province until 1958 when it moved to a new building on the University of Saskatchewan campus in Saskatoon.

SRC started its own research program and contracted its expertise to industry and government. The original facility housed laboratories, pilot plants and offices for research in chemistry, engineering, geology, industrial services and physics.

Now SRC has major facilities in Saskatoon and Regina and conducts field operations throughout the province. In 1985, SRC centralized its operations in Saskatoon's Innovation Place Research Park, reflecting its role as a key player in the province's technology community.

In addition to the new Innovation Place headquarters, the council operates a world-class slurry pipeline centre for solids transportation research and an aquaculture research laboratory, both in Saskatoon.

In Regina, the SRC Petroleum Division works with industry on enhanced recovery and upgrading of all provincial oil resources, particularly heavy oil. A Regina field services office extends the National Research Council's Industrial Research Assistance Program (IRAP) to southern Saskatchewan.

SRC's staff of 210 includes 90 scientists and engineers with a mandate of "applying science and technology for Saskatchewan's development" within a framework of four client-oriented branches.

The Research and Development Branch works with the resources and environment of the province. Programs cover air, water and land resources related to industrial activity. All economic minerals development, including uranium, potash, gold, coal, clays and heavy oil, benefit from branch research and technical support.

The Technology Transfer Branch has programs to aid Saskatchewan business and manufacturing sectors, including product development, management consulting and innovation programs to guide entrepreneurs through all phases of new product start-up. The branch operates the CAD/CAM Robotics Centre and delivers the National Research Council's Industrial Research Assistance Program.

The Administration and Finance Branch provides internal services to SRC programs and operates analytical laboratories that process resource, environmental and archaeological samples. A Slowpoke nuclear reactor (one of seven in Canada) handles neutron activation analyses for western Canadian mineral resources clients.

The Canadian Centre for Advanced Instrumentation (CCAI) is the fourth SRC branch. An electronics group and a precision instruments group design, manufacture, test and calibrate measurement and control equipment for national and international markets.

SRC builds innovation into the research process in two distinct ways – by developing new technologies and unique equipment to answer real needs, and by reworking existing worldwide technologies and adapting them for maximum provincial benefit.

For further information, contact: Jim Hutch, President or Katherine Lawrence, Communications Manager, Saskatchewan Research Council, 15 Innovation Boulevard, Saskatoon, Saskatchewan S7N 2X8 Tel: (206) 933-5400

This building in Saskatoon's Innovation Place Research Park houses the Saskatchewan Research Council's headquarters. Other SRC facilities are located in Saskatoon and Regina.

B.C. Research

Solving problems and promoting innovation

B.C. RESEARCH has been in existence, in one form or another, since 1944 when the B.C. War Metals Research Board (BCWMRB) was established to help machine shops, foundries and other metal-working industries to overcome their technical problems and meet standards and delivery deadlines.

Its main objectives were to:

- research subjects which were important to the province's industrial development;
- make research staff and facilities available to industry;
- assist in transferring existing technology to industries with limited or no technical resources of their own.

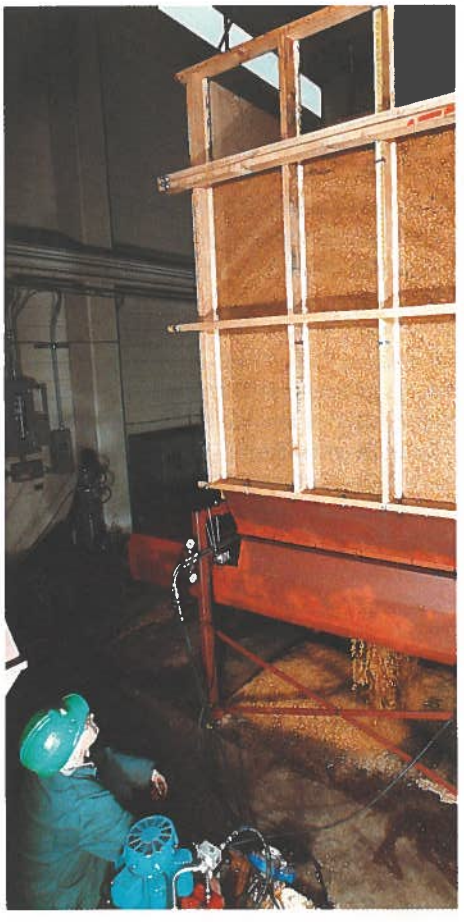
As demands for assistance became greater and more varied, the BCWMRB became the British Columbia Industrial and Scientific Research Council which, in turn, became B.C. Research.

During its 42 years, B.C. Research has grown in size and contracts as well as in expertise. Well established and highly successful, it has continued to expand into new areas and to retain people with a variety of skills while maintaining the objectives set at the time of its founding.

Seven operating areas work together, forming a self-sufficient research organization that provides technical assistance to government and industry.

These divisions include chemical technology, physical technology, extractive metallurgy, fisheries and biotechnology, environment and health, operations management, and business assistance.

The general areas of capability are: process development, product development, systems and operational analysis, research studies, testing, and industrial development and technology transfer.



Programs exist in areas such as alternate fuels, aquaculture, industrial chemistry, toxicology, remote sensing, bulk handling and ocean engineering.

Work is done on a fee-for-contract basis and, where work is being undertaken for small British Columbian companies, financial support is available. Ideas and innovations are screened, promoted and funded by B.C. Research.

All together, 120 people, including 80 technical staff, work together to benefit B.C.'s economy through research and development.

For further information, contact: B.C. Research, 3650 Wesbrook Mall, Vancouver, British Columbia V6S 2L2
Tel: (604) 224-4331

Technology Transfers

Offered

Canada
- Over-speed Spoilers for Vertical Axis Wind Turbines
- Magnetron Sputtering Apparatus
- Pressure Leaching of Magnesium Ores in a Chloride Medium
- Viscometer
- Electrically Erasable Non-Volatile Transistor Memory
- Bacterial Enzyme Used as Cheese Ripening Aid
- Convertible Trailer
- Ground-Working Sweep
- Wood Densification Technology
- Software Engineering
- Safety Handle for Transport Cargo Box Doors
- Pile Splice
- Edible Oil Deodorizer
- Device to Treat Deep-Sea Divers

Australia
- Phenolic Foam Insulating Panels

Austria
- Sheet Metal-Working Machines
- Electric Floor Heating

Britain
- Sailboats

Czechosolvakia
- Tubular Convective Heat Recuperators

East Germany
- Surface Stabilizer
- Utilization of Waste-Water Heat
- Recovery of Copper and Aluminum

France
- Motorcycle Wheel Alignment Check
- Modular Dehydrator for Fruits and Vegetables
- Fracture Simulator
- Integral Acoustic Guitar
- Composite Panels
- Concrete Anchoring Systems
- Temporary Shelters
- Disposable Bib
- Concrete Pipe
- Concrete Bucket

India
- Pesticides

Ireland
- Security Products

Israel
- Computer Numerical Control

Sweden
- Tire Recycling

Switzerland
- Pressure-Measuring Sets
- One-Person Submarine

U.S.A.
- Comparator for Automatic Curve Tracers
- Portable Composite I-Section Ultrasonic Inspection System
- Universal Hinge-Latch
- Precision Wire Stripper for Large-Gauge Wire
- Hand-Held Power Stripper
- Safe-Cutting Hand Knife
- Speed Drives
- Closet Door Hardware
- Manufacturing Inspection Systems
- Multi-Purpose Hand Rail

West Germany
- Handles and Closures
- Koster Glass System

Requested

Canada
- New Plastic Technologies
- Computer Software

Asia and Pacific
- Food Processing
- Disposable Hospital Supplies
- Rear-View Mirrors
- Heaters and Cathodes
- Condiments

Brazil
- Miscellaneous Technologies

India
- Diapers and Allied Products
- Electronic Circuit Breakers

West Germany
- Environmental Protection

Offered

Canada

Over-speed Spoilers for Vertical Axis Wind Turbines 6039
Over-speeding of the rotors of vertical axis wind turbines in high winds often results in damage to the turbine. These light, simple, automatic spoilers will eliminate over-speeding and will not adversely affect the operation of the turbine airfoil sections at normal wind speeds.

Magnetron Sputtering Apparatus 7411
A composite cathode target for use in magnetron sputtering which permits simultaneous sputtering of several different materials in any desired ratios. The ratios are determined by the relative areas of the different materials of which the cathode target is composed. Hard-to-fabricate alloys such as Ni-Cr are easily produced with this cathode target.

Pressure Leaching of Magnesium Ores in a Chloride Medium 7826
This process presents an alternative leaching method for the recovery of uranium and small amounts of radionuclides, particularly radium, in the ore. An acidic solution of an alkaline earth metal chloride is used under oxygen pressure. Sulphate ion build-up is controlled to improve the extraction of the radionuclides. Recovery efficiency averages over 95 percent for uranium and over 90 percent for the radionuclides. The tailings are environmentally inert and suitable for backfill.

Viscometer 8141
This instrument is a modification of the Cannon-Fenske type capillary viscometer, specially designed for measuring the viscosity of volatile or radio-active liquids. The sample liquid is timed as it passes through the capillary, protected by vacuum to prevent contamination by air.

Electrically Erasable Non-Volatile Transistor Memory 8483
In this design of electrically erasable non-volatile transistor memory, an insulating layer of ferroelectric material replaces a double layer of dielectric material resulting in a simpler and easier to fabricate storage structure. Information is stored and erased by polarizing and de-polarizing the storage structure. This memory offers high-density storage and is compatible with planar technologies.

Bacterial Enzyme Used as Cheese Ripening Aid 8305
This invention concerns the production of Cheddar cheese using an improved ripening aid which reduces aging time while enhancing the development of desirable flavour and texture characteristics.

For any of the offers listed above, write to:
Canada Patents and Development Ltd.,
275 Slater Street, Ottawa, Ontario K1A OR3;
Telephone: (613) 990-6100.
Please quote the appropriate case number.

Convertible Trailer
A Canadian company wishes to enter into a licensing agreement with an interested party for the manufacture of its "Bulktrailer". The main feature of this trailer is that it can be converted within minutes from a dry bulk load carrier to a flat-bed, general freight trailer, or vice-versa.
Write to: C. Neumann, D.N.A. Systems Inc.,
67 Lakeshore Road, Pointe-Claire, Quebec
H9S 4H5; Telephone: (514) 695-3382;
Telex: 055-62171.

Ground-Working Sweep
A Canadian inventor is offering to companies in the agricultural or machinery industries, under licence, the manufacturing and marketing rights for his patented invention, a cultivator sweep. The inventor claims that his design eliminates the problems of using a conventional sweep. Additional benefits include durability, versatility and overall effectiveness as sweep or shovel.
Write to: Gerald J. Anderson, P.O. Box 1317,
Melville, Saskatchewan S0A 0P0;
Telephone: (306) 728-3506.

Wood Densification Technology
A Canadian inventor offers licensing of his patented technology for a mechanical/chemical method to convert low-quality, low-density woods into high-quality, high-density hard woods. With the same method and without any additional cost, wood can be bent, formed or deeply embossed to produce moulding, curved furniture pieces, etc.
Write to: P. Favot, Renova Manufacturing Co. Ltd., 170 Booth Street, Ottawa, Ontario K1R 7W1;
Telephone: (613) 234-8169; Telex: 053-4834.

Software Engineering
A Canadian firm is offering to other Canadian companies, through licence or joint venture, technology relating to computer software consisting of two packages – the developer and the documenter – both designed to assist systems analysts, designers and product managers in production.
Write to: Asyst Technologies Inc., 1080 Beaver Hall Hill, Suite 1400, Montréal, Quebec H2Z 1S8;
Telephone: (514) 871-0108.

Safety Handle for Transport Cargo Box Doors
A Canadian company is offering, through a licensing or joint-venture agreement, its technology "Load Guard", a handle improvement which can be added to all cargo boxes with rotatable locking bars, or installed during manufacture. Once installed, it is impossible to open or close trailer doors without using the Load Guard handle.
Write to: E. Haist, Load Guard Registered,
P.O. Box 299, Maitland, Ontario K0E 1P0;
Telephone: (613) 348-3398 or 348-3579.

Pile Splice
A Canadian company wishes to enter into a joint-venture agreement or to license its technology "Sure Lock" mechanical pile splice. The pile splice consists of male-female plates which lock after they are brought together with no welding necessary. The company claims many advantages including: concrete piles of different sizes and shapes can be spliced together; equipment of smaller capacity can be used to drive deep piles by using shorter piles with "Sure Lock".
Write to: Brian Cebryk, Agra Industries Ltd.,
1200 CN Towers, Saskatoon, Saskatchewan
S7K 1J5; Telephone: (306) 653-5163;
Telex: 074-2496.

Edible Oil Deodorizer

A Canadian company is seeking a licensing or joint-venture agreement with other Canadian firms for its "Campro" edible oil deodorizer. It is claimed to be a unique concept in vacuum steam stripping technology featuring external de-aeration for greater flexibility and economy in handling both wet oils and those requiring gentle handling.
Write to: Brian Cebryk, Agra Industries Ltd., 1200 CN Towers, Saskatoon, Saskatchewan S7K 1J5; Telephone: (306) 653-5163; Telex: 074-2496.

Device to Treat Deep-Sea Divers

A Canadian inventor is offering to companies, through a licensing agreement, the manufacturing and marketing rights to his portable device used in treating deep-sea divers who have surfaced too quickly. The inventor claims many advantages including low cost, ease of use, quick results and no requirement for medical attendance.
Write to: Silvain Desjardins, Université de Sherbrooke, Sherbrooke, Quebec J1K 2R1; Telephone: (819) 821-7840.

Australia

Phenolic Foam Insulating Panels

An Australian company is offering to a Canadian firm, under licence, the rights to manufacture in Canada its phenolic foam insulating panels, suitable for use in ceilings, exterior or interior walls, office partitioning, temporary buildings and boat or ship walls.
Write to: Senior Trade Commissioner, Australian Trade Commission, P.O. Box 69, Commerce Court Postal Station, Toronto, Ontario M5L 1B9; Telephone: (416) 367-0783; Telex: 06-21962.

Austria

Sheet Metal-Working Machines

An Austrian firm is seeking a licensing agreement with a Canadian company for the production of sheet metal-working machines.
Write to: Kagerer Gesellschaft MBH, Ignaz Mayer-Strasse 7, 4020 Linz, Austria; Telephone: (0732) 27.44.71; Telex: (61) 37.32.91.

Electric Floor Heating

An Austrian firm is offering to Canadian companies, through a licensing agreement, its technology related to mobile electric floor heating. The firm claims it is a new kind of floor heating which is not built-in but is laid on existing floors. It consists of reinforced plates with electrical connections controlled by a standard room thermostat. This system is claimed to have many advantages, including fast and simple installation, high economy, high efficiency, quick control response and portability.
Write to: J. Windisch, Jowitherm-Herzelemente, A-8793 Trofaiach, Austria.

Britain

Sailboats

A British company wishes to enter into a licensing agreement with a Canadian company for the manufacturing and marketing rights of its sailboats. One is a small, lightweight, multi-hull sailboat claimed to have low structural stresses in waves and in planing, and capable of being converted to land and ice sailing. The second type is a large and lightweight, multi-hull sailing yacht which can be converted into a power boat.
Write to: F. N. Potter, The Willow, 116 Main Street, Burton Joyce, Nottingham, NG14 5EP, England; Telephone: 0602.31.3115

Czechoslovakia

Tubular Convective Heat Recuperators

A Czechoslovakian trading corporation offers to Canadian companies, through a licensing agreement, the technology for tubular convective heat recuperators intended for reheating furnaces to recover heat from combustion of gases or fumes. The main application is for continuous reheating of furnaces of all types used in the iron and steel industries.
Write to: Polytechna Foreign Trade Corporation, Technical Cooperation Agency, Panska 9, POB 834, CS-11245 Praha 1, Czechoslovakia; Telephone: 244941; Telex: 121585.

East Germany

Surface Stabilizer

An East German company seeks Canadian companies interested in manufacturing, through licence or joint venture, its stabilizer "Floormax". This is a chemical concentrate designed to stabilize any kind of soil, particularly for roadmaking. It is claimed that the treated soil becomes water-resistant. It is non-toxic and easy to use.
Write to: Bank fur Arbeit und Wirtschaft, Aktiengesellschaft, Filiale Worgl, Innsbrucker Strasse 2, Worgl, East Germany.

Utilization of Waste-Water Heat

An East German firm is offering Canadian firms, through licensing, technology for a flexible absorber system for the utilization of waste-water heat. The system is well suited to waste heat recovery from sewage and industrial wastes.
Write to: Ogilvie Taylor & Associates Inc., 355 Southend Avenue, Suite 25L, New York, N.Y.; Telephone: (212) 912-0986.

Recovery of Copper and Aluminum

An East German firm is offering to Canadian companies, through a licensing agreement, the know-how for a highly productive method for the recovery of copper and aluminum from plastic-insulated and rubber-insulated waste cable, after pre-treatment by means of refrigeration engineering.
Write to: Ogilvie Taylor & Associates Inc., 355 Southend Avenue, Suite 25L, New York, N.Y.; Telephone: (212) 912-0986.

France

Motorcycle Wheel Alignment Check

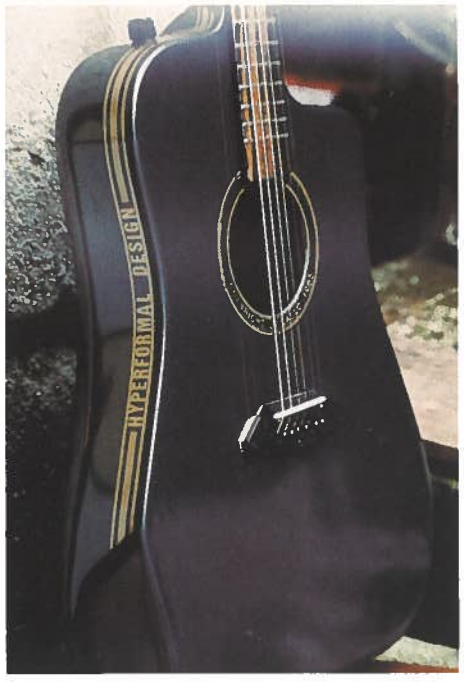
A French company is offering Canadian firms, under licence, its technology for a device that can be used to determine the proper alignment of wheels without having to dismantle them. The company claims that only eight minutes are required to analyse and make the necessary corrections.
Write to: Établissments Duchene, 92, rue Edouard Vaillant, 92300 Levallois, France.

Modular Dehydrator for Fruits and Vegetables

A French firm is offering to Canadian companies, through a licensing agreement, its technology for a new dehydrator which combines great processing speed and maximum preservation of nutritional qualities. It is claimed that this dehydrator can process four tons of fresh produce an hour while preserving vitamins A and B, natural colours and flavours.
Write to: Monsieur Fiamma, Établissment NEU, 70, rue du Collège, 59700 Marcq-en-Bareuil, France.

Fracture Simulator

A French inventor is offering Canadian companies, for manufacture under licence, a device for simulating fractures of bones in the upper and lower limbs. The device simulates fractures with or without deformation and is intended to be used in teaching how to set fractures painlessly.
Write to: Mr. Augier, 168, avenue du Général de Gaulle, 38290 La Verpillière, France; Telephone: 74.94.19.40.



Integral Acoustic Guitar

A French inventor is offering Canadian companies, under a licensing agreement, the rights to manufacture his electric guitars which have no structural discontinuity between the arm and the sound box. It is claimed that the uniquely designed guitar can be manufactured more easily and at lower cost than classic or other conventional models.
Write to: J. P. Gallo, 4, Impasse de la Monnaie, 46100 Figeac, France; Telephone: 65.34.64.37.

Composite Panels

A French manufacturer is offering to Canadian companies, through a licensing agreement, the know-how to manufacture large-sized glass reinforced panels in laminated polyester, used in containers, road transport and the construction industry. The panels are claimed to be of high mechanical strength, to have high thermal and sound absorbing characteristics and to have an aesthetic appearance.
Write to: M. Boulanger, S.N.E. Polyfont, "Le Point du Jour", Hoymille, 59380 Bergues, France; Telephone: 28.68.60.65; Telex: 160911F.

Concrete Anchoring Systems

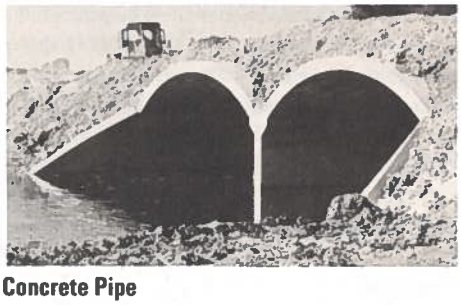
A French firm is offering Canadian companies, through a licensing agreement, a system to anchor rails in concrete. It is made of thermoplastic material covered by two metallic half-shells. Among the advantages claimed are superior strength, ability to withstand variations of temperature from -25° to 85° Celsius, economy, simplicity and vibration resistance.
Write to: M Vanotti, VAPÉ, B.P. 1002,01101, Oyonnax Cedex, France;
Telephone: (33) 74.77.34.66

Temporary Shelters

A French company is offering to Canadians, under a licensing agreement, technology required to construct "Dinka" shelters, inflatable structures made of polyester canvas impregnated with plastic and pressurized. Bags of water hold the shelter firmly on the ground. Circular shelters of up to 40 m (130 ft.) diameter can be erected in less than a day. Other shapes are available.
Write to: SNC Lantermoz-Pitance, 28, rue Pierre Copel, 42031 Saint-Etienne Cedex, France; Telephone: (33) 77.57.22.67.

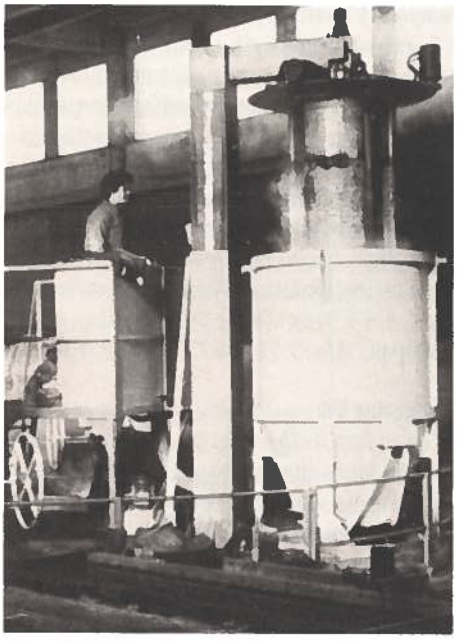
Disposable Bib

A French firm is offering to Canadian companies, through a licensing or joint-venture agreement, its technology related to a disposable bib which covers the whole front of the child, its arms and half of its back. The bib consists of a sheet of paper with a perforated hole for the head and cuts for the arms, which are fastened under the wrists. It is claimed to be supple, soft to the touch and waterproof.
Write to: Mme Isabelle Bondenet, Société Kester, 36, rue de Picpus, 75012 Paris, France; Telephone: 43.07.05.46.



Concrete Pipe

A French company is offering Canadian companies a licence to produce pipes for the construction of passageways under embankments, water conduits and the like. These pipes are assembled in longitudinal prefabricated segments. The firm claims that the pipes are water-tight and air-tight and cost less than concrete poured on site.
Write to: Matière, 10, avenue Franklin Roosevelt, 75008 Paris, France; Telephone: (1) 43.59.37.20



Concrete Bucket
A French company is offering Canadian manufacturers, through a licensing agreement, the right to manufacture and market its innovative concrete bucket that uses electric conduction to heat its contents directly. It is claimed that this procedure offers energy savings of up to 60 percent. It is also claimed that it reduces by 60 percent the time needed to solidify a batch of concrete.
Write to: Jacques Beaufils, Beau Fils s.a., 37, rue d'Audincourt (Dasle), 25230 Selon Court, France; Telephone: (33) 81.34.56.24.

India

Pesticides
An Indian firm is offering Canadian companies, through joint-venture, technology for the manufacture of high-grade pesticides such as methyl parathon, quinalphos, phorate, zineb, monocrotophos and fenvalerate.
Write to: Aimco Pesticides, Akhand Jyoti, 8th Road, P.O. Box 16806, Santacruz (East), Bombay, 400-055, India.

Ireland

Security Products
An Irish firm is offering Canadian companies, through a licensing agreement, technology for security products.

The first, an anti-intruder barrier, is designed to be installed on top of a wall or fence. It is fabricated of two sheets of expanded steel threaded on a thimble, mounted on brackets fixed to a wall or fence. The revolving unit prevents a stable hand or foot hold.

The second product is a zig-zag security fence that requires no nuts, bolts, clamps or concrete posts, only gate posts when necessary. It consists of pre-formed vanes that are placed in a vertical position in a half-metre trench and employs a unique joiner. The firm claims advantages of high impact resistance, fast, easy installation, low cost and great strength.
Write to: Michael P. McCowan, MNJ Engineering, 80 Baggot Lane, Dublin 4, Ireland; Telephone: 604883.

Israel

Computer Numerical Control
An Israeli firm, specializing in computer numerical control, offers a Canadian company in the field a marketing agreement leading to joint venture for its products. Its Numericon 850 is claimed to have unique features, including storage and retrieval of up to 30 programs on one cassette; a CRT terminal for display of stored programs for easy editing and programming; 12K RAM memory; 40K of eprom memory and a manual panel with manual/auto buttons.

The firm claims its second product, a mini-computer-based, multi-axes CNC control unit, ELEX LX 140 IQ, will compute, power and control CNC machines using the latest state-of-the-art technology.
Write to: Yair Eilam, Conlog Control, 102 Jabotinsby Street, Petads Tivka 49517, Israel.

Sweden

Tire Recycling
A Swedish firm is offering Canadian companies, through licensing agreement, a method of recycling ground-up, worn-out tires. Uses to date of the resultant hard rubber sheets include mechanical protection, stroke compression, electrical insulation and noise suppression.
Write to: Ernest Weingarten, We Konsult KB, Oxbarsvagen 1, 43400 Kungsbacka, Sweden.

Switzerland

Pressure-Measuring Sets
A Swiss company offers a Canadian company, under licence, the manufacturing and marketing rights for Canada and the United States for various pressure-measuring sets for liquid and gaseous mediums. The instruments can be used either as calibrators or as measuring devices for tests or adjustments of pneumatic components, apparatus and control systems, or as field maintenance instruments.
Write to: E. L. Hoffer, Rietwiesstrasse, CH8810 Horgen, Switzerland; Telephone (01) 725-43-90; Telex: 429-520-SFGO-CH.

One-Person Submarine
A Swiss manufacturer of various one- and two-person submarines, offers a Canadian company, under licence, the manufacturing and marketing rights for Canada and non-exclusive rights for the rest of the world, of its one-person submarine. The craft, designed primarily for naval use, is suitable for scientific use, observations, underwater work, coast guards and rescue work on sunken aircraft and ships, as well as for naval applications.
Write to: E. L. Hoffer, Rietwiesstrasse, CH8810 Horgen, Switzerland; Telephone: (01) 725-43-90; Telex: 429-520-SFGO-CH.

U.S.A.

Comparator for Automatic Curve Tracers
This device is a plug-in adaptor to a circuit tracer for comparing signals between a reference integrated circuit board (IC) and a suspect IC. The signal of the suspect IC is displayed on the curve tracer as an overlay on the reference IC signal. Automatic switching and selection of comparable

pin combinations is possible for multi-pin devices. It is claimed that this device eliminates the inconvenience of manually making the connections, and significantly speeds up the evaluation process.

Portable Composite I-Section Ultrasonic Inspection System

A hand-operated, eight-channel through-transmission system that is capable of identifying flaws in composite I-sections, this device consists of a single-channel ultrasonic instrument within a multi-scanner and multiplexer, a scanning fixture and associated cables, water lines and readout. Flaws are indicated by the flashing LEDs (light emitting diodes) for each channel. The advantages of this system are its relatively low cost, reliability and versatility.

Universal Hinge-Latch

Designed for use in confined areas of pleasure boats, automobiles and aircraft, this unique device functions as a hinge which can be changed easily to function as a latch by moving a spring-loaded latch activator.

Precision Wire Stripper for Large-Gauge Wire

Hand-operated wire stripper cuts and removes insulation from large-gauge wire without nicking, scratching or scraping. It contains a micro-adjustment for the blade, permitting use on a wide variety of wire sizes and insulation types. It is capable of stripping wires from 12 to 0000 gauge.

Hand-Held Power Stripper

This lightweight power stripper is easily held in one hand while wire is inserted into the funnel guide for stripping. By depressing and releasing, the insulation is stripped and ejected in approximately two seconds. The unit is reliable and easily maintained, can be operated with air pressures as low as 3 kg/cm^2 (40 psi) and is adaptable to electrical or hand modes.

Safe-Cutting Hand Knife

This industrial-use hand knife solves the very real problem of frequent injuries when sharp knives are required in production situations. It is claimed that injury from inadvertent cutting has been virtually eliminated in the fabrication and build-up of honeycomb core parts without affecting production rates.

For further information on the above devices, write to:
Boeing Associated Products, Mail Stop 7E-14, P.O. Box 3707, Seattle, Washington 98124-2207; Telephone: (206) 828-2440.

Speed Drives

An American company is offering Canadian companies, through a licensing agreement, its technology covering mechanical and electrical, adjustable and fixed-speed drives. The company supplies drawings and technical specifications.
Write to: Ken Ingalls, Graham Company, 8800 West Bradley Road, Milwaukee WI 53224; Telephone: (414) 355-8800.

Closet Door Hardware

An American company is offering, under a licensing or joint-venture agreement, manufacturing rights for a wide range of closet door hardware for bi-fold, pocket and bipass doors.
Write to: R. E. Wood, Crawford Manufacturing Co. Inc., 5800 Wheaton Drive, P.O. Box 43666, Atlanta, Georgia 30336; Telephone: (404) 346-3460.

Manufacturing Inspection Systems

An American firm is looking for a Canadian company interested in becoming involved in a joint venture. The technologies offered consist of various expert systems, robot vision products and systems designed for quality inspection and inspection of welding.
Write to: Michael M. Bahn, Autoflex Inc., 23380 Commerce Drive, Farmington Hills, Michigan 48024; Telephone: (313) 476-3100.

Multi-Purpose Hand Rail

An American company is offering, through a licensing agreement or outright sale of patent, its technology for a multi-purpose hand rail. The firm claims the rail can be used in many different applications including in recreational vehicles (RVs) and homes.
Write to: Wiebe Industries, 90 Donald Drive, Hollister, California 95023; Telephone: (408) 637-3715.

West Germany

Handles and Closures

A West German firm is offering Canadian companies, through a licensing agreement, its methods of manufacturing handles, closure rings and press-it closures for use on barrels and drums. The technique of combining steel and plastic and the tools necessary for production forms an essential part of the offer.
Write to: Dr. Gregory, Th. Schemm Metall-und-Kunststoffwarenfabrik, 5952 Attendorn, Papiermuhle, West Germany; Telephone: (0.27.22) 7215; Telex: 876723.

Koster Glass System

A German inventor offers to Canadian companies, through a licensing agreement, technology for the manufacture of insulating glass. The system involves placing a sheet of reflective material between two plates of glass to allow the sun's rays to penetrate and provide heat in winter, and to deflect the rays during summer to keep room temperatures down.
Write to: Helmot Koster, Koster Patente und Architektur, Hallesche Strasse 21, 100 Berlin 61, West Germany; Telephone: 030/251.60.60.

Requested

Canada

New Plastic Technologies
Canadian companies are seeking new technologies, through licensing or joint-venture arrangements, in the field of plastics by injection, blow-mould or roto-mould for consumer and automotive goods and electronics applications.
Write to: Gerald Desjardins, Industrial Commissioner, 220 Place Municipale, Cowansville, Quebec J2K 1T4; Telephone: (514) 263-0141.

Computer Software
A Canadian firm is seeking, through joint venture or licence, technology in the computer software field on a data base management system and on-line data dictionary running on a large IBM (or IBM-compatible) computer, code generators, and fourth generation languages and prototyping techniques.
Write to: Asyst Technologies Inc., 1080 Beaver Hall Hill, Suite 1400; Montréal, Quebec H2Z 1S8; Telephone: (514) 871-0108.

Asia and Pacific

Food Processing AB1-74
A firm from the Philippines is seeking new technology, through a licensing agreement, for equipment related to processing pickles, fruits, fish and vegetables.

Disposable Hospital Supplies CH-1
A firm from Pakistan wishes to acquire, through a licensing or joint-venture agreement, new technologies to manufacture disposable hospital supplies, more particularly dextrose/saline infusion bags.

Rear-View Mirrors MISC-82
An Indian company is seeking, through a licensing agreement, new technology and equipment related to the manufacture of rear-view mirrors for motor bikes and cars.

Heaters and Cathodes EE-47
An Indian company, involved in the manufacture of heaters and cathodes, seeks a joint-venture partner to supply both technology and equipment for the manufacture of 3-MN heaters and cathodes used for TV picture tubes.

Condiments AB1-78
A firm in Thailand is seeking a licensing or joint-venture agreement with a Canadian company to acquire new technology related to the production of chili sauce, tomato ketchup, pickles, etc.

For information on the above requests, write to: Han-Col Kang, Asia and Pacific Centre for Transfer of Technology, 49 Palace Road, P.O. Box 115, Bangalore 560 052, India; Telephone: 76931-3. *Please quote project number.*

Brazil

Miscellaneous Technologies
Brazilian firms are looking for new technologies to manufacture whirlpool baths, pools, filters, pumps and pool equipment (Project 11/86); terra cotta kitchen and household articles (Project 14/86); spare parts for cars, trucks and buses (Project 15/86); electronic automating equipment (Project 20/86); and petrochemical equipment for processing industries (Project 21/86).
Write to: Guilherme Arroio, Embassy of Brazil, 255 Albert Street, Suite 900, Ottawa, Ontario K1P 6A9; Telephone: (613) 237-1090; Telex: 053-4222.

India

Diapers and Allied Products
A manufacturer of measuring tapes wishing to diversify seeks technical know-how, collaboration, machinery and equipment to produce diapers and allied products.
Write to: R. Nayar, National Tape Co., Ferozepore Road, Ludhiana 141 001, India.

Electronic Circuit Breakers
A manufacturer of electronic equipment seeks a joint-venture partner with technical know-how to manufacture electronic circuit breakers. The product must consume very little power and be able to handle power up to 10 kW single-phase or three-phase 400/440 V alternating current supply.
Write to: Bhatts Electronics (P) Ltd., 8/1, Palmgrove Road, Bangalore 560 047, India.

West Germany

Environmental Protection
A West German firm is looking to acquire, through a licensing agreement, new processes in the field of environmental protection. Its main areas of interest are: air pollution control including incineration, filters, flue-gas scrubbing, waste-water treatment such as biological processes, and solid waste treatment such as gasification. All engineering and marketing capabilities are in-house.
Write to: Dr. W. G. Hartweck, Deutsche Filterbau GMBH, Neusser Str. 111, 4000 Dusseldorf 1, West Germany; Telephone: (021) 3028-0 (439).

Special Events

Summary

U.S.A.
- Licensing Executives Society U.S.A./Canada Western Regional Meeting/Palm Springs, California – January 1987

WEST GERMANY
- CEBIT-Computer and Communication Equipment Show/Hanover-March 1987
- Hanover Industry Fair/Hanover – April 1987

U.S.A.
- Licensing Executives Society U.S.A/Canada Eastern Regional Meeting/Hilton Head Island, South Carolina – May 1987

BELGIUM
- Flanders Technology International Fair Ghent – May 1987

MALAYSIA
- Machmex '87/Kuala Lumpur – May 1987

JAPAN
- World Conference on Advanced Materials for Innovations in Energy, Transportation and Communications/Tokyo – May 1987

FINLAND
- Pulp Washing '87/Mariehamn – May 1987

AUSTRALIA
- Communications '87/Melbourne – June 1987

CANADA
- 1987 International Mechanical Pulping Conference/Vancouver – June 1987
- 6th Annual CAD/CAM, Robotics and Automation Show/Toronto – June 1987

U.S.A.
- Licensing Executives Society U.S.A/Canada Central Regional Meeting/Brainerd, Minnesota – June 1987

CANADA
- Exposition CAO/FAO/Montréal – September 1987
- Electronicom '87/Toronto – September 1987
- Canada's Woodworking Machinery and Supply Exhibition/Willowdale, Ontario – September/October 1987

CANADA
- Centre for Advanced Technology Education Seminars/Toronto – Winter and Spring 1987

Licensing Executives Society U.S.A./Canada Western Regional Meeting

Rancho Las Palmas Hotel
Palm Springs, California
January 30-31, 1987
For additional information on the meeting, please write to: Licensing Executives Society U.S.A./Canada, 1225 Elbur Avenue, Cleveland, Ohio 44107, U.S.A.
Tel: (216) 226-1642

CEBIT
Computer and Communication Equipment Show

Hanover Messe, Hanover
West Germany
March 4-11, 1987
For additional information on CEBIT, please write to: Susan Cooke, Worldwide Trade Fair Inc., 69 Sherbourne Street, Suite 222, Toronto, Ontario M5A 3X7
Tel: (416) 364-5352

Hanover Industry Fair

Hanover Messe, Hanover
West Germany
April 1-8, 1987
For additional information on the fair, please write to: Susan Cooke, Worldwide Trade Fair Inc., 69 Sherbourne Street, Suite 222, Toronto, Ontario M5A 3X7
Tel: (416) 364-5352

Licensing Executives Society U.S.A./Canada Eastern Regional Meeting

Hotel Inter-Continental
Hilton Head Island, South Carolina
May 1-2, 1987
For additional information on the meeting, please write to: Licensing Executives Society U.S.A./Canada, 1225 Elbur Avenue, Cleveland, Ohio 44107, U.S.A.
Tel: (216) 226-1642

Flanders Technology International Fair

Technology Transfer Center
Exhibition Hall
Ghent, Belgium
May 11-17, 1987
Technology transfer exhibition focusing on products, processes, distribution systems, management techniques.
For additional information on the exhibition, please write to: Dr. H. Debbaut, Flanders Technology International 1987, c/o G.O.M.O.V., Floraliapaleis, bus 6, B-9000 Ghent, Belgium,
Tel: (32) 91/21 55 11 *Telex:* 12666

Machmex '87

Putra World Trade Centre
Kuala Lumpur, Malaysia
May 13-17, 1987
The Fourth Malaysian International Exhibition of production machinery, metal-working and engineering equipment and hardware.
For additional information on the exhibition, please write to: Mr. Calvin Fook, ISE Management (M) Sdn. Bhd., 3A, Jalan SS 2/8, Taman Megah, 47301, Petaling Jaya, Selangor, Malaysia
Tel: 03-7749377/7741890

World Conference on Advanced Materials for Innovations in Energy, Transportation and Communications (CHEMRAWN VI)
Nippon Toshi Center
Tokyo, Japan
May 17-22, 1987
For additional information on this world exhibition, please write to: Prof. Saburo Nagatuira, Chairman of the CHEMRAWN VI World Conference, c/o The Chemical Society of Japan, 1-5, Kanda Surugadai, Chiyoda-ku, Tokyo 101, Japan
Telex: 2226198 CSJ J, *Fax:* 03-292-6087

Pulp Washing '87
Hotel Arkipelag
Mariehamn, Aland
Finland
May 19-21, 1987
An international symposium on the fundamentals and practice of pulp washing.
For additional information on this international symposium, please write to: Mr. David H. Paterson, Technical Section, CPPA, Sun Life Building, 23rd Floor, 1155 Metcalfe Street, Montréal, Quebec H3B 2X9
Tel: (514) 866-6621, *Telex:* 055-60690

Communications '87
The Australian International Electronic Communications and Information Technology Exhibition.
Melbourne, Australia
June 1-4, 1987
For additional information on the exhibition, please write to: UNILINK, 5 Donalda Crescent, Agincourt, Ontario M1S 1N5
Tel: (416) 291-6359, *Telex:* 06-968027

1987 International Mechanical Pulping Conference
Hotel Vancouver
Vancouver, British Columbia
June 2-5, 1987
For additional information on the conference, please write to: Mr. W. Robert Wood, Technical Section, CPPA, Sun Life Building, 23rd Floor, 1155 Metcalfe Street, Montréal, Quebec H3B 2X9
Tel: (514) 866-6621, *Telex:* 055-60690

6th Annual CAD/CAM, Robotics and Automation Show
Skyline Hotel, Airport Road
Toronto, Ontario
June 17-18, 1987
For additional information on the CAD/CAM show, please write to: Shannon Kyles, 46 Hyde Park Avenue, Hamilton, Ontario L8P 4M5
Tel: (416) 527-4739
or
Mr. D. Christiensen, Ontario Centre for Advanced Manufacturing, 190 Atwill Drive, Suite 402, Rexdale, Ontario M9W 6H8
Tel: (416) 675-4363

Licensing Executives Society U.S.A./Canada Central Regional Meeting
Madden's Resort on Gull Lake
Brainerd, Minnesota
June 20-21, 1987
For additional information on the meeting, please write to: Licensing Executives Society U.S.A./Canada, 1225 Elbur Avenue, Cleveland, Ohio 44107, U.S.A.
Tel: (216) 226-1642

Exposition CAO/FAO '87
Palais des Congrès
Montréal, Quebec
September 22-24, 1987
For additional information on this exposition, please write to: Silvie St-Laurent, D'Avirro & Associé, 1440, Ste-Catherine ouest, Montréal, Quebec H3G 1R8
Tel: (514) 879-9037

Electronicom '87
Metro Toronto Convention Centre
Toronto, Ontario
September 28-30, 1987
For additional information on Electronicom '87, please write to: Southex Exhibitions, 1450 Don Mills Road, Don Mills, Ontario M3B 2X7
Tel: (416) 455-6641

Canada's Woodworking Machinery and Supply Exhibition
Toronto International Centre
Toronto, Ontario
September 28-October 1, 1987
This exhibition will feature displays of woodworking machinery, hardware and fasteners, tooling, dust control, adhesives, lumber, mouldings, springs, saws, stain repellants and abrasives.
For additional information, please write to: H. F. MacGregor & Associates, 360 Consumers Road, Willowdale, Ontario M2J 1P8
Tel: (416) 491-9656

Centre for Advanced Technology Education Seminars
Centre for Advanced Technology Education
Ryerson Polytechnical Institute
Toronto, Ontario
Winter and Spring 1987

Strategic Manufacturing Management
- Understanding Computer Integrated Manufacturing
  - January 20-22, 1987
  - March 10, 1987
- Strategic Planning for Computer Integrated Manufacturing
  - February 5-6, 1987
  - March 11-12, 1987

Information Systems/Communications
- Manufacturing Information Management: Fundamentals for Engineers and Manufacturers
  - February 25-26, 1987
- Fibre Optic Applications in the Manufacturing Environment
  - April 10, 1987

Design/Analysis
- An Introduction to CAD/CAE/CAM
  - February 10-12, 1987
- Advanced CAD/CAE/CAM
  - March 24-26, 1987
- CAD Laboratory: "Hands-On" Mainframe Lab
  - March 11, 1987
  - April 2, 1987
- Advanced Manufacturing Simulation
  - March 12-13, 1987

Production/Automation
- Robotics: Fundamentals
  - February 10, 1987
  - March 24, 1987
- Robotics: Applications
  - February 11-12, 1987
  - March 25-26, 1987
- Design for Robotics
  - January 27, 1987
- Flexible Automated Assembly
  - February 27, 1987
- Applied Machine Vision: An Overview of Manufacturing Applications
  - February 4, 1987
- Laser Applications for Manufacturing Productivity
  - March 31, 1987

Production/Control Management
- Manufacturing Resource Planning
  - February 12-13, 1987
- Just-in-time Techniques for Canadian Manufacturing
  - January 23, 1987
  - March 23, 1987

For additional information regarding these seminars, write to: Centre for Advanced Technology Education, Ryerson Polytechnical Institute, 350 Victoria Street, Toronto, Ontario M5B 2K3

Regional Offices

The Department of Regional Industrial Expansion maintains regional and local offices in each province for your convenience:

Newfoundland
P.O. Box 8950
Parsons Building
90 O'Leary Avenue
St. John's, Newfoundland
A1B 3R9
Tel: (709) 772-4884

Local Offices:
Corner Brook
Tel: (709) 634-4477
Goose Bay, Labrador
Tel: (709) 896-2741

Prince Edward Island
P.O. Box 1115
Confederation Court Mall
134 Kent Street, Suite 400
Charlottetown
Prince Edward Island
C1A 7M8
Tel: (902) 566-7400

Nova Scotia
P.O. Box 940, Station M
1496 Lower Water Street
Halifax, Nova Scotia
B3J 2V9
Tel: (902) 426-2018

New Brunswick
P.O. Box 1210
Assumption Place
770 Main Street
Moncton, New Brunswick
E1C 8P9
Tel: (506) 857-6400

Local Offices:
Bathurst
Tel: (506) 548-8907
Fredericton
Tel: (506) 452-3124

Quebec
Tour de la Bourse
800, Place Victoria, Bureau 3800
C.P. 247
Montréal, Quebec
H4Z 1E8
Tel: (514) 283-8185

Local Offices:
Alma
Tel: (418) 668-3084
Drummondville
Tel: (819) 478-4664
Québec City
Tel: (418) 648-4826
Rimouski
Tel: (418) 722-3282
Sherbrooke
Tel: (819) 565-4713
Trois-Rivières
Tel: (819) 374-5544
Val-d'Or
Tel: (819) 825-5260

Ontario
P.O. Box 98
1 First Canadian Place, Suite 4840
Toronto, Ontario
M5X 1B1
Tel: (416) 365-3737

Local Offices:
London
Tel: (519) 679-5820
Ottawa
Tel: (613) 993-4963
Sudbury
Tel: (705) 675-0711
Thunder Bay
Tel: (807) 623-4436

Manitoba
P.O. Box 981
330 Portage Avenue, Room 608
Winnipeg, Manitoba
R3C 2V2
Tel: (204) 949-6182

Local Office:
Thompson
Tel: (204) 788-4486

Saskatchewan
105-21st Street, 6th Floor
Saskatoon, Saskatchewan
S7K 0B3
Tel: (306) 975-4400

Local Offices:
Regina
Tel: (306) 780-6108
Prince Albert
Tel: (306) 764-6800

Alberta
Cornerpoint Building
10179-105th Street, Suite 505
Edmonton, Alberta
T5J 3S3
Tel: (403) 420-2944

Local Office:
Calgary
Tel: (403) 292-4575

British Columbia
P.O. Box 49178
Bentall Postal Station
Bentall Tower IV
1101-1055 Dunsmuir Street
Vancouver, British Columbia
V7X 1K8
Tel: (604) 666-0434

Local Offices:
Victoria
Tel: (604) 388-3181
Prince George
Tel: (604) 562-4451

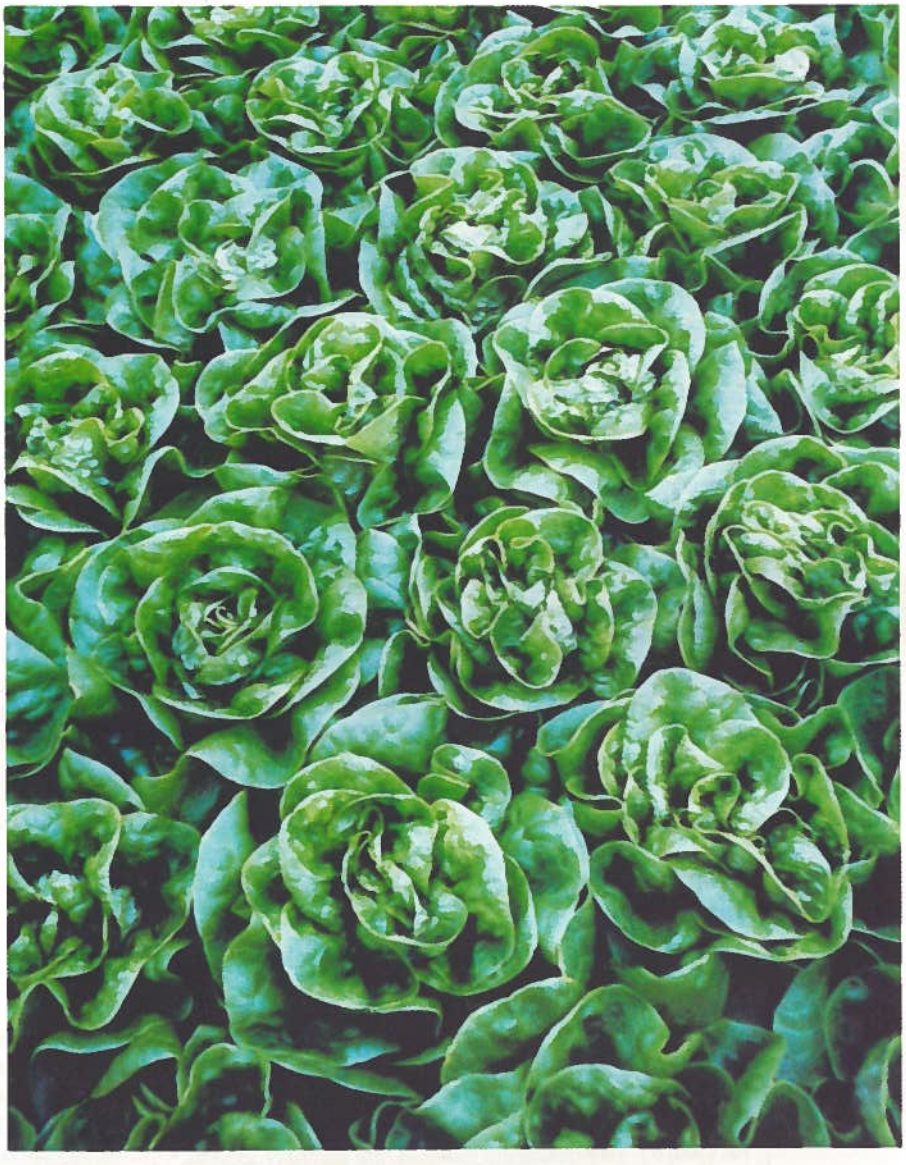
Yukon
Suite 301
108 Lambert Street
Whitehorse, Yukon
Y1A 1Z2
Tel: (403) 668-4655

Northwest Territories
P.O. Bag 6100
Precambrian Building
Yellowknife, Northwest Territories
X1A 1C0
Tel: (403) 920-8571

If undelivered return to:
Canada Commerce
Dept. of Regional Industrial Expansion
Ottawa, Canada, K1A 0H5

Canada Post / Postes Canada
Postage paid / Port payé
Bulk third class / En nombre troisième classe
K1A 0H5
OTTAWA

Please return this label with your correct mailing address and your *POSTAL CODE*.



Government of Canada / Gouvernement du Canada

Regional Industrial Expansion / Expansion industrielle régionale

Canada