canada courier

INTERNATIONAL EDITION

VOLUME 10, NUMBER 10, OTTAWA 1973

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Canada's aerospace industry exports 80 per cent of production

Aviation's greatest show sees Canada flying high

Highly successful Canadian STOL aircraft.

by Anna Armstrong
Editor, Canada Courier

It's that time again. When the eyes of the world's aviation industry focus on Le Bourget and the Paris Air Show. The razzmatazz, the hoop-la, the visiting Heads of State, the company presidents and the chairmen of the boards entertaining, and being entertained. The closed (to the public) days, the open days. The glorious wind-up weekend with the spectacular air display when the aviation giants bring on the big drums.

And underneath it all, the exhibitors, large and small, who are there to show the world that their particular products or services are just what the industry needs. The Paris Air Show, correctly, 30e Salon International de l'aeronautique et de l'espace, takes place May 25 to June 3, 1973.

While Canada cannot claim to be one of the aviation giants, Canada's aerospace industry can and does manufacture a broad range of products, 80 per cent of which is exported to world markets. The industry's experience and expertise embraces aircraft, engines, components, avionics, accessories, ground handling equipment, spacecraft design and manufacture, space electronics and components. Its products can be found on the ground, in the air and in outer space programs involving many nations.

Canada pioneered the STOL (Short Takeoff and Landing) concept and has produced more aircraft of this type, such as the Beaver, Otter, Buffalo and Caribou, than all other nations combined. The Canadian Government showed faith in the STOL concept to the tune of some $63,000,000 recently when it backed production by The de Havilland Aircraft of Canada Limited of two 48-passenger STOL prototype airplanes, to be ready by 1975.

STOL — as our story in this issue tells — is felt by the Canadian Government to be the answer to crucial problems at the world's major airports.

It follows then that a STOL theme area, featuring a huge animated model of the de Havilland prototype DHC-7, is an important part of the Canadian Exhibit at the 1973 Paris Air Show. (The exhibit is sponsored and co-ordinated by the Canadian Department of Industry, Trade and Commerce.) But look to hardware such as mobile air traffic control towers and to mechanical and electronic systems and assemblies to steal a few scenes, staged inside and outside the Canadian Pavilion, Building E.

Among the 27 Canadian companies represented for instance is Air Vision Industries Inc. of Montreal. This company designs, develops and manufactures air traffic control towers for all types of airports ranging from V/STOL to high activity level airports.

CAE Electronics Ltd. is one of the world's largest and most respected designers and manufacturers of commercial and military flight simulators, with more than 20 years experience in the field. The company builds flight simulators for all three types of large-bodied commercial jet aircraft and there are 11 major air carriers and one aircraft manufacturer now using CAE simulators.

Then there are castings companies — Cercast Inc., Montreal and Haley Industries Limited, Haley Station, Ontario. Cercast is mainly engaged in producing, by the waste-wax process, non-ferrous metal parts primarily intended for the aeronautical and electrical industries, while Haley is one of the major suppliers of castings for the aircraft industry in North America and has been producing sand castings in magnesium and aluminum alloys since 1952.

To take a long jump from castings and illustrate the diversity of the Canadian Exhibit, there is also represented Irvin Industries Canada Limited, Fort Erie, Ontario. Irvin has emerged as a leader in the design, development and manufacture of life support equipment and general aerospace products. These include a complete line of parachutes for emergency escape systems, with zero-zero capability; cargo canopies; deceleration and anti-spin chutes for high performance aircraft; flare chutes and tow targets.

In the area of avionics, names like Marconi, Collins, Computing Devices, Leigh, Litton, Philips, Space Research and Valeriote command attention.

The Avionics Division of Canadian Marconi Company (CMC), Montreal specializes in the design, manufacture, marketing and support of airborne avionics systems for all categories of professional aircraft users. CMC's doppler product line covers the complete spectrum spanning three generations of doppler navigation system growth — tubes, transistors and microcircuitry — as well as the latest techniques in stripline microwave antenna design and gun diode RF sources.

Collins Radio Company of Canada Ltd. is a communications equipment and systems oriented organization. Whether for a single station or a far-flung network, the company is equipped to design, manufacture, install, test and support communications systems in any environment.

Computing Devices of Canada Limited manufactures the position and homing indicator (PHI), a short-range navigational system for military aircraft. Successor to the PHI is the projected map system (PMS) developed for use with both simple and complex avionics systems. Two variants of the PMS are the area navigation system, a fully automatic pictorial display of aircraft routes; and the automatic chart system, a dynamic display of aircraft position as calculated by an area navigation computer.

Since 1961 Leigh Instruments Limited, Carleton Place, Ontario, has been involved in the design, development and manufacture of precision aircraft instrumentation, crash position indicators, flight recorder-locator systems, flight data recorders, cockpit voice recorders, structural loads recorders, aerial delivery systems, pressure-driven and servo-driven instruments. More than 2,500 Leigh systems are now in use in military and commercial aircraft.

Litton Systems (Canada) Limited (LSL) was established in 1960 primarily for the production of military aircraft inertial navigation systems components and expanded rapidly to the production of inertial navigation systems and supporting test equipment. Today's LSL's product lines cover a broad range to include special purpose weapons computer systems; land, sea and airborne tactical data equipment; digital computer-controlled simulation systems for operations training, and much more.

Advanced modular instrument landing systems come from Philips Electronics Industries Ltd., Telecommunications Division, of Scarborough, Ontario. Many of the systems, including CO-SCAN microwave landing systems, are supplied to Canadian airports, marketed internationally and used in airports in many countries.

Space Research Corporation (Quebec) Inc., is a fully integrated research, development, manufacturing and professional services company specializing in ballistics and digital control systems. Through its European subsidiary — SRC International s.a. — and in co-operation with s.a. PRB and Eurometaal, the company has fabrication and marketing capabilities within the European Common Market and an established world-wide network of sales and marketing representatives.

A specialist company, Valeriote Electronics (Guelph) Ltd., Ontario, designs and manufactures antennas for low frequency to ultra high frequency applications on land, sea or in the air. The company's 35-foot (10.6-m) and 80-foot (24.4-m) whip antennas are used for air traffic control and navigation across Canada. These whip antennas are made of high strength epoxy glass in a single section or as many sections as required.

In the propulsion, engines and parts category, the Canadian industry is well represented at the Exhibit by United Aircraft of Canada Limited, Longueuil, Quebec, and Walbar Machine Products of Canada Ltd., Mississauga, Ontario.

United Aircraft is a leader in the development and manufacture of gas turbine engines for the international aviation market. It developed and produces the PT6 series now used in light turboprop aircraft operating in more than 80 countries. A second development, the JT15D turbofan engine, powers new light jet transport aircraft including the Cessna Citation in the United States and the SN-6-1 Corvette from Aerospatiale in France.

Walbar operates three plants where the company designs and manufactures a complete line of components for gas turbine, jet engines and steam turbines, particularly for the aerospace industry.

And when it comes to airframe, components and accessories, Canada boasts such distinguished names as Boeing, Bristol, Fleet, Garrett, Menasco and Spar.

Located adjacent to the Winnipeg International Airport, the new Winnipeg Division plant of Boeing Canada Ltd. is one of the most modern of its type in North America and represents a major capability for the design and manufacture of all types of composite products. The Division produces fibre reinforced plastic components of both sandwich panel and solid laminate construction for high per-

Continued on page 2

And inside . . . **Page**

Speedy harvesting cuts costs . . . . . see page 7

canada courier

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Canada's aerospace industry

formance, close tolerance applications.

Bristol Aerospace Limited is one of Canada's foremost manufacturers for the aerospace industry. Its Black Brant series of research rockets has won world recognition for successful work in space research projects. The company's activities are divided into four main areas: gas turbines; rockets; airframe component manufacture and aircraft overhaul.

Fabricating major aircraft components for Canadian and United States manufacturers, Fleet Manufacturing Limited, of Fort Erie, Ontario, covers a wide range: fin and rudder assemblies; cargo doors; loading ramps; bonded panels; bonded skins; bonded wing panels and trailing edges; flaps and ailerons; aft engine cowling; main landing gear doors and aft dorsal; speed brakes and flaps.

Just as versatile in its own production area is Garrett Manufacturing Limited, Rexdale, Ontario. From Garrett come temperature control systems for many uses; flight instrument test sets; pressure standards for use in any situation that requires precise measurement; mesometerological data measuring and collection systems; micro-electronic devices; emergency locatory beacons; microcomputers and digital trainers.

Menasco Manufacturing of Canada, Ltd., Montreal, designs, develops and manufactures aircraft landing and power flight control systems for prime aircraft manufacturers and provides repair and overhaul, spares support and field service support to operators. Around the world, 85 airlines depend on the reliability and economy of Menasco products.

Spar Aerospace Products Ltd. designs, develops and manufactures communications satellite major subsystems; extendible antennas and structures for ground, air and space applications; aircraft gears, drives and transmissions; remote sensing systems. One of the company's best-known products is its STEM (storable tubular extendible member) devices of which, since 1962, more than 450 have been used in Canadian, American and European satellites and spacecraft.

And when it comes to the aircraft themselves, Canadian companies in the building forefront include Canadair, de Havilland, Saunders and Trident.

At Canadair Limited, Montreal, current production includes the CL-215 amphibious multipurpose and firefighting aircraft; the CL-89 unmanned airborne surveillance drone system; the CL-84 tilt-wing deflected slipstream V/STOL aircraft; under licence, the CF-5 supersonic strike and reconnaissance aircraft; major components for the C5A heavy transport and the F-111 swing wing fighter aircraft. And in the commercial sphere, Canadair is co-producer of the Breguet Dassault Mercure II, 150-passenger short-range jet transport, building major components of the craft.

The de Havilland Aircraft of Canada, Limited, Downsview, Ontario, is mainly concerned in the manufacture of short takeoff and landing aircraft for commercial and military use. These are described in some detail in another article on this page .

Saunders Aircraft Corporation Limited, Gimli, Manitoba, makes the ST-27 commuter airliner designed specifically for the short haul or third level airline industry, while Trident Aircraft Limited of Richmond, British Columbia, is manufacturing the Trigull-320 — a high-performance, single-engine amphibian ideally suited to forestry patrol, ambulance, search and rescue and government transport.

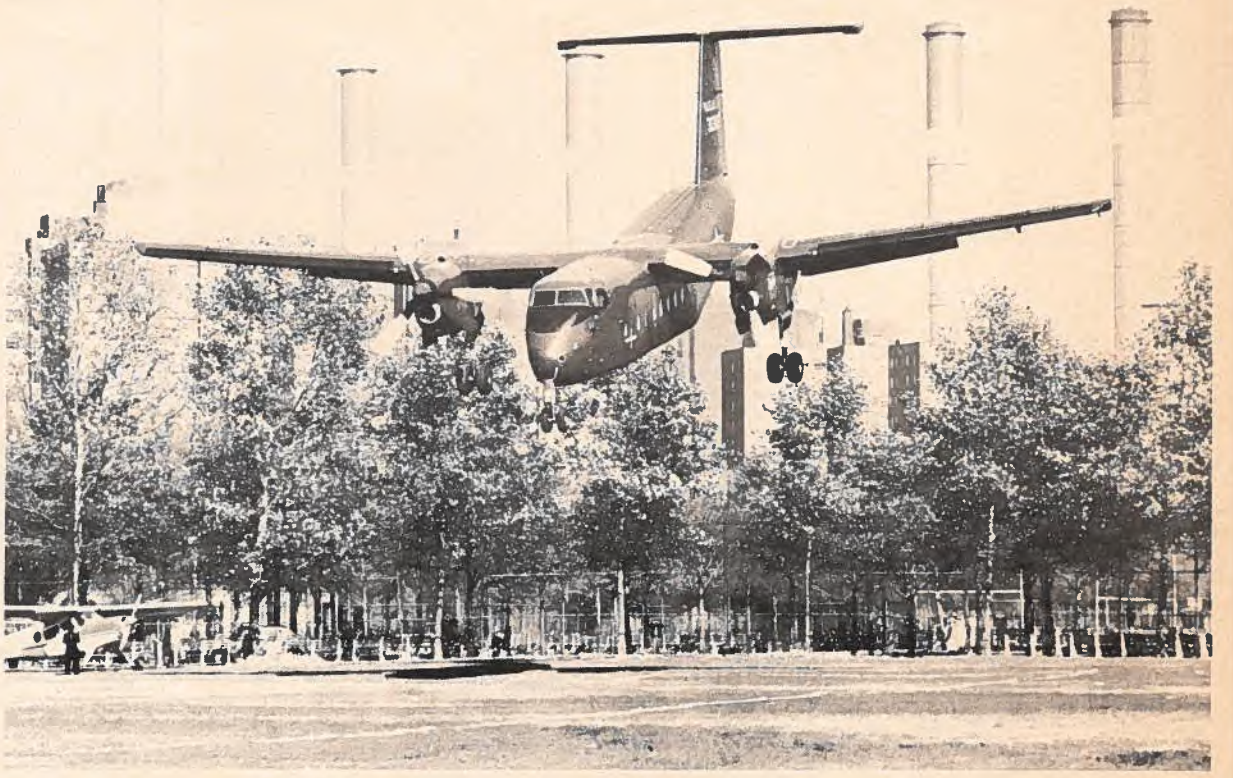
Far from lagging in the Air Cushion Vehicle department, Canada has a full range of amphibious, self-propelled ACV's in the production capabilities of Bell Aerospace Canada, Grand Bend, Ontario. Currently in production is the Voyageur, a highly adaptable flatbed ACV with 25-ton payload, and the Viking, a smaller version with a five-ton payload capability.

Representing Canadian expertise in services to all sectors of the aviation industry is Aviation Planning Services Ltd. (APS) of Montreal. The company has staff specialists in engineering, computer sciences, flight operations, ecology, economics and marketing. In addition to the broad capabilities of APS personnel, the company can draw on the extensive engineering, architectural and planning backgrounds of Acres International Ltd. and Searle, Wilbee and Rowland, both Canadian companies with which APS is affiliated.

All in all, this year's presentation at the Paris Air Show is the most comprehensive and integrated display yet seen from Canada. For further details, fill in the trade inquiry form on page 7, stating specific interests if possible. Code 2-1

Canadian-designed and produced portable air traffic control tower.

Canada — pioneering STOL technology



Cargo liner showing STOL characteristics on landing.

The Canadian government, involved for many years in research in low speed aerodynamics in connection with Canada's bush flying aircraft requirements, has recently bet $63,000,000 that it has the answer to crucial problems at the world's major airports. The government is backing production by The de Havilland Aircraft of Canada Limited of two 48-passenger STOL prototype airplanes, to be ready by 1975.

STOL craft have become a topic of increasing interest to countries with overcrowded airport facilities. Theoretically, STOL services could relieve airport congestion, could greatly reduce construction and land acquisition costs, speed up travelling time between neighboring city centres, expand regular air services to regions that have never had them and give a boost to aircraft manufacturers faced with decreased productivity due to declining defence orders.

Canada pioneered the STOL concept and has produced more Beaver, Otter, Buffalo and Caribou aircraft than all other nations combined so it seems logical for Canada to take the initiative in developing STOL airliners.

On the other hand, Canadian airports aren't nearly as congested as major terminals in the United States, Britain and Japan, countries requiring STOL services more than anyone. But Canada wants to avoid further congestion, improve transportation coverage of its wide geographical area and, with the rate of international air travel increasing at prodigious rates annually, foresees the demand in international passenger service for turbofan jet STOL and vertical takeoff craft. If these needs are to be met, someone has to move now to develop not only a first generation STOL airliner, but also a STOL transportation system.

Canada also wants to retain its considerable lead in STOL technology.

The prototype being developed by The de Havilland Aircraft of Canada Limited is the DHC-7, a high-wing aircraft powered by four United Aircraft of Canada PT6A-50 turbo-prop engines using Hamilton Standard 24PF propellers.

Designed for short-haul trips, DHC-7 can carry a full payload over 450-mile (720 km) ranges taking off from 2,000-foot (609.6 m) runways, and up to 800 miles (1,288 km) using slightly longer airstrips. Conventional airplanes require runways of 6,000 to 10,000 feet (1,829 to 3,048 m).

The DHC-7's main attraction for travellers is its ability to take off and land in busy city centres and designers have concentrated heavily on public reaction to this innovation. The craft is quieter than conventional planes. It is estimated that occupants of buildings will have difficulty detecting it flying overhead at 750 feet (228 metres), and in ascent and descent, the airplane's steeper angles will expose a much smaller area of land to noise. On a mile-to-mile basis, emission of pollutants will be one-half that of the average automobile.

The DHC-7's speed of 300 miles (480 km) an hour is slow by current standards but by eliminating time-consuming trips to outlying air terminals, it will deliver passengers to their destinations faster than more powerful planes. Frequent departures that will eliminate the need for reservations and reduce traffic bottle-necks in and around terminal buildings, are also expected to heighten the DHC-7's appeal.

STOL promises even more important benefits for terminal authorities and carriers, particularly in countries where the public opposes expansion of existing terminal facilities and construction of new airports. Studies show that STOLports capable of handling five to 10 million passengers annually — complete with runway and all necessary buildings and parking lots — can be built on approximately 40 acres, or less than one per cent the area required by jetports.

STOL runways can also be incorporated into existing facilities, thus delaying or eliminating new construction of conventional terminals. The shorter runways do not even require additional land acquisition and STOL's low noise output and steep flight profile permit greater activity without further disturbance to nearby communities.

STOL and conventional craft co-located in the same area would be directed by different control centres, which would increase the terminal's overall capability for handling traffic. This could spell the end to carrier losses in operating efficiency caused by "stacking," or circling the airport for indefinite periods of awaiting clearance to land.

STOL systems could also be a useful tool for regional development. Many airports whose runways are too short for large airplanes could accommodate the smaller STOL, and small communities and developing countries that cannot afford conventional facilities could finance relatively cheaper STOLport infrastructures.

Developers do not, however, claim that STOL will solve all the air transport industry's problems. For one thing, STOL craft will be more expensive than conventional planes to operate, although these costs should be offset by savings in airport construction and overall operational efficiency.

And before STOL airplanes can be placed in service, a whole new transportation system must be devised and tested. Plans for this are already underway.

In the fall of 1973, a STOL passenger program will be introduced between Ottawa, Canada's capital, and Montreal, its largest city, approximately 100 miles (160 km) distant. In addition to a good volume of passenger traffic — 100,000 to 150,000 a year — this route offers stiff competition to road, rail and conventional air transport services.

The program will involve a systems approach embracing all aspects of an operational STOL network, from navigational aids to STOLports, connecting intermodal services, and the reactions of the public.

Six 11-seat Twin Otters are scheduled to make 22 round trips a day and standby aircraft will be available at each STOLport in case of over-loads or unserviceability of scheduled craft. Operating under federal air regulations, the airplanes will be equipped with wing spoilers, high capacity anti-skid brakes and propeller discing, a sophisticated avionics system including area navigational systems, weather radar, dual flight directors and flight data collection systems as well as standard avionics.

STOLports will demand terminal buildings, portable control towers, service buildings and runways with specially designed lighting, microwave landing systems and a new visual glide slope indicator.

While these facilities may seem excessive for the estimated passenger traffic, Canada's intent is to learn as much as possible from the program so that it will have not only a new aircraft to offer the world but also a completely defined system for its operation.

The experience derived from the STOL demonstration service will be applied directly to the prototype development certification of the DHC-7 program and marketing activities. It is anticipated that 150 DHC-7's could be in service by 1980 and eventually, up to 500 Canadian STOL aircraft could be flying on the world's regional and commuter air lanes. Code 2-2

Class progress evaluated on-the-spot

An instruction aid that gives the instructor a rapid on-the-spot evaluation of each student's comprehension of each step of a lesson is being marketed by E.D.A. Electronics Ltd. of Ottawa, Ontario. An instructor, in many cases, will depend on a quick written test at the end of a lesson to judge the success of his presentation and the understanding of the students as a group and as individuals. Probably it will be evening before he can go over these written tests, and if he is not satisfied with the results he may have to repeat all or part of the lesson the next day.

But, if he uses the multiple answer question method with an E.D.A. Seminar Training System, he can see in a moment where repeated or extra explanation is necessary, and he can spot the students who need extra help. At the same time, this closed loop system maintains complete privacy between student and instructor.

This is how it works. The instructor proceeds in the usual manner, discussing a point, performing a demonstration, presenting an idea (perhaps using a slide projector). He then gives the students a choice of four or five possible answers and a certain time to respond. When that time is almost up he depresses the display answer button on his console and an audio tone begins. This tone lasts for about three seconds and warns the students that it is their last chance to answer. When the warning tone ends, the yes or no lamp lights up on the individual responders to tell the student whether or not he selected the correct answer. At this point the responders become inactive so that the student cannot change his choice, and they remain so until the instructor presses the master reset button on his console. When the student presses one of the five different coloured buttons a corresponding coloured lamp lights up on his responder and on the instructor's console. The instructor can see at a glance which and how many of the students have the correct answer.

This equipment is particularly suited to technical training courses for employees in such fields as meteorology and aeronautics, and in the use and repair of specialized equipment. The E.D.A. system is now being used by the Canadian Ministry of Transport.

A special feature of the system is its ability to be directly coupled to a standard teletype. By pressing the print button on the console, the instructor can obtain a complete record of the results of the lesson. The tedious recording of attendance and correcting of papers is eliminated. Alternatively, the results can be fed directly into a computer, providing an analysis of each student's progress and special needs and an evaluation of the teaching method. E.D.A. Electronics can arrange for the supply of the teletype with the training system and also a suitable computer, if the customer wishes, and would supervise the complete installation.

The equipment consists of an instructor's console and a maximum of 32 individual student responder units. Fewer than 32 responders can be used, but for economical operation the minimum is eight. Each responder has its own logic and its individual identity. This means mobility — individual responders can be repositioned in a classroom, removed, or added. The student selects the answer he considers correct on one of five push buttons lettered A to E (the fifth could be used to indicate that the question is not understood) and a corresponding light goes on. The responder button returns to position immediately and the student can change his selection as often as he wishes during the time allotted by the instructor.

The responder unit is 4½ inches (114.3mm) wide by 7 inches (177.8mm) long and one inch (25.4mm) deep and weighs about one pound (.454 kg). The units come complete with all hardware necessary to mount them vertically at the side of a desk. Indicating lamps are recessed to ensure that they are visible only to the student concerned.

On the instructor's console, 32 sets of five student response lamps numbered 1 to 32 are grouped in four rows of eight, simulating a standard classroom layout four desks wide and eight desks deep. Five A to E push buttons, each with indicator lamp, correspond to those on the student responders. The instructor can insert manually a five digit question number using a thumbwheel switch in the front panel. The other controls are a display, a print and a master reset button. The console is a desk-mounted type, 22 inches (558.8mm) wide by 15 inches (381mm) long and 9 inches (228.6mm) deep, and weighs about 20 pounds (9.080kg). An outlet can be provided to permit a slide projector to be operated directly from the console. Transparent overlays can be inserted easily over the console to provide a seating chart of the class.

All cables used in the equipment are less than one half inch in diameter. Interconnection of both the instructor console and the student responder units is serial in format. For ease of physical layout the instructor console can accept four cables in parallel — all the responder units may be connected as a single chain to one output in the console, or in four chains of eight to all four console outputs. The system requires 115 vac 60 cps (alternatively, if specified, 220 vac 50 cps). The single power input to the console is adequately fused and protected; the system cables carry no voltage in excess of 28 vdc. The system does not produce any RF or audio interference outside the classroom in which it is installed.

Code 3-1

Canadian designed and made, this electronic instruction aid gives rapid visual record of student response to multiple answer questions and can be coupled with teletype and computer for a permanent record. E.D.A. Electronics Limited is the developer and manufacturer.

Freshening air, reducing bacteria

A leading Canadian manufacturer and distributor of sanitary supply products, G. H. Wood and Company Limited, Toronto, Ontario, now is acquiring a world market, most notably for its air sanitizers and its Doctor Brook "Life-Saving" Airway for resuscitation.

The air sanitizers, called Ozium (a glycolized air sanitizing spray), are seen by the company as one means of answering the world's growing demand for better health and environmental conditions.

Designed to freshen and sanitize the air, remove smoke, odours, staleness and reduce airborne bacteria, the sanitizers can be used wherever odour control and freshened air is desired.

The hand-held Ozium dispensers are in sizes 500, 1500 and 2000. (The figures indicate the number of individual measured sprays in each dispenser.) There are also automatic dispensers.

For instance, the Ozimatic (1500) Automatic Dispenser, transistorized and powered by two standard flashlight batteries, dispenses Ozium every 30 minutes around the clock, completely removing smoke, unpleasant odours and reducing airborne bacteria.

Another dispenser, La Ronde, which also provides continual around-the-clock air freshening, resembles a wall thermostat and is made of stainless steel. Its dial control, which regulates the air freshener, can be set to a required position for more economical use in smaller areas, such as washrooms and elevators. The dispensers are shipped in sets containing a varying number of refills.

Another G. H. Wood and Company product, the Doctor Brook "Life-Saving" Airway, is designed for resuscitation without personal contact. Its patented built-in by-pass non-return valve prevents the patient's breath from returning to the rescuer.

Sanitary, safe and easy to clean, the airway can be used by anyone and is a valuable asset to have on hand wherever people work or congregate or wherever accidents requiring resuscitation are apt to occur.

The company now is selling these sanitary supply products in East Asia, Britain and all the European Common Market countries, the Caribbean countries, South Africa, Kenya, Mozambique and Nigeria, and is ready to sell to other countries.

Code 3-2

A product of G. H. Wood and Company Limited, this Ozium air sanitizer freshens and sanitizes the air, removes smoke, staleness and reduces airborne bacteria. Other dispensers in decorative wall containers automatically dispense Ozium for around-the-clock air freshening.

No kicks about this bucket

A light-weight container for a heavy load is what it's all about and M & B Magnesium Products Limited, Weston, Ontario, has the answer. The company's magnesium buckets for hoisting concrete are light, strong, clean and can be moved manually when empty.

Magnesium buckets give a cost saving on every concrete pour. Their immunity to alkalis guarantees a long life and concrete does not adhere to them. This eliminates the gradual reduction of their loading capacity and avoids the build up of extra "dead weight."

The buckets are available in six models according to capacity, volume, loading height, weight, etc. Loading from the concrete mix truck is made easier by the bucket height. For instance, the largest model has a loading height of 60 inches (1,524mm) and the smallest model has one of 38 inches (965.2mm).

There is no danger of accidental discharge because the bucket's gate cannot open unless the operator moves the handle. The 20-inch (508-mm) diameter opening permits fast discharge and the operator can control the flow from a trickle to a dump.

These magnesium buckets are lap-welded for added strength. Yet they are so light that when empty they can be moved manually from place to place. The heaviest model weighs 335 pounds (125.1kg); the lightest is 165 pounds (74.9kg).

M & B Magnesium Products Limited is interested in acquiring an international market and reports that magnesium buckets have been accepted by most contractors in North America.

Code 3-3

Plan with Plantel— versatile consultant company

Telecommunications consultants, Plantel Company Limited, Montreal, provides consulting services to the telecommunications industry, corporations, governments, architects and other consultants.

Organized in 1970, this multi-faceted company provides a complete service for such diverse requirements as electronic, electrical, acoustical, mechanical and architectural expertise.

One of Plantel's larger involvements is in the telephone field where about 80 per cent of its activity is in the engineering of outside plant and switching equipment. Studies in the telephone field also involve radio systems layout, noise objectives for long and short haul transmission for voice and data communications, and electrical co-ordination between telephone and power utilities.

For corporations and governments Plantel supplies a complete consulting service on such systems as radio, television, audio-visual, data, intercom, telemetering and telecontrols.

Consulting services for telecommunications users involves reviews of existing arrangements, planning to meet future requirements, recommendations on the optimum choice of service offerings, facilities and network configurations; as well as direction and co-ordination during the implementation phase of an undertaking.

Plantel Company Limited also provides advisory consultation services to architects, management consultants, engineering firms and individual consultants where these do not have sufficient expertise in-house.

This Montreal company, already working with a number of telephone companies in Canada and with Telecommunications D'Haiti, is interested in further expansion overseas.

Code 3-4

Packaging machinery can make you a bundle

Canadian specialists produce competitive-priced equipment

Since packaging is used in one form or other in practically every industry today (major users being the food, chemical, textiles, pharmaceutical, tobacco and beverage industries) Canadian manufacturers of packaging equipment have realized that they cannot satisfy needs for such great diversity of machinery and have tended to specialize in a limited range of equipment. In doing so they have become internationally competitive in the type that they make.

Bottle labelling machinery is manufactured in Scarborough, Ontario by Phin Universal, Division of Canadian Stackpole Ltd. This company has orders for machinery in numerous countries including Japan, Spain, Thailand, Mexico, Scotland, the U.S.A. Phin has developed continuous motion, labelling and strip stamping machinery which can apply all types of labels to nearly any type of containers' material and shape, including plastics. A recent Phin development is capable of labelling from 400 to 800 bottles per minute. Testing this equipment has been successfully completed on beer bottles in a Toronto brewery.

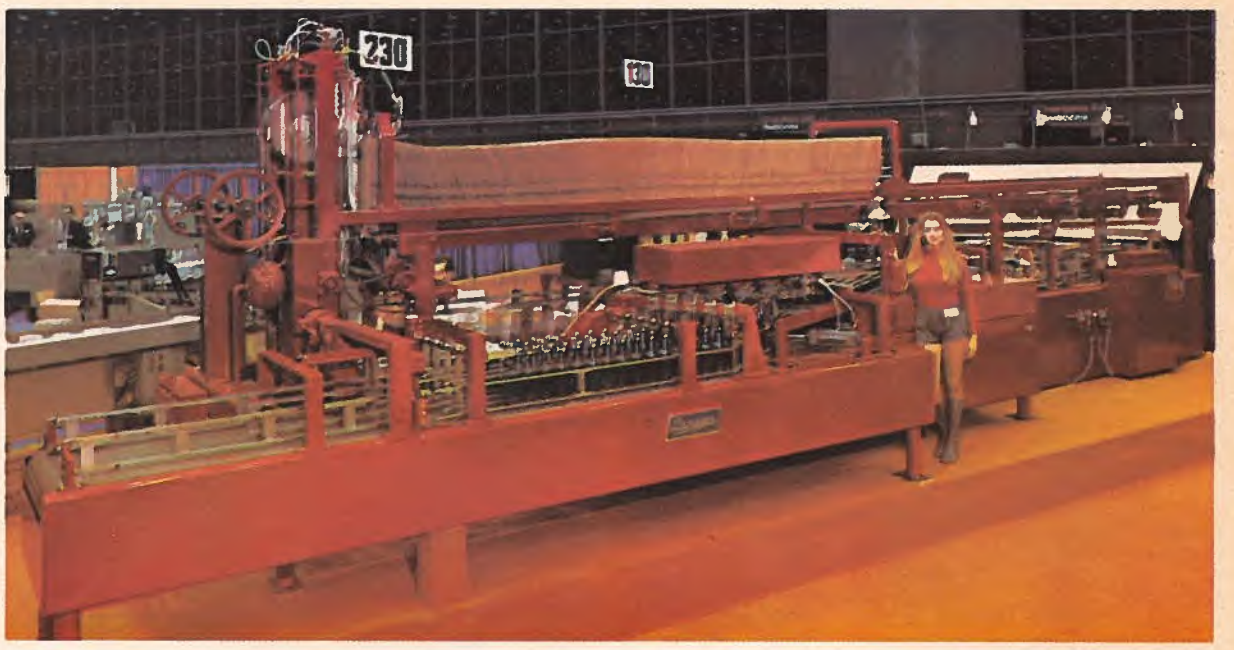
Another manufacturer of high speed equipment is H. J. Langen & Sons Ltd. of Rexdale, Ontario, which manufactures sophisticated high speed cartoners and packers, and also low cost cartoners capable of handling a wide range of items. Products that have been successfully cartoned by Langen machines include frozen pies, band aids and other sanitary goods, bottles, toys, scouring pads, and fruit. One of the higher speed units manufactured by Langen is an end-load bottle and can packer which can process up to 1600 units per minute.

General Plastics Co. Ltd. of Cookshire, Quebec, has invented the "Genpak" fish packaging system which packages 10 or 20 pounds (4.5 or 9.1 kg.) of fresh fish fillets into a tray with a heat-sealed polyethylene membrane cover. Eighty pounds of trays can be packed in a master carton to provide drip and odor-free shipping, and a marked increase in length of product freshness. The containers can also be used to package flowers, fluids, hardware, industrial components and bulk convenience foods. A heat sealing machine is offered as part of the "Genpak" system.

In the portion packaging sector, Portion Packaging Ltd. of Rexdale, Ontario, has developed a cream portion filling machine to complement their styrene creamer cup and aluminum closure manufacturing. These machines are available in a number of models that can fill up to 5 cups simultaneously with filling speeds up to 400 cups per minute. This company also manufactures a small condiment machine for filling jams, jellies, mustard, salad dressings, etc.

A new industrial strapping material has been developed by the Caristrap Corporation of Chomedey, Quebec, which has greater tensile strength than equivalent width steel at a lower price and weight. This material is non-metallic and therefore no sharp edges arise to endanger employees or damage merchandise. The material will not mar, is impervious to all weather conditions, and does not support combustion. In addition to the strapping material, Caristrap can supply the tensioning and sealing tools, seals, buckles and accessories to provide the user with a complete strapping system.

Canadian manufacturers can also supply a wide range of custom designed equipment. A typical example is a high speed ribbon tying machine which was developed by the Longueuil, Quebec company, Advanced Dynamics Corp. Ltd. for a whisky bottling line. The decorative ribbons can be applied at a rate of up to 300 bottles per minute.



H. J. Langen & Sons Ltd. makes packaging machinery of all kinds. The BP-1 model is used by the brewery and soft-drink industries.

Although high speed, large capacity, fillers are not now available from Canadian sources, H. G. Kalish Co. Ltd. of Montreal manufactures piston and pump fillers capable of filling viscous liquids, creams, cosmetics and pharmaceuticals, etc., in various speeds and capacities, with consistent accuracies up to 0.1 per cent. These versatile machines can be rapidly changed to adapt to different bottle shapes and sizes. The latest development by Kalish is a Pump-A-Filler which has been designed for filling chunky products such as beef stew and chicken-a-la-king.

Michael Shulman Associates Ltd. has developed low cost pallet shrink equipment under the trade name "Infra Pak". Using a controlled emission infrared energy source, only the film is heated — resulting in no wasted energy. The Infra Pak unit is available from this Downsview, Ontario company in portable models, in various sizes, and can be used in extreme ambient conditions including temperature of —60°F (—51c) below zero. Pallets can be tightly shrink-wrapped in less than one minute.

For further information, fill in the trade inquiry form on page 7, stating specific interests if possible.
Code 4-1

Cost and labour saver for food packers

The cost-cutting, labour-saving Wraparound, capable of producing 2,000 finished cases per hour using only one man, is an attractive investment for high volume food producers. Pyramid Machine Works Ltd., Surrey, British Columbia, has designed and patented a case loader and sealer that meets all today's demands for high-speed fully-automated packing — it takes over the individual functions of counting, collating, setting up the corrugated container and loading and sealing it.

The company has named its machine the Wraparound because it uses a flat scored and slotted sheet of corrugated board that is formed around the product, rather than the more expensive conventional preformed corrugated box.

Fast changeover and flexibility is a plus feature of the Pyramid packer. Separate infeed tables and separate can hoppers are eliminated. Time and labour involved in disconnect, removal, replacement, reconnect and new size synchronization is reduced to a fraction of that required by other systems.

Pyramid's double-tier standard model can be changed to single-tier for the same size of can by one man in five minutes. A simple switch on the solid state control blanks out the circuitry controlling the upper level infeed table. Adjustment of the carton hopper to suit the new size of corrugated blank and relocation of the glue guns is all that is needed to effect the change to single tier.

Complete change, size to size or pattern to pattern, takes one man no longer than 30 minutes with simple and easy manipulation of locking pins and handwheels.

Looking ahead to future needs is a Pyramid policy. Now in the final stages of completion is a sophisticated fully-automated wraparound packer that packs food products into a decorative shelf tray that is subsequently covered with plastic film to form a solid, sturdy transparent shrink package, specifically designed to speed up and simplify shelf stocking in retail groceries.
Code 4-2

How the tea gets into the bag—by D & W

Bagged, tagged, gusseted, overwrapped and packed — tea gets the full treatment automatically from the Rotorex 401 manufactured by Delamere & Williams Company, Ltd. of Toronto, Ontario. D&W created the first continuous motion machine for processing sewn gauze bags early in the 1930's and developed its 300 model to produce heat sealable paper bags in 1946. Now comes the 401, designed to form, fill and seal at speeds of 450 or more tea bags per minute. The machine can be equipped to produce tagged or untagged, plain or gusseted bags. It can also package other products — instant tea, sugar, crystal materials, etc.

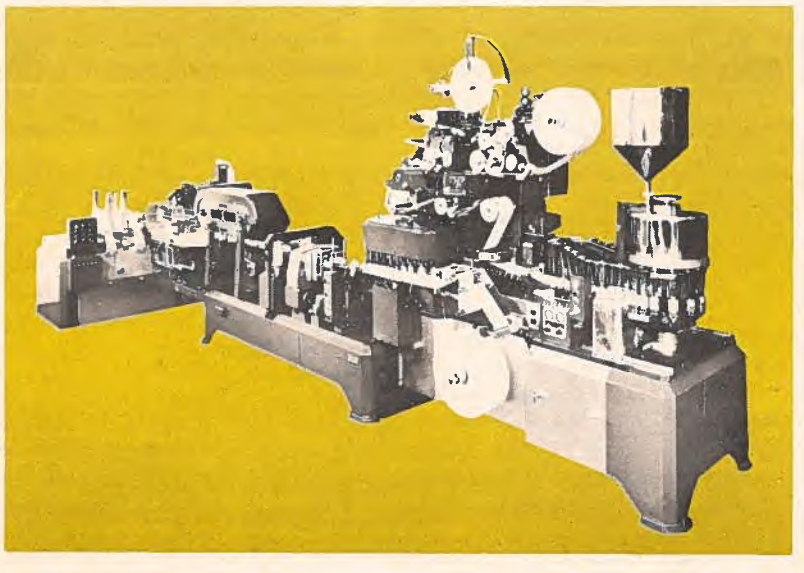
The Rotorex can handle packet sizes between 2¼ (57mm) and 2¾ (70mm) inches high with a fixed width of 2⅛ inches (56mm). Single-web feed of heat sealing material is from a roll 15 (381mm) to 24 (609mm) inches in diameter with 3 inch (76mm) I.D. core. The filled and sealed bags are automatically removed and placed for the manual, semi-automatic or completely automatic packaging operation.

Two types of automatic cartoners, capable of processing completed tea bags with or without envelope overwrap, are available. Cartoner No. 1 sets up cartons from flat (side seam glued), stacked and fed from the carton magazine, collates, counts and loads bags vertically into the carton in two rows, applies adhesive (hot melt), closes and delivers the carton to the take-away conveyor. Cartoner No. 2 works from already set-up, open-top loading cartons, counts and loads bags horizontally in one, two or more rows, closes and delivers the carton to the take-away conveyor.

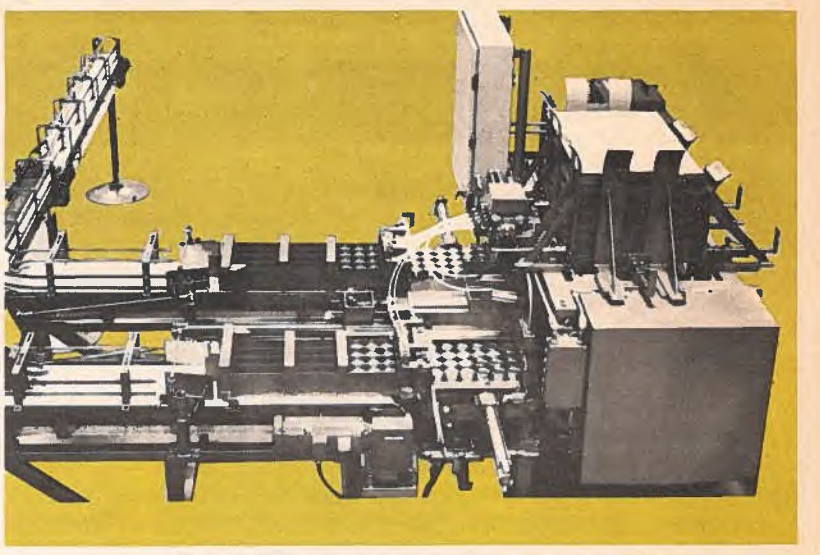
D&W can supply a gusseting attachment to reduce the height of the tea bags so that they can be overwrapped in a sanitary envelope (or for any other reason). The overwrap attachment is fed with the wrapper paper from roll stock and the ends of the wrapper are heat-sealed in plain or embossed designs. The unit will take random pattern prints or paper with positive panel design, requiring electric eye panel registration.

Staples are eliminated with the Sealstrip tagging unit. The tags and tape are fastened to the tea bag paper. One end of the tape is sealed to the tag, the other end is folded and tacked over the edge of the paper to achieve wraparound on the completed bag. Then the paper with tag and tape is fed into the Rotorex for filling.

Delamere & Williams also manufactures pouch machines, liquid and volumetric fillers, and a variety of cartoners.
Code 4-3



The complete Rotorex unit from Delamare & Williams — it bags, tags and packs.

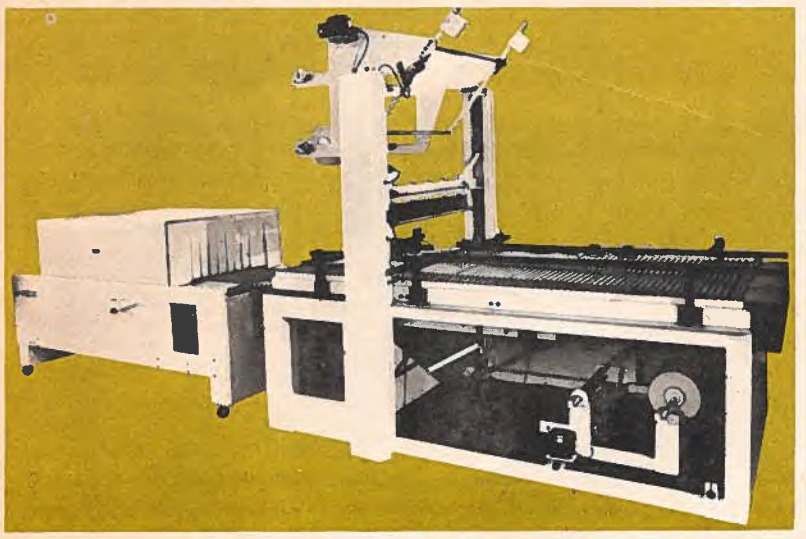


Pyramid's double-tier standard model Wraparound can be changed to single-tier by one man in five minutes.

Disposable container equipment

Fibracan Inc. of Chomedey, Quebec, designs and builds a complete range of equipment for the manufacture of disposable cups and containers — production, printing, automation and packaging machinery. This Canadian company started operations about eight years ago producing a full range of disposable paper and polystyrene foam cups and containers ranging in size from one half ounce (4 drams) to 32 ounces (256 drams). This side of Fibracan's operation continues and its containers sell all over the United States, Canada and the Caribbean, and to the Middle East. On the machinery side, Fibracan undertakes joint venture turnkey projects and two are now under construction. The company is highly interested in making more of these arrangements in various parts of the world, supplying machinery and technology as well as marketing and management expertise.
Code 4-4

Versatile automatic shrink wrapper



Ideal's automatic sleevewrapper and air flow shrink tunnel saves material and warehouse space and produces a package preferred by supermarkets.

A laundry and a printing company are two of the satisfied customers that Ideal Equipment Company Limited has been serving since 1936. The company, with head office and manufacturing facilities in Montreal, does all its own designing and manufacturing, and claims trouble-free operation with the minimum of maintenance for upwards of 15 years. Ideal's shrink-wrapping equipment saved time and money for the laundry and won compliments from customers. The printing house used the machines to package stationery for retail and bundles of publications.

Ideal has developed a fully automatic sleevewrapper, Model 505, that can be adjusted to the customer's specifications for both speed and package size. Automatically propelled into the web of film in the sleevewrapper, the package carries the film with it and covers itself. The sealing bar descends behind the package, sealing the film and cutting the package off from the web. The sides of the package are left open as it moves on into the Ideal Shrink Tunnel, which produces a skin tight package ready for shipping.

For those who need a completely sealed package, Ideal has developed side sealing equipment that, added to the sleevewrapper, delivers a fully sealed package to the shrink tunnel.

The Air Flow Shrink Tunnel, Ideal's Model 1520, produces skin tight packages with no unsightly dog ears. It will handle all shrink films — P.V.C., polypropylene, polyolofin, polyethylene, etc. Four variable controls provide heat where it is needed to ensure proper shrink on all shapes and sizes of packages. The shrink tunnel can handle parcels that have been sealed by the company's L-Bar Sealer, Sleevewrapper or Bundler.

As well as shrink wrapping equipment (automatic or manual), Ideal Equipment manufactures bagging and boxing and tray equipment. Code 5-1

Heat-shrink packaging and sealing machine

A basic design that carries through from one model to another with little change — manual to semi- to fully-automatic — makes Wrap-O-Matic equipment an appealing proposition. The company's machines are being manufactured under licence by a British firm which sells to the Scandinavian and South African markets. Arrangements for manufacture in Germany are expected to be completed soon following the visit to Canada of a group of German businessmen.

From its Canadian plant in Scarborough, Ontario, Wrap-O-Matic Machinery Company Limited is shipping equipment to the United States, Jamaica, Japan, the Philippines and Thailand.

This company produces a line of L type sealers. The Model LEC series has an electro-magnetic sealer bar assembly that locks in while applying pressure to the sealer bed area without the operator's assistance. Fast and simple to operate without air line services, it is necessary only to lower the sealer bar until the micro switch energizes. The LPC Model features pneumatic controls, with a mounted dual switching panel and reversing controls for safety. Timer controls for conveyor discharge and burn-off and heat controls are also panel mounted. Both models permit a height variation of five inches (127mm), allowing for ten-inch (254-mm) package height. The uni-body construction uses formed heavy gauge metal. A manual model is also available.

Wrap-O-Matic's semi-automatic sleeve wrapping machine (Model-PMXF) can handle up to 15 packages a minute. The wide band impulse sealing system is temperature-controlled to provide best sealing results. Trimming is by separate hot wire cut off. The machine is equipped with a disc brake assembly for positive film feed and tension control, and the solid state circuitry requires no maintenance. Pneumatic safety controls and a gravity discharge conveyor to the heat tunnel are standard equipment. Because of modular design, an automatic right angle or inline feed can be connected directly to the basic unit.

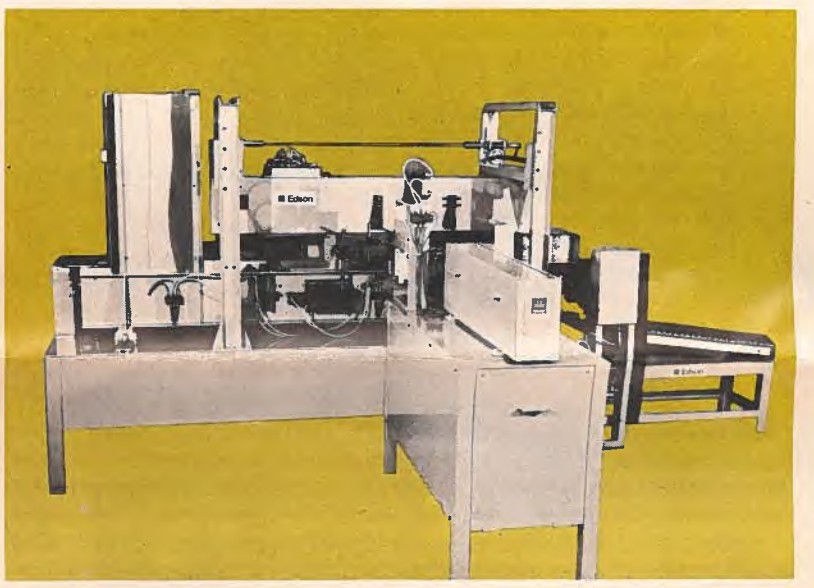
For high speed requirements, the company produces an automatic sleeve wrapping machine with speeds of up to 40 packages a minute. Model ASW uses a reciprocating sealing system that travels with the package and heat-seals during the time-consuming impulse. While the sealing head is returning the next pack enters the sealing conveyor. Separating the conveyors prevents jam-ups in the sealing head area. Code 5-2

You name it, they can pack it

Emphasizing equipment for packing in corrugated cases, Edson Packaging Machinery Limited, Hamilton, Ontario, has developed machinery with many unique features. The versatility of the company's automatic or semi-automatic case opening, packing and sealing systems has been demonstrated with large rolls of wallpaper, trays of biscuits, cartons of all shapes and sizes, oblong cans and cans with bails, soft tissue products, stacks of floor tile, gable-top milk cartons and foil-wrapped film.

Edson's flexible equipment can be adjusted to custom requirements — very large or very small corrugated cases, unusual shapes and sizes of packages. The company recently developed a bottom load case packer for aerosol cans. This unit packs cans from the bottom up and offers many advantages. The machine is being adapted to handle such products as poly-wrapped trays of biscuits.

Now selling to the United States, Britain, the Netherlands and Australia, Edson is planning to expand its sales in these markets and to establish sales representation or licensing agreements in Europe and Asia. Code 5-3



Quarts and gallons of paint are packed into corrugated cases by the Edson case opener-packer.

Smooth and easy operation

Arpeco Engineering Limited, Weston, Ontario, has a special interest in developing equipment for the paper film and foil converter industry. The company's inspection slitter/rewinder, the Tracker, has several special features that make it exceptionally easy to operate, even by inexperienced personnel.

Web inspection is made in the same general area as slitting/rewinding and when the operator detects a web fault he has time to stop the faulty web at the splicing station. This means that he does not have to reverse the machine to retrieve defective material and therefore avoids slit side-register problems and has only one web to splice.

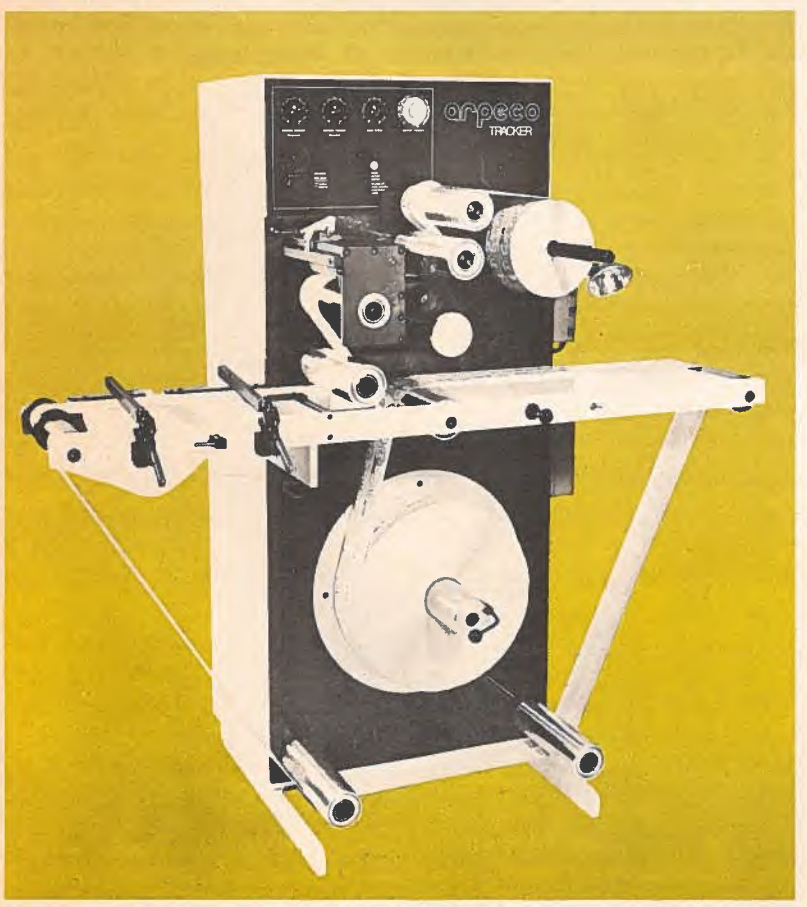
The machine is normally run with very low unwind tension which allows the processing of a roll which has not been properly wound (with respect to wrap tension and/or edge runout). When the machine is told to stop, the inertia of the unwind roll would tend to keep it unwinding. This is overcome by increasing the unwind brake power automatically on a stop command.

Unwind and rewind tensions are separated by the draw roll system. This allows the operator to apply the desired rewind tension to finished rolls without regard to looseness of the unwind roll.

One count on the four-digit predetermining electric counter represents 10 inches of web through the draw system. When the preset count is reached, the machine is told to stop automatically.

The standard Tracker model is equipped with a one-horsepower direct current drive system. The drive controller is equipped with variable acceleration and deceleration rate adjustment for smooth web speed changes during production conditions. All control components are easily accessible. The speed and sequencing control design is such that any qualified electrician can handle maintenance. Readily available, deep groove, prelubricated and shielded ball bearings are used throughout. The strength of support members and the absence of bronze bearings increase the Tracker's mechanical life significantly.

Arpeco can meet a customer's special requirements. Modified systems have been produced to include double (duplex) rewinding shafts, automatic web threading, automatic hole detection, tension contour followers, web splice detection, web break detection, and a razor slitting attachment. Code 5-4



All control components are easily accessible on the Arpeco inspection slitter/rewinder.

Case stapler fluidically controlled

A new fluidically controlled case stapling machine that can be set up in less than ten seconds by pushing two buttons has been developed by Price and Knott Manufacturing Co. Limited of West Hill, Ontario. Running at speeds of 25 cases per minute with 18-inch (457.2-mm) long cases, the machine closes the top flaps in correct sequence and clinches the required number of staples in the top and bottom to complete the case. Switching size is a push button operation also — no parts need be changed.

Price and Knott have designed a machine that can be understood and serviced by people who are not familiar with it: all functions are obvious and clearly labelled, components and circuitry are easily checked. The solid state air logic controls contain no moving parts. Air motor drives that resist abuse, a roller conveyer bed that eliminates chain and flight problems, a rugged frame and modular components are features of a machine designed for years of continuous service.

Flexibility is built in. The machine senses each end of the case and places the staples relative to the ends, therefore it will run short and long cases intermixed as a single size, providing other dimensions do not vary. If more than four staples are required another sensing device is added. Stapling can be restricted to the top only or the bottom only with the flick of a switch.

Variations can be built in at the factory to permit two or three rows of staples to be run side by side, or the top to be glued and the bottom stapled. One model of the Price & Knott machine can staple the sides of telescopic containers, stapling at fixed or at random heights. Case dimensions and weights can be expanded to handle large appliances, such as stoves, and all of the minimums can be reduced.

This Canadian designed and built machine is available in three models: a push button preset for running one size at a time, a binary preset for two intermixed sizes, and an automatic preset for all random sizes within the range of the machine. Code 5-5

Canadian woodenware and the beautiful life

Look closely at this delectable scene — Canada is there, represented by more than 12 of the wide range of salad bowls produced by Baribeau & Son Inc. of Levis, Quebec. Les Sherpas hotel in Courcheval, France, chose distinctive Baribocraft woodenware for meal service on its solarium terrace.

Salad bowls, all sizes, are one of the principal lines produced by this 50-year-old family firm which has been exporting since the 1940's. The bowls are available in several designs and in sizes that range from single servings to 60 servings; for the larger bowls, Baribeau makes a wood tripod stand. Sets of bowls are protected by an exclusive and lasting finish that makes them impervious to water, food acids, vinegar, soaps and detergents. Salad servers, salts and peppers — including grinders for both salt and pepper — complement the salad bowls.

A family of candle holders is Baribeau's newest line — some 14 designs from 2½ to 14 inches (63.5mm to 355.6mm) tall and suited to several sizes of candles.

Cheese boards are another Baribocraft specialty, some plain, others with a cleft slate cutting area and depressions to hold crackers. All come equipped with cheese knives. The company also makes carving boards and steak platters, and accessories such as ice buckets with removable vinyl lining, two and three tier tidbit trays, cake or candy plates with brass plated handles, bread servers, and ball bearing lazy susans with ceramic sectioned serving dishes.

Moving from the dining room to the kitchen, Baribeau's second line, Baribo-Maid, includes a variety of chopping, cutting and pastry boards, meat tenderizers, rolling pins and mixing spoons, toothpicks and clothespins. A new line of cutting boards, ideal for restaurants, hotels and institutions, has waterproof glued joints to prevent splitting and cork feet to prevent slipping.

Baribeau also makes wood coat hangers in a full range of sizes and shapes.

The Canadian hardwoods Baribeau uses include yellow and white birch, ash, maple and basswood. A number of different finishes are available: natural; Canadiana, a dark colour between walnut and mahogany; Colonial, for which great care is taken to preserve the natural markings in the wood. The colour of this finish is slightly darker than natural. Code 6-1

Crane carriers, custom-designed

Three of Consolidated Dynamics transit crane chassis. Left to right, model 12615 (total weight lifting capacity 150 tons), 12625 (250 tons), and 10665 (65 tons).

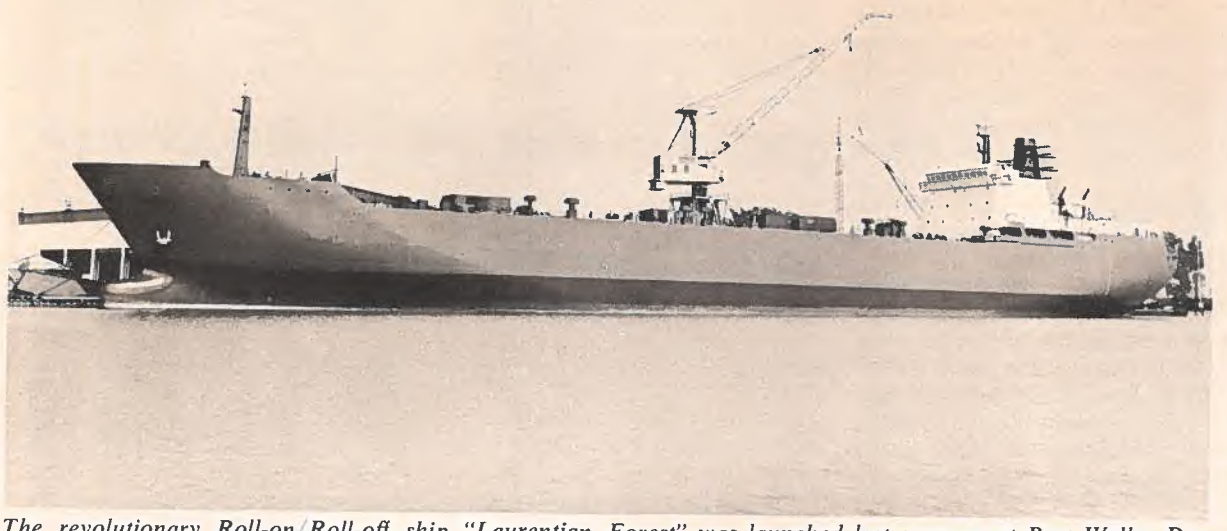
The problem with cranes is getting them there. It's a problem because their weight and size must meet road regulations, and those regulations vary from country to country. And when they arrive at the construction site, the docks, the gravel pit or wherever, they need a secure and flexible anchorage for safety and mobility.

The solution to these problems is available from Consolidated Dynamics Limited of Buttonville, Ontario. This company designs, develops and manufactures transit crane chassis and exports 90 per cent of its production. Consolidated attributes its success to the fact that its multi-axle chassis with a maximum over-all width of three metres meets the strict road regulations in most countries.

The company's carrier designs range from 18 to 300 metric ton lifting capacity with 8 x 4, 10 x 6 or 12 x 6 drive axle configuration which is easier on roads and on tires. Consolidated works closely with the crane manufacturers and the company's transit chassis are designed to meet the special needs of each type of crane. Its 12615 model, for instance, has 18 tires, 12 of which are driving and six non-driving but steering, and a capacity of 120 metric tons at 75 per cent stability.

The cranes are welded to the carrier on a swing circle or ring gear. The low profile design of the two-man cabin makes it easier to enter and provides good visibility. It is fitted with a safety glass windshield and sliding side windows. Built-in shock absorbers are another feature. Front and rear fenders are designed to form continuous non-skid walkways. Some of Consolidated's models are offered with one-man cabins, all can be converted to right hand drive. For full specification details of all models, check and mail in the trade inquiry box on page 7. Code 6-3

Roll-on, roll-off concept for new Canadian cargo ship



The revolutionary Roll-on/Roll-off ship "Laurentian Forest" was launched last summer at Port Weller Drydocks and underwent intensive trials on Lake Ontario.

The first of two new Ice Class I Roll-on/Roll-off cargo ships, the 20,000-ton "Laurentian Forest," was christened last August at Port Weller Drydocks Limited in St. Catharines, Ontario, where she was built. Her sister ship, "Avon Forest," is now being built for delivery in mid-1973.

"Laurentian Forest" is the first ship specially built to carry newsprint, forest products and other unitized general cargo from St. Lawrence River ports of Eastern Canada to the Port of Bristol, England, returning with British and European automobiles to Montreal. Built for The Burnett Steamship Company Limited of Newcastle-upon-Tyne, England (a subsidiary of Federal Commerce and Navigation Company Limited, Montreal), she was designed by Knud E. Hansen I.S. of Copenhagen and completed in record time by Port Weller Drydocks. With the exception of the main engines, reduction gears, ramping system and certain auxiliaries, most materials for the ships' construction, including steel, electrical equipment, auxiliary machinery and fittings were provided by Canadian manufacturers.

These Ro/Ro ships use their own straddle carriers (large tractors which pick up 12 tons of cargo at a time) to carry newsprint from the shore warehouses through the large hydraulically-operated doors in the side of the ship, over a system of ramps, and into the holds where the newsprint or other cargo is stowed with the use of elevators and camp-trucks. Automatic sensors built into the ramps cause them to adjust automatically to the rise and fall of the tide. This method gives much faster loading rates than that of conventional ships.

For the return trip carrying cars, four cardecks are lowered from the deck heads making the ship a huge floating garage for more than 2,000 automobiles which are driven right into their parking places on board. Apart from speeding up the loading and discharging, this system prevents most of the scrapes and dents which cars usually suffer during shipping. All cargo is carried below deck.

The sister ships have a length overall of 683 feet (208.2m), breadth of 75 feet (22.9m), depth 58 feet (17.7m), and a cubic capacity of 1.25 million cubic feet (35,396,250dm³). Their 18,000 BHP engines give them a service speed of 19-20 knots, which enables them to make the Atlantic crossing in seven days. The ships are specially strengthened and will be able to trade to St. Lawrence ports all year round through the thickest winter ice. Code 6-2

Flexible lab furniture meets many needs

Like most good ideas Interflex is a simple one, and as far as anyone knows, unique in North America. This flexible laboratory furniture system is based on interchangeable components that can be built up, stretched out and put together to suit individual laboratory needs. And when the needs change it can be re-arranged at no cost, without skilled labor or tools or the loss of user time. Components can be added easily to enlarge the system. Interflex Laboratory Furniture of Toronto, Ontario, won a Canadian National Design Award for this laboratory system, which has been installed at Canada's National Research Council in Ottawa. The company credits the co-operation of architects, engineers, installers and users for much of the success of the product. The system provides creative scope for the designer, short installation time for the contractor, a clean functional-working environment for the user and economy for the owner. The company describes its reception in the United States as overwhelming — Cornell University has placed its third order, an installation has been made at Lady of Lourdes hospital in Binghamton, N.Y., and one is being prepared for a hospital in Schenectady. Code 6-4

Speedy harvesting cuts costs

Sod harvesting was time-consuming, back-breaking labour until Brouwer Turf Equipment Limited, Keswick, Ontario, developed and manufactured the Model A3 sod harvester now being used in many parts of Canada and the United States.

This money-saving harvester recoups acquisition costs in one-and-a-half to two years, claims the company, because it will cut, roll and load up to 1,300 square yards (1,086m²) of sod in an hour and can be operated by only two or three labourers.

Available in 16, 18 and 24-inch widths (400.4mm, 457.2mm, 609.6mm) and lengths of 24 to 98½ inches (609.6mm, 2,501.9mm), the Brouwer sod harvester has a cutting blade — with flexible speed — that adjusts to uneven fields, providing consistently clean cutting and uniform sods up to 2 inches (50.8mm) thick. The harvester will harvest weak sod and operate on either wet or dry soil.

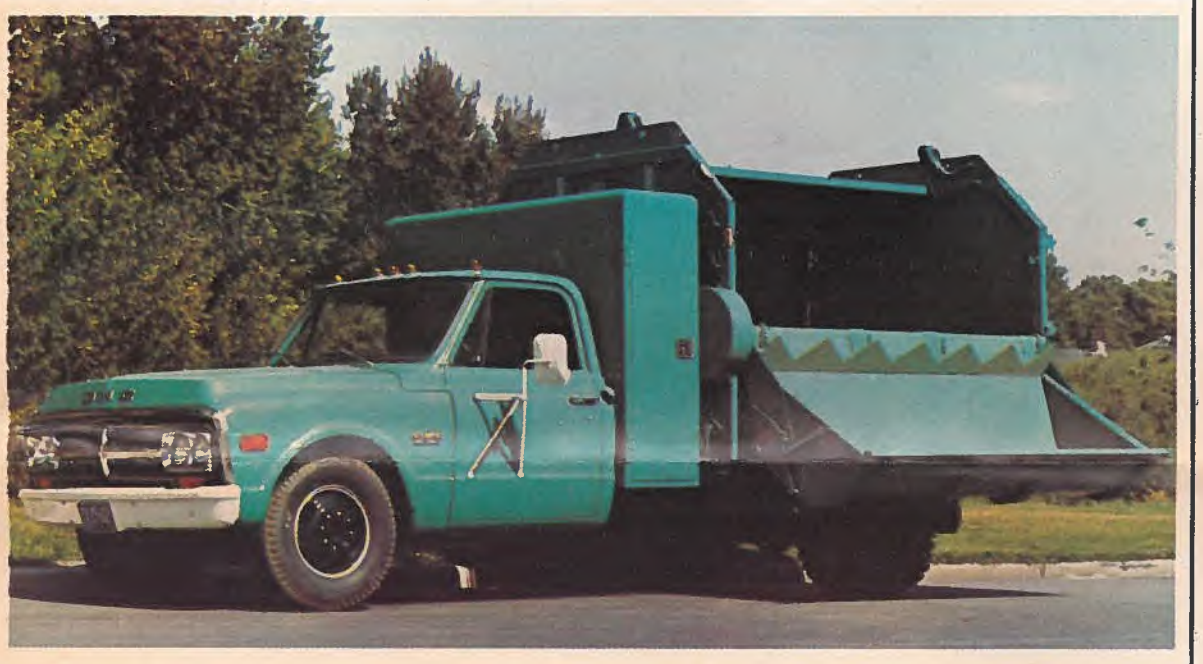
The hydraulically powered knife and conveyor makes for more trouble-free operation than conventional belt-driven models. And the harvester provides a tight, even roll, instead of the loose or cone-shaped roll produced by some rolling methods. This makes it possible to stack up to 75 square yards (62m²) of sod on a 48-inch by 48-inch (1,219.2 mm by 1,219.2 mm) pallet.

Constructed of heavy tubular steel with welded steel chassis, the harvester is complete and ready to fit the tractor. Brouwer will also sell the sod harvester without tractor. It can be attached to a standard tractor that is suitably equipped. Shipping weight of the harvester is 2,650 pounds (1,203.1 kg).

Optional lights and canopy allow the harvester to operate 24 hours a day in a variety of weather conditions. Other options include a paper pallet carrier, pallet extensions, slabbing and folding attachments.

Code 7-1

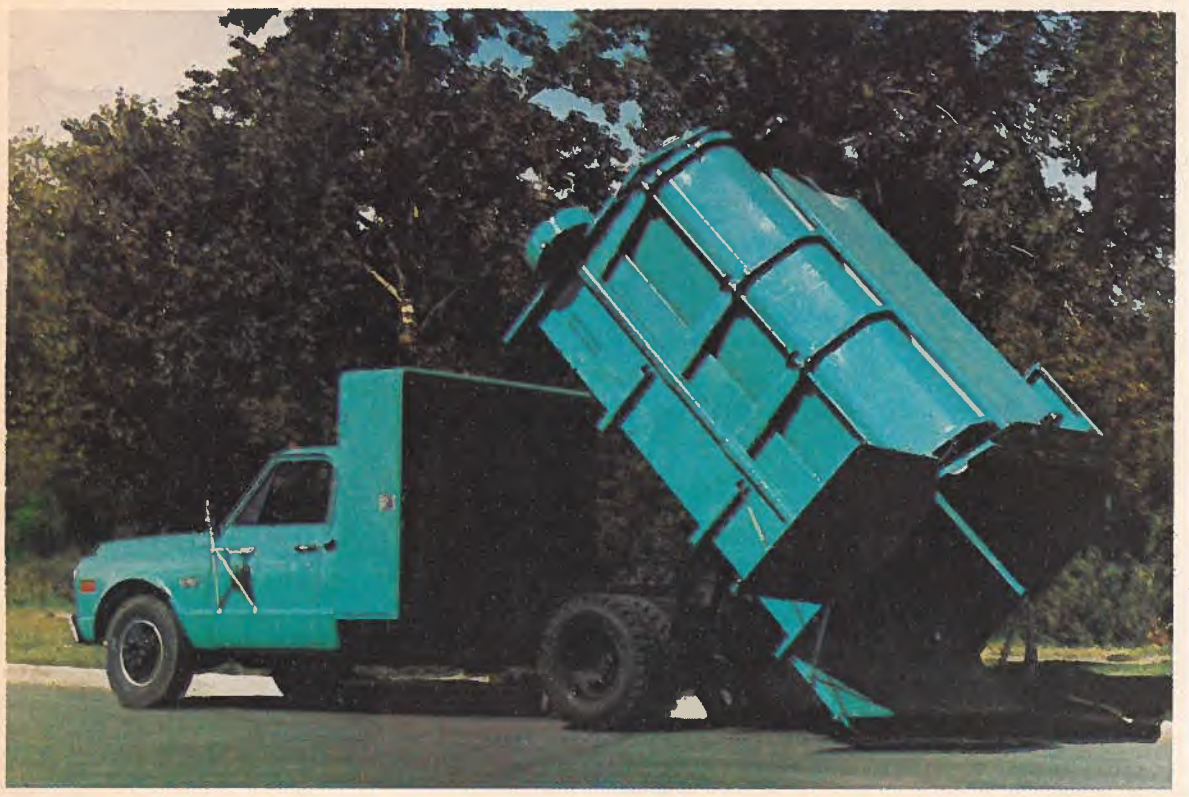
Brouwer's harvester does it all — cuts, rolls and loads up to 1,300 square yards (1,086m²) of sod in an hour.



Haul-All's the name . . .

But it's more than a catchy name, it's an accurate description of the multi-purpose truck body by Century Industries Limited of Calgary, Alberta. An instant success as a garbage collector, the Century No. 12 has been a popular choice by cities, towns, parks, highway departments and private contractors for a variety of maintenance jobs. Aside from its versatility, the Haul-All undoubtedly owes much of its success to its low initial and maintenance costs, and low operation costs. Easily installed on a standard 10,000 GVW chassis, the unit can be operated by one man. The one-cubic-yard (0.765m³) loading bucket is hydraulically operated from a control placed at the front of the body. The bucket can be lowered to a height of 26 inches (660.4mm), and has a 34 square foot (3.16m²) opening for large objects. A compaction stroke of 26 inches (660.4mm) exerts a force of 1,500 pounds (681kg) on the load for an approximate packing ratio of 3–1. The body has a capacity of 12 cubic yards (9.1m³), carrying an average payload of 3,500 pounds (1,589kg). Only one cylinder is used for the load and compaction cycle which takes 10 seconds. A twin post hoist is used for dumping.

Code 7-2



A flair with fur

Canada will be there . . .

. . . . when spring brings the fur trade to Frankfurt, Germany, for the 1973 International Fur Fair, April 27 to May 1. The best of Canadian ranched and wild fur pelts, and coats, jackets and pant coats, styled with quiet elegance and fun fashion flair, will be shown by the Canadian fur industry. This is the industry's seventh year at the Frankfurt Fair which attracts buyers from all over the world.

A sampling of the Canadian-designed coats at the fair are shown on this page. They come from the workrooms of six Province of Ontario manufacturers who are going to Frankfurt as a group for the third consecutive year and can be found in the Ontario Ministry of Industry and Tourism display.

The Canada Mink Breeders Association has reserved space to present Majestic Mink in pelts that represent the full colour range of this famous, fabulous fur. In the same area, a display of splendid wild fur pelts, loaned by Canada's provincial and territorial governments and the Indian and Northern Affairs Department, has been co-ordinated by the Department of Industry, Trade and Commerce.

Two German schools that train furriers will receive a gift from Canada — a specimen collection of Canadian furs including ranched mink and chinchilla and wild furs such as beaver, fox, lynx, muskrat, marten and fisher. The collection will help to acquaint the apprentices with Canadian furs and their uses.

Canada exports approximately 75 per cent of its annual fur crop to almost all the fur trading countries in the world, divided roughly half and half between the ranched and the wild furs. **Code 8-1**

A straight coat of extra dark pastel Canada mink designed by Sunrise Fur Co. of Toronto. The coat is fully letout with turned-back sleeve and pleated winged collar. **Code 8-2**

S. Kelman Fur Co. of Toronto designed this muskrat coat with blue fox collar and border. **Code 8-3**

Choosing lynx pelts for the Canadian exhibit at the Frankfurt International Fur Fair are, left to right, C. R. Merkley, Department of Industry, Trade and Commerce, and from the Government of the Province of Quebec — Steven Poliquin, Department of Agriculture, and Marcel Beaudet, Department of Tourism, Game and Fish. **Code 8-4**

A new look for casual living — pant coat by S. Kuretsky Furs Ltd. of Toronto. The racoon has been dyed to look like blue fox and leather has been used to give a slimming effect. **Code 8-7**

Men get into the fur scene with this muskrat coat with full clip lapels of tab design. The natural colouring of muskrat and the leather trim produce a very masculine look. The coat is in the new collection of Peter Makos Fur Ltd. of Toronto. **Code 8-5**

This Canadian red fox coat with fitted body worked vertically to the waist and horizontally in the skirt is in the collection of Wm. Einhorn Fur Mfg. Co. of Toronto. **Code 8-6**