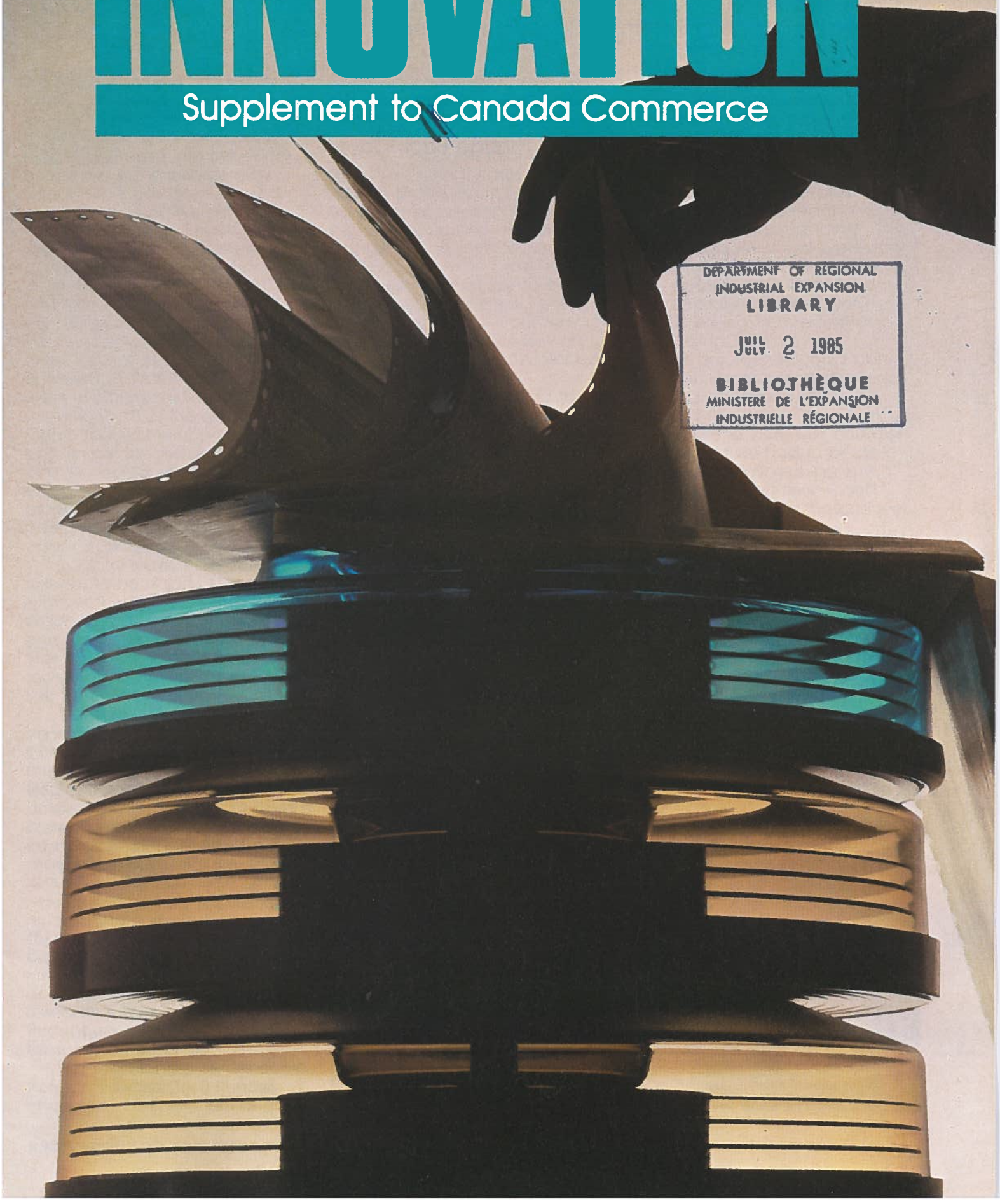
INNOVATION

Supplement to Canada Commerce



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Introduction

Innovation Supplement to *Canada Commerce* has been devised to take the place of the publication *New Products Bulletin* but will provide a much more complete service.

The *New Products Bulletin* simply listed patented products and offers of technology transfers and was distributed to a limited readership. The *Innovation Supplement*, which will be published four times a year, does all of this but on a more selective basis to serve as examples rather than providing complete lists. In addition, the supplement introduces a new feature in publishing requests for technology transfers as well as offers. It will also include articles and information of interest on innovative companies, organizations, products, processes, programs, services — in short, anything that emphasizes the innovative spirit of Canadians.

The *Innovation Supplement* will be distributed to the full subscription list of *Canada Commerce* across Canada.

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 the *Innovation Supplement* with your comments and ideas. You can contact us at:

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Putting the Ivory Tower into the Marketplace

Business and universities can work well together, even when you throw government into the equation. While some people may doubt this, it has been proved profitably true at the Waterloo Centre for Process Development (WCPD) in Waterloo, Ontario.

Founded with federal government funding in 1978, the WCPD functions much like a private consulting and research centre, but one that just happens to draw most of its staff from the University of Waterloo's Department of Chemical Engineering.

In fact, 18 of the department's faculty members participate in centre activities and projects. An additional 40 research engineers and technicians are employed by the centre to conduct the contract and project research activities.

In many ways, it can be considered to be a sort of "business arm" of the academic world — a place where professors, scientists and researchers regularly prove that they can fit into corporate towers as comfortably as they fit into the "ivory" variety.

As proof, they point out that since 1981 there have been 34 patents issued to the chemical engineering professors who form the backbone of the semi-autonomous organization. These patents are assigned to the centre which markets them and shares the profits with the professors who perfected them.

The patents, along with numerous processes and procedures developed on a contract basis with government and industry, have generated millions of dollars in new jobs, new research funding and in revenue through royalty payments and licensing agreements.

The idea for the centre came from Dr. Edward (Ted) Rhodes, chairman of Department of Chemical Engineering and director of the WCPD, who has been with the university for 20 years.

"When I became chairman, in 1976," recounts Rhodes, a specialist in heat transfer, "we had 28 professors publishing hundreds of papers and producing a small number of patents. I wanted to see a better use of our technology and knowledge; and I wanted that use to be on a more practical level. I wanted our developments — our new technology and processes and procedures — to be developed to their full potential."

Both the university and the department have had a long history of working with industry, but not at the level Rhodes envisioned, explains E. B. (Ted) Cross, who became executive director of the centre in 1982.

"The university is unique in that respect," adds Cross, a graduate chemical engineer with a great deal of experience in business. "It has been working with business for 27 years. The centre is just the next logical step for the university to take.

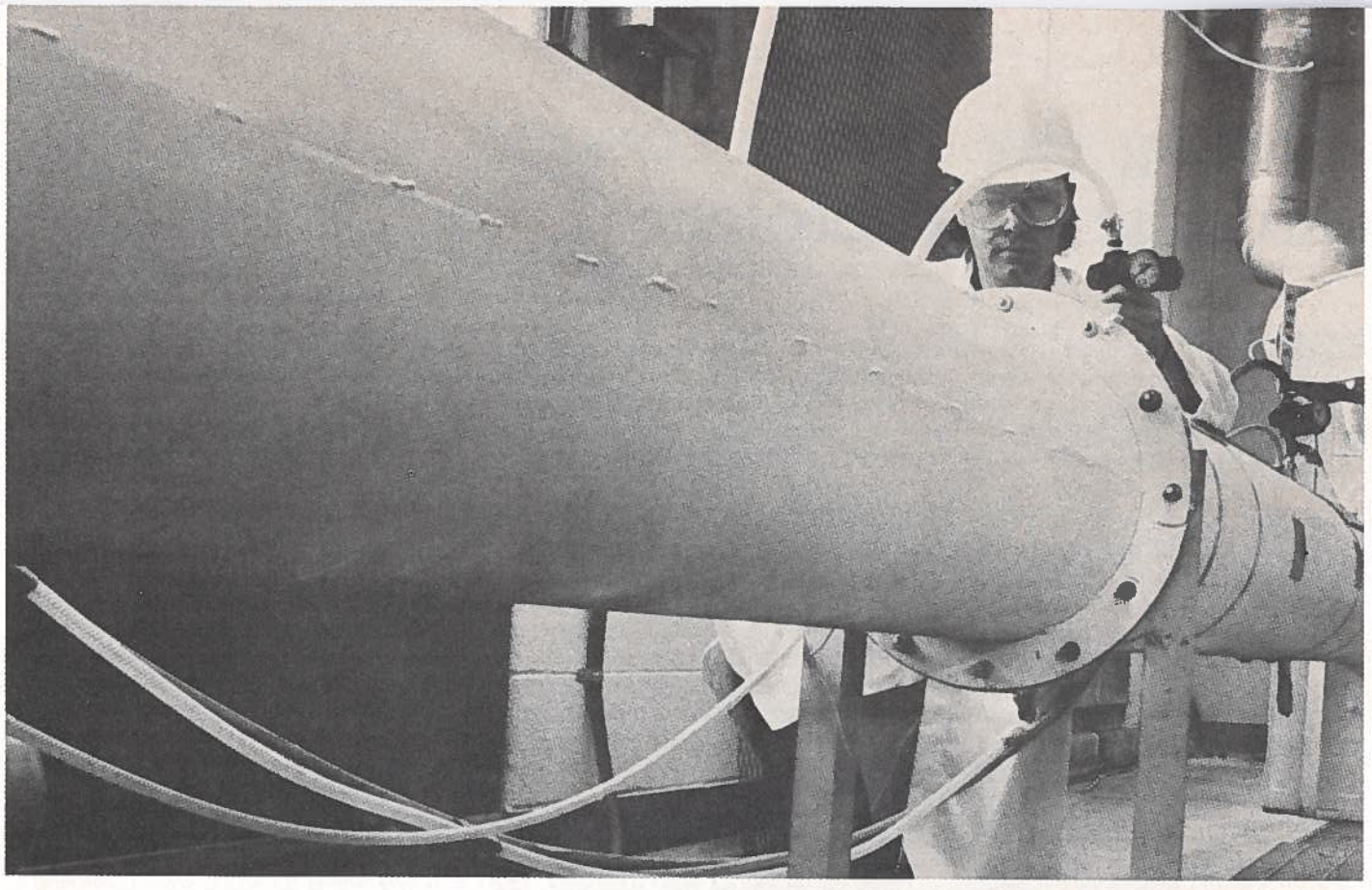
"One of the real problems addressed by the centre is providing a basis for a better understanding between academics and businessmen — and the reverse.

"It's like the generation gap. But I call it the professional gap — a gap in understanding between professional professors and professional business people. By creating a business environment here at the university we're helping bridge that gap. It's working."

But before they could start doing it, Rhodes recounts, "we needed an infrastructure. We needed to operate as a business if we were to work with business. That meant we had to be able to deal with lawyers, patents, licensing agreements — and everything else that the business world deals with.

"But the main problem was money.

"We could not afford the necessary infrastructure. We could not afford to hire a 'business manager'. In most cases, we could not even afford to



carry an idea through to the point where we could demonstrate it on a large enough scale to prove to industry that it would really work on an industrial scale."

So, over a two-year period, Rhodes talked to the government. The government listened and in 1978 the former federal Department of Industry, Trade and Commerce (now the Department of Regional Industrial Expansion) decided to fund the WCPD, giving it a total of $1 million spread over five years to get it operating.

With the funding in place, the centre started to pick its projects.

One of the first was the single cell protein bioconversion process, usually referred to as the SCP process, being developed at that time by Professor Murray Moo-Young. Simply put, the SCP process turns fibrous and potentially polluting waste material, such as sawdust and the residue from pulp and paper mills, into animal feed. The process has been installed in a Vancouver pilot plant by Envirocon Ltd., which is licensed by the centre to use the technology.

In May 1984, that process was singled out by the Department of Regional Industrial Expansion for excellence in technology transfer when it gave the centre one of the first Canada Awards for Excellence.

One of the keys to the SCP process, and to all the other processes, procedures and inventions the centre gets involved with, is approaching every situation from a businesslike as well as a scientific perspective.

Professor Donald R. Spink kept business requirements in mind when he developed his idea for the Waterloo Scrubber, rated by many to be the most efficient "wet scrubber" ever invented. Scrubbing is one way of removing contamination from the air. Water is sprayed into the air to be cleaned — often in a smokestack or chimney — and the impurities are scrubbed away.

"What I did," Spink explains, "was look for the most efficient and simplest way to do it. It has to be efficient if you want it adopted by industry. And in the process, I also made it as simple as possible."

WCPD not only looks at the financial and scientific mathematics of each project but understands government as well as industry.

The scrubber has received extensive testing on industrial pollutants, especially in the pulp and paper as well as the metallurgical industries, and has been sold to corporations ranging in size and type from El Dorado Nuclear, Inco and General Motors.

Dr. Murray Moo-Young also kept the business side of technology firmly in mind when he developed his SCP process. He says that what makes his innovative process worthy of note is not that it works, but that it works at a cost which makes the final product — protein — competitively priced.

Business and industry appreciate the fact that the centre looks at the financial as well as the scientific mathematics of every project. They also appreciate the fact that the WCPD understands government as well as it does industry.

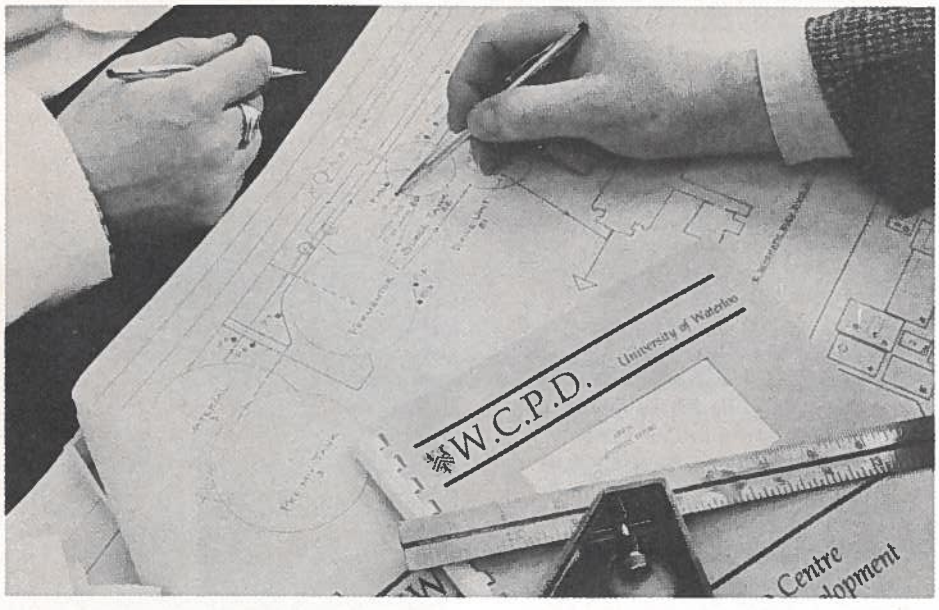
Several years ago, for example, Gerald Dubrick, president of Canadian Farm Tec Systems, went to the centre's Gerald R. Sullivan to find out if a new and efficient method could be developed to dry grain, one of the most energy demanding jobs in the agricultural industry.

to determine the feasibility of developing a computerized grain drying control system. Without the centre's involvement, it is doubtful that we would have been successful.

"Then the centre helped us get a $195 000 grant/loan from the Enterprise Development Corp. to develop the hardware and software to do the job."

Farm Tec is now marketing the system across Canada and plans to take it into the U.S., paying the centre a royalty for each sale.

As an added bonus to all concerned, the graduate student Sullivan hired for some of the



But the problem they had to solve was more than just drying grain. They also had to leave 15.5 per cent of the moisture in the grain, no matter how "wet" it was when it was harvested. In addition, they had to use as little energy as possible in the process. They did, and in so doing impressed Farm Tec.

"We're a small company," Dubrick explains, "with no research staff and no experience in dealing with government agencies.

"After one meeting with Sullivan, he and the WCPD took charge. The centre started using its contacts with government agencies to help us get an Agriculture Canada research grant

research and to help install the prototype system has been hired by Farm Tec as the company's first engineer.

This happens quite frequently, Ted Cross says. "The people involved in developing different projects for different agencies and companies are quite often creating jobs for themselves with those same agencies and companies in the process."

As Sullivan puts it: "We transferred the technology in the best way possible — by putting it in the form of a human body."

The centre also manages to advance the cause of "pure research" as well as profits in its work.

The Waterloo Centre for Process Development is managing successfully to blend academics and research into a thriving business.

For example, when Ted Rhodes created the Waterloo Ash Monitoring System for the Canadian Electrical Association, he explains that he managed not only to develop a system to prevent ash build-up in giant coal-fired furnaces, he also managed to give people a better picture of what actually happens inside a furnace when it's operating at nearly 2 000°C.

The computerized monitoring system he developed also makes it possible to study the patterns and effects of the heat and of the different types of coal used.

The "academic knowledge" gained in the process will probably be found to also have some commercial potential.

The commercial potential of any project is analyzed before the WCPD puts any of its own funding into it, Cross explains, because "we are looking for the projects that will pay off — in terms of money as well as scientific advancement".

These projects have ranged from the Waterloo Microwave Drying Process — which utilizes microwaves in the drying of commercial, industrial and agricultural products — to the Waterloo Process Control/Simulation Software [SPEEDWACS] which has been adapted to a number of different industrial uses.

And since a good portion of the money the centre receives from its various royalties and licensing fees goes toward funding future projects, it is managing to blend academics and research into a thriving business.

The CRIQ and Small Business, 15 Years of Co-operation

For the past 15 years, the Quebec Industrial Research Centre (le Centre de recherche industrielle du Québec — CRIQ) has been helping Quebec's small and medium-sized businesses carry out research and development projects.

A Crown corporation, the CRIQ comes under the Quebec Department of Industry and Commerce and is responsible for promoting the province's economic growth and development by supporting and stimulating the technological development of manufacturing firms.

Concretely, this means that the CRIQ helps these firms deal with market requirements and competition by providing them with technological or industrial information, helping them solve production problems or assisting them in the development and improvement of products and manufacturing procedures.

The CRIQ has different types of services to meet the needs of manufacturing firms:

- information;
- technology transfer assistance;
- technical assistance;
- development of products and manufacturing procedures.

The CRIQ's terms of reference and objectives recently convinced it to start offering a wider range of services in the greater Montreal region, beginning in the fall of 1985. In the past, only electronics and technology transfer assistance had been offered. However, in the face of ever-increasing demand, the CRIQ decided to expand its services and thus become better equipped to handle the needs of Montreal businesses.

In the future, specialized services will be available in the following areas:

- robotics and flexible manufacturing;
- industrial engineering;
- analytical mechanics;
- compliance testing.

In Quebec City, existing services will be expanded in the areas of metals and materials, the development of machines and mechanical equipment, energy and technological information.

With extensive experience in the industrial sector, the CRIQ understands the needs of Quebec firms and, in co-operation with them, has developed several procedures and pieces of equipment which have been of immeasurable assistance in improving productivity and opening up new markets.

Technological Information

The CRIQ's industry information service provides business people and various economic development agents with technological information on a wide variety of subjects, including manfacturing techniques, the suppliers or distributors of a specific product, regulations, standards and patents, conversion to the international system of units (SI) and alternative sources of energy.

The service's team of information specialists has at its disposal a number of effective finding aids, including access by computer terminal to more than 400 North American and European data bases, containing some 40 million references.

The engineers and scientists who handle telephone requests are equipped to understand the question, identify the practical objectives, organize their research accordingly, and then collect the relevant information and convey it to the requestor.

Businesses can also ask the CRIQ to conduct various types of technical and economic studies, dealing with such things as market overviews, the status of a given technology or diversification studies. This type of strategical information helps business people in their decision-making.

Industrial Information Bank

Every year since 1978, the CRIQ's industrial information bank has published the *Répertoire des produits fabriqués au Québec (Index to Products Manufactured in Quebec)*. This index provides

CRIQ headquarters at Sainte-Foy.

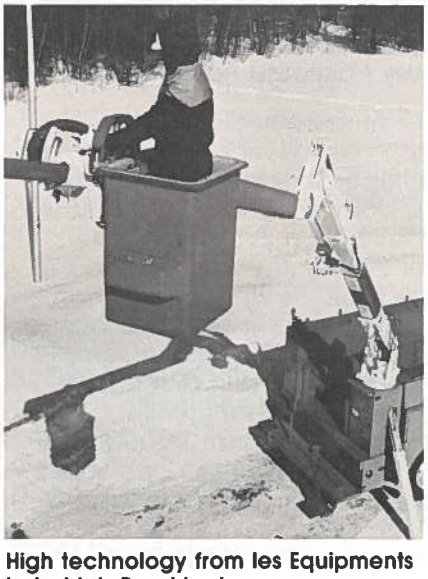
users with information on such things as the number of people employed by a company, its products, its trademarks, its distributors or its points of sale. It also contains information on exports, manufacturing standards and use of the international system of units (SI).

This publication is designed not only to give Quebec manufacturers some additional exposure, but also to serve as a practical guide for buyers and managers in the public and pri-

An aerial ladder from Camions Pierre Thibault Inc.

With extensive experience in the industrial sector, the CRIQ has developed procedures and equipment to help Quebec firms.

vate sectors who want to promote the purchase and sale of Quebec products. Users of the index also have access to other services offered by the industrial information bank, including lists and sets of manufacturers' addresses. Using information recorded in its computer, the bank offers prompt service at a price agreed to in advance. It is able to provide these lists and sets of addresses (labels) by region, by sector of activity and by number of employees.



High technology from les Equipments industriels Poudrier Inc.

Research and Development

Quebec firms are placing increasing emphasis on research and development. Various products have been manufactured by private-sector firms in co-operation with the CRIQ. For example, research done at the CRIQ enabled the Victoriaville firm, Poudrier et Frères Ltée, to manufacture an aerial basket comparable with, if not superior to, those sold by its competitors. The control levels ensure smooth, reliable handling, despite the basket's tendency to rock, something which used to affect the operator. Moreover, the insulating arm makes it possible to combine mechanical strength with a relatively simple manufacturing method. Thus, this new product facilitates handling, increases the safety of the operator and reduces maintenance.

The CRIQ has also developed a new polymer concrete, made from silica aggregates and polyester resin, in co-operation with Janin Construction. A number of municipalities have already used this material in their construction projects. Examples are the Bois-Joli school in Sept-Îles and the Plamondon subway station in Montreal.

Another major project is the revolutionary new fire truck developed by Camions Pierre Thibault Inc. of Pierreville. This truck offers a number of exceptional features in the way of design and use. Within this major project, the CRIQ was responsible for designing and developing a new aerial ladder with a potential extension of 46 metres. And, of course, municipalities are the prime clients for this sort of equipment.

These few examples are concrete proof that the CRIQ is attuned to the needs of the manufacturing industry. This is the result of regular co-operation with Quebec's various economic and industrial agents. At the CRIQ, the doors are always open to manufacturers and other players interested in the development of healthy, dynamic businesses.

Minitube Air Sampling System: A Canadian Success Story

The Minitube Air Sampling System (MASS) was designed and developed by the Saskatchewan Research Council's (SRC) Canadian Centre for Advanced Instrumentation (CCAI) under contract with the federal Department of National Defence (DND).

CCAI is a resource centre devoted to solving problems in industry, education and government through the use of innovative instrumentation. It was established on March 15, 1982, by agreement with the then Department of Industry, Trade and Commerce (now the Department of Regional Industrial Expansion). The agreement specifies a contribution to the centre of up to $200 000 for five years and the centre is to become self-supporting at the end of that five-year period.

CCAI evolved from two support services of SRC — an electronics laboratory and a precision instrument shop — which formed the CCAI's nucleus. Preliminary negotiations for the MASS contract had been initiated by these two groups before the centre had been officially established.

Contact with DND's Defence Research Establishment (DRES) in Suffield, Alberta, was made through the head of SRC's Physics Division, a former Defence Research Establishment employee. Negotiations began in 1980 and the contract was awarded in 1982. DRES had some familiarity with the expertise available from CCAI through a previous small contract (the construction of a specialized injection valve for gas chromatography).

Field trials are conducted at Suffield to investigate the dispersion of aerosols of biological simulates over land areas of, typically, one square kilometre. To do this effectively, upwards of thousands of samples are required for each trial. To compound the measurement problem, aerosol concentrations over the test area vary by several orders of magnitude. Previous techniques to cope with this problem were cumbersome, unreliable and labour-intensive. The obvious solution was a fully automated sampling system.

A working relationship was established between scientists at DRES and CCAI engineers and, after numerous discussions, a design was conceived and the Minitube Air Sampling System was born. A contract for $235 495 to develop a prototype system over 20 months was received in April 1982.

The resulting system is based on miniature re-useable sample tubes packed with a selected porous adsorbent (minitubes). Air samples are drawn through the minitubes in the field and subsequently analyzed in the laboratory by gas chromatography techniques. The minitube is a glass tube, 38 mm long with an internal diameter of 2 mm and packed with approximately 15 - 20 mg of suitable adsorbent.

A moulded carousel houses 50 minitubes and is the transfer vehicle for the samples (Figure 1). When sampling occurs, only one tube at a time has air drawn through it with the other tubes being protected from cross-contamination. The design of the carousel permits collection and analysis to be performed without manually handling or sorting individual minitubes.

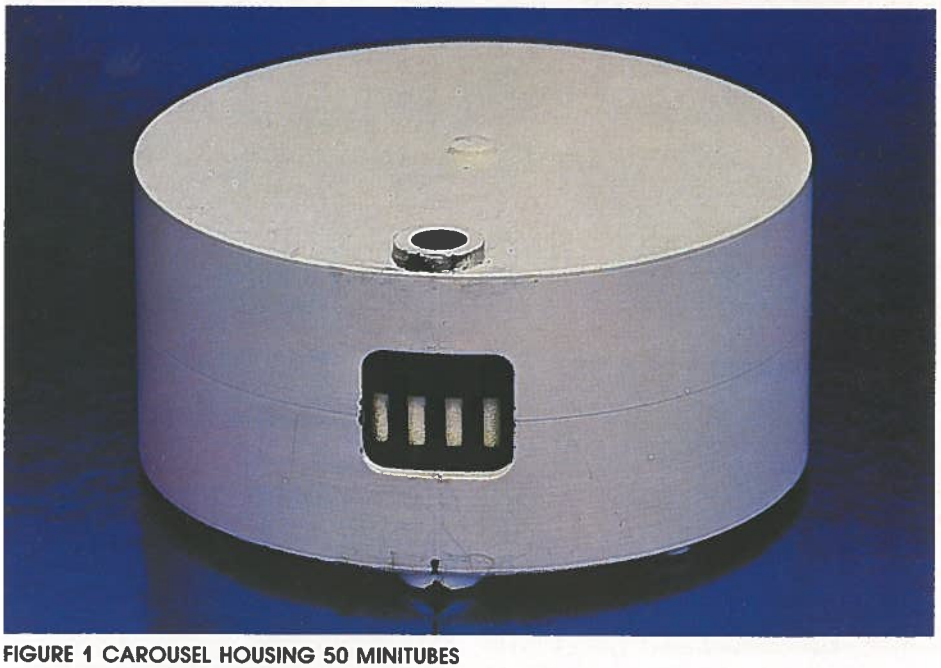


FIGURE 1 CAROUSEL HOUSING 50 MINITUBES

To correlate analysis to sampling, it is necessary to control the following parameters — flow rate of gas drawn through the adsorbent, sampling time period and the time of the event — all of which are pre-programmed and stored in a program module. The program module is plugged into a micro-processor-based controller which, in turn, guides the field sampler through 50 sampling events. The controller is designed to control up to 10 field samplers. A photograph of the field sampler is shown in Figure 2. A block dia-

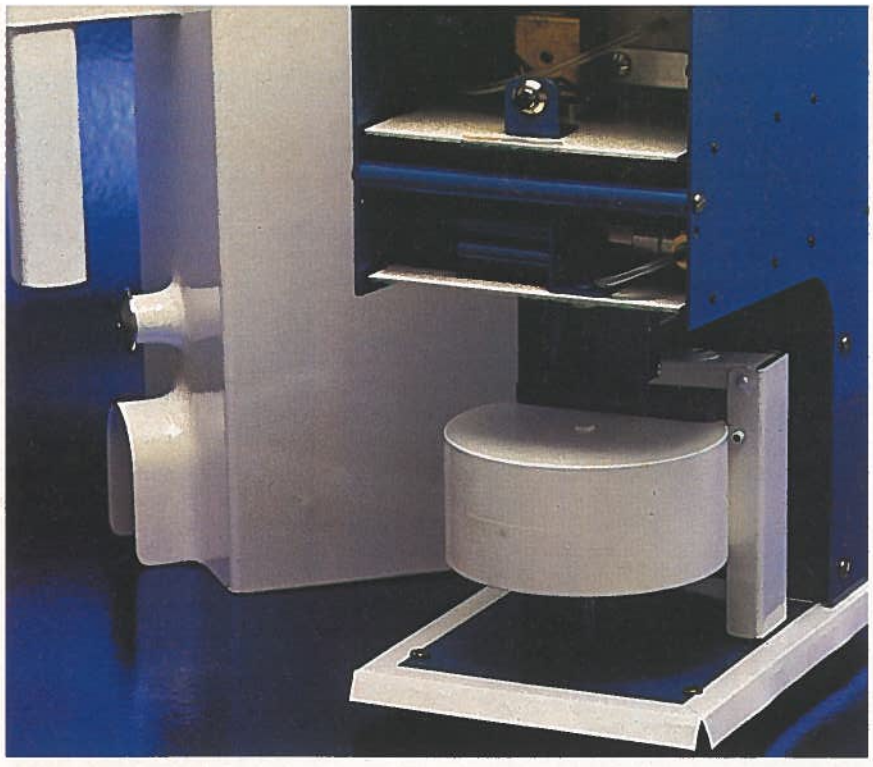


FIGURE 2 FIELD SAMPLER

Defence markets (i.e., other NATO countries) are being investigated as well as other applications such as agricultural (measure herbicide drift downwind of a crop spraying operation); industrial (analyze effluents from industrial processes); and environmental (monitor workplace air quality with respect to worker's health and safety concerns).

Specifications for a commercial version of MASS are being compiled and it is expected that this system will be a simplified version of the defence system.

FIGURE 3 MINITUBE SAMPLING STATION

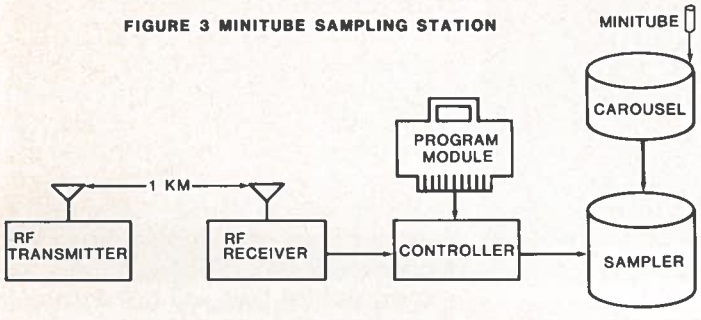
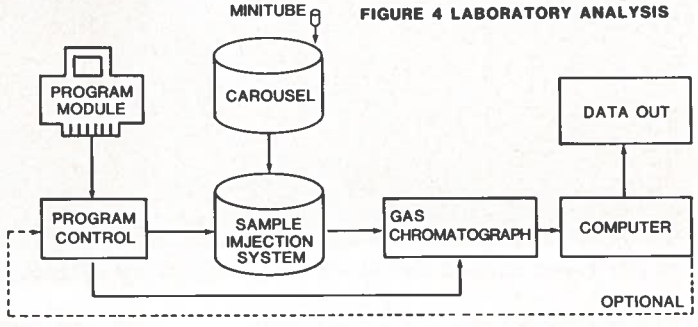


FIGURE 4 LABORATORY ANALYSIS



gram of a typical sampling station is illustrated in Figure 3. The sampling process can be initiated either locally, with a hand-held switch (not shown) or remotely by a radio transmitter.

On completion of the sampling cycle, the carousel containing the minitubes is removed and returned to the laboratory for analysis of the adsorbed contaminants.

To facilitate analysis (Figure 4), an automated thermal desorption sample injection system was designed and developed by CCAI. This injection system was retrofitted to a commercial gas chromatograph. Control of the analysis cycle can be manually programmed by an operator through a front panel console or, optionally, through a pre-programmed module which can be plugged into the injection system. The output data from the gas chromatograph are manipulated by a commercial mini-computer.

A further option, which would permit this mini-computer to control the analysis cycle, may be implemented in the future. This option would be able to predict trends and control the sample injection system accordingly (e.g., if the concentration of a particular sample was insignificant, it would be rejected and the next minitube selected).

The technique of thermal desorption permits re-use of the minitubes as contaminants are "flushed out" during analysis. The carousel can be removed from the injection system and immediately replaced in a field sampler for another sampling cycle.

The prototype system has been completed and tested. A further contract to supply production quantities to DRES is expected shortly. A patent application has been initiated by the Department of National Defence and a licence will be granted to CCAI for commercial exploitation.

For example, it is likely the commercial version would not require remote initiation of the sampling process. It is also probable that the controller will be an integral part of the sampler rather than a separate package.

For those customers who do not wish to commit to the expense of the laboratory analytical system, arrangements will be made to have the analysis performed on a fee for service basis by the analytical laboratories of the Saskatchewan Research Council.

This contract was truly a "win-win" situation. It not only solved a difficult problem cost-effectively, but indications are that the technology developed will be successfully transferred to the marketplace both nationally as well as internationally.

— by Don Barnett
Director, Canadian Centre for Advanced Instrumentation
Saskatchewan Research Council

Research and Development in Fire

The Fire Research Field Station, located near Carleton Place, Ontario.

The National Research Council (NRC) of Canada's Fire Research Station, located on a former 90-hectare farm near Carleton Place, Ontario, is unique in Canada and one of the few such facilities in the world. It is the only facility in Canada designed for fire experiments involving large quantities of fuel burned in a controlled fashion in realistic settings.

Its facilities are used in the research programs of NRC's Division of Building Research (DBR) and in support of the testing and regulatory needs of government agencies and the experimental and development needs of industry.

The Fire Research and Building Services sections of DRB both use the station for studies on smoke movement in tall buildings, fires involving typical room lining materials and furnishings, fuel loads and the toxic products of combustion.

Both sections are also planning studies on residential sprinkler systems, the flammability of exterior cladding materials, the performance of windows in sprinklered fires, the fire performance of structural frames and the control of smoke in elevator and stair shafts.

Non-NRC work is undertaken either on a contract basis for space and services or, where the experimental work complements the research activities of the DBR, on a co-operative basis in which some of the costs are absorbed by the NRC.

The DBR has conducted fire research since 1950 at the Montreal Road campus of NRC in Ottawa. Fire research laboratories were opened in 1958 and have been used extensively for small-scale experiments and standard testing.

However, full-scale or large-scale experiments were not possible, partly because of the potential problem of smoke affecting residents in the surrounding area. The increasing number of high buildings also created a need to study methods of fire and smoke control in them.

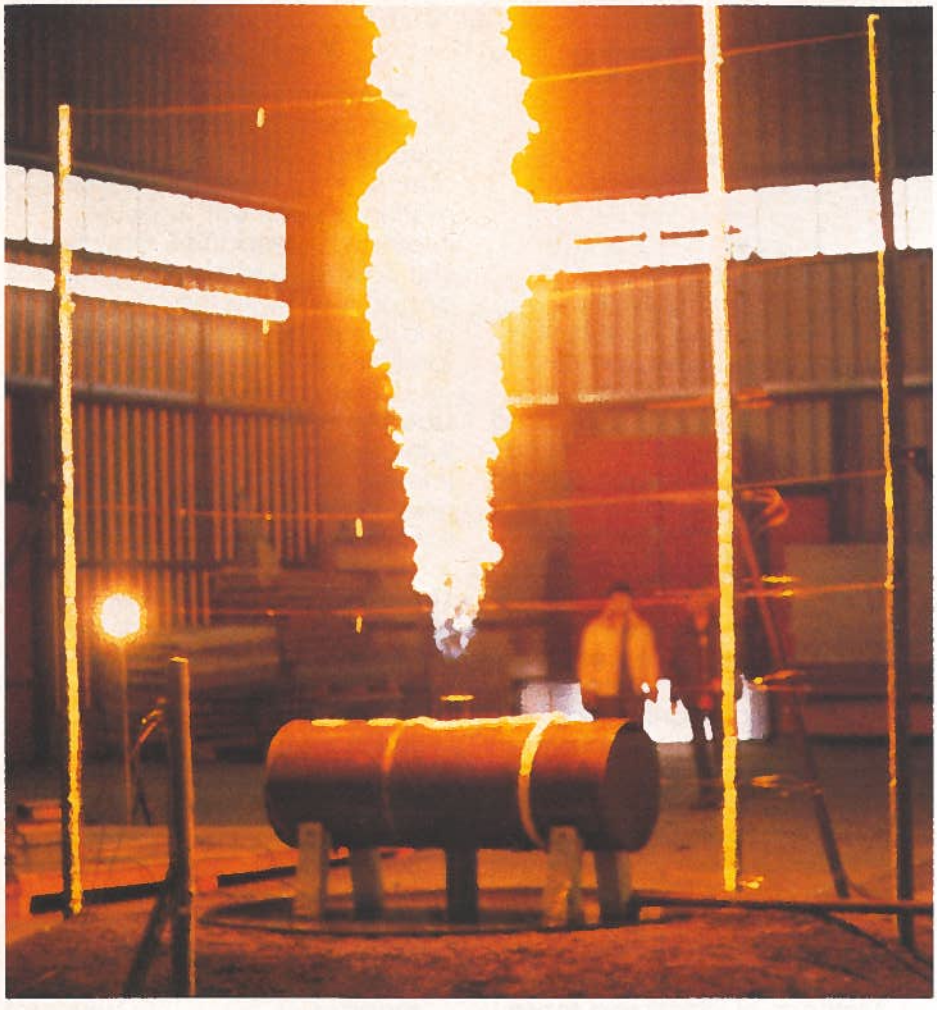
To undertake such experiments, an additional large facility was required in a location sufficiently remote to avoid disturbing local residents. Responding to this need, the National Research Council opened the Fire Research Field Station in 1981.

Description

The station consists of a 1 700-square-metre (18 300-square-foot) burn hall, a 10-storey tower and an ancillary building to house support services. The complex is situated and operated in such a manner, at the edge of the site, that the concentration of airborne contaminants from the experimental fires will not exceed the provincial regulations for air quality.

The unheated burn hall is a column-free floor area of approximately 55 by 30 metres (180 by nine feet) with an inside clear height of 12.5 metres (41 feet). To ensure continued use, the structural frame of the building is designed to withstand the effects of flame and heat. Ceiling fans and power-operated louvres permit the removal of smoke.

The NRC encourages joint research projects with industry and government agencies in the use of its Fire Research Field Station.



An experiment to simulate venting a propane tank car.

The experimental tower is designed specifically for research on fire propagation and methods for controlling smoke movement during high-rise fires in cold climates.

It contains a central core with typical shafts (elevator, stair and service) and a minimal area of approximately 37 square metres (400 square feet) on each floor where controlled fire experiments can be conducted. A protected service tower adjoins the experimental tower and permits the monitoring of experiments on each floor.

A portion of the tower's exterior cladding is removable to permit the installation of typical building facades for the study of vertical fire spread.

The service unit, located between the burn hall and the tower, contains a fully-equipped workshop, office space and computer facilities. Remote data acquisition hook-ups and plug-ins necessary to operate peripheral equipment such as computer terminals are installed in the burn hall and tower.

Activities

DBR encourages joint research with industry and government agencies in the use of the station.

Experiments study the effects of insulation on fire severity.

The Product Safety Branch of Consumer and Corporate Affairs Canada has used the burn hall to test the flammability of tents and to determine the effectiveness of fire retardant treatments for Christmas trees.

Davis Engineering Ltd., on contract to the Transportation Development Centre of Transport Canada, used the hall for fire tests to simulate a propane tank car surrounded by a fire involving a flammable liquid.

Experiments to determine the impact of thermal insulation on fire development have also been conducted as part of an industrial fellowship program sponsored jointly by the National Research Council and the Society of the Plastics Industry of Canada.

Co-operative work with industry provides invaluable research information for NRC while assisting industry in the development of products, systems and measures which are related to fire technology.

Fire departments in Canada will benefit from studies to be conducted at the station on fire fighting methods and equipment, sponsored by the Associate Committee on Research for the Fire Services.

The facility also finds use in experiments designed to verify specific fire-related requirements of the National Building Code of Canada.

Activities at the Fire Research Field Station are directed at reducing the death toll and property loss caused by fire. These will lead to a reduction in the costs of fire prevention and protection in Canada.

Through the use of the station, Canadian industry will profit from the development and verification of new fire technology.

— by J. Kenneth Richardson, P. Eng.
Manager, Fire Research Field Station
Fire Research Section
Division of Building Research
National Research Council of Canada

Innovative By-Products With Market Value

In the process of designing and manufacturing airplanes and other products, innovative Boeing Company employees have developed by-products that have market value in themselves.

To profit from the commercial potential of these technical by-products developed within the various divisions of The Boeing Company, an organization called Boeing Associated Products (BAP) was established in 1960.

According to BAP Director Floyd Knock, "These by-products encompass inventions, processes, innovations and other new technology that have market potential independent from the sale of Boeing's main product line. They may require further design and engineering efforts before they can be sold in industrial or consumer markets."

Employees Benefit

Knock said that, under a patent agreement with the company, Boeing employees can profit from their inventions as well.

The Boeing policy relating to inventions and proprietary information encourages its employees to "foster the development of technological innovation, to document it and to bring it to the attention of the appropriate patent staffs". The documentation is accomplished by means of the Boeing invention disclosure system.

Following submission to the Boeing patent staff, all invention disclosures are routed to BAP for review.

BAP is a small corporate organization staffed primarily by people having technical backgrounds. It is supported by Boeing division organizations such as patent staffs, engineering, and manufacturing.

Systematic Review

The BAP staff systematically reviews new Boeing inventions and technology, selects those that qualify as by-products, collects related technical data, and negotiates agreements with companies best suited to achieve the product's market potential.

"Since 1960," Knock said, "BAP has negotiated more than 450 licence agreements with companies around the world, and joint venture agreements have resulted in the formation of several new companies that manufacture and market Boeing by-products as their main line."

The first step of the marketing activity is to determine the industry or industries that could benefit most from a particular invention, and then identify companies having the best capability of marketing it commercially.

Methods of identifying those companies include maintaining files on approximately 3 500 firms with which BAP staff members have had prior contact; consulting business directories; contacting local embassies interested in bringing new business into their countries from companies with which Boeing has joint marketing ventures or consultant service agreements, and from recommendations made by the Boeing corporate office of Small/Small Disadvantaged Business and Small Minority-Owned Business. Some companies periodically contact or visit BAP to discuss and review products of interest.

Personal Contact

After a candidate company is identified, personal contact is made with company people having authority to make decisions regarding new business ventures. On the first contact, Boeing describes the features and advantages of the invention without disclosing proprietary information.

Interested companies are furnished more detailed technical data and patent information after signing a proprietary information agreement. Seriously interested companies may then visit Boeing to review the product and to meet with the inventors and other personnel thoroughly familiar with the development.

Licence Agreement

If the prospective licensee is still interested following this review and marketing analysis, a licence agreement is negotiated.

The agreement includes:

- Exclusive or non-exclusive right to make, use and sell the licensed product;
- Definition of the territory in which the product will be sold;
- Patent filings and patent payments for the U.S. and/or other countries;
- Effective date and term of the agreement;
- Extent of technical assistance to be provided by Boeing personnel, laboratories and shops;
- Extent of technical data to be furnished by Boeing;
- Payments due to Boeing, which might be in the form of company stock, a lump sum or one-time payment, an advance cash payment, a royalty based on sales, or combination of these.

"Following general agreement on licence terms and conditions, a licence agreement is prepared and forwarded to the prospective licensee," Knock said.

"After signing the agreement with Boeing, the licensee is ready to launch a new business venture and, in future years, additional business opportunities will be brought to that company's attention as they become available," he added.

Some of BAP's products available for licensing can be found in the list of technology transfer offers and requests in this *Innovation Supplement.*

TECHNOLOGY TRANSFERS

OFFERED

CANADA
- Magnetic Road Vehicle Control System
- Alcoholic Beverage from Maple Sap or Concentrates Thereof
- Hitch Assembly
- Flushing Device for Holding Tanks on Campers, Trailers and Motor Homes
- Insulated Wall Unit Construction
- Flax Straw Buncher
- Combination Meat Saw and Grinder
- Balcony Safe Escape Ladder
- Commonwealth Flexible Wall Dams (CFD2)
- Self-Lifting Device for Automotive Vehicles
- Method for Heat Recovery from Internal Combustion Engines for Supplementary Power
- Wheel Motion Indicator
- Inflation Dome
- Roof Vent
- Personal Safety Flasher

AUSTRALIA
- Gating Circuit

AUSTRIA
- Insulating System for Outdoor Walls

BELGIUM
- Polyester Silos
- Low Cost Prefab Building System
- Coldstores Made of Polyurethane Sandwich Panels
- Machinery for the Production of Sanitary Disposables
- Sanitary and Hospitals Disposables
- Microwave Heating of Foodstuffs
- Electronic Funds Transfer Terminal
- Battery Powered Portable Data Collection and Handling Terminal
- Magnetic Card (Plastic or Paper)
- Laser Machining Centre
- Fluid Clean Installation for Plastic Industry
- Concrete Reinforcement Corrosion Prevention
- Polyac Resin Compounds
- Glassfibre Reinforced Concrete
- A New Continuous Vulcanization Process
- Centralized Lubrication Systems
- Advanced Elastic-Ribbons
- Heat Treatment and Finishing of Components of Mechanical Devices
- Heavy Mechanical Drives

BRITAIN
- Building System

FINLAND
- Process for the Exploitation of Low-Grade Oxidic and Iron-Bearing Complex Ores or Concentrates
- Process for the Recovery of Lead, Silver and Gold from the Iron-Bearing Residue of an Electrolytic Zinc Process

FRANCE
- High Security Doors
- Isometric Abdominal Exerciser

GERMANY
- Cell Cracking Technology

ICELAND
- Baiting Machine for Seafishing

ITALY
- System for Creating Dams with Mobile and/or Partially Mobile Water-Retaining Elements

SOUTH AFRICA
- Laminated Wearing Plate Assembly for Tire Chain

SWEDEN
- Method for Preventing Slip of Driving Wheels

U.S.A.
- Fibrous Mat and Product and Method of Making the Same
- Container Corner Post Locking Assembly
- Universal Stitching Guide
- Hard Compositions and Methods of Preparation
- Antenna Isolator
- Graphite/Kevlar Coil Spring
- Pallet Transfer System
- Drill Runout Measurement Instruments
- Portable Compressed Air Drying Unit
- Gundrill Diameter Gauge

REQUESTED

BELGIUM
- Prefabricated Reinforced Concrete Products
- Dehydration Systems for Vegetables
- Specialty Chemicals
- New Techniques in the Field of Diecasting

OFFERED

CANADA

Magnetic Road Vehicle Control System
A Canadian inventor offers a Canadian company, under licence in Canada, know-how for his invention which consists of a motor vehicle control system for use with a roadway having many magnetic lane marking elements located in a pattern indicating the centre or the lateral edges of the lane, and of lower speed control zones such as curves or intersections in the roadway.
Write to: J. B. Douglas, President, Concept Conversion Inc., 1412 Erin Street, Winnipeg, Manitoba R3E 2S8.

Alcoholic Beverage From Maple Sap or Concentrates Thereof
A Canadian inventor offers a Canadian company in the food and consumer products industry a suitable licensing or joint venture partnership in Canada for his patented alcoholic beverage and process. It is claimed that the maple sap product may be made to retain a characteristic aroma and a unique and distinctive flavour.
Write to: V. W. Adamkiewicz, 5507 Côte St-Antoine, Montréal, Québec H4A 1R3.

Hitch Assembly
A new hitch assembly, employing scissor type connectors on both the towed and towing vehicle, greatly simplifies connection of the two. The assembly is particularly suited for off-road applications on farm and construction equipment.
Write to: J. K. Kirchner, 1314 - 13th Street South, Lethbridge, Alberta T1K 1S9.

Flushing Device for Holding Tanks on Campers, Trailers and Motor Homes
A tube is secured to a mounting plate attached to the holding tank. On the inner side, the tube is attached to a U-shaped fume trap and a nozzle is added at the end. On the outer side, the tube may be attached to a pressurized water line which assists in cleaning the inside walls of the tank.
Write to: A. Balazsi, 1906 Cumberland Avenue, Saskatoon, Saskatchewan S7J 1Z1.

Insulated Wall Unit Construction
A structural log-like member for use in constructing walls, having an outer and an inner wooden wall. Wooden spacer members connect the walls in spaced parallel fashion. The spaces between the walls and spacer members can be filled with an insulation material. In use, the structural members can be stacked one on top of the other to form a wall.
Write to: G. A. Lacombe, 199 O'Brien, Gatineau, Québec J8P 2Y5; **L. Bonicalzi**, 200 Cité des Jeunes, Hull, Québec J8Y 6M1.

Flax Straw Buncher
A flax straw buncher for use behind a combine in a single operation where the straw is bunched behind the combine for subsequent burning, comprises a two-pronged frame section extended behind a hitch with groundwheels at the rear of the frame section. A rake portion is pivotally mounted on the frame sections to extend back from them and across them. The rake portion includes tubular steel fingers and provides the only transverse connection of the frame. The space provided in front of the rake and inside the frame section forms the straw in bunches.
Write to: A. Lypka, P.O. Box 212, Abertnethy, Saskatchewan S0A 0A0.

Combination Meat Saw and Grinder
A band type meat saw includes supporting structure and a table with a meat grinder mounted upon the table on one side of the meat saw. An electric motor is mounted under the framework on a hinged platform so that the weight of the motor gives tension to the drive belt, which can either be connected to the saw or to the grinder. The drive pulleys for the saw and grinder lie on substantially the same plane as the drive pulley of the motor. An adjustable meat guide slides along the bar on one edge of the table to control the width of the meat being cut so that it will engage within the grinder bowl.
Write to: S. Weichel, P.O. Box 51, Odessa, Saskatchewan S0G 3S0.

Balcony Safe Escape Ladder
This rigid and lockable lightweight ladder has a reverse "S" curvature so that it can be hung over one balcony to permit descent to the balcony below. Horizontal struts improve the stability and safety of the ladder. The process of descent can be repeated by lifting the ladder free of the balcony above and lowering it to the balcony on which the user is standing.
Write to: J. G. Ilett, 210-3244 Quadra Street, Victoria, British Columbia V8X 1G2.

Commonwealth Flexible Wall Dams (Abbreviated as CFD2)
This invention covers combined interrelated inventions dealing with flexible wall dams, flexible wall water-locks, flood control flexible retaining walls, flexible liquid reservoirs, generally referred to as Commonwealth flexible well dams. They use in combination: an upright, flexible, impermeable, non-extendable, reinforced flexible wall having elongated upper and lower peripheral edge, with the lower edge, positively and substantially sealed and secured to the base of the waterbed, the riverbed, the seabed or the like. The rest of the flexible wall is supported directly or indirectly by contained fluid or by loose solid substance, shielded by the front flexible wall which absorbs the upstream water pressure.
Write to: R. Hoyeck, 80 Somerville Avenue, Westmount, Quebec H3Z 1J5.

Self-Lifting Device for Automotive Vehicles
This self-lifting device, powered by a hydraulic pump, is composed of two hydraulic cylinders attached, at one end, to a base plate and, at the other end, to a crossmember, forming a U. Two of these devices, installed at the front and rear of an automobile or other vehicle and operated by means of the power-steering pump, can:
- raise and lower the vehicle;
- move the vehicle sideways;
- rotate the vehicle.

Write to: B. Bogdan, Range 4 and 5, Val Senneville, Quebec J0Y 2P0

Method for Heat Recovery from Internal Combustion Engines for Supplementary Power
Nearly two thirds of the fuel energy consumed in internal combustion engines is expelled as heat in the exhaust gases and coolant. The lower temperature portions of this heat can be upgraded by a heat pump cycle to produce steam which can then be superheated by the higher temperature portion of the exhaust gases. The current proposal for achieving this can be improved by separating the boiler into two sections; directing the high temperature portion of the exhaust gases into the superheating boiler; conducting the low temperature portion of the exhaust gases through a heat exchanger in the low temperature boiler; and conducting a controllable portion of the exhaust steam from a driven turbine through the second stage, instead of the first stage of the heat pump cycle.
Write to: J. L. Marshall, Apt. 906, 1081 Ambleside Drive, Ottawa, Ontario K2B 8C8.

Wheel Motion Indicator
A device for sensing wheel rotation that includes a cylindrical casing with a conical bottom end, which defines a ramp for a steel ball in the casing. A shaft connected to the casing top is rotated by a vehicle's wheel to cause the ball to ride up the ramp; A pair of contacts at the bottom of the ramp are electrically interconnected by the ball when the wheel and consequently the shaft and casing stop rotating, thereby closing an electrical circuit to provide a signal indicating that rotation of the wheel has ceased.
Write to: A. Garford, 10755 - 164 Street, Edmonton, Alberta T5P 3S1.

Inflation Dome
An inflatable pool enclosure that is formed of arched ribs, adjacent to each other to form a continuous longitudinal structure. The terminal ends of each arch are affixed to the ground by convenient means preferably a weight. Each rib of the arch is composed of impervious sheet material that forms a cell in which compressed air may be entrapped so as to inflate the cell and hence the rib. Each rib is inflated in a similar manner so that the longitudinal continuous arch-like structure is formed.
Write to: Sunrise Pools Limited, 303 Edinborough Street, Windsor, Ontario N8X 3C3.

Roof Vent
A roof vent for use on new or old roofs includes a narrow diameter, tubular body which is inserted into a small hole in the roof between the rafters; and a disc-shaped, hollow head on the body with a closed top end and many small ventilation openings in the side.
Write to: S. W. Sampson, P.O. Box 745, Melfort, Saskatchewan S0E 1A0.

Personal Safety Flasher
A safety flasher for use by pedestrians, bicyclists and the like for producing a flashing signal. The flasher comprises a battery casing, a lamp secured to and extending outside the casing and circuit in the casing connecting the battery and lamp for selectively actuating the lamp. The circuit includes an acceleration responsive switch for causing the lamp to flash on and off.
Write to: W. J. I. Montgomery, 9250 Pinetree Road, Sidney, British Columbia V8L 3W2.

AUSTRALIA

Gating Circuit
The Australian government offers to a Canadian company the manufacturing and marketing rights, under licence in Canada, for its invention which relates to a gating circuit for applying an output signal to one of a large number of output lines in response to an incoming signal being applied to one of a large number of input lines.
Write to: Assistant Secretary, Marketing Branch, Department of Defence Support, Anzac West Building, Canberra, ACT 2600, Australia.

AUSTRIA

Insulating System for Outdoor Walls
An Austrian firm offers to a Canadian company in the construction industry an exclusive licence for the manufacturing and marketing in Canada of its complete insulating system for outdoor walls. The system consists of a special dry wall glue which serves to stick slabs of polystyrene to the raw brick wall. It is claimed to save in fuel cost when heating the building in winter and, at the same time, the house stays cool during warm summer months.
Write to: Thermit I.S.P.-Insulating Systems, Industriestrasse 34, A-4840 Voecklabruck, Austria.

BELGIUM

Polyester Silos
A Belgian designer and constructor offers a Canadian company a joint-venture, manufacturing and marketing licence agreement in Canada, for his glassfibre reinforced polyester silos and automation systems for storage of products in industry and agriculture. REF. NR.: 0-84 139.

Low-Cost Prefab Building System
A Belgian designer offers a Canadian company a new, total package of technology and associated equipment for manufacturing self-supporting, fully interlocking p-u panels for low-cost housing. REF. NR.: 0-84 137.

Coldstores Made of Polyurethane Sandwich Panels
A Belgian designer offers a Canadian company a new, total package of technology and associated equipment for manufacturing, in Canada, self-supporting, fully interlocking p-u panels for coldstores. REF. NR.: 0-84 136.

Machinery for the Production of Sanitary Disposables
A Belgian firm offers a Canadian company in health care products a joint-venture, manufacturing licence for its machines for the production of hygienic disposables. REF. NR.: 0-84 134.

Sanitary and Hospitals Disposables
A Belgian firm offers a Canadian company in health care products a manufacturing licence for its hygienic disposables. REF. NR.: 0-84 133.

Microwave Heating of Foodstuffs
A Belgian firm offers a Canadian company a joint-venture agreement for its micro-wave equipment. Microwave heating allows rapid and healthy preparation of animal and human food. Degree of development: prototype. REF. NR.: 84 132.

Electronic Funds Transfer Terminal
A Belgian manufacturer offers a Canadian company a manufacturing or know-how licence for his data handling equipment for fuel stations, monitoring up to nine self-service fuel dispensers. REF. NR.: 0-84 106.

Battery Powered Portable Data Collection and Handling Terminal
A Belgian manufacturer offers a Canadian company a manufacturing or know-how licence for his light-weight portable terminal. It provides data storage, retrieval, interrogating editing, two-way communication, multiple copy printing, real time clock and basic calculating functions. REF. NR.: 0-84 107.

Magnetic Card (Plastic or Paper)
A Belgian manufacturer offers a Canadian company a manufacturing or know-how licence for his motor operated magnetic card reader/writer with a printing function in addition to the read/write function of a conventional card reader. REF. NR.: 0-84 108.

Laser Machining Centre
A Belgian firm offers a Canadian company a joint-venture or manufacturing licence agreement for its industrial multikilowatt lasers for civil and military applications. The combination of a multikilowatt laser and a numerical controlled machining centre makes this machine a versatile tool. REF. NR.: 0-84 109.

Fluid Clean Installation for Plastic Industry
A Belgian firm offers a Canadian company a licence agreement for its high temperature fluid bed for removal of polymeric residues from metal parts. Cleaning is effected by incineration and sand movement. REF. NR.: 84 111.

Concrete Reinforcement Corrosion Prevention
A Belgian producer of special coatings offers a Canadian company a licence of know-how for his unique resistance coating for the protection of all kinds of construction: steel, aluminium, brickwork. The new technology is particularly relevant for concrete reinforcement protection. The coating is applied with special high pressure spray equipment. REF. NR.: 0-84 115.

Polyac Resin Compounds
A Belgian firm offers a Canadian company a licence of know-how for its range of synthetic resins. These compounds may be used in the construction of new floors, or in the resurfacing of old ones and may be laid on concrete, metal or wood substrates. Application can also be made to asphaltic or bituminous surfaces to give oil and solvent protection. A range of colours, surface finishes and thicknesses can be obtained to meet specific requirements. REF. NR.: 0-84 122.

Glassfibre Reinforced Concrete
A Belgian firm offers a Canadian company a licence of know-how for its fibre reinforced concrete panels that can be shaped into almost every possible architectural style. REF. NR.: 0-84 124.

A New Continuous Vulcanization Process
A Belgian firm offers a Canadian company a licence or joint-venture agreement for its integrated system of continuous vulcanization of rubber by microwaves. Degree of development: prototype being tested. REF. NR.: 0-84 131.

Centralized Lubrication Systems
A Belgian manufacturer offers a Canadian company a manufacturing or know-how licence agreement for its centralized lubrication system which provides an adequate amount of grease or oil to numerous lubricating points at the right moment. REF. NR.: 0-84 130.

Advanced Elastic-Ribbons
Belgian company offers a Canadian company a know-how and machinery agreement for its highly specialized grade of technology for elastic ribbons for the foundation industry. REF. NR: 0-84 128.

Heat Treatment and Finishing of Components of Mechanical Devices
A Belgian manufacturer offers a Canadian company a licence or joint-venture agreement for its special heat treatment facilities for several parts of mechanical drives and other transmission needs. REF. NR.: 0-84 127.

Heavy Mechanical Drives
A Belgian manufacturer offers a Canadian company a licence agreement for its specialised know-how for heavy mechanical drives such as gears and transmissions for locomotives, heavy trucks for mining, bulldozers, etc. REF. NR.: 0-84 126.

For more information on these and other offers please write to:
Dr. H. Debbaut
GOMOV
Floraliapaleis P.B.6
B-9000 Gent/Belgium
Please indicate appropriate REF. NR.

BRITAIN

Building System
British inventors offer a Canadian company in the construction industry an exclusive licence agreement for the manufacturing and marketing of a complete building system in Canada. It is a new system, using prefabricated steel or other metal components. The structural frames are rolled hollow section steel and galvanised sheet steel for roof and wall panels. The hollow structural frames are liquid filled and are in direct thermal contact with the steel wall and roof panels to permit the conduction of heat. All types of buildings can be designed and constructed using the system and can vary considerably in appearance from traditional to futuristic to suit the architectural requirements.
Write to: A. H. Ridett, Ridett Huntward Technology Limited, Binfield House, Mill Lane, Binfield, Newport, Isle-of-Wight, England.

FINLAND

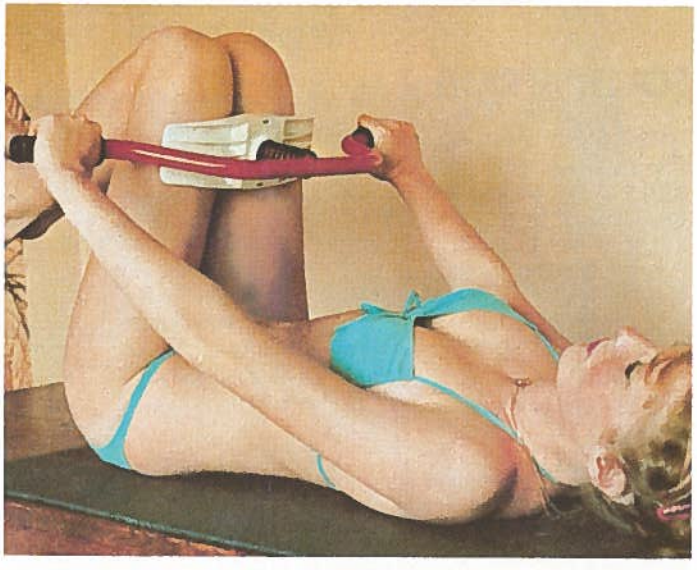
Process for the Exploitation of Low-Grade Oxidic and Iron-Bearing Complex Ores or Concentrates
In this process the initial materials are reduced in a rotary kiln at a temperature of 1 000-1 500°C in such a manner that the products are a magnetic fraction primarily consisting of iron and a non-magnetic oxide fraction. The materials present in this fraction are further exploitable by conventional methods.
Write to: Outokumpu Oy, Toolonkatu 4, SF-00100 Helsinki 10, Finland.

Process for the Recovery of Lead, Silver and Gold from the Iron-Bearing Residue of an Electrolytic Zinc Process
A process for froth-flotating a slurry of the iron-bearing residue in the presence of a sulfidic collector agent in order to froth-flotate the sulfides and to separate them from the iron-bearing residue. The iron-bearing residue is sulfidized selectively in order to convert the lead, silver and possibly gold to sulfides before the iron-bearing residue is froth-flotated.
Write to: Outokumpu Oy, SF-83500 Outokumpu, Finland.

FRANCE

High Security Doors
A French firm offers a Canadian company in the forest products industry an exclusive licence for manufacturing and marketing in Canada its high security doors with a continuous peripheral locking system. They claim to offer complete security, are less expensive than conventional security doors and can be produced in wood or metal.
Write to: M. P. Montet, CODIM S.A., 46, rue Edgar Quinet, 42100 Saint-Etienne, France.

Isometric Abdominal Exerciser
A French firm offers to a Canadian company in the tube forming or plastic industry the exclusive manufacturing and marketing rights for Canada, and perhaps the United States, for its light and portable isometric abdominal exerciser for personal and professional use. It is claimed that the exerciser works on the principle of short action muscular contractions, has more working power units than a simple movement, is faster, more intensive and more lasting than ordinary muscle building. In addition, the effort being made in a static position, there is no risk of damage to the spine.
Write to: M. P. Montet, CODIM S.A., 46, rue Edgar Quinet, 42100 Saint-Etienne, France.



GERMANY

Cell Cracking Technology
A West German firm offers a Canadian company complete technical know-how based on many years of experience and an exclusive licence for manufacturing and marketing in Canada and perhaps the United States, of its pressure expansion technology cell cracking, a method of mashing organic material without mechanic power.
Write to: Emma Helwig, Ulrichstrasse 17, D-5014 Kerpen 3, Federal Republic of Germany.

ICELAND

Baiting Machine for Seafishing
An Icelandic inventor offers to a Canadian company the manufacturing and marketing rights in Canada for his auto-fishing line system. The machine is claimed to be easy to operate and install in any kind of ship of any size. The machine is much smaller, needs fewer men to run. The inventor further claims that the fish is always fresh and unbruised as compared to trawler or net fishing.
Write to: Sigurbjorn AEvarr Jonsson, Kvistaland 14, Reykjavik, Iceland.

ITALY

System for Creating Dams with Mobile and/or Partially Mobile Water-Retaining Elements
Dams which basically consist of foundation plinths, secured as necessary, carrying movable and/or partially movable dam elements which can be inclined, using appropriate lifting or lowering devices, to retain or release water as required. The system also includes a control cabin.
Write to: A. Ferrari, Via Celestino Lendri, Fumane (Verona), Italy.

SOUTH AFRICA

Laminated Wearing Plate Assembly for Tire Chain
Tire protective or traction chain comprising a network of wearing plates perpendicular to the surface of a tire and connectors parallel to the surface of the tire interconnecting the wearing plates. Each wearing plate on the tread portion of tire comprises an assembly of multiple plates that are relatively thin and that together form a wearing plate assembly of the required thickness. Alternate plates of an assembly may be of different heights or have sloping ground engaging edges arranged opposite to one another for increased traction.
Write to: H. O. Dohmeier, 24 Shipston Lane, Victoria, Johannesburg, South Africa.

SWEDEN

Method for Preventing Slip of Driving Wheels in Multiple-Axle Type Drive Systems
The method maintains axle speed in a multi axle drive system within pre-prescribed limits of time and speed differential by reducing the hydraulic pressures to the axle of the spinning wheels for a predetermined period of time. This system continuously monitors several functions to eliminate slippage.
Write to: Volvo Flygmotor AB, Box 136, S-46181 Trollhattan, Sweden.

U.S.A.

Fibrous Mat and Product and Method of Making the Same
A fibrous mat which may itself or in combination with other materials be an end product, or from which a product of predetermined shape can be moulded by the application of heat and/or pressure. The mat consists essentially of two types of fibres with the first having a substantially higher softening temperature than the second. The fibres intertwine to resist separation. The second fibres are bonded to the first and to each other to form connections. There is also disclosed a method by which the fibrous mat is made and product made from the mat.
Write to: Van Dresser Corporation, 755 West Big Beaver Road, Suite 1610, Troy, Michigan 48084, U.S.A.

Container Corner Post Locking Assembly
A corner post assembly for locking together two cargo containers placed one upon another. The assembly includes an upper activating unit and a bottom twist lock and shear pin unit installed inside each vertical corner of the container, the upper activating unit being engagable by a bayonet of a hydraulically powered container handling spreader. The bayonet turns the upper activating unit which thus transmits rotation to the bottom twist lock and locks the shear pin to a container.
Write to: R. M. Del'Acqua, c/o R.L. Miller, 3612 Woolworth Building, New York, N.Y. 10007, U.S.A.

Universal Switching Guide
A universal stitching and seam guide attachable to any sewing machine for permitting the operator to produce straight or curved stitchings, and even and uniform seams and hems. A thin steel mounting plate with a pressure-sensitive adhesive on its bottom surface is provided for installation on a sewing machine bed plate adjacent to the needle plate and presser foot. A guide plate is provided formed from magnetized rubber-like material and having straight sides and curved sides. The guide plate is placed on the mounting plate and is held in place by magnetism. The appropriate edge is selectively positioned for the type of stitching being performed. The guide plate will also adhere to the needle plate on the machine when a narrow tuck, edge stitching or seam is to be made.
Write to: D. Y. Kirby, 633 Linden Street, Clermont, Florida 32711, U.S.A.

Hard Compositions and Methods of Preparation
A method of preparing hard composites using a special carbide or materials which will convert to this carbide under heat and pressure is offered. These hard composites will have a number of valuable properties found only in more expensive metal alloys such as pure tungsten or cobalt-bonded tungsten carbides. They are claimed to be superior for ultra-high pressure anvil applications and others.
Write to: United States Department of Energy, Washington, D.C. 20585, U.S.A.

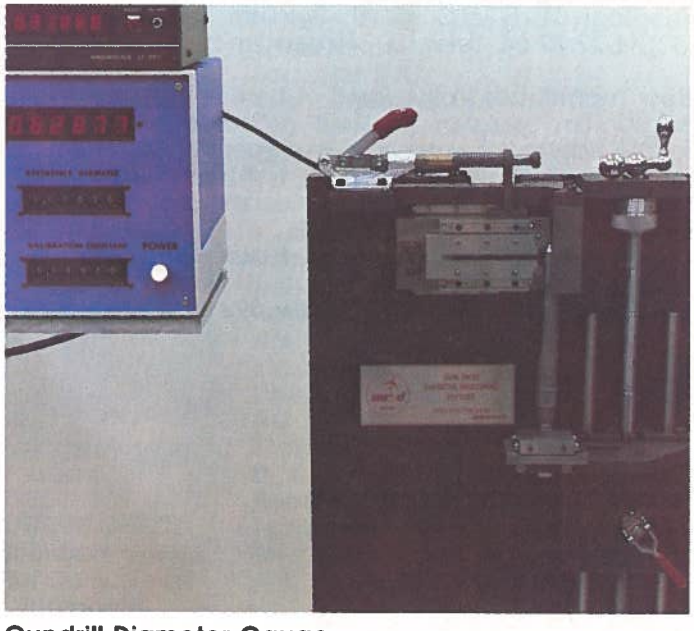
Antenna Isolator
American firm offers a Canadian company, under a manufacturing licence, the antenna isolator which replaces a standard quarter-wave choke used to isolate an antenna from a ground plane. The isolator is about 0.01 wave lengths thick and shaped like a disk. It should find application in the HF through UHF bands. PRODUCT NUMBER: 1298-RA.

Graphite/Kevlar Coil Spring
American firm offers a Canadian company in the industrial equipment, farm machinery, trucking and automotive fields, under a manufacturing licence, its lightweight graphite/Kevlar coil spring which has been developed to replace steel and titanium springs, is less expensive to fabricate and provides a much greater fatigue life than conventional coil springs. PRODUCT NUMBER: 2583-WW.

Pallet Transfer System
American firm offers a Canadian company in the service industries machinery division, under licence, a low cost, reliable parts handling system which has been developed to transfer parts between two or more machine tools. It is claimed that the new design can easily be adapted to a large number of existing machine tools. PRODUCT NUMBER: 2609-WW.

Drill Runout Measurement Instruments
American firm offers a Canadian company in the service industries machinery division, under a manufacturing licence, two instruments — a stand-alone bench top instrument and a machine-mounted instrument using a light beam directed toward the rotating tool or machine spindle for precise runout measurement. It is claimed that both instruments provide quick, accurate and reliable measurements. PRODUCT NUMBER: 4265-RA.

Portable Compressed Air Drying Unit
American firm offers a Canadian company in the service industries machinery division, under a manufacturing licence, its compact, portable air drying unit designed to provide clean, dry and relubricated compressed air in extreme weather conditions. PRODUCT NUMBER: 2596-RA.



Gundrill Diameter Gauge
American firm offers a Canadian company in the service industries machinery division, under a manufacturing licence, its gauge system which is designed to provide accurate, repeatable measurements of gundrill or gun reamer diameter and back taper. It is used to inspect new drills and used drills after they have been reground. PRODUCT NUMBER: 4285-RA.

For additional information about these and other products available under licence please write to: Boeing Associated Products, Mail Stop 7E-14, P.O. Box 3707, Seattle, Washington 98124-2207, U.S.A.

REQUESTED

BELGIUM

Prefabricated Reinforced Concrete Products
Belgian firm seeks contact with a Canadian company to manufacture, under licence or joint-venture agreement, products in concrete or novel materials for the building industry, building renovation, ornamental and garden applications. Ref. No.: D1.
Write to: Jos Vanherk, Vaheja, Lillerheidestraat 51, B-3582 Neerpelt, Belgium. Telephone: (32)-11-64.00.41. Telex: 39929.

Dehydration Systems for Vegetables
Belgian firm seeks contact with a Canadian company for its full scale know-how of canning for its dehydration systems for vegetables, such as green peas, green beans, wax beans, broad beans, carrots, celery, salsify, etc. Ref. No.: D2.
Write to: De Bruyn, Executive Director, Scana-Noliko N.V., Roermonderweg 2, B-3690 Bree, Belgium. Telephone: (32)-11-46.49.41. Telex: 39169.

Specialty Chemicals
Belgian firm seeks Canadian partners, under licence or joint-venture proposal, to manufacture all types of specialty intermediary organic chemicals (flame retarders, resins, polyesters). Ref. No.: D4.
Write to: Guido Quanten, Technology Transfer Service, Regional Development Authority Limburg, Kunstlaan 18, B-3500 Hasselt, Belgium. Telephone: (32)-11-22.29.64. Telex: 39245 gomlim-b.

New Techniques in the Field of Diecasting
Belgian firm seeks contact with a Canadian company for the transfer of know-how or a licensing agreement for its new techniques in the field of high-pressure aluminium and zinc precision diecasting of small technical products. Ref. No.: D9.
Write to: Albert Riskin, Director, Riskin N.V., Neremstraat 40, B-3780 Tongeren, Belgium. Telephone: (32)12-23.49.22. Telex: 39212 rijdal-b.

SPECIAL EVENTS

JAPAN
- **TSUKUBA EXPO 85**/March-September 1985

GERMANY
- **1985 LEIPZIG AUTUMN FAIR**/September 1985

BRITAIN
- **DES — DESIGN ENGINEERING SHOW AND CONFERENCE**/October 1985

FRANCE
- **S.I.T.E.F. (Salon International des Technologies et Energies du Futur)**/October 1985

- **NOVOTECH**, 3rd European forum of operators of the transfer of technology.

BRITAIN
- **BARCLAYS TECHMART** — 1985/October 1985

GERMANY
- **IENA '85**/October-November 1985

JAPAN
- **TECHNO '85**/November 1985

JAPAN
- **85 PATENT INFO FAIR**/November 1985

GERMANY
- **TECHNOLOGIEFORUM BERLIN**/November 1985

BELGIUM
- **EUREKA 34TH WORLD INVENTIONS EXHIBITIONS**/ November-December 1985

GERMANY
- **HANNOVER FAIR**/April 1986

TSUKUBA EXPO 85
Dwellings and Surroundings-Science and Technology for Man at Home
Tsukuba Science City
Ibaraki Prefecture, Japan
March 17-September 16, 1985
TSUKUBA EXPO 85
Tsukuba Science City
Ibaraki Prefecture, Japan

1985 LEIPZIG AUTUMN FAIR
RAW MATERIALS, FUELS AND ENERGY
Technical Fair Grounds
Leipzig, German Democratic Republic
September 1-7, 1985
Leipziger Messeamt
GDR-7010 Leipzig
Markt 11-15
Postfach 720
Telephone: 71810
Telex: 512294

DES — DESIGN ENGINEERING SHOW AND CONFERENCE
National Exhibition Centre
Birmingham, England
October 8-11, 1985
Cahners Exhibitions Limited
Chatsworth House
59-61 London Road
Twickenham, TW1 3SZ England
Telephone: 01-891 5051
Telex: 936028

S.I.T.E.F. (Salon International des Technologies et Energies du Futur) (Incorporating F.I.T.T. '85 — Forum International du Transfert de Technologies)
Palais des Congrès
Parc des Expositions de Toulouse
Toulouse, France
October 22, 1985
Commissariat général du SITEF
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2, rue Alsace-Lorraine, B.P. 1506
31002 Toulouse, Cédex (France)
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BARCLAYS TECHMART — 1985
THE SECOND MAJOR TECHNOLOGY TRANSFER EXHIBITION
The New Technology Exhibition
National Exhibtion Centre
Hall 3A
Birmingham, England
October 22-25, 1985
National Exhibition Centre
Exhibitions Limited
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IENA '85
Nuernberg Fairground
Messezentrum Nuernberg
Federal Republic of Germany
October 30 - November 3, 1985
Mrs. Zetel
AFAG-Ausstellungsleitung
Messezentrum Nuernberg
D-8500 Nuernberg, Germany
Telephone: 0911/86691
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TECHNO '85
7TH INTERNATIONAL LICENSING AND JOINT VENTURE EXPO
Science and Technology Museum
Chiyoda-ku, Tokyo, Japan
November 12-15, 1985
Techno Tokyo EXECUTIVE OFFICE
The Nihon Kogyo Shimbun
(The Japan Industrial Daily News)
Sankei Bldg., 7-2, Ohtemachi 1-chome
Chiyoda-ku, Tokyo 100, Japan
Telephone: (03) 231-7111
Telex: J22235

85 PATENT INFO FAIR
Science and Technology Museum
Chiyoda-ku, Tokyo, Japan
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Techno Tokyo EXECUTIVE OFFICE
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Sankei Bldg., 7-2, Ohtemachi 1-chome
Chiyoda-ku, Tokyo 100, Japan
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NOVOTECH
3rd European forum of operators of the transfer of technology
November 19-22, 1985 — Lyon, France
BRUSSELS INTERNATIONAL TRADE FAIR
Parc des Expositions, Place de Belgique
B-1020 Brussels, Belgium
Telephone: 02/478.48.60

Technologieforum Berlin
International Innovation Market
Exhibition and Congress
Berlin, Federal Republic of Germany
November 26-29, 1985
AMK Berlin
Ausstellungs-Messe-Kongress GmbH
Messedamm 22
D-1000 Berlin 19

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Expo Rogier Center
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1000 Brussels, Belgium
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HANNOVER FAIR
Hall 7, Hanover Fairgrounds
Hanover, Federal Republic of Germany
April 9-16, 1986
Mr. Wiegmann
Deutsche Messe und Austellungs AG
Messegelaende
D-3000 Hanover 82, Federal Republic of Germany
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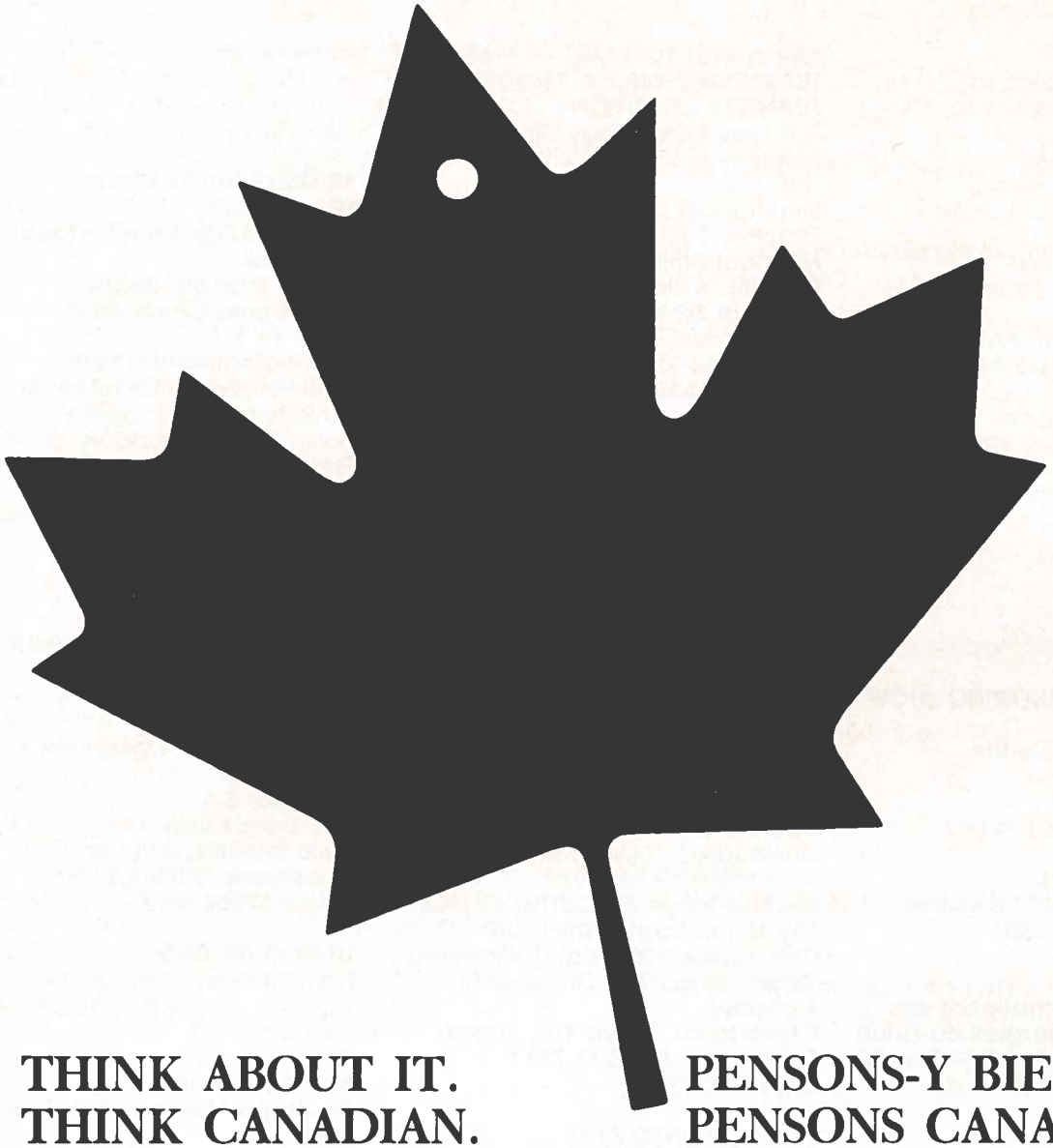

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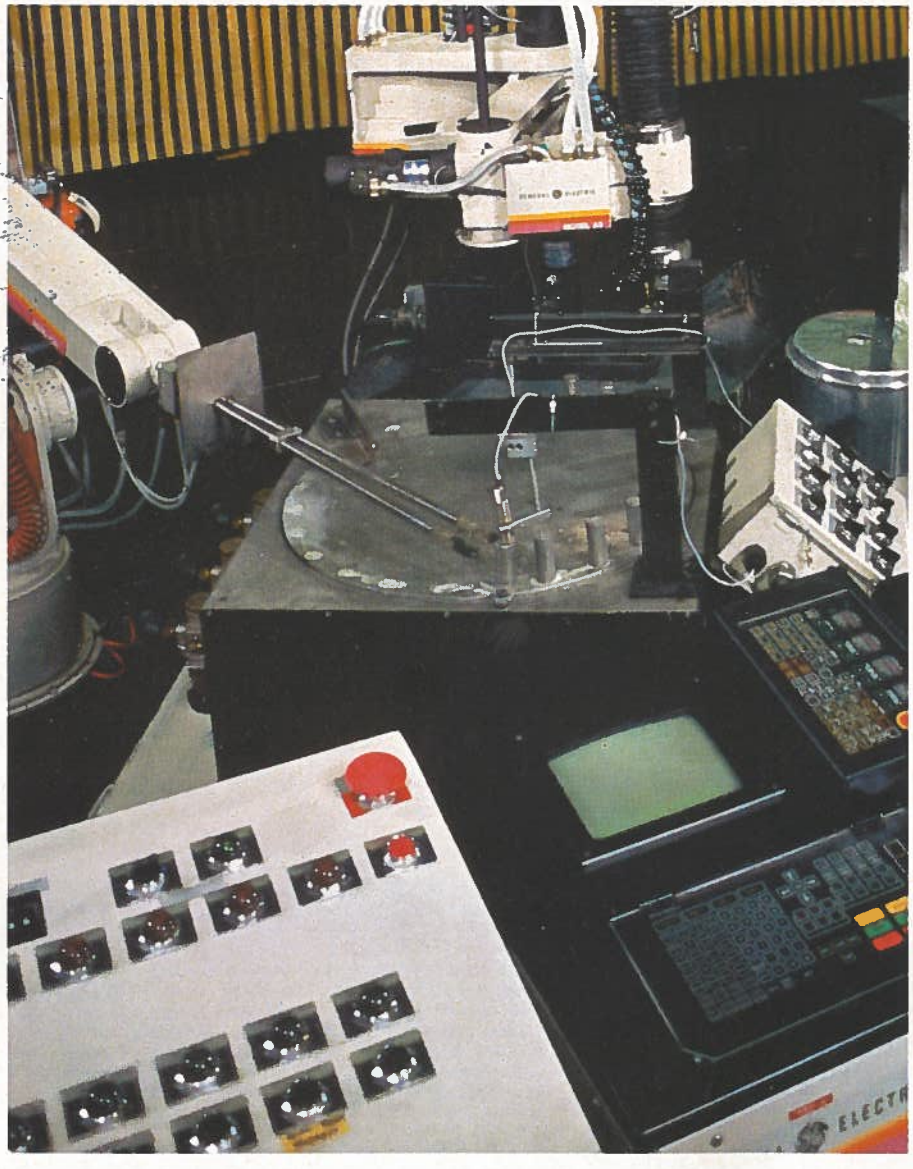

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