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Canadian Defence Products Guide



Canada 



System Controller.

*Power Supply Tape Recorder
and Downlink Transmitter.*

Canadian Remote Sensing Systems

***Synthetic Aperture
Radar (IRIS)***

***Manufactured by
MacDonald Dettwiler
mounted on a
Challenger 601***



61911818 (E)

Canadian Defence Products Guide

Dept. of External Affairs
Min. des Affaires extérieures

SEP 18 1989

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False-coloured radar image of Detroit.



43-296-356



Introduction

Canada is one of the first Western countries to have recognized the need for international co-operation to harmonize defence requirements and to co-ordinate defence research, development, and production programs with friendly countries. Canadian policy has encouraged the domestic defence industry to specialize in product areas on the basis of natural advantage. The national geography, which is characterized by vast distances and extreme climate variations, has resulted in the development of innovative and advanced transportation and communications equipment and cold weather apparel. Other fields of expertise have their roots in Canadian military operational experience.

This book is designed to assist officials in other countries interested in a basis for co-operation in defence that

includes procurement from Canada. The firms whose defence-related products and capabilities are described do not represent the total production of the Canadian defence industry: they have been selected to illustrate the variety of defence products available from Canada.

Canada can be a unique source of supply for defence requirements because of its international reputation for high-quality products and equipment, manufactured to exacting standards. Canadian industry is thoroughly familiar with North American and NATO military specifications and standards.

At the back of this book for easy reference is an alphabetical product listing identifying the Canadian companies that manufacture each product, followed by an alphabetical listing of all the companies together with their products.

The services of the Canadian Commercial Corporation are available for those countries wishing to purchase defence equipment on a government-to-government basis.

A publication of this nature cannot provide complete specifications and other relevant data on the equipment portrayed; interested parties are therefore invited to contact the Canadian companies directly, or to obtain further information from the nearest Canadian embassy or trade office.





Canadian Commercial Corporation

Canadian Commercial Corporation (CCC), a Crown corporation owned by the Government of Canada, was established in 1946 by Act of Parliament "to assist in the development of trade between Canada and other nations."

CCC's principal function is to act as contracting agency to foreign governments and international agencies who wish to purchase goods or services from Canada on a government-to-government basis. Contracting for the corporation is carried out by the Department of Supply and Services, the central procurement agency for the Government of Canada. The customer is assured that the Government of Canada considers the selected Canadian supplier to be financially and technically capable of conforming with bid specifications, contract terms, and supplier warranties.

The availability of CCC's services does not prevent foreign governments or international agencies from contracting directly with Canadian manufacturers if they so desire. The corporation, however, can provide foreign buyers with the same level of purchasing services as enjoyed by the Government of Canada. Using the services of the government's own purchasing experts, CCC can identify competent sources and assure customers that prices and terms from Canadian suppliers are equitable. The financial aspects of transactions are also simplified: approved customers receive open-account privileges and CCC assumes responsibility for paying suppliers' invoices and performing contract audits when required.

The corporation can also make arrangements to have Quality Assurance and

acceptance of defence goods carried out in Canada on behalf of the customer government by the Canadian Department of National Defence.

Enquiries concerning CCC should be addressed to the Canadian embassy, high commission or consulate in your country, or directed to:

*Canadian Commercial Corporation
Ottawa, Ontario, CANADA
K1A 0S6
Tel: (819) 994-0960
Telex: 053-3703*



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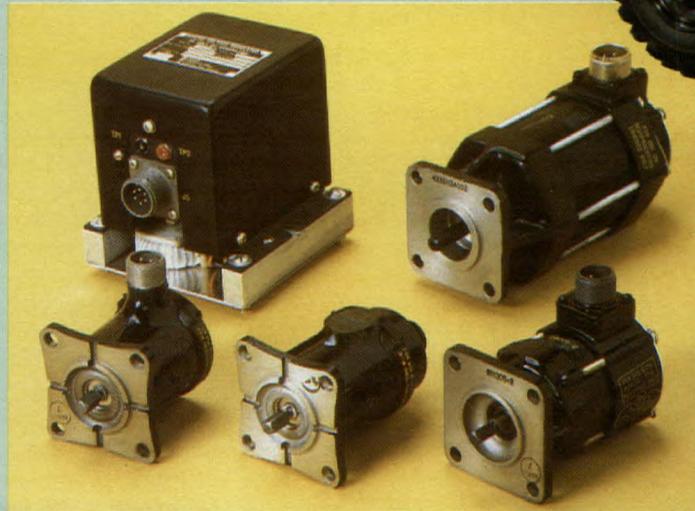
Advance Power Inc.

152 East Drive
Bramalea, Ontario, CANADA
L6T 1E1
Tel: (416) 793-5844
Telex: 06-97637

Advance Power Inc., a privately owned Canadian company, has over 20 years of expertise in the design and manufacture of generators and generator sets to MIL specifications. Generator products available range in power output from 1.5 kW through 200 kW in 60 Hz, 400 Hz or DC configurations. Tachometer generators and starter generators are also produced by Advance Power for civil and military aircraft.

The company has designed ground power units for aircraft service, to the requirements of both Canadian and foreign defence agencies. The company's long-established relationships with the armed forces of Canada and the United States have resulted in proven products for both military and civilian purposes.

*Ground power unit 28 V DC
1 500 AMPS gasoline engine.*

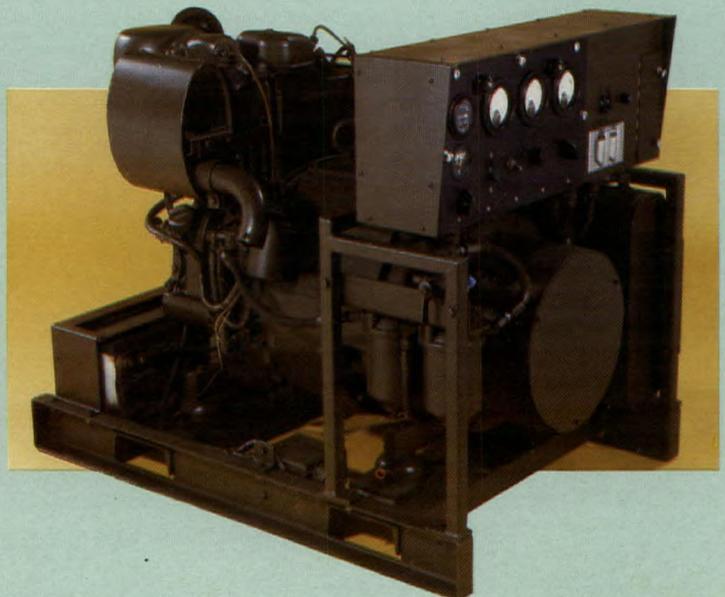


Tachometer generators.

*1.5 kW gas generator 60 Hz
120/240 V.*

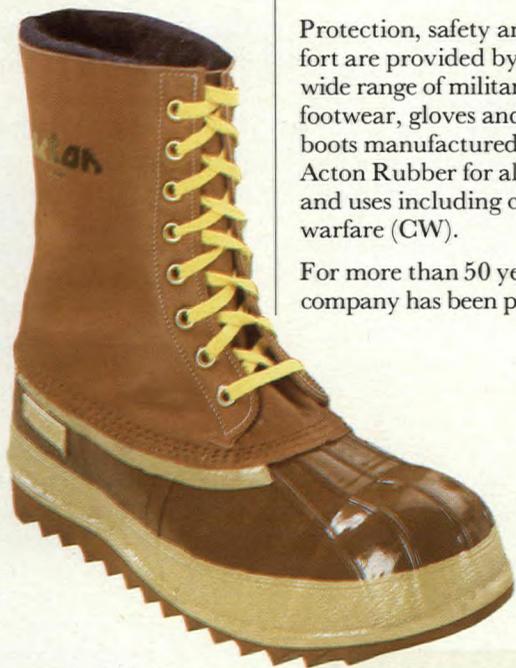


10 kW diesel generator 1 800 RPM.



The Acton Rubber Ltd.

881 Landry Street
 Acton Vale, Quebec, CANADA
 J0H 1A0
 Tel: (514) 546-2776
 Telex: 058-25712



Protection, safety and comfort are provided by the wide range of military rubber footwear, gloves and overboots manufactured by Acton Rubber for all services and uses including chemical warfare (CW).

For more than 50 years, the company has been producing

The Clinton boot with full grain leather top, sturdy rubber bottom with safety box toe, and removable felt liner. Anti-slip "Acton W" outsole. Sizes 6 to 13.

vulcanized rubber footwear, such as light and heavy overshoes, rubber boots, gloves, and other products for military, domestic and industrial needs. The Acton line features leather top and flight boots, lumberman footwear, rubber arctics, excluders, and insulated boots for extremely cold weather.

An integral part of the CW protective clothing system are Acton's gloves which are available in various styles. The gloves consist of duo-stretch knitted cotton coated with butyl rubber for complete protection, durability,

and comfort. The soft butyl rubber, plus finger and palm of curved configuration, offer excellent manipulative dexterity and finger tactility as well as dependable durability.

The CW overboot is a slip-on design with elastic loop closures. The upper is made from chloroprene (Neoprene) and butyl-coated duo-stretch cotton fabric while the outsole and upper reinforcing components are made from chloroprene (Neoprene) rubber resistant to petroleum, oil, and lubricants.

Easy to put on and take off, the CW overboots are worn over the combat boots and together with the CW coverall and gloves, provide more than 24 hours of protection against persistent CW agents.

The Mukluk boot offers some of the best protection available against the cold. Made of strong polyester it features such details as white rubber toe protector, counter, foxing, anti-skid outsole and heel, removable double wall wool-liner, thick mesh insole, and thick felt insole. These boots have been designed as a complete footwear system, with each component dependent upon the others for maximum benefit.



Overboots designed for nuclear, biological and chemical (NBC) and chemical warfare protection.



Acton's chemical warfare protective gloves (lined and unlined).



Fireman's boot providing light, flexible, comfortable fit with top-quality protection.



The Acton Rubber Ltd.

Flying Boots 3060G11

Both air and ground crews appreciate the environmental protection offered by Acton's flying boots. Worn over combat or safety boots, they provide good cold weather defence, while their black Neoprene soles and uppers render them oilproof. The knitted nylon tops are silicone coated and water repellent, while their heavy foam rubber insulation adds warmth. The 28-cm front zippers assure quick on-off operation. Charcoal grey in colour, flying boots are available in sizes 4 to 13.

Flyer 4591G12

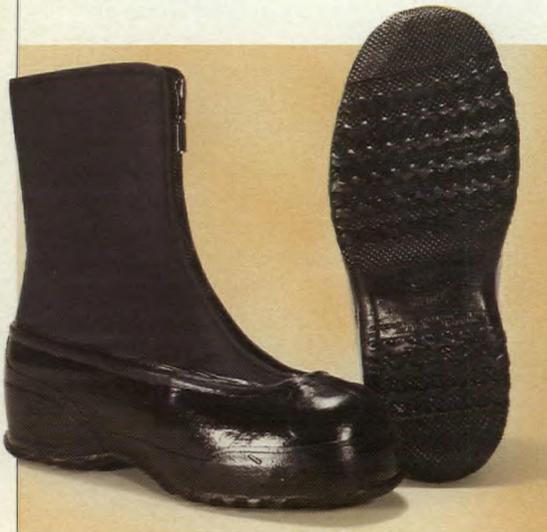
Top cold weather protection for transport personnel and all who require regular shoe overshoes is provided by Acton's Flyer. Made of brown split-leather sewn to a rubber bottom, the Flyer is genuine-shearling-lined and has two slide fasteners for quick on-off action. It is available in full sizes from 6 to 13.

Mukluk Flyer 4094G11

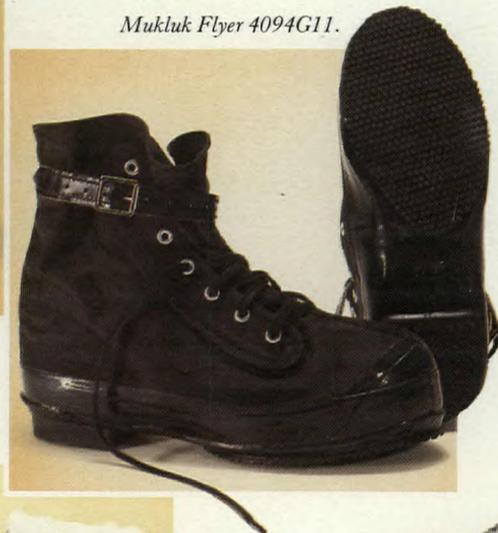
Designed for use with cold weather flying suits, Acton's Mukluk Flyer is similar to the army mukluk except its heel and sole area has been reduced to accommodate flying clothing and aircraft controls. The boot features a black rubber moulded sole and heel bottom integrally vulcanized to a polyamid black upper with eyelets and lace closure and 2.5-cm-width leather strap. This ankle strap prevents boot loss during high-speed ejection. For effective cold weather protection, the Mukluk Flyer must be used in conjunction with duffle socks and insoles. It is 22 to 24 cm high and available in sizes 6 to 14.

Combat Overshoe 3080G11, bright finish, Combat Overshoe 3083G11, matte finish

Designed to complement the Canadian Infantry's combat clothing system, this Acton model fits over combat boots in cold and wet conditions. Black, 28-cm high, the waterproof overshoe features a medium-coarse, knurl-design outsole with a high resistance to abrasion. Other properties include a full bellows tongue under its front-slide fastener, lower part insulation, nylon tricot insole cover and inside back strip for quick donning and doffing. All components are cemented and vulcanized under the differential pressure-cure system. The combat overshoe size range encompasses full and half sizes from 5 to 14. Other lasts and finishes are also available.



Flying boots 3060G11.



Mukluk Flyer 4094G11.



Flyer 4591G12.



Combat overshoe 3080G11, bright finish, combat overshoe 3083G11, matte finish.

The Acton Rubber Ltd.

Mukluk/Chimo Boots 4090G13

Eight-hour cold weather protection to -53.9°C (-65°F) is assured with Acton's Mukluk/Chimo boots. Made up of mukluks, duffle socks and two types of insoles, these boots have been designed as a complete footwear system, with each component dependent upon the others for maximum benefit. The rubber boot, with moulded sole and heel bottom, is integrally vulcanized to a polyester fabric upper, with lace and D-ring for drawstring closure. The wedged, moulded heel accepts ski harness and showshoe with ease. The duffle sock, made of 80 per cent wool, 20 per cent viscose fabrics in two layers, combines effectively with Saran plastic insole and additional 12.7-mm-thick felt insole. Boots are 34.3 to 40.8 cm high in sizes 4 to 14. They are available in white or blue, in medium and narrow widths.



Mukluk/Chimo boots
4090G13.

Prairie 3670G15

When cold and wet conditions prevail, Acton's water-proof Prairie boot provides excellent protection. The 30.5-cm-high green rubber boot features a warm removable, felt liner, stretchy net lining, steel shank and anti-slip-design outsole. Its adjustable nylon collar-top prevents snow or other particles from entering the boot. The Prairie is available in full sizes from 6 to 13.



Prairie 3670G15.

Women's Extreme Cold Weather Boot 5642G61

A 30.5-cm water-repellent, brushed nylon boot with moulded outsole and heel is Acton's answer for women who work in cold weather conditions. Lined with heavy fleece and with an insulated insole, the boot features elastic gore on the outside, slide fastener on the inside. It is offered in full sizes 6 to 11.



Women's extreme cold weather boot
5642G61.

Overshoe, Genuine- Shearling-Lined 4095G11

For top protection against cold weather, Acton offers this genuine-shearling-lined model tank boot, for transport personnel and all who require a work boot overshoe. Made of black, first-quality, chrome-tanned leather sewn to a rubber bottom, the boot features a bellowed tongue, three-strap-and-buckle adjustment, felt insoles and genuine shearling lining. It is available in full sizes from 5 to 13.



Overshoe, genuine-shearling-lined
4095G11.

Aerotech International Inc.

100 Eagle Drive
Winnipeg, Manitoba, CANADA
R2R 1V5
Tel: (204) 633-1999
Telex: 07-55272
FAX: (204) 694-1612

Although just over 10 years old, Aerotech International has firmly established its reputation as a leading supplier and manufacturer of portable heaters, canvas ducting and a complete line of aerospace and airline ground support equipment.

While Aerotech's technological expertise, design and

production capabilities have captured an impressive industrial clientele, its special focus on military applications has attracted contracts from the Canadian Armed Forces; the United States Air Force and Army; NASA; the Royal Air Force and Navy; the Dutch Air Force and Army; the Italian Army, Air Force and Police; the Norwegian

Air Force and Army; the Finnish Air Force and Army; and many other NATO countries.

Flexible ducts are among Aerotech's most effective innovations. The company's canvas ducting — Arctic Fox and Polar Bear — adapts to almost any application. It withstands both hot and cold extremes, maintaining its soft, pliable and non-cracking qualities in extremely cold weather. Arctic Fox and Polar Bear ducting is manufactured from treated canvas to be mildew and acid resistant, waterproof and fire retardant. It is resilient, abrasion resistant, easy to install, and fitted with internal, self-storing capability.

The company offers a comprehensive line of heaters that includes the small, ultra-efficient BT400 series, capable of handling the toughest cold weather jobs. Tested from pole to pole, the lightweight (only 250 kg (500 pounds)), portable space heaters withstand temperatures to -54°C .



Aerotech International Inc.

Aerotech International also manufactures and supplies Yukon stoves, ground power units, aircraft maintenance hoists and other airline ground support equipment. These products are utilized in over 100 countries.

To service its international clientele, Aerotech has dealers and distributors in major centres such as London, Oslo, Paris, Amsterdam, Helsinki, Lima, Chicago

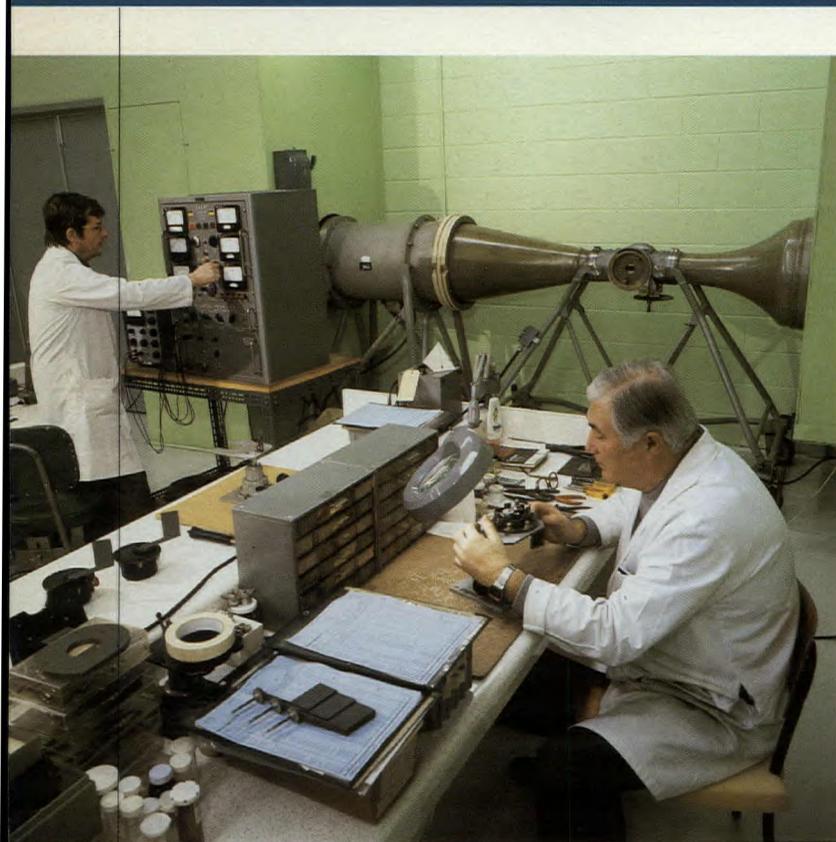
and Frankfurt. Manufacturing facilities are based in Winnipeg, Canada, and North Dakota, U.S.A. The company's Winnipeg head office maintains a 24-hour telephone order line to accommodate the various time zones of its customers world-wide.



Aircraft Appliances and Equipment Limited

Repair & Overhaul Division

150 East Drive
Bramalea, Ontario, CANADA
L6T 1C1
Tel: (416) 791-1666
Telex: 069-7540



The Repair and Overhaul Division of Aircraft Appliances and Equipment (AA & E) is a DND and MOT-approved facility for the repair and overhaul of military and commercial aircraft equipment, ground support equipment, power supplies, generator test stands, and all types of test equipment.

As the company has its own Engineering Department, it is actively engaged in the design and fabrication of specialty test equipment, power supplies and load banks.

AA & E currently has manufacturing contracts to produce modification kits for the shop testing of the CF-18 generators, portable synchro testers and 56-VA, 3-phase load banks.

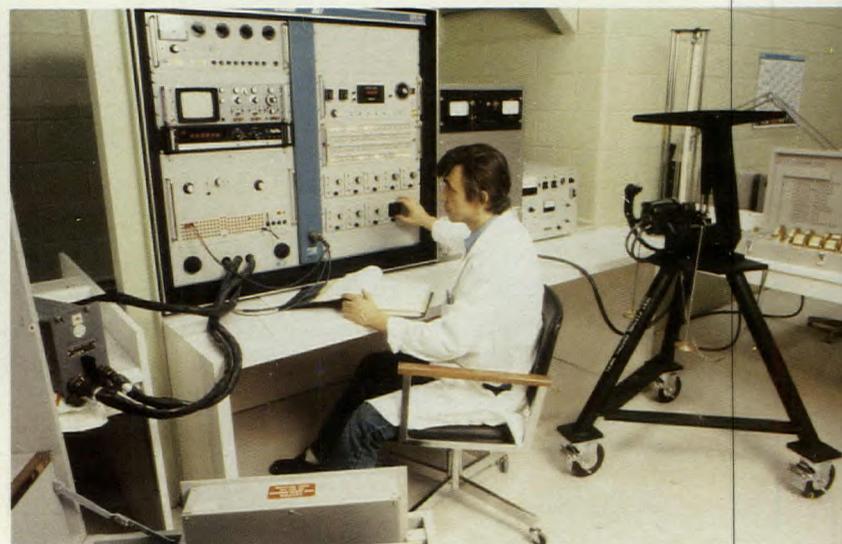
Established in 1949 and having experienced continuing growth, the company is now in its fifth new building at its current address with a complete facility for the rewinding of rotor and stator assemblies. AA & E is approved to DND AQAP-1 and has an MOT approval number 21-85.

To augment the facilities offered, the technicians at AA & E have received training from many manufacturers on their own equipment —

companies such as Lear Siegler Inc. Power Equipment Division, Romec Division, Astronics Division; Hartman Electric; Strong Electric; Avtron Manufacturing; Leland; Litton; 3M; GE; Teledyne; and others.

The following is a list of some of the more common units that go through its facilities:

- DC generators
- AC generators
- Tachometer generators
- Motor generator sets
- Air conditioning units
- Ground power units
- Rotary inverters
- Static inverters
- Converters
- Transformer rectifier units
- Voltage regulators
- DC generator control panels
- AC generator control panels
- Contactors and specialty relays
- Searchlights
- Galley ovens
- Engine-driven fuel and oil pumps
- Electrically driven fuel booster pumps
- Hydraulic pumps
- Angle of attack transducers
- RPM indicators
- Angle of attack indicators
- Landing lights
- Servo systems
- Test equipment
- Test stands



Aircraft Appliances and Equipment Limited

Fluid Power Division

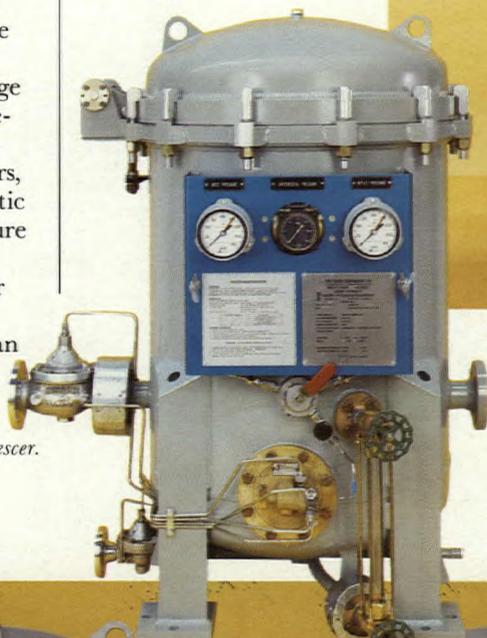
Aircraft Appliances and Equipment Limited, Fluid Power Division, has pioneered the development of coalescers for the separation of water and solid contaminants from lubricating and fuel systems for marine gas turbine power plants.

Over 20 years of research and development have resulted in many U.S. and Canadian naval ships having AA & E equipment installed. This equipment ranges all the way from simple in-line filters to duplex coalescers which automatically change over from clogged filter elements to clean ones. They come complete with heaters, service indicators, automatic water level controls, pressure and temperature gauges, safety interlocks, and other features. Flow rates from 0.1 GPM to 1 000 GPM can be accommodated.

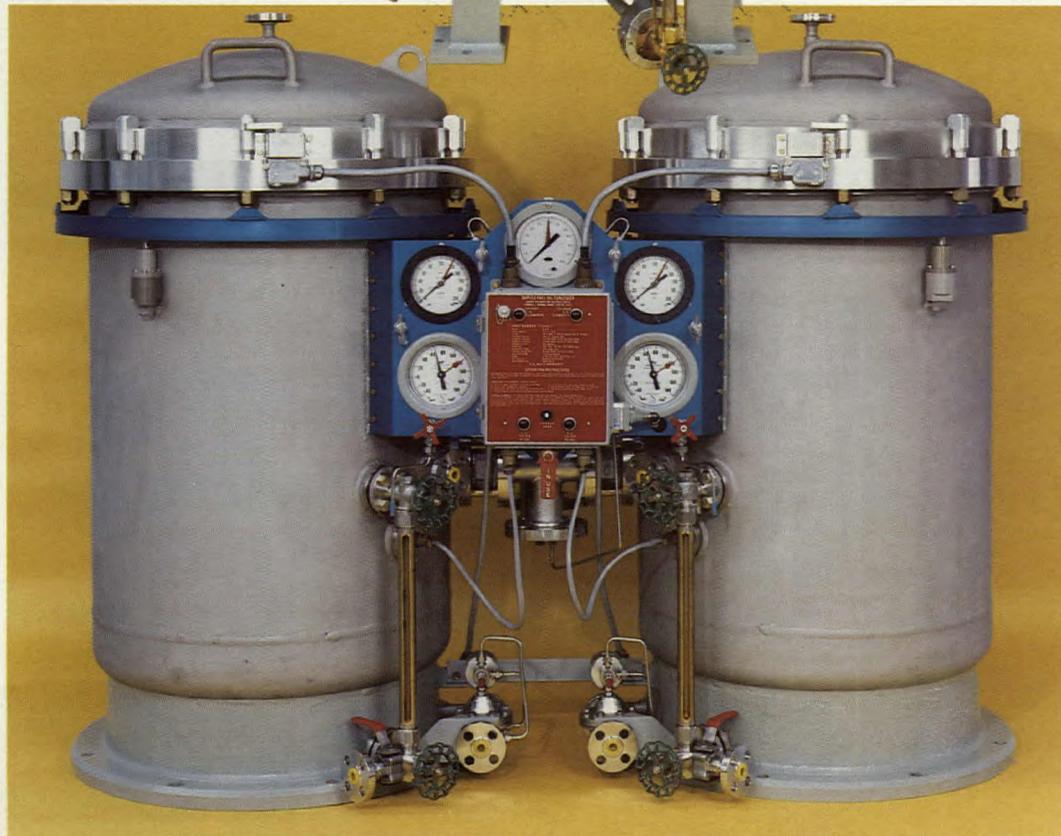
Duplex prefilters.



Simplex fuel oil coalescer.



Duplex fuel oil coalescer.



Many designs have been approved to MIL-F-15618, MIL-F-8901 and qualified to the shock requirements of MIL-S-901 and vibration requirements of MIL-STD-167.

Micronic filters and pipeline strainers have been manufactured for the most advanced navies around the world. Several patented designs are available in many different alloys to meet the most demanding shocks from arctic vessels to the high-frequency vibrations of hydrofoils and surface-effect ships.

Aro Canada

51 Worcester Road
Rexdale, Ontario, CANADA
M9W 4K2
Tel: (416) 675-5611
Telex: 06-989193

Aro Canada is the major Canadian supplier of aeronautical life support equipment. Since 1952, the company's activities in this area have encompassed manufacture, assembly, repair, overhaul, and testing.

The Aro life support equipment line includes liquid oxygen converters, cryogenic equipment, test stands, oxygen regulators, valves,

hoses, chemical defence accessories, test equipment, and reducers.

Products such as liquid oxygen converters, cryogenic equipment, emergency oxygen systems, cylinders, oxygen regulators, test stands, mask assemblies, and valves are overhauled/ repaired by Aro to the latest specifications.

All work is performed in accordance with Allied Quality Assurance Publications (AQAPs), Certification of Compliance, Canadian Department of National Defence (or US 9858) publications, and supported by official documents.

Aro products are supplied to the Canadian Armed Forces, Transport Canada, Canadian aircraft manufacturers, as well as to commercial and business aviation agencies from coast to coast.

Aro products for cryogenic and life support systems.



Anachemia Canada Inc.

P.O. Box 147
Lachine, Quebec, CANADA
H8S 4A7
Tel: (514) 489-5711
Telex: 055-66129

Anachemia is a major Canadian manufacturer of chemical warfare detection equipment.

Chemical Agent Liquid Detectors — 3-Way, M-8, M-9

The chemical agent liquid detector papers were designed to provide a simple, rapid method of detecting and differentiating between the three major groups of liquid chemical warfare agents. The detector papers can quickly determine the presence of G, V or H agents in liquid form.

The detectors include

- dye-impregnated paper sensitive to liquid chemical agents;
- booklets with adhesive-backed sheets (3-Way);
- booklets of sheets without adhesive (M-8);
- dispenser rolls with adhesive backing (M-9);
- colour comparison charts and instructions.

The test consists of

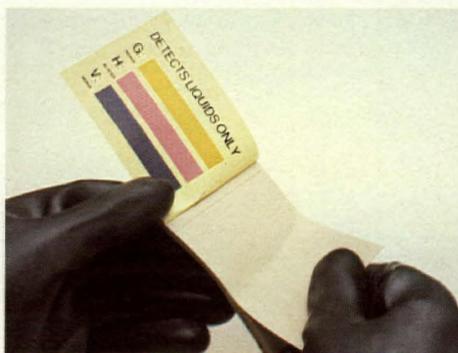
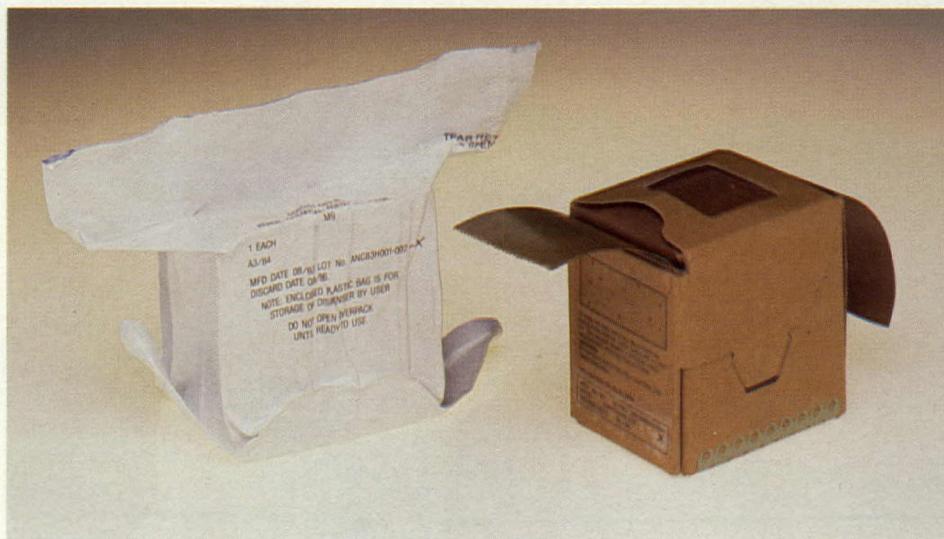
1. detaching a piece of the detector paper from a booklet or dispenser roll;
2. exposing the paper to the surface suspected of contamination or expected to

be in contact with a liquid chemical agent.

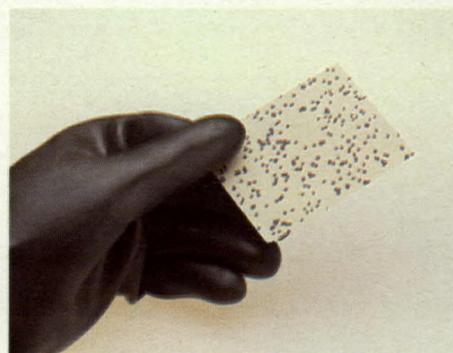
If the paper comes in contact with an agent, it changes colour. The 3-Way and M-8 papers exhibit three different colours to signal the presence of G, V or H agents. M-9 paper develops a single colour that indicates the presence of any of the above agents.

Custom configurations are readily available on request.

Chemical agent liquid detector M-9.



Chemical agent liquid detector — 3-Way testing paper.



Paper chemical agent liquid detector following exposure to liquid chemical agent spray — 3-Way liquid adhesive backed.

Anachemia Canada Inc.

Chemical Agent Nerve Vapour Detector

The chemical agent nerve vapour detector is a simple inexpensive, expendable device designed for the individual soldier to detect nerve gas vapours.

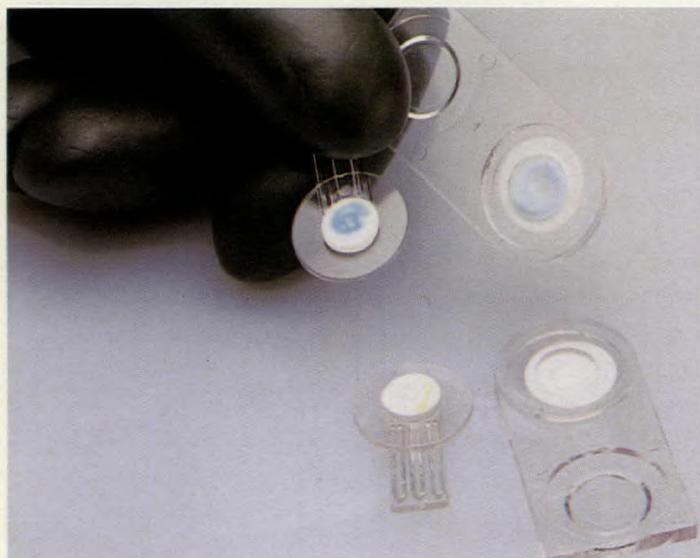
The detector can be used to quickly determine

- if a chemical attack detected by a "gas alarm" system is dangerous in the immediate vicinity of the individual;
- when it is safe for an individual to unmask.

- The detector consists of
- a plastic detector body containing an enzyme-impregnated test paper;
 - a plastic holder containing a chemically impregnated test paper;
 - an instruction sheet.

- The test is carried out by
1. moistening the test paper in the detector body and exposing it to the atmosphere;

Chemical agent nerve vapour detector. Gloved hand holds detector showing negative results; other detector shows positive results indicating presence of nerve agent vapour.



2. pressing the detector body into the holder so that the test papers are in contact. The test paper will turn blue or green in the absence of nerve agent vapour. If such vapour is present or the test has been incorrectly performed, the test paper colour will remain unchanged.

Chemical agent nerve vapour detector package.



Chemical Agent Detector Kit C-2

The chemical agent detector kit C-2, designed for issue to a small unit, is easily operated by one person with a minimum of training. The kit may be used to

- determine the presence or absence of chemical agents;

- identify chemical agents;
- collect vapour samples of unknown chemicals for laboratory identification;
- identify when it is safe to unmask for either short (½-hour) or long (12-hour) periods;
- test for the presence of chemical agents after decontamination procedures.

The kit consists of

- a vinyl-coated carrying case designed to withstand severe environmental conditions;
- chemical agent liquid detectors;
- chemical agent vapour detectors;
- white band detector tubes;
- plain detector tubes;
- three bottles of chemical reagents;
- air sampling pump;
- other miscellaneous items.

Chemical agent detector kit (C-2) open on the left, displaying contents, and closed, on the right showing carrying strap. Note the air sampling pump in the foreground.

Anachemia Canada Inc.

Chemical Agent Detector Kit M256

The M256 is a compact, simple-to-use kit designed to detect blister, nerve and blood agents.

The kit consists of

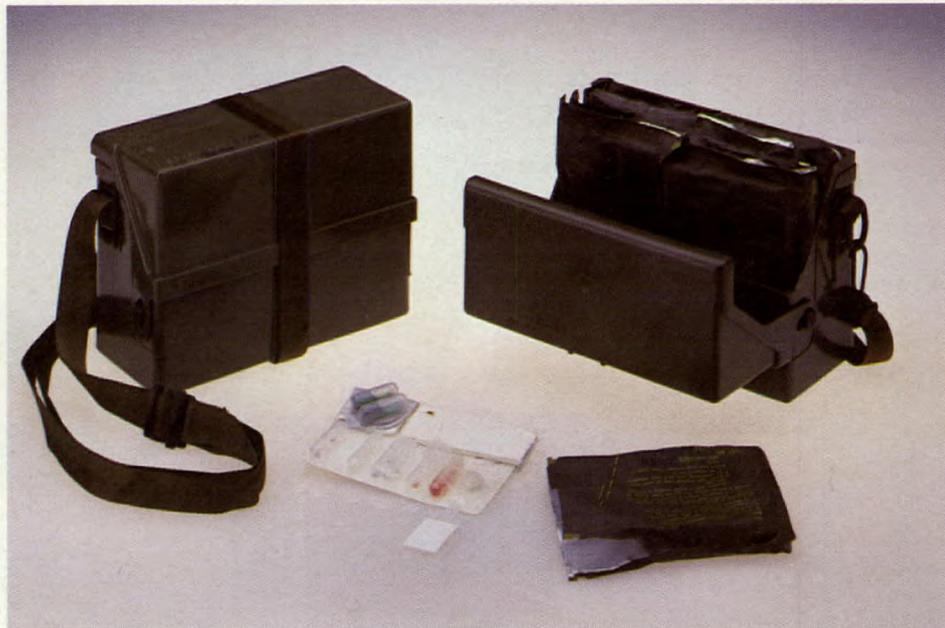
- a plastic carrying case with Velcro closure;
- a booklet of M-8 test paper sealed in a plastic bag;
- 12 pouches containing the chemical agent detector samplers;
- instruction cards.

The test is carried out by following the simple instructions printed on the sampler packet. The test requires

1. activating the sampler by breaking the integral crushable ampoules and releasing test reagents;
2. exposing the activated test disc to ambient air;

3. comparing the observed colour change with the colour chart in the instructions to determine the presence or absence of chemical agents.

Chemical agent detector kit M256, air test pictured open and closed.



Chemical agent water testing kit M272.

Chemical Agent Water Testing Kit M272

The chemical agent water testing kit M272 is designed for Lewisite, nerve, cyanide and mustard chemical agents which may be present in water. It requires a minimum of training.

The kit consists of

- a heat-resistant, plastic test container with rubber stopper and connector;
- chemical agent detector tubes banded with blue or red;
- chemical agent test reagents;
- nerve agent test tickets;
- training simulants to demonstrate tests and results to trainees;
- a thermometer;
- waterproof matches and striking strip;
- a tube holder that fits in the case lid, a clip, extra rubber connectors;
- a plastic-coated instruction card.

The nerve agent test requires

1. wetting the white patch on the ticket with the water sample;
2. clipping it for the time indicated;
3. pressing it against the opposite white patch on the ticket. If the patch turns blue, no nerve agents are present.

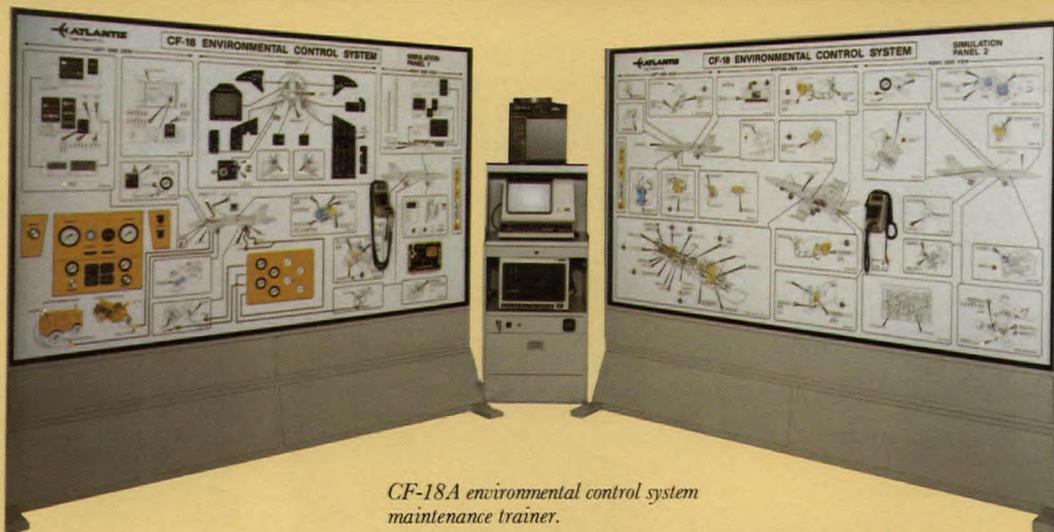
The tests for Lewisite, mustard and cyanide are carried out by

1. filling the test container with the water sample;
2. adding the indicated reagent;
3. breaking the ends of either the blue-banded and/or red-banded glass tubes and inserting the tubes in the rubber connector;
4. heating the test container base. This will produce a colour change in the glass tubes which can then be compared with the sample colour chart on the instruction card to determine which agents, if any, are present.

Atlantis Aerospace Corporation

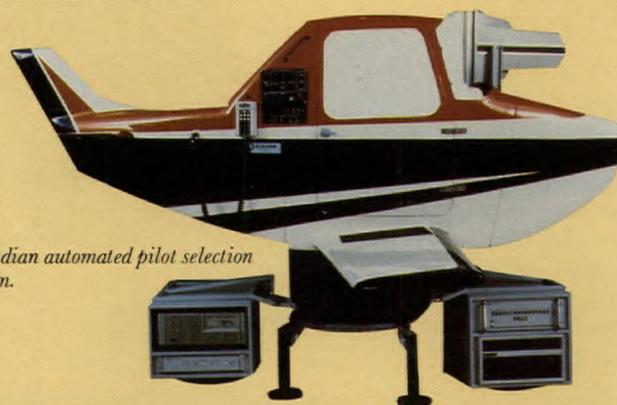
951 Rowntree Dairy Road
Woodbridge, Ontario, CANADA
L4L 4E4
Tel: (416) 851-8531
Telex: 06-986766

A commitment to excellence, innovation and cost-effectiveness has earned Atlantis Aerospace Corporation an enviable reputation in the defence community. Atlantis, continuing to undergo rapid growth, has become a leader in the application of advanced technologies to demanding defence and training requirements. The company supplies custom-designed simulation/training systems, avionics test equipment and instrumentation/control systems to a wide variety of commercial and military operations.



CF-18A environmental control system maintenance trainer.

H-46 flight control hydraulics conceptual maintenance trainer (CMT).

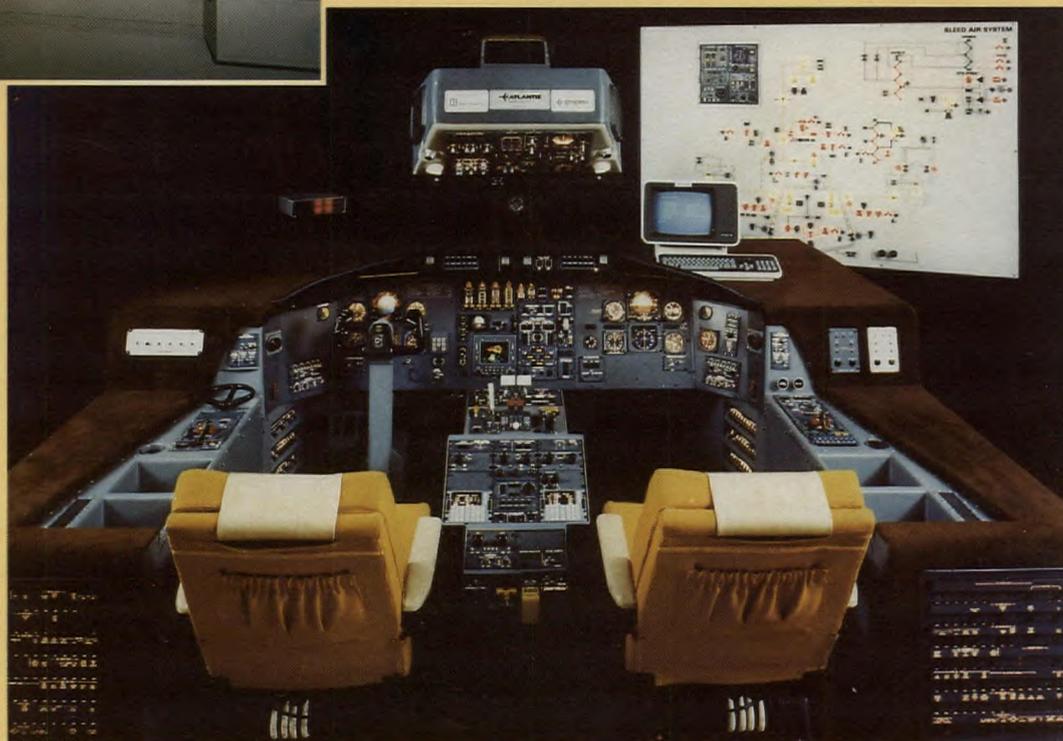


Canadian automated pilot selection system.

Training Systems Group

The Training Systems Group specializes in maintenance and operational systems simulation for land, air and sea applications. The group has developed training technology ranging from a cockpit procedures simulator for the Canadair Challenger to a special pilot selection system for the Canadian Armed Forces. Involvement with the CF-18A fighter program resulted in the development of a very capable ECS maintenance trainer for this aircraft.

A complete F/A-18 maintenance training package is being developed for the Royal Australian Air Force. The trainers encompass avionics, armament, ECS, flight control electronics, hydraulics, and fuel systems.



Another Atlantis project is the production of Boeing-Vertol H-46 helicopter hydraulics and AFCS maintenance trainers for the U.S. Navy and Marines. A Bell

Jet Ranger (Kiowa) helicopter instrument procedures simulator (HIPT) is also being developed for the Canadian Armed Forces.

Canadair Challenger cockpit procedures simulator.

Atlantis Aerospace Corporation

Test Equipment Group

The Test Equipment Group has developed technology ranging from avionics interface panels to sophisticated digital test equipment. The group's digital and analog radio altimeter ramp simulators can interface with virtually all commercial altimeters in service.

A complete family of Arinc 429 test equipment offered by Atlantis covers all applications from the bench to the flight line, including ATE systems. The DCM-1553 digital bus communicator offers MIL-STD-1553 bus communications capability. Designed specifically to support the CF-18 fighter, the unit features a touch-sensitive CRT operator interface and automatic word-building.

Instrumentation/Control Systems Group

The Instrumentation/Control Group designs and manufactures systems for all three military elements. A major activity is the development of the digital autopilot/guidance system for Boeing Canada's Robot-X rocket powered target drone*.

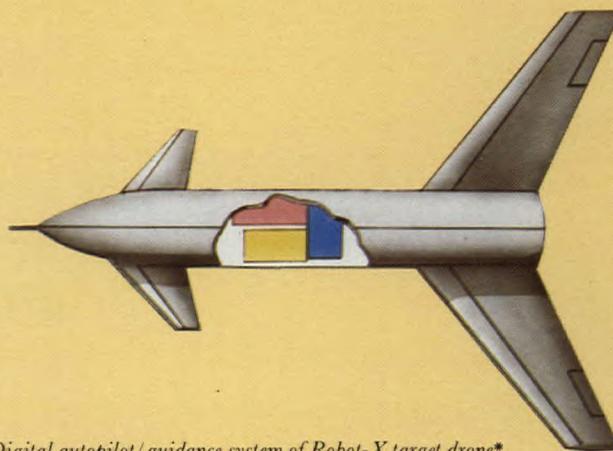


DCM-1553 digital bus communicator.

Together with another firm, Atlantis is developing a field-hardened prototype of the Leopard tank muzzle reference system (MRS). The MRS is a microprocessor/laser device designed to compensate for the phenomenon of "barrel droop" which results from thermal gradients along the gun barrel.

The Instrumentation/Control Group of Atlantis has also recently completed modifications to the AN/FSQ-T501 (V) submarine training set for the Canadian Forces Fleet School.

*Her majesty the Queen in right of Canada as represented by the Minister of National Defence. Rd 1983



Digital autopilot/guidance system of Robot-X target drone*.



Digital and analog radio altimeter testers.



Ballistech Systems Incorporated

Box 444
 St. Bruno, Quebec, CANADA
 J3V5G8
 Tel: (514) 676-6259
 Telex: 063666.
 TO 21. XAE 001

Ballistech Systems is a progressive, high-technology engineering company specializing in aerospace and defence-related research and development. The company's recognized expertise includes large and small-calibre ammunition and weapons systems; radar augmented (target) projectiles; remotely piloted (RPV) and target aircraft; RPV autopilot and computerized ground control and communication systems; fixed and mobile air traffic control towers; and radar environment air traffic control and tactical air defence training systems.

The company's expendable target radar augmented projectiles carry passive forward-looking radar reflectors that can simulate the radar signature of any airborne threat, from surface-skimming missiles to fighter aircraft. Essentially all high-velocity air-to-surface missile attack profiles can be duplicated with ballistic accuracy and precision. Service applications include use as tactical decoys and as evaluation of CIWS/LLAD radar and air defence weap-

ons and training for personnel on such systems. The low cost of these projectiles and their high-fidelity simulation allow the frequent, realistic practice necessary to develop and maintain a high level of human response.

The inert radar augmented projectiles are fired from conventional guns and require no special handling or support equipment. Multiple targets with different radar cross-sections and aerodynamic retard may be burst-fired to create realistic battle scenarios. The augmentation technology may be applied to any calibre projectile or free-flight rocket vehicle.

The mobile Ballistech control tower cab has a 2.4-metre x 3-metre (8-foot x 10-foot) fully air-conditioned control room, 2.5-metre (8¼-foot) head clearance, full 360-degrees and overhead visibility. The tower cab, mounted on a ¼-ton RV chassis, contains two fully equipped control positions with five radios and two telephone lines. Power may be drawn from an external 110-V 60-Hz source, a 15-kW generator, or internal 24-V battery supply. Standby to full operation requires less than 10 minutes.

R2P2, a research remotely piloted aircraft developed by Ballistech for the Department of National Defence, has been designed to carry payloads of up to 50 kg (110 pounds) with maximum flight duration of up to 10

hours. R2P2 has a bi-wing canard configuration and a single pusher propeller. Wings, rudder and canard are easily removable to facilitate handling.

The combined air traffic control/tactical air control training simulator provides air traffic and defence sector training centres with a modern, state-of-the-art capability in all facets of radar environment exercises. The simulator is modular, and thus expandable in essentially unlimited blocks of 16 to 32 targets in 1 000-nm x 1 000-nm airspace areas. The system includes such features as precision approach radar (PAR); air-air and ground-air intercept; weapons assignment; multiple aircraft performance categories; wind, weather, clutter, ECM; and secondary radar simulation.



R2P2 (RPV).



Target radar augmented projectiles.

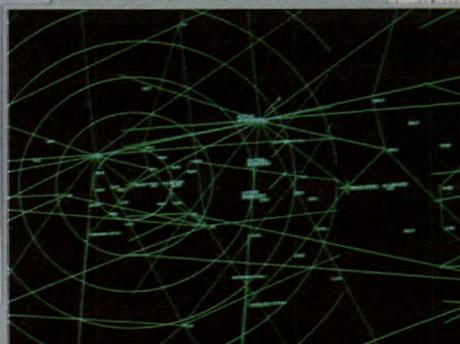
5/54 CAL
 RADAR
 AUGMENTED
 PROJECTILE
 1.0M-10GH.

5/54 CAL
 RADAR
 AUGMENTED
 PROJECTILE
 .75M-10GH.

5/54 CAL
 RADAR
 AUGMENTED
 PROJECTILE
 .25M-10 GH.

Mobile control tower.

ATC/TAC simulator display.



Barrday

A Division of Wheelabrator
Canada Ltd.

75 Moorefield Street
P.O. Box 790
Cambridge, Ontario, CANADA
N1R 5W6
Tel: (519) 621-3620
Telex: 069-59334

Barrday is the largest supplier of custom-designed soft body armour in Canada. The calibre of the bullet, angle of penetration, and area of protection are major considerations in the design of the garment as are comfort, weight and flexibility. The concealability, type of carrier, and personal capacity are other factors taken into account by Barrday to

achieve maximum effective protection. The company's products undergo rigid testing to assure fullest protection under all conditions.

A wide range of strict quality controls are maintained from origin of material to the finished product. The company is experienced in the use of ballistic fabrics of Kevlar aramid yarns and

can furnish the most recent data available. Barrday meets the challenge of supplying the protective garment to customer standards.

Comfort and convenience are built into these custom-designed soft body armour units designed by Barrday — Canada's largest supplier of these protective garments.



Bel-Aire Shipyard Ltd.

1667 Columbia Street
North Vancouver,
British Columbia, CANADA
V7J 1A5
Tel: (604) 985-8781
Telex: 043-52678

Bel-Aire Shipyard, strategically located in the ice-free waters of Vancouver Harbour, is a highly competent ship-

builder with many years of experience and a rich diversity of skills.

Bel-Aire provides services to meet the requirements of government activity, offshore oil exploration, seismic and

oceanographic research, and towboat and fishing industries.

One example indicative of Bel-Aire's expertise is the oceanographic survey ship, the *John P. Tully* commissioned by the Government of Canada. A number of vessels of similar sophisticated construction and outfit have been supplied to companies engaged in oceanographic activities in several foreign countries as well as Canada.



A recent Bel-Aire delivery, the 69-metre hydrographic survey vessel, John P. Tully.

Bell Aerospace Canada Textron

Division of Textron Canada Limited

P.O. Box 160
Grand Bend, Ontario, CANADA
N0M 1T0
Tel: (519) 238-2333
Telex: 064-7268

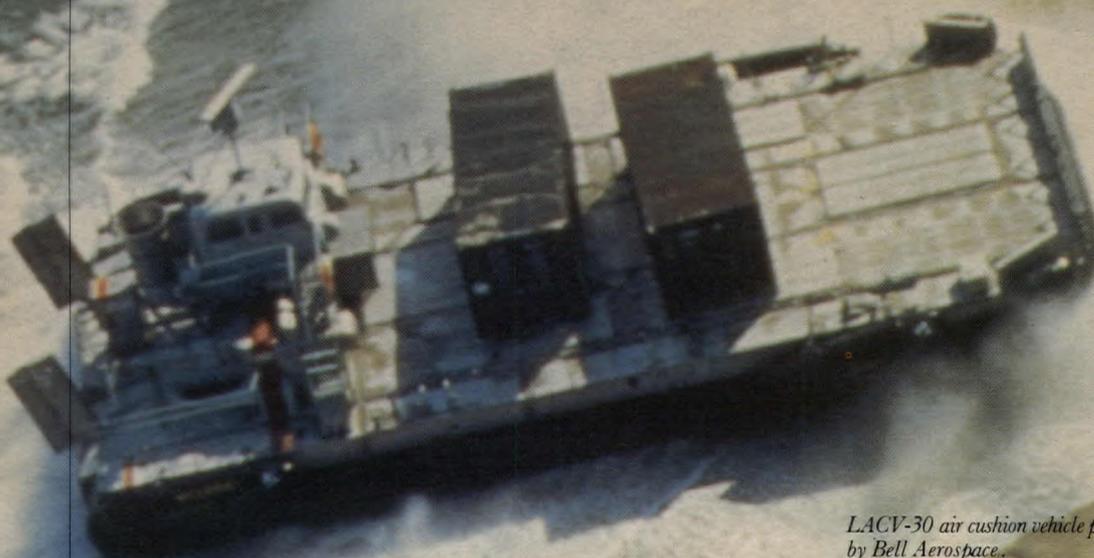
Bell Aerospace is a leading producer of commercial and military air cushion systems. The company's specially

designed, fully amphibious high-speed cargo carrier has been produced in quantity for the United States Army.

Its prime function is to move cargo from ship to shore and inland rapidly and efficiently, when other facilities are not available.

The Bell cargo carrier travels at speeds of up to 99.78 km/h (62 mph) and operates over water, land, snow, ice, marshes and swamps. It serves many purposes such as coastal, harbour and inland waterway patrol; search and rescue missions; medical evacuation rescues; water and fuel resupply; vehicle, personnel and troop transport; pollution and fire control.

The carrier needs no dock or berthing facilities and operates effectively from sub-zero to tropical conditions.



LACV-30 air cushion vehicle produced by Bell Aerospace.

Bendix Avelex Inc.

P.O. Box 2140
 Montreal, Quebec, CANADA
 H4L 4X8
 Tel: (514) 744-2811
 Telex: 05-826688

Bendix Avelex Inc., a unit of Allied Corporation, is a major domestic and international supplier of defence and aerospace products. The company's dedicated and experienced work force provides the industry with a wide range of advanced technology products and services.

Bendix Avelex manufactures communications equipment, vehicle navigation systems, artillery gun alignment and control systems, aircraft fuel controls, and engine accessories. Services include repair and overhaul, equipment calibration, and comprehensive after sales service and product support.

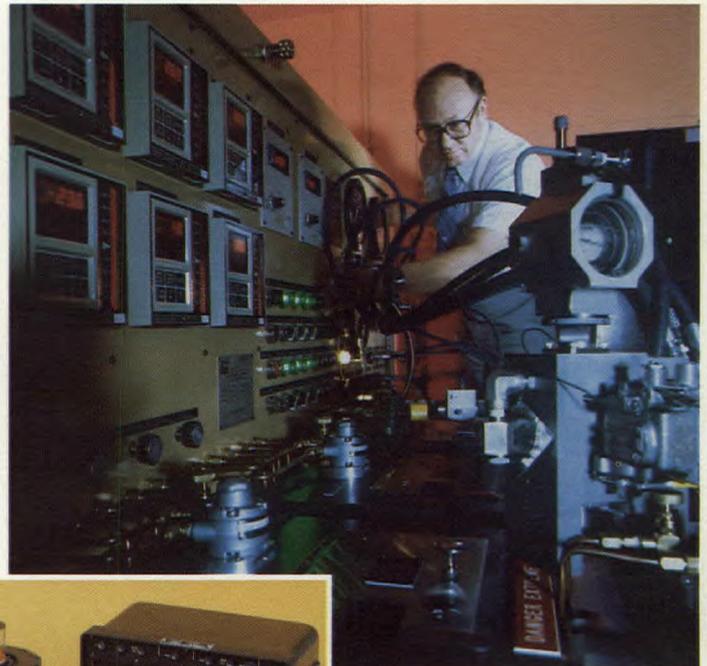
The company's expertise encompasses a wide range of engineering disciplines including electronics, software generation, electro-optics, geomagnetics, pneumatics, fluid dynamics and hydromechanics.

Bendix Avelex quality standards meet or exceed the most stringent requirements of the defence industry. The total quality approach ensures that reliability and dependability are designed and built into every Bendix Avelex product that also meets the demanding requirements of MIL-Q-9858A (NATO-AQAP-1).

The company employs highly skilled technicians, machinists, mechanical and electronic assemblers, as well as trained professionals in all disciplines: engineering, marketing, quality assurance, manufacturing and product support. The main plant and offices are located in Montreal, in a modern complex that includes a sophisticated precision machine shop, engineering design offices, CAD facility electronic laboratories, and extensive test facilities. Bendix Avelex operates one of the largest and most versatile overhaul

and repair shops in Canada for aircraft and marine products. An electronics facility in Cornwall, Ontario, manufactures sophisticated electronic systems for aerospace and defence applications.

The Product Support Group provides repair and overhaul services, spare parts, publications, and technical support world-wide for high-technology equipment produced by 250 different manufacturers.



The artillery gun alignment and control system (GACS) is three systems in one — a rapid automatic north alignment system for all guns, a digital fire order transmission system, and a two-way voice communication system.

The VNS is a microprocessor-based system that provides continuous, real-time land navigation capability to military vehicles. The system's read-outs indicate heading and position, as well as range and bearing to a predefined objective upon selection.



The PT6A-62 electronic limiting system limits and monitors critical engine variables. Designed for high-performance turbo-prop trainers, the device allows single-lever control similar to a jet aircraft, and maintains constant engine power during aerobatic manoeuvres.

Bombardier Inc.

Logistic Equipment Division

Valcourt, Quebec, CANADA

JOE 2L0

Tel: (514) 532-2211

Telex: 05-832575

In arctic snow, tropical swamp, marshland or desert sands, on-road or off-road, Bombardier's tracked and wheeled carriers fulfill the many logistic requirements of a modern army.

Bombardier has earned an enviable reputation worldwide for the quality and performance of its products. These range from all-terrain tracked vehicles, snowmobiles and off-road motorcycles to

diesel engines, and rail passenger vehicles for urban, suburban and intercity transit.

In the military field, the company offers a line of vehicles for troop and cargo transport, communications, patrol or reconnaissance work.

Bombardier's experience in the military market began in World War II with the development of the tracked

Penguin carrier for use by the Canadian Armed Forces on snowbound northern terrain. Bombardier has since provided the armies of several countries with commercial and industrial vehicles modified to suit military needs. A military version of the Can-Am motorcycle, for example, was produced for the Canadian, British and Belgian armies.



"ALPINE" snowmobiles in action in the Canadian north.

"ALPINE" snowmobile being unloaded from a Hercules C-130.



Bombardier Inc.

Bombardier's participation in the field of logistic equipment expanded in 1981, with its first major contract to supply 2.5-ton trucks to the Canadian Armed Forces. The company has signed a licensing agreement with AM General of the United States, for the manufacture of 2.5-ton 6 × 6 trucks specifically designed for the military market, and another agreement with Volkswagen A.G., of West Germany, covering the world-wide production and distribution rights for the 4 × 4, 0.5-ton ILTIS vehicle, developed for the requirements of the West German army. The ILTIS is now produced by Bombardier for the armed forces of Canada, Belgium as well as West Germany.



▲ "ILTIS" 0.5-ton 4 × 4 "SMP" vehicle.

"BOMBARDIER" 6 × 6, 2.5-ton vehicle.



The ILTIS is a robust cross-country vehicle with four-wheel drive and independent suspension on all four wheels, designed to meet the most exacting military requirements. By virtue of its low weight, excellent handling characteristics both on and off-road, advanced engine features and corresponding gearbox design, the ILTIS offers great tactical mobility. It can cover almost any kind of terrain at high speed while ensuring optimum protection for occupants and equipment.

The Bombardier 6 × 6, 2.5-ton truck was designed by and for the military. Featuring automatic transmission and fuel-saving diesel engine, this rugged, reliable personnel and cargo carrier provides ideal strategic mobility. Fast, easy to drive and air transportable, it is also economical to operate and maintain. The cargo bay can accommodate more than 65 varieties of shelters, from workshop to dentist laboratory or sophisticated electronic communications centre.

Bombardier Inc.



"SKIDOZER" personnel carrier equipped with hydraulic snow plow.

One of Bombardier's main advantages in the field of logistic equipment is its flexibility in engineering and manufacturing techniques. The company has the capability based on experience to adapt its standard equipment to the specific needs and requirements of any customer. Bombardier's experts work closely with the military at every stage of a project, from demonstration tests and definition of specifications through performance and

quality control testing and after sales service.

Bombardier's manufacturing activities are spread among seven Canadian, two U.S. and two Austrian plants, which in total employ about 5 000 people. Production facilities for the company's logistic equipment are located in Valcourt, Quebec.

Bombardier also manages a sales and customer service network extending to more than 50 countries. Through this global network, the company provides comprehensive product support services that contribute to confirm its reputation as a dependable manufacturer. Such services include feasibility studies, evaluation of requirements, design, supply of spare parts and technical training as well as financing assistance.



"ALPINE" heavy-duty twin-track puller transporter snowmobile.



"SKANDIC" two-passenger, single-track reconnaissance snowmobile.

Boeing of Canada Ltd.

Winnipeg Division

99 Murray Park Road
Winnipeg, Manitoba, CANADA
R3J 3M6
Tel: (204) 888-2300
Telex: 07-57309

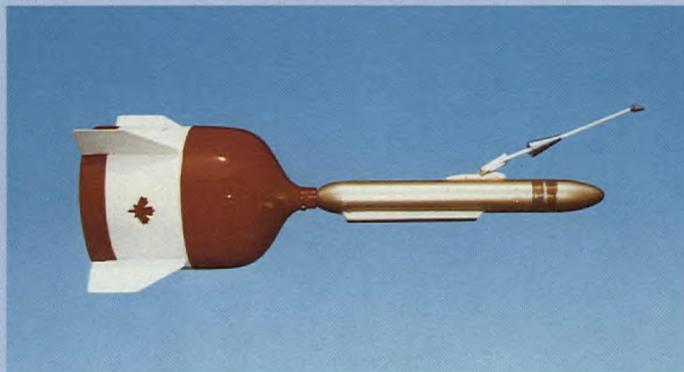
Boeing of Canada Ltd., Winnipeg Division, is a world leader in the design and manufacture of advanced composite components for commercial and military applications. The company is currently involved in the development of specialized advanced composite applications of lightweight components for weapon systems, missiles, and high-temperature engine components.

The main Boeing of Canada product line is a complete low-cost family of target systems for point defence training and weapons evaluation. These targets cover air-to-air, ground-to-air and sea-to-air applications and simulate high-angle-of-attack fighter aircraft and missile threats. The new Robot-X target simulates the low altitude flight of cruise missiles.

Robot-X is an advanced system being developed in co-operation with the Canadian Armed Forces to provide a completely user-operated target with over-the-horizon range and controlled manoeuvrability. This target will allow armed forces to train or evaluate new weapons systems without the costly requirement of sophisticated controlled ranges or support personnel.

The Boeing of Canada quality assurance program meets all requirements of NATO AQAP-1 and MTL-Q-9858A military specifications.

Milkcan.
A ground-to-air or air-to-air tow target with scoring for use with light aircraft towing.



Lightweight recoilless gun.
A filament wound graphite/epoxy barrel and Venturi for a man-portable anti-tank weapon.



Robot-9.
A low-cost high-angle-of-attack airplane or missile target.

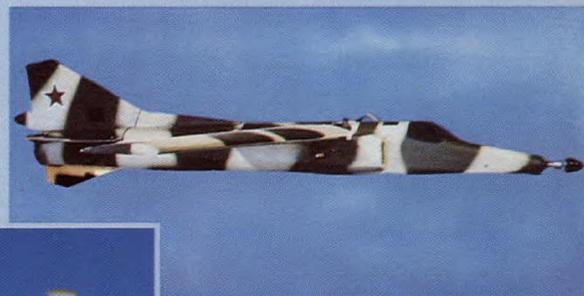


Robot-X.
A manoeuvrable low altitude target.

HEAT (1/5 scale) hostile expendable aerial target.



BANSHEE aerial target system.



HIND-D (1/5 scale) helicopter target.

Bristol Aerospace Limited

P.O. Box 874
Winnipeg, Manitoba, CANADA
R3C 2S4
Tel: (204) 775-8331
Telex: 07-57774

Bristol is a world leader in the field of aircraft sheet metal assemblies, helicopter component test cells, nuclear reactor core components, high-altitude research rockets, research rocket telemetry, precise jigs, fixtures and tooling. The company maintains its competitive edge through continuing research and development at its modern facilities.

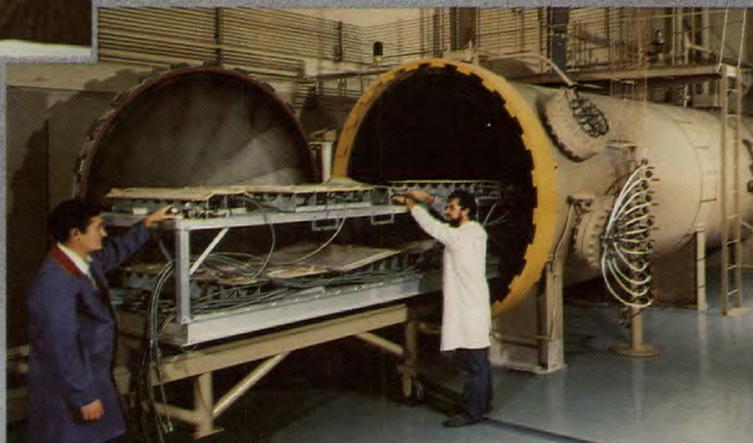
Bristol specializes in the repair, overhaul and modification of military and civilian aircraft and provides advanced welding, machining and processing services for high-strength heat-resistant materials used in the manufacture of gas turbine components, specifically in the hot section of the engine.

CF-18 firing the CRV-7 produced by Bristol Aerospace Ltd.

Bristol Aerospace Ltd. CAD/CAM provides high-technology engineering/manufacturing.



Loading the Bristol Aerospace Ltd. autoclave with composite aircraft parts.



Bristol Aerospace Limited

The company also maintains a Centre of Excellence for afterburner restoration. The superior quality of its restoration work is amply demonstrated in several key programs undertaken by the company in support of the Canadian and other militaries around the world. For years, Bristol has been the backbone of Canada's third-line maintenance activity for the CF-101 aircraft. It provides complete repair, overhaul and update of the Canadian Armed Forces' fleet of light and medium helicopters. For this purpose, Bristol

operates a one-of-a-kind helicopter transmission repair, overhaul and test facility. Bristol also handles the repair and overhaul of the F-404 afterburner for the Canadian Armed Forces as well as the manufacture of critical engine components. The company has the recognized capability to provide full engineering support teams for military fixed and rotary-wing aircraft to customers on a contract basis.

The Wire Strike Protection System (WSPS)[®] is an example of a proprietary Bristol product. The system, originally co-developed with the Canadian Armed Forces for retrofitting to Bell helicopters, is now available for military and commercial operators around the world.

Test firing the Bristol Aerospace Ltd. Black Brant X at Poker Flats, Alaska.

Together with the Canadian Department of National Defence, Bristol developed the CRV-7 rocket weapon system. The 70 mm (2.75-inch) rocket system is certified for the CF-18 and has been selected by the airforces of at least 10 countries world-wide.

These are clear examples of Bristol's demonstrated ability to work in close co-operation with militaries, governments and commercial users in providing detailed and sophisticated engineering and production support.



Inspection of a wing to fuselage fairing composite for the DASH 8 aircraft.

Bristoll Group

181 Rutherford Road South, Unit 8
Brampton, Ontario, CANADA
L6W 3P4
Tel: (416) 454-2998
Telex: 06-988576

Canadian Body Armour Ltd.

Canadian Body Armour ensures the safety of personnel with protective garments made with Kevlar inserts to stop shrapnel, flak, and penetration from handguns.

The lightweight, cool and comfortable Canadian Body Armour vests offer maximum freedom of movement and optimal protection levels. Canadian Body Armour is designed in compliance with National Institute of Law Enforcement and Criminal Justice standards. The basic vest meets standards to threat Level I in the 10-layer model. With the optional second 10 layers of Kevlar, Canadian Body Armour meets Level II threats.

The Bristoll Group is pleased to supply either stock or custom-made Canadian Body Armour in any quantities required.

Protection Levels*

With one panel (basic protection) inserted in the front of the carrier and one inserted in the back of the carrier, protection is afforded against penetration and serious blunt trauma from the following:

- .22 LRVH, 40 gr. RN lead (1000 ± 50 f.p.s.)
- .38 Spl ± P, 158 gr. SWC lead

With two panels (extra protection) inserted in the front of the carrier and two inserted in the back of the carrier, protection is afforded against penetration and serious blunt trauma from the following:

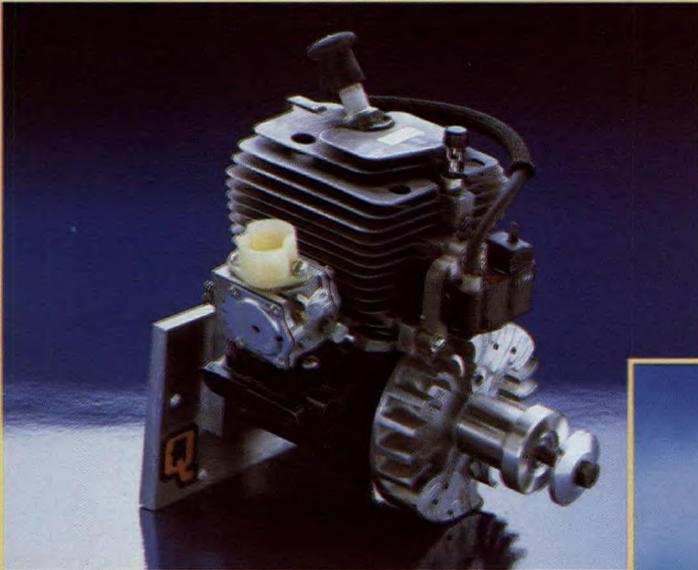
- .22 LRHV, 40 fr. RN lead (1200 ± 50 f.p.s.)
- .357 Mag., gr. JSP (1300 ± 50 f.p.s.)
- 9 MM, 124 gr. FMJ (1100 ± 50 f.p.s.)**



Abbreviations:
FMJ — full metal jacket
LRHV — long rifle high velocity
SWC — semi-wad cutter
* — As per Dry-Test procedure given in NILECJ 0101.01 Standard
** — Ammunition equivalent in configuration, structure and composition to Remington Catalogue No. R9MM2.
(For more information, contact Mr. M. Harris, President, at above address.)



Bristoll Group



Quadra 100.

Quadra Power

Quadra aero engines, the precision-engineered products of demanding craftsmen, set the standard of excellence in drone and model aircraft engines world-wide.

Quadra engines are renowned for outstanding

durability, performance and reliability. Precise machining, continuous testing and stringent quality control procedures make Quadra quality one of the best in the world.

(For information, contact Bristoll Group at (416) 456-1090, Telex: 06-988576.)



Bristoll Group Chain Saw Safety wear

Bristoll chain saw safety wear gives the operator vital protection in whatever environment chain saws are used.

Layers of protective material within the garment seize and snag the chain's teeth, stopping the saw before injury can occur.

Bristoll chain saw safety wear provides proven protection in pants, chaps, and gloves.

Garments can be custom made in any outer cover cloth and colour combination desired.

CAE Electronics Ltd.

P.O. Box 1800,
St. Laurent, Quebec, CANADA
H4L 4X4
Tel: (514) 341-6780
Telex: 05-824856
TWX: 610-422-3063

CAE Electronics designs and produces sophisticated flight and tactical simulators for training aircrews; airborne magnetic anomaly detection (MAD) equipment for anti-submarine warfare; integrated machinery control systems for the new Canadian patrol frigates; multi-axis hand controllers; and a fibre-optic helmet-mounted visual display system.

CAE's simulators safely reproduce actual aircraft performance within the full flight envelope to train air-

crew in all phases of aircraft and tactical systems operation. Normal and abnormal conditions, as well as a wide range of emergency procedures, can be simulated with no danger to personnel. The simulator flight deck looks, sounds, and feels exactly like the real aircraft. A number of sophisticated tactical systems can be included in the training such as radar, weapons release, terrain following, electronic warfare, and anti-submarine tactics. Instructors can monitor, record, and

play back all aspects of a flight training exercise and can easily and quickly change the aircraft configuration, environmental conditions, and the tactical situation.

CAE Electronics has designed and built simulators for the MRCA Tornado and CF-18 tactical combat aircraft, the close support/advance trainer Alpha Jet, the C-130 Hercules transport, the E-3A AWACS, and the CP-140 maritime patrol aircraft. Helicopter simulators have been built for the

UH-1D, CH-53, CH-47, AB-205, AB-212, the SAR Sea King, and the Sea Lynx.

The company has been included in a three-company team selected by the United States Air Force to provide equipment and management for the complete training of aircrew for the MAC C-5 Galaxy. CAE's part in the program is to supply six C-5B advanced technology flight simulators.

Canadian Forces CF-18 flight, tactics and mission simulator manufactured by CAE Electronics Ltd.



CAE Electronics Ltd.

Multi-role combat aircraft (MRC.A) Tornado for the Federal Republic of Germany is manufactured by CAE Electronics Ltd.



Magnetometer

Over a period of 25 years, CAE has produced a family of MAD systems that are used on 95 per cent of the free world's ASW patrol aircraft:

AN/ASQ-504 (V) magnetic anomaly detecting set: CAE's advanced integrated MAD System (AIMS) can be used on helicopter and fixed-wing ASW aircraft. AIMS technology allows inboard installation of the detecting magnetometer on helicopters. The set provides visual and audible contact alert signals and advises the operator if he is within target acquisition range.

AN/ASQ-502 magnetometer: This model offers superior detection capability in the location and classification of submarines.

QA-5154/ASQ fully automatic compensation system (FACS): With CAE FACS, a minimum of aircraft manoeuvres are needed to complete compensation, and the quality of compensation achieved greatly enhances system detection capability.

AN/ASQ-64 submarine anomaly detection system (SAD): The SAD constantly monitors anomaly signals and alerts operators through visual and audible alarms.

SM-5016/ASQ submarine signal simulator: This simulator produces a variety of signatures under diverse operational parameters to train MAD operators in detection and classification of submarines.

Advanced integrated MAD system (AIMS) can be used on helicopter and fixed-wing ASW aircraft.

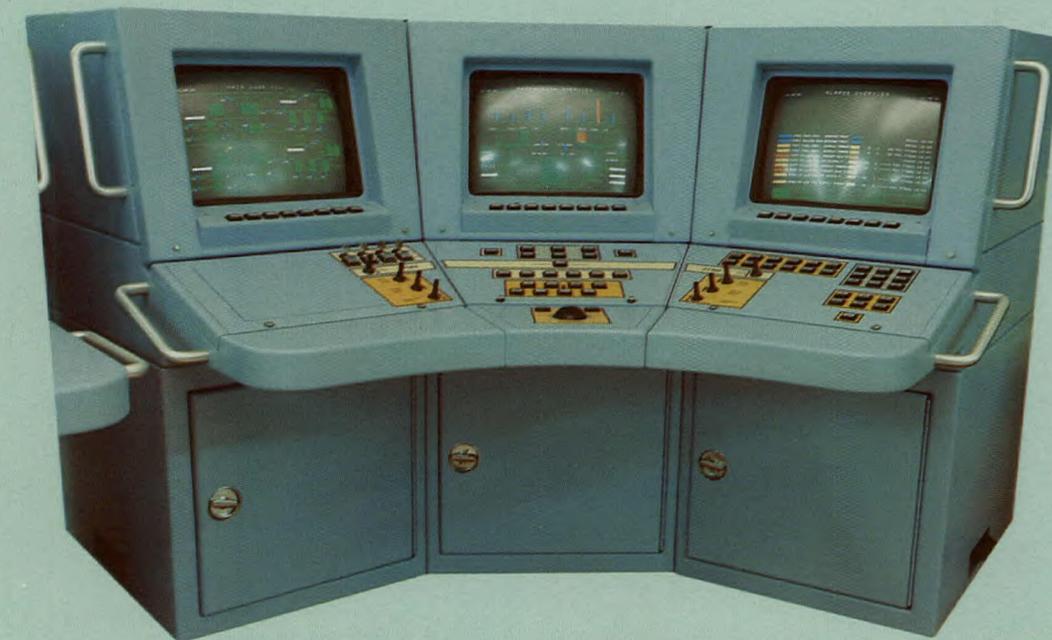


CAE Electronics Ltd.

Control Systems

The shipboard integrated machinery control system (SHINMACS*), developed by CAE Electronics, is a Canadian Forces' machinery control concept conceived to meet present and future control systems requirements for propulsion, ancillary and auxiliary plants. The system employs distributed architecture, and utilizes redundant serial data buses that link the operator console supervisory computers with the microprocessor-based data collection units. Following work on a SHINMACS* ADM (advanced development model), CAE was selected to supply the control systems for six new Canadian patrol frigates.

SHINMACS* utilizes computer-generated colour graphics and text displays to present plant monitoring data. The selective presentation of information enables the watchkeeper to interact with the machinery systems in a more efficient manner than was possible with previous systems. The ergonomically designed, integrated control consoles are constructed to keep their size



Integrated machinery control system for the Canadian Forces' new patrol frigates is manufactured by CAE Electronics Ltd.

and weight to a minimum, thus complementing similar weight and installation benefits achieved through the use of distributed architecture.

SHINMACS* reduces operator training time, provides simplified operation, greatly decreases possibility of operator error, cuts equipment weight and

cabling requirements, allows debugging of ships' systems on land, provides commonality of equipment and spares, features built-in redundancy and allows use of add-on training simulators.

CAE SHINMACS* gives the performance, reliability and survivability required for warship machinery control systems at significant savings in installation, maintenance and training costs. It has the flexibility to serve in a wide variety of marine applications.

Multi-Axis Controllers

CAE presents its new generation of multi-axis controllers for advanced remote manipulator systems — the result of 17 years of intensive research and development, and culminating in the unqualified success of CAE's rotational and translational controllers for the NASA Space Shuttle's Canadarm.

CAE controllers have undergone exhaustive system testing on both the NASA orbital manoeuvring vehicle and the manned manoeuvring unit simulators,

4-Axis single hand controller manufactured by CAE Electronics Ltd.

and are ready for full space application. The new CAE multi-axis controllers will allow astronauts to easily do with one hand, what has until now required both hands.

In what may be its most far-reaching application, the CAE controller has been successfully tested as a single-point co-ordinated system in a variable-stability helicopter of the National Aeronautical Establishment of the National Research Council of Canada.

The CAE device provides control in up to 6 degrees-of-freedom — 3 rotational and 3 translational. It produces a variable analog voltage output that is easily filtered, programmed, integrated or otherwise processed, and will meet system and sensory perception requirements from the most delicate to the most rugged.

There are many areas of endeavour that can benefit from this technology which allows man's grasp to exceed his reach in hostile environments — such as underwater exploration, nuclear reactor maintenance, mining and robotics.

**Trademark of the Canadian Department of National Defence.*



CAE Electronics Ltd.

Fibre-Optic Helmet-Mounted Visual Display System

The visual requirements for nap-of-the-earth flight, air-to-air and air-to-ground combat, and multiple participant scenarios are very demanding. Extraordinary advances have been made in the area of image generation, but some of the inadequacies of current visual display technology have prevented these advances from having the desired impact on training programs. The inevitable compromises which have had to be made between resolution, field-of-

view, luminance, amount of detail, and cost have restricted the use of visual systems for tactical simulation.

The CAE fibre-optic helmet-mounted display (FOHMD) represents a practical approach to overcoming visual display problems encountered in tactical simulation. With the FOHMD, imagery is generated and displayed only in the direction in which the pilot is looking. Only this central region is presented in high resolution.

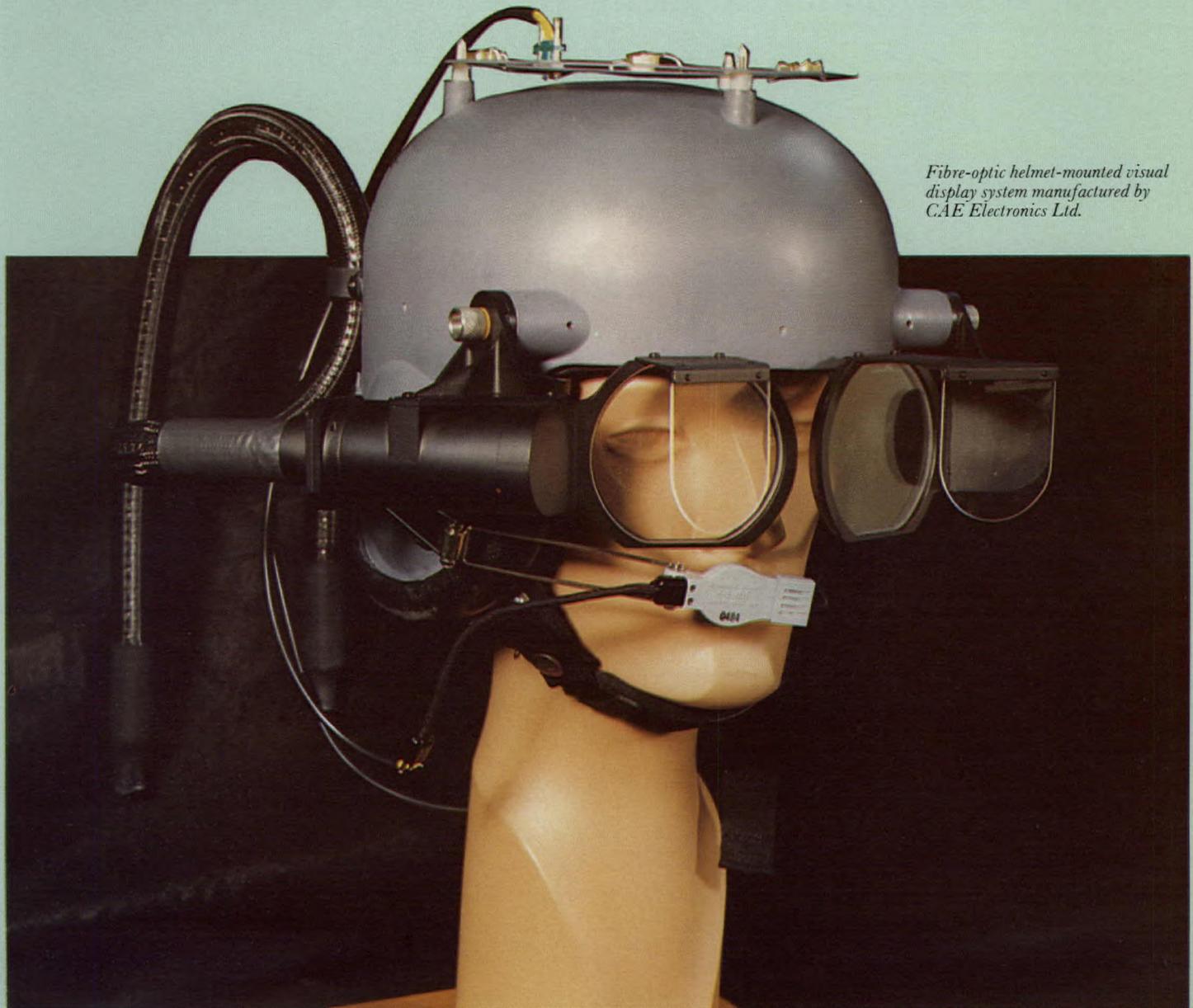
The FOHMD provides a 64° instantaneous FOV display located anywhere

within the pilot's total viewing volume (360°). The display is full-colour, and provides a minimum of 30 footlamberts (typically much higher) at a contrast ratio greater than 30:1. The image is located at infinity for viewing comfort. Moreover, by driving each display with a separate, displaced eyepoint from the CIG, full stereo vision can be produced.

FOHMD makes maximum use of the high quality of present image generation systems hardware and, through the use of proven, off-the-shelf television projectors and optical com-

ponents, high performance can be achieved at a relatively moderate cost.

As the helmet optics are semi-transparent, cockpit indicators and head-up displays (HUD) can be viewed through the helmet. A cockpit mask is modelled in the CIG to prevent the pilot from looking through aircraft structure.



Fibre-optic helmet-mounted visual display system manufactured by CAE Electronics Ltd.

Canadair Limited

1800 Laurentian Boulevard
St. Laurent, Quebec, CANADA
H4R 1K2
Tel: (514) 744-1511
Telex: 05-826747

Canadair, a leading Canadian aircraft producer, is one of the best equipped and most versatile aerospace manufacturers in the world. In its four modern plants (250 000 square metres) located in the Montreal area, the company's 4 500 skilled employees produce commercial planes and advanced military aircraft and unmanned surveillance drone systems for the Canadian Armed Forces and several NATO countries.

The Canadair Challenger jet transport aircraft has a wide-bodied fuselage, quiet, fuel-efficient twin turbofan engines and an intercontinental range. These features make it especially suitable

for a variety of military and commercial applications including corporate transport, air ambulance, maritime surveillance, electronic warfare trainer, and flight inspection and calibration. The Challenger 601, the latest version of this innovative aircraft, has a range of nearly 6 400 kilometres (3 970 miles), a normal cruise speed of 820 kilometres per hour (510 mph) and a capacity to carry up to 19 passengers or a 2 230-kg (4 915-pound) payload.

Canadair's multipurpose aircraft, the CL-215 was

primarily intended for forest fire-fighting. It has become an exceptionally versatile plane that is adaptable to a wide variety of roles including aerial spraying of insecticides and oil dispersants, maritime patrol, search and rescue, and transportation.

Canadair, a world leader in the design, development and production of unmanned airborne surveillance systems, currently has three of these intelligence gathering sys-

tems in production or under development. The CL-89 system designed for the army division commander, consists of reusable air vehicles, or drones with related ground support and operational maintenance equipment. Each drone carries either a photographic or infrared line scan sensor. The CL-89 is now in the inventories of the armies of Britain, the Federal Republic of Germany, France and Italy.

Challenger 601 twin turbofan transport aircraft.



Canadair Limited



CL-215 multi-purpose amphibian.

The CL-289, a more sophisticated version of the CL-89, is being developed jointly by Canadair and Dornier GmbH to meet German Army requirements. The CL-289 operates in a similar manner to the CL-89. The drone, however, is larger, has longer range and a more accurate navigation system, and carries both optical and infrared sensors. Infrared imagery is transmitted in flight via a data-link. The CL-289 meets the requirements of the army corps commander.

The CL-227 Sentinel is a medium-range surveillance and target acquisition system consisting of a remotely

CL-89 unmanned airborne surveillance system.

piloted air vehicle (RPV) plus ground support and maintenance equipment. The air vehicle can take off and land vertically, translate to horizontal flight, and hover. It is highly survivable because of its very low noise level, small size and low radar signature. Its sensor transmits real-time radar, TV or laser designating data.

Canadair also manufactures major components for aircraft made by other producers including the Boeing 767, the Lockheed C-5B and P-3C, the McDonnell Douglas F-15 and F/A-18A, and the Northrop F-5, CF-5 and T-38.

CL-289 unmanned airborne surveillance system. ►



CL-227 Sentinel unmanned surveillance and target acquisition system.



Canadian Arsenals Limited

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Le Gardeur, Quebec, CANADA
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Telex: 05-24642

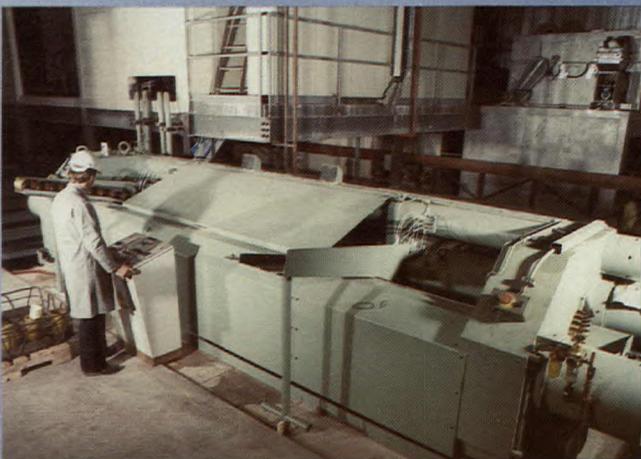
For the past 40 years, Canadian Arsenals has produced armament and related products for the Canadian Armed Forces, earning an enviable reputation as a centre of excellence for medium and large-calibre ammunition and ancillary military equipment. With these products, the company continues to

maintain the high standards of safety, quality and reliability that have long been recognized by NATO countries.

The company's manufacturing operations are supported by technological expertise, and imaginative design and engineering. Rigid quality

control is enforced from the reception of raw materials to the final assembly and testing of the finished products. This allows the company to offer excellent quality products at competitive prices.

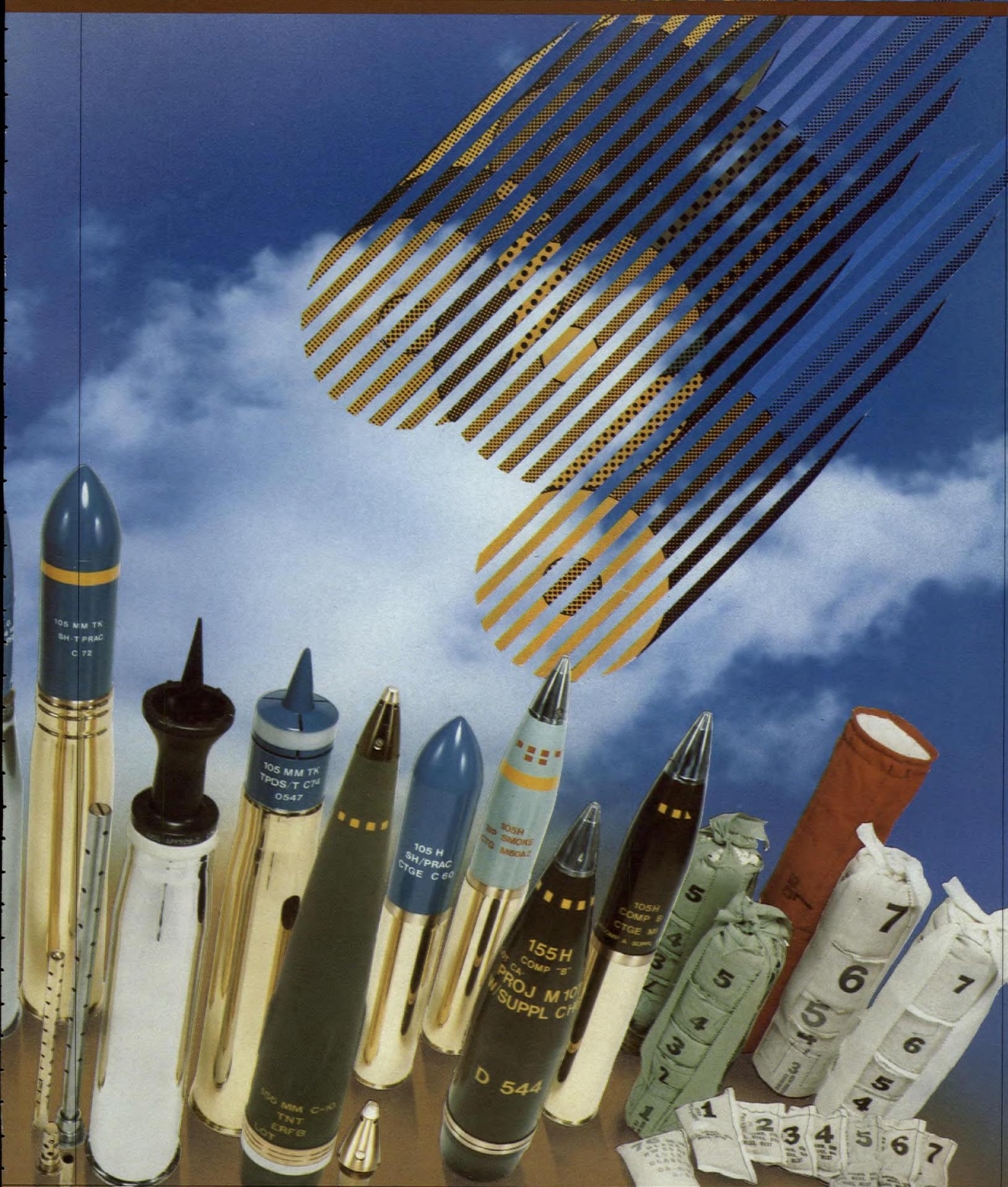
Constantly innovating and improving, Canadian Arsenals' research and development department gives priority to the search for better products and processes in the explosives and aero-ballistics fields.



Canadian Arsenals' new cartridge case plant in St. Augustin, Quebec and typical products.



Canadian Arsenals Limited



Canadian Astronautics Limited

1050 Morrison Drive
Ottawa, Ontario, CANADA
K2H 8K7
Tel: (613) 820-8280
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Canadian Astronautics Limited (CAL) is a diversified high-technology systems and engineering company that offers a broad range of products and services in space systems, radar and communications, signal processing and defence systems.

In recognition of its success, CAL received the Ontario Chamber of Commerce Outstanding Business Achievement Award in 1985.

CAL's laboratories, which include a clean room for aerospace hardware assembly, are equipped to support analog and digital electronic research, antenna and radio frequency (RF) development, and have computer facilities for signal processing and process control work.

Space Systems

CAL is currently designing and manufacturing an advanced, experimental HF ionospheric sounder which NASA will launch as part of a shuttle-based Space Plasma Laboratory in 1989.

CAL has developed and produced a deployable helical UHF antenna for the British Skynet 4 series military communications satellites. The antenna, launched from either the space shuttle or Ariane, will provide earth coverage radiated patterns from a geo-stationary orbit over two narrow frequency bands.

Cell procurement, battery production, and testing are just samples of CAL's spacecraft power systems capabilities.

CAL has developed a high-reliability battery management system for NiCd battery packs as well as several efficient low and high-voltage power supplies for satellites and the space shuttle.

CAL is prime contractor for the development of a spaceborne far ultra-violet solid-state imaging system which will travel aboard the Swedish Viking satellite to provide top-side real-time imagery of the polar auroral activity in the far ultra-violet band. By compensating electronically for the satellite's spinning motion, and using the ultra-violet region of the spectrum, day and night-time images of high sensitivity can be obtained.



CAL UHF antenna.



Corporate headquarters.



SARSAT local user terminal.

Advanced Systems

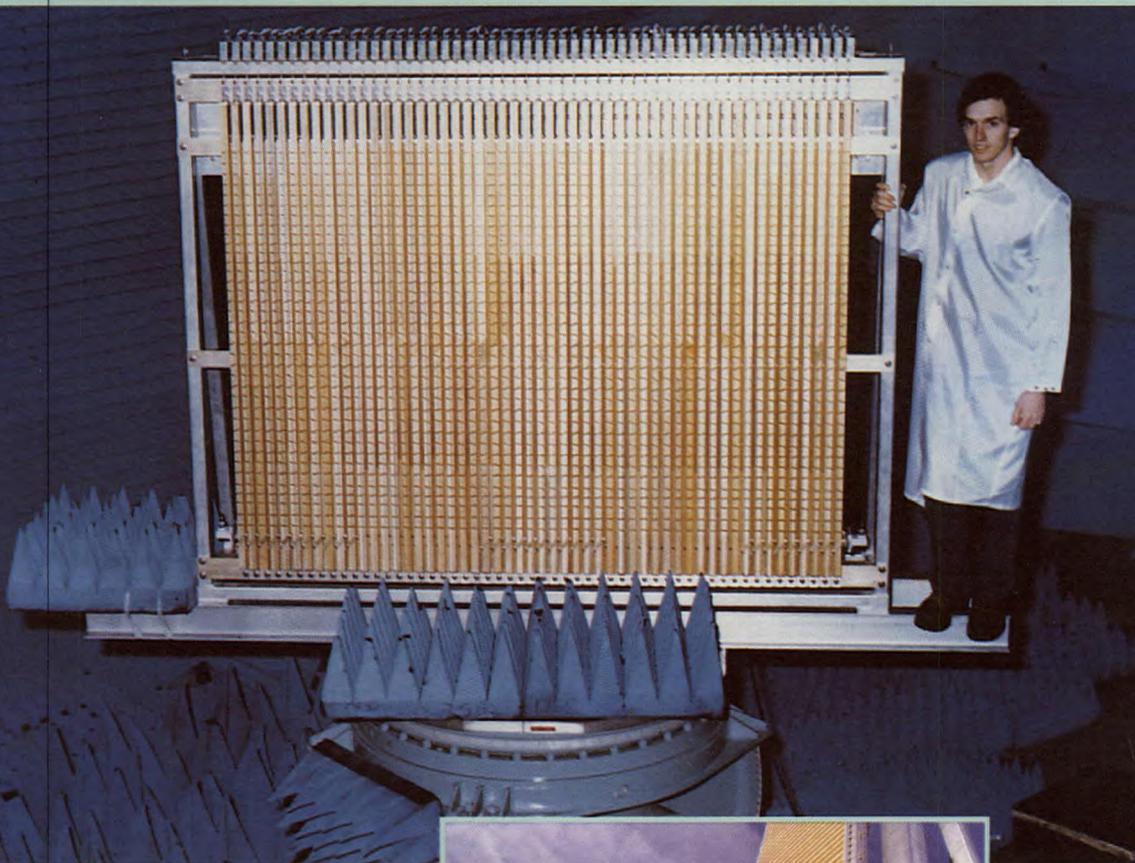
CAL's expertise in signal processing has made the company a leading supplier of search and rescue satellite system ground stations that interact with the international search and rescue satellite to locate distressed aircraft and vessels. CAL has also developed a fast, multidimensional image processing system and a number of acoustic processing systems for anti-submarine warfare.

Canadian Astronautics Limited

Military Systems

CAL's tactical signal simulator (TASS) is a family of powerful, versatile, software-programmable radar threat signal generation systems that will ensure readiness for the electronic battlefield. Not only is TASS an effective training tool, but it can also be used to test, validate and evaluate electronic warfare systems and to create tactical deception. CAL also markets a programmable communication signal simulator for complex waveform generation.

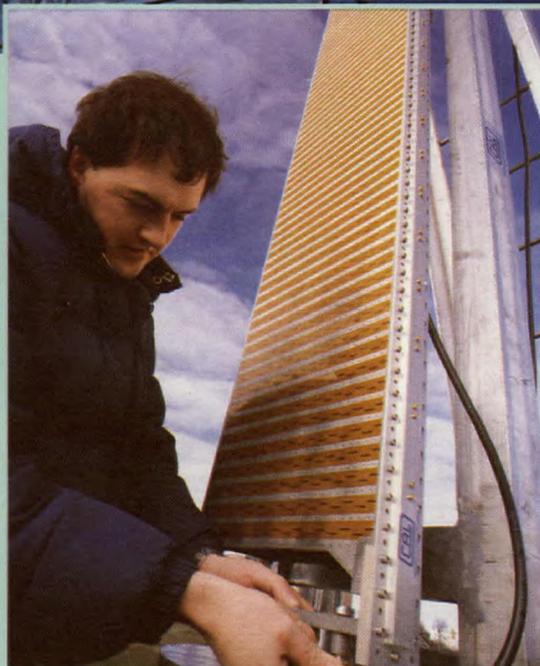
Microwave landing system (MLS) antenna.



Radar Systems

A highly efficient, low-cost, modular CAL radar system produces terrain maps as well as detects discrete targets. The side looking airborne radar (SLAR) has many applications ranging from coastal surveillance, sea-ice and iceberg mapping, crop and forest management, oil slick monitoring and natural resource identification, to agricultural analysis and policing of territory.

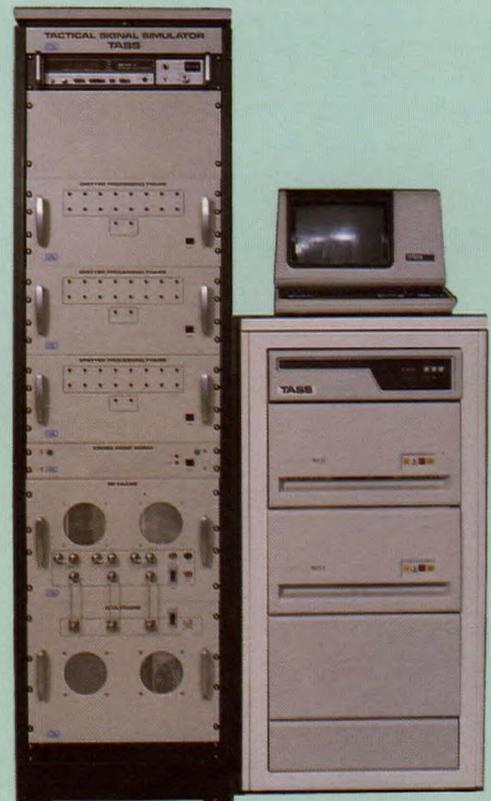
A phased array antenna has been engineered and fabricated by CAL for the azimuth portion of a new commercial microwave landing system (MLS). The antenna produces a narrow, steerable, fan-shaped beam which sweeps rapidly and continuously to the left and right of the extended runway centre lines as required by MLS. The CAL antenna has been integrated into an MLS system currently in operation. An improved



Side looking airborne radar (SLAR) antenna.

version is being developed for the Transportation Development Centre. This type of experience puts Canadian Astronautics in an excellent position to solve MLS problems, both by supplying subsystems and by meeting special installation/testing requirements.

Tactical signal simulator TASS® dynamic ground trainer.



Canadian Foremost Ltd.

1616 Meridian Road N.E.
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FAX: (403) 273-8084



DELTA 3.

Founded in 1965, Canadian Foremost Ltd. specializes in the design and manufacture of heavy-duty, off-road, all-terrain vehicles, both wheeled and tracked, with payload capacities ranging from 4 to 70 tons (3.6 to 63.5 tonnes).

Foremost vehicles are in service throughout the world

providing versatile off-road transportation for many industries including pipeline and powerline construction, geophysical exploration, mining, heavy oilfield hauling, and logistic support. They are also used to service such military needs as heavy-duty recovery.



NODWELL 60 personnel carrier.



*Division Offices:
Tracked Vehicle Supply (TVS)
Parts & Service —
Calgary, Alberta
HEP Pumping Units Division
Oilwell Pumping Units —
Lloydminster, Alberta*

*HDRV — Canadian Foremost's
heavy-duty recovery vehicle.*

Canoe Cove Manufacturing Ltd.

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Tel: (604) 656-3915
Telex: 049-7484

For almost 50 years, Canoe Cove has been building custom vessels and designing hulls to meet the quality, performance and durability requirements of government and business.

Canoe Cove's Commercial Division has constructed a variety of craft noted for their high-quality workmanship and proven hull design. These include research vessels, water taxis, camp tenders,

tour boats and patrol vessels. Agencies of the Canadian government have purchased a large number of Canoe Cove boats, ranging in size from 7 to 20 metres (20 to 60 feet). They serve in all phases of the marine field, on both Canadian coasts as well as on the Great Lakes and other inland waters. Most of these vessels have been built to meet the rigid standards of the Canadian Steamship Inspection Service.



The 12.5-metre Canoe Cove / R.C.M.P. patrol vessel with 4.5-metre beam is powered by twin 250-hp Caterpillar diesels (187.5 kW). Service speed is 24 knots and top speed, 25 knots.

The Canoe Cove 16-metre (53-foot) F.R.P. search and rescue / patrol vessel with beam of 4.5 metres is powered by twin 12V71 TIGM diesels of 550 hp with a maximum speed of 23 knots and cruise speed of 20 knots. This vessel is in service with the Canadian navy.



Canadian General Electric Company Limited

Aerospace Operation

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Telex: 06-989302
TWX: 610-492-8866

Canadian General Electric (CGE) is one of Canada's most diversified manufacturers. The company's participation in defence products supply is primarily through the CGE Aerospace Operation which currently produces aircraft engines, electronic systems, and provides repair and overhaul services through Genelcom, a wholly-owned subsidiary.

Aircraft Engines

CGE produces compressor blades and vanes for the CFM 56 family of aircraft

engines at its new plant in Bromont, Quebec. These engines power a wide range of military and commercial aircraft including the KC135, DC8 series 70, B737-300 and A320.

The Bromont facility, one of the most modern of its type in the world, utilizes the most advanced automation technology available today. Islands of automation consisting of robots, intelligent vision systems, and voice recognition equipment, all controlled by a central computer optimize every manufacturing process

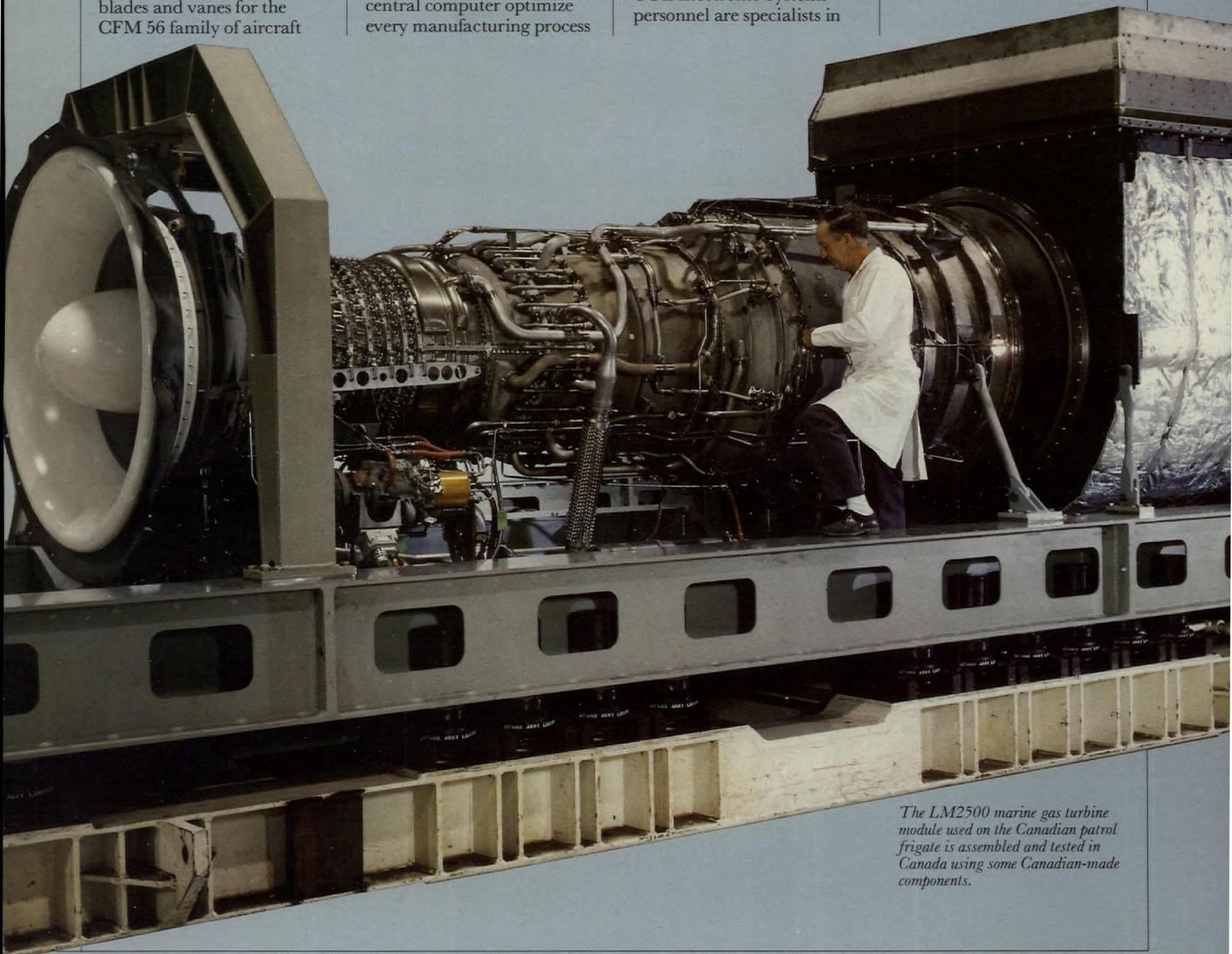
including material handling and quality assurance.

At its Peterborough and Montreal plants, CGE manufactures aerospace maintenance support equipment, ranging from engine bases and enclosures to complex balancing machine adapters and fixtures for the F404. The product line includes onboard and dock-side equipment required for Marine LM2500s.

Electronic Systems

CGE Electronic Systems personnel are specialists in

digital and RF communications technology. Secure systems have been developed using such special digital processing techniques as fast frequency shift keying. Signal security has further been enhanced by CGE through the development and use of advanced RF transmission methods.



The LM2500 marine gas turbine module used on the Canadian patrol frigate is assembled and tested in Canada using some Canadian-made components.

Canadian General Electric Company Limited



A time division interface unit test set.

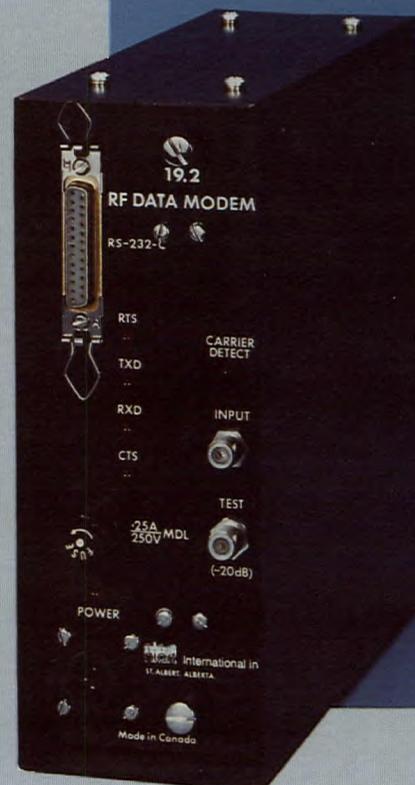
CGE has designed and produced time division interface units (TIU) for military data communication control systems. The TIU has the capability of receiving data at 2 400 BPS from a data modem and converting it to 1 300 BPS for processing by data-link transmitter. The company is also manufacturing data modems for specialized control applications.

Other defence projects in which CGE is currently involved include filament wound missile launching tubes and ship propulsion and control systems.

Repair and Overhaul

Genelcom Limited repairs and overhauls military electronics equipment to the quality standards of DND1015, AQAP-1, and MIL-Q-9858A. Current programs include the repair and overhaul of ground surveillance and airborne fire control radars and airborne communication equipment.

A communications modem.



Canadian Marconi Company

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Overview

Canadian Marconi Company (CMC) is involved in the design, development, manufacture, and support of specialized advanced technology electronics and communications for military and commercial markets, worldwide. The company's major divisions cover a broad range of products:

Avionics

A world leader in electronic systems for aerospace, the Avionics Division is active in the development, production and marketing of Doppler and Omega navigation systems, engine instruments, specialized airborne monitoring and display systems, Navstar GPS receivers, microwave landing systems (MLS) airborne receivers, MLS ground station equipment, instrument landing systems (ILS), distance measuring equipment (DME), and VHF omni-directional range equipment (VOR).

Components

An important activity of the Components Division is the custom manufacture of multilayer printed wiring boards, thin film and thick film hybrid microcircuits, edge-lit panels, power supplies, and magnetic devices.

Defence Communications

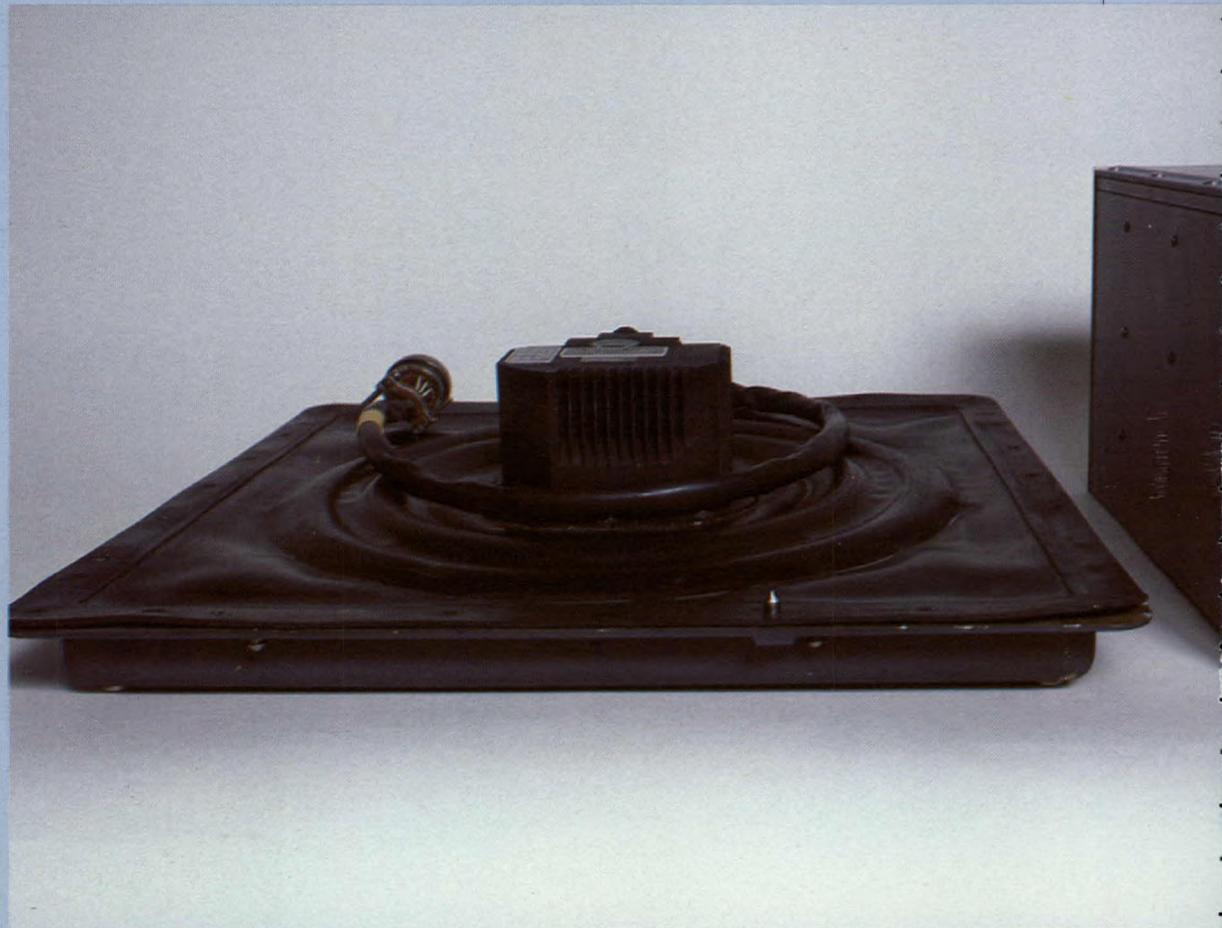
This division has developed command, control and communications systems for armed forces around the free world. Tactical communications packages include multi-channel line-of-sight radios, multiplexers, field switchboards, and the new Forward Error Correcting Codec (FECC).

Radar

The Radar Division is engaged in the development and production of navigation radar and surveillance radar systems and associated equipment, including the AN/SPS-503, chosen for Canada's Destroyer Life Extension (DELEX) Program.

Special Services

This division provides customers with specialized technical personnel and logistics support in the following three major areas: calibration of precision instruments, repair and overhaul of electronics systems, and field operations concerned with long-term installation and maintenance contracts for communications systems.



Canadian Marconi Company

Avionics Division

The CMA-734 "Arrow" Omega/VLF navigation system combines a high-performance, high-reliability 1/2 ATR receiver processor unit with a high-definition liquid crystal cockpit display to provide a lightweight, low-cost navigation system for both helicopter and fixed wing aircraft. Standard outputs include autopilot roll command and HSI interfaces. The total system with an E-field antenna weighs less than 8 kg (18 pounds).



The AN/APN-235 Doppler velocity sensor is an integral navigation subsystem that provides self-contained, three-axis velocity measurement on military helicopters. The system is an evolutionary design based on the velocity sensor elements of the AN/APN-221 Doppler Navigation set. It incorporates a fully compliant MIL-STD-1553B multiplexed data bus terminal for communication of velocity data to the aircraft central computer. The system determines velocity measurement with superior accuracy due to the use of the most modern microwave techniques and digital microcomputer control of the signal processing functions.

The advanced level of technology is apparent throughout the full range of CMC's Doppler equipment, which includes the APN-227 operational on USN and allied forces P-3Cs; the APN-221 installed on the USAF HH-53H "Pave Low III" helicopter; and the AN/APN-208(V)/CMA-708C (a derivative of the AN/APN-221 Doppler Navigation system) on board many allied forces' fixed and rotary-wing SAR, ASW and Maritime patrol aircraft.

CMA-734 "Arrow" Omega/VLF navigation system.

CMA-774 GPS D-Sets are designed for medium anti-jam applications. In aircraft, ships and land-based vehicles, Canadian Marconi two-channel NAVSTAR/GPS D-Sets are the latest and most precise in a series of superior military navigation aids.

CMA-786 GPS C-Sets, designed for low-dynamic applications in aircraft, ships and land vehicles, utilize the latest advanced software and hardware technologies to take advantage of the Navstar Standard Position Services (SPS) capability. Systems are available for both commercial and military applications.



Canadian Marconi's GPS receiver.



AN/APN-235 Doppler velocity sensors.

Canadian Marconi Company

Avionics Division

CMA-730 opto-electronic vertical scale instruments manufactured by Canadian Marconi Company incorporate advanced fibre-optic display technology to provide analog and digital readouts of various engine and fuel parameters. The colour-coded scales increase pilot efficiency and quickly alert him/her if a parameter is exceeded. They offer extremely wide viewing angles and sunlight readability (10 000 foot candles). Night vision goggle compatibility (ANVIS 6 specification) is achieved with the use of an absorptive filter over the face of the instruments. Another benefit of standard line instruments is the significant reduction in the use of cockpit panel space. CMA-730 instruments have been selected for every U.S. Army helicopter program since the mid-1970s because of their reputation for excellent reliability, unique display approach and modularity. Installations include the OH-58D, Apache and the CL-600 Canadair Challenger.

CMA-776 status display system (SDS) is a dual-redundant caution and warning system that provides readouts of prioritized faults on a two-line alphanumeric display. The system can be installed as the primary aircraft warning system or alongside the existing system where centralization and

CMA-730 opto-electronic vertical scale instruments



clarity of fault warning are necessary. Engine maintenance/operating costs can be reduced through engine performance monitoring. Engine data and air data parameters are automatically recorded throughout all phases of the aircraft operation. Recorded data are subsequently removed on the ground and analyzed to produce performance trend plots, using the CMA-887 data transfer unit. The more rugged CMA-796 data collection unit is available for flight line/military applications.

CMA-923 flight advisory computer (FAC) is a computer-based system that achieves significant fuel savings in fixed-wing applications. The unit is programmed with all relevant performance sections of the aircraft operating/flight

manuals. After the crew inputs planned flight parameters, the FAC advises optimum fuel loadings and flight profile. Subsequent in-flight performance monitoring and crew advisory warnings by the FAC enable the crew to operate the aircraft in the most efficient manner.

Rotary-wing applications of the FAC concentrate on

The CMA-882 avionics management system (AMS) is a flexible avionics information management and control system capable of acting as either a bus controller or as a remote terminal when integrated with a MIL-STD-1553 bus. The use of a small, high-resolution flat-panel display leaves room for other functions and makes a single box, self-

CMA-923 flight advisory computer (FAC).



optimum/safe operating advisories to the crew. The FAC serves as an electronic flight manual that provides direct readouts for operation of the helicopter in response to flight condition inputs by the crew.

contained unit possible. Applications for the AMS include a communications, navigation identification (CNI) control and display unit; an integrated weapons control and display unit; an integrated mission planning station; and a navigation system control and display unit.



CMA-776 status display system (SDS).

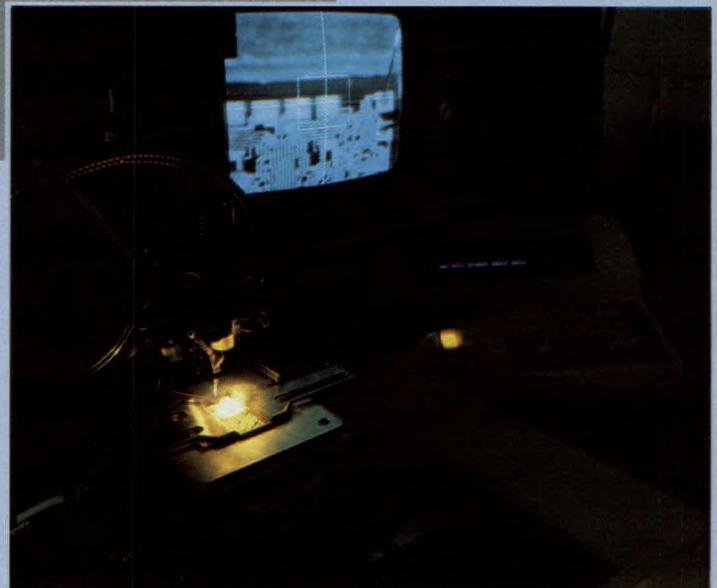
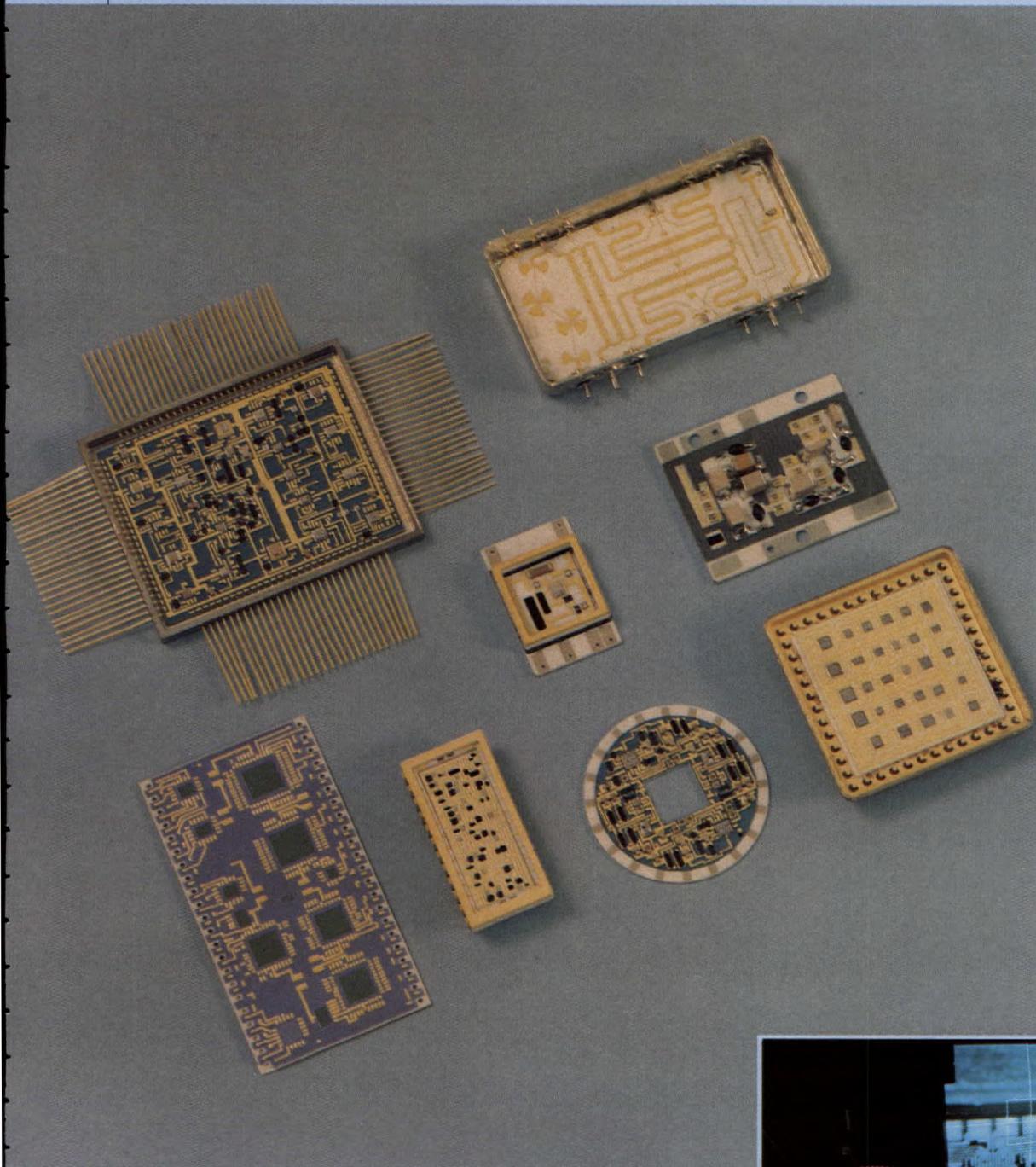
Canadian Marconi Company

Components Division

Canadian Marconi Company has more than 20 years of experience in the production of hybrid microcircuits. CMC microcircuits are manufactured in a self-contained facility that fully integrates engineering, production, quality control, sales and support personnel to meet demanding customer needs.

CMC applies thin and thick-film technologies to produce high-performance hybrid microcircuits to exacting military and industrial standards. Excellence in quality is assured through a stringent clean-room environment and computerized state-of-the-art production and test equipment.

Canadian Marconi Company's hybrid microcircuit products range from resistor networks to multilayer memories and microwave devices. They are used in sophisticated satellite communications systems, missile inertial guidance systems, aircraft weapons systems, and advanced computer systems.



Canadian Marconi Company

Components Division

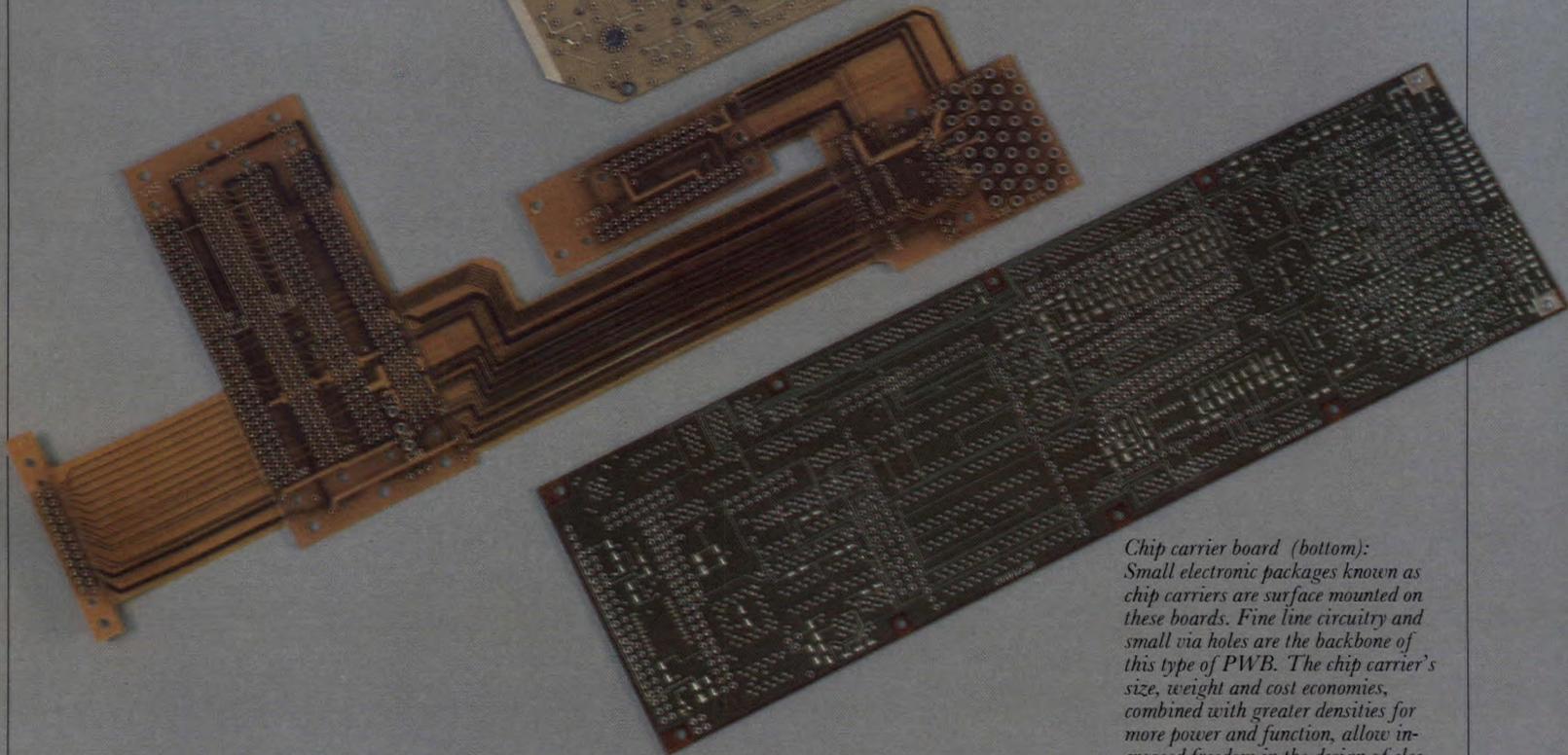
Canadian Marconi Company is a leading manufacturer of state-of-the-art printed wiring boards (PWB) used in high-reliability defence systems. The company's modern PWB facility is one of the largest in the world, and its customers include the foremost aerospace, defence and electronics manufacturers in the U.S. and Europe.

CMC applies the latest technologies to produce complex metal core, rigid-flex and chip carrier boards as well as strip line circuits, in accordance with military requirements and certifications. Solder mask over base copper and heat-sinks are common processes at CMC.

Metal core board (top):
This type of printed wiring board is constructed with an embedded heat sink to ensure heat dissipation as well as electromagnetic shielding for the components.



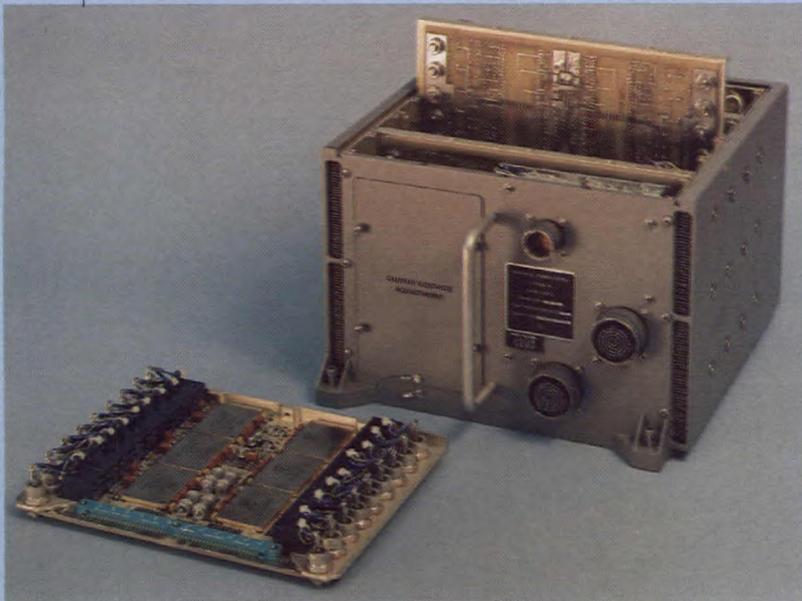
Rigid flex board (centre):
A rigid flex printed wiring board provides interconnection between the connectors of an electronic equipment box without the use of hand-soldered wires. The small space required by the rigid flex board helps to reduce the box size.



Chip carrier board (bottom):
Small electronic packages known as chip carriers are surface mounted on these boards. Fine line circuitry and small via holes are the backbone of this type of PWB. The chip carrier's size, weight and cost economies, combined with greater densities for more power and function, allow increased freedom in the design of electronic products.

Canadian Marconi Company

Components Division



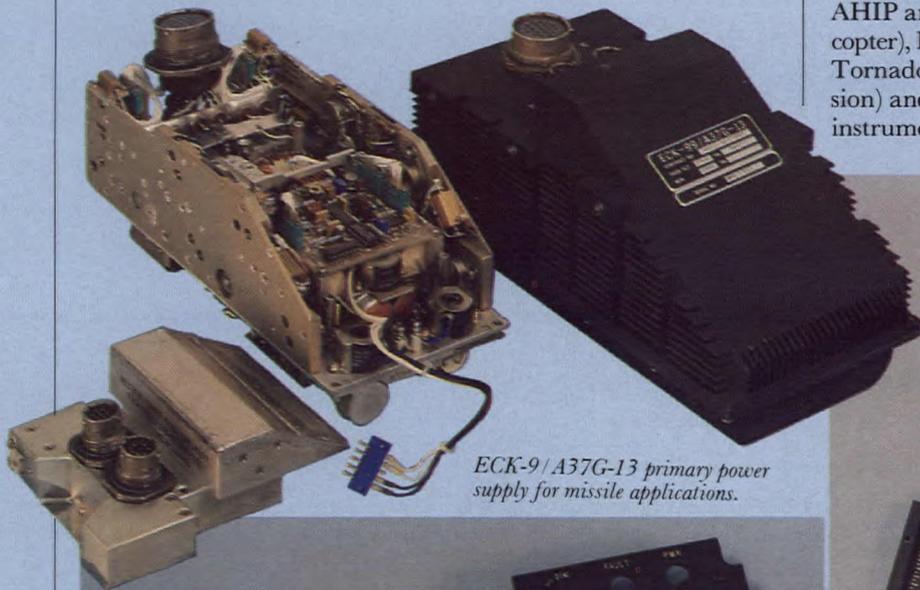
Light dimmer for combat helicopter.

The CMC plant producing integrally-illuminated-panels is a self-contained unit, with its own engineering prototype and production capabilities and support staff. The panel shop, which is QPL approved to MIL-P-7788, designs and manufactures a wide range of simple and complex panels and keyboards for both military and commercial applications.

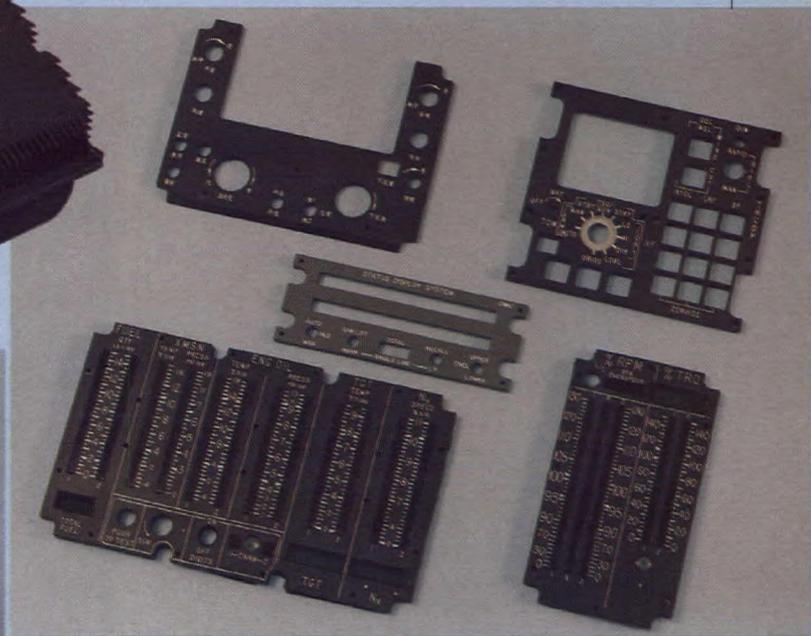
CMC's panel shop has set up a full program for research and development of electroluminescent (EL) and filtered incandescent night vision goggle (NVG) compatible panels and keyboards. NVG compatible prototypes and production panels have been fabricated for military avionics applications such as AHIP and Cobra (Bell Helicopter), Blackhawk (Sikorsky), Tornado (Simmonds Precision) and CMC's engine instruments.

Canadian Marconi's power supplies and specialized electronic components address the power and signal conditioning needs of the aerospace industry. Specific products range from 100-ampere/1 000-watt power supplies designed for airport ground-based equipment to miniaturized high-frequency passive element networks and active signal conditioning circuits used in missile applications.

CMC's expertise in the fields of circuit design and analysis, materials and electronic packaging, thermal design and analysis, and magnetics design allow this product group to respond to most of the defence industry's power supply needs.



ECK-9/A37G-13 primary power supply for missile applications.



CMC produces panels and keyboards for military avionics and missile control applications.



Canadian Marconi Company

Defence Communications Division

The combination of CMC's state-of-the-art digital UHF CMR-104 radio set and its TD-5064(V)/U delta modulation multiplexer creates a tactical multichannel radio relay system of outstanding flexibility. The CMR-104 operates in the 1350-1850 MHz band, and accepts both TRI-TAC and Eurocom traffic with selectable interface formats.

All radio elements are housed in a single rugged case suitable for hard rack mounting. Baseband and power interconnections are on the rear panel; orderwire and antenna connections are on the front panel. Set-up, control and monitor functions are performed on a single-purpose keyboard and alphanumeric display. These functions are microprocessor controlled to

minimize human error. A digital orderwire provided in the unit can be accessed by the operator handset or by external encryption equipment.

Advanced circuitry and mechanical design with no moving parts ensure high reliability. Repair time is cut by the ready access and replacement of modules and sub-assemblies. Faults are located by built-in test equipment (BITE). The radio operates from 115/230-VAC or 24-VDC power sources, with automatic changeover to DC if there is an interruption in AC supply.

The TD-5064(V)/U multiplexer, a self-contained solid state unit, offers 15 voice channels over a radio or cable link. It can be used in master/slave configuration to provide up to 63 channels if four units are stacked. In this case, the 16th channel of the master unit serves for frame synchronization. The channel sampling rate is 16/18 or 32/36 kb/s, the low or high rate being selectable. The basic configuration uses 15 delta modulation voice frequency codecs, any or all of which can be replaced by codecs providing for digital, teletype, data and in-band signalling codes.



CMR-104 radio set with TD-5064(V)/U multiplexer.

Canadian Marconi Company

Defence Communications Division



AN/GRC-103(V) radio set.

The AN/GRC-103(V) is an easily transported tactical radio designed for the rapid establishment of high-quality radio relay circuits in military forward area communications systems. It is intended for use with delta modulation, pulse code modulation, or frequency division multiplex equipment and is suitable for transmitting a wide variety of traffic including telephone, telegraph, teletype, facsimile and data. The equipment operates in 220 to 1 850-MHz frequency range in four separate frequency bands. Any of the RF channels can be rapidly selected by means of simple front panel controls.

A directional antenna system and a lightweight, portable mast assembly, specifically designed for this equipment, are also available. The transmitter and receiver operate on the same corner reflector or parabolic antenna selected according to the frequency band. All components of the AN/GRC-103(V) are designed for continuous operation and fully meet military environmental and qualitative specifications for this class of equipment.

The radio set will carry 15-63 channels delta modulation, 6-24 channels pcm, or 4-60 channels fdm.

The SB-4170/TT is a 12-line semi-automatic field tactical switchboard, incorporating a microprocessor-controlled circuit-switching crosspoint matrix. This allows straightforward subscriber interconnection and status display, and automatic release at the completion of each call. Optional net radio interface (NRI) permits direct connection to a Combat Net Radio Base Station. This compact switchboard is one-man transportable and is designed for service in adverse tactical environments.

All circuitry is on printed circuit cards, including common cards and optional channel cards. Four types of channel cards are available, covering Magneto,

DC Closure, CB/CBS and four-wire trunk services. These can be selected in any combination up to a maximum of six channel cards per switchboard to provide a required interface capability.

An optional pair of cards provides the NRI facility. Using this facility, a call to or from a man-pack radio in the field can be patched directly into the telephone system.

The SB-4170/TT is designed to accommodate either one or two power modules: the AC/DC power supply or the manual ringer battery. Both have a DTMF keyboard and can be switched to either dial pulse or DTMF operation.



SB-4170/TT telephone switchboard.

Canadian Marconi Company

Defence Communications Division

By developing more efficient multiplexing, conversion and combining units, CMC's Defence Communications Division has produced shelterized communications terminals and relays that provide greater channel

capability, broader use of channels, and more methods of communicating than were previously available.

The AN/TRC-180(V) radio terminal set is designed to replace the AN/TRC-145 radio terminal set and the

AN/TRC-113 radio relay, which can be easily converted to the AN/TRC-180(V) configuration. The AN/TRC-180(V) combines three 15-voice channel radio relay and multiplex terminal systems with ancillary equipment for security interface, interconnection and power distribution. The three radio terminals use the AN/GRC-103(V) radio in conjunction with the TD-5064(V)/U multiplexer and a CR-3837/U converter to provide interface with TSEC/KG-27 security equipment. Patch

panel arrangements are installed for video and order-wire signal cross-connection, and a separate patch panel is in place for cable connection in conjunction with three TD-754 multiplexers.

The Dual Facility radio terminal consists of two radio terminal systems with a separate switching centre. The terminals are rack-mounted and each comprises an AN/GRC-103(V) radio set with antenna and mast, and a TD-5064(V)/U multiplexer. The switching centre has two SB-4170/TT telephone switchboards with a total of 24 lines controlled by a single operator.



Camoplast Inc.

Kingsbury, Quebec, CANADA

JOB 1X0

Tel: (819) 826-5911

Telex: 05-25126

Camoplast Inc., a wholly Canadian-owned company, supplies the automotive, transportation, office equipment industries and the military with polymeric components (rubber, plastics,

and reinforced plastics) as well as industrial and institutional clothing.

The Mode Division produces top-quality industrial garments designed to clients' specifications. Among the company's satisfied Canadian customers are the Department of National Defence, the Royal Canadian Mounted Police, and the Government of Quebec.

The Rockland Division specializes in moulding products such as guidance rings, obturator rings (military shells) and suspension wheels for military tanks to ASTM, SAE, CSA, BNQ, and military standards.

The Roski Division has the expertise and the sophisticated facilities for moulding,

painting and assembling fibre-glass and plastic products for automotive, military, heavy transportation and office equipment applications. The wide range of Camoplast products includes truck and subway car cabs, gondola car covers, tank seats, and photocopier parts.

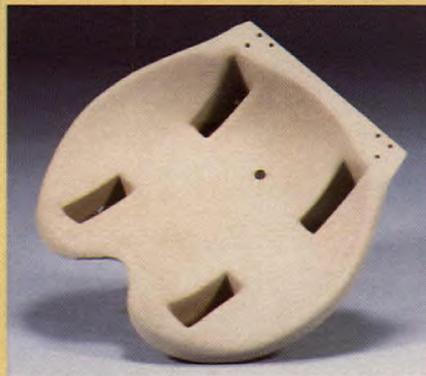
Camoplast is committed to quality control. The company's expertise, extensive laboratories, up-to-date equipment, and statistical process control guarantee production according to the customer's quality specifications. This commitment together with on-time delivery and close co-operation with customer engineering and design departments, have made Camoplast a major supplier to North American industry.



Camouflage jacket.



Cold weather work jacket.



Seat for military tank.



Suspension wheels for military tanks.
Track pads for military tanks.
Guidance ring.



Truck cabs.

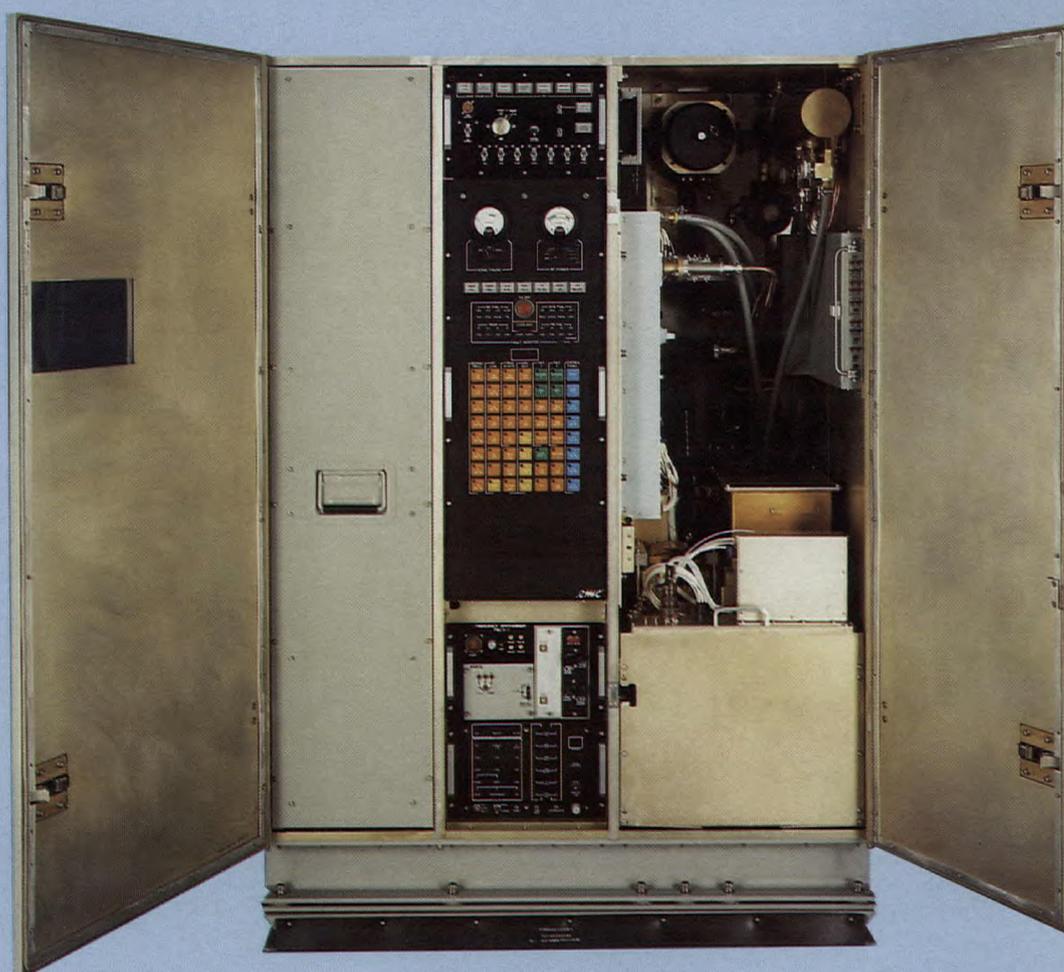
Canadian Marconi Company

Radar Division

The AN/SPS-503 is an E/F (S) band, shipborne air search radar that can be used in severe ECM and sea clutter environments. Frequency agility, pulse compression and advanced signal processing techniques are some of the superior performance features of this compact, lightweight system. It is ideally suited for ships as small as 300 tonnes.

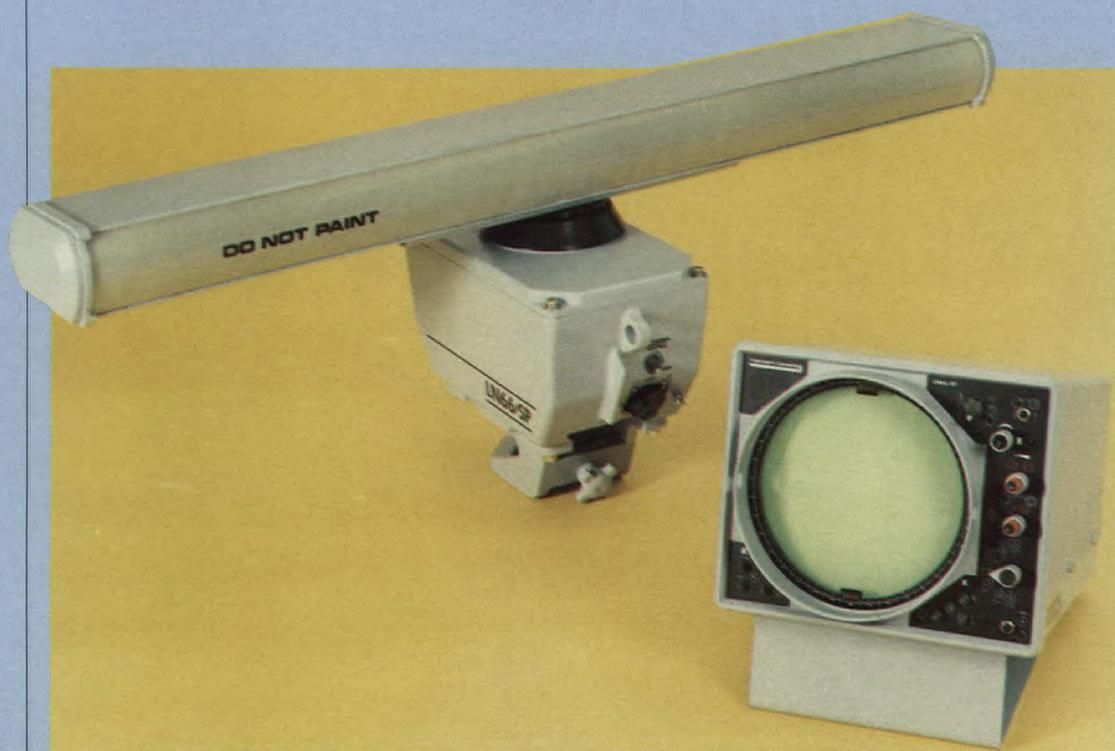
The modular design permits various system configurations with the selection of low and high-power transmitter options and a range of small, medium or large aperture antennae with or without stabilized platforms. IFF facilities can be incorporated. The AN/SPS-503 offers a coherent transmitter with pulse-to-pulse frequency agility, pulse compression, sidelobe cancellation, jamming strobe, digital signal processing, CFAR, PFR discrimination, and adaptive velocity compensation.

System output can be conventional video or digital data. An optional plot extractor (digitizer) can be accommodated with the signal processor unit.



AN/SPS-503 surveillance radar.

LN-66 surface search radar.



CMC's LN-66 radar is a marine craft surface search radar designed to provide accurate data for target location, navigation, collision and adverse weather avoidance. The system includes a 10-kW transmitter/receiver unit, a high-resolution 25-cm (10-inch) PPI display including relative or north stabilized presentation, and antenna assembly. The LN-66 has been installed by the U.S. Navy in all classes of ships from river patrol boats to nuclear-powered aircraft carriers. Under the nomenclature AN/SPS-59(V), it is used extensively by U.S. Army marine craft. A 75-W high-powered version is found on all U.S. Navy LAMPS helicopters in ASW and surveillance roles, and under the nomenclature AN/TPS-66, in the U.S. Navy AN/TSQ-108 radar sonar surveillance centre.

Casey Copter Accessories Limited

P.O. Box 121, Montreal AMF
Dorval, Quebec, CANADA
H4Y 1A5
Tel: (514) 636-6155
Telex: 05-821574

Casey Copter Accessories, founded in 1975, designs and manufactures aircraft cabin heating systems operating on the recovery of waste engine heat.

Casey Copter's products function as air-to-air heat exchangers to recapture waste heat from gas turbine engines. As the Casey system does not use bleed air or fuel, it has no effect on aircraft performance as measured by exhaust gas temperature, range, station time or manoeuvrability.

Casey heaters are available for the following aircraft and helicopters:

Agusta A109
Agusta-Bell 206
Beech A36 Bonanza
Turbine Conversion
Bell 206B, 206L, 206L1,
206L-3, 0H58A, 0H58C
Hughes 500, 0H6A
MBB B0105
Pezetel MI-2
Siai Marchetti SF700

Casey has now developed and tested heating systems to fit Pratt & Whitney Canada PT6 engines producing 32 000 BTU/h with

no power penalty. An engine-driven vapour cycle air conditioning system development program is under way with the first unit FAA certified on a Bell 206L3 helicopter. The innovative system is tailored to the Bell 406 Combat Scout and 0H58D military helicopters.

The company is heavily involved in the commercial market and has installed over 1 500 units on Bell 206 helicopters alone. Some current users of helicopters heated by the Casey system

include the Royal Canadian Mounted Police, Canadian Coast Guard, Finnish Border Guard, Swedish National Police and Yugoslavia State Police. Military sales are becoming increasingly more important with systems installed on 0H58 and 0H6A helicopters of the U.S. Army National Guard.

The excellent quality and reliability of Casey products are recognized on international markets. Export shipments rose to 83 per cent of total sales in 1984.



CBTS-Computer Based Training Systems Ltd.

135, 6715 — 8th Street N.E.
Calgary, Alberta, CANADA
T2E 7H7
Tel: (403) 275-1680

CBTS-Computer Based Training Systems offers computer software products and consulting services to support the application of computer-based learning systems in a wide variety of educational and industrial training situations.

The company has extensive experience in both instructional technology and computer applications. Collectively, senior personnel possess a comprehensive background in computers, education, electronics, and industrial training, as well as educational administration and project management.

The computer software products developed by Computer Based Training Systems have been designed for adaptation to virtually any learning situation, and to all teaching methods and curricula. From traditional classroom techniques to individualized teaching methods, CBTS can assist with the delivery of instructional materials as well as with the management of the learning environment.

CBTS-CML is a software package designed to manage armed forces recruits while they proceed through an individualized competency-based training program. The strength of the system lies in its ability to manage large numbers of students undergoing any type of training, be it lectures, CBI, simulators, or other.

Self-paced CML courseware in mathematics, electronics, medical emergencies, technical emergencies and other subjects, is currently available. Present armed forces training courses can economically be converted to the CML system in preparation for any future "contingency situation." Depending upon the quality of the instructional design of the current

armed forces courseware, CBTS-CML can easily transfer the materials to computer-based management within months. The start-up time required to add a large number of new trainees to an already developed training program is minimal.

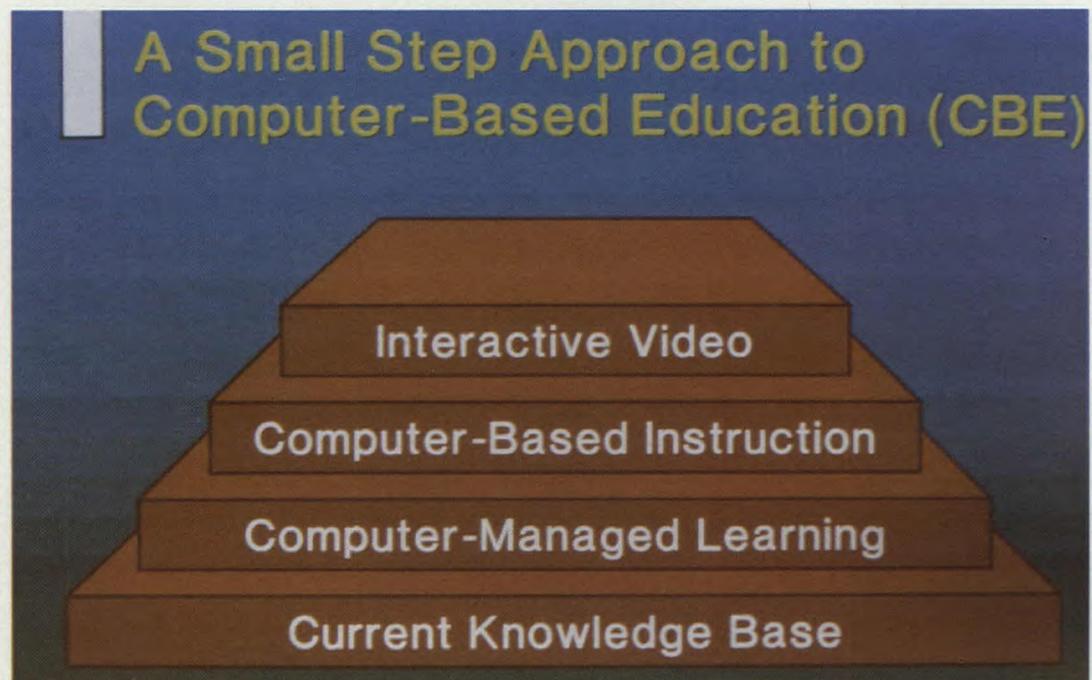
CBTS offers a complete range of consulting services that focus on sound instruc-

tional design and on the development and implementation of a total learning system to meet the client's needs. The company provides first-time computer users with a general introduction to computer-based learning and assists more experienced clients with its quality software products and wide range of experience in specific computer applications. CBTS works closely

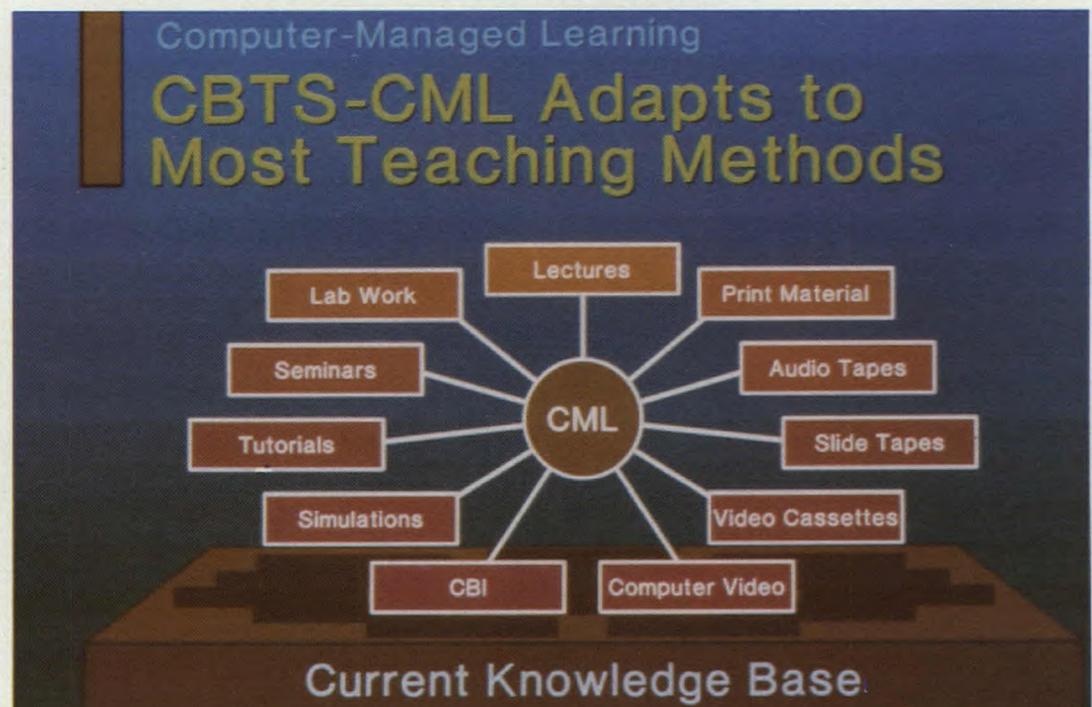
with clients both to adapt existing systems to specific needs and to develop new systems when required.

Sensitive to the changing trends in education and training, CBTS is committed to continuing its research and development activities, upgrading its existing software and creating new products to meet evolving client needs.

A Small Step Approach to Computer-Based Education (CBE)



Computer-Managed Learning CBTS-CML Adapts to Most Teaching Methods



C-D-N Nordic Int'l.

1044 Rangeview Road
Mississauga, Ontario,
CANADA
L5E 1H3
Tel: (416) 278-3331
Telex: 06-961146

C-D-N Nordic Int'l., a division of Woodhead Canada Ltd., manufactures an extensive range of fire-fighting and fire-protection vehicles and equipment for industrial, commercial and municipal purposes, including airports. Manufacturing facilities are located in Mississauga, Ontario.

C-D-N specific-purpose equipment is custom-designed and outfitted to meet the needs for specific emergency situations of customers around the world. The company's unique design and manufacturing capability can satisfy virtually any particular requirement with equipment that overcomes obstacles such as rough terrain, tight quarters, remote locations, needs for huge quantities of water/foam, and highly dangerous industrial situations.

The company offers a complete design service for C-D-N fixed-position systems for refineries, industrial complexes, processing plants, aircraft hangars and similar locations.

Among the most popular C-D-N fire trucks are dual-agent crash/rescue vehicles for commercial airports (11 000 litres (3 000 U.S.



All-Terrain Foam Boss.

gallons)), and the "All-Terrain Foam Boss" that goes where most conventional vehicles cannot.

In intermediate-sized fire-fighting vehicles, the best-

known C-D-N Nordic design is its series of "Rapid Rascal" trucks. Built on a commercial 4x4 chassis, this series has water/foam capabilities and can be supplied with roof turrets. They are designed



Rapid Rascal.



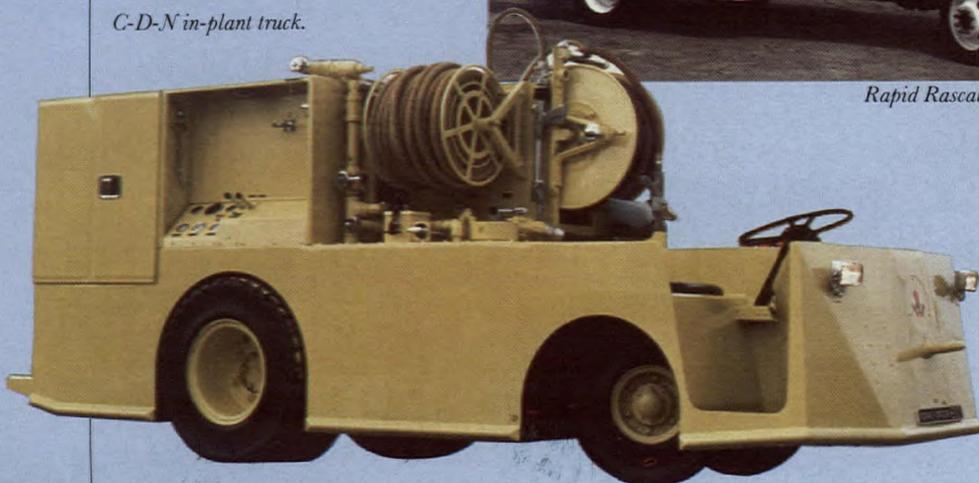
Foam Boss.

for use in refineries, industrial complexes, and smaller airports.

C-D-N Nordic has built a solid reputation for its high-quality, highly dependable skid packs of water/foam systems that can be trailer or truck mounted, installed as fixed position units, carried by helicopter to remote areas, or mounted on military marine vessels.

An in-plant fire truck, a recent development by C-D-N Nordic, is designed specifically for factory and warehouse use. It has the manoeuvrability of a fork lift with a 70° cramp angle power steering system, and can be turned in a space no larger than its own length. It can be driven around factory equipment, assembly lines and storage racks, with speed and precision.

C-D-N in-plant truck.

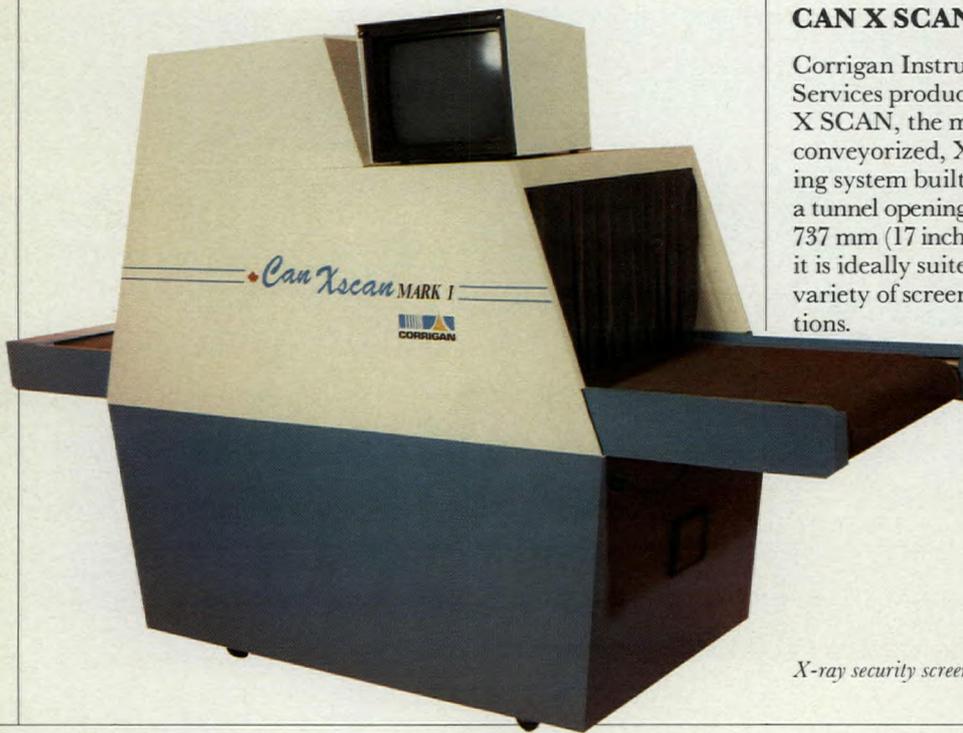


Skid pack.

Corrigan Instrumentation Services Ltd.

330 Guelph Street, Unit 8A
Georgetown, Ontario, CANADA
L7G 4B5

Tel: (416) 877-2273
Telex: 06-97862



CAN X SCAN MARK 1

Corrigan Instrumentation Services produces the CAN X SCAN, the most compact, conveyORIZED, X-ray screening system built today. With a tunnel opening of 432 mm x 737 mm (17 inches x 29 inches) it is ideally suited to a wide variety of screening applications.

Equipped with a removable 2 438-mm (8-foot) conveyor and large rubber casters the system can be moved into elevators and on carpeted areas. By employing the latest technology in detector systems and digital video storage, resolution of 34 AWG copper wire is routinely obtained. With 0.15 mR output per dose, the unit is safe for high-speed colour film.

Among the diverse clients who benefit from the security the CAN X SCAN provides are correctional facilities, government buildings (courthouses, etc.), nuclear power plants and small to medium-sized airports.

X-ray security screening system.

CTF Systems Inc.

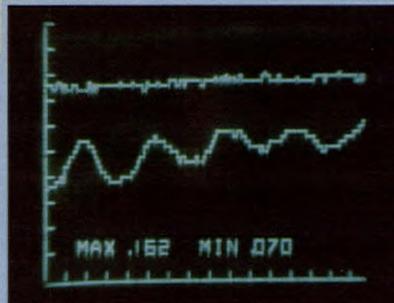
15-1750 McLean Avenue
Port Coquitlam, British Columbia,
CANADA

V3C 1M9
Tel: (604) 941-8561
Telex: 04-353622



The NDE-2 automatic tube analyzer showing superheater (1) and generator (2) probes with support modules.

The display module shows a plot of maximum and minimum tube wall thickness (vertical axis) along the tube's length (horizontal axis). Scales are 0.5 mm and 25 mm (0.02 inch and 1 inch) per division respectively.



CTF Systems Inc. is involved in research and development, as well as in manufacturing, in two areas of defence interest: SQUID-based magnetic anomaly detection and ultrasonic non-destructive testing.

The Model NDE-2 automatic tube analyzer is a microprocessor-based system which within minutes accurately assesses the state of fireside corrosion of power boiler tubes in naval vessels of the frigate or destroyer class. Data are quickly collected on the entire boiler allowing a far more systematic approach to scheduling overhauls. This avoids costly unscheduled tube removal and replacement. Data collected can be viewed, plotted and recorded on digital cassette for archiving and later analysis by engineering staff. This system of boiler maintenance is much more cost-effective than conventional boiler inspection procedures.

Codalex Ltd. / Ltée

5780 Decelles Avenue
 Montreal, Quebec, CANADA
 H3S 2C7
 Tel: (514) 731-3251
 Telex: 05-25225

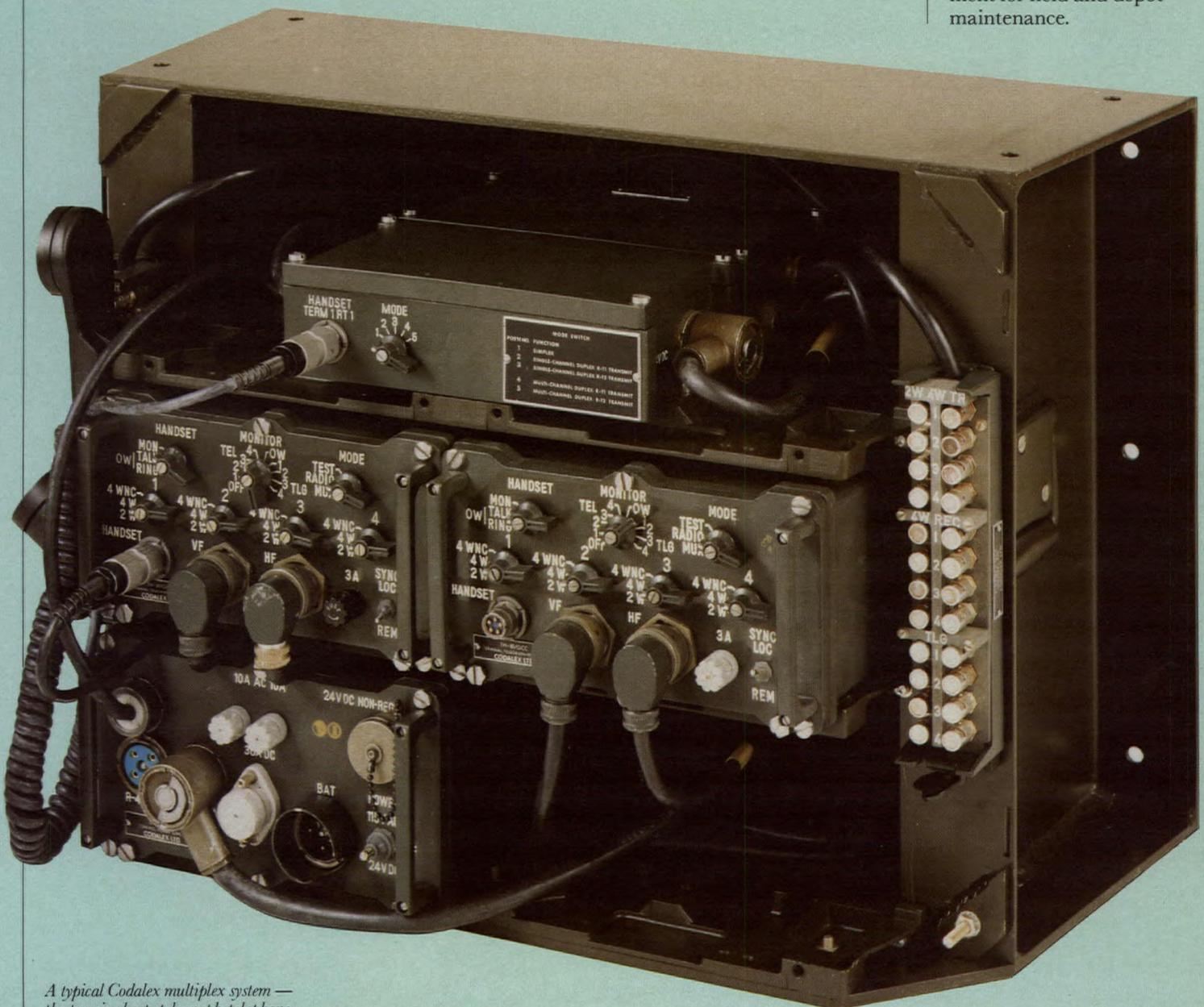
A leading producer of tactical frequency division multiplex (FDM) systems, Codalex is a major supplier of multiplex systems and accessories to the U.S. Department of Defense and the armed forces of several Far Eastern and Middle Eastern, African and European countries.

Codalex systems are primarily designed for use with standard military tactical radio sets, such as the AN/VRC-12 and AN/PRC-77.

The basic multiplex unit has the nomenclature terminal, telegraph telephone, TH-81/GCC. It permits four telephone channels, four VF telegraph channels and one orderwire channel to be carried over a single radio or wire path originally designed to carry only a single conversation. All telephones and teleprinters connected to the system may be used simultaneously with no interference between them.

A modification kit is now available for the radio terminal set, telegraph-telephone AN/MRC-135 and other similar sets such as the AN/TCC-501. The kit allows such sets to provide two 16 Kb/s data channels in addition to the four telephone channels, four VF telegraph channels and the orderwire channel.

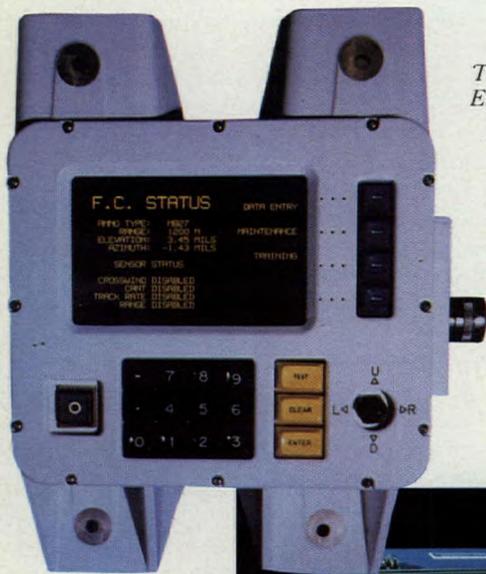
Codalex offers product support through training and custom-designed manual and automatic test equipment for field and depot maintenance.



A typical Codalex multiplex system — the terminal set, telegraph-telephone AN/TCC-501 supplied to Canada's Department of National Defence.

Computing Devices Company

P.O. Box 8508
 Ottawa, Ontario, CANADA
 K1G 3M9
 Tel: (613) 596-7059
 Telex: 053-4139



Tank F.C.C. with E.L. display.

Computing Devices was founded in 1948 to design and produce sophisticated electronic equipment, largely for military applications. The company is currently involved in the following specific areas of activity: anti-submarine warfare acoustic signal processing; tactical fire control for direct and indirect applications; perimeter intrusion detection systems; aircraft engine thrust computing systems; and digital display systems.

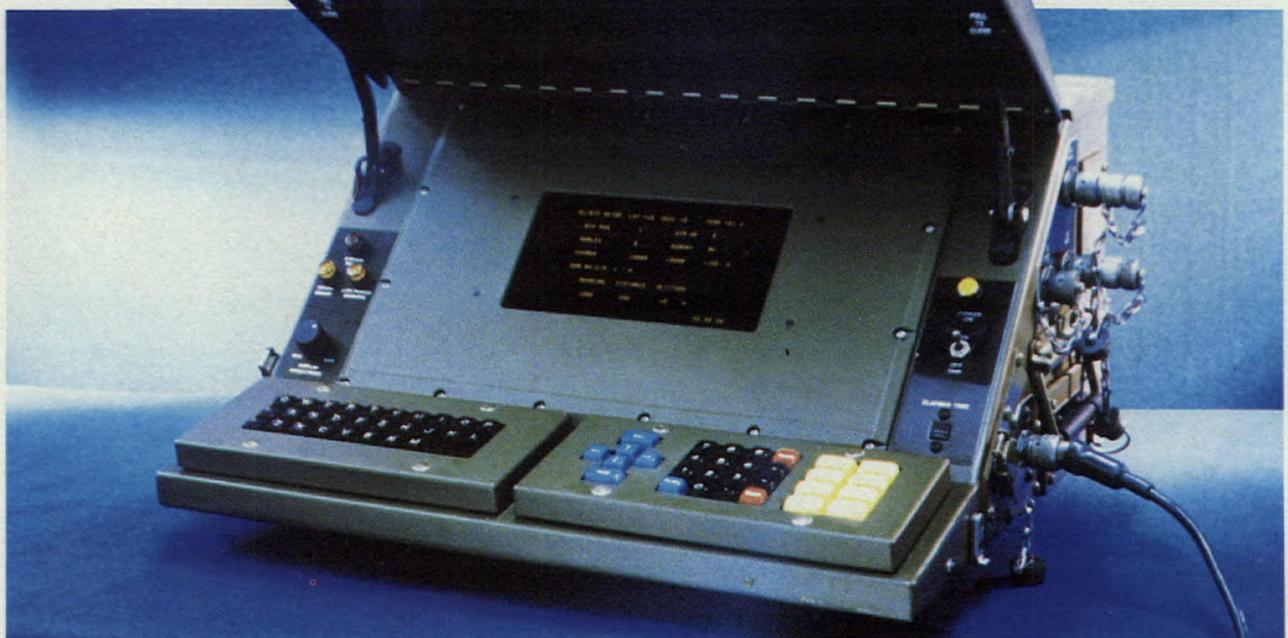
TCSE equipment.



Computing Devices has worked in ballistics computation since the early 1960s. It has successfully developed a digital ballistic computer for the U.S. Army M-1 Main Battle Tank, an upgraded model for the M1-A1 and an alternate version for the South Korean XK-1 M.B.T. The company has also designed and manufactured a portable artillery computer (Milipac) for the Canadian Armed Forces.

Computing Devices' thrust computing support equipment (TCSE) is a rugged portable unit that accurately determines the gross thrust of jet engines. With the use of TCSE, bare and installed engines can be trimmed to required levels of thrust at minimum hot section temperatures. Implementation of this new trim-to-thrust concept provides increased engine life and reduced operating maintenance costs. The company is now under contract to the U.S. Air Force for application of TCSE equipment to its entire T-38 training fleet.

Milipac™.



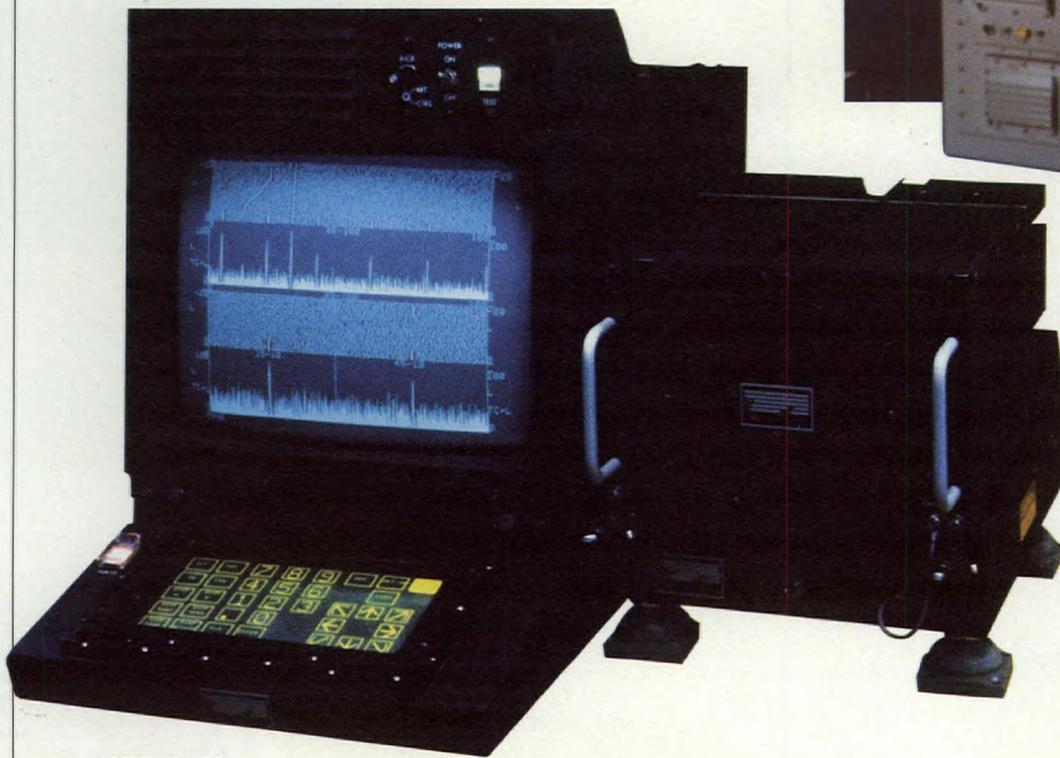
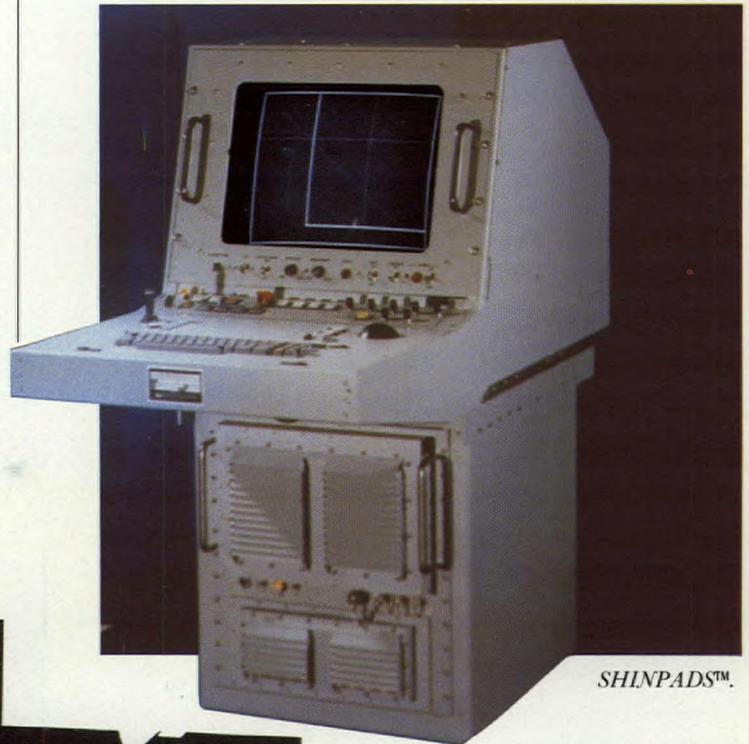
Computing Devices Company

Computing Devices is actively involved in image enhancement technology for the military, specifically in the design and manufacture of digital ship displays for the Canadian naval forces. The company develops digital display systems for many uses, emphasizing the design and utilization of flat panel display technology.

In the field of security, Computing Devices produces GUIDAR, a commercial system the company devel-

oped for the surveillance of large outdoor perimeters. A military version was developed for the U.S. Armed Forces. For small perimeter surveillance, the company offers the SPIR system.

Computing Devices manufactures a unique digital motion detection system for outdoor applications and is involved in the development of other advanced perimeter intrusion detection devices for both civil and military applications.



AN/UYS-503.

ASW Division

Computing Devices has been developing and deploying ASW acoustic signal processing, analysis and display systems since 1962. In response to the significant demand for these products, the company in 1984 formed the ASW Division staffed by over 150 engineers dedicated to solving aircraft, ship, submarine and shore installation anti-submarine problems.

The Computing Devices AN/UYS-503 is the most powerful, versatile, low-cost sonobuoy processor available. It accepts input from any existing U.S. inventory sonobuoy through any standard sonobuoy receiver. It can be used either as a stand-alone system or interfaced with standard data buses and onboard tactical navigations systems.

The AN/UYS-503 incorporates a new architectural concept that fully exploits the potential of advanced microprocessors and dense memory components. It is made from four identical, independent processors (slices) each of which can process inputs from one DIFAR buoy in one surveillance and six vernier bands or from two omni buoys in two surveillances and twelve vernier bands. All of the bands are processed and stored continuously, ready for immediate viewing. All processing and display are linear.

A dipping sonar option, available with the AN/UYS-503, is compatible with Computing Devices' AQA-801 Barra Side Processor, to give an advanced broadband capability.

The AN/UYS-503 is in-service with Canada's Armed Forces and with the Swedish Navy. It has been selected by the Royal Australian Navy as the acoustic processor for its new ASW helicopter, the Sikorsky SH-70.

COM DEV

155 Sheldon Drive
 Cambridge, Ontario, CANADA
 N1R 7H6
 Tel: (519) 622-2300
 TWX: 610-366-3164

COM DEV designs and manufactures microwave subsystems (multiplexers, frequency reuse feeds, phased arrays, beam forming networks), millimetre-wave systems (30-110 GHz) and signal processing subsystems (SAW based pulse-compression subsystems, Fourier transform processors) for both communications and remote sensing satellites, earth terminals, surveillance radar, electronic warfare and millimetre-wave systems.

Each COM DEV product line is supported by a total capability. From conceptual system analysis through product design, manufacture, qualification and testing, COM DEV employs the facilities and skills necessary to achieve technical and schedule compliance.

Since 1980 COM DEV has supplied more than \$60 million of microwave equipment for communications satellite systems. Currently, 34 satellites carrying COM DEV equipment are in orbit, representing a total of 97 years of continuous service without a single COM DEV product failure.

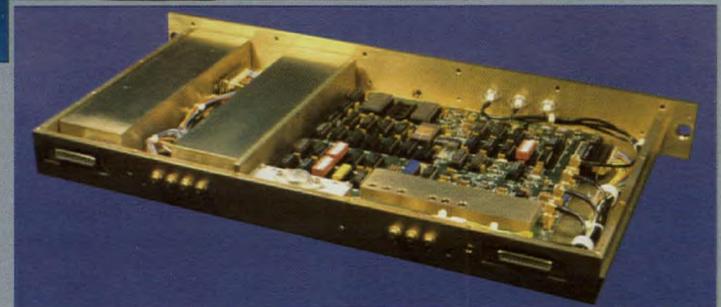
Defence projects under way include airborne radar warning receivers and phased array antennae; ground-based microscan receivers; pulse-

Wide bandwidth (25 per cent), full frequency reuse feed network with horn for KU-band operation.



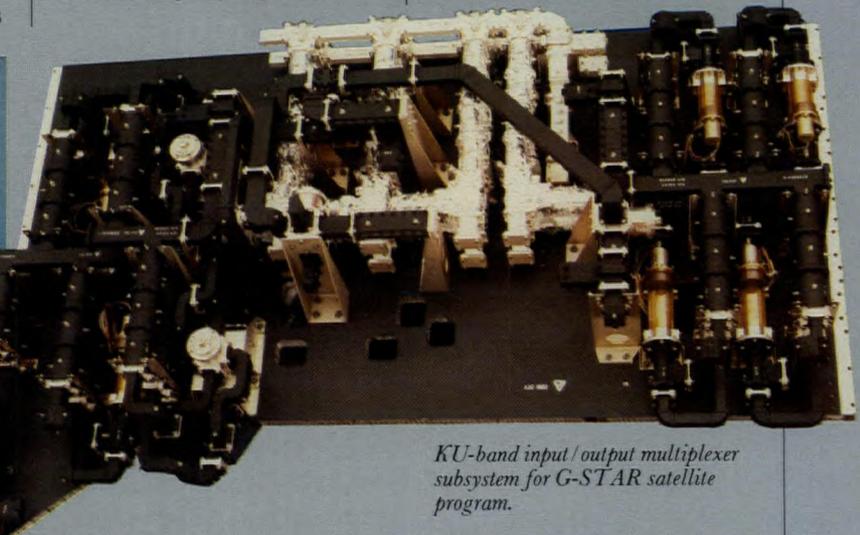
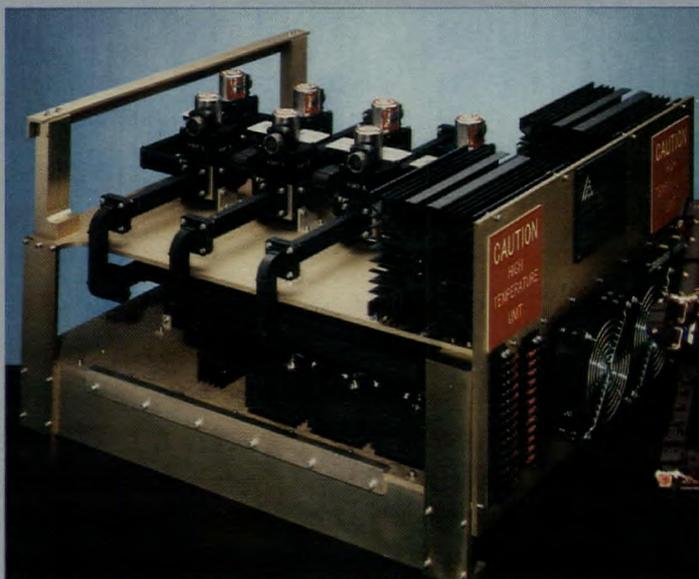
compression subsystems; and high-power circuits for millimetre-wave earth terminals.

To maintain its position as a technology leader in each of its business areas, COM DEV assigns some 10 percent of annual revenues to research and development projects. Many Canadian, U.S. and European patents have been awarded to COM DEV as a result of this



work. Research and development work funded by government agencies or commercial customers is also undertaken where such work complements company objectives.

Combined SAW and digital pulse compression subsystem for radar application.



Six-channel high-power KU-band earth station contiguous multiplexer for transportable shelters.

KU-band input/output multiplexer subsystem for G-STAR satellite program.

C-Tech Ltd.

P.O. Box 1960
525 Boundary Road
Cornwall, Ontario, CANADA
K6H 6N7
Tel: (613) 933-7970
Telex: 05-811538

C-Tech Omni Sonar and Transducers

C-Tech has been involved in the design and manufacture of over 25 different types of electronic scanners for sonar equipment of the NATO navies for over 15 years.

C-Tech capabilities include the manufacture of a variety of multi-element cylindrical and planar array transducers with all of the physical, functional, environmental and reliability characteristics required by the Canadian, United States, Royal Netherlands, Belgian and Royal navies. These transducers extend beyond the military to encompass designs for use by other organizations, both government and commercial.

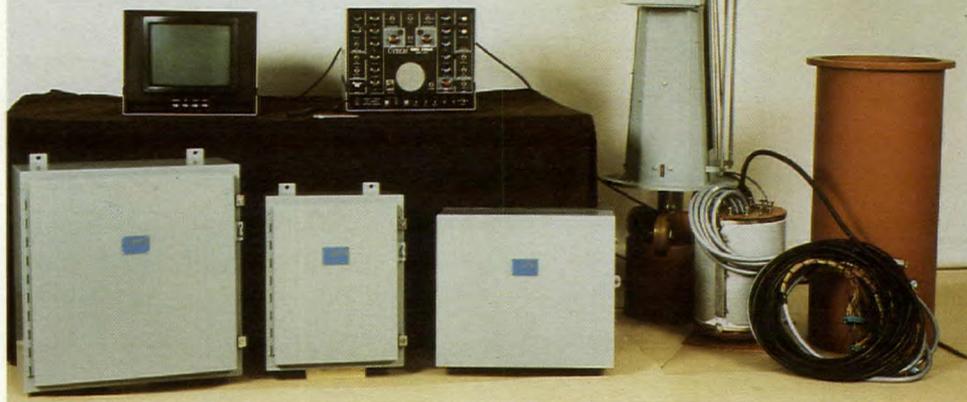
C-Tech was the first to use electronic scanning and colour displays in its line of omni sonars. Although their major application is commercial fishing, the C-Tech sonars are suitable for other marine and offshore industries and have been used by foreign navies.



Model 3000 display

Model 3000 control panel.

C-Tech Model 3000 sonar system.



C-Tech Standard Electronic Modules

C-Tech has been an active participant in the U.S. Department of Defense Standard Electronic Module (SEM) program since 1971,

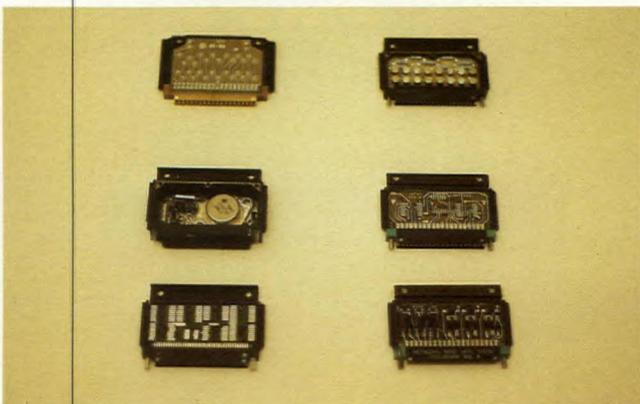
as a user, designer and manufacturer. The company is a qualified supplier of a broad range of "standard" SEMs, in addition to manufacturing "special" SEMs to fulfill customer requirements.

C-Tech Custom Inductive Components

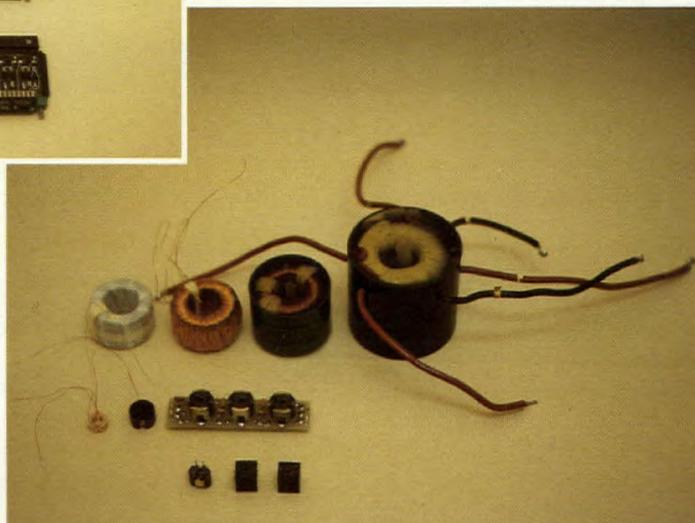
C-Tech designs and manufactures a variety of signal and power conditioning inductive components and filters for use in its own products.

The technical skills and equipment which are the basis of this work are also utilized in the design and manufacture, or the build-to-print, of custom inductive components for both commercial and military customers.

Both linear and toroidal winding machines, and related tools and fixtures, allow efficient production of a variety of coil configurations, which can be further processed in vacuum ovens and impregnating tanks if required. Extensive apparatus and test equipment permit a wide range of functional, as well as environmental, testing of completed components and devices.



Standard electronic modules (SEM).



C-Tech inductive components.

Dataradio Inc.

1819 Dorchester Boulevard West
Suite 400
Montreal, Quebec, CANADA
H3H 2P5
Tel: (514) 932-6600
Telex: 055-60435

Dataradio specializes in packet radio-based technology for commercial markets and is developing versions of its commercial products to meet military specifications. The Dataradio radio-based networking system is cost-effective and spectrum-efficient, unlike other available equipment.

The Dataradio 4800, a self-contained wireless modem, operates at 4800 bits per second on a simplex radio channel. This point-to-multipoint data communi-

cations system eliminates the need to install and maintain expensive lines in-plant or in the field.

Dataradio 4800 series uses advanced packet-switching techniques to provide capabilities for addressing up to 255 stations on a single frequency, and for automatic error-detection and correction that is totally transparent to the user.

Currently under development is an OEM version of the product, which operates at 2400 BPS, as well as a

4800-BPS radio-based synchronous modem. Store and forward repeaters for the standard 4800S series product are available. The entire network normally operates on a single voice grade radio channel, with a full duplex dual frequency repeater available as a standard option.

Dataradio creates complete turn-key packages that ensure the simple integration of a Dataradio system into a client's computer network.



Davis Engineering Limited

1260 Old Innes Road
Ottawa, Ontario, CANADA
K1B 3V3
Tel: (613) 748-5500
Telex: 053-3862

Davis Engineering is a dynamic, diverse consulting and manufacturing engineering firm that offers a wide range of products and services to the military and civilian sectors.

Davis has developed a unique expertise in the design of IR suppression systems, combining the effects of film cooling, cooling air entrainment, and optical blockage to reduce IR emissions from

exhaust stack metal surfaces and plumes. These systems can be applied to either new or retrofit installations. They are now installed with turbine power plants in naval vessels, reducing very significantly the IR signature of the vessel and thus increasing the ship's survivability under attack. The Davis IR suppression systems offer a logical method for reducing equipment vulnerability to heat seeking missiles.

Canada's position as a major maritime nation has been enhanced by the work of the NRC Hydraulics Laboratory and the establishment of the Institute of Marine Dynamics. Davis is proud of its role in the design, development, manufacture and installation of state-of-the-art wavemaking systems for these institutions. This technology has attracted world-wide interest from both military and civilian research establishments.

The company applies the latest analysis techniques in the creation of custom components and installations built to withstand the rigours of military service in all environments. Custom mechanical and structural systems are designed and fabricated to withstand the loads imposed by cross-country vehicles and naval vessels. Davis has completed the design and production of 20 different types of mobile shops for the Canadian Armed Forces that are engineered to survive the hardships of cross-country travel.



Example of IR suppression devices used onboard ships.



Example of wave-making machines used for testing semi-submersibles.

The de Havilland Aircraft of Canada, Limited

Garratt Boulevard
Downsview, Ontario, CANADA
M3K 1Y5
Tel: (416) 633-7310
Telex: 06-22128 DE HAV TOR

The de Havilland Aircraft is a long-established major aircraft manufacturer.

DASH 8

The first derivative of the DASH 8, de Havilland's latest military transport, is a navigational trainer designed to Canadian Armed Forces specifications. The aircraft's training system includes six multipurpose consoles to accommodate two instructors and four students, any one of whom may assume full control of all navigational systems at any one time. Training emphasis is on the management of automatic navigation systems as well as the mastering of traditional manual DR and celestial navigation techniques.

The DASH 8 has a wide pressurized cabin and air conditioning which make it ideal for training. The aircraft, which can easily accommodate a variety of equipment, can also be used for specialist training of weapon systems officers and radar navigators.

Ice reconnaissance version of Series 150 DASH 7 MR.



DASH 8 military transport.

Other military applications of the DASH 8 include anti-submarine warfare, maritime reconnaissance, search and rescue, airborne early warning, and electronic surveillance.

DASH 7

An important derivative of the DASH 7 Series 100 military transport is the Series 150 maritime reconnaissance (MR) aircraft. This variant, which may be

outfitted for either military or civilian roles, retains the transport's STOL capabilities but has a higher gross weight.

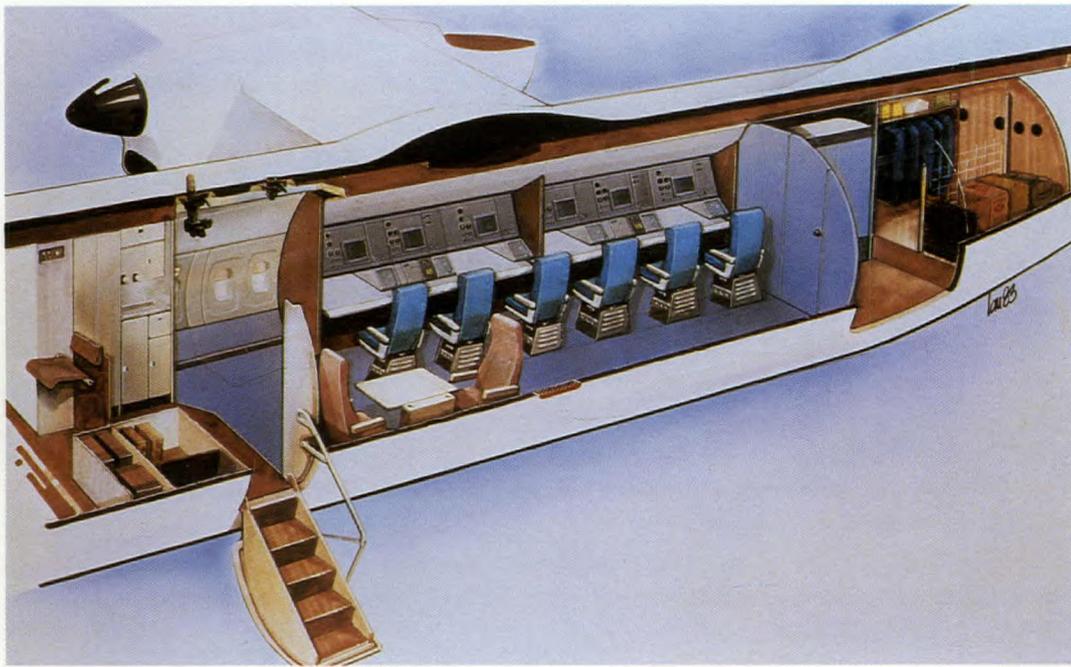
The DASH 7 shown in the photograph is operated by the Canadian Department of the Environment for ice reconnaissance and other surveillance activities. It carries a sophisticated navigation system that is integrated with the role equipment by means of an airborne management computer.

The onboard equipment includes SLAR, laser profilometer, vertical/oblique cameras and a real-time data-link. Outwardly it differs from the military MR variant in having an observer's cockpit mounted on the upper fuselage.

The DASH 7 is also used for anti-submarine warfare, airborne early warning, electronic surveillance, and search and rescue duties.



The de Havilland Aircraft of Canada, Limited



▲ DASH 8 navigation trainer, cabin layout.

DHC-6

With more than 800 aircraft delivered to operators in over 70 countries, the DHC-6 Twin Otter has proved to be the most rugged, reliable and versatile aircraft in its class. The Series 300M military Twin Otter has an increased gross weight but retains the full STOL capabilities of the civilian model as well as its ability to operate on floats, skis and high-flotation landing gear.

The 300M serves as an air ambulance, search and rescue aircraft, military cargo/paratroop/VIP transport, a military counter-insurgency aircraft, and a maritime reconnaissance (MR) platform.

The MR version shown in the accompanying photograph has two rocket pods, a gun pod and a searchlight mounted on standard underwing hardpoints. MR mission equipment also includes a 360° radar, a camera subsystem, an air-operable door and four bubble windows. An integration system in this MR variant ties together the navigation, autopilot, radar and camera subsystems.



DHC-5 Buffalo.



Maritime reconnaissance Twin Otter.

Devtek Corporation

2900 John Street
Markham, Ontario, CANADA
L3R 5G3
Tel: (416) 477-6861
Telex: 065-26128

Devtek Corporation is a major Canadian developer and manufacturer of quality systems and products for the aerospace, defence and electronics markets.

The corporation consists of eight manufacturing companies each specializing in various phases of high-technology engineering and manufacture with products ranging from undersea detection devices to components for outerspace projects. Total employment is over 1 000 people and about 75 per cent of production is destined for export markets.

Hermes Electronics, Dartmouth, Nova Scotia

A fully integrated defence systems company, Hermes specializes in the research, development, design and manufacture of ASW systems and equipment. Products include a full range of anti-submarine warfare sonobuoys and towed arrays that meet U.S. and NATO standards; ocean data systems; HF communications antennae and sounding equipment; and custom-designed electro-mechanical systems.

Diemaco Inc., Kitchener, Ontario

Canada's centre of excellence for small arms weapons, Diemaco has a wide range of system production capabilities:

- manufacture of the C7 and C8 rifle and carbine (Canadian versions of the M16);
- major subsystems for the C9 light machine gun (Canadian version of the Belgian Minimi);
- major subsystems for the M240 general purpose machine gun;
- rotary forged gun barrels and replacement parts for NATO standard small arms;



- accessories, including blank firing attachments for the 50-calibre Browning heavy machine gun.

The company also offers the following:

- integrated logistics support and fourth-line repair and overhaul for NATO standard small arms;
- product development, including engineering design, analysis and prototype testing of small arms weapons systems;
- management of complex mechanical systems from concept development to product manufacture.

Magna Electronics, Toronto, Ontario

Recognized in the industry as the leading producer of high-quality, high-precision aerospace products, Magna has proved its special capabilities through the manufacture of such products as critical mechanical subsystems for the AEGIS phased array radar system; complex dip brazed and bonded enclosures for avionics and ECM system for military aircraft; satellite grapple fixtures and articulated joints for the Canadarm; major mechanical components for satellites; gyro-

scope components of pure beryllium; cartridge and powder-activated ejection systems; and a wide range of components manufactured to extremely close tolerances in exotic metals.

West Heights Manufacturing, Kitchener, Ontario

An expert in the manufacture of major structural and landing gear components in ultra-high-strength alloys for military and commercial aircraft, West Heights produces main gear, main pistons, nose pistons and other major landing gear components for Macair AV8BVTOL, F-4, F-18,

A-6A and A-10; main gear for Canadian Challenger and Gulfstream; main pistons for Boeing 737 and de Havilland DASH 8; trunnions for Boeing 757 and 767; side braces and power unit hydraulic assembly for F-18; and helicopter rotor hubs and related hardware, retaining plates for tail rotors, and transmission covers for the Sikorsky Black Hawk.

Verral Metal Fabricators, Toronto, Ontario

Verral, a specialist in precision sheet metal components and complete enclosures for the electronics, avionics and aerospace/defence industries, manufactures modular rack enclosures for shipboard electronics; transportable equipment cases used for U.S. Army antenna systems; precision enclosures for avionics; welded structures such as torpedo combustion chambers; and special-purpose consoles and cabinetry.

Devtek's corporate engineering and quality control staff is available to augment and guide the operating divisions.



DEW Engineering and Development Limited

3429 Hawthorne Road
Ottawa, Ontario, CANADA
K1G 4G2
Tel: (613) 523-8150
Telex: 053-3167



Toboggan.

DEW Engineering and Development manufactures a complete range of air, sea and land transportable shelters for military and industrial clients. DEW is the Canadian licensee of Gichner Mobile Systems. Shelter configurations are offered for tactical communications, field hospitals, command field offices, and a variety of other applications. DEW's design engineers can meet any customer requirement for shelter equipment.

DEW shelter models include the familiar S-280 shown here and the S-250 designed for pick-up truck mounting, as well as a line of shelters engineered for complexing. Some of the shelter features, even when complexed,

include RFI shielding, ballistics hardening, nuclear hardening, NBC and EMP protection.

DEW also manufactures seven different security screens for 2½-ton cargo trucks and 1½-ton cargo trailers. Their design makes them durable and lightweight allowing maximum use of each vehicle's carrying capacity for other purposes.

Other DEW products include truck-mounted storage racks and equipment-carrying toboggans.

All DEW designs are documented by Level III drawing packages and operator manuals produced to strict Canadian government specifications.



S-280 shelter on 2½-ton truck.



Roof rack on 2½-ton cargo truck.

Security screen on 2½-ton cargo truck.



Dowty Canada Limited

574 Monarch Avenue
Ajax, Ontario, CANADA
L1S 2G8
Tel: (416) 683-3100
Telex: 06-981295
FAX: (416) 686-2914

Dowty Canada offers integrated systems management from original concept to final world-wide product support for the following:

- aircraft landing gear apparatus;
- microprocessor-controlled ground handling and flight control systems;
- industrial, marine and military hybrid actuation devices;
- equipment health monitoring, information and communication systems.

Since its inception in 1940, Dowty Canada has engineered and produced landing gear for many successful commercial and military aircraft, ranging from business jets and commuter transports to military fighters, jet trainers and helicopters. Today, Dowty is recognized as one of the foremost manufacturers of aircraft landing gear in the world.

The company is currently developing the main landing gear for the Bell-Boeing V-22

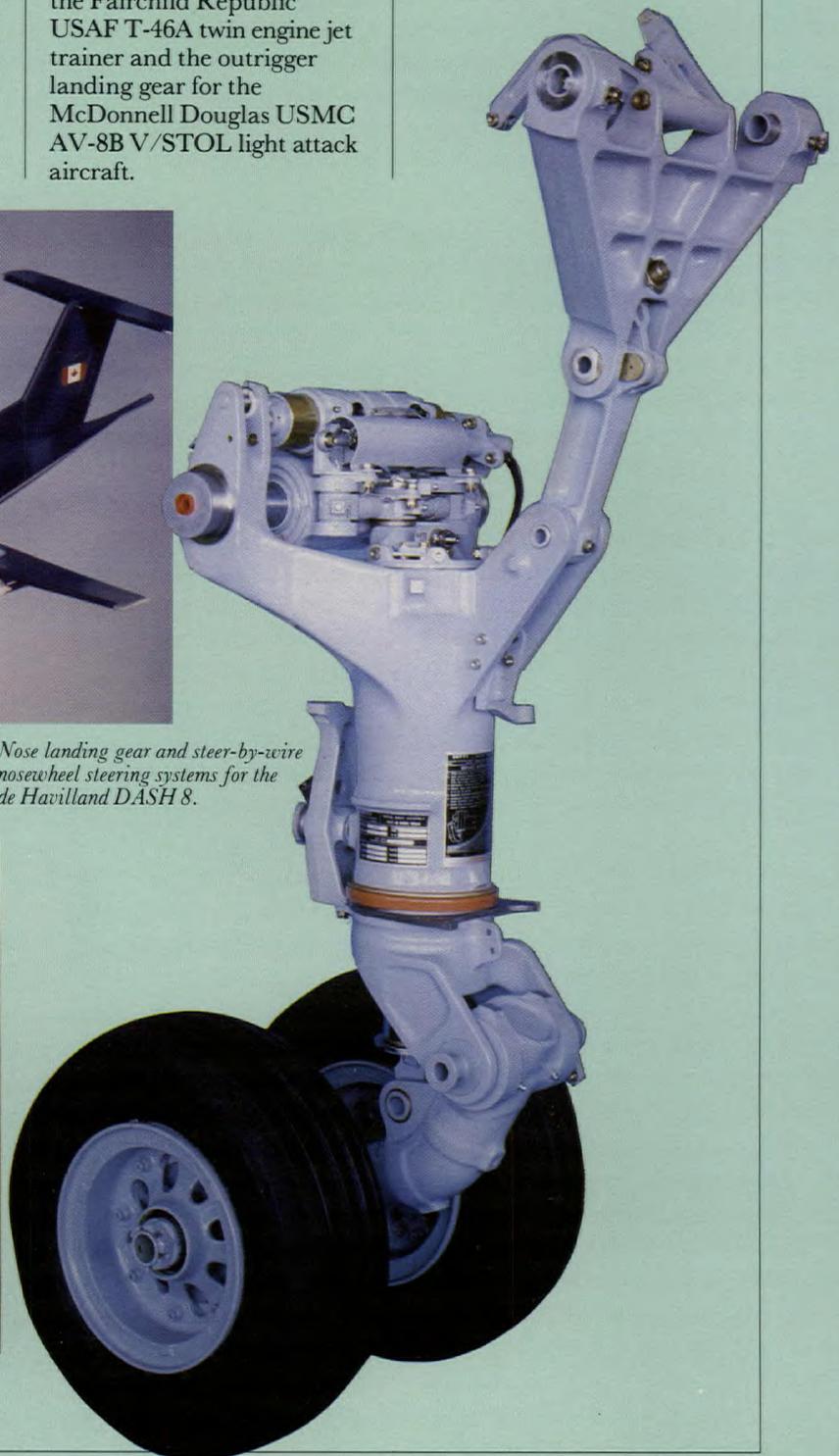
joint services vertical lift aircraft and the Kaman Aerospace USN SH-2F (LAMPS MK1) helicopter. In production are the main and nose landing gear, steer-by-wire nosewheel steering systems and other equipment for the de Havilland DASH 8 short haul transport and the Canadair CL-601 jet transport, as well as the main and nose landing gear for the Fairchild Republic USAF T-46A twin engine jet trainer and the outrigger landing gear for the McDonnell Douglas USMC AV-8B V/STOL light attack aircraft.



Nose landing gear and steer-by-wire nosewheel steering systems for the de Havilland DASH 8.



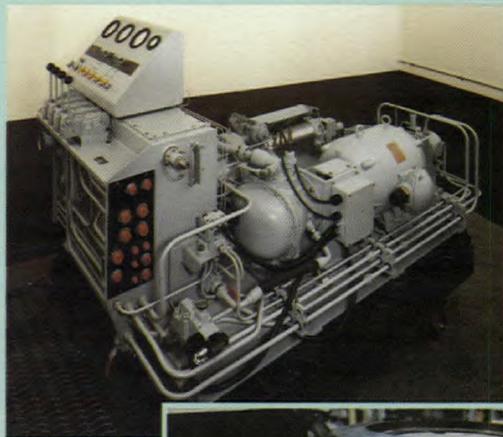
Main landing gear for Bell Boeing V-22.



Dowty Canada Limited

Marine Hydraulic Systems

Dowty Canada designs and manufactures a wide range of marine equipment and systems. Currently in production are lightweight capstans for the Bell Aerospace U.S. Navy air-cushion landing craft (LCAC). Dowty also supplies the hydraulic power pack and constant tension winch for the DAF Indal helicopter recovery assist, securing and traversing (RAST) system, which is in service with the U.S., Japanese and Canadian navies.



Hydraulic power pack and constant tension winch for DAF Indal RAST system.



Lightweight capstan for Bell Aerospace LCAC.

Microprocessor-Controlled Systems

Typical of its capability to design efficient microprocessor-controlled devices are the Dowty steer-by-wire systems that provide a proven weight-and-cost-effective means of improving the ground handling performance of aircraft. A microprocessor-based electronic control unit integrates signal inputs from the rudder pedals and/or a pilot's handwheel to control the electrohydraulically-actuated nosewheel. Dowty designs and manufactures the electronics, the hybrid actuation and the landing gear, thus offering complete systems management throughout the project.

Dowty steer-by-wire systems have been developed for de Havilland DASH 8, Canadair CL-601 and Gulfstream G-IV aircraft. The

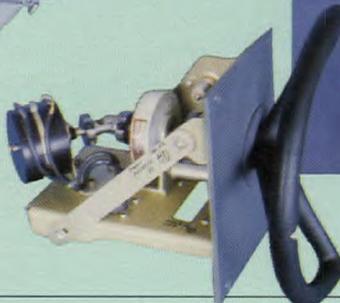
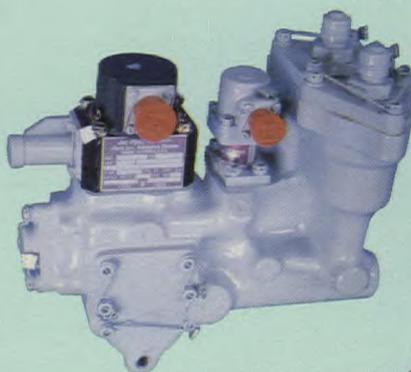
system is readily adaptable to other aircraft, either as original equipment or as a retrofit.

Dowty Canada has a wide-ranging design capability, augmented by an integrated

CAD/CAM system. The company has implemented a flexible machining system to retain its continued competitiveness and to ensure the high standards of precision and quality associated with this sophisticated technology in accordance with

AQAP-1, AQAP-4, AQAP-6, FAA DoT requirements.

Enquiries regarding the application of microprocessor-based hybrid actuation technology to other military or commercial aerospace, marine ground transportation or industrial uses are invited.



Steering control, hydraulic and electronic control units.

EDO Canada Ltd.

8-6320 11th Street S.E.
Calgary, Alberta, CANADA
T2H 2L7
Tel: (403) 255-6667
Telex: 03-825895

EDO Canada is engaged in the development, manufacture and marketing of precision electronic instruments for the marine and land survey market.

With a full range of testing and development facilities in-house, EDO offers a diversity of equipment that includes the following three systems:

- The EDO marine integrated navigation system (MINS) is a compact and reliable navigation processor developed for the Canadian Department of National Defence. MINS utilizes a mix of navigational inputs that include Transit and GPS receivers, Loran-C, Omega, Speedlog and Gyro Compass.

- SatTrak a low-cost GPS dual-function receiver, achieves accuracies of 10 metres (32.8 feet). It can provide three-dimensional static point positioning with 20 minutes of satellite data and real-time dynamic positioning with one-second up-

dates for navigation of land vehicles, offshore rigs and some aircraft.

- The 2531A colour cockpit video camera system, a small two-piece configuration consisting of a miniature camera head, remote camera control unit and interconnect cables,

permits various installation possibilities with minimal line-of-sight interference to the pilot. Its solid-state image sensor allows high resolution, high sensitivity and improved HUD capability with colour and black and white compatibility.



SatTrak.



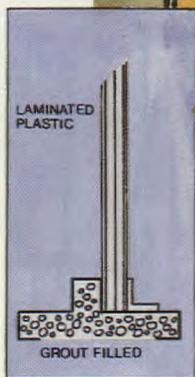
2531A camera.



MINS (three pieces).

EM Plastic & Electric Products Limited

430 Norfinch Drive
Downsview, Ontario, CANADA
M3N 1Y4
Tel: (416) 665-6111
Telex: 065-27201



MASTERGARD

MASTERGARD security systems.

EM Plastic and Electric Products Limited has worked closely for many years with sheet manufacturers and specification bodies at all levels of the Canadian government as supplier of bullet and attack resistant glazing materials.

EM designed MASTERGARD to complement its sheet products to meet a need in the marketplace for a security framing system. The MASTERGARD frame is a steel profile specifically designed to retain the glazing sheet under the most severe physical and ballistic attack.

MASTERGARD is available in a range of ballistic protection levels that will defeat small hand guns through to high-power rifles. Independent test results (available on request) prove that the MASTERGARD system provides the stated levels of protection.

In times of civil disorder, plants, offices and other facilities need increased protection against firearms and physical attack. The MASTERGARD security glazing system has the versatility to fulfil these requirements.

Empra Systems Corp.

608-5960 No. 6 Road
 Richmond, British Columbia,
 CANADA V6V 1Z1
 Tel: (604) 273-1015



Mass evacuation.

Empra Systems has developed new rescue equipment, the emergency multiple person rescue apparatus (EMPRA), designed to overcome the dangers and difficulties of conventional winch or rope net rescue operations from helicopters.

Intended for offshore emergency rescue operations, EMPRA has been effective in a wide range of applications that include airlifting people from fires in highrises, carrying crew from ship to oil rig or from ship to shore, or dropping armed service personnel into remote areas. Three sizes of the EMPRA are available with capacities for 6, 12 and 18 people respectively.

EMPRA is a collapsible, open-top ring net with a

rigid base, designed to be slung from beneath a helicopter by a cargo hook or sling. The EMPRA is very stable in the air even at speeds of up to 100 knots, does not swing while the helicopter is hovering, and is not difficult to lower into or raise from the sea. It is also quickly, efficiently slung from a ship's crane or boom mast for "man overboard" situations or for the rescue of large numbers of people from the sea by standby vessels, lifeboats, support ships, or other craft.

EMPRA is in use wherever a need exists for emergency rescue equipment. This includes all of Canada's offshore drilling areas, Alaska, the North Sea, the Gulf of Mexico, Western Australia and South America.

Eleven-metre (35-foot) waves, North Sea.



Roof-top rescue.



Collapsible.



Easy entry.

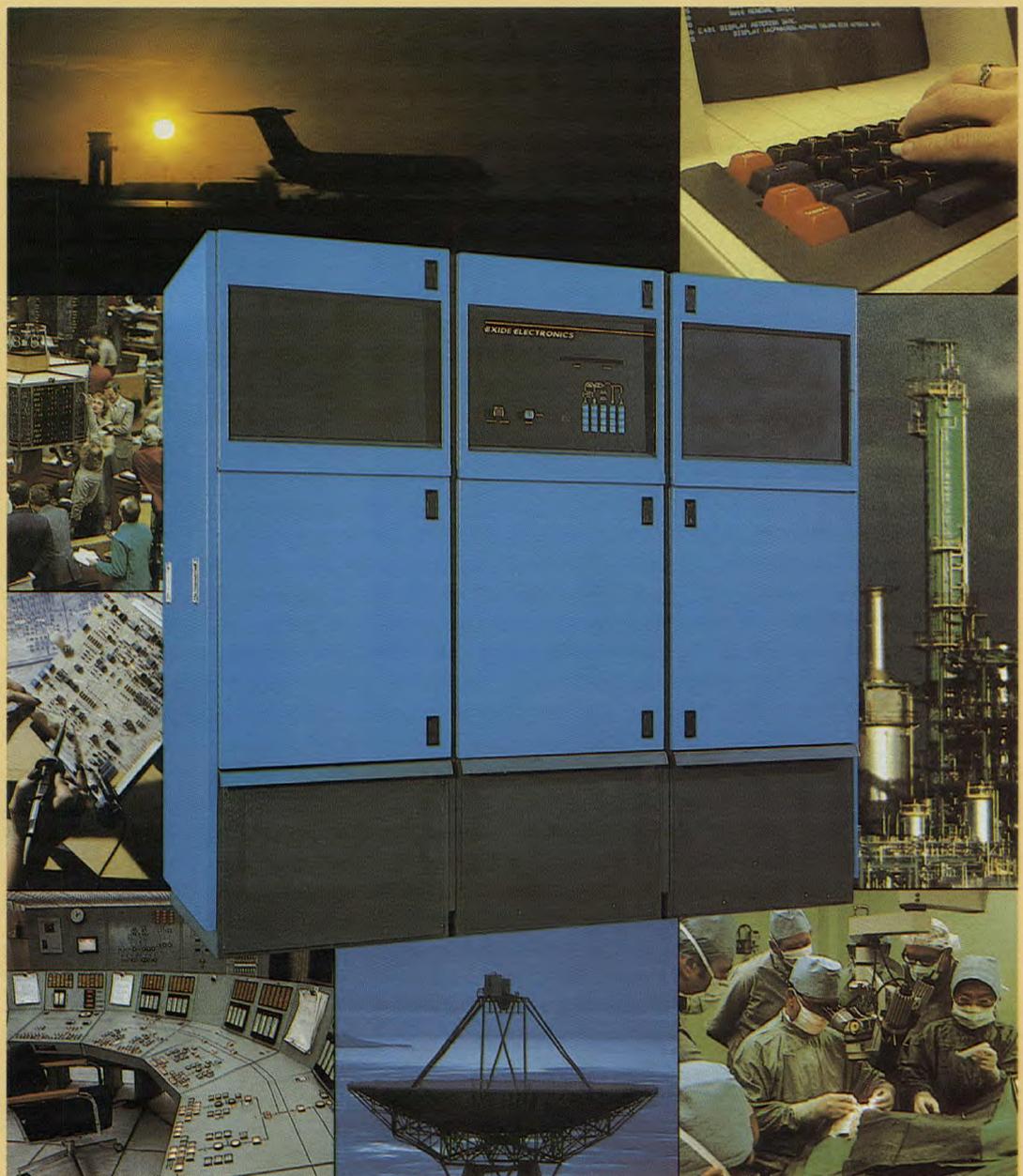
Exide Electronics Canada Inc.

5200 Dixie Road, Unit 20
Mississauga, Ontario,
CANADA
L4W 1E4
Tel: (416) 625-9627
Telex: 06-961272

Exide Electronics Canada Inc. specializes in the manufacture and supply of uninterruptible power systems (UPS) for critical electrical load protection against momentary power line surges, brownouts and millisecond interruptions. Specially designed batteries with a 20-year life expectancy serve as power back-up. Exide UPS models provide reliable power source protection for defence/air traffic control radars, airport control towers, ground stations, telecommunications, electric power generation controls, security and life protection operations, and critical data processing.

Exide Electronics is the Canadian leader in research, development and manufacture of static uninterruptible power systems and frequency converters. The advantages of solid-state UPS technology include maximum UPS power *availability uptime* through proven reliability designs, microprocessor controls/diagnostics, replaceable modular components and built-in self diagnostic test features. These ensure easy maintenance with short corrective times (MTTR) resulting in minimum *downtime*.

UPS and frequency converter systems are available in output ratings from 15-kVA to 750-kVA three-phase modules. They are also produced with inputs of 50 and 60 Hz and outputs of 50, 60 and 400 Hz. These systems may be paralleled for high powers in the megawatt range. Exide Electronics also manufactures the compact Series 1100, single phase AC power



systems that offer high reliability, high efficiencies and are equipped with built-in maintenance-free batteries.

Exide UPS products are the preferred choice wherever a continuous source of uninterrupted power is required.

Uninterruptible power supply systems.

230 New Toronto Street
Toronto, Ontario, CANADA
M8V 2E8
Tel: (416) 255-9193
Telex: 06-984692

Explosafe America Inc.

The "Explosafe" explosion suppression system is a proven method of protecting fuel tanks containing volatile vapours from internal explosions.

The Explosafe system is based on a matrix of very thin expanded aluminum foil webs that are layered and formed into a honeycomb-like mesh of hexagonally shaped openings. This mesh literally fills the interior of the fuel tank, with voids being left where appropriate to allow for internal components. In the event of internal vapour ignition, the Explosafe system prevents the generation of destructive internal combustion overpressures.

These pressures arise when heat is released by rapid self-

sustained burning. The Explosafe system uses two mechanisms: either quenching the rapid burning reaction, by dividing the fuel tank into minute cells which inhibit complete combustion; or using a porous filler mass with high heat reception capability to absorb the heat released during the reaction.

The Explosafe material has successfully undergone a rigorous three-year testing program to validate the effectiveness of the Explosafe explosion suppression system, resulting in a United States Air Force Military Specification and Qualified Products Listing.

The Explosafe system provides full-time, maintenance-free protection even at high

temperatures (600°C), and facilitates on-site welding repairs of damaged fuel tanks without the need for removal and purging. The displacement is minor (less than 2 per cent of tank volume) and the system is lightweight, averaging 37 grams per litre of tank volume.

The Explosafe system, pre-engineered and designed in modular kit form, is tailored for each application for easy installation during fuel tank manufacture or for retrofitting where access allows.



Fathom Oceanology Limited

6760 Campobello Road
Mississauga, Ontario,
CANADA
L5N 2L8
Tel: (416) 821-8730
Telex: 06-218222
FAX: (416) 858-1249

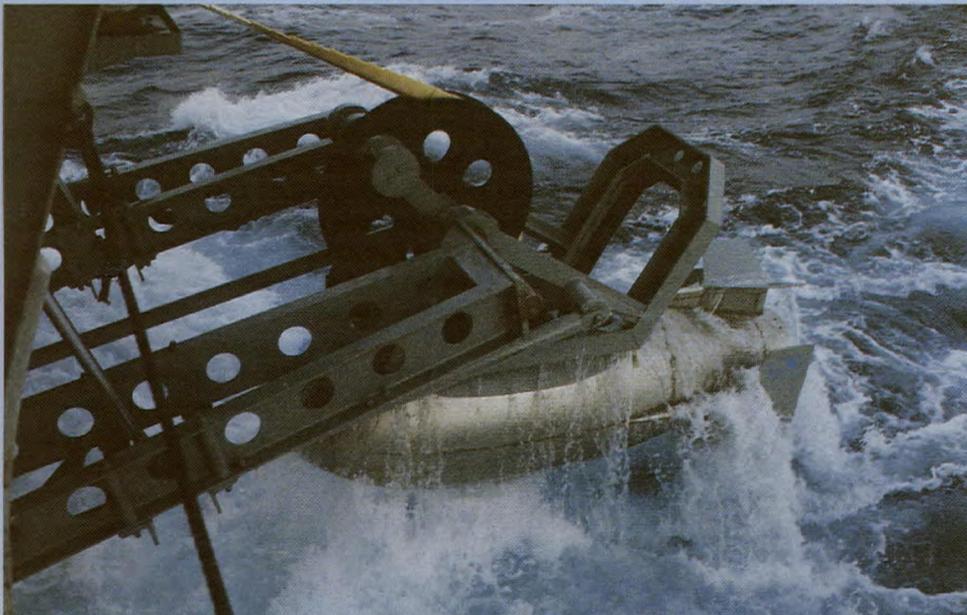
Fathom Oceanology specializes in the design, manufacture and testing of military submerged towing systems and hull-mounted sonar domes. The company has developed towed acoustic systems for military and commercial use, mechanical cable handling systems for variable depth sonar, towed line array, and mine countermeasures applications. These systems are available

with a passive or an optional microprocessor-controlled active motion compensation mechanism. Such equipment has been delivered to the Canadian government as well as to the navies of many other countries.

Fathom Oceanology's recognized hydrodynamic expertise has created a range of controllable and cable-dominated towed vehicles. One important result of this

commitment to the study of the hydrodynamic performance of tow cables has been the design of fairings with the lowest drag coefficient of any commercially available today.

Much of Fathom's design incorporates computer-aided analyses with supplemental hydrodynamic and aerodynamic testing at major research facilities.



Recovery of the towed body of the Fathom Model 9-600 variable depth sonar system on board a "Lupo" class frigate at sea.

The United States Navy hydrofoil Highpoint towing a Fathom variable depth sonar system at speeds in excess of 30 knots.



2343 Barton Street East
 Hamilton, Ontario, CANADA
 L8H 7L6
 Tel: (416) 560-9230
 Telex: 061-8673
 Cable: FELL FAB
 HAMILTON

Fell-Fab Products

Fell-Fab is a major supplier of textile products for the aviation, aerospace, communications, environmental control, and transportation industries. The company's continuing product research and development has led to significant breakthroughs in fabric applications. Commitment to quality and excellence ensures that the

company's quality assurance conforms to AQAP 4 specifications and equivalent standards.

Established over 30 years ago, Fell-Fab has supplied private industry, federal, provincial, and municipal governments, as well as major utilities, with a wide range of custom-order textile specialties through several

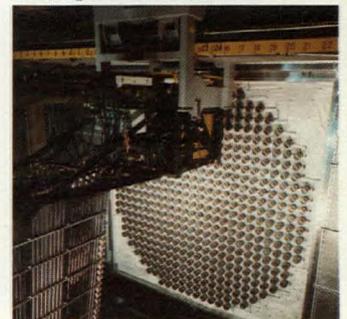
divisions operating from modern facilities in Hamilton, Ontario.

The company maintains branches/agents in the United States, England, Ireland, Australia and the Orient.

Sophisticated insulating pad engineered by Fell-Fab conserves energy by controlling heat loss.



Clean-room solar blanket production for the European satellite program.



Fell-Fab custom-manufactures rugged seat covers and fire-blocking systems in a variety of hard-wearing materials to comply with the most stringent safety regulations.



Custom-manufactured wing covers fit precisely around airplane wings to safeguard them during transport and storage.



Personal web, water bottle.



Military back-pack.

Flexible planar radomes are custom-made for microwave antennae. These covers improve performance, protect equipment from weather hazards.



Flight helmet bag.

Field Aviation Company Limited

Toronto International Airport
 P.O. Box 6023
 Toronto AMF, Ontario, CANADA
 L5P 1B9
 Tel: (416) 676-9030
 Telex: 06-968530

Field Aviation Company Limited is a leading Canadian aviation sales, service and support organization that provides a complete range of specialized services to the private, commercial and military aviation communities in Canada and abroad.

A member of the Hunting group of companies, Field Aviation consists of three wholly-owned subsidiary management companies in Calgary and Toronto: Field Aviation West Ltd., Field Aviation East Ltd., and Field Aviation Sales Ltd.

Field Aviation West of Calgary, an approved facility under criteria established by Transport Canada and the Department of National Defence, specializes in the overhaul, modification and conversion of military fixed-wing aircraft and helicopters. The company's many departments interact with one another to provide a total integrated support package that includes hydraulic, electrical, avionics, maintenance, sheet metal, inspection and an environmentally controlled

paint facility. Its Canadian military recognition meets both NATO and U.S. military standards.

Field Aviation East provides on-site employment of maintenance technicians engaged in a support function at the Canadian Forces Base Trenton/Mountainview aircraft maintenance development unit.

The company's engineering department, with headquarters in Toronto, has earned international respect for innovations in the field of specialized aeronautical engineering and outfitting of individual aircraft for special applications.

Field Aviation Sales is the aircraft marketing arm of Field Aviation Company Ltd. and is the exclusive Canadian Beechcraft distributor. Field Sales maintains an office in Ottawa and serves as an important liaison with the various federal government departments and agencies in support of the many Beechcraft operated by the departments of Defence and Transport.



Field Aviation East Ltd. Support Service at A.M.D.U., Canadian Forces Base Trenton.



U.S. Navy DHC-5 Buffalo after major airframe modification, conversion and painting at Field Aviation West Ltd.

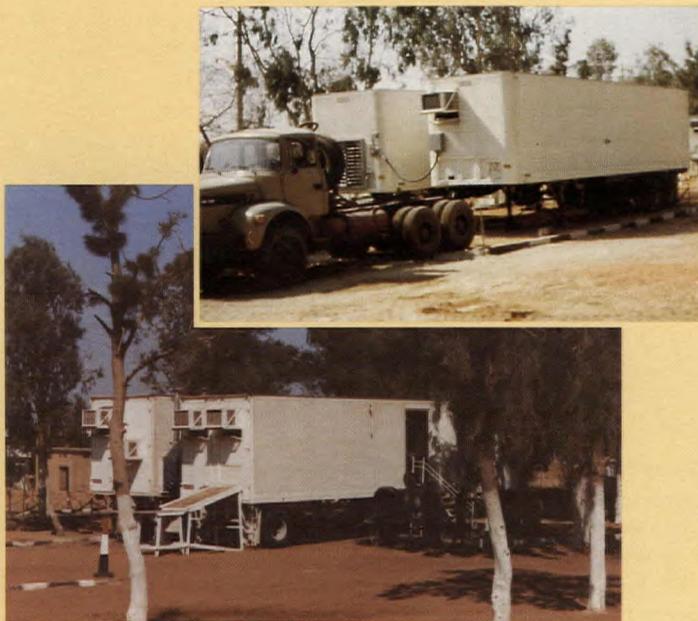
Canadian Forces Buffalo aircraft undergoing a repair and overhaul program at Field Aviation West Ltd.

U.S. Army Shorts SD-330 aircraft undergoing major repair and modification program at Field Aviation West Ltd.



Food Machinery Engineering

8251 Keele Street
 Concord, Ontario, CANADA
 L4K 1Z1
 Tel: (416) 738-2140
 Telex: 06-964715

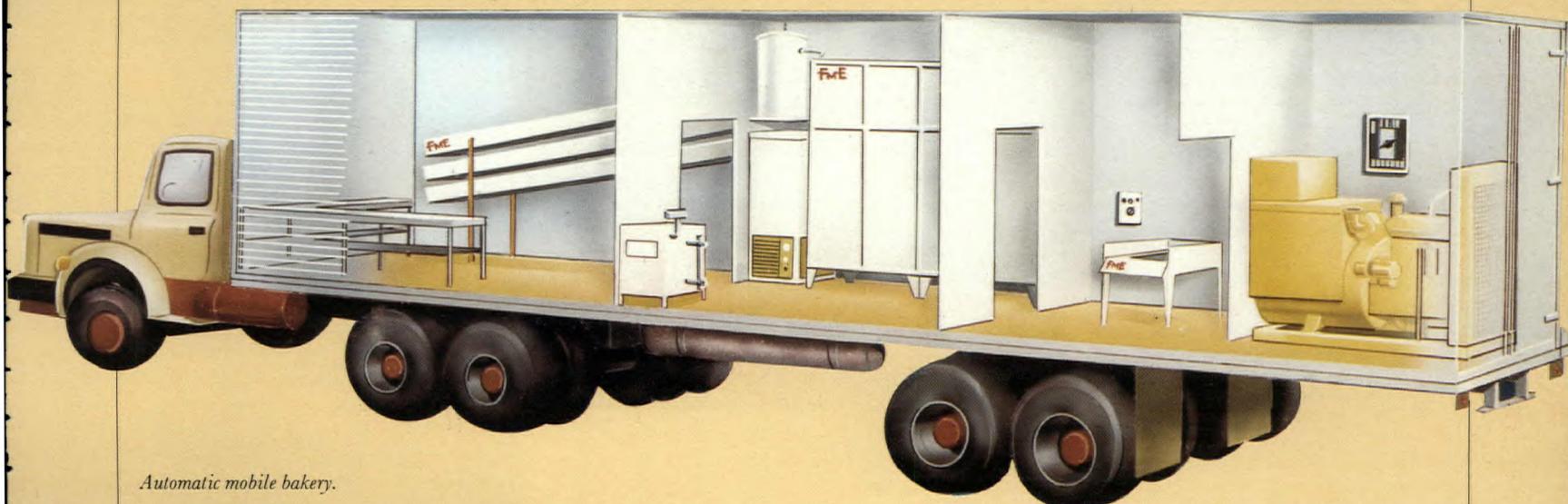
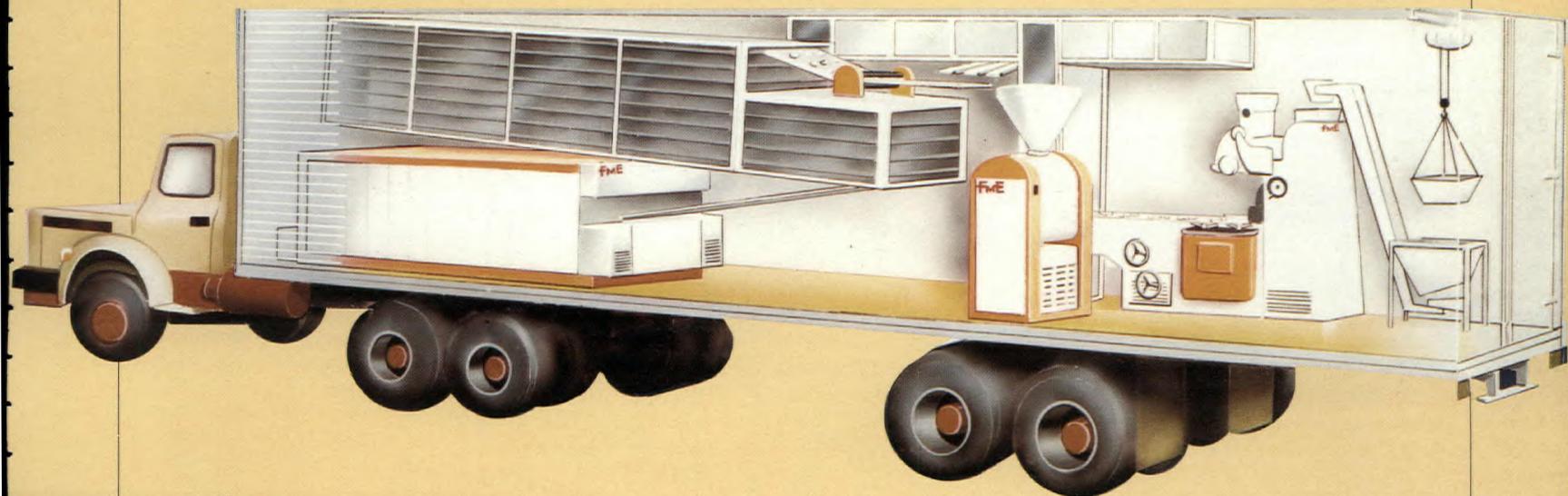


Food Machinery Engineering (F.M.E.) specializes in the design, manufacture and installation of bakery equipment. Systematic research, rapid application of the research findings into production, and the utilization of the latest scientific and dietetic information make it possible for the company to produce bakery equipment that satisfies the requirements of all types of environments and all weather conditions.

Mobile bakeries are a specialty of Food Machinery Engi-

neering which has designed and delivered such units for a variety of baked goods including bread, rolls, buns and flat Middle Eastern bread. F.M.E. mobile bakeries have a production capacity ranging from 500 to 4 000 baked goods per hour. Set-up of a mobile bakery in the field requires approximately one hour and dismantling can be achieved in approximately 20 minutes.

Food Machinery Engineering custom builds bakeries to meet the needs of armed forces in many situations.



Automatic mobile bakery.

Fleet Aerospace Corporation

P. O. Box 400
Fort Erie, Ontario, CANADA
L2A 5N3
Tel: (416) 871-2100
Telex: 061-5165

Fleet Aerospace, a diversified Canadian aerospace company, produces aircraft, sonar, radar and satellite components and subsystems. Among the company's manufacturing divisions and subsidiaries are Fleet Industries (Fort Erie, Ontario), Fathom Oceanology (Mississauga, Ontario and Dartmouth, Nova Scotia), Techwest (Vancouver, British Columbia) and H.I. Thompson (Guelph, Ontario).

Fleet Industries Division

Fleet Industries is a leading Canadian source of high-quality components and

subsystems for the North American aerospace industry. Using fabrication and bonding techniques and various metal and high-performance composite materials, the division manufactures radar, sonar and satellite structures, as well as commercial and military helicopter and aircraft assemblies.

The major aircraft manufacturers served by the division include Boeing, Canadair, de Havilland, Grumman, Lockheed, MBB, McDonnell-Douglas and Sikorsky.

The division's 46 450-square-metre (500 000-square-foot) plant contains a new 12 540-square-metre (135 000-

square-foot) bonding facility equipped with an X-ray laboratory, C-Scan ultrasonic inspection, water-jet cutting and five-axis honeycomb CNC router, and three autoclaves. Here, Fleet produces a range of bonded metal-to-metal and composite products, such as primary and secondary structural components for aircraft, satellite structures, helicopter blades, radar antennae and electronic cabinets.

Fleet Industries' quality assurance program meets the requirements of both Canadian DND-1015 and U.S. military MIL-Q-9858A specifications. Standard

mechanical inspection techniques are supplemented by computerized co-ordinate measurement equipment (tied directly to the division's CAD/CAM system), magnaflux, fluorescent penetrant, radiography, destruction testing and chemical analysis.

The division supplies radar equipment for General Electric, ITT-Gilfillan, Lockheed Electronics, Raytheon and Sperry; satellite components for Hughes and Spar; and sonar equipment for General Electric, Gould, Raytheon, Westinghouse and the Government of Canada.

Fathom Oceanology Limited

Fathom Oceanology specializes in the development, design, testing and manufacture of towed naval acoustic systems. The company has engineered towed variable-depth sonar systems for anti-submarine warfare and mine countermeasure applications for many industrial and defence programs in Canada and abroad. The company's

Fleet produces bonded wing and fuselage panels, aft engine nacelle, inboard/outboard flaps, and spoilers for the DASH 8.



Fleet manufactures the composite blade sub-assemblies and MEDEVAC kits for the Sikorsky Blackhawk.

Fleet manufactures the bonded graphite composite avionics and gun motor doors and the precision-machined radar rack assembly.



Fleet Aerospace Corporation

hydrodynamic experience and expertise have helped to develop a range of controllable and cable-dominated towed bodies for use with military and oceanographic systems.

Fathom's commitment to the study of the hydrodynamic performance of tow cables and fairings has resulted in the development of fairings with the lowest drag coefficient available. Fathom recently entered the new market of towed line array handling systems, complementing its variable-depth sonar equipment activities. Fathom manufactures cabling systems that operate at speeds of up to 40 knots and tensions of up to, but not limited to, 29 500 kg (65 000 pounds). The company is also engaged in motion compensation, which is an integral component of the military cabling-handling systems it designs and builds.

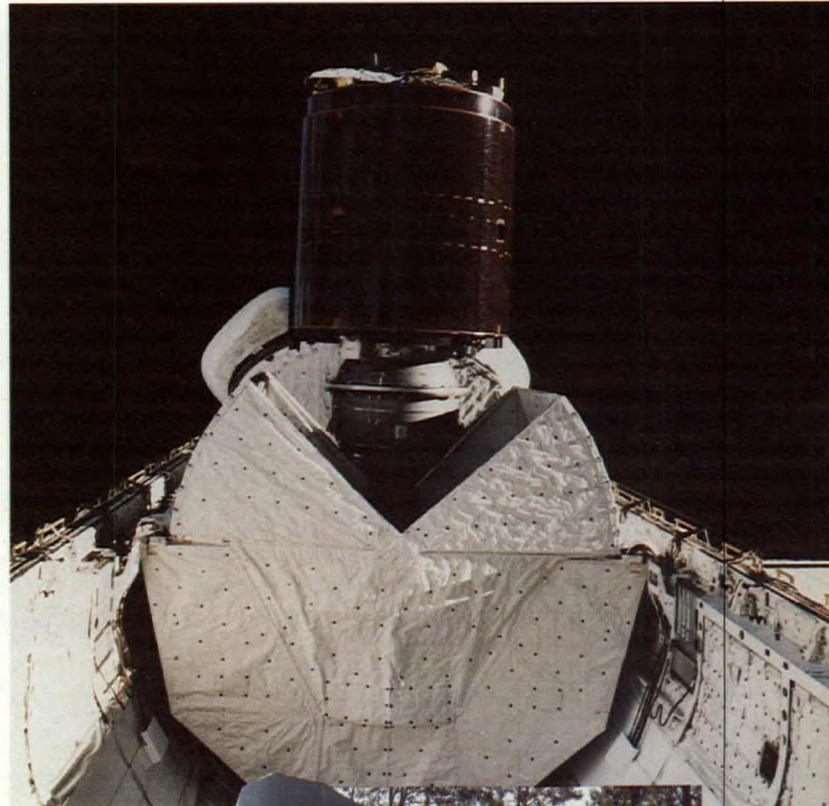
Fathom is a world-wide supplier of hull-mounted sonar domes for towed acoustic systems. The company also offers custom deck machinery, such as davits and traction winches, to meet various international military and civilian requirements.

Techwest Enterprises Limited Division

Techwest is a design-engineering operation with particular expertise in motion compensation for marine towing systems. The company designs and develops motion compensating cranes and winches for offshore commercial and military applications, such as the towing and handling of manned and unmanned submersibles, diving bells and deep sea mining equipment. Techwest has also developed an antennae stabilization device for use on offshore drilling platforms and ocean-going vessels. The research and development and engineering capabilities of this division complement the sonar operations of both Fleet and Fathom.

Advanced composite solar panel substrates on the Hughes HS376 were manufactured by Fleet.

Fleet manufactures and assembles the radial beam and the rib components for the Harris Corporation quick reaction antenna.



H.I. Thompson Company of Canada Ltd. Division

Recently acquired by the Fleet group, H.I. Thompson is engaged in the design and manufacture of heat shields, high and low-temperature insulation blankets, and related devices for the aerospace industry. These heat-resistant products include metal-encased moulded insulation components for jet and rocket engines, and

thermal-protected ducts for fuel and oil. The division has the capability of developing and producing custom insulation components and using new materials, to customer specifications. Current aerospace clients include Pratt & Whitney, de Havilland and General Electric. This division also produces heat-resistant insulated fabric and web products for use in fire-fighting clothing and military applications.



Foundation Instruments

Lightwave Group

24 Colonnade Road
Ottawa, Ontario, CANADA
K2E 7J6
Tel: (613) 226-4000
Telex: 053-4153

Foundation Instruments, standing on the leading edge of fibre-optic systems engineering and design in Canada since 1977, is a major participant in the rapidly growing commercial and military fibre-optic communications market. The company's record of achievements in fibre-optics technology began with the landmark Yorkville experiment with Bell Canada in Toronto in 1978 and has continued since then with many successful projects completed.

Beginning with a full understanding of a client's communications requirements, Foundation Instruments assists in project management, systems specifications, application engineering, installation supervision, documentation and training. The company provides complete turn-key service from the design to the installation of a fibre-optic communications system that fully meets existing and foreseeable future requirements.

The company not only manufactures instruments, but also designs and builds fibre-optic transmission systems.

Foundation's innovative products include the FI-9000 series of single-mode fibre-optic transmission systems; the FI-7000 series of multimode fibre-optic transmission systems that carry video, data and voice; the PFS-200SM "the intelligent" single-mode fusion splicer; the DMX-20, a 20-channel asynchronous data multiplexer with speeds of up to 56 Kb per channel; the PFS-101 multimode portable fusion splicer and the OATS optical attenuation test equipment; and all necessary supporting hardware components.

Foundation products and systems are being used in military satellite entrance



PFS-200 SM single-mode fusion splicer.

link applications where MIL-SPEC reliability, quality and ruggedness are essential. Where warranted, systems can be designed and supplied to meet TEMPEST specifications.

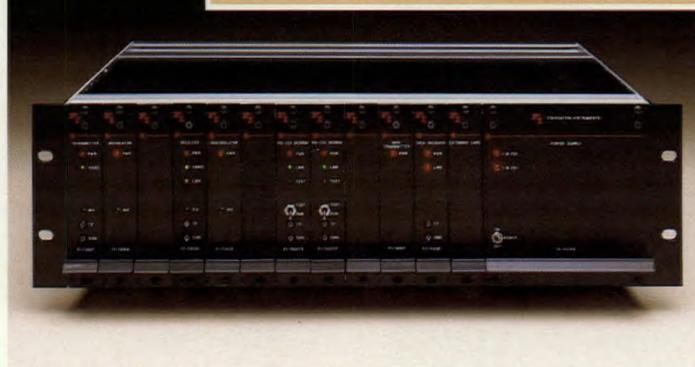
The flexibility and capability of Foundation were highlighted in 1984 when the company won the British

Columbia Transit contract to supply and install a state-of-the-art fibre-optics communications system for Vancouver's new Advanced Light Rapid Transit. The system will provide a reliable, integrated, video, audio and data-link between 15 stations along a 24-kilometre (15-mile) electric rail span.

The Canadian Broadcasting Corporation used a dual fibre-optic cable system designed and installed by Foundation Instruments to transmit network coverage of the World Cup Downhill Ski Races at Mont Tremblant, Quebec, and Lake Louise, Alberta.



*PFS-101 multimode fusion splicer.
Optical attenuation test sets.*



FI-7000 Series multimode transmission system.

Greening Donald Co. Ltd.

P.O. Box 430
55 Queen Street North
Hamilton, Ontario, CANADA
L8N 3J3
Tel: (416) 528-5971
Telex: 061-8601
Cable: GREENDON HAMILTON

Greening Donald is an established supplier of wire rope and other industrial products to defence, resource and manufacturing industries world-wide. Since 1859 the company's high-technology products have been setting industry standards. Greening Donald is the leading supplier to the United States Navy for the world's most sophisticated wire rope assemblies such as the pendants used for launching and arresting aircraft on navy carriers. Similar assemblies have been manufactured for Latin American and European countries.

Other special-purpose rope assemblies manufactured by Greening Donald include flattened strand elevator rope, helicopter haul-down assemblies and stainless steel mine sweep ropes for use in corrosive environments.

Committed to excellence and to innovation, Greening Donald has developed expertise in plastic extrusion technology and synthetic ropes. The company offers ropes with plastic jacketting or complete plastic impregnation. A complete line of ropes was recently developed based on Kevlar®, the world's strongest synthetic fibre. Greening Donald Kevlar® ropes are replacing traditional steel ropes in specific working and standing rope applications where light weight and high corrosion resistance are important. These technological advances add ropes that withstand harsh environmental conditions to the Greening Donald extensive product line.

Greening Donald manufactures other products for defence industry applications. They include perforated metal panels that have

desirable acoustical properties, specialty wire, wire cloth and wire screens.

A resident inspector representing the Canadian Department of National Defence is located on the premises to monitor the procedures, methods and standards of manufacture. These quality assurance procedures and practices fully conform to DND 1015 standards.

Greening Donald's markets are serviced by an international sales force and distribution network.

*Kevlar® is DuPont's registered trademark for its aramid fibre.



Elevator hoisting aircraft from below deck storage. Elevator wire rope from Greening Donald is used to hoist elevator.



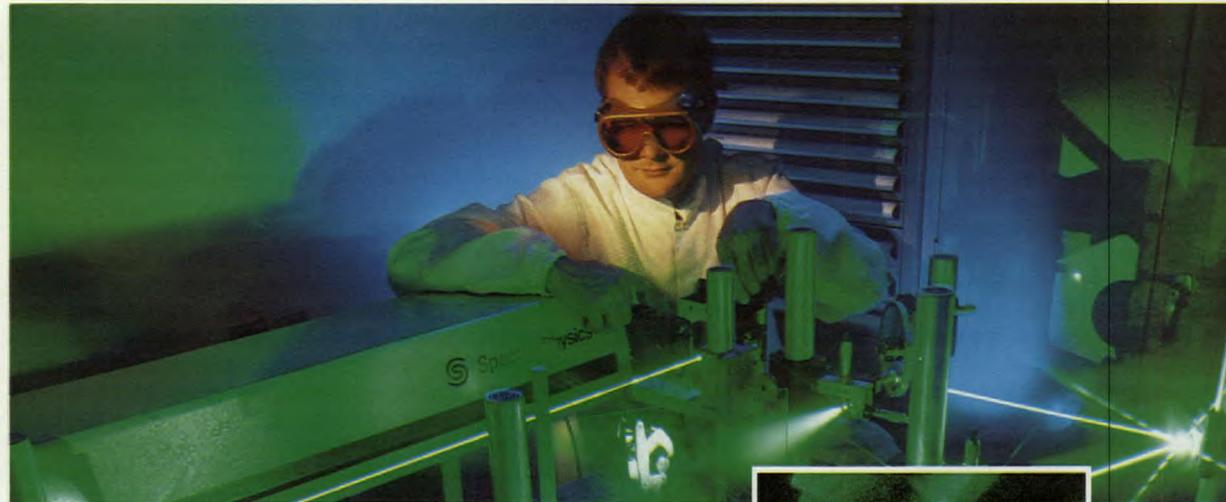
Aircraft landing on flight deck of U.S. Navy aircraft carrier. In foreground, Greening Donald arresting wire rope assembly.

Garrett Canada

With its diverse range of products, and strong commitment to meet the challenges of a dynamic and progressive industry, Garrett Canada has established a technology base second to none. Backed up by 23 000 square metres (250 000 square feet) of modern design, manufacturing, testing and support facilities, the company markets the following:

- Electronic environmental control systems
- Communications systems
- Hybrid microcircuits
- Illuminated information panels
- Peripheral vision display systems
- Advanced systems and sub-contract services

Garrett Canada is a division of Allied-Signal Canada Inc. Garrett's marketing efforts are supported in the field by the Garrett Corporation sales and service organization with offices in most major cities throughout the world. With the recent addition of its manufacturing facility for illuminated information panels, the company now has six plants in Rexdale,



Ontario. Of approximately 950 people employed, 30 per cent are engineering or engineering-support staff.

Recently the engineering facilities have expanded significantly and marketing efforts have yielded important accomplishments in all of the company's product lines.

Garrett Canada

- exported approximately 80 per cent of its total sales of \$85 million in 1985;
- spent over 12 per cent of annual sales on research;

- received contracts to lead a study of the ICECS (integrated closed-loop environmental control system) concept for future aircraft;
- obtained Canadian government approval to offer a "test house service" within the Canadian Industrial Tempest program. This facility is staffed to perform Tempest testing for equipment accreditation based on compliance with national or NATO government standards;
- has been certified to Military Standard 1772. At this time of writing fewer than 10 of North America's hybrid micro-circuit manufacturers have been certified to this new and more stringent standard which will be mandatory for all manufacturers of military hybrids supplied to the United States government and their subcontractors;



Optics laboratory: Holography.

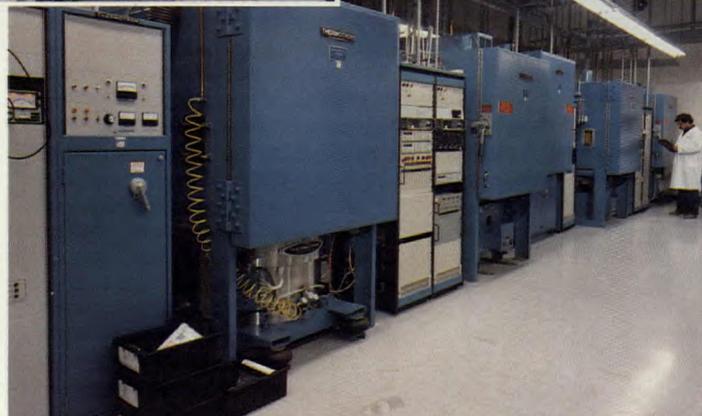
- has been selected as the Canadian prime contractor for ASRAAM. The company's responsibility includes the design and development of the missile fin control actuation system and other elements of the total weapon system;
- introduced a new concept in flight instrumentation. The peripheral vision display (PVD) system is intended to reduce the loss of life and aircraft resulting from spatial disorientation suffered by pilots.

Garrett is actively engaged in the research and development of control systems, RF communications, analog and digital circuit design, and display technology.

Environmental and EMI qualification testing to military/aerospace standards is performed in the company's government-approved test facility. A single, standard, quality control system that conforms to NATO AQAP-1 and MIL-Q-9858 is employed.



Production burn-in.



Garrett Canada

Electronic Environmental Control Systems

These electronic controls are a major subsystem of the Garrett environmental control systems that fly on more than 70 per cent of the commercial and military aircraft in the western world. They are used in cabin, cockpit and compartment air-conditioning systems; wing anti-ice temperature control systems; window heat control systems; and some liquid coolant systems.

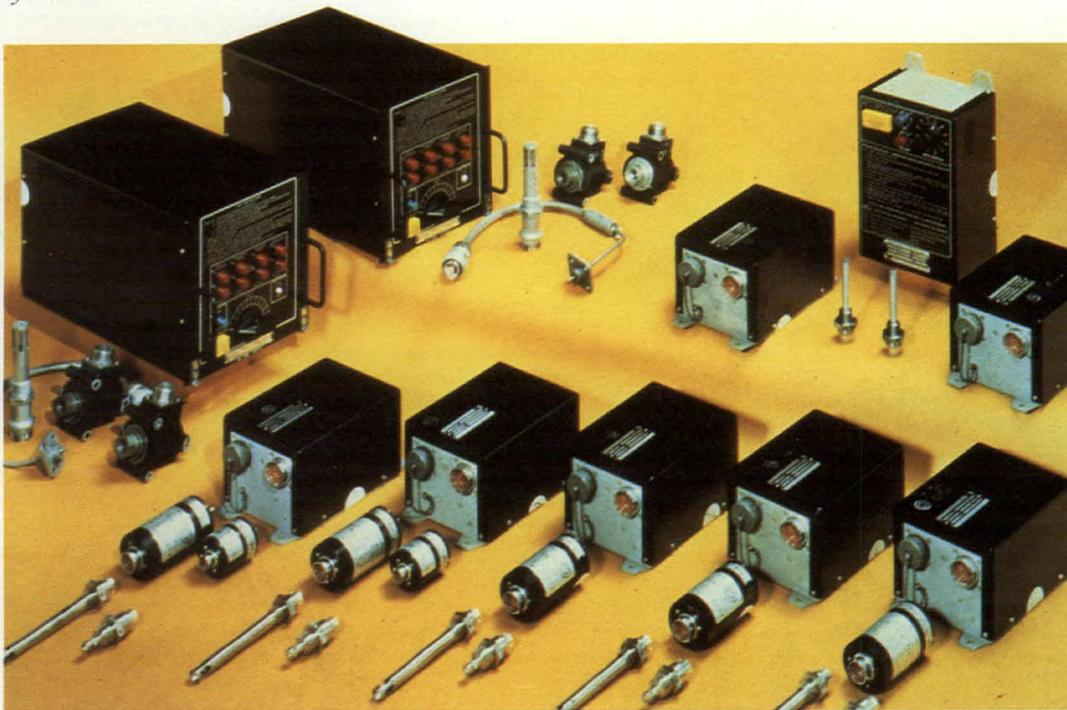
A300/A310 temperature control system.

Garrett's systems are used on civilian and military aircraft of all major manufacturers, including McDonnell Douglas, Boeing, Hughes, Lear, and others.

In 1984, the company was awarded a contract sponsored by the Flight Dynamics Systems Division at Wright Patterson Air Force Base to study and demonstrate the life-cycle costs related to advanced digitally-controlled integrated closed-loop environmental control



F-18 temperature control system.



systems (ICECS). Four years of research will involve the analysis, simulation, and development of a full-scale laboratory system.

The ICECS program will further enhance the company's internationally recognized expertise and technology base with the implementation of modern control theory techniques within a fully integrated aircraft system. Several advanced digital technologies will also be studied.

F-15 temperature control system.



Boeing 757/767 window heat control units.



Garrett Canada



▲ Ejection-activated survival radio set.



RESCU 99 water-activated survival type E.L.T.

AN/PRQ-501 personal locator beacon.



◀ Air traffic control receiver and transmitter.

communications. This equipment offers many performance and maintenance features.

The ILS (instrument landing system) signal analyzer is a portable microprocessor-controlled radio receiver that precisely measures the signal characteristics radiated from instrument landing systems, and provides assurance that the landing system is operating within prescribed tolerances. Transport Canada employs this equipment to measure the accuracy of landing systems at over 80 airports across Canada.

The survivable battlefield antenna, designed as an alternative to the conventional fragile 3-metre whip vehicular antenna, provides a lower visual signature and enhanced battlefield survivability.

Inset: Survivable battlefield antenna.

▼ ILS signal analyzer.



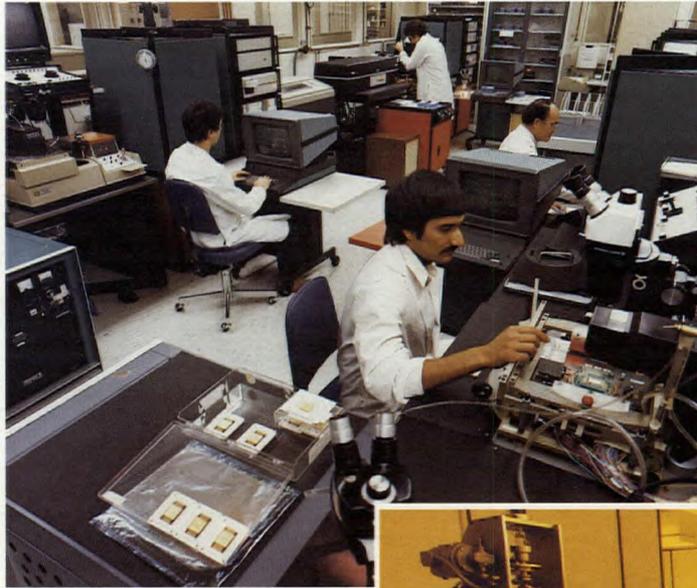
Garrett Canada

Custom Thick and Thin Film Hybrid Microcircuits

Garrett's microcircuits are produced in a fully integrated facility with a dedicated engineering, sales and production staff. The facility, equipped with specialized manufacturing equipment, is considered one of the best in North America.

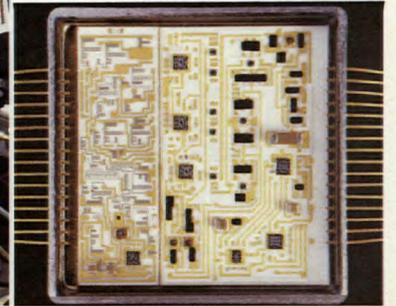
Custom thick and thin film hybrids are now being manufactured to the new and more demanding Military Standard 1772 — Manufacturer Certification and Line Certification of Fabrication processes. These include power hybrids and assemblies with leadless chip carriers that are surface mounted on multilayer ceramic motherboards.

Hybrids manufactured by Garrett are used in missile guidance, inertial navigation and radar systems and other



Computer-aided laser trimming of resistors.

Combined thin and thick film hybrid microcircuit.



electronic equipment for a variety of military and commercial aircraft, as well as in United States Government electronic security systems.



Thin film facility.

Typical illuminated panels.

Technician operates photometer for precision testing of chromaticity and luminescence.

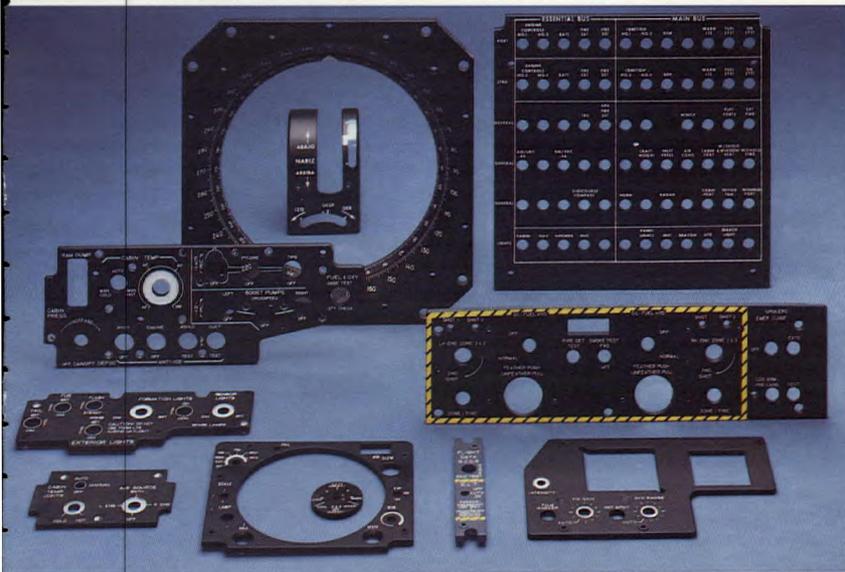


Illuminated Information Panels

Garrett now produces Types IV, V and VI illuminated information panels and accessories for use on ground, airborne, and marine-based equipment for the following:

- communications;
- pressure and other environmental control systems;
- navigational aids and radar systems.

All panels and accessories are manufactured to MIL-P-7788, MIL-L-27160, MIL-C-25050, MS33558 and NVG (night vision goggle) compatibility requirements.



Garrett Canada

Peripheral Vision Display System

Spatial disorientation is a well-known problem facing aircraft pilots flying under instrument conditions. A very high percentage of all fatal aviation accidents is attributable to it. Garrett's solution is a laser system that projects a line of light that moves across the instrument panel in correspondence with the actual horizon.

In the late 1960s, Canada's Defence and Civil Institute of Environmental Medicine, under the direction of Dr. Richard Malcolm, began research into the problems of pilot spatial disorientation. The study concluded that pilots (particularly military pilots), presented with a complex array of instruments, CRTs and weapons systems controls to monitor with central vision, were less vulnerable to spatial disorientation when the earth's horizon was available in their peripheral field of vision. The peripheral vision display's artificial horizon effectively substitutes for the earth's under instrument flying conditions.

Human balance and sense of orientation are derived about 90 per cent visually and 10 per cent through the mechanism of the inner ear and other sensors. It is now known that peripheral vision contributes nine times as much balance information as central vision. Peripheral vision is "hardwired" to dedicated parts of the brain whereas central vision is fed into non-dedicated parts of



the brain and requires additional processing before it can be used.

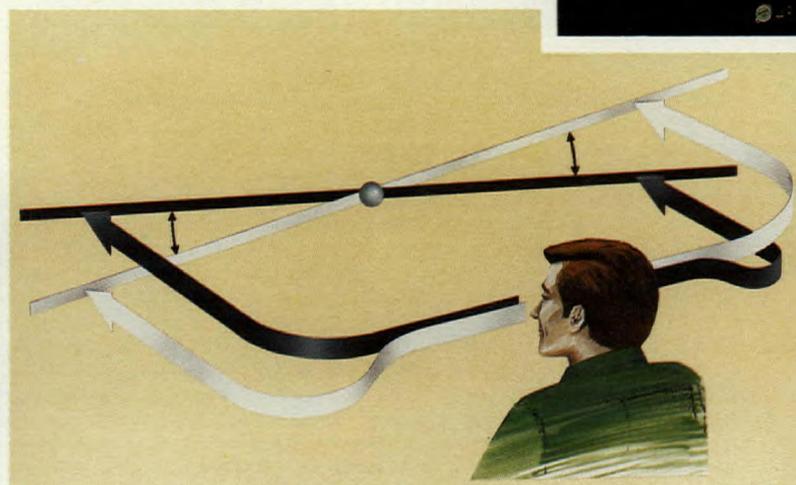
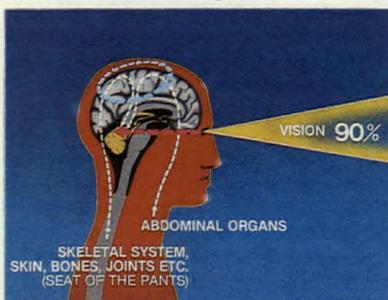
The pilot, using his peripheral vision, senses small movement over a wide area as opposed to looking at a small instrument using central vision. The amount of deflection, while very little on a small instrument, reaches large proportions when spread across the entire instrument panel. This ability is particularly advantageous when flying in turbulence, when it is difficult to read any instruments large or small and when other cockpit duties necessitate pilot head movement.

The Garrett peripheral vision display concept is being well received by military operators. Following the success of extensive operational and technical evaluations, production of the display unit for high-performance aircraft of the United States Air Force is underway. Evaluations on helicopters are being performed by the Canadian Forces at Summerside and by the Royal Aeronautical Establishment in Farnborough, England.

Peripheral vision display system.

Current equipment consists of the following three basic units:

- Control panel
- Processor
- Projector



Garrett Canada

Advanced Systems and Sub-contract Manufacturing Service

The 30 years of experience accumulated by Garrett in the design, development and manufacture of a wide range of aerospace and aerospace-related products creates a sound base for the production of major state-of-the-art defence and communication systems. This experience, supported by a modern up-to-date facility, is also available for sub-contract manufacturing.

The advanced systems capability provided by Garrett involves the company in a number of collaborative NATO programs. These are carried out from R&D and design, through systems integration, to complete life cycle support and world-wide marketing.

Garrett is currently studying the feasibility, design, and development of control actuation systems, power supplies, weapons computers and specialized test equipment for several NATO requirements.



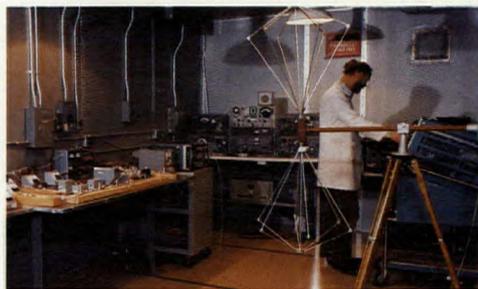
Brunswick's low-drag altitude dispenser on F-16 L.H. wing station basis for NATO LOCPOD development.



ASRAAM on underwing station of R.A.F. Tornado.

Computer-aided design.

The company has been selected as the Canadian national prime contractor for ASRAAM, with a mandate to design and develop the missile's fin control actuation system. Garrett is also a member of the multi-national teams conducting the feasibility studies for NATO's LOCPOD (low-cost powered off-boresight dispenser) and SRARM (short range anti-radiation missile) systems.



Computer-aided component attach.



Computer-aided test.

The sub-contract manufacturing services include the following:

- build to print;
- assembly and testing of sub-assemblies;
- assembly and testing of electronic systems.

The services utilize Garrett's highly experienced manufacturing groups, including aerospace standard assurance and computer-aided test facilities, to help customers meet demanding delivery schedules.

This service, backed by a team of high-technology experts employing computer-aided design and manufacturing techniques, provides the best co-operation in major procurement programs.

General Cybernetics Group

10851 Shellbridge Way
Richmond, British Columbia,
CANADA V6X 2W8
Tel: (604) 273-2243

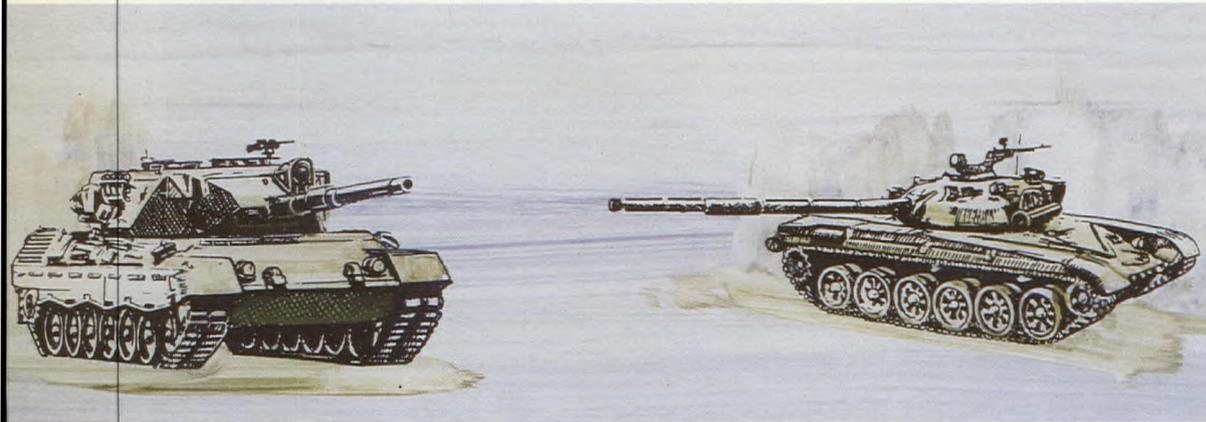
General Cybernetics specializes in the research, development and marketing of computer-based technologies for application to the problems of military training and health promotion.

The Military Division is dedicated to the development of sophisticated hardware and software that permit the use of the most advanced and effective military training techniques. Creating an

illusion of battle to enable soldiers to undergo "pre-experience" to a required level of realism, is the central drive and focus of the military application.

The Health Promotion Division applies the latest computer-assisted learning (CAL) technology to the process of changing attitude and behaviour, concentrating on lifestyle factors that are the source of the vast majority of modern-day health problems.

With its main facility in Richmond, British Columbia, and offices in Ottawa and Toronto, General Cybernetics anticipates international expansion to better serve a wide range of clients abroad including the military, governments, multinational organizations, educational and healthcare institutions, and the general public.



Battlefield simulators for today.

Isolation Systems

26 Six Point Road
Toronto, Ontario, CANADA
M8Z 2W9
Tel: (416) 231-1248
Telex: 06-984737

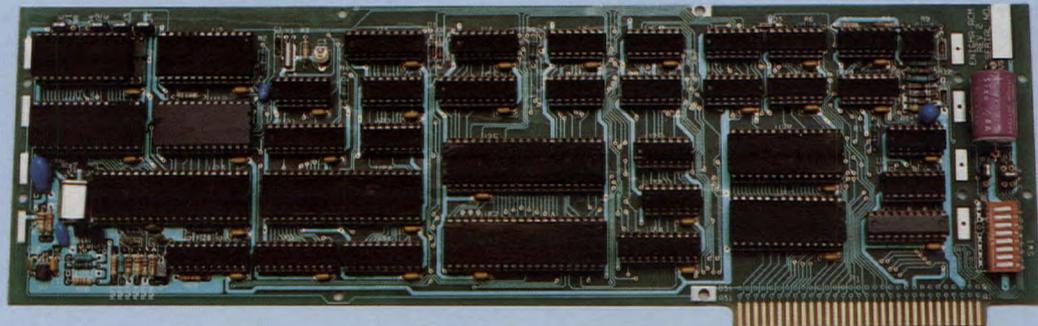
Isolation Systems specializes in the implementation of DES cryptographic techniques for electronic data security. The security procedures incorporated by Isolation are automatic and transparent, to ensure that good security practice is followed by the user without any conscious action on his part. The access control module and Enigma secure communications system are among the commercial products created by Isolation for microcomputers.

The access control module restricts access to a microcomputer to authorized users only. A high-speed cryptographic facility automatically encrypts all data written to disk. In addition, a file access

structure limits what data a user may access. User access to peripherals (modems, printers) can also be controlled.

The Enigma secure communications system provides encrypted dial-up communications of a network of microcomputers. The system offers

automatic encryption key management, mutual authentication, tamper detection, network management facilities, and other features.



The access control module — plug-in board for the IBM PC/XT/AT.

Global Thermoelectric Power Systems Ltd.

P.O. Box 400
Bassano, Alberta, CANADA
T0J 0B0
Tel: (403) 641-3512
Telex: 03-848141

Global is a prominent Canadian manufacturer of field-proven thermoelectric generators designed for unattended operation in remote locations. The company carries out extensive research and development and has the capability and experience to custom design products for military and commercial applications. The firm produces a line of

solid-state thermoelectric generator systems with outputs of 20 to 2 000 watts engineered to produce electric power continuously for many years with minimal maintenance.

Military development products include a 120-watt manpack thermoelectric generator that weighs only 18 kg (40 lb). It silently

generates DC electrical power for tactical operations and for applications such as powering communications equipment. A self-powered vehicle engine heater is also under development.

Global's energy conversion technologies are marketed throughout the world to military, government and private agencies.



Global Thermoelectric's 120-watt manpack generator.

General Motors of Canada Limited

Diesel Division

P.O. Box 5160
London, Ontario, CANADA
N6A 4N5
Tel: (519) 452-5184
Telex: 064-5643

The Diesel Division, General Motors (GM) of Canada has emerged since 1977 as a major world force in the development and production of wheeled armoured vehicles. Best known for its 6-wheeled and 8-wheeled vehicles, built under licence from the Swiss MOWAG company, GM now has more than 1 000 light armoured units

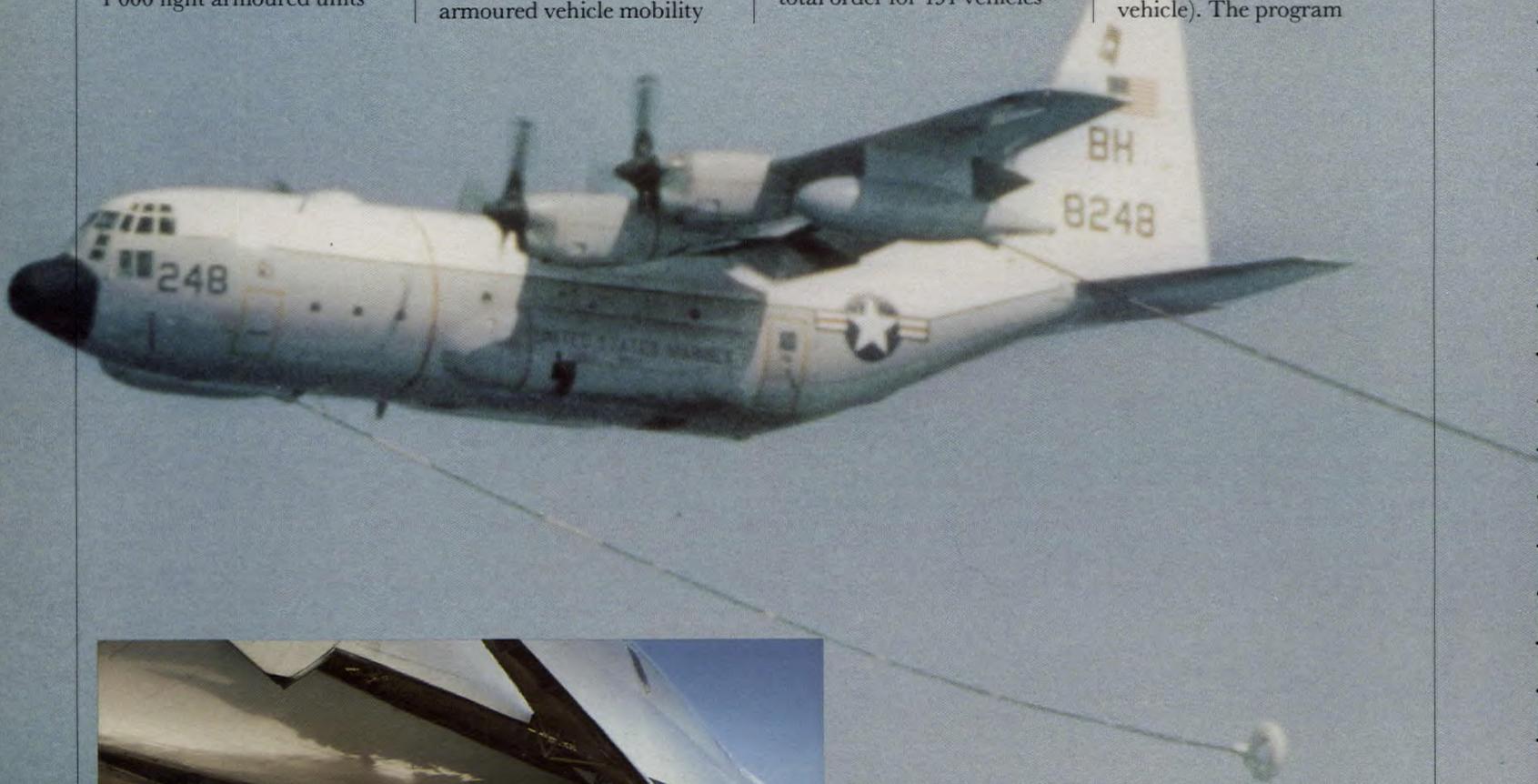
in the field that have accumulated more than 7 000 000 km (4 375 000 miles) of military service.

GM first entered the field to support MOWAG's bid for the Canadian Forces AVGP (armoured vehicle general purpose). The venture married MOWAG's technological breakthrough in armoured vehicle mobility

to GM's vast and highly specialized production resources. GM proved its capabilities in advanced welding techniques, quality assurance, applications engineering, and materials management. Canada's first 6 x 6 vehicle was delivered less than two years after the contract was awarded. The total order for 491 vehicles

— including fire support, personnel carrier and recovery variants — was completed in 1982.

The performance of both vehicle and contractor were proven again with GM's successful bid, following an intense competitive evaluation, for the U.S. Marine Corps' LAV (light armoured vehicle). The program



With up to 10 combat-ready units aboard a single C-5A, an entire LAV battalion can be air lifted anywhere in the world with just 14 sorties.

The driveline and suspension characteristics of these vehicles greatly enhances their cross-country capabilities.



General Motors of Canada Limited

centres on an upgraded, 8-wheel variant of the Canadian vehicle equipped with a 25-mm (1-inch) light assault gun turret. Other variants in the 758-unit order adapt the same wheeled platform to anti-tank, mortar carrier, logistics and recovery roles.

Exceptional mobility, outstanding reliability and low operating cost highlight the qualities of the GM 8 x 8 in all of its many roles. With nine distinct variants already

fielded, the vehicle family provides an excellent selection of non-developmental solutions to military requirements for the following:

- deployable light armour forces;
- rear area battle;
- combat service support;
- hard-skin systems platforms;
- command and control.

GM's extensive integrated logistic support (ILS) program has attracted particular attention. At its

heart is one of the world's most comprehensive computer databases for supporting military vehicles. Its function is to assure the highest level of force readiness for the least cost: from initial design to crew training to life-cycle parts provisioning.

GM also utilizes its extensive resources to enhance existing vehicles. For the M113, GM built and applied a new engineering kit and integrated the LAV 25-mm (1-inch) two-man turret.

A mine clearance kit is being applied to the LVTP7 amphibious vehicle for the U.S. Marine Corps. GM offers additional capabilities to refit, repower or upgrade vehicles to modern military standards.

In co-operation with the Canadian government, GM is actively exploring new opportunities throughout the defence product line.



Weighing less than 14 tons, GM armoured vehicles are air transportable by heavy lift helicopter and tactical transport craft such as the C-130 and the C-141.



The useful service life of M113 inventories can be extended with GM enhancements such as Delco 25-mm (1-inch) turret integration to meet modern firepower standards.

Halifax-Dartmouth Industries Limited

Barrington Street North
P.O. Box 1477
Halifax, Nova Scotia,
CANADA
B3K 5H7
Tel: (902) 423-9271
Telex: 019-22672

Halifax-Dartmouth Industries designs, constructs and repairs naval vessels, ice-breakers, semi-submersible drilling rigs, dynamically positioned drill ships, fishing vessels and commercial ships of all classes. The company offers technological expertise combined with more than 100 years of time-tested tradition and a solid reputation for quality, delivery and price.

The company's capabilities are in demand by the offshore

oil industry for such tasks as the completion of leg sections in jack-up rigs, the installation of piping and of high-pressure blow-out preventers.

Halifax-Dartmouth is also experienced in the repair and maintenance of submarines and offshore service and supply vessels. With its modern facilities that include marine railways, fitting out docks, a graving dock and two floating drydocks, the Halifax-Dartmouth shipyard located in the deep and

ice-free water of Halifax harbour can handle any vessel capable of passing through the Panama Canal.

Halifax-Dartmouth applies state-of-the-art CAD/CAM technology and utilizes computer-aided critical path planning and scheduling; production scale modelling of machinery spaces; and modular and unit construction techniques. The company carries out comprehensive quality control and maintains its expertise

through its staff of creative naval architects and marine engineers and its skilled and experienced work force.

Halifax-Dartmouth Industries Limited operates three primary divisions: Halifax Shipyards, Dartmouth Marine Slips, and Industrial Repair and Manufacturing. Aerial photo shows the Halifax Shipyard operation with its wide range of berths and docks, including the Panamax dry dock.



HANDS Fireworks Inc.

1785 Woodward Drive
Ottawa, Ontario, CANADA
K2C 0P9
Tel: (613) 224-8753
Telex: 06-960229
(Milton, Ontario)

HANDS Fireworks is the major supplier of military pyrotechnics to the Canadian Armed Forces. The company has been active in the military and commercial pyrotechnics fields since 1873.

HANDS has two manufacturing plants, one at Papi-neauville, Quebec, and the other at Edwardsburgh,

Ontario. The Edwardsburgh plant includes specifically designed facilities for the manufacture and testing of smoke items, as well as a new research and development laboratory. The company is actively engaged in new product development.

The range of military products includes the following:

- Operational stores:
- coloured signal smokes
 - screening smokes
 - marine markers
 - signal cartridges
 - illumination projectiles
 - trip flares
 - squib igniters

Training simulators:

- air and groundburst simulators (NBC)
- thunderflashes
- artillery fire simulators
- anti-personnel practice mines

Specialized or custom pyrotechnic devices.

Atomic explosion simulation.



◀ Battle effect simulators.

HC smoke hand grenade.



Chemical weapons simulation. ▼



Airburst simulator (NBC).

Coloured smoke hand grenades. ▶



Coloured signal smokes.



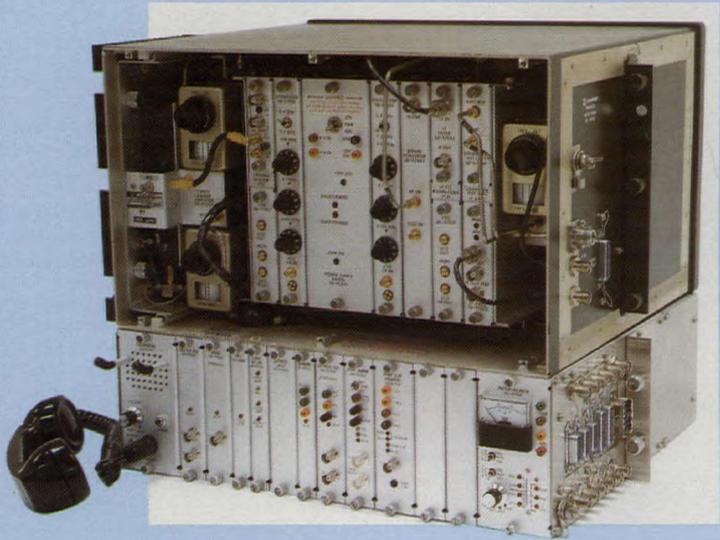
Anti-personnel practice mine.

Harris Farinon Canada, Inc.

657 Orly Avenue
Dorval, Quebec, CANADA
H9P 1G1
Tel: (514) 636-0974
Telex: 05-821893
TWX: 610-422-4122

Harris Farinon Canada, Inc., is a leading Canadian producer of digital and analog microwave radio and multiplexers. Over the last 25 years, Harris Farinon has established an excellent reputation as a supplier of highly reliable communications equipment that meets the most demanding performance standards.

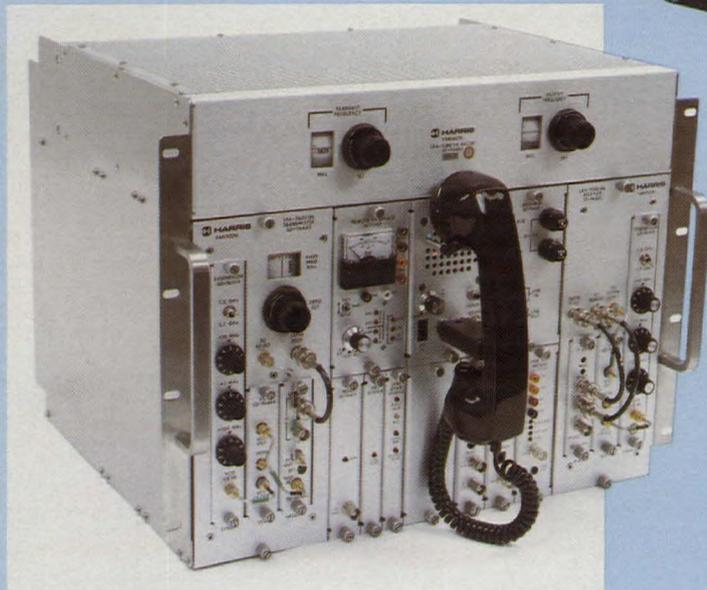
In addition to the products shown here, Harris Farinon Canada manufactures a complete line of analog and digital microwave radios in all the common frequency bands, from 300 MHz to 18 GHz. The company has proven experience in the design, manufacture and installation of major turn-key communications systems, with products currently in service in more than 140 countries around the world.



*RF-590.
Reliability and easy servicing are built into the RF-590 receiver. The unit is fully synthesized in 1-kHz steps from 10 kHz to 30 MHz.*



*DTM-2500.
Fully synthesized 2.5-GHz digital microwave radio with field tunable RF filters. The RF/IF head is shock mounted in an enclosure suitable for installation atop a mobile telescoping tower.*



*DTM-2500.
RF/IF head enclosure with overvoltage protection unit.*

*DTM-2000.
Fully synthesized and field tunable 2-GHz digital microwave radio for fixed or transportable use. Operating frequency can be changed in seconds without the use of test equipment.*

John T. Hepburn, Limited

914 Dupont Street
Toronto, Ontario, CANADA
M6H 1Z2
Tel: (416) 671-2200
Telex: 06-968793
FAX: (416) 671-0499

John T. Hepburn has proven expertise in the design and manufacture of marine and deck equipment for naval and other vessels as well as deck and drill machinery for the offshore petroleum exploration and production industry.

Hepburn manufactures such precision-engineered products as replenishment-at-sea

(RAS) systems, winches, capstans, windlasses, elevators and chain tensioning units.

The Hepburn RAS systems, available in various configurations, are designed for the transfer at sea of fuels and/or solids from one ship to another. These high-performance systems are in service with the Canadian, French, Italian and Australian navies.

The range of Hepburn winches includes stern anchor, mooring, towing, helicopter haul down, cargo handling, and other multipurpose models. The company manufactures forward and aft mooring capstans, buoy handling and other special-purpose units.

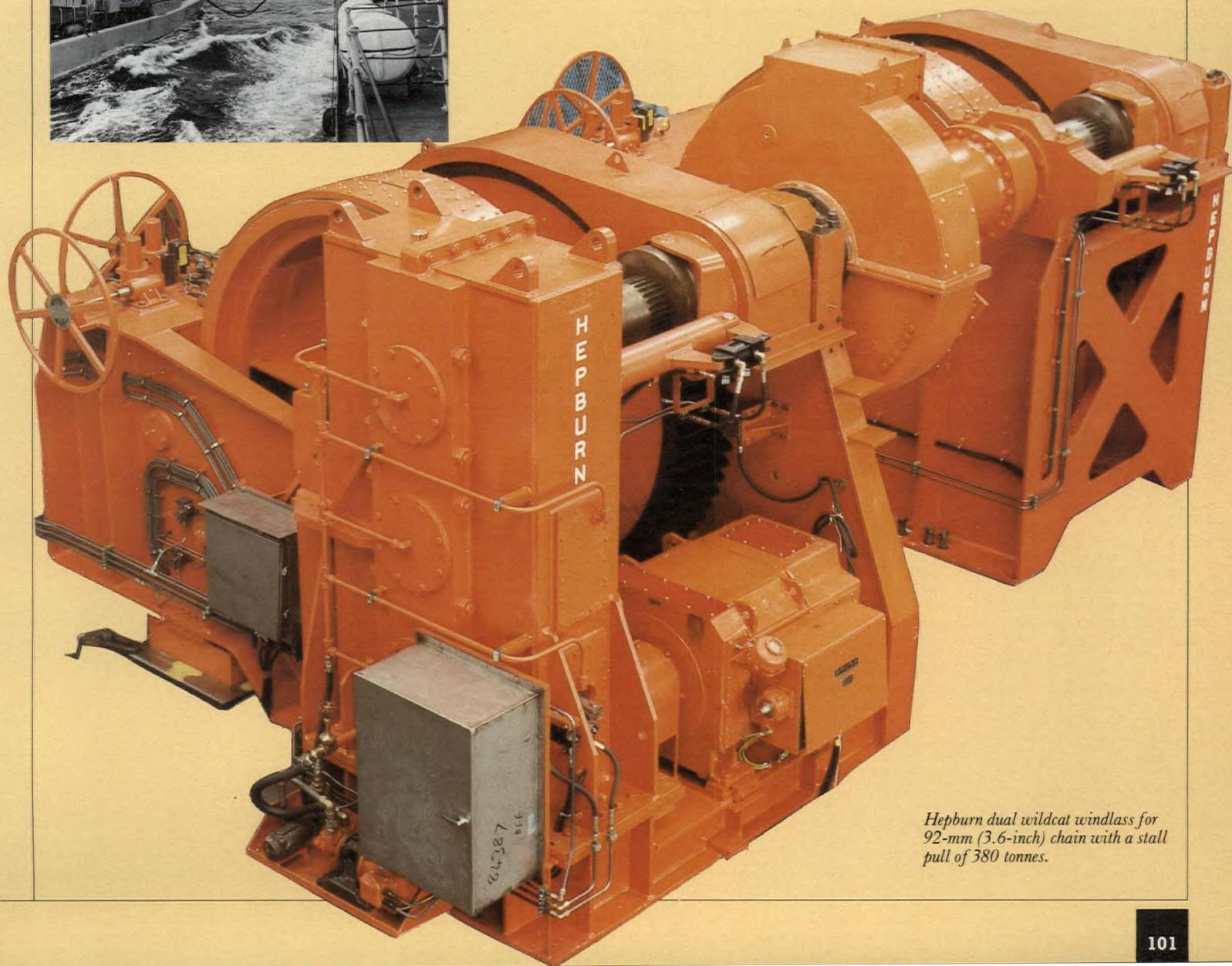
Elevators are engineered by Hepburn for stores, ammu-

nition and helicopter lift configurations. The Hepburn chain tensioning units serve as a compact economical alternative to the conventional anchor or winch.

Other Hepburn products include industrial cranes, hydraulic presses, mine hoists, steel mill equipment, machine tools, design services and custom manufacturing to specifications.



Replenishment-at-sea (RAS) system in operation transferring stores and fuel.



Hepburn dual wildcat windlass for 92-mm (3.6-inch) chain with a stall pull of 380 tonnes.

Hawker Siddeley Canada Inc.

Orenda Division

P.O. Box 6001
Toronto AMF, Ontario,
CANADA L5P 1B3
Tel: (416) 677-3250
Telex: 0696872
FAX: (416) 678-1538
Cable: ORENDA

The Orenda Division of Hawker Siddeley Canada, established in 1946 as the Gas Turbine Division of A.V. Roe Canada Limited, has played a major role in the growth of the Canadian aerospace industry. The company is a significant participant in the maintenance of the Canadian Armed Forces' fighter engine inventory.

From the design and production of over 3 800 Orenda engines for the F86 Sabre and CF100 interceptor aircraft, and the production under licence of over 1 300 J79 and J85 engines for the CF104 Starfighter, CF5 Free-

dom Fighter and CT114 Tutor Trainer, Orenda has emerged as the foremost engine maintenance facility for the front-line fighter aircraft of the Canadian Armed Forces. The recent award of the Third Line maintenance contract for the F404 engines of the newly acquired CF-18 aircraft keeps Orenda in the forefront of engine technology.

Located adjacent to Toronto's International Airport, Orenda operates a modern facility, with over 65 000 square metres (700 000 square feet) of space, that has four test cells capable of accepting all military afterburner-type

gas turbine fighter engines up to a thrust of 15 000 kg (30 000 lbs). To accommodate the advanced F404 engine, one test cell has been fully computerized and made functionally identical to those installed at Canadian Armed Forces bases in Canada and West Germany. This allows direct correlation to be made of data gathered by the microprocessor-based data acquisition system.

Orenda also manufactures engine components, provides engineering support and undertakes research and development projects on behalf of the Canadian Armed Forces. Components are pro-

duced in a well-equipped fabrication and machine shop complex, with excellent facilities for heat treatment, surface treatment, NDT testing and production material and process controls. Today Orenda manufactures such parts as turbine discs and nozzles, compressor casings, drive shafts and spacers for the J79 and J85 engines for Canadian and other forces. Similar parts, together with compressor stators, turbine cases, combustion liners, gas generators and firewalls are manufactured for the U.S. Armed Forces, Pratt & Whitney Aircraft, Avco Lycoming, Allison, and Pratt & Whitney Canada.



Hawker Siddeley Canada Inc.

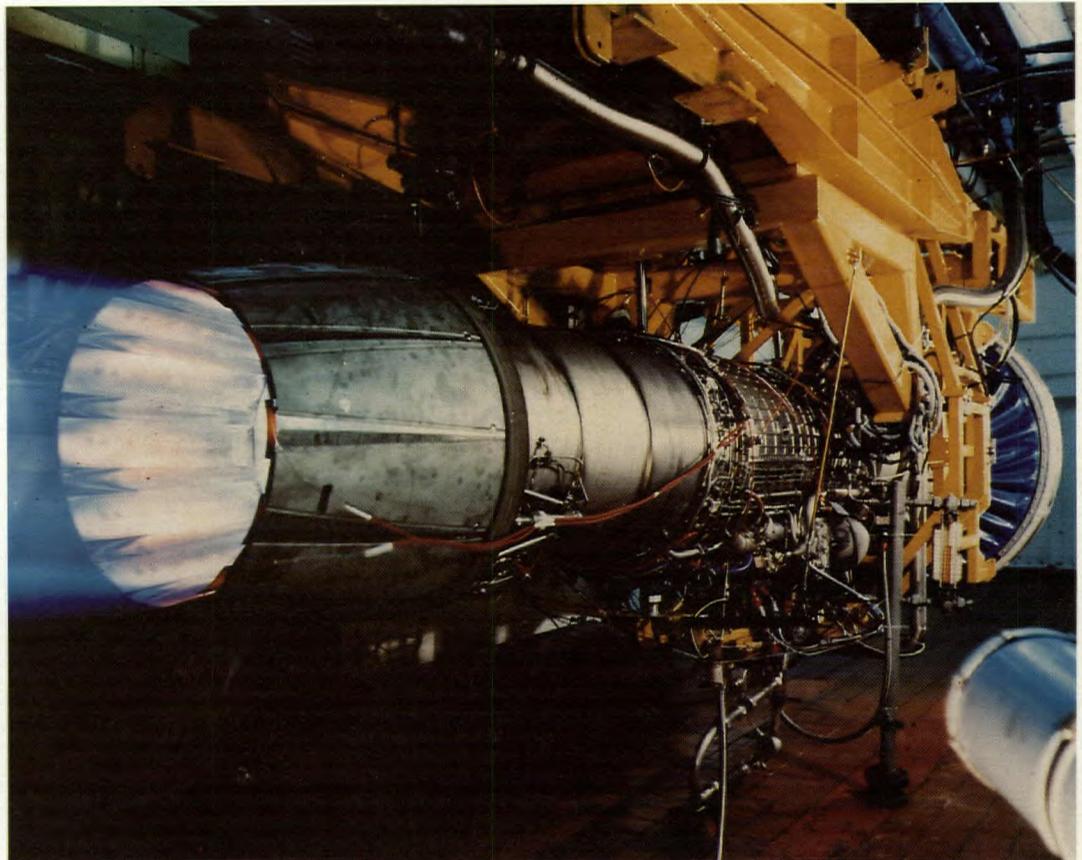
Orenda's engineering support group is entirely devoted to the engineering needs of the Canadian Forces for the J79, J85 and F404 engines. A major responsibility of this department is the configuration control of these engines. The group of engineers and technical specialists is complemented by an experienced laboratory staff of metallurgical, welding, fuel and controls, electric and electronic mechanical and instrumentation specialists, and a graphics department.

Orenda is currently undertaking a gas turbine structure and materials-oriented technology program for military fighter engines, for specific application to the repair, overhaul and life-cycle management of the Canadian Forces' engine inventory. Other research and development projects underway include the following:

- development of modifications in J79 and J85 engines;
- research into use of degraded fuels in afterburning engines;
- manufacture of seals and bearing test rigs, and testing of newly developed engine seals and bearings;
- low-temperature testing of gas turbine fuels.

Orenda is fully qualified to DND 1015, MIL-Q-9858A, AQAP-1, DOT and numerous other customer specifications.

Two aircraft (CF-104 (left) and CF-18) for which Orenda has engine maintenance and R & O (repair and overhaul) responsibility.

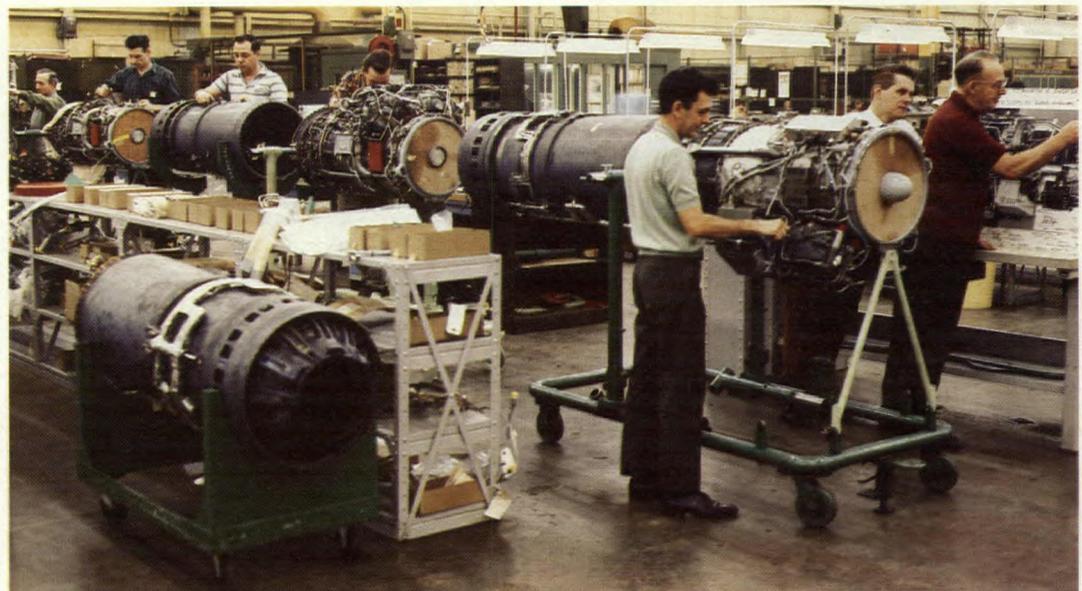


An F404-GE-400 Turbofan engine operating on full afterburner during a test run.



J85-CAN-40 turbine nozzle produced by Orenda is typical of the extensive range of spares manufactured for the J79 and J85 engines.

Orenda's repair and overhaul line for J85-CAN-15 afterburning engines.



Hewitt Equipment Limited

P. O. Box 1200
Pointe-Claire, Quebec,
CANADA
H9R 4R6
Tel: (514) 630-3100
Telex: 05-822746

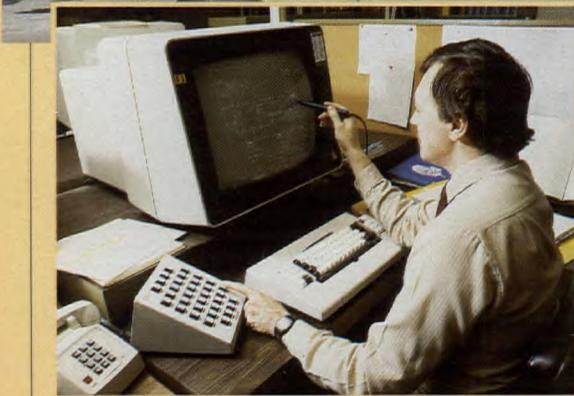
Customized power is generated by the reliable, advanced technology products of Hewitt Equipment. The company has steadily expanded and diversified its operations since it was established over 30 years ago, and today offers a

product line that meets defence logistic support requirements as well as commercial needs. A major strength of Hewitt is its capability to customize products to customer specifications in a cost-effective way.

Hewitt Equipment has played a key role in many Canadian defence projects such as the DEW radar line in the Canadian Arctic. Internationally, Hewitt's products, especially its generator sets with switchgear are equally well-known. Recent Hewitt projects include the supply of diesel engine electric generator sets for army camps in the Middle East; diesel engine pipeline pumping units for NATO installations; diesel engine power generator sets with branch power distribution units for the ground support system of a major air defence program in the Middle East.

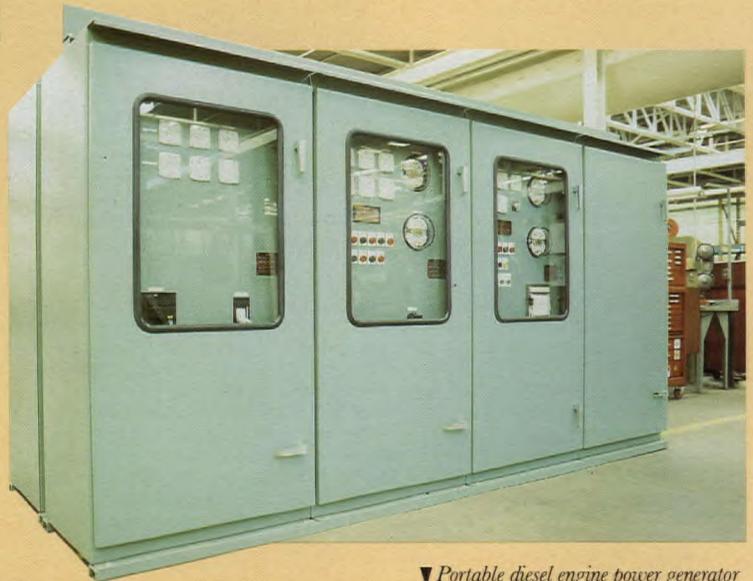
The Hewitt product line includes stationary and mobile diesel electric sets ranging from 50 kW to 4 400 kW; electrical switchgear up to 36 kV; synchronized control modules; generator and tactical auxiliary power; industrial and vehicular diesel engines; marine propulsion and auxiliary diesel engines; gas turbine generator sets; and material handling and earth moving equipment.

Continuing research and development ensure that Hewitt will retain its leading position as manufacturer of generator systems for industrial and defence applications.



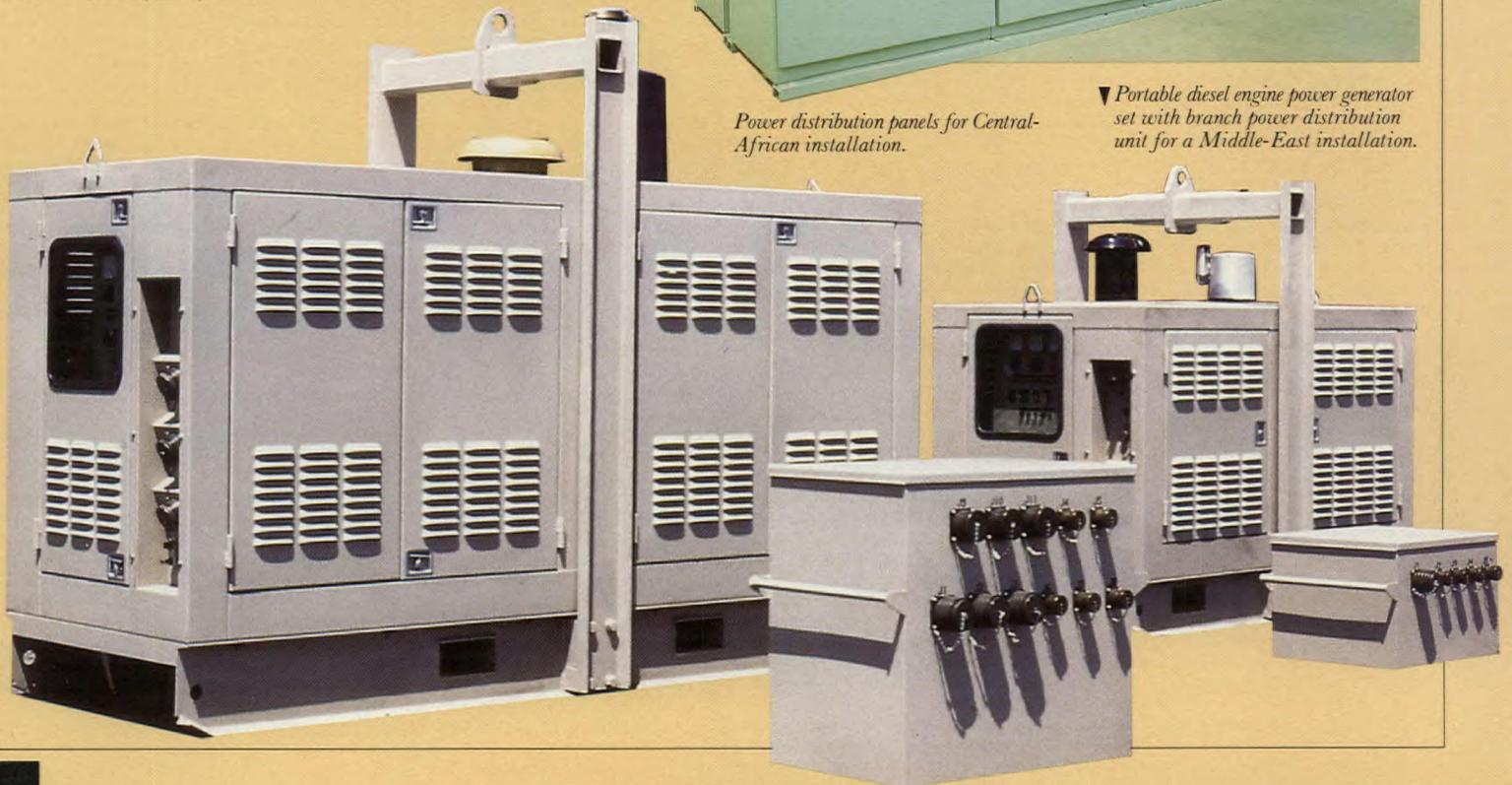
Headquarters and manufacturing plant, located in Pointe-Claire, Quebec.

Products are designed and manufactured with the assistance of the CAD/CAM computer system.



Power distribution panels for Central-African installation.

▼ Portable diesel engine power generator set with branch power distribution unit for a Middle-East installation.



Honeywell Limited

Defence & Systems Research Division

99 Bank Street, Suite 935
Ottawa, Ontario, CANADA
K1P 6B9
Tel: (613) 238-6628
Telex: 053-3307

Honeywell Canada's Defence & Research Division (DSRD) services the aerospace and defence markets through its Advanced Technology Centre, Learning Centre, and a Software Development Centre for the programming of new software. Honeywell also maintains an avionics repair and overhaul facility in Canada.

The Advanced Technology Centre (ATC) performs applied research and development in various advanced technologies leading to new Canadian products. ATC's strong new product orientation and emphasis on aerospace and defence areas centre on the following technologies:

- systems and controls
- signal and image processing
- man-machine sciences
- microelectronics

Current ATC programs include the development of an integrated multi-sensor navigation system for military helicopters (HINS), and a variable depth sonar (VDS) with enhanced performance by means of high-rate data transmission on fibre-optic cable and tow body motion

compensation using inertial reference data. The design and manufacture of prototype mines for training purposes are also in progress. The ATC is also investigating the feasibility of processing electronic materials in space.

The Learning Systems Centre (LSC) has been developing turn-key computer-based training systems for the Canadian Armed Forces since 1980. The LSC's full range of capabilities includes expertise in task analysis through the design, development and evaluation of training systems and courseware creation. The principal emphasis of the centre has been on the integration and delivery of the complete training system.

Current activities of the LSC include the development of the following:

- a portable audio-visual voice interactive system, voice interactive maintenance aiding device (VIMAD), that will aid in equipment maintenance for constrained or harsh environments;

- a generic microcomputer-based skills simulator/trainer incorporating audio/video disk technology and controlled by a personal computer;
- a computer-based course in instructional design methodology.

Honeywell's Defence Division enjoys significant benefits from its access to the company's international technology and product base that enhance its ability to respond to customer requirements. The division is able to import selected technologies for new

product development as required, which reduces product lead-times and increases the "value-added" of Canadian-developed technology.

Honeywell Limited recognizes the importance of addressing global markets and therefore has positioned its research and development centres to bring together Honeywell world technologies and Canadian capabilities. The goal of this strategy is to foster invention, leading to new Canadian products with export potential.

Variable depth sonar.



HINS for Sea King helicopter replacement program.



Integrated helmet and display sighting system.



VHSIC circuit.



Hovey Industries Ltd.

2378 Holly Lane
Ottawa, Ontario, CANADA
K1V 7P1
Tel: (613) 731-1200
Telex: 053-4922



Commander's field office.

Hovey Industries is a comprehensive engineering and manufacturing company with a world-wide reputation for innovative design and development of a wide range of electro-mechanical and micro-electronic systems, vehicle systems, and other specialized product lines.

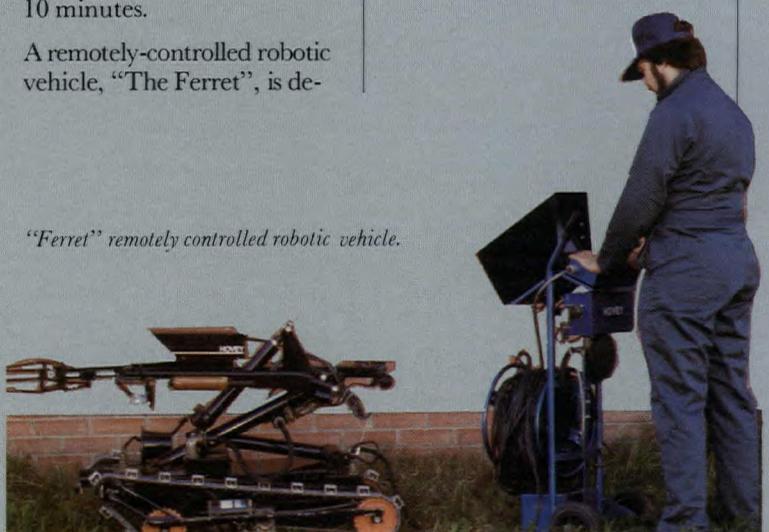
The special projects division was instrumental in developing a series of dedicated military kits and wheel servicing equipment for the Canadian Department of National Defence. Such kits of modular configuration

provide maximum operational flexibility. They range from the Commander's Field Office and the Postal Field Office to various maintenance kits such as aircraft armament and vehicle wheel servicing.

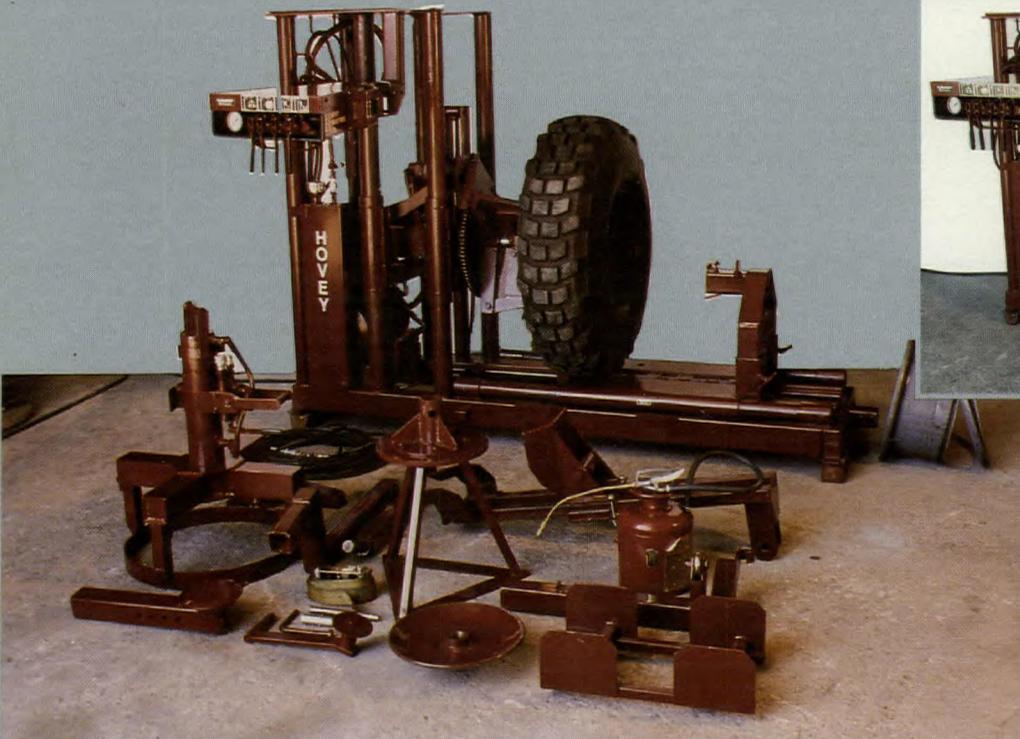
The versatile Hovey tire changing machine enables a wide range of tires and wheel assemblies to be serviced quickly and conveniently. A single, unskilled operator can completely service the Hutchinson runflat insert wheel assembly in less than 20 minutes, and a beadlock wheel assembly in less than 10 minutes.

A remotely-controlled robotic vehicle, "The Ferret", is de-

signed primarily for security agencies. It is an economical, versatile, compact, and lightweight vehicle that incorporates the most current advances in remote vehicle technology, such as stair climbing capability to 45°. The Ferret is designed for a variety of applications from explosive ordnance reconnaissance and disposal, surveillance, anti-hijacking and hostage taking, to fire and radiation detection and other emergency situations.



"Ferret" remotely controlled robotic vehicle.



Hovey tire changer.

5795 De Gaspé Avenue
Montreal, Quebec, CANADA
H2S 2X3
Tel: (514) 273-0451
Telex: 05-24651

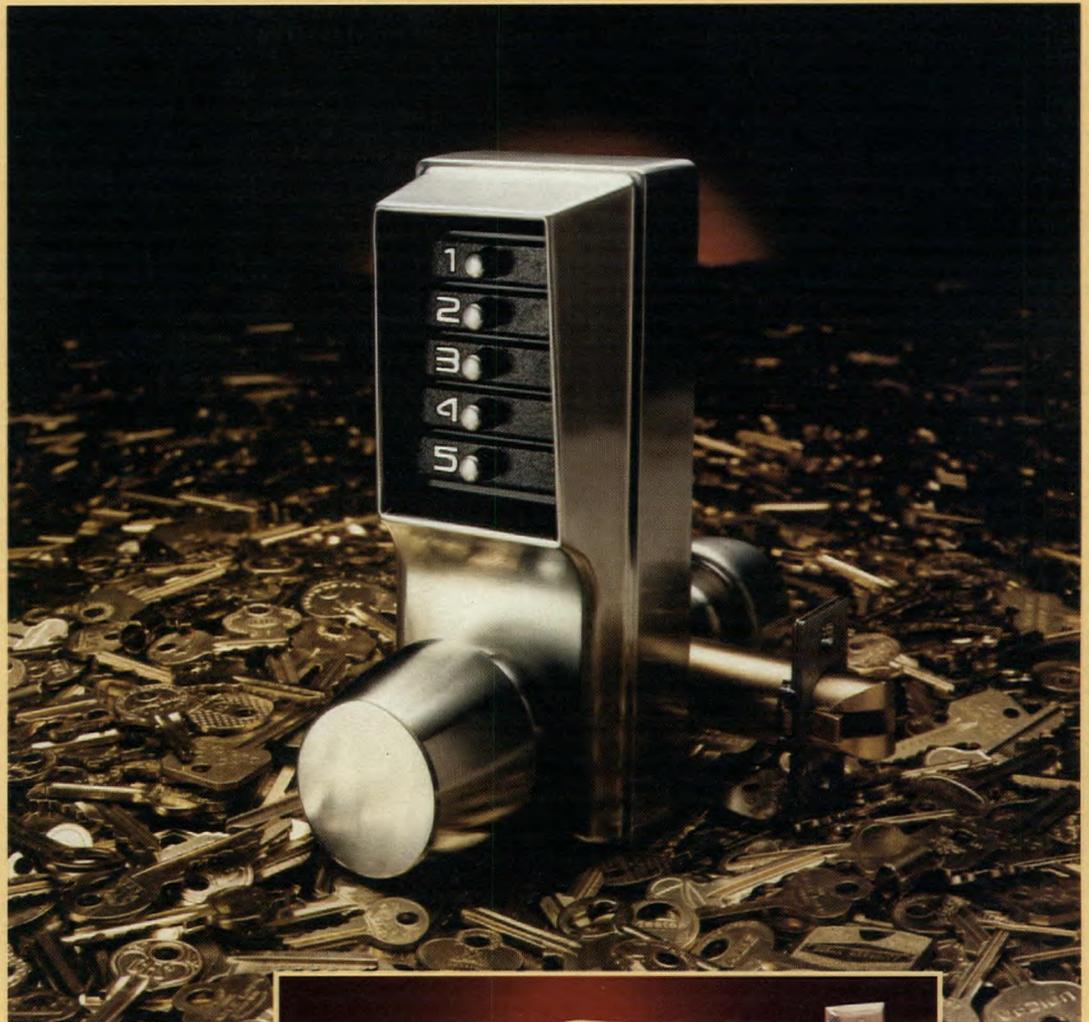
Ilco Unican Inc.

Unican Security Systems Ltd. is the world's leading manufacturer of mechanical, changeable combination, pushbutton locks. Unican® is best known for the 1000 Series lock, a heavy-duty model originally developed to solve access control problems for the Bell Telephone Company of Canada.

The Unican 1000 Series* is a high-strength lock designed for years of trouble-free operation. Its features include 19-mm (0.75-inch) anti-friction deadlocking latch-bolt, weather-resistant construction, completely mechanical one-hand operation, and quick cost-free combination change.

Now in use around the world, Unican pushbutton locks are ideal for data processing centres, airports, police and military installations,* universities, or any heavy traffic area where frequent turnover of personnel demands numerous lock changes to maintain security. The owner can re-program the lock with a new access code in less than a minute.

The 3000 Series lock for narrow stile aluminum and glass doors.



The Unican 1000 Series lock.*



Miscellaneous pushbutton locks for various applications.

Unican locks have earned an excellent reputation in the international security field. Used by NATO and many other security-sensitive organizations, they provide easily installed, keyless, pick-proof security. They can be used anywhere there is a need to limit access without inhibiting authorized personnel.

Ilco Unican produces a broad range of security hardware, decorative hardware, and locksmith supply products. It operates four manufacturing facilities in North America and maintains an international sales and distributor network.

**The Unican 1000 Series lock is designed for complete compliance with paragraph 36A of the Industrial Security Manual of the U.S. Department of Defense.*



I.M.P. Group Limited

7037 Mumford Road
Halifax, Nova Scotia,
CANADA
B3L 2J1
Tel: (902) 454-8391
Telex: 019-21668

The Aerospace Repair and Overhaul Division of the I.M.P. Group is the major maintenance facility for fixed and rotary wing aircraft in eastern Canada. Located at Halifax International Airport, the division serves both the military and commercial aircraft industries.

The maintenance facility with its highly trained operational management and engineering staff, offers a full range of equipment modifications. I.M.P. performs overhaul services on military aircraft such as Canada's C.P. 140 Aurora aircraft, the Tracker aircraft, and the Sea King helicopters.

The Aerospace Manufacturing Division plant in Hammonds Plains, Nova Scotia, is one of the most modern electrical harnessing plants in North America. The plant manufactures electronic wire assemblies for aircraft and electrical industries. It also produces miscellaneous aerospace metal components and designs and manufactures precision injection moulds. The on-site injection moulding machines are capable of moulding plastics, nylon and Teflon at pressures of up to 500 tons.



The I.M.P. Aerospace Engineering Division has one of the most highly qualified and versatile engineering departments of any aerospace repair and overhaul company in Canada. This division provides total aerospace engineering, weapon systems studies, software engineering and project management. The technical writing department is recognized by the

I.M.P. hangars at Halifax International Airport.

Repair and overhaul of military aircraft.

I.M.P. manufacturing plant.



Department of National Defence to be one of the best in the country, developing technical information from raw engineering data into text copy and finished product complete with technical illustrations.

I.M.P. is a diversified group of companies. From its headquarters in Halifax, Nova Scotia, I.M.P. serves the natural resource, high-technology and many other industries in Canada.

Repair and overhaul of Sea King helicopters.

Innotech Aviation

455 Michel-Jasmin Avenue
Dorval, Quebec, CANADA
H9P 1C2
Tel: (514) 636-8484
Telex: 05-822879



Avionics systems design and integration has been an Innotech strength since 1955. Shown here is an all-digital 5-Tube EFIS (electronic flight instrument system) avionics package in a business jet.



Innotech Aviation is one of Canada's leading specialists in prototype engineering, short-run production of components, and certification of all types of aircraft modifications, both structural and avionic. Typical examples of Innotech's capabilities are the installation of ELT housings in 42 Falcon 20s for the U.S. Coast Guard, the integration of two complete electronic countermeasure (ECM) packages in Royal Norwegian Air Force Falcons,

Electronic countermeasures fitments were accomplished on two Falcon 20s for the Royal Norwegian Air Force by Innotech Aviation, Montreal.



Custom interiors, avionics special modifications and engineering services are an Innotech specialty. The interior of an 11-passenger Challenger 601 is shown.

the inspection and refitting of wiring systems in the Canadian Forces' CC-109 Cosmopolitans, and the design, engineering and installation of the interiors, avionics and external finishes for the Canadian Forces' fleet of 12 Challengers.

The company's main base is in Montreal, where the Modification Centre, Engineering, Design, Avionics and Service Divisions are located. Vancouver, Toronto, Ottawa, and Calgary complete the Innotech plant network with ancillary technical services and repair stations. The company is approved by the departments of National Defence and Transport, and has wide experience dealing with the aviation administrations of many other countries.

For information, contact:
Douglas M. McGregor,
Vice-President,
Marketing and Sales,
Technical Division,
Innotech Aviation Limited,
Cargo Road "C",
Montreal International
Airport,
Dorval, Quebec, CANADA
H4Y 1A6;
Tel: (514) 636-8484;
Telex: 05-82156.

Two of 18 Challengers for the Armed Forces of Canada and other nations are shown here undergoing interior and avionics completion in the Modification Centre at Innotech Aviation, Montreal.



Indal Technologies Inc.

3570 Hawkestone Road
Mississauga, Ontario, CANADA
L5C 2V8
Tel: (416) 275-5300
Telex: 06-961482

Indal Technologies (formerly DAF Indal Ltd.) is internationally recognized in the aerospace and marine industries as a supplier of shipborne helicopter support systems to safely land, secure, traverse and protect helicopters at sea.

The combination of expertise and equipment has formed the ship/helicopter interface system that consists of the following:

- helicopter recovery assist, securing and traversing (RAST) systems for helicopters as small as the Hughes 500D or as large as the Sikorsky SH-60B. RAST enables helicopter pilots to safely land on and take off from the decks of ships in rough seas, at night or in foggy weather, and helicopters to be securely manoeuvred on deck under these same conditions;
- telescopic hangars to provide shelter for helicopters operating from ships where a conventional fixed hangar cannot be incorporated because of space limitations;

A Sikorsky SH-60B helicopter landing on a USN FFG-7 frigate.

Indal Technologies Inc.

- special high-strength doors for both fixed and telescopic hangars;
- lightweight helidecks for shipboard installation;
- visual landing aids, including flight deck lighting and motion indicators;
- helicopter refuelling systems;
- flight deck firefighting and rescue equipment;
- complete design and turn-key supply of shipboard helicopter operation and maintenance facilities;
- pilot and flight deck crew training.

Indal Technologies' RAST has been selected by the United States Navy for its LAMPS (light airborne multipurpose system) Mark III ASW program as well as by the Canadian Armed Forces for the Canadian Patrol Frigate Program. This RAST version is based on the Canadian Navy's helicopter haul-down and rapid securing device (HHRSD), a wire-assisted landing aid for large helicopters which was developed for the Canadian Navy to permit Sikorsky Sea King helicopters to operate from destroyer class vessels in North Atlantic conditions.

Indal Technologies is skilled in all aspects of design engineering, program management, integrated logistic support, and system integration services related to electro-mechanical-hydraulic and structural systems including but not limited to those listed above.

Originally incorporated in 1951 under the name of Dominion Aluminum Fabricating Ltd., the company became a member of the Toronto-based Indal Group of companies, and changed its name to DAF Indal Ltd., and then to Indal Technol-

ogies Inc. The parent company, Indal Limited, is a diversified industrial organization with 38 operating divisions and subsidiaries in Canada and the United States. Indal Limited sales exceeded \$935 million in 1985.

Helicopter safely secured in up to sea-state-5 conditions.



Intellitech Canada Limited

81 Metcalfe Street, Suite 400
Ottawa, Ontario, CANADA
K1P 6K7

Tel: (613) 236-7803
Telex: 053-4823

Intellitech Canada offers specialized products and services for communications and computer systems. The company's expertise in both hardware and software has produced a solid base for its engineering and consulting services in communications and information systems applications.

Intellitech also offers expertise in the areas of packet network communications, high-level data communications protocols, encryption, multi-microprocessor systems, database and information systems and HF/UHF/VHF packet radio.

A strong research and development effort supports the high quality of these services and is responsible for Intellitech's specialized computer system products. The company has invested heavily in computer centre and laboratory facilities.

Intellitech has developed and installed several parts-inventory turn-key systems for Canada's Fighter Aircraft Program that accelerate the handling of aircraft parts for the new CF-18s and for the Canadian Armed Forces' supply depots and bases. A

comprehensive information system is at the heart of the operation and bar-code equipment is used to achieve high operational efficiencies.

The "spectrum management system" designed by Intellitech automates the management and allocation of radio licences and frequencies. The proliferation of mobile and fixed radio equipment produces congestion in the airwaves causing complex interference

and management problems. Intellitech has skillfully developed a turn-key system on minicomputers that provides significantly improved price performance over the traditional main-frame approach. Relational database mechanisms, forming the foundation for the information system, are integrated with computer-aided engineering tools for the electromagnetic compatibility (EMC) analysis.



International Submarine Engineering Ltd.

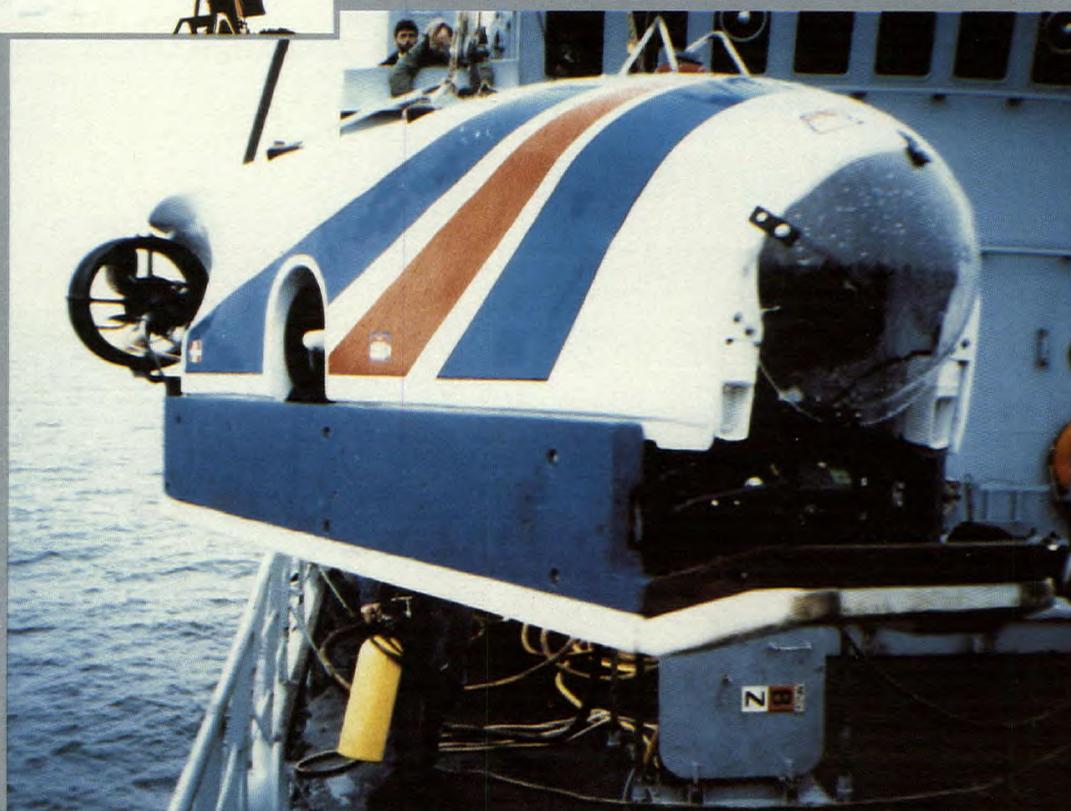
2601 Murray Street
Port Moody, British Columbia,
CANADA V3H 1X1
Tel: (604) 937-3421
Telex: 04-353554



Dolphin.



Underwater robot ARCS.



The Trail Blazer.

International Submarine Engineering (I.S.E.) and associated companies are the designers and builders of manned, tethered and autonomous undersea vehicles, as well as producers of imaging sonars, remotely controlled cranes and remote-controlled land vehicles.

I.S.E. remotely controlled vehicles have been designed and built for an operating range of up to 2 500 metres (2 734 yards); towed systems are operational for 6 000 metres (6 560 yards). Over 140 I.S.E. vehicles and 175 manipulators are in use world-wide.

Internav Ltd.

Sydney Industrial Park
 Sydney, Nova Scotia, CANADA
 B1P 6J9
 Tel: (902) 564-2043
 Telex: 019-35126

Internav manufactures airborne, marine and special applications Loran-C receivers ranging from compact low-cost units to advanced high-precision systems. The equipment is in use world-wide, and has a high reputation for accuracy, ease of operation and rugged reliability.

Internav receivers are installed in all Canadian Coast Guard and National Defence vessels, and in search and rescue aircraft. Units have been supplied to several foreign government and military organizations, and to a large number of Canadian and overseas commercial users.

The Internav LC-720 marine navigation system provides complete latitude/longitude navigation functions, including position, track made good, speed, and distance and time to any of up to 40 waypoints. The system can use one or two separate Loran "chains" simultaneously for enhanced



INTERNAV LC-720.

performance in marginal areas. Options include automatic search and rescue patterns, calculation of equivalent Decca Navigator Zones and

Lanes, and RS-232 and other outputs.

The Internav LC-1200 airborne R-Nav system also operates in single or dual-chain mode. Full navigation capability is provided between any of up to 1 200 5-character alphanumeric waypoints. Fifty pre-stored routes allow instant flight plan selection. Options include search and rescue patterns, parallel tracks for agriculture, forestry patrol, and other special applications. The LC-1210 variant is a single unit, dual-chain Loran sensor designed for use with navigation management and

similar systems via an ARINC 429 interface.

The Internav LC-408, designed for geophysical surveying, monitoring, and other applications requiring maximum precision, allows two complete Loran chains of up to 10 stations to be tracked simultaneously. Master independent and range/range modes are standard, plus several special RS-232 interfaces including remote data-link operation. The LC-403 variant provides single chain monitoring capabilities in a very small package suitable for buoys or other unmanned objects.



INTERNAV LC-1200.



INTERNAV LC-408.

Irvin Industries Canada Ltd.

Aerospace Division

*P.O. Box 280
Fort Erie, Ontario, CANADA
L2A 5M9
Tel: (416) 871-6510
Telex: 061-5169*



Irvin Industries, the designer and manufacturer of a variety of special-purpose recovery systems for the NASA Space Program, the AN USD 501 and AN USD 502 surveillance drone systems, and cruise missiles, produces deceleration systems for supersonic transports and multi-use high-reliability deceleration systems for fighter aircraft. Irvin's emergency escape system, the automatic inflation modulation (AIM) parachute program, represents a major breakthrough in improved reliability and survivability. The AIM parachute incorporates advanced fabrics that permit high-speed parachute deployment without injury to the aircrew.

Irvin offers a wide range of aerial delivery systems for cargo and personnel that are tailored to the mission requirements of military forces. The cargo parachutes, containers and load rigging equipment are available for low-level extraction, or, when fitted with precision opening release systems, are suitable for higher level deliveries. Personnel parachutes vary in size according to application and include non-steerable, steerable and freefall military parachutes; high-performance parachutes for special forces application; search and rescue and emergency parachutes.

The complementary Irvin product line offers inflatable life support equipment; air cargo ground handling equipment; aircraft, automobile and industrial restraint systems such as the vehicle "air bag."

Irvin's quality control program conforms with the requirements of the Canadian Armed Forces. The company has been listed by the military as an "approved" supplier since 1938.

IVI Inc.

1010 Sherbrooke Street West
Suite 608
Montreal, Quebec, CANADA
H3A 2R7
Tel: (514) 282-1396
Telex: 05-24207 (IVI MTL)
Cable: VALCAR (MTL)



IVI Inc. is the sole producer of small-calibre military and commercial ammunition in Canada, and the exclusive supplier of 5.56-mm, 7.62-mm, 9-mm, .50 calibre, .303 calibre and 20-mm ammunition to the Canadian Armed Forces.

Plant facilities are fully integrated with the company's foundries that produce the brass, gilding metals, and lead required for the manufacture of military ammunition. Military cartridge components are also available. Facilities include the necessary equipment to inspect and pack ammunition to NATO standards.

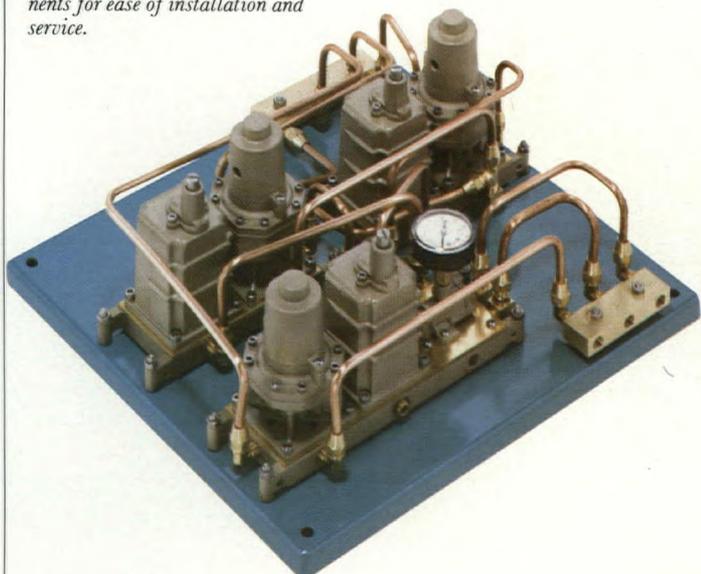
All military products are manufactured to the highest quality standards and meet all NATO specifications. Canadian Armed Forces inspectors, resident in the plant, are available for processing and inspection of sales to foreign customers. IVI Inc. is strongly committed to the development of new markets. The company has been particularly successful in Europe, Africa, Southeast Asia, and South America.

Large assortments of sporting ammunition are produced by IVI Inc., including 22 calibre rimfire ammunition, centre-fire and shotshells, sold in Canada under the "Imperial" brand name.

Kobelt Manufacturing Company Ltd.

11720 Horseshoe Way
Richmond, British Columbia,
CANADA
V7A 4V5
Tel: (604) 271-2741
Telex: 04-355853

Model 2850-1110 constant timing throttle display panel. Timing panels consist of manifold-mounted components for ease of installation and service.



Kobelt Manufacturing Company Ltd., a leading supplier of quality marine control systems and disc brakes, produces components that are engineered to withstand the harshest service environments for many years. Kobelt disc brakes have been used successfully in almost all fields, from mining applications to general industrial uses such as for heavy vehicles. The company has provided marine propellor shaft brakes for many tug boat fleets, ocean going vessels and navy applications, including totally non-magnetic brakes for mine sweeper use. Kobelt controls, made of non-

magnetic and non-corrosive brass and stainless steel materials, are warranted by the company for five years.

Mechanical, pneumatic and electric marine control systems can be engineered to the most exacting military requirements by Kobelt's highly qualified, well-trained professionals.

From propulsion controls on a mine sweeper or patrol vessel, to deck equipment controls on a destroyer, Kobelt control components are custom designed to specific application requirements. Kobelt controls are already in use in many NATO countries.

Model 2074 electric control head.

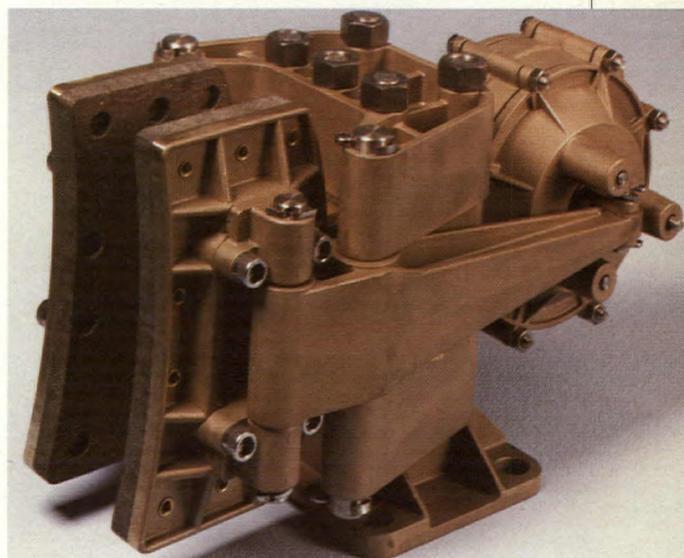


Model 2050 heavy-duty, single-lever, push-pull control head with overriding throttle.



Model 2556 two-lever pneumatic control head.

Model 5021 brake caliper. Brake calipers are made from all brass and stainless steel. Main castings are die cast in silicon brass.



Kaufman Footwear

Division of William H. Kaufman Inc.

410 King Street West
Kitchener, Ontario, CANADA
N2G 4J8
Tel: (519) 576-1500
Telex: 069-55453

Kaufman Footwear, Canada's largest manufacturer of footwear, has crafted quality products offering protection, safety and comfort since 1907. Kaufman, originally the manufacturer of only rubber boots, expanded its product line dramatically to include protective boots for military and industrial applications and cold weather boots, additions to its regular slippers, casual shoes and industrial rainwear.

The firm's standards of excellence in materials and construction have earned it contracts with the Canadian Department of National Defence for the supply of ecological warfare boots and combat overshoes.



Sorel Snowcat

Worn on numerous Arctic and Antarctic expeditions in temperatures to -53°C (-63°F), the Snowcat has stormtrooper styling, 407-mm (16-inch) polyurethane-backed nylon upper, attached to waterproof bottom of natural rubber, 1-cm (0.4-inch) wool felt liner to top of boot, 100-percent natural rubber suregrip waffle sole. Full sizes 6 to 13, black or white, are available. Other styles are offered with leather or nylon uppers, various fastenings and numerous sole patterns.



Ecological Warfare Boot

Designed for chemical warfare protection, this boot meets DND Spec D-87-003-005/SF-001. It consists of a butyl shell covered in Neoprene, with Neoprene outsole and knurled tread. Designed for quick entry, the boot is resistant to mustard and nerve gas for 24 hours. Full sizes only, 4 to 13, are available.



Combat Overshoe 160-7568

Similar to the Varsity, the Combat overshoe has an outsole of small diamond definition with knurled strips for added traction. The lower portion of the boot is insulated. It is available in powder finish, in sizes 5 to 14, full only.

Kaufman Footwear



Environmental Boot

Designed for wear over combat or safety boots in cold weather, the boot offers maximum water repellancy, with its silicone-treated, Neoprene-backed nylon upper. Thick foam rubber insulation adds warmth. It has an easy-on-and-off design with a

heavy, front zipper. Waterproof bottom is of natural gum rubber with slip-resistant tennis-roll sole. Bottom of black Neoprene gives the boot oil and acid resistance. Sizes 5 to 13, full only, are available.



Varsity

Designed to be worn over combat boots in wet and cold conditions, the Varsity features a tennis-roll outsole design — highly resistant to abrasion. It has full bellows tongue under a heavy-duty front zipper, a nylon tricot back slider, and nylon covered foam insole for easy entry. Its lining is of 100-per-cent cotton net. All components are

cemented and vulcanized by the autoclave method. Heavier gauge friction tape and rubber reinforce the back stay, heel counter, vamp, foxing and zipper. The Varsity is made of 100-per-cent pure gum rubber, with a semi-gloss finish. Sizes 6 to 14 are offered in full and half; sizes 3, 4 and 5 full only.



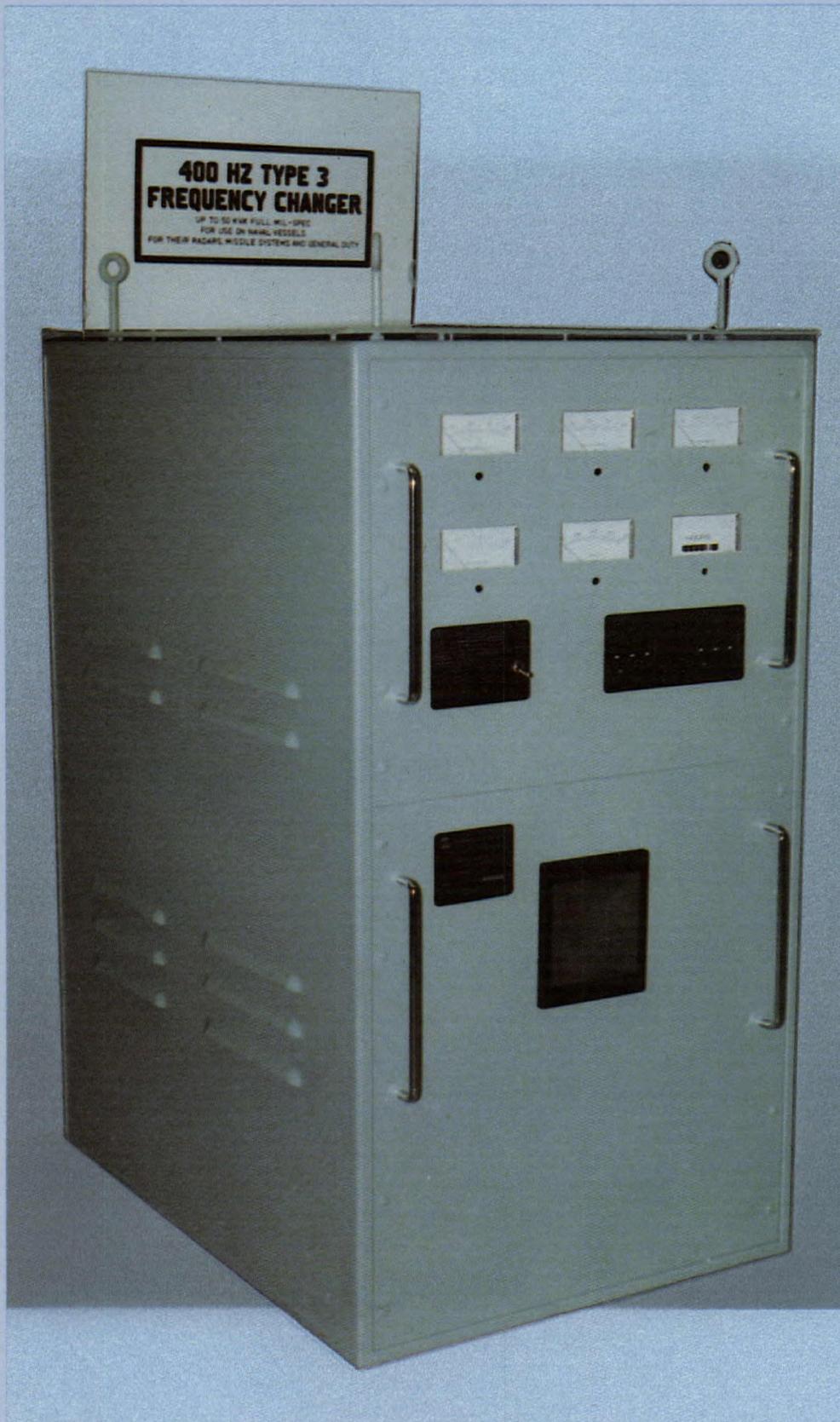
Sorel Roustabout

Designed to provide warmth and safety in extreme cold conditions, the Roustabout has a 170-gram (6-ounce) full-grain high oil content leather upper, 1-cm (0.4-inch) wool felt liner to top of boot, oil-resistant Neoprene bottom

with cleated sole. Steel toe is CSA Grade 1 and A.N.S.I. approved. Similar styles are available with hard rubber safety toe or steel sole, and various treads with Neoprene or rubber bottoms. Full sizes 6 to 14 are available.

KB Electronics Limited

150 Bluewater Road
Bedford, Nova Scotia, CANADA
B4B 1G9
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Telex: 019-21779
FAX: (902) 835-6026



KB Electronics has been manufacturing electronic power conversion equipment for the commercial, marine, and defence industry since 1979. The company is an established designer and manufacturer of 400-Hz frequency changers, UPS systems, helicopter starting supplies, battery chargers, and converters. Direct participation in major Canadian and United States defence programs and as subcontractor to American, European and Canadian original equipment manufacturers has established the company as a world leader in power conversion. Naval vessels, military aircraft, weapon and missile systems rely on KB power systems for top performance and reliability.

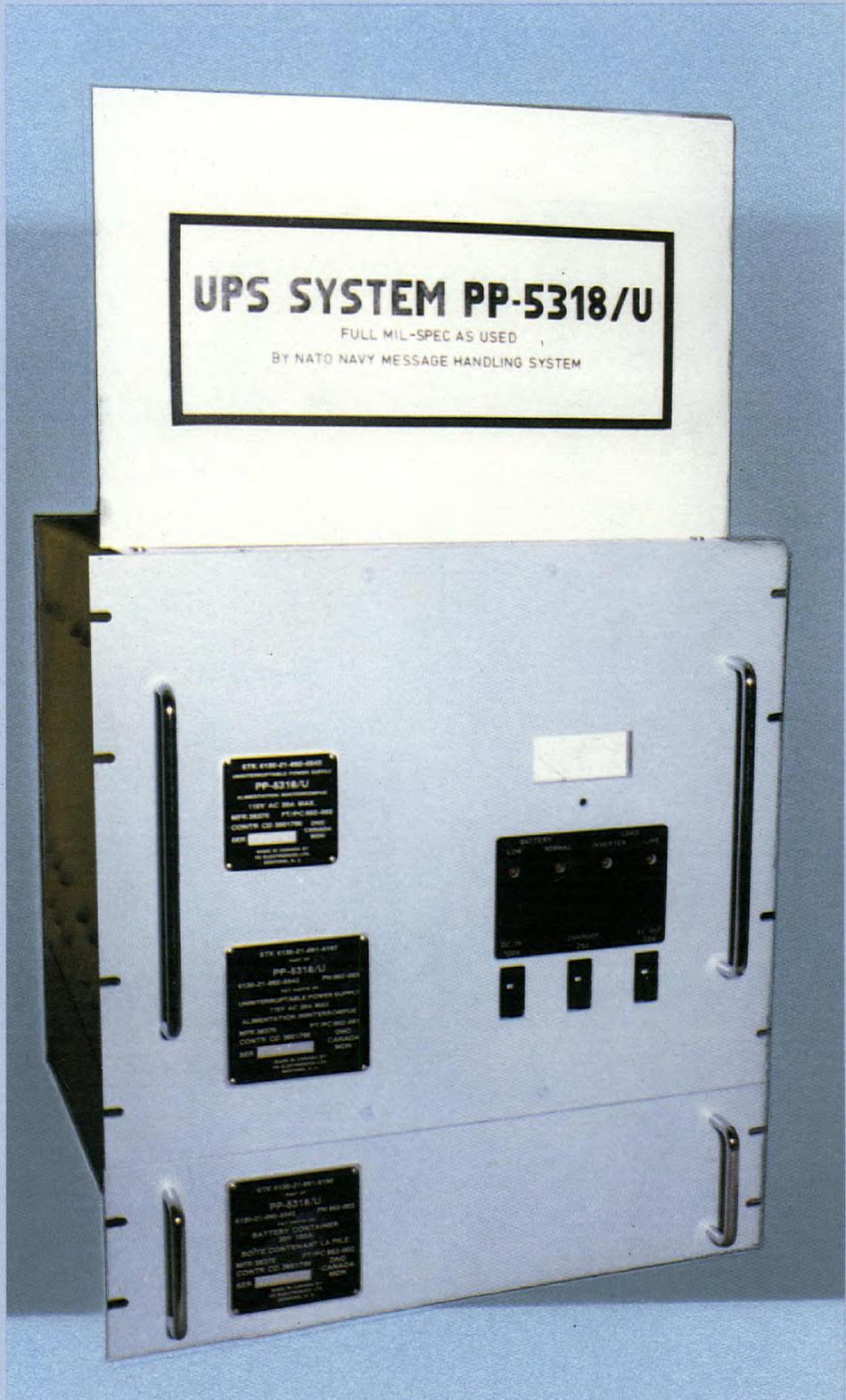
*Frequency changer, 400 Hz, Type 3,
built to military specifications.*

KB Electronics Limited

Modern well-equipped research and development facilities with computerized environmental testing, vibration, audio noise, electro-magnetic interference, CAD systems and scientific computers contribute to the manufacture of an efficient, reliable finished product.

Manufacturing is self-contained in a 9 300-square-metre (100 000-square-foot) plant that contains metal shop, plating, painting, assembly and sophisticated testing equipment.

KB Electronics is NATO certified (code 38370) with a quality assurance system complying to AQAP-1 and MIL-Q9858A and its military certification laboratory meets AQAP-6 requirements.



UPS System PP-5318/U, full military specifications.

Leigh Instruments Limited

2680 Queensview Drive
Ottawa, Ontario, CANADA
K2B 8J9
Tel: (613) 820-9270
Telex: 053-4129

Leigh Instruments is an established supplier of advanced defence electronic products and systems for government and defence agencies in Canada and around the world.

Leigh recently developed a secure digital voice communications system (SHINCOM) for naval vessels that will be installed on Canada's new patrol frigates. SHINCOM meets a wide range of applications from naval update programs, land-based installations with high security requirements, submarines, and ice-breakers to offshore oil rigs.

A space vision system developed by Leigh assists the space shuttle's remote manipulator arm in locating, targetting and manoeuvring payloads in space. Using closed-circuit cameras and real-time photogrammetric techniques, the system has applications in other hostile or hazardous environments.



Leigh's naval integrated communications system has been selected for the new Canadian patrol frigate.



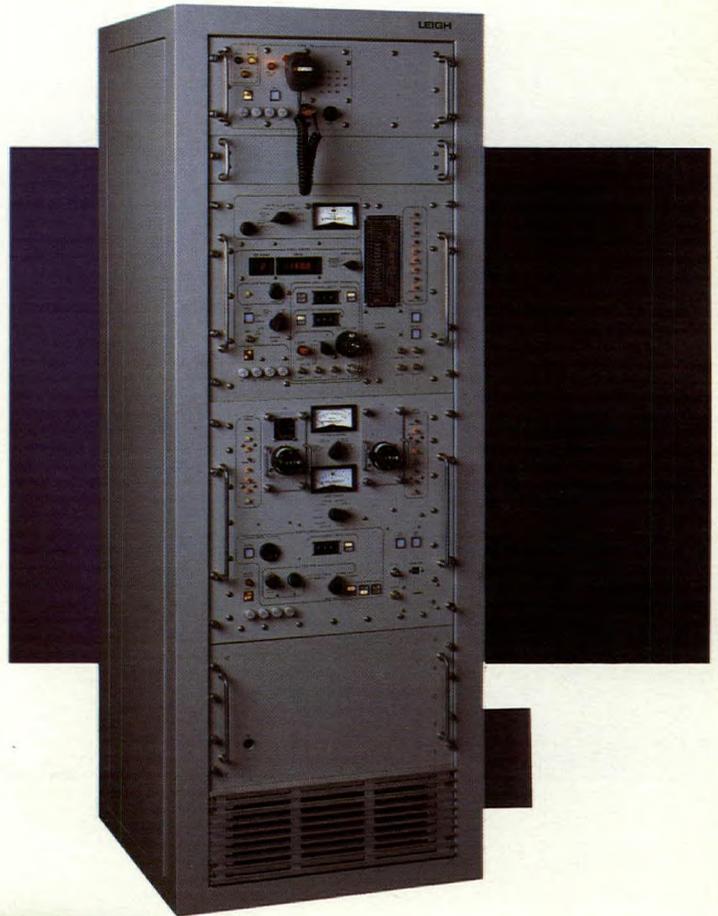
Leigh Instruments Limited

Leigh's TACAN solid-state beacon transponder provides identification, range and bearing to aircraft from en-route or terminal sites. Available in fixed ground, ship-board, VORTAC, and tactical mobile configurations, it has been selected for the Canadian Patrol Frigate Program and for land-based sites across Canada.

The company has renowned expertise in safety-related avionics such as deployable crash position indicators for fixed and rotary wing aircraft, crash-survivable flight data recorders, cockpit voice recorders, helicopter ice detection systems, mechanical strain recorders, and illuminated panels.

The company co-produces the stores management system and communications system control set, two major avionics subsystems under licence for Canada's CF-18 aircraft.

Leigh also designs and manufactures quartz crystals, crystal filters, crystal oscillators and frequency synthesizers for use in communications and navigation equipment, and high-performance glass-to-metal hermetic seals.



Leigh's TACAN beacon transponder features rapid channel selection and remote maintenance monitoring



Pre-production solid-state memory modules are flight-tested in this deployable crash position indicator air-foil that ensures the survivability of flight data.

Ernst Leitz Canada Limited

328 Ellen Street
Midland, Ontario, CANADA
L4R 2H2
Tel: (705) 526-5401
Telex: 06-875561
FAX: (705) 526-5831

The Leitz facility is capable of complete production of electro-optical systems.



Precision optical assemblies.

Leitz Canada has gained a world-wide reputation for excellence and precision in the design, development and manufacture of sophisticated optics, opto-mechanical assemblies, and advanced electro-optical instruments. This expertise has found application in many areas of military, industrial and scientific optics.

Military systems developed and manufactured by Leitz Canada include visual and infrared assemblies for guidance and fire control applications, binoculars, rifle sights, weapon sights, laser rangefinders and designators, HUD and HDD optics, periscopes, and muzzle reference systems for armoured vehicles.

The company also designs and produces lenses (with focal lengths from 18 mm to 900 mm (0.7 to 35.4 inches) for underwater, aerial reconnaissance, earth resource and space applications.

Leitz Canada provides specialized custom assemblies such as complex periscope viewing systems for use in high-radiation nuclear environments, industrial electro-optical equipment including laser scanners, non-contact inspection devices and quality-control instruments.



Design, development and application of multilayer thin film coatings for UV, visible and IR materials.



Leitz maintains a complete, precision mechanical fabrication capability.

Leitz 3-axis co-ordinate measuring machine for quality assurance.



Ernst Leitz Canada Limited

To maintain its excellent reputation in optic systems, Leitz Canada constantly pursues new methods of improving quality and performance through a comprehensive research and development program.

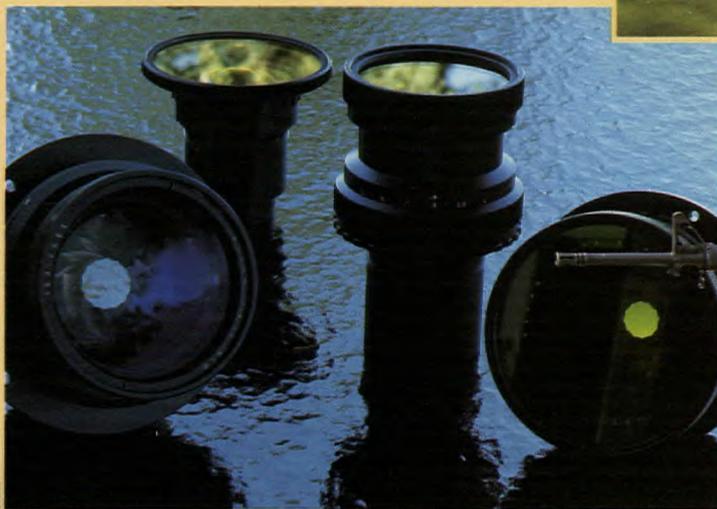
New developments are under way in optical data storage equipment for use in harsh environments and military systems, infrared coatings and weight reduction techniques using plastics. Other areas of research under study by Leitz Canada include optical countermeasures,

optical data storage for harsh environments, thermal imaging, image intensification and optics for space.

From a full complement of computerized optical design and CAD programs in the engineering departments, to complete opto-mechanical testing capabilities, Leitz Canada has the most modern facilities to undertake the design, development and manufacture of components, assemblies and systems for conventional and advanced applications as well as for research programs.



A sample of photographic and reconnaissance optics.



Leitz Canada designs and manufactures visual and IR electro-optical and opto-mechanical devices such as laser rangefinders, fire control and muzzle reference systems for a variety of armoured vehicles.



The ELCAN integrated rifle sight for small arms and machine guns.



Levy Auto Parts Company

1400 Weston Road
Toronto, Ontario, CANADA
M6M 4S7
Tel: (416) 243-2944
Telex: 065-24148
Cable: LEVYAUTO

Levy Auto Parts specializes in the supply of maintenance spare parts and major assemblies for wheeled and tracked armoured vehicles of Canadian and United States military design. Levy is particularly competent in the fabrication of components and assemblies for the drive-train of these vehicles, including engine

assemblies (both gas and diesel), transmission assemblies, final drive assemblies, cooling systems and electrical systems.

Competence, quality and integrity in applications in more than 40 countries have won world-wide recognition for Levy Auto Parts. A major supplier of spare parts to

NATO countries and to other international organizations Levy is a leader in the updating and repowering of existing military equipment.

The company's manufacturing facilities are equipped and staffed to provide quality engineered products for all classes of military vehicles. Levy's production capability in supplying and rebuilding all types of transmissions and drive trains and the modification of equipment to meet special environmental and other requirements is unmatched in the world.

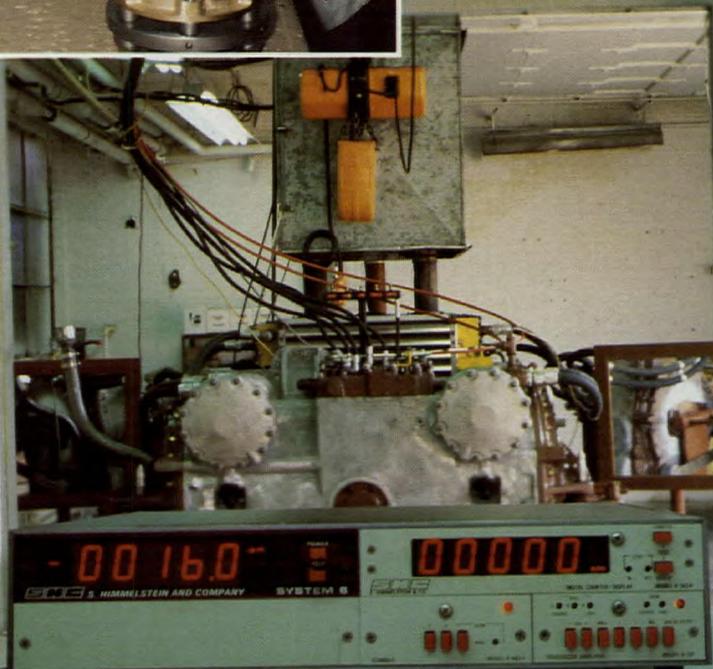
Single vehicles, light or heavy, tracked or wheeled, for

Quality assurance inspection at Levy's Military Transmission Division evaluating a newly manufactured cam ring in accordance with U.S. military specifications.

example, are prototyped at the Levy facility; complete new drive trains may be installed, units repowered or dieselized. Bodies and suspension units may be rebuilt or modified, and integral hydraulic and electrical systems modernized. To improve their mobility and range capability, modern fuel supply systems, more efficient cooling, and high-speed drive mechanisms may be installed.

Dynamometer-equipped modern testing facilities at the Levy manufacturing plant ensure that every prototype delivered for demonstration and field trials measures up and exceeds customer requirements.

Military design transmission test facility.



Levy Auto Parts Company

The Brute Truck Division of Levy Auto Parts manufactures the Brute terminal tractor, a super efficient freight movement system for container ports, railroad yards and freight terminals. The Brute has a Detroit Diesel, Cummins, or Caterpillar engine and features power train and drive components that set the industry standard. The transmission is Allison, the axle selection front and rear is Rockwell. Custom-

designed features to enhance specific capabilities can be incorporated. Most systems are covered by a one-year warranty from their manufacturers.

Shunt truck operators appreciate the unique comforts of the Brute: 360° visibility through oversized windows; heavy-duty insulation for a quiet ride in a climate-controlled environment; a spacious walk-in cab with almost one foot more head

room than in competitive vehicles; easy access to the rear sliding door; a full-length, unobstructed deck with non-slip surface; and easy-to-operate trailer hook-ups.

The Brute's hydraulic fifth wheel has a lifting capacity of 45 000 kg (100 000 pounds). Dual, single or double-acting 18-cm (7-inch) hydraulic cylinders operate at low pressures to minimize potential oil leaks and seal wear.

The efficiency in motion of the Brute illustrates why a conventional highway tractor cannot begin to compete with its productivity. The Brute terminal tractor's manoeuvrability, reliability, and productivity ensure an efficient freight movement system.

Brute terminal tractor manufactured by the Brute Truck Division of Levy Auto Parts Company.



Litton Systems Canada Limited

25 Cityview Drive
Etobicoke, Ontario, CANADA
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Telex: 06-989406
TWX: 610-492-2110

Litton Systems Canada is a major designer, producer, and integrator of high-technology products and systems for land, sea, and air applications. With its large-scale command and control electronic systems integration experience, the company also has proven capabilities to undertake the design, acquisition, manufacture and installation of major turn-key projects.

Litton Canada currently employs more than 3 000 highly skilled engineers, technologists and other specialists at its 70 000-square-metre (750 000-square-foot) modern, environmentally controlled facilities. Annual sales are currently in excess of \$240 million, of which 84 per cent is exported.

Inertial Navigation Systems

Of the more than 20 000 Litton-built inertial navigation systems (INS) in use around the globe, a large percentage provide the worldwide, self-contained navigation capability of more than 80 international airlines. The majority of all "inertial equipped" corporate aircraft, many scientific aircraft, and military transport and patrol aircraft use INS built by Litton Canada.

The LTN-72 series of transport inertial navigation systems utilizes two "spinning wheel" gyroscopes and three accelerometers mounted on

a gimballed reference platform to combine inertial and area navigation. In addition to ARINC 561 inertial navigation, the system has en-route, terminal and approach RNAV capability.

The LTN-90 series guidance systems utilize electro-optic technology to replace conventional gyroscopes with the new "ring laser gyroscopes." Each system contains three gyroscopes and three accele-

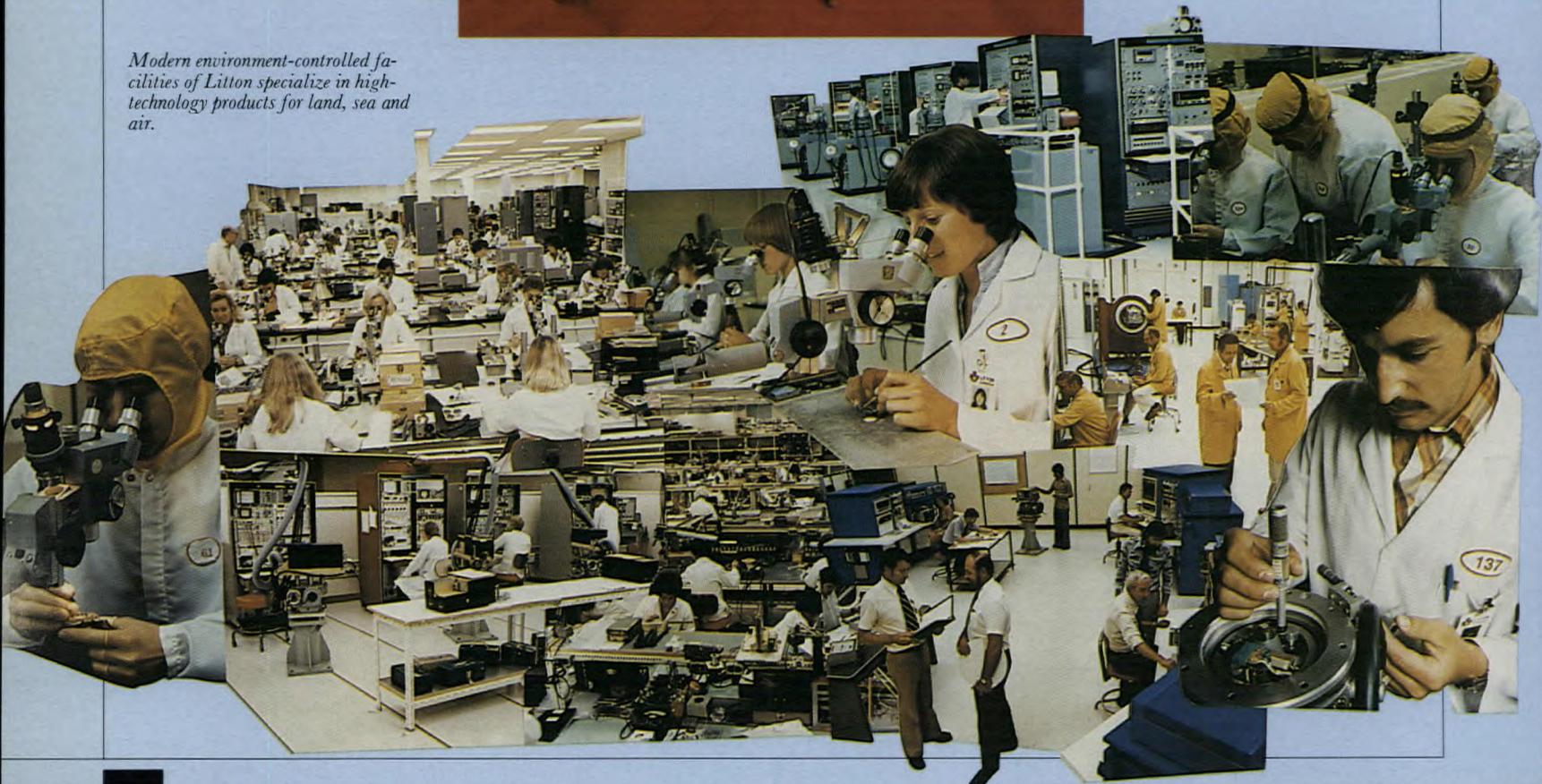


The LTN-90 has been built for the all-digital aircraft of the 1980s. Commercial aircraft such as the Airbus, and executive aircraft, such as the Challenger, use the LTN-90.

The LTN-72R inertial/area navigation system used by major airlines and the P-3C aircraft.



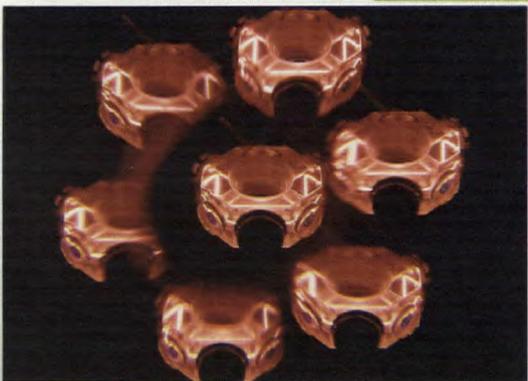
Modern environment-controlled facilities of Litton specialize in high-technology products for land, sea and air.



Litton Systems Canada Limited

rometers in a strapdown configuration. The LTN-90-100 and LTN-91 inertial reference systems are configured to ARINC 704. The LTN-90-100 systems meet all digital aircraft requirements. The LTN-91 generates digital and analog outputs for those aircraft requiring both formats. Both systems function as an element of flight management systems (FMS) or performance management systems (PMS).

Litton's latest ring laser gyro system is the LTN-92 stand-alone inertial navigation system with RNAV capability. It is in a 1-ATR configuration that combines both ARINC 561 and 429 requirements.



The latest generation of Litton Systems Canada built navigational equipment uses state-of-the-art ring laser gyros.



The LN-35 inertial navigation system is used aboard U.S. cruise missiles including the U.S. Navy Tomahawk.

Military

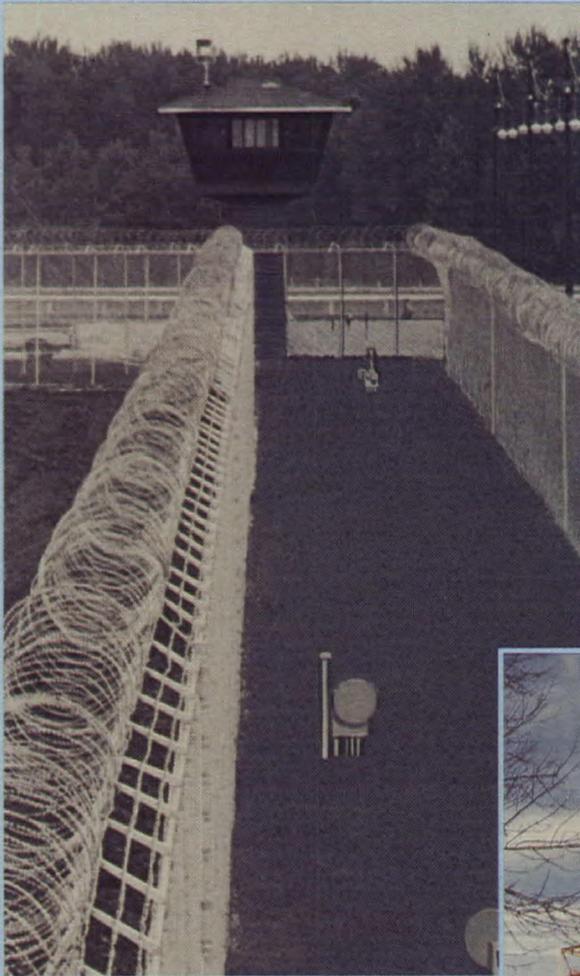
The latest of the more than 4 000 military inertial navigation systems produced by Litton Systems Canada are the LN-33 systems aboard the Canadian CP-140 long-range patrol aircraft and the LW-33CF systems retrofitted to the Canadian CF-104 Starfighter aircraft. Both systems incorporate the most modern technological developments in standard design to ensure high accuracy and reliability at low cost and weight.

In 1978, the company was selected as second source of supply for the inertial navigation unit for the U.S. Cruise Missile Program. The Litton LN-35 system will provide geographically oriented guidance reference for precise missile navigation and targeting, real-time processing for autopilot control, vehicle steering, sequencing, and control of missile functions.

Canada's CP-140 long-range medium patrol aircraft is fitted with Litton's inertial systems.



Litton Systems Canada Limited



Microwave motion detectors — part of a Litton-supplied perimeter security system at a prison.

Litton supplies modern perimeter security systems to oil refineries and other installations requiring protection.



Integrated Security Systems

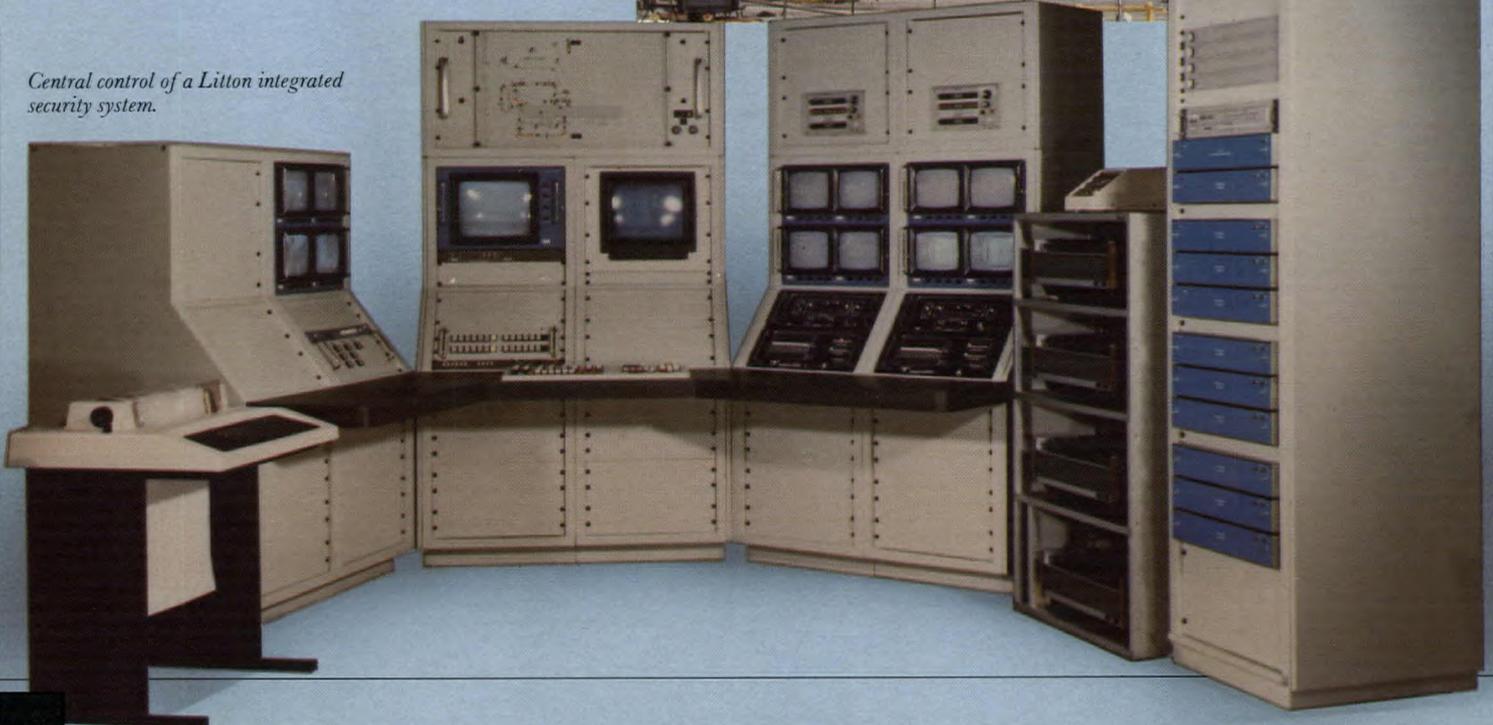
Airports, nuclear power generating stations, prisons, and other essential service facilities are prime targets for theft, sabotage and terrorist activity. To protect these vital installations and guarantee their operation, Litton Systems Canada, with its large-scale command and control electronic systems integration and experience, is undertaking the design, acquisition, manufacture and installation of turn-key security systems.

Command and control consoles are human-engineered to allow monitoring and

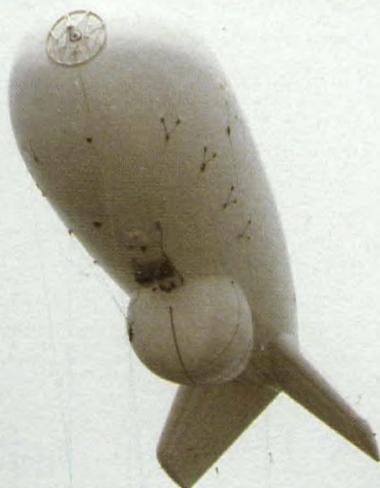
control of the site's entire security systems by a single operator. State-of-the-art closed circuit TV allows the system to out-perform traditional perimeter patrol in adverse environmental conditions.

Total civil defence systems can be designed for surveillance and protection of key facilities over very large areas. Litton Systems Canada has installed integrated security systems at penitentiary and nuclear power sites in Canada and is currently involved in the development of a security system around an air force base in the Middle East.

Central control of a Litton integrated security system.



Litton Systems Canada Limited



Litton APS-504(V)5 radar installed in maritime patrol aircraft, such as the Nomad.

The APS-504(V)2 and APS-504(V)3 are used in a unique maritime patrol role in the southern United States. The radar units are on-board tethered aerostats; this is a cost-effective and highly successful way to combat the illegal importation of drugs into the United States.

Airborne Radar

Litton airborne search radar enhances the surveillance and detection capabilities of maritime patrol aircraft and provides efficient tactical navigation.

The AN/APS-504 is a 100-kW radar that is installed aboard Canadian Armed Forces and Royal Thai Navy tracker aircraft. The APS-504(V)2 radar has been installed in a variety of maritime patrol aircraft. The APS-504(V)3 utilizes a high-resolution, digital display; digital signal processing allows signal returns to be better displayed. After being received, the video is processed by a scan converter into a form suitable for display by a TV-type raster indicator.

The newest Litton airborne search radar is the APS-504(V)5, an advanced system satisfying the requirements of aircraft used in tactical and maritime surveillance roles. The APS-504(V)5 enhances the detection capabilities of the internationally proven (V)2 and offers the digital processing, high definition and versatile raster display of the (V)3.

The TV-type raster in the (V)3, the (V)5, and the AN/APS-140(V) marks a significant step forward, providing additional capability and flexibility. As well as allowing viewing in high ambient light conditions, alphanumeric are now displayed from internal or external navigation systems or tactical computer outputs. The display picture can be frozen for close study of critical areas. The indicator can also be used to display any other type of information compatible with an 875-line TV format, such as forward-looking infrared (FLIR) or low-light-level TV.



Litton Systems Canada Limited

Expanded Litton Automated Test Sets

Litton Systems Canada has over 16 years' experience in the design and production of mainframes, interface devices and test program sets. The company offers general-purpose, high-speed automated test equipment for the support of modern analog and digital avionics systems.

The expanded Litton automated test set (ELATS) and its predecessor, the Litton automated test set (LATS), use easy-to-work, abbreviated test language for all systems (ATLAS) test programs and high-speed computers to perform automatic diagnostic and acceptance tests at the system, black box, and plug-in module level.

ELATS features a general-purpose, automated test system controlled by a 32-bit high-speed minicomputer with 2 Mb mainframe memory. It is built using a modular construction with off-the-shelf commercial test equipment, controlled via IEEE-488 data bus. A microprocessor controls the digital subsystem of the ELATS and consists of 256-bit wide bi-directional digital I/O system. Each bit is backed by 8K RAM.

The total system has 131 Mb mass storage and a high-speed digital transfer rate. It has simultaneous test program execution and generation capability, and three levels of self-testing. As well, it has on-system certification and calibration and on-system test and fault isolation of the mainframe card assemblies.

The recently designed ELATS has been purchased by air forces flying modern analog and digital aircraft, such as the CF-18 and F-4. The Canadian Armed Forces has purchased three ELATS to support the CF-18; the Royal Australian Air Force has ordered ELATS for its F/A-18s; and an ELATS has been purchased by a European NATO air force in support of the F-4.

The newest version of Litton automated test systems is the RF ELATS, which provides a cost-effective solution to the intermediate and depot level support requirements of a wide variety of microwave and radio frequency avionic items. In combination with operational test program sets, it will automatically perform test and fault diagnosis on weapons replaceable assemblies (WRA) and shop replaceable assemblies (SRA) of electronic warfare, radar, radio navigation and communications systems.

Litton Systems Canada's expanded automated test set (ELATS) is computer-controlled for avionic equipment.



Litton Systems Canada Limited



Inertial Referenced Flight Inspection System

The Litton inertial referenced flight inspection system (IRFIS), when coupled with the normal navaid receiver, is a self-contained en-route and terminal navaid calibration system. It calibrates Category I, II and III ILS/MLS and TACAN systems to a higher accuracy and at lower operating costs than other devices now in use.

The system's high-speed data acquisition and computation capabilities permit calibration, correction and recal-

ibration to be performed during the same flight in any flying weather.

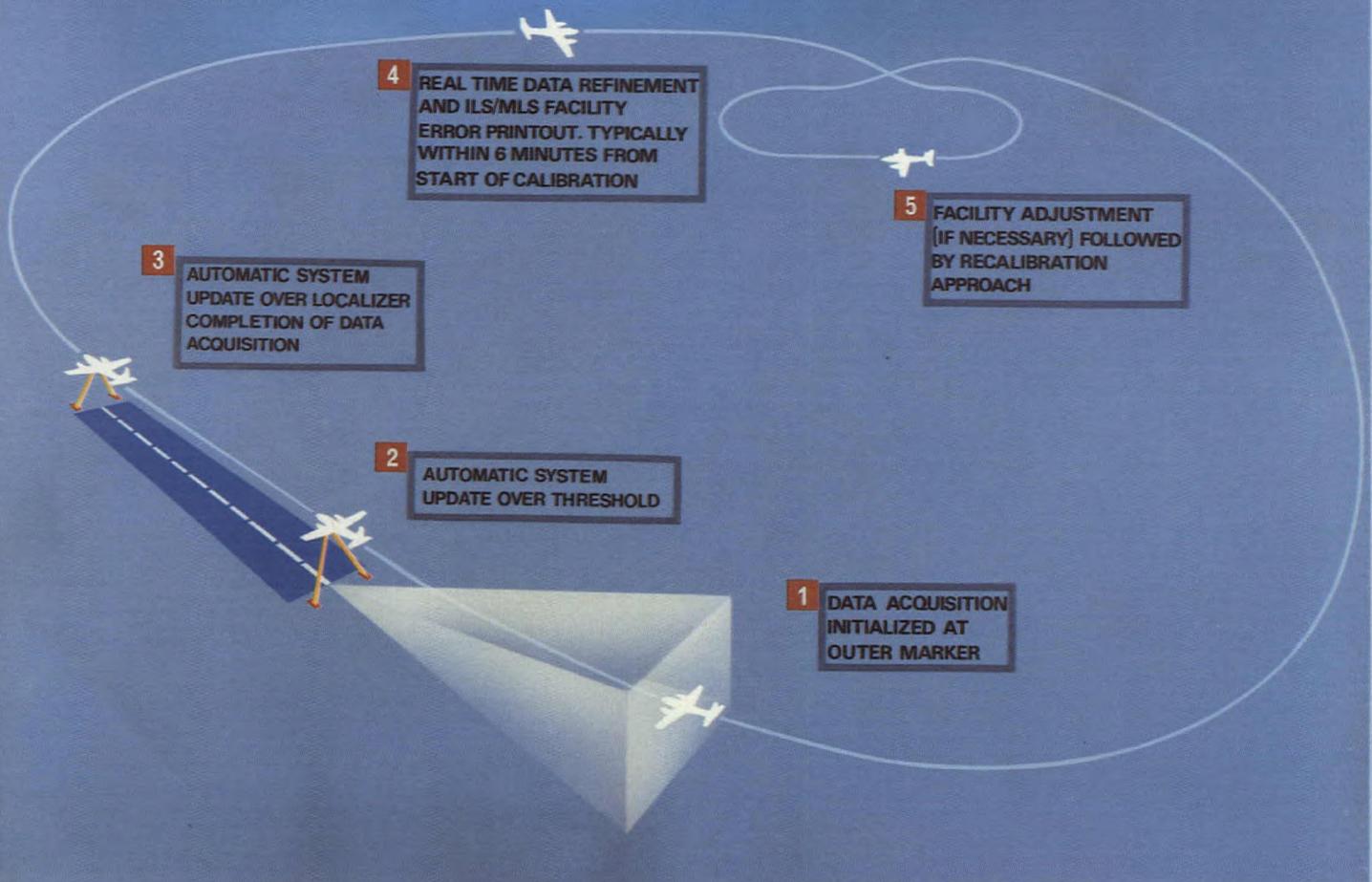
Unlike other systems, the Litton IRFIS does not require ground personnel operating theodolites or other land-based supporting equipment.

The system is compact and lightweight, and has minimal power requirement. It is small enough to be used by an operator aboard an economically operated twin-engine light aircraft.

IRFIS has been acquired by Holland, Britain, China, and Canada.

Litton's inertial referenced flight inspection system displays navaid calibration data directly to the operator.

IRFIS provides real-time measurement of calibration of aircraft navigational aids.



Litton Systems Canada Limited

Litton Display Systems

Light-Emitting Diode Displays

To ease the problem of crowded cockpit instrument panels and to improve the presentation of pertinent aircraft information to flight crews, Litton Systems Canada has developed multifunction, light-emitting diode (LED) displays. Multifunction displays, under computer control, can present a broad range of data on demand and yet take up the panel space of only one instrument.

Litton Systems Canada produces a complete suite of LED displays ranging in both size and LED density. The Litton-designed displays come in single-colour and tricolour LEDs.

The displays allow cockpit engineers a new design freedom in display panel layout by eliminating traditional depth restrictions. With mounting space of only 4 cm (1.5 inches), these new displays can provide a crisp alphanumeric or graphic display of any desired size,

in locations where conventional instruments and displays cannot fit.

The display surface is created by using 6.5-cm² (1-square-inch) plug-in modules. Each module contains 64 rows of 64 LEDs and necessary drive electronics. The high brightness of the display allows the equipment to be sunlight viewable. The green LEDs are compatible with generation III night goggles.

A 2.5-cm by 7.5-cm (1-inch by 3-inch) data entry display is in production for the General Dynamics Corporation and is currently being installed in its F-16 C & D aircraft.

Litton LED displays are available in many configurations ranging from programmable display modules (PDM) containing 560 LEDs in a 16 by 35 array and associated electronics to general purpose, multifunction keypads possessing a 4-row by 5-column

array of PDMs, to a multi-purpose display with a 6.3-cm by 6.3-cm (2.5-inch by 2.5-inch) LED array for the presentation of alphanumeric and vectorgraphics in military cockpits.

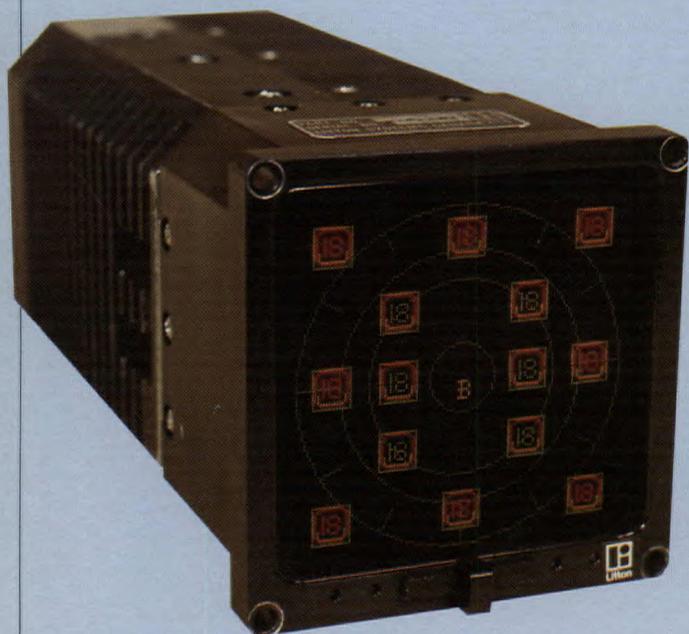
Liquid Crystal Displays

Through its subsidiary, Litton Data Images of Ottawa, Ontario, and its associated division, Litton Panelvision of Pittsburgh, Pennsylvania, Litton Systems Canada has expanded its display systems activities to the design and production of liquid crystal displays (LCD).

LCDs offer several advantages such as extremely low power consumption, low voltage operation, direct interface with microprocessors, wide temperature range of operation, low cost, sunlight readability and flexibility of size. LCD applications include the airborne military cockpit, telecommunications and industrial instrumentation.



The Litton-built control display unit features two LED displays on one piece of avionics equipment.



Litton's ADM IX is a multipurpose LED display that has a wide range of cockpit applications.



Litton's programmable touch panel has 16 individual programmable display modules.

Litton Systems Canada Limited

Automatic Data Link Plotting System (ADLIPS)

The ability to react quickly to rapidly changing conditions is one of the most critical demands placed on the naval tactical commander. Today, modern weaponry and vehicles have significantly shortened the time he/she has available to make vital decisions. It is, therefore, imperative that all pertinent tactical data be acquired, collated, analyzed and displayed both accurately and swiftly. Litton Systems Canada has responded

to this need with ADLIPS — the automatic data link plotting system.

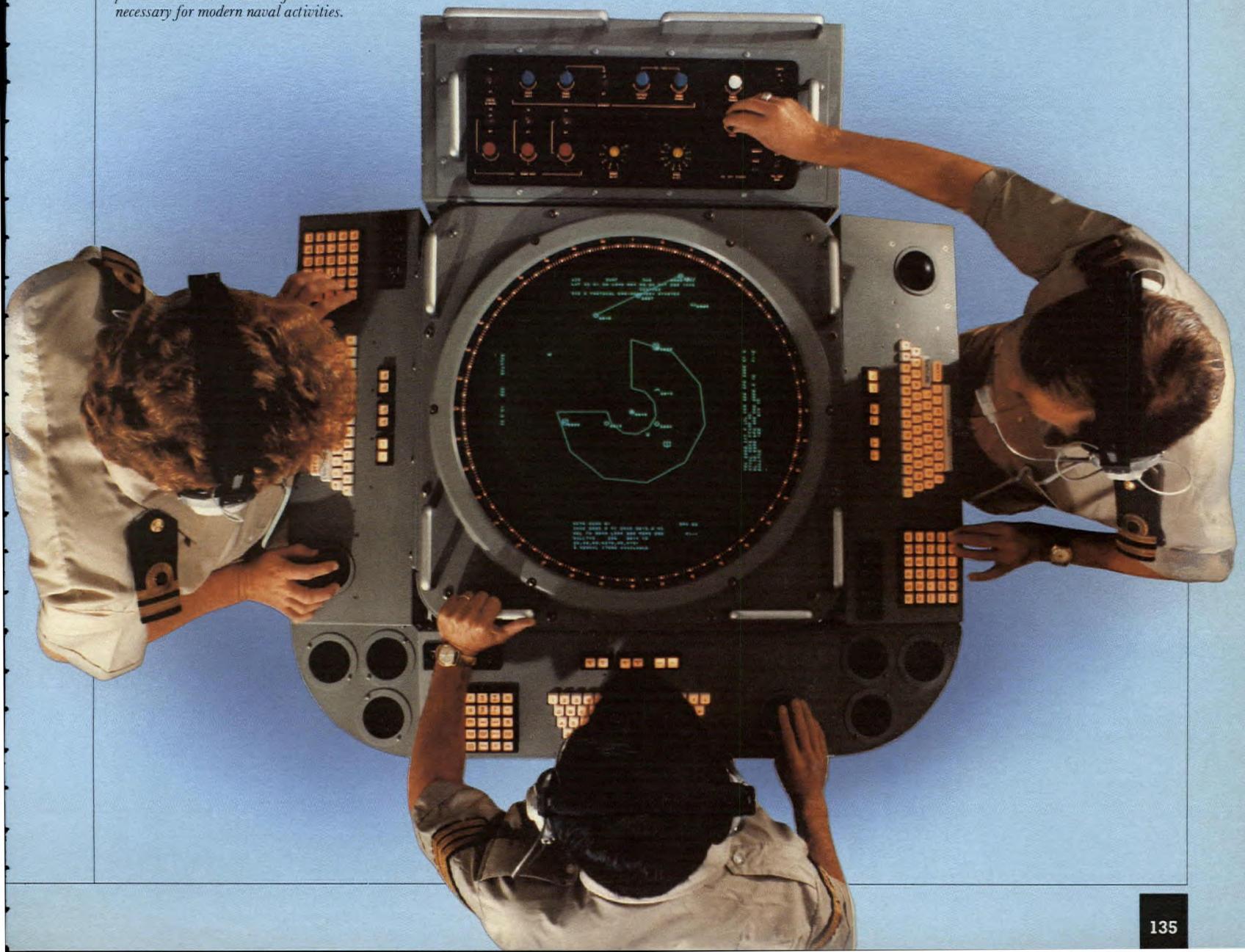
ADLIPS is a modular, low-cost command and control and tactical data communication system designed to replace electromechanical plotting tables and associated radar displays in non-TDS equipped ships. The system provides transmission, reception, filtering and display of target track data from Link 11 and Link 14 data communication networks.

ADLIPS also collects and

processes own-ship weapon systems. When operating in a TDS environment, ships fitted with ADLIPS have the capability to share tactical data with each other as well as with aircraft and other

ships similarly equipped with data communication systems. This capability aids co-ordinated tactical operations and, therefore, increases performance efficiency.

Automatic data link plotting system provides real-time action information necessary for modern naval activities.



Leigh Navigation Systems Ltd. (LNS)

7 Bovis Avenue
 Pointe-Claire, Quebec, CANADA
 H9R 4W3
 Tel: (514) 695-8130
 Telex: 05-821-529

Leigh Navigation Systems (LNS) manufactures, integrates and installs air traffic control systems, communications systems, radio spectrum monitoring systems (RSM), runway lighting systems (RLS) and emergency measures systems (EMS).

The LNS family of air traffic control systems is used by civil aviation authorities and air forces in operational areas around the world. The family includes the following air traffic control products:

- ANT 57 ATC tower systems
- ANT 57 RSU runway supervisory units
- RLS 2000 mobile runway lighting systems
- CT 250, 350 and 450 fixed control tower systems
- TT 070 transportable control tower systems
- Control tower support structures
- ATC tower consoles and communications refurbishment
- 909E communications switch systems

The RSM-200 systems, state-of-the-art computer-controlled electronic communications and test equipment with specialized software, are used by government communications agencies for the management of the national radio spectrum and by security agencies for surveillance of that spectrum. The EMS-100 transportable and mobile emergency measures systems are designed to provide a command vehicle for deployment in emergency situations. The vehicle is outfitted with remote control cameras and voice receivers to allow for both video and audio monitoring.

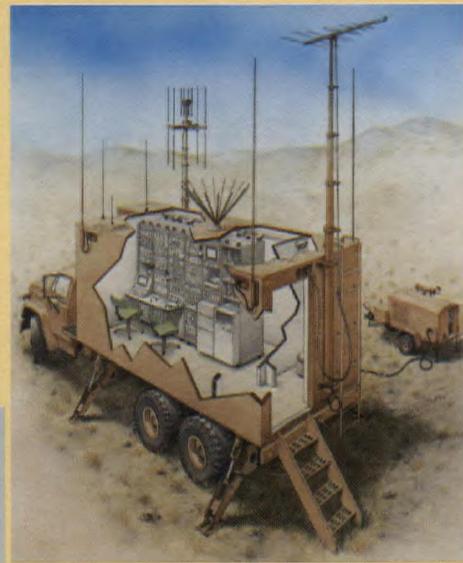
LNS designs, manufactures, procures, integrates and installs all equipment in a fully operational facility to meet customer specifications. Each system is assembled, tested and verified at the LNS 40 000-square-foot (3 700-square-metre) facility in Montreal, thereby removing system integration risks, ensuring a fully operational system and allowing the customer to take the equipment to site for operation with minimum system commissioning delays.

LNS has carried out over 60 systems installations in more than 20 countries world-wide.



909E communications switch system.

RSM 200T transportable monitoring system.



ANT 57 Hi-lift mobile ATC tower system.

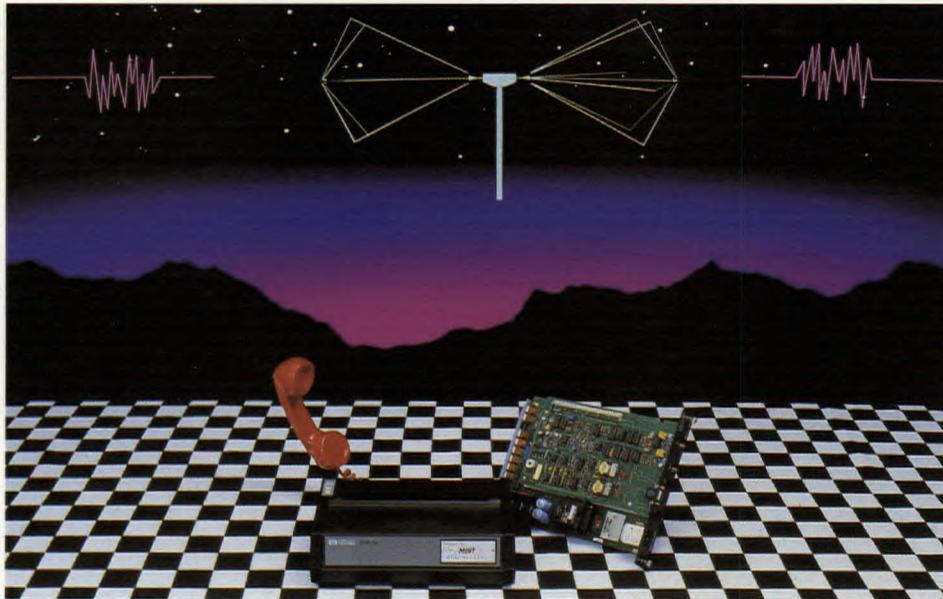
Landspan International of Canada Limited

2200 Walkley Road
Ottawa, Ontario, CANADA
K1G 3T9
Tel: (613) 526-3930
Telex: 053-4956
(CAN CNSRTM OTT)

The Landspan Group is dedicated to the development of a wide spectrum of reliable

communications products, information processing terminals and services that will

enhance data protection and maintain integrity throughout the product's lifetime.



Many industries, whether they be military, government or private sector, have similar telecommunication security vulnerabilities and requirements. Recognizing this problem, the Landspan Group specializes in the secure transmission, reception and storage of information.

Landspan experts offer innovative solutions to ensure timely, secure and effective systems integration and protection of intelligence for business needs as well as the sophisticated requirements at national security levels.

Marine Industries Limited

P.O. Box 550
Sorel, Quebec, CANADA
J3P 5P5
Tel: (514) 743-3351
Telex: 055-61081

Marine Industries, as one of Canada's leading naval ship-builders and designers, is a multidivisional organization manufacturing a wide range of high technology products serving the hydroelectric, railroad transportation and process industries worldwide.

The company is the only one in Canada certified to NATO-AQAP-1 and to hold Master Ship Repair Agreements for both "Military Sealift Command" and

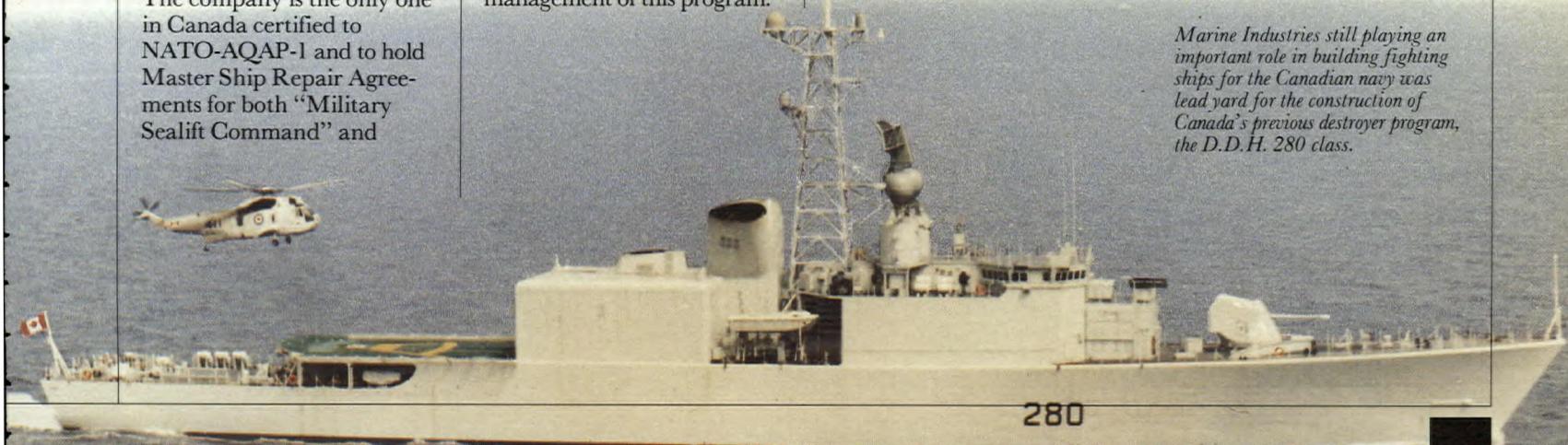
"NAVSEA" (pending) departments of the U.S. Navy.

M.I.L., selected to be a major participant in the construction of Canada's newest patrol frigates and because of its in-house computer expertise, is also involved in the overall contract management of this program.

The company's research and development centre is actively engaged in a wide range of studies for the Canadian Department of National Defence. These projects include the evaluation of the properties of metallized coatings on seagoing vessels; the development and testing, in

conjunction with the steel industry, of weldable material suitable for the proposed Canadian submarine program; and, most recently, the development of welded connections and X-ray parameters for the new Canadian Patrol Frigate Program.

Marine Industries still playing an important role in building fighting ships for the Canadian navy was lead yard for the construction of Canada's previous destroyer program, the D.D.H. 280 class.



MacDonald Dettwiler and Associates Ltd.

3751 Shell Road
Richmond, British Columbia,
CANADA V6X 2Z9
Tel: (604) 278-3411
Telex: 04-355599

MacDonald Dettwiler is a major world-supplier of turn-key satellite ground stations and specialized digital image information systems and products for international remote sensing, aerospace and communications applications.

The Systems Division specializes in the design and construction of satellite ground stations. Since 1971, the division has delivered 10 advanced meteorological ground station systems to customers worldwide. MacDonald Dettwiler's

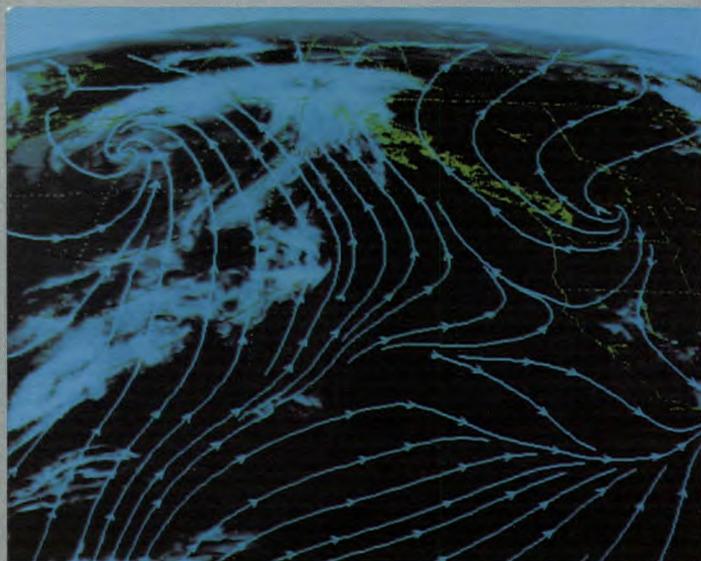
image analysis systems are state-of-the-art software packages that provide environmental data of interest to governments, commercial clients, management bureaus, and national defence departments with a need for satellite mapping tools.

Precision film image recorders from the Electro-Optical Products Division are a fast-growing part of the company's business. In 1980, MacDonald Dettwiler engineers designed and built a laser film recorder whose specifications far out-

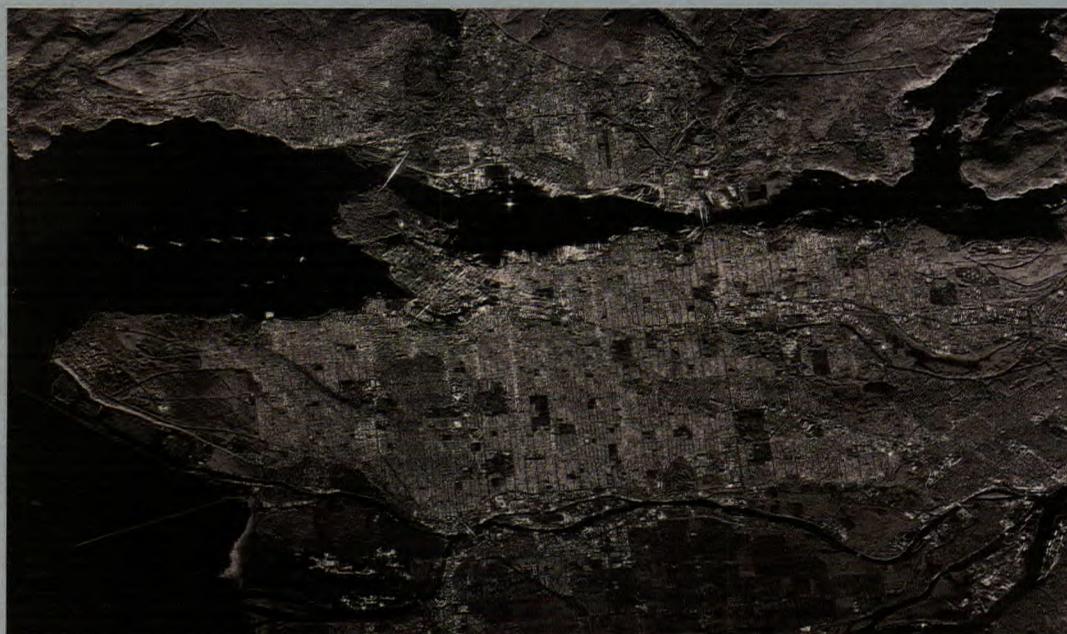
strip those of similar products on the market, even today. This product has become the basis for an entire series of precision film recorders that includes tactical reconnaissance models.

The company currently employs more than 450 people, 50 per cent of whom hold degrees in electrical engineering, physics, computer sciences and related disciplines. With headquarters on Canada's west coast, the company has offices in Switzerland, Los Angeles, Boston and Dallas to serve its international clients.

A strong research and development program committed to the creation of new products, coupled with up-to-date management policies, ensures that MacDonald Dettwiler will continue to be an international leader in imaging technology.



Automated weather distribution system (AWDS): weather satellite image of Pacific Coast of North America. Graphic overlay shows predicted atmospheric flow.



Synthetic aperture radar image of Greater Vancouver, British Columbia, processed on the IRIS system in real-time aboard a Cessna Conquest aircraft.

IRIS

The Airborne Radar Division of MacDonald Dettwiler is the supplier of IRIS (integrated radar imaging system), a high-resolution, airborne synthetic aperture imaging radar for border surveillance and maritime patrol applications. IRIS produces real-time continuous strip imagery at between 3 and 15-metre (10 and 49-foot) resolution; swath coverage of up to 60 km (37 miles). The imagery is available onboard the aircraft and via a radio downlink at portable ground terminals.

Automated Weather Distribution System (AWDS)

The automated weather distribution system (AWDS) is a development for the United States Air Force (USAF) funded under the United States-Canada Defence Production Sharing Agreement. AWDS receives weather information over the USAF air weather networks and provides weather forecasts, alerts and supporting data to every USAF airbase. It gives military flight crews and operations personnel real-time, ongoing forecasts, weather alerts, NOTAMS and weather briefings.

MacDonald Dettwiler and Associates Ltd.

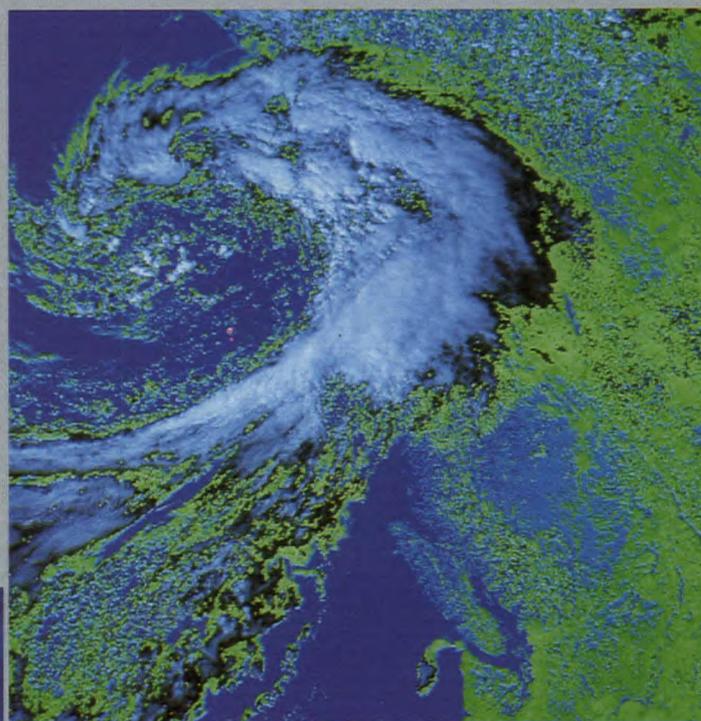
Image Processing Systems

MacDonald Dettwiler has been designing and implementing image processing systems for the high-production needs of satellite ground receiving stations for over 15 years. Today, this technology is packaged in modules that allow small users the same functionality and speed.

The geocoded image correction system (GICS) removes all known satellite errors from the data and rotates images to accurately align them with standard maps.

Spaceborne Synthetic Aperture Radar (SAR)

The initial technological breakthrough of creating the world's first digitally processed image from satellite SAR signals has been followed by the first real-time satellite SAR processor delivered to the European Space Agency in 1984. Currently, the company is working on six projects dealing with SAR processing, notably the ERS-1 satellite ground segment for the European Space Agency and the ground systems for Radarsat.



Weather system approaching west coast of North America imaged on MacDonald Dettwiler METDAS system, using NOAA-7 data.



Landsat receiving station in Alice Springs, Australia.

MERIDIAN

MERIDIAN is an integrated mapping and analysis system that allows creation and editing of maps exhibiting various themes or topological features. MERIDIAN combines existing maps, air photos and digital imagery to produce image maps with applications for base mapping, geological mapping and ice charts.

An example of the utility of image processing is the real-time monitoring of the earth's weather through METDAS, which allows weather forecasters and others to analyze imagery from space along with data from buoys, radiosondes and other instruments.



MERIDIAN PC showing satellite image of British Columbia coast with map overlay.

Manac Inc.

2275-107th Street
P.O. Box 490
St-Georges (Beauce), Quebec,
CANADA G5Y 5C9
Tel: (418) 228-2018
Telex: 05-833531

Kitchen trailers.



Manac Inc., a member of the Canam Manac Group Inc., manufactures all types of trailers for on and off highway applications. The company's strong engineering group has developed specialized trailers for the construction and forest industries. As well, Manac Inc. has supplied trailers for tanks, cargoes and mobile kitchens to the specifications of the Canadian Armed Forces. Low bed trailers for the transportation of tracked vehicles and heavy equipment, for example, are designed to a weight of 75 tonnes. Over 2 000 trailers for various functions have been supplied to the Canadian military.

Sixty-ton low bed trailers.



Light cargo trailers.



Mason Boats Ltd.

P.O. Box 398
Lombardy Road
Smiths Falls, Ontario, CANADA
K7A 4T4
Tel: (613) 283-6161



Designers and builders of reliable top-quality boats since 1867, Mason manufactures a variety of vessels with 100-per-cent hand-laid-up fibreglass hulls. Mason boats range from the 5-metre (17-foot) CCF17-Centre Console Fisherman, with the unsinkable cathedral hull, to the 6.7-metre (22-foot) CF220-Cuddy Fisherman, CC238-Cuddy Cruiser and 8-metre (27-foot) MX284-Cabin Cruiser with their deep vee hulls.

Mason boats are designed for safety and dependable performance.

The CF220-Conqueror equipped with a self-bailing cockpit and an unsinkable hull, has been designed with the safety, durability and performance features that law enforcement agencies, paramilitary units and commercial fishermen demand.

Mechron Energy Ltd.

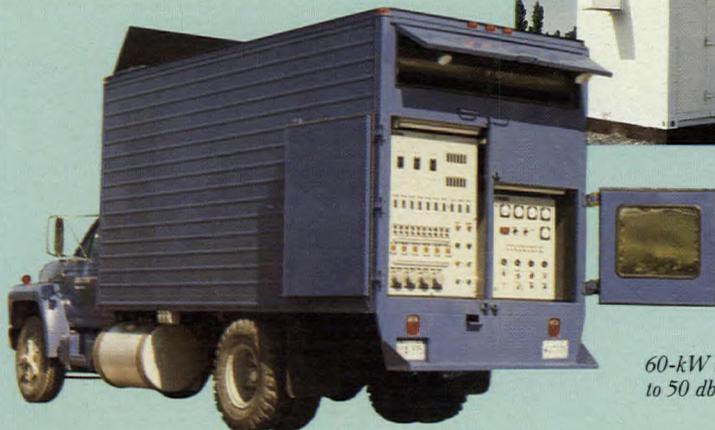
2437 Kaladar Avenue
Ottawa, Ontario, CANADA
K1V 8B9
Tel: (613) 733-3855
Telex: 053-4271

Mechron Energy specializes in the production, installation, service and maintenance of custom-engineered electric power generating systems for critical applications. Major customers include the Canadian Department of National Defence, Transport Canada, telephone companies, specialized common carriers, broadcasters, and electric utilities. The Mechron product line includes prime and standby power, uninterruptible power systems, DC power systems as well as related parts, maintenance and service.

Mechron has achieved an excellent reputation for the quality, reliability and low maintenance requirements

of its systems, which frequently operate unattended in remote and hostile environments.

As well as its turn-key capability, the company works in multi-disciplines of electrical, electronic, and mechanical systems.



Relocatable, environmentally controlled power system.

60-kW mobile power system, silenced to 50 dbA at 9 metres (30 feet).

MDI Mobile Data International Inc.

Riverside Industrial Park
 Richmond, British Columbia,
 CANADA
 V7A 4Z3
 Tel: (604) 277-1511
 Telex: 04-355865

MDI is recognized as the world's leading producer of mobile digital terminals — the small, rugged computerized units (vehicle-mounted or portable) that communicate using high-speed packet data bursts over any standard two-way radio link.

Installed world-wide, MDI systems have achieved their market leadership by the use

of innovative hardware and software designed to yield maximum data throughput yet preserve message integrity by using powerful error control techniques.

MDI has recently expanded its family of MDTs to include a military tactical data terminal that is compatible with existing standard military radios.

Two-line display and custom keypad.



"Self-contained clipboard" terminal with voice option and built-in 800-MHz radio.



Tactical data terminal connects directly to AN/PRC-77 radio.



Vehicular terminal with CRT display and full keyboard.

Med-Eng Systems Inc.

1519 Star Top Road
Ottawa, Ontario, CANADA
K1B 3W5
Tel: (613) 748-9849
Telex: 053-3881
(MED-ENG OTT)

The Med-Eng Systems EOD-6 explosive disposal helmet.



Blasting cap container designed to contain pressure and fragments caused by accidental detonation.



Med-Eng Systems is a world-renowned specialist in the design and manufacture of body protection systems that safeguard against the effects of blast. Years of detailed testing on the effects of over-pressure, fragmentation, ballistics, impact and heat have developed the company's considerable expertise in protective armour systems.

Med-Eng's state-of-the-art explosive disposal helmet is now standard issue with police and military forces in North and South America, Europe, the Middle and Far East, and Africa.

The company also manufactures a wide range of products which include blasting cap blast suppression containers; explosive containers; ballistic shields used in forced-entry operations; ballistic panels designed to stop high-calibre rifle fire; and ballistic helmets/face shields to protect against small arms fire. In addition, ballistic helmets or other equipment can be supplied with optional integral communication systems.

Micronav Ltd.

Sydney Industrial Park
Sydney, Nova Scotia, CANADA
B1P 6J9
Tel: (902) 564-8833
Telex: 019-35126

Micronav MLS installation at Sydney Airport, Nova Scotia.



Micronav manufactures microwave landing system (MLS) ground transmitting equipment meeting ICAO standards. The Micronav MLS, an advanced Canadian development, provides the signal characteristics of the U.S. FAA Type I system; i.e., $\pm 40^\circ$ azimuth scan with a 2° beam, and 0.9° to 15° elevation scan with a $1\frac{1}{2}^\circ$ beam.

The system incorporates dual microprocessor control and timing, with fully phased array antennae. A key feature is the total interchangeability of electronic components between azimuth and elevation subsystems, with significant cost savings in spares, technician training, and repair time. Automatic fault diagnostic routines describe

failures in plain language on alphanumeric displays in each subsystem, minimizing the need for specialist engineers. Any malfunctioning component can be quickly replaced on site with simple tools and without the need for subsequent re-calibration, tuning or flight test. Full system monitoring is provided.

Flight checks by the Canadian Department of Transport indicate very high-quality guidance signals, with control motion noise and path following noise measured to be more than four times better than ICAO requirements.

The Micronav MLS is a completely Canadian design and is not built under licence from a foreign manufacturer.

M.E.L. Defence Systems Ltd.

1 Iber Road
P.O. Box 90
Stittsville, Ontario, CANADA
K0A 3G0
Tel: (613) 836-6860
Telex: 053-3944
FAX: (613) 836-6566

M.E.L. Defence Systems specializes in engineering, developing and manufacturing sophisticated electronic warfare (EW) systems and provides engineering consultant and program management services.

M.E.L. Defence Systems has the Philips world product mandate for the manufacture of the EW suite composed of CANEWS* and RAMSES. The company won major contracts with a combined value in excess of \$100 million for the manufacture and testing of an EW suite comprising CANEWS* (AN/SLQ-501) ESM and RAMSES ECM.

The CANEWS* (AN/SLQ-501) shipboard ESM set will be installed as part of the Canadian navy's TRUMP and DELEX upgrade programs and under the Canadian Patrol Frigate (CPF) new construction program. It provides instantaneous threat detection, identification and warning, and is also used to build and update a threat data bank.

The Canadian Patrol Frigate Program also includes the installation of M.E.L. Defence Systems' software-controlled radar jammer — RAMSES (reprogrammable advanced multimode shipboard ECM system).

This device counters all stages of an attack using a variety of electronic noise and deception techniques.

M.E.L. Defence Systems' modern Stittsville facilities of 4 200 square metres (45 000 square feet) house engineering, manufacturing and program management as well as corporate management and marketing. The company mainly employs professionals and holds a facility clearance to Secret level.

Current work focuses on the integration and testing of AN/SLQ-501 and RAMSES systems. Space and facilities

are also devoted to research and development of both hardware and software. For the latter, the company has installed a Tempest enclosure to shield computers and equipment used in software generation.

M.E.L. Defence Systems Ltd. is a wholly-owned subsidiary of Philips Canada Ltd. As a member of the world-wide Philips Defence and Control Systems Main Industry Group, M.E.L. Defence Systems has full access to the substantial research, engineering, production and marketing resources of all the Philips companies.

*CANEWS is a trademark of the Canadian Department of National Defence.



Microtel Limited

2100 — 401 West Georgia Street
Vancouver, British Columbia,
CANADA V6B 5C8
Tel: (604) 683-3575
Telex: 04-354603
FAX: (604) 641-4146

Microtel, a major designer and manufacturer of advanced telecommunications equipment, installed its first system in the Yukon in 1906 and has remained an innovative industry leader ever since.

Microtel, a member of the worldwide GTE family, has

products in service in 68 countries. Its systems and components are used in many diverse applications by governments, military customers, resource industries, utilities, private industry and other telecommunications firms.

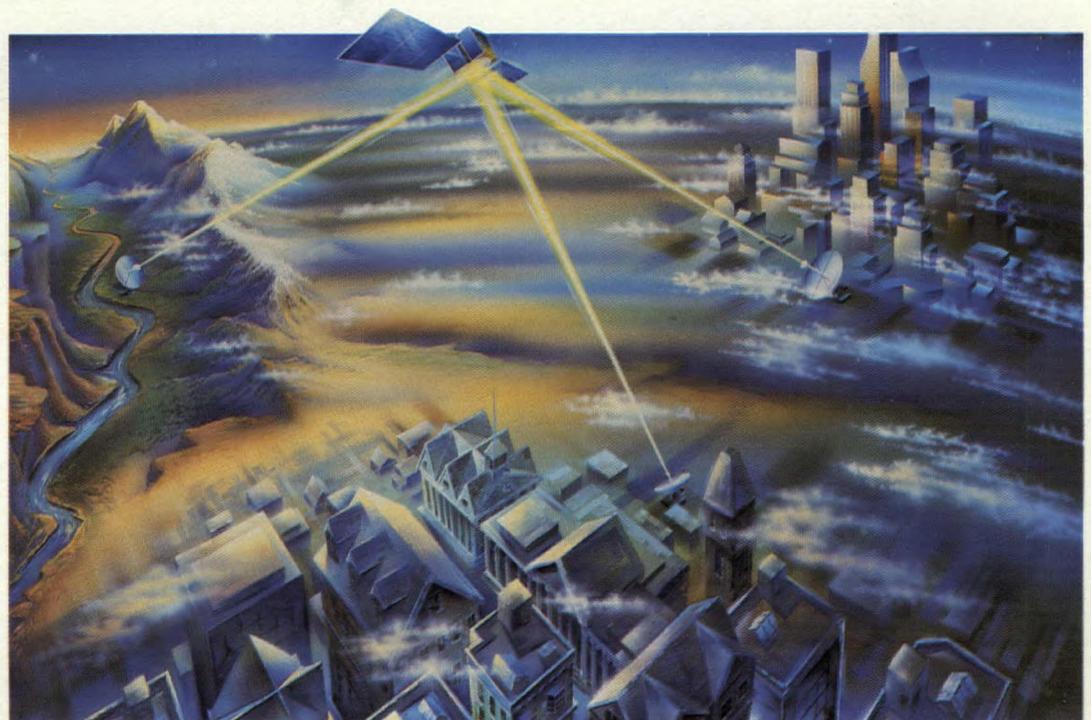
One system that has found

enthusiastic acceptance is Spacotel. This satellite communication system increases the flexibility and reduces the cost of long-distance data and voice communication. Virtually eliminating the need for cumbersome land-based networking, Spacotel provides a central hub for a variable number of permanent or mobile terminals.

Other Microtel innovations include the following:

- System 51, a cost-efficient data acquisition and control system that monitors a telecommunication system over geographically dispersed sites, and fulfills maintenance and network management functions.
- DAXCON 16 and 64 systems, a microprocessor-controlled digital access cross connect system (DACS) that permits cross-connecting of DSO channels between T1 or T1C facilities locally or remotely.
- A complete range of MULTIPLEX products.

Microtel is constantly meeting the ever-growing needs of its clients for innovative solutions within the telecommunications industry.



Left: Single channel remote terminal.

Bottom Centre: Master control station.

Right: Multi-channel remote terminal.

Microtel Limited

Manutronics
Custom Electronic Manufacturing

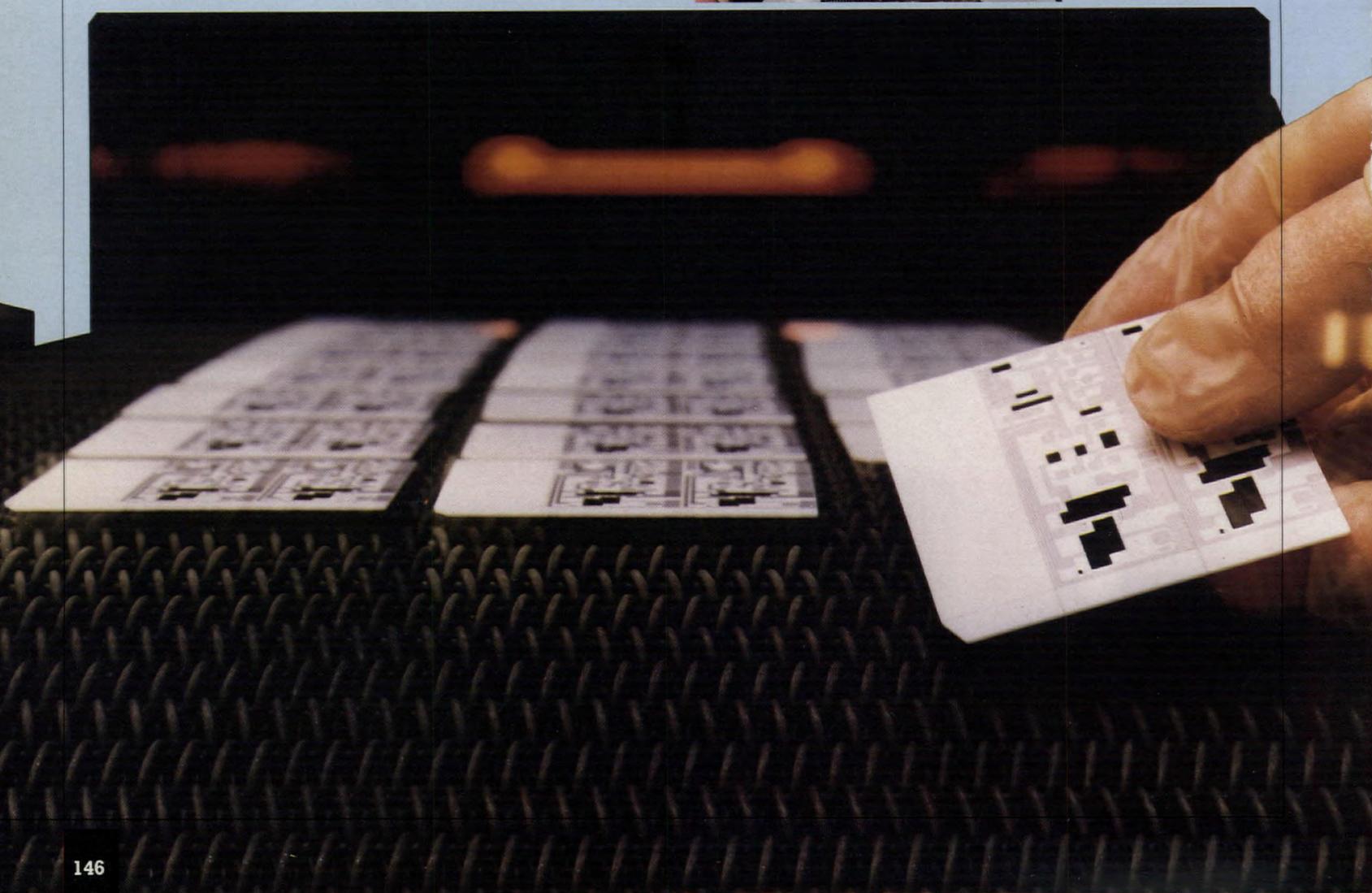
100 Strowger Boulevard
Brockville, Ontario, CANADA
K6V 5W8
Tel: (613) 342-6621
Telex: 06-636532
TWX: 610-525-1061

Microtel Limited is a world leader in the design and manufacture of advanced telecommunications equipment. As an integral part of Microtel, Manutronics brings to its customers the knowledge and expertise required for the production of reliable high-technology electronics from sub-assemblies to complete "black box" systems. The Product Engineering and Pilot Production groups of Manutronics provide total product packaging, including the production of working prototypes.

In addition to its proven expertise, another reason Manutronics has successfully fulfilled contracts for military suppliers is its multi-million dollar investment in advanced tools and equipment. Manutronics is an approved military specification (MIL-I-45208) supplier of wired backplanes and continually meets new military specification requirements. A recent example is MIL-P-55110-C, that qualifies Manutronics as a manufacturer of military standard multilayer (12-layer) circuit boards.

All phases of any contract, from concept to delivery, can be co-ordinated by Manutronics. The wide experience of Manutronics in manufacturing offers the "high-tech" entrepreneur the rare opportunity of seeing an idea transformed into a marketable solution.

Commitment to its customers earned Manutronics the 1985 Superior Performance award from Hughes Aircraft Company of Fullerton, California.



Microtel Pacific Research

VLSI Applications & Marketing

8999 Nelson Way
Burnaby, British Columbia, CANADA
V5A 4B5
Tel: (604) 294-1471
Telex: 04-356628
TWX: 610-952-7309

Microtel Pacific Research (MPR) is western Canada's largest telecommunications research and development centre. A subsidiary of Microtel, MPR leads the industry in the design and manufacture of a wide range of products for switching, transmission, and satellite applications. This leadership is maintained through MPR's expertise in the use of advanced silicon technologies.

MPR is very aware of the need to bring innovative products to market in the shortest time possible, to allow Micro-

tel's clients to capitalize on the latest technology as it becomes available. For this reason, and to remain price-competitive, MPR uses the most advanced computer-aided design and engineering (CAD/CAE) tools in the industry. Current design capabilities include the following:

- CAE for design and simulation
- thick film hybrids
- thin film hybrids
- gate array circuits
- semi-custom very large integrated circuits (VLSI)
- full custom VLSI

Working out of new laboratories near British Columbia's Simon Fraser University, MPR's staff of more than 300 includes specialists in every facet of chip design, hardware architecture, and other fields essential to modern telecommunications technology. With this team effort in a variety of related disciplines, MPR brings a rare understanding of integrated system requirements to its conceptual design and development of individual components, as well as total networks.



MIL-COM Technologies Inc.

480 Dutton Drive
Waterloo, Ontario, CANADA
N2L 4C6
Tel: (519) 885-3123
Telex: 069-55182

MIL-COM Technologies is an expert in coating such fabrics as nylon, dacron, and cotton, with rubber, polyurethane and other protective materials to meet exacting military specifications. Using these coated fabrics, MIL-COM produces inflatable products ranging from military air mattresses to positive-pressure chemical protective surgery rooms for military field hospitals. All products are quality assured and inspected to NATO AQAP-4.



Mattress pneumatic CI with cold-weather sleeping bag.



CL89 Drone landing bag.

MIL-COM is now successfully marketing landing bags that are used in Britain, Germany, France and Italy as part of the retrieval system of the remotely piloted (RPV) surveillance drone currently in use. The bags provide the reconnaissance RPVs with a cushioned landing mechanism following the completion of a mission.



DOME — fully opened, enter either end.

Well-known for its high quality standards, MIL-COM Technologies now produces a revolutionary new Canadian invention, the MILI-DOME, a portable, inflated beam structure. Easy and fast to erect, the wind-sturdy MILI-DOME can be used as a servicing or maintenance shelter; camouflage (woodland, sand or arctic); cover/shelter for environmental protection; arctic or desert

MIL-COM Technologies also produces military air mattresses, which are part of the essential equipment for Canadian Armed Forces personnel serving in cold weather environments. The mattress

inflates automatically through simple manipulation of the material. Sleeping bags attach directly to the mattress, ensuring a thermal underbed effective to -40°C .

DOME — fully enclosing vehicle.



DOME — half opened for vehicle exit.

weather protection and insulation; emergency search and rescue drop protection. The MILI-DOME is capable of housing tanks, light armored vehicles, artillery, fighter aircraft, and other military battle equipment. It weighs as little as 13.6 kg (30 pounds), and

fits inside a 61 x 91 x 61-cm (2 x 3 x 2-foot) carry-on stowage bag. The MILI-DOME can be custom designed to serve as a HELI-DOME version for helicopters and VTOLs and for other user requirements. Patents are pending.

MONITEQ

630 Rivermede Road
 Concord, Ontario, CANADA
 L4K 2H7
 Tel: (416) 669-5334
 Telex: 06-964776

MONITEQ, an innovative high-technology company, specializes in the manufacture and application of micro-processor-based electro-optical remote sensing instrumentation for a wide range of defence and commercial requirements.

The company has developed airborne and portable remote sensing systems and created new applications for the resource and defence markets. Its programmable electro-optical imagers have particular interest for the military.

The airborne programmable multispectral imager (PMI) developed by MONITEQ measures the low radiance light fields characteristic of water scenes. It has very high spectral resolution (2.5 nanometers) over 288 bands, coupled with high spatial resolution over 1 925 pixels, based on two-dimensional CCD technology. PMI provides shallow water depth mapping, bottom type classification and various water

quality parameters. Among its land applications are geobotanical and geological mapping, vegetation stress, forestry and crop management. Defence use includes border surveillance, camouflage detection, trafficability studies and military mapping.

The PMI digital mapping process can also be accurately positioned with a MONITEQ-developed geometric correction system, AIR II, so that different flight lines can be co-registered, and imagery integrated with existing geocoded databases.

MONITEQ PROBAR is a ground/helicopter programmable radiometer that simultaneously and accurately measures reflected and illuminating radiation with high spectral resolution over the UV/visible spectrum, and in the IR to 2 300 nanometers. PROBAR can provide target recognition and target background signatures, corrected for atmospheric effects.

Another MONITEQ airborne remote sensor, GAS-PILS, measures hydrocarbons and other gases with absorption features in the thermal IR. Applications include gas

pipeline and oil spill monitoring, chemical warfare agent detection, chemical leakage and perimeter monitoring.

GASPILS "ball" mounted below helicopter shows two gas viewing ports and low-light-level TV camera above. These are directed downward when in flight.



Bathymetry showing water depths in metres of the Magdalen Islands taken from one aircraft pass at 7 000 metres (22 900 feet) altitude.



MONITEQ programmable multispectral imager (PMI) end products.

Land scene of Renfrew, Ontario in full spatial mode and three spectral bands from 7 000 metres altitude.

PROBAR mounted in helicopter for ice classification survey.

Muirhead Systems Limited

50 Galaxy Boulevard., Unit 4
Rexdale, Ontario, CANADA
M9W 4Y5
Tel: (416) 675-7450
Telex: 06-989264

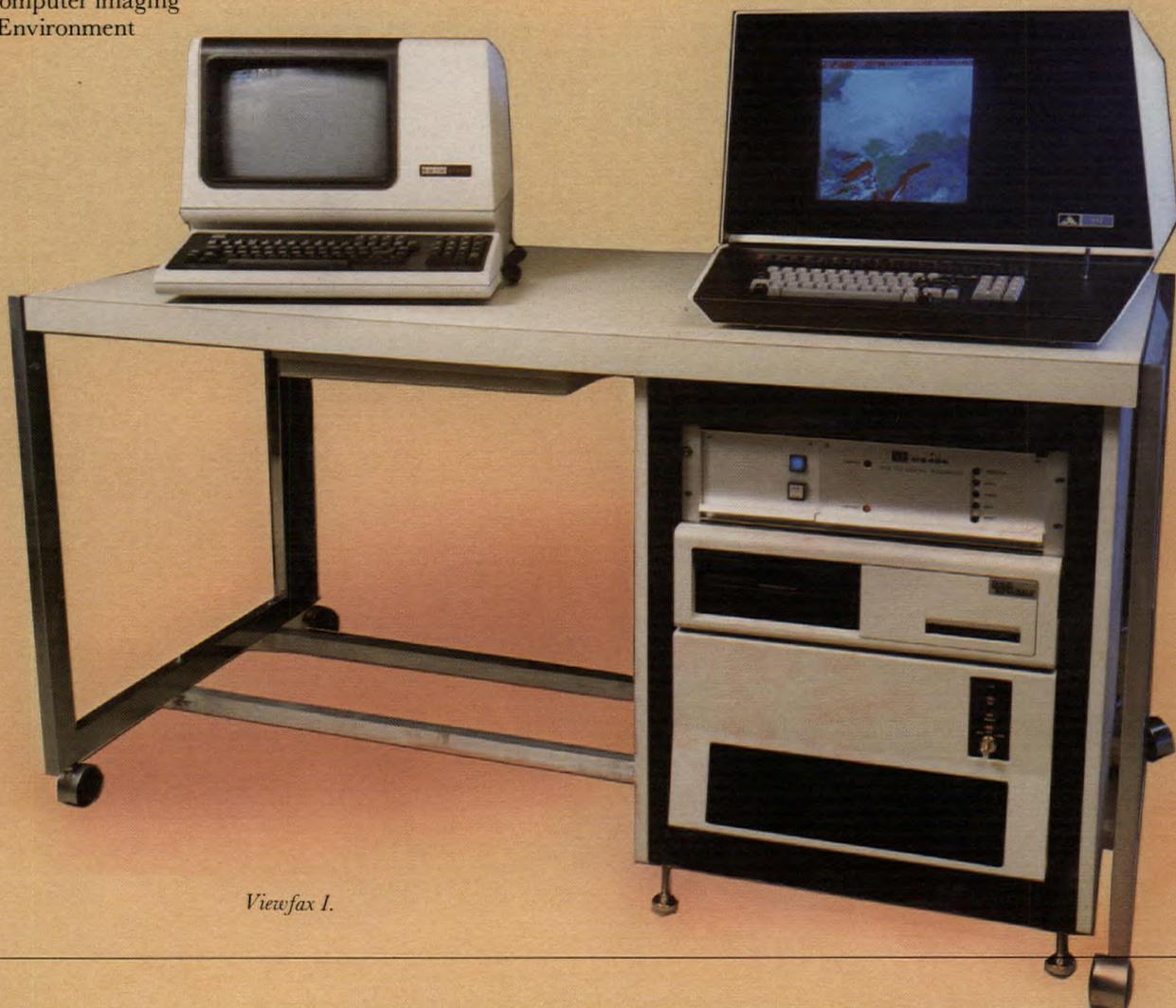
Muirhead Systems produces equipment for the electronic processing of high resolution images.

The Viewfax I and Viewfax III have been designed in Canada by Muirhead to receive, store and computer edit weather satellite pictures, radar images, news photographs, and finger-prints transmitted via facsimile. The company has produced high-quality photographic recorders specifically for markets such as these, while other areas of expertise include switching, computer/facsimile interfaces and high-speed modems.

Muirhead Systems has supplied weather chart recorders to the Canadian Department of National Defence and the Canadian Coast Guard, finger-print transmitters and receivers to the Royal Canadian Mounted Police, and switches, computer interfaces and computer imaging systems to Environment Canada.



Viewfax III.



Viewfax I.

Northwest Industries Limited

A Division of CAE Industries Ltd.

P.O. Box 9864
Edmonton International Airport
Edmonton, Alberta, CANADA
T5J 2T2
Tel: (403) 955-6300
Telex: 037-41574

Foreground: T-33 aircraft being processed through fly-in repair, DLIR and modification programs.

Background Centre: C-130 aircraft on fly-in repairs.

Background Right: Falcon aircraft undergoing IFS installation and empennage repairs.

Serving the needs of the military and civil aerospace industry for more than 40 years, Northwest Industries has emerged as one of Canada's important aerospace companies with a rapidly growing reputation at home and abroad for competence and innovation in a highly competitive market.

The company is primarily engaged in aircraft repair, overhaul and modifications; instruments and accessories overhaul; aircraft electronics; aircraft avionics design and

systems interface; aircraft structural and systems engineering; and airframe component manufacture. Northwest also prepares technical publications relevant to the aerospace industry.

At the company's one-stop facilities at the Edmonton International Airport, Northwest can accommodate aircraft up to the size of a Boeing 747 for all phases of overhaul and can handle aircraft up to the size of a Boeing 707 in its paint shop hangar.



Nautical Electronic Laboratories Limited

Hackett's Cove
R.R. #1
Tantallon, Nova Scotia, Canada
B0J 3J0
Tel: (902) 823-2233/4
Telex: 019-22552



500-W ruggedized NDB transmitter.



Map.



1-kW AM broadcast transmitter.

Nautical Electronic (NAUTEL), designs and manufactures totally solid-state, high-power LF/MF transmitters for navigation, communication and broadcasting. Aeronautical and marine non-directional radiobeacon systems (NDBs) are available in multiple power levels up to 4 kW, MF communication transmitters up to 5 kW and AM broadcast transmitters up to 50 kW. Over 2 000 systems have been purchased by both military and civilian government users in more than 90 countries. Many are NATO nomenclatured. NAUTEL's quality control program conforms with AQAP 4.

Norseman Shelters

A Division of North West Tent & Awning Ltd.

11311 - 120th Street
Edmonton, Alberta, CANADA
T5G 2Y1
Tel: (403) 451-4011
Telex: 037-3707
FAX: (403) 451-6527



Shelter shown in photo, with outside and inside view, has 12 m x 30 m x 3.6 m eave with peak height of 6 m. Note that the translucent fabric allows for day-time use without additional lighting required.



Norseman Shelters manufactures portable buildings made with a steel frame and fabric cover and designed for fast, easy erection by unskilled personnel. Norseman's pin and pocket assembly system requires no bolts, allows personnel to keep their gloves on, and eliminates the need for special tools. The frame and fabric dismantle into easy-

to-handle sections for transportation by air and other methods.

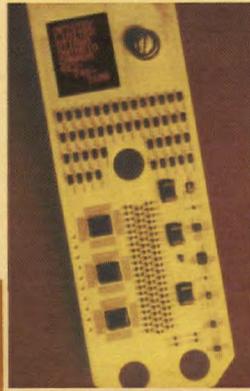
Norseman constructs buildings of any size and can design them to meet any snow and wind-load requirements. Norseman shelters are found in the Antarctic, Alaska, Siberia and the Canadian Arctic, Africa, Indonesia and Britain.

Norseman's capability extends to the construction of buildings that telescope or those that require movement by crane and/or skidding. Applications vary and include tent camps for barracks, shop or warehouse facilities, equipment storage and repair, or aircraft and helicopter hangars.

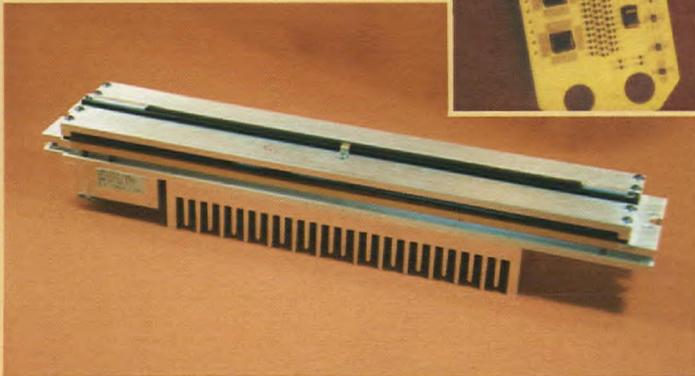
1283 Algoma Road
 Ottawa, Ontario, CANADA
 K1B 3W7
 Tel: (613) 746-3100
 Telex: 053-3524

Optotek Limited

Reconnaissance subsystem — LED display with integral drive electronics.



LED non-impact printhead, 300-line-per-inch resolution.



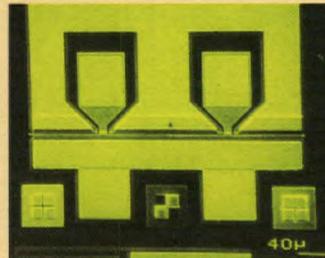
18-GHz gallium arsenide low noise field-effect transistor. ▶

Since incorporation in 1977, Optotek's opto-electronic semiconductor products have enjoyed widespread international acceptance in the military, avionic and industrial sectors. The company's vertically integrated product capability encompasses light-emitting diode displays and associated electronic subsystems; infrared photo-detectors; and gallium arse-

nide monolithic microwave integrated circuits.

Optotek's light-emitting diode display products fall into two categories: visual and photo-exposure. The visual type includes X-Y addressable matrix displays, alphanumeric displays, linear bargraphs, and programmable switch displays. These products are available both in monochromatic and multi-colour configurations.

Photo-exposure displays and electronic subsystems are manufactured by Optotek for marking of military reconnaissance film, photo-typesetting, non-impact computer printing, and similar applications.



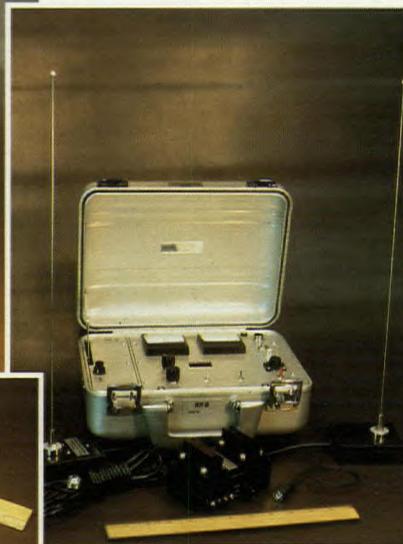
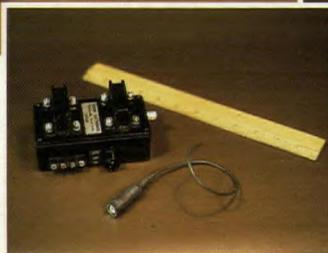
Orion Electronics Limited

Church Point, (Digby County),
 Nova Scotia, CANADA
 B0W 1M0
 Tel: (902) 769-3059
 Telex: 019-38506



Military parachute tracking system showing a parachute transmitter (blue) and direction finding receiver with detachable D/F antenna.

Vehicle tracking transmitter with magnetically mounted detachable antenna.



Portable direction finding receiver with magnetic mount car-top antenna.

Orion Electronics specializes in the design and manufacture of UHF/VHF radio tracking and homing equipment for use world-wide in applications ranging from oceanography to surveillance and security where reliability and quality are essential.

The very specialized Orion radio equipment includes directional receivers, transmitters and responders, available in models ranging from simple portable types to complex computer-controlled and stand-alone automatic units.

Orcatron Manufacturing Ltd.

14 - 7550 River Road
Delta, British Columbia,
CANADA
V4G 1C8
Tel: (604) 946-5438
Telex: 04-352848 VCR

Wireless Underwater Communication System

Orcatron Manufacturing produces the convenient Scubaphone wireless underwater communication system for both military and commercial markets. The practical Scubaphone employs crystal-controlled single side band suppressed carrier ultrasonic techniques. Special filters within the system process the incoming signal to re-

move background sounds such as the bubble noise caused by the exhalation of the diver. The result is distortion-free voice communication comparable to that achieved with hardwire systems.

With the Scubaphone, diver-to-diver communication is independent of the surface unit. Communication from the diver can be performed over ranges up to 1 200 metres (3 900 feet) in salt water while that from the surface station

ranges up to 3 600 metres (11 800 feet). The diver's microphone and earphones are water and pressure proof to 76 metres (250 feet) in salt water. The system's wireless construction allows the diver total freedom from trailing wires and hoses that can get tangled in underwater obstructions.

The Scubaphone is powered by 12-V rechargeable batteries. The charging system, with an automatic shut-off and charge indicator that is built

into the surface station, permits the simultaneous charging of two diver units and the surface unit. A tape recording facility is also provided.

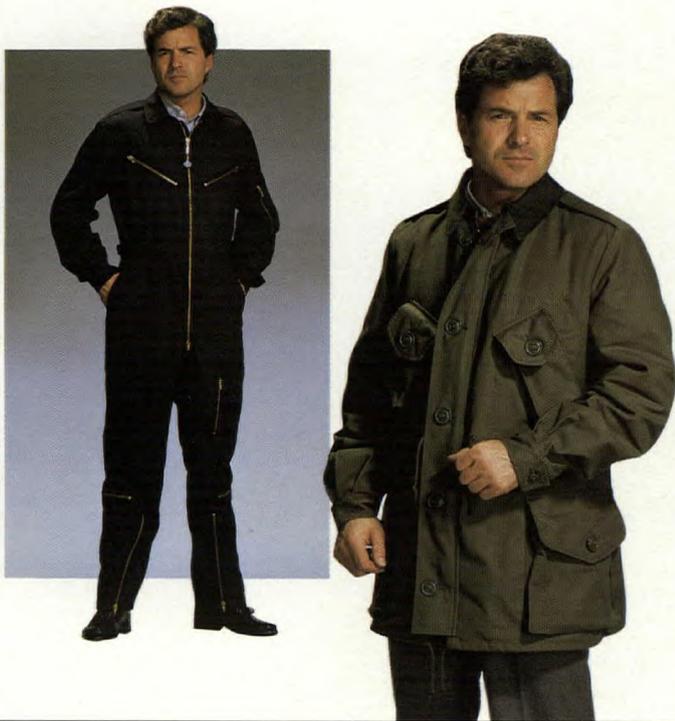
Used by military, police, scientific and commercial divers in several countries, the Scubaphone is the first wireless system to deliver a verbal comprehension quotient in excess of 90 per cent, even in currents up to six knots.



Orcatron's Scubaphone wireless underwater communication system.

Outdoor Outfits Ltd.

372 Richmond Street West
Toronto, Ontario, CANADA
M5V 1X6
Tel: (416) 598-4111



For the last 40 years, Outdoor Outfits has been a leading manufacturer of uniform clothing for Canada's Department of National Defence, the Royal Canadian Mounted Police and other police forces, fire departments, post offices and security companies.

Outdoor Outfits' quality assurance department ensures compliance with military or other demanding requirements. The company's quality control standards meet Canadian Department of National Defence Specifications, and a DND inspector is in the company plant at all times. The production of special-purpose flight crew clothing for the Canadian Armed Forces, for example, is subject to this

careful company performance assessment.

In addition to weatherproof parkas and military clothing, the company also manufactures patrol jackets, topcoats and surcoats in a variety of styles and materials. Outdoor Outfits' design department is experienced in working directly with a client to accommodate special requirements of style, proportion or materials.

The company has agents in the Middle East and South-east Asia.

Pedasco (Canada) Ltd.

12 Principal Road, Unit 2
Scarborough, Ontario, CANADA
M1R 4Z3
Tel: (416) 755-3852
Telex: 06-986766 (TOR)



The Pedasco RMI lightweight multipurpose vehicle has proven its efficiency and dependability under demanding conditions in both defence and police applications. The

vehicle is designed for the remote handling of improvised explosive devices (IED), surveillance, fire-fighting, handling of radioactive material, anti-hijacking and hostage-taking — and many other varied and related functions.

Other Pedasco products include disrupter (water gun) systems, battery-operated pulsed X-ray equipment, "night vision" television systems, stethoscopes, radio control packages, and car hooks. These products have been selected for use by the armed forces and police forces of several countries.

The Pedasco RMI lightweight multipurpose vehicle for defence and police purposes.

Pall (Canada) Limited

1380 California Avenue
Brockville, Ontario, CANADA
K6V 5Y6
Tel: (613) 345-2280
Telex: 066-36546

Pall (Canada) manufactures general and special-purpose canisters for use with masks to protect against chemical and biological toxic agents.

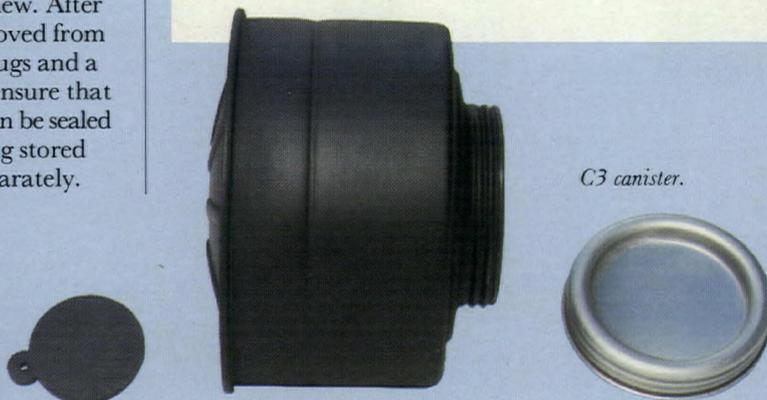
C2 Canister

This Canadian development uses a pleated paper particulate filter and a bed of activated charcoal to protect wearers from chemical and biological toxic agents and radioactive dust particles. The C2 design incorporates standard NATO thread and has an even lower breathing resistance than its predecessor, the C1 canister.

A heat-sealed foil bag ensures that the C2 canister is moisture proof when new. After the canister is removed from the bag, rubber plugs and a plastic outlet cap ensure that the canister holes can be sealed whenever it is being stored on the mask or separately.



C2 canister.



C3 canister.

C3 Canister

This canister utilizes a pleated paper particulate filter and a larger bed of TEDA charcoal to protect against chemical and biological toxic agents and radioactive dust particles. It is provided with C1 threads, and its primary application is in maritime environments, especially onboard ship. It is a special-purpose canister for applications which require longer protection.

HC20 Canister

The HC20 is a C2 canister with C1 threads. The performance of the HC20 is identical to that of the C2. For moisture-proofing, the HC20 canister is provided with attached rubber plugs and metal base seal cap.

The HC20 canister is a direct field replacement for the C1 canister on a C3 mask.



HC20 canister.

Patlon Aircraft and Industries Ltd.

5502 Timberlea Boulevard
Mississauga, Ontario,
CANADA
L4W 2T7
Tel: (416) 624-5572
Telex: '06-960379
TWX: 610-492-4312

An engineering, sales and warehousing distributor, Patlon has been serving the total aircraft industry for over a quarter of a century. The company specializes in the logistic support of a wide variety of North American designed military, transport and fighter aircraft.

Patlon has developed excellent sources of supply for both current and out-of-production equipment in North America, the Commonwealth and Europe. From its extensive master reference library in Canada, which includes all

free world military equipment and vehicle purchases, the company is able to cross-reference products, replacing specified materials and equipment with qualified products from multiple sources — usually at lower cost. The firm has been particularly successful in this approach in supplying to the Canadian military airframe and engine repair and overhaul depots, and in meeting the needs of other governments.

Patlon has the ability to service and respond quickly to market demands; that is an impor-

tant reason why the Canadian government appointed the company as its exclusive supplier of all vendor items for its Boeing 707 fleet. The Boeing 707s fulfill many roles such as transport for cargo and personnel, airborne tankers for in-flight refueling, and northern surveillance. The aircraft travel around the world and are kept in the air almost continuously. Patlon is responsible for keeping downtime to a minimum and is required to supply parts on a 24-hour basis in many areas of the world.

Patlon also holds Canadian government "blanket" contracts for the supply of airframe and engine spares, instruments, and electronic equipment for other aircraft. It is providing similar services to other governments around the world.

Patlon opened an office in Miami in 1979, Patlon Aircraft and Industries Inc., to extend its military and commercial services to the general aviation field in both the Central and South American markets.



Patlon is a major supplier to Boeing 707 and provides emergency spares for Canada's CP140 fleet. Patlon holds Canadian gov-

ernment "blanket" contracts for airframe and engine spares, instruments, electronic equipment — and other aircraft parts.

Philips Electronics Ltd

Quartz Crystal Department

601 Milner Avenue
Scarborough, Ontario, CANADA
M1B 1M8
Tel: (416) 292-5161
Telex: 065-25100
TWX: 610-492-0483
FAX: (416) 297-1019

A Canadian member of the world-wide Philips federation of industries, Philips Electronics has been manufacturing quartz crystals since 1949.

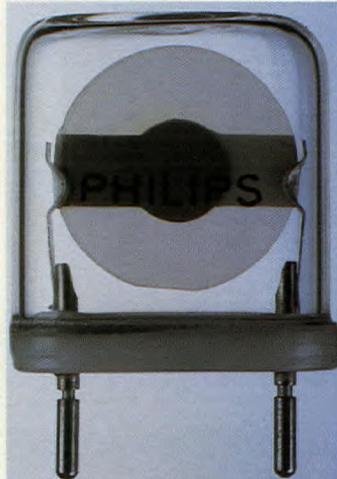
As stability requirements have increased over the years, the company's processes have been improved and perfected. Glass, as well as metal, enclosed crystals are being manufactured for demanding military and commercial applications.

Philips' crystals are ideally suited for Hi-Rel, military

and aerospace frequency control applications. Their features include frequency range of 1.5 to 175 MHz and Hi-Rel — Glass enclosed units. Philips Electronics offers

- MIL-approved in-plant test laboratory to MIL-C-45662;
- Q.P.L.-approved types to MIL-C-3098;

- free application consulting services;
- uncompromising quality standards;
- automatic computerized test data for each crystal.



Glass encapsulated precision quartz crystal.



Automatic sealing station for glass encapsulated crystals.

Presentey Engineering Products Limited

2784 Fenton Road
P.O. Box 919, R.R. #5
Ottawa, Ontario, CANADA
K1G 3N3
Tel: (613) 822-1251



Brushless DC motors.



Transmissometer telescope.

Presentey Engineering is a prime contractor in a wide range of research, development, design, manufacturing and consulting activities for

both the private and military sectors. The company engineers and manufactures such products as airborne speech recorders, memory loop recorders, and airborne camera annotators for remote sensing.

Presentey Engineering is currently involved in the design and manufacture of transmissometers for Canadian airports, as well as the research and design of a brushless DC motor for Hercules (CF-130) aircraft flight data recorders and electronics patch panels for the Canadian Patrol Frigate Program.



Transmissometer projector.

Pratt & Whitney Canada

P.O. Box 10
Longueuil, Quebec, CANADA
J4K 4X9
Tel: (514) 677-9411
Telex: 05-267509
Cable: PRATTWHIT MTL

Pratt & Whitney Canada, a subsidiary of United Technologies Corporation, is a world leader in the design, manufacture and overhaul of small gas turbine engines. The Canadian operation is totally responsible for the design, development, manufacture and marketing of the small gas turbine engines for military and civilian air, land and sea applications. The company's engines power a wide variety of aircraft in 147 countries.

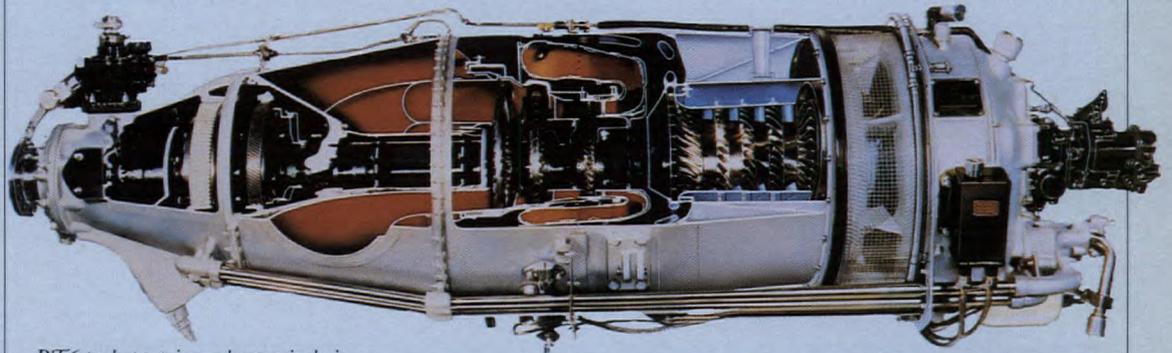
Pratt & Whitney Canada's Industrial & Marine Division is an innovator in the application of gas turbine engines to industrial and marine uses. These include applications as power generating units, pumping stations for gas and oil pipelines, and propulsion systems for civil and military ships.

Approximately 2 300 employees work full time on research and development projects to continually improve gas turbine technology that will meet the challenges of today and the demands of the decades ahead.

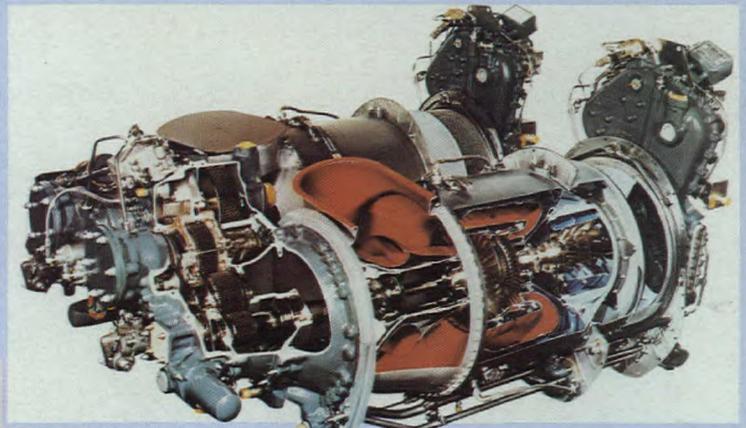
Research, development, manufacturing and overhaul operations are carried out in three plants near Montreal, each conveniently located near a major airport where company test flights are carried out. As well as a plant in Toronto, the company has a new automated manufac-

turing facility under construction in Halifax. Pratt & Whitney maintains overhaul and repair facilities in the United States, Argentina, Australia, Brazil, France, Italy, Japan, Britain and Singapore. These facilities augment a world-wide distribution network for spare

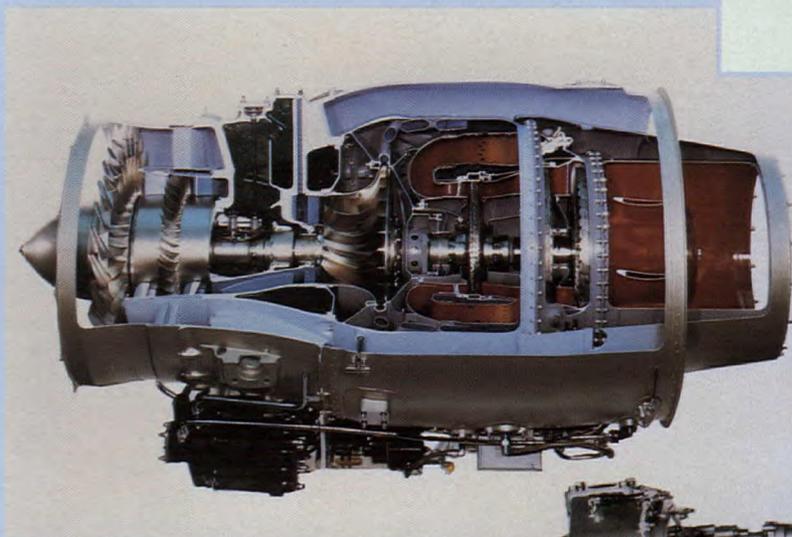
parts and provide after-sales support of the company's products in major world markets.



PT6 turboprop is used extensively in single and twin engine military trainers, twin engine Medivac, coastal patrol and transport aircraft.

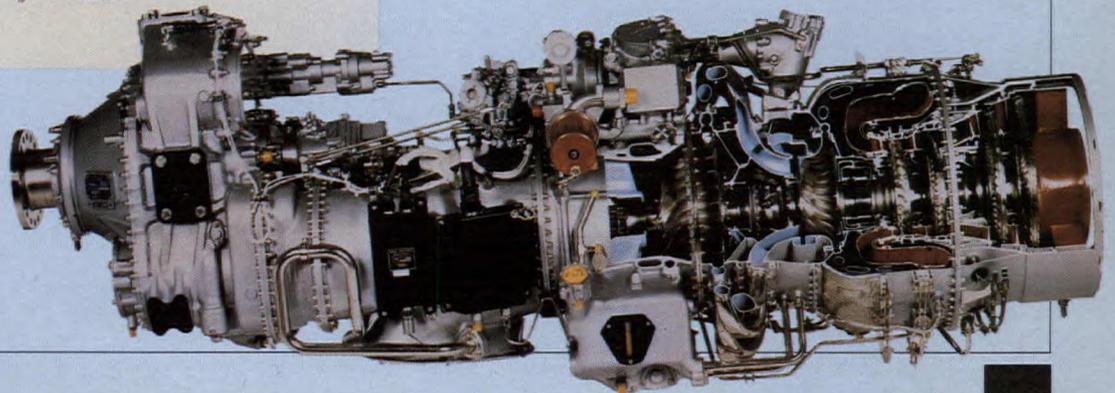


PT6 turboshaft, as a TwinPac®, is used in the Bell AH-1J and T gunships, the UH-1N and CUH-1N transport helicopters, and ASW helicopters built by Agusta. As a single engine, two are installed in Sikorsky's S-76B.



JT15D turbofan is used in single and twin-engine military training aircraft.

PW100, a new advanced technology engine, is utilized as a turboprop powering 30-80 passenger transports with application as a turboshaft in medium to heavy-lift military helicopters.



Raytheon Canada Limited

400 Phillip Street
Waterloo, Ontario, CANADA
N2J 4K6
Tel: (519) 885-0110
Telex: 069-55431
TWX: 610-365-3469

Raytheon is Canada's leading supplier of military ground controlled approach (GCA) systems and air traffic control (ATC) systems for both military and civil applications.

Ground Controlled Approach Systems

Raytheon's GCA system incorporates the most advanced solid-state radar and display equipment to provide unsurpassed system availability. The GCA meets or exceeds all operational requirements for the control and recovery of high-performance jet aircraft, even under severe weather conditions.

Two separate radars make up the complete system: the airfield surveillance radar (ASR) provides primary surveillance coverage; and a precision approach radar (PAR) displays all approaching aircraft and tracks as many as six targets on final approach simultaneously. Both radars are available in fixed site or mobile versions. An operations centre (which can be housed in a transportable shelter) contains the radar displays, control and communications facilities, and can be linked to the radar heads by either cable or microwave.

Raytheon GCA systems are in the inventories of the air forces of the United States, West Germany, Australia, Austria and the Netherlands.

ATC Systems

The Raytheon Canada ASR-9000 Series of primary surveillance radars is the world's first family of completely solid-state ATC radars. This L-band system provides coverage to 100 nm (in the standard version) which may be enhanced to 160 nm or 200 nm, in alternative configurations.

In addition to very high reliability and availability, solid-state technology offers a variety of features such as optional random frequency agility, pulse compression, and sidelobe blanking. Low radiated power also ensures survivability.

The ASR-8000 Series of conventional, magnetron-technology ATC radars is available in both L- and S-bands, again in a variety of ranges to suit all requirements.

Raytheon Canada also offers a full range of radar display systems and radar data automation systems. The company is currently prime contractor to the Government of Canada on a national program to update and enhance the civil ATC radar network, including new radars, displays and radar data processing.

Other Products

Raytheon Canada manufactures a range of single-board microprocessors and power supplies for a variety of defence products.

For civil aviation, the company produces ground-based navigation aids, including distance measuring equipment (DME) and VHF omni range (VOR), that meet or exceed ICAO and FAA specifications.

As a turn-key systems supplier, Raytheon Canada will design, develop, produce and install air traffic control systems. Such service begins with the earliest technical evaluations, through to continuing after-sale support and logistics.

Raytheon Canada's facilities and manufacturing procedures meet Canadian Department of National Defence standards, which are also internationally recognized.

A/N/ GPN-22 precision approach radar.



RCA Inc.
New Products Division

P.O. Box 900
Vaudreuil, Quebec, CANADA
J7V 7X3
Tel: (514) 457-9000



A sampling of RCA's new products.

RCA Inc., New Products Division, provides research, development and manufacturing capabilities for state-of-the-art electro-optical components and subsystems.

RCA produces semiconductor injection lasers and arrays, infrared emitters, transmitter modules, P-I-N photodetectors, avalanche photodetectors, hybrid detector preamplifier assemblies and receiver modules using the latest silicon and III-V compound technologies. These precision products are designed for such applications as laser range-finding, optical proximity fusing, target designation and tracking, weapons fire simulation, line-of-sight optical communications, and fibre-optic communications.

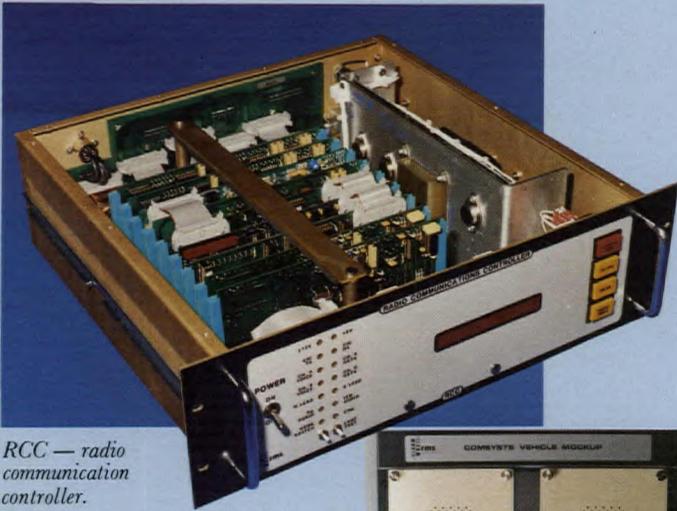
RCA's consolidation of both its emitter and detector capabilities in a new facility in Vaudreuil, Quebec, will effectively double its capacity for the production of these devices. The facility, one of the most modern of its kind in North America, contains 1 394 square metres (15 000 square feet) of clean rooms of which 279 square metres (3 000 square feet) are class 100 and meet the quality requirements of DND1015, AQAP-1 as it applies to these products.



Artist's impression of new facility in Vaudreuil, Quebec.

RMS Industrial Controls Inc.

1100 Lansdowne Street
Port Coquitlam,
British Columbia,
CANADA
V3B 5E2
Tel: (604) 464-2315
Telex: 04-353612

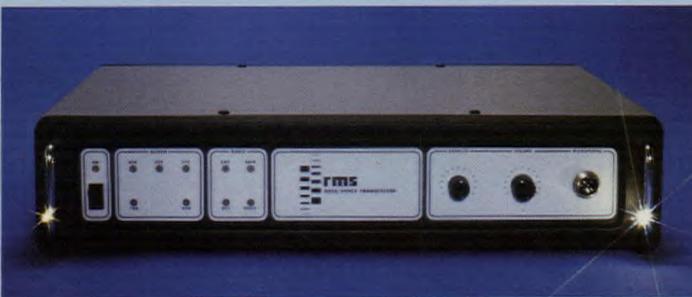
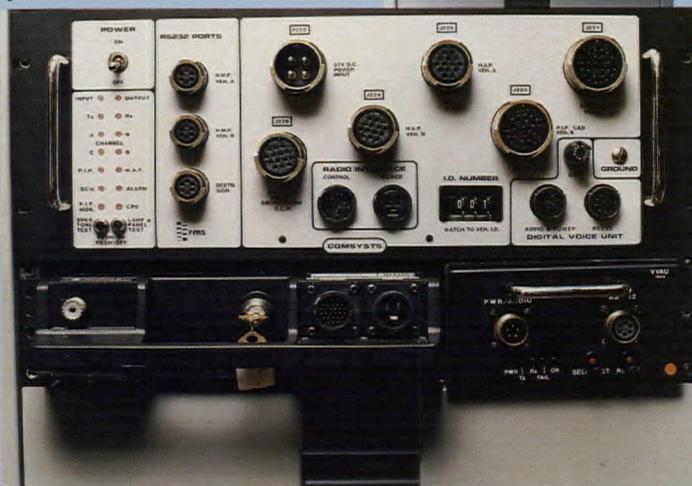


RCC — radio communication controller.



Comsys — mockup/test unit.

Comsys — light rail communications system.



RMS Industrial Controls, a high-technology company that builds RF communication systems to client specifications, specializes in the design and manufacture of data, voice and video communication products and data acquisition systems for a variety of applications.

In the last 10 years, RMS has supplied turn-key systems for telemetry, industrial radio control systems, data and voice RF communication networks, radio link video transfer systems, and supervisory control and data acquisition systems (SCADA) in the transportation, forestry, OEM (original equipment manufacturer), oil and gas, mining and waste water management industries.

The company designs and manufactures reliable, high-quality full and half-duplex UHF radio transceivers in the 400-MHz and 800-MHz bands. This includes single-channel radio for small radio control systems and multi-channel digital synthesized transceivers for DataTran radio modems, Comsys light rail communication systems, and Cadcom-Bus transit communication systems.

RMS designs and assembles large numbers of electronic data acquisition boards uti-

lizing both 16-bit and 8-bit Intel microprocessor technology. Designed to the SIEMENS Eurocard specifications, these electronic boards are the basic building blocks of many of the company's advanced data acquisition, telemetry and communication systems.

Using the RMX real-time operating systems, RMS custom designed several communications network programs and protocols for specific application requirements. Some of these programs feature advance polling techniques, error detection and forward correction of data, collision detection, and much more.

The modern RMS manufacturing plant has a comprehensive environmental and vibration test laboratory. All products and systems go through extensive quality assurance testing and before-shipment inspection.

The RMS research and development centre, opened in 1985, attests to the company's commitment to stay at the cutting edge of technology in advanced communications. RMS' experience and expertise can assist customers in implementing the right strategy for a radio communication network.



Comsys 5 — vehicle monitoring system.

Data Tran 400LT — radio modem.

Rohde & Schwarz Canada Inc.

25E Northside Road
Nepean, Ontario, CANADA
K2H 8S1
Tel: (613) 829-3944
Telex: 053-3662
FAX: (613) 829-1207

Rohde & Schwarz Canada Inc., provides systems and development capability in the EW and radio monitoring environments.

The PA2000 is the first in a series of "monopulse" radio direction finding systems that operate on the Adcock/

Watson-Watt principle. It intercepts and locates frequency hopping communications sources. Components of the PA2000 provide the core for the development of a tracking jammer that will have the capability of disrupting frequency hopping communications.

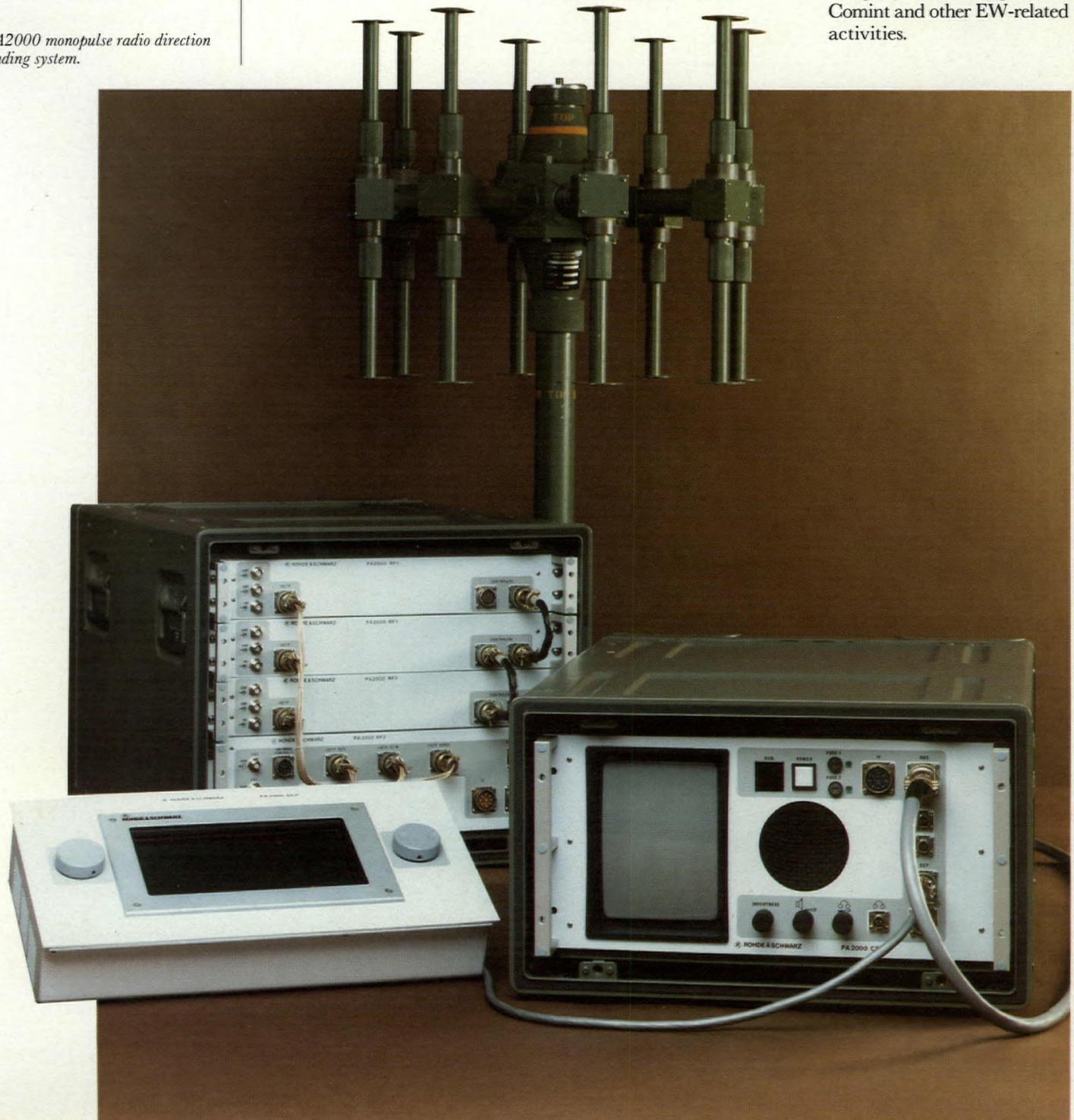
The PA2000 has the following special features:

- 2-500 MHz;

- 1 300 MHz optional;
- hopper intercept capability;
- operator interaction via touch-sensitive screen;
- fixed or mobile operation;
- remove control capability;
- multiprocessor multitasking system control.

Rohde & Schwarz Canada Inc. offers full in-house capability to develop and design systems for Sigint, Comint and other EW-related activities.

PA2000 monopulse radio direction finding system.



Rockwell International of Canada Ltd.

Collins Canada Division

150 Bartley Drive
Toronto, Ontario, CANADA
M4A 1C7
Tel: (416) 757-1101
Telex: 06-963573

The Collins Canada Division of Rockwell manufactures advanced telecommunication products including a family

of HF-80 radio sets; a new general purpose VLF/LF/MF/HF receiver featuring digital signal processing; a

miniature general purpose synthesized HF receiver; and a lightweight HF packset and a lightweight airborne HF system both designed for tactical use. The division also produces a new generation of automatic airborne direction finders and self-contained transportable HF communication systems for optimum operation in tactical military environments.

Collins Canada offers various versions of HF-80 radio equipment to meet the voice and data communication challenges of the 1980s and 1990s. From simple, operator-

attended receivers and transmitters to fully automated and remote communication stations, the HF-80 provides support and cost advantages not previously available. This family of 1-kW, 3-kW and 10-kW transmitters is satisfying communication requirements in more than 50 countries.

The Collins HF-2050 HF receiver is the latest in state-of-the-art HF communication equipment. Introducing digital signal processing techniques to the HF communication market, the HF-2050 receiver gives superior performance, high reliability, and operational flexibility not found in other contemporary receivers.

The Collins S-1 HF receiver is a miniature, single-channel synthesized receiver covering 0.10 to 29.9999 MHz in 100-Hz steps. It is exceptionally well-suited for use as a guard receiver, as an IF strip for other radio equipment, or as a portable receiver. The compact, single-piece unit features standard AM, USB and LSB modes plus a syllabic rate squelch.

The Collins AN/PRC-515, a 20-W HF man-pack transceiver built to meet a full range of communications requirements, provides the flexible and quiet operation necessary in a tactical environment. A synthesizer enables frequency coverage from 2 to 29.9999 MHz in 100-Hz steps with fully automatic antenna tuning. The AN/PRC-515 is standard equipment in the Canadian Department of National Defence.

Collins Canada manufactures standard and custom-designed transportable HF communication shelters for optimum operation in tactical military environments.

The AN/TSC-60(V)5 communication central is a transportable HF communication



Collins HF-2050 general purpose VLF/LF/MF/HF receiver.



HF-80 communication equipment room. Filling the communication needs throughout the world.



Collins AN/PRC-515 HF packset. The 20-W HF man-pack transceiver meets a full range of tactical communication requirements.

Rockwell International of Canada Ltd.



system with dual 2.5-kW transmission capability. Modes of operation include ISB, SSB, voice, continuous wave (CW), multichannel TTY, AM, and compatibility with TADIL-A data-links.

The AN/TSC-60(V)7 communication central is a transportable high-frequency 1-kW communication system designed for rapid deployment applications. Accessory equipment allows the system to offer modern adaptive techniques such as selective calling, receive scanning, and link quality analysis.

AN/TSC-60(V)7 communication central. Equipment complement.

HF-9000 Series of HF airborne communication. HF-9100 System consists of HF-9010 control, HF-9030 receiver/transmitter and HF-9040 antenna coupler.

Protected at the system level, all equipment provides a highly reliable communication system for optimum operation in tactical military environments.

The OZ-11A/TSC-60(V) radio set group, housed in a transportable S-141 modified shelter, contains a 10-kW HF power amplifier and is used to increase the power output capability of the AN/TSC-60(V)5 or AN/TSC-60(V)7 communications centrals.

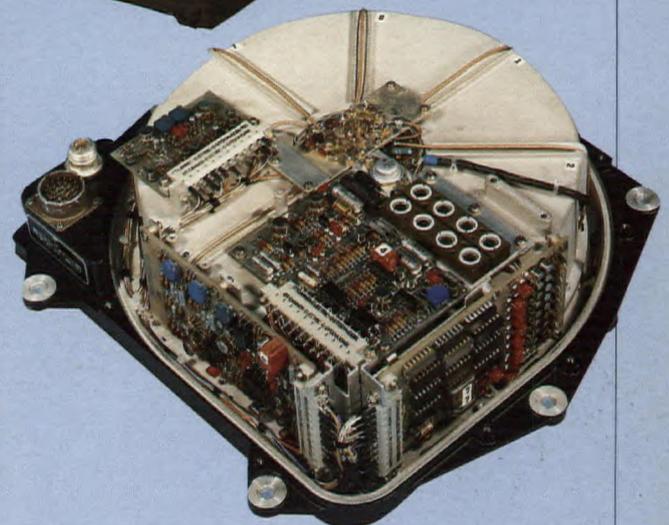
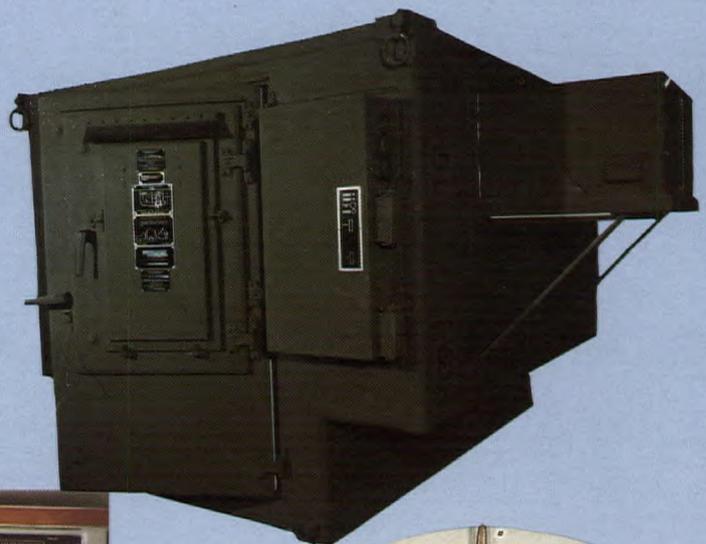
The HF-9000 Series of HF airborne communication

systems is designed for the needs of the airborne tactical user. The latest technology, including microprocessors, direct digital frequency synthesis, and fibre optics, as well as pre-planned product improvement design philosophy makes the Collins HF-9000 Series one of the most modern lightweight airborne systems available today.

The DF-301E direction finder fulfills the requirement in new aircraft for smaller, more reliable avionics systems. The electronically rotated antenna permits the use of microelectronics to their best advantage in lowering power

requirements and heat generation. The DF-301E includes a wide-band low noise pre-amplifier that enhances the sensitivity and reduces the susceptibility to noise pick-up on the coax to the companion receiver. Logical functional organization of the modules enables rapid isolation of a failure for minimal MTTR.

AN/TSC-60(V)7 communication central. Transportable HF communication shelters for optimum operation in tactical military environments.



DF-301E direction finder provides for more reliable, smaller avionics systems.

Rolls-Royce (Canada) Limited

P.O. Box 1000 Montreal AMF
Montreal, Quebec, CANADA
H4Y 1B7
Tel: (514) 631-3541
Telex: 05-821882

Rolls-Royce Canada, established in 1952 as a wholly-owned subsidiary of Rolls-Royce Limited of Britain, overhauls most Rolls-Royce civil and military aircraft engines, their industrial derivatives, and more recently has become a full overhaul agency for General Electric T64 engines.

The company has established a specialist facility for the overhaul of turbine engine component parts and has remained at the forefront of this specialized field.

Rolls-Royce Canada currently overhauls the following engines:

G.E. T64	Wright 1820
RR Nene	RR Viper
RR Spey	RR Dart

High-technology repair processes of aircraft engines carried out by Rolls-Royce Canada include the following:

- vacuum high-temperature brazing;
- automatic TIG welding;
- plasma spray anti-wear coatings;
- plasma spray anti-corrosion coatings;
- ceramic thermal barrier coatings;
- electrolytic plating with copper, cadmium, nickel and chrome;
- Tribomet anti-wear electro-plating.

The experienced staff of Rolls-Royce Canada is expert in the weld repair of light alloy engine casings and all combustion chamber repairs.

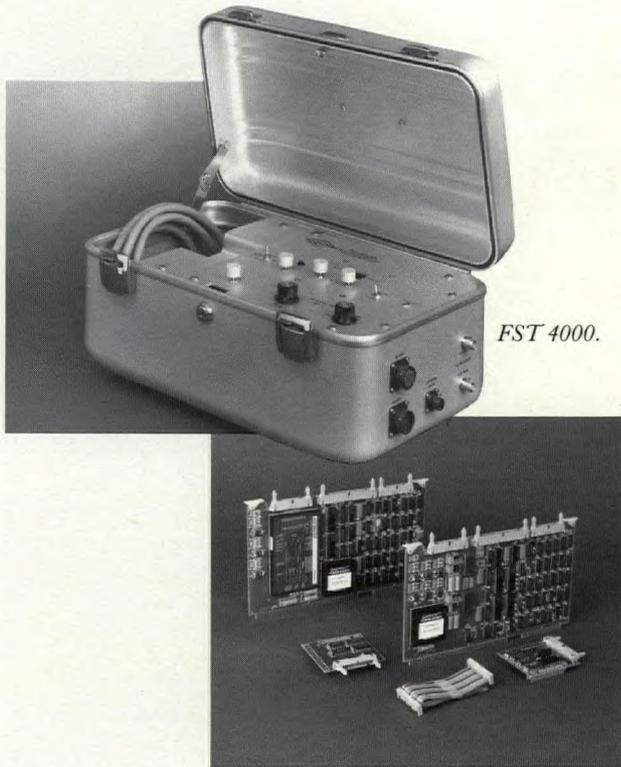
Spey being prepared for shipping.

Inset: T64 engine and gear box.

Roy Ball Associates Ltd.

Systems Engineering

1750 Courtwood Crescent,
Suite 300
Ottawa, Ontario, CANADA
K2C 2B5
Tel: (613) 226-7890
Telex: 053-4712



FST 4000.

Analog I/O subsystem.

Roy Ball Associates, Canadian owned and operated, provides software design and development services and fully integrated custom-designed microprocessor-based products for image processing, signal processing, pattern recognition, data acquisition and processing, control systems, and modelling simulations for government and industry. The company specializes in the fields of remote sensing, electronic warfare, radar and data communications.

IMAVISION, an IBM PC-based image analysis system, offers flexible image analysis at a quality level normally associated with that of a powerful minicomputer. The software is upwards compatible with proven minicomputer software. IMAVISION supports a full range of peripherals and hardware options and can be operated stand-alone or as an intelligent work station.

Analog I/O subsystem is a four-channel simultaneous sampling I/O system for MULTIBUS*. It is designed for high-speed signal processing applications that require real-time simultaneous sampling in such fields as sonar, seismology and communications.

The FST 4000 is designed for system check-out and maintenance of the FPS-2 fence protection system. The tester connects directly to the FPS processor and provides access to parameters needed to optimize and verify system performance.

Roy Ball Associates also provides consulting services in the engineering, evaluation and installation of security systems for large institutions and facilities.

*MULTIBUS is a registered trademark of INTEL Corporation.



IMAVISION.

Safeco Manufacturing Limited

947 Warden Avenue
Scarborough, Ontario,
CANADA
MIL 4E3
Tel: (416) 752-6740
Telex: 06-963823

Body Armour Bomb Disposal Suit

The Safeco Body Armour (E.O.D.) bomb disposal suit provides bomb technicians and investigators with ballistic

and impact protection against the hazards of fragmentation and blast effects when dealing with explosives ordnance emergency situations.



Chieftain Citation fire fighter's helmet.



Model 258 hearing protector.

E.O.D. bomb disposal suit.



The ballistic evaluation of the Safeco E.O.D. suit and all related components was carried out using the NATO-Stanag 2920 test method.

The suit is designed with the required flexibility to ensure the comfort of the wearer. Weight of the suit is only 19.4 kg (42.5 pounds), and that of the helmet/visor only 4.3 kg (9.3 pounds).

Hearing Protector — Model 258

The Safeco Model 258 hearing protector, a Canadian development, offers superb performance. The ruggedness of the Model 258 is complemented by its exceptional comfort and simple convenient method of putting it on and removing it. The liquid-filled cushions in the protector are primarily responsible for the exceptional attenuation performance of the Model 258. All parts are replaceable for easy and economical field maintenance. The Model 258 is currently used by both the Canadian and West German armed forces.

Chieftain Citation Fire Fighter's Helmet

This helmet offers the state-of-the-art protection that is required by today's fire-fighting professionals. The moulded fibreglass composite outer shell ensures excellent high heat and chemical resistance. In combination with its inner cap designed to resist impact and penetration, the Chieftain Citation helmet is an unbeatable head protection system. The Chieftain Citation system meets all U.S. N.F.P.A. Standard 1972 (1985 Edition) requirements, and is S.E.I. Certified. It is presently used by fire departments across North America as well as by the Canadian Armed Forces.



Saint John Shipbuilding Limited

P.O. Box 970
Saint John, New Brunswick,
CANADA
E2L 4E5
Tel: (506) 633-4444
Telex: 014-47243

Saint John Shipbuilding operates a Canadian centre of excellence for marine design and construction management.

The company is the program manager and prime contractor for the \$3.85-billion Canadian Patrol Frigate Program, the largest and most technically complex project assigned to date by the Canadian government. In addition to the design and construction of six state-of-the-art frigates for Canada's Maritime Command, Saint John Shipbuild-

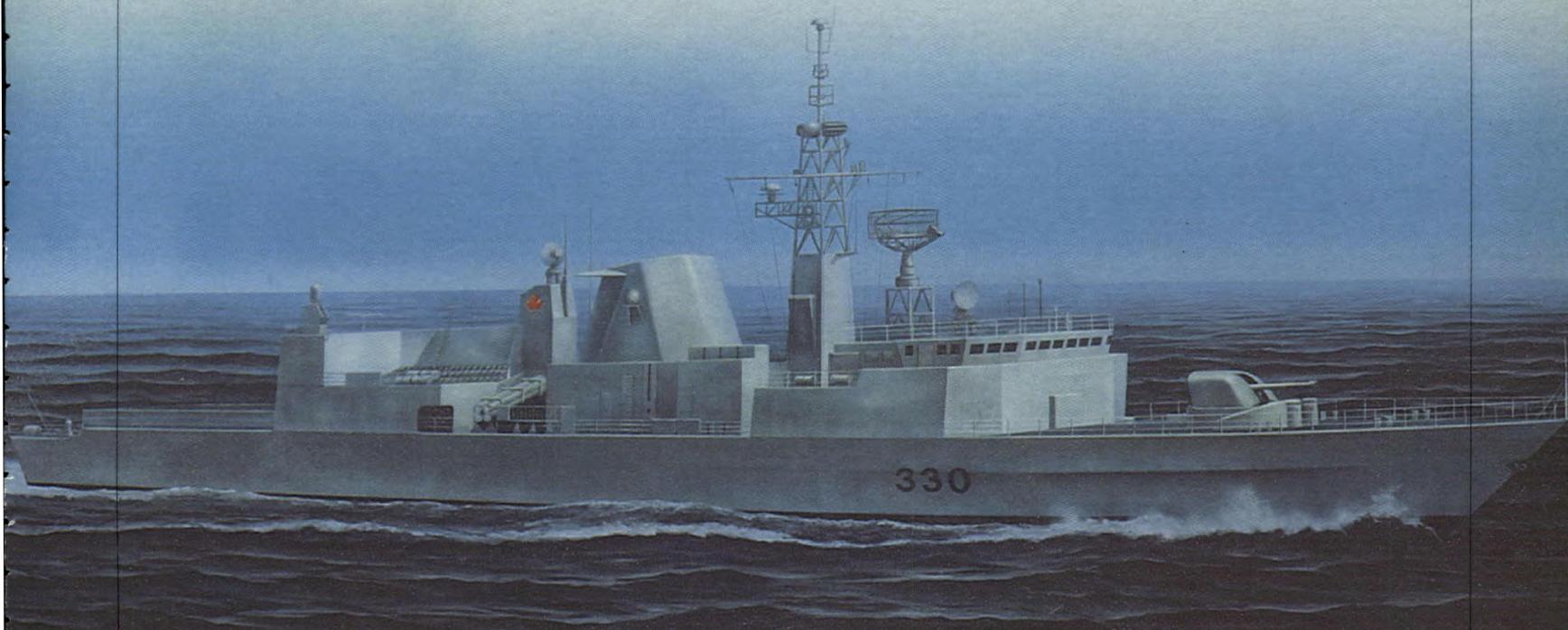
ing is responsible for the quality assurance of the program, initial provisioning, testing and trials, development of life-cycle support systems, training manuals and crew training.

Over its 50-year history, Saint John Shipbuilding has acquired broad experience and expertise in the design and construction of ships to meet the full spectrum of the marine market's needs. Its long association with Canada's navy began in the 1940s when the company built such cor-

vettes as the H.M.C.S. *Sackville*, the sole remaining survivor of Canada's once-large fleet. Canada's navy knows it can still depend on the operational support ships, the H.M.C.S. *Preserver* and the H.M.C.S. *Protecteur*, built in the company's shipyard.

Saint John Shipbuilding Limited, located on the ice-free Bay of Fundy, is fully experienced in ship conversions, refits and naval vessel repairs.

The future H.M.C.S. Halifax, first of the new Canadian patrol frigates.



Scannar Industries Inc.

777 Walkers Line
 P. O. Box 5009
 Burlington, Ontario, CANADA
 L7R 4B3
 Tel: (416) 528-8811
 Telex: 061-8401

Scannar Industries manufactures anti-submarine warfare (ASW) sonar systems for small ships and patrol vessels. This enables almost any navy to have an effective ASW detection capability at a very low cost. In addition to con-

ventional submarines, Scannar sonar systems detect underwater targets such as swimmers and mini-submarines.

The sonar systems are specifically designed to operate effectively in water as shallow

as 30 metres, or even less, depending on the required range. For example, in continental shelf water of approximately 200-metre depth, a conventional ASW sonar will have an effective range of only 500 metres (1 600 feet), but the Scannar sonars will have an effective range of approximately 3 km (1.9 miles).

SCAN 525

The SCAN 525 sonar system is an effective ASW sonar for both shallow and deep water. Its display is programmable to customer requirements, and in its basic form provides all the information needed to successfully detect, classify and attack underwater targets.

The SCAN 525, a fully omnidirectional sonar operating at 15-KHz frequency, has electronic tilt and stabilization, computer-aided detection, interface to ASW weapons, and self-diagnostic test systems, among others.

SCAN 515 Series

The SCAN 515 system, available in frequencies of 45, 22 and 15 KHz, is a high-resolution omnidirectional sonar designed for patrol vessels. The type and shape of the sonar beam can be adjusted to suit operating conditions.

The display has both a horizontal view and a vertical view of the surrounding water and produces numerical readouts of target bearing, range, depth and signal strength.

A full self-diagnostic test system is built into the SCAN 515. Maintenance and repair are fast and easy and require no specialized training.



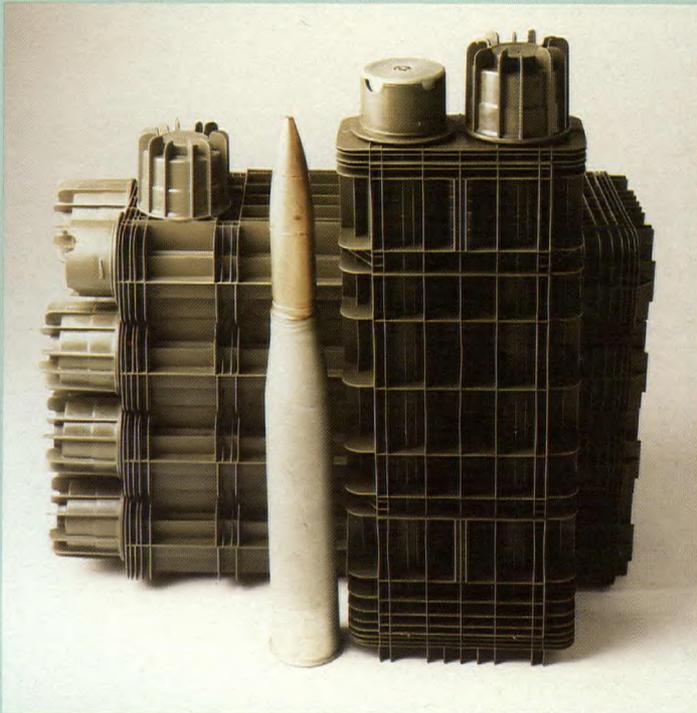
SCAN 525 search/attack sonar.



SCAN 515 ASW patrol sonar.

Scepter Manufacturing Co. Ltd.

11 Bermondsey Road
Toronto, Ontario, CANADA
M4B 1Z3
Tel: (416) 751-3820
Telex: 06-23762



Scepter offers total design, development and manufacturing services for high-performance, protective packaging of heavy calibre ammunition.

Incorporating state-of-the-art plastics and restraint technologies, Scepter ammunition containers

- meet or exceed NATO specifications;
- are waterproof and corrosion resistant;
- offer maximum protection, minimum weight;
- are easily stacked and palletized, and just as easily disassembled and handled individually;
- are maintenance free and permanently coloured; and
- provide optimum drop-impact protection.

The 70-mm (3-inch) container, shown above, stacks easily to form a unitized load on a standard 1 000-mm × 1 200-mm (39-inch × 47-inch) pallet. Scepter's innovative design technology provides maximum load stability, handling convenience, and contents protection.

Scepter Manufacturing, a world leader in the design and manufacture of plastic fluid containers, has more than 20 years of experience in supplying Western armed forces with NATO-approved jerry cans for the transport of water and fuels. Unlike traditional metal cans, Scepter containers do not rust, are 50-per-cent lighter, and provide superior protection, even in the most severe applications, such as parachute dead drops.



Scepter manufactures durable 20-litre (5-gallon) water and fuel containers, designed and developed in co-operation with the Canadian Armed Forces, that have been proven to perform well under extreme combat conditions.

222 Snidercroft Road
Concord, Ontario, CANADA
L4K 1B5
Tel: (416) 669-2280
Telex: 06-964570
FAX: (416) 669-5132
Cable: GEOSCINT TORONTO

Scintrex

The Scintrex MFM-3 high-sensitivity vector fluxgate magnetometer is used for MUSA applications.



Scintrex is a diversified high-technology company engaged in the development and manufacture of sensing devices for use in the defence and security fields. The current Scintrex product line includes radiation monitoring equipment and a broad range of magnetometers with applications in ferrous ordnance detection and surveillance of marine and land routes.

Searching for hidden danger with the Scintrex V-92 explosive ordnance detector magnetometer.

Magnetic Underwater Surveillance Array (MUSA)

Magnetic underwater surveillance arrays (MUSA) are systems of magnetometers set up to provide three-dimensional surveillance of fjords, harbours and other strategic marine installations. A number of Scintrex magnetometer systems have MUSA applications. They can be positioned at strategic locations and their outputs transmitted to trigger an alarm signalling the presence and location of intruders with ferromagnetic properties

(because of their vessels, their mechanical transport, or the weapons they carry).

Explosive Ordnance Detector Magnetometer

The V-92 explosive ordnance detector magnetometer is a portable, battery-operated magnetometer for detection of buried ordnance and other ferrous objects. It is designed for searching areas when carried at a walking speed or alternatively, it can operate on up to 61 metres (200 feet) of cable. The device can be used in underwater applications as well.

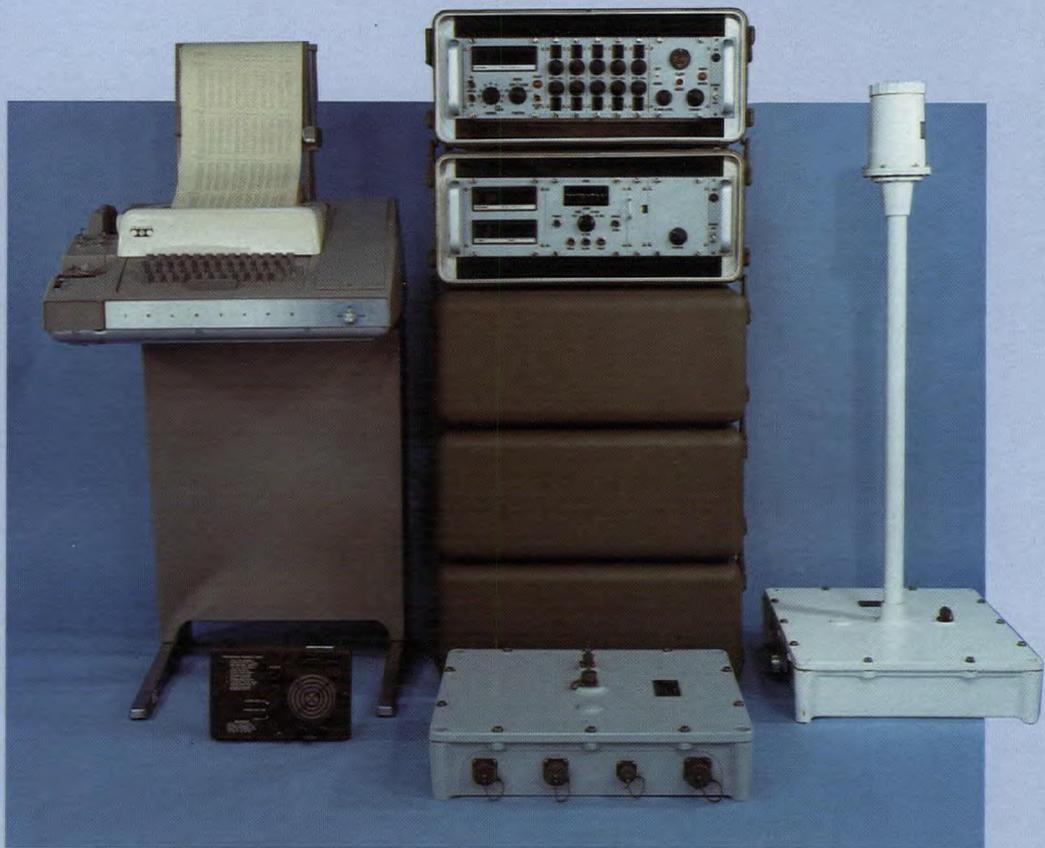


Scintrex

Radiation Monitor and Automatic Alarm System

This Scintrex system continuously detects and measures the gamma radiation rate from fallout produced by nuclear explosions and automatically initiates alarms based on these measurements. The equipment is installed at fixed or semi-fixed locations and provides in-place radiation monitoring from remote detectors distributed over a large area.

The Scintrex system consists of 10 remote detectors, an interconnecting box, and an operating console containing an interface module, a control module and a desk. Auxiliary equipment to be used with the AN/GDQ-3 system (a United States Army configuration) includes a field telephone, an alarm unit and a teletype unit.



Radiation monitor and automatic alarm system AN/GDQ-3.

Portable Explosives Vapour Detector (EVD-1)

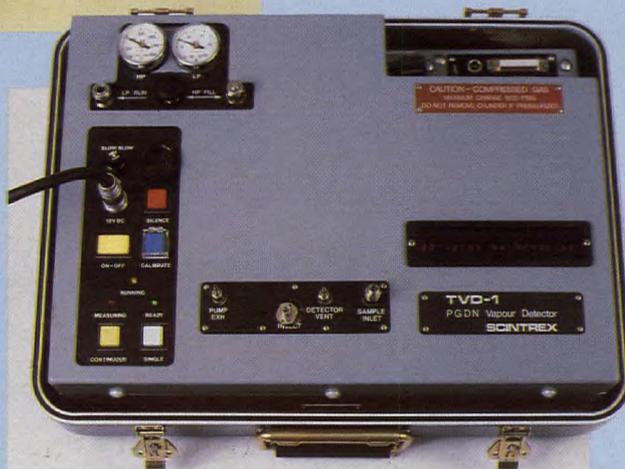
EVD-1, the latest security product from Scintrex, is an explosive vapour detector (bomb sniffer) that senses the presence of very minute amounts of vapours given off by explosives. Its applications include the protection of personnel, buildings, aircraft, vehicles and equipment from terrorists and other hostile agents.

PGDN Vapour Detector (TVD-1)

The TVD-1 PGDN vapour detector accurately measures the propylene glycol dinitrate ("Otto Fuel") in air. Designed for portability, ruggedness, reliability under rigid military specifications, the TVD-1 incorporates microprocessor-based intelligence to provide easy one-button operation. Unlike current Otto Fuel detectors, it possesses high selectivity which greatly suppresses possible interference from other air contaminants, thus reducing the likelihood of a false alarm. The innovative device can be used to detect the presence of PGDN in the ambient air of torpedo assembly and maintenance workshops, and torpedo storage areas.



The EVD-1 portable explosives vapour detector is the latest security product from Scintrex.



The TVD-1 PGDN vapour detector.

P.O. Box 424, Station T
 Toronto, Ontario, CANADA
 M6B 4A3
 Tel: (416) 591-8439;
 (416) 782-9898
 Telex: 06-986391 (TOR)

Securesearch

Securesearch is an independent research agency engaged in the analysis of planned, violent group crime, including political terrorism.

The company markets a comprehensive audio-visual training program entitled "Explosives, Bomb Threats and Search Procedures."

Available in both slide/tape and videocassette format, the program is produced in English, French and Spanish. It is used by police, military and private security forces, corporate security executives, fire service agencies, and governments at all levels in more than 20 countries.

After giving formal training to security and police personnel on improvised explosive devices, Securesearch recognized the need for reliable working models. In 1982, the first series of inert training models was made available to agencies wishing to conduct their own in-service instruction on this subject.

Securesearch has recently increased its product range to 200 different models of initiators and improvised explosives. The latter include blasting caps, fuses, detonating cords, dynamite, water-gels, boosters, plastic explosives, sheet explosives, and simulated deteriorated explosives. All items are inert and non-hazardous, but provide for realistic instruction in the recognition of hazardous materials.

Securesearch does contract testing of vehicle armour, body armour and bullet-resistant glazing materials. It is the only non-governmental agency in Canada with test facilities, with computerized ballistic chronograph and with personnel licensed for destructive testing using restricted weapons.

A complete line of security and law enforcement publications is also carried for sale to professionals in the field.



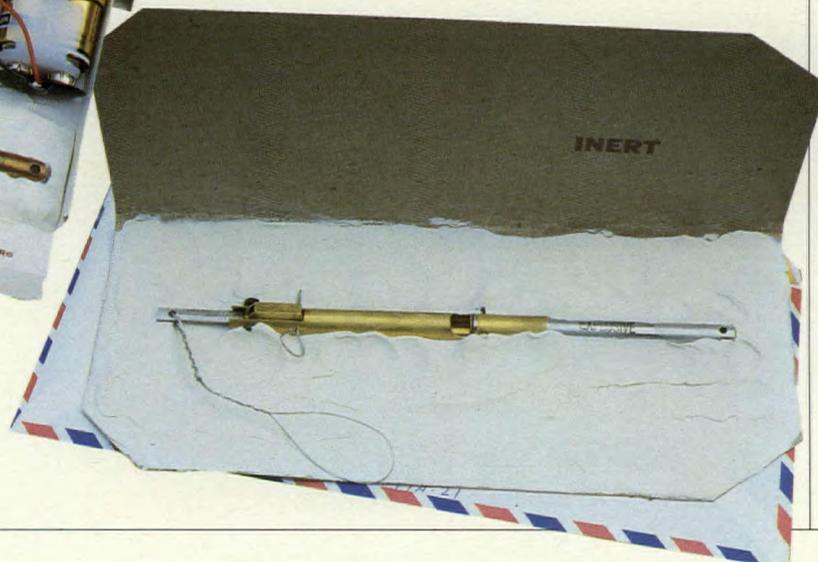
Ninety-minute bomb threat training package in slide-tape and videocassette format.



Model booby-trap initiator hidden in explosive charge.



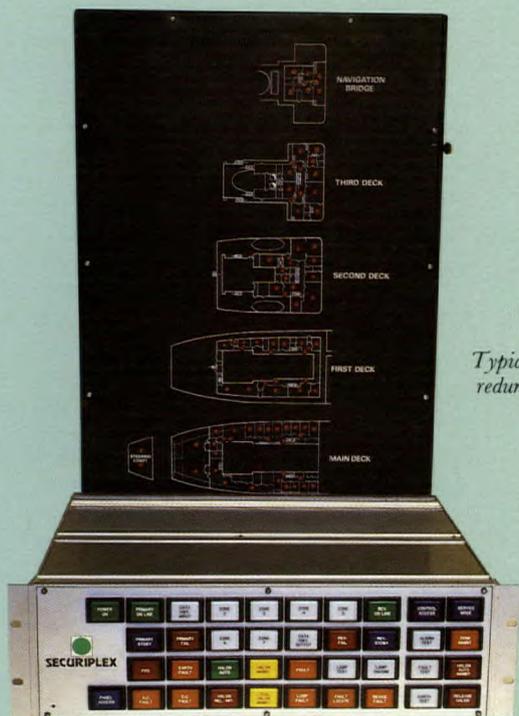
"Small but deadly" model of cigarette package bomb with five arming and firing devices.



Model of mechanically initiated letter bomb.

Securiplex Systems Inc.

210 Brunswick Boulevard
 Pointe-Claire, Quebec,
 CANADA
 H9R 1A6
 Tel: (514) 697-8002
 Telex: 05-821854



Typical mimic and dual redundant loop controller.

Securiplex Systems, a wholly-owned subsidiary of the SNC Group, manufactures advanced microprocessor-based fire detection, control and status systems primarily for the naval and marine markets. Securiplex also produces a full range of fire-suppression systems each of which is integrated with electronics to create an effective package for damage control.

Securiplex is the developer and sole manufacturer of Fire-Scope* status and control systems for ships. An all-digital microprocessor-based system, Fire-Scope* uses a unique technology to power, transmit, control and receive status information over a single four-conductor multi-

plexing loop from a large number of sensors distributed in a wide variety of locations onboard ship. Status and control information in analog or digital format is displayed on an interactive custom-designed graphic representation of the decks of the vessel. The loop wiring arrangement of the cable makes it possible to realize substantial savings in weight and installation costs, and to achieve increased operational reliability.

The Fire-Scope's* unique configuration renders the system immune to all ship's power failure conditions, including shorted or broken cables. It will continue to function in spite of such failures while it self-diagnoses the location of the trouble.

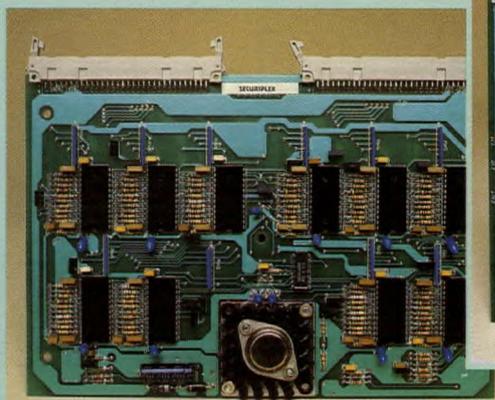
The Fire-Scope* systems engineered for the Canadian Patrol Frigate Program are configured to provide additional mimic displays to other parts of the vessel via multiplexed lines. Other features are power line short protection and dual redundant (primary — reversionary) computers installed at widely separated points on the vessel.

Securiplex Systems also supplies damage control systems for the new frigates using this innovative technology. They provide control and status for liquid level management, firemain, HVAC, and fire detection and suppression, capability that includes Halon 1301, water, foam and twin agent. An interface to the machinery control system is provided.

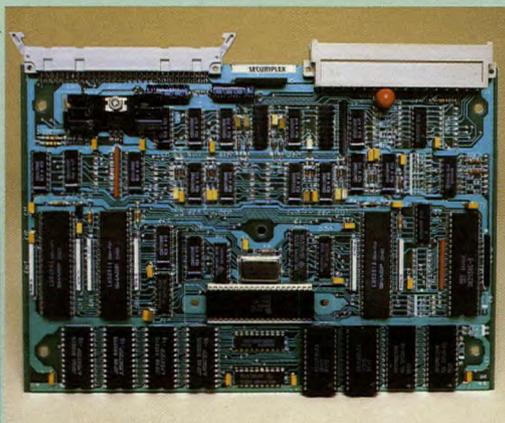
Securiplex products are reliable, economical and easy to maintain. Custom engineered systems for any application are available.

*Registered trademark of Securiplex Systems Inc.

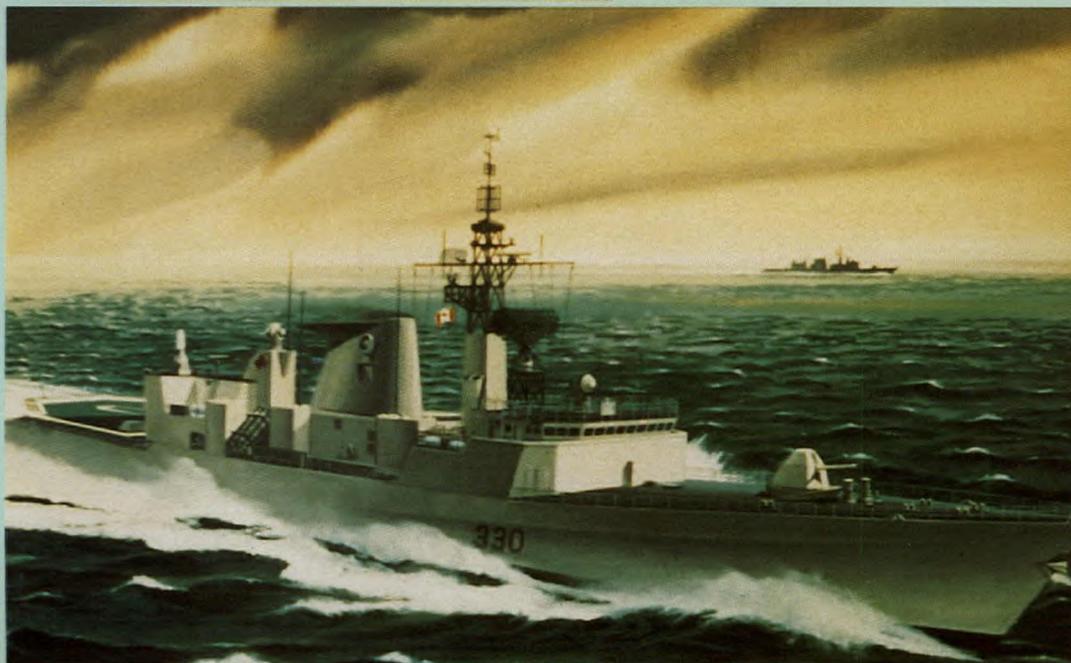
Artist's rendition — Canadian patrol frigate.



▲ Microprocessor circuit board.

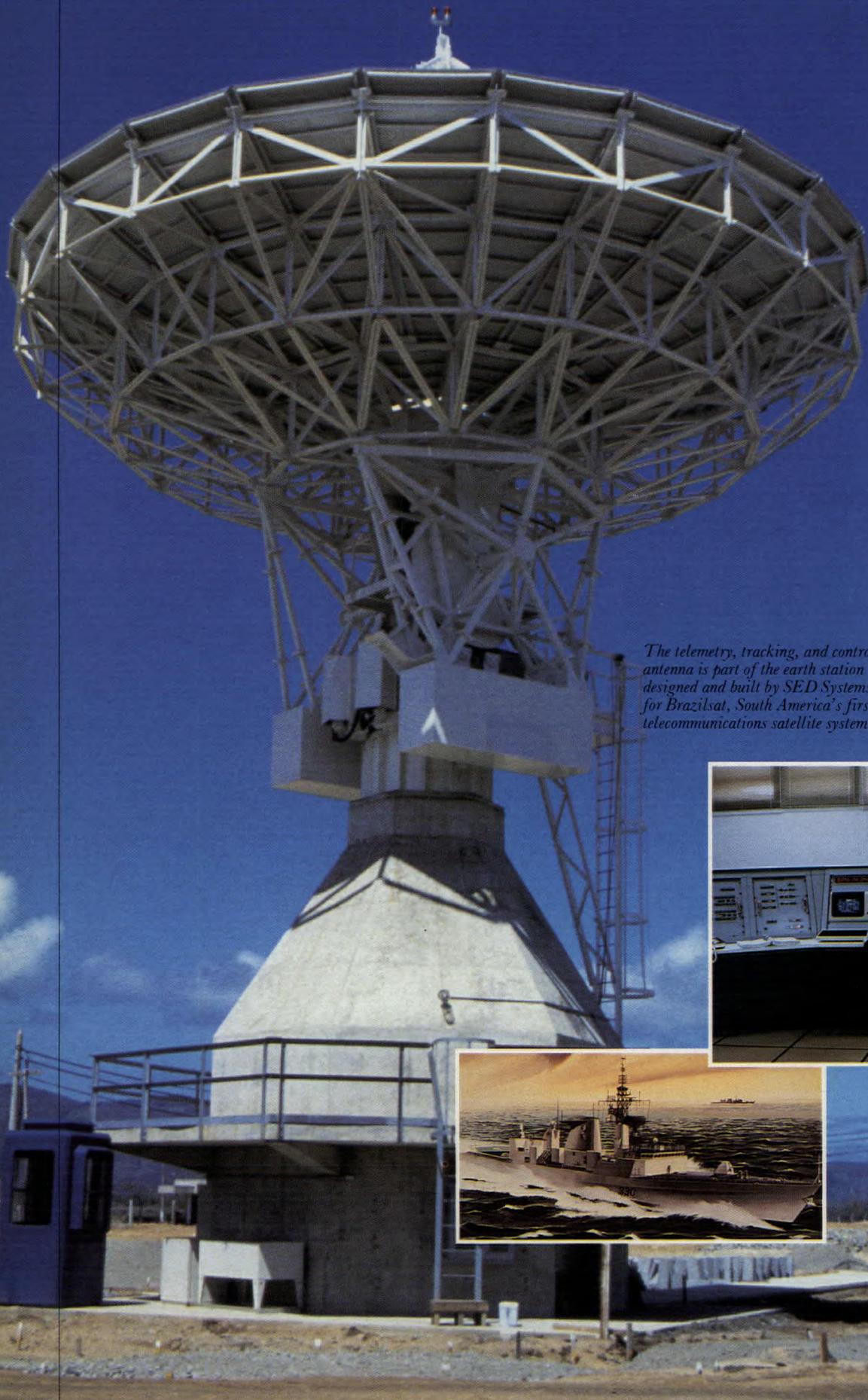


◀ Fifty-point display driver circuit board.



SED Systems Inc.

P.O. Box 1464
Saskatoon, Saskatchewan,
CANADA
S7K 3P7
Tel: (306) 244-0976
Telex: 074-2495
FAX: (306) 934-0405



The telemetry, tracking, and control antenna is part of the earth station designed and built by SED Systems for Brazilsat, South America's first telecommunications satellite system.

SED Systems has acquired an international reputation for engineering achievement in providing products and project services in the defence, space and communication markets.

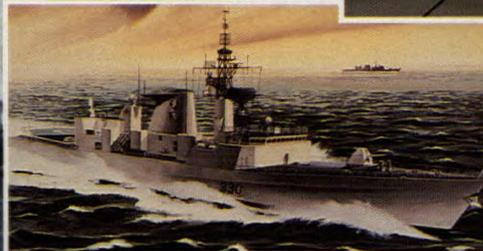
SED Systems offers communications systems analysis and design; custom and off-the-shelf communications earth station systems and products; satellite telemetry, tracking and command systems and earth stations; automated test systems; and custom software and hardware systems.

The company has played a major role in such projects as the joint surveillance system (JSS), search and rescue satellite (SARSAT), Canadian patrol frigate (CPF), Anik A, B, C and D, satellite business systems (SBS), and Landsat.

Among the company's key customers are Hughes Aircraft, Paramax Electronics (Sperry), Telesat Canada, Spar Aerospace, Raytheon, INMARSAT, the Canadian Department of National Defence and others.



A team of Brazilian technicians and engineers monitor the SED-built console.



Canada's new patrol frigates will be supplied with communications and meteorological systems designed and built by SED Systems, Saskatoon.

Sellick Equipment Limited

358 Erie Street North
Harrow, Ontario, CANADA
N0R 1G0
Tel: (519) 738-2255
Telex: 064-77710

Sellick Equipment is one of the most innovative manufacturers of rough terrain forklifts and attachments in the industry. Founded in 1968, the company has grown by providing users with quality machinery and ensuring the availability of parts and service for total product support.

The Sellick-originated forklift design evolved from the tractor turn-around series to become an integral one piece frame concept. A standard Ford tractor power train is used as the basic power module for most models. The rugged construction and breadth of line (1 300 to 7 250 kg (3 000 to 16 000 pounds)), 2 and 4-wheel drive of the Sellick straight mast rough terrain forklifts have captured increasing sales through the early 1980s.

The Sellick Teleporter telescopic boom material handling machines have virtually taken over the construction site placement market. Available models have capacities of 2 270 kg and 2 720 kg

(5 000 pounds and 6 000 pounds) and boom heights of 6.7 metres and 9.1 metres (22 feet and 30 feet). The larger MAXI-REACH with capacity of 3 630 kg (8 000 pounds) and height of 10.4 metres (34 feet) complements the Teleporter line.

Sellick also manufactures lift trucks sold and serviced by all ten Caterpillar lift truck dealers in Canada and 55 dealers in the United States

and overseas. There are over 1 500 lift trucks in the field under the Sellick nameplate. The company also builds private-branded machines for such prestigious firms as John Deere, International Harvester and Taylor Machine Works.

Sellick Equipment was recently awarded a \$5.5-million Government of Canada contract to supply a total of 124 aircraft tow tractors to the

Canadian Armed Forces and the Turkish Air Force. With a drawbar pull of 3 630 kg (8 000 pounds), these 4-wheel drive tow vehicles are capable of handling the 22 680-kg (50 000-pound) CF-18A with ease in all climatic extremes and ground conditions. The tow tractors have the capacity to tow up to 7 380-kg (175 000-pound) aircraft in most commercial applications.

*Military towable forklift
— 4-wheel drive.*



Aircraft tow tractor — 4-wheel drive.

Senstar Corporation

Box 13430
 Kanata, Ontario, CANADA
 K2K 1X5
 Tel: (613) 839-5572
 Telex: 053-3840
 FAX: (613) 839-5572

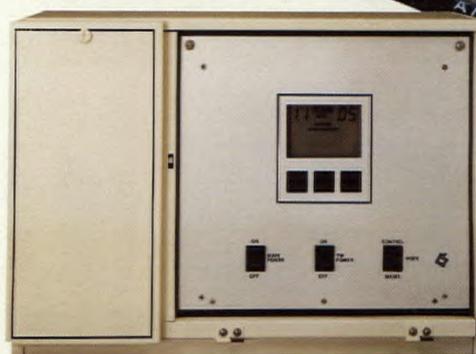
Senstar Corporation is a Canadian-owned company specializing in the design and manufacture of SENTRAX perimeter intrusion detection security systems.

SENTRAX is a modular, covert, perimeter intrusion detection system designed to address the complete security requirements of any perimeter. The system combines a high probability of detection with a low false and nuisance alarm rate under a wide range of environmental conditions. An invisible electromagnetic field, immune to seismic, acoustic and/or magnetic effects, is generated by SENTRAX both above and below the ground. High reliability is achieved through rugged design and the innovative use of electronic circuitry, advanced single-chip microprocessors and unique digital processing algorithms.

SENTRAX ported coaxial cable.



SENTRAX consists of several transceiver modules (TM), cable sets (CS), a control module (CM), a printer (PR) and an operator terminal (OT). A TM and one or two CS zones can stand alone or be cascaded to form a perimeter security system of any size. The CM distributes power, collects data from each TM/CS sensor and sends these to the operator terminal using both time and frequency domain multiplexing. A colour graphic video map at the OT dis-



(CM) Control module.

plays all necessary information to rapidly identify any perimeter penetration, and to guide the operator's response to an alarm.

SENTRAX is an ideal stand-alone exterior system and is also well suited for security applications where sensors based on other physical phenomena (such as microwave or fence disturbance sensors) are employed. The system has been designed to distribute power to, and collect

and display data from other perimeter security sensors. Each TM has ports for several input and output signals, and the OT can be used for control and display of perimeter and/or interior sensors. An interface unit is available to provide up to 256 input and/or output relay closures. The system, compatible with a wide variety of burial media and environments, is highly adaptable to the most difficult conditions, such as uneven



(TM) transceiver module and pedestal.



SENTRAX protected site.

Senstar Corporation



SENTRAX console display and control.

terrain, soil variations and irregular perimeter configurations. SENTRAX is undetectable when installed.

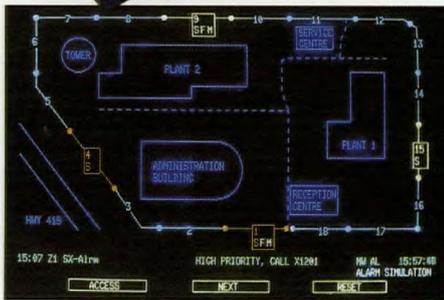
SENSTAR Display and Control Systems

Senstar Corporation has developed a range of products that can be integrated to form large, medium and small single site security systems. Monitoring and control of complex internal and external security subsystems take place from a central console by one operator.

Surveillance, assessment and communication activities are all performed at a custom-configured console designed for maximum operator efficiency. Simple operator interfaces, such as full-colour, touch-sensitive, text and graphic displays or "soft-keys" ensure easy operation. Data logging, statistical report generation, video and audio recording capabilities may also be included.

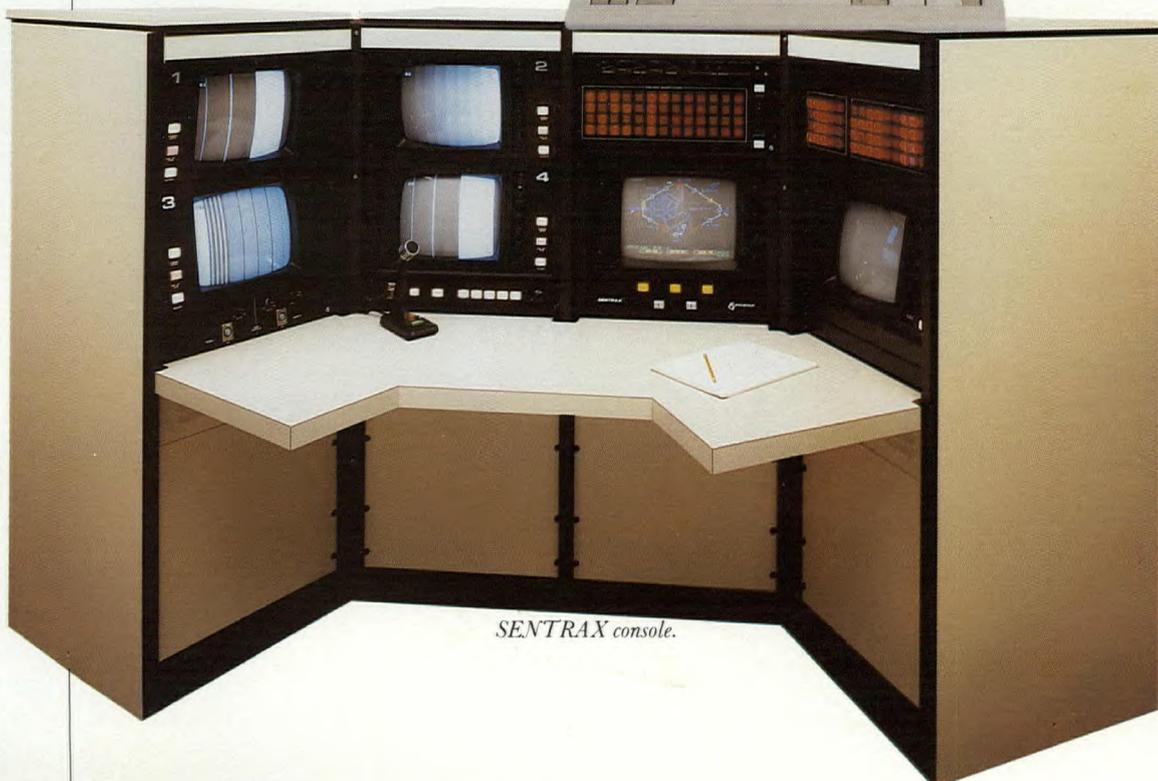
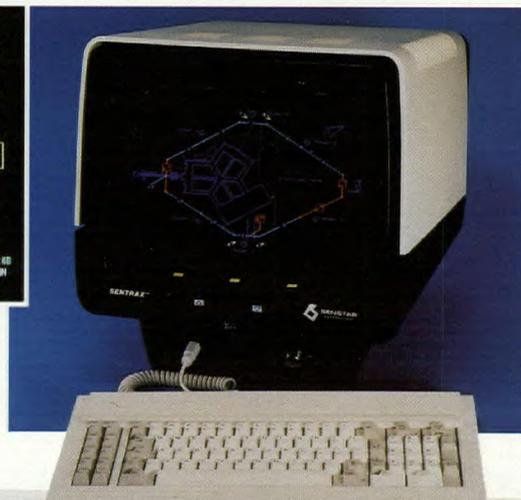
Sensor and control connections are implemented through serial interfaces. Transponder units may be located many miles from the central location and communication takes place over dedicated or dial-up telephone lines. Typical applications include the integration of perimeter intrusion detection systems, switched perimeter CCTV assessment systems, internal and external public address systems, radio communications equipment and internal building alarms, such as mechanical, fire, volumetric and fixed point. If required, the SENTRAX perimeter intrusion detection system may be incorporated directly into an integrated security system.

SENTRAX has been tested by many leading agencies and clients requiring a high level of security in North America, Europe, Britain, the Middle East and Australia. It has been proven to provide superior performance in a wide variety of operational sites under the most demanding requirements. Users include government facilities, penitentiaries, nuclear, commercial, industrial establishments, and private estates around the world.



Colour graphic map.

(OT) operator terminal with colour graphic display map.



SENTRAX console.

Sinclair Radio Laboratories Limited

85 Mary Street
Aurora, Ontario, CANADA
LAG 3G9
Tel: (416) 727-0165
Telex: 06-218782
(SINCLABS AUR)

Sinclair Radio Laboratories has an impressive 30-year record of innovation and expertise in the development and manufacture of radio

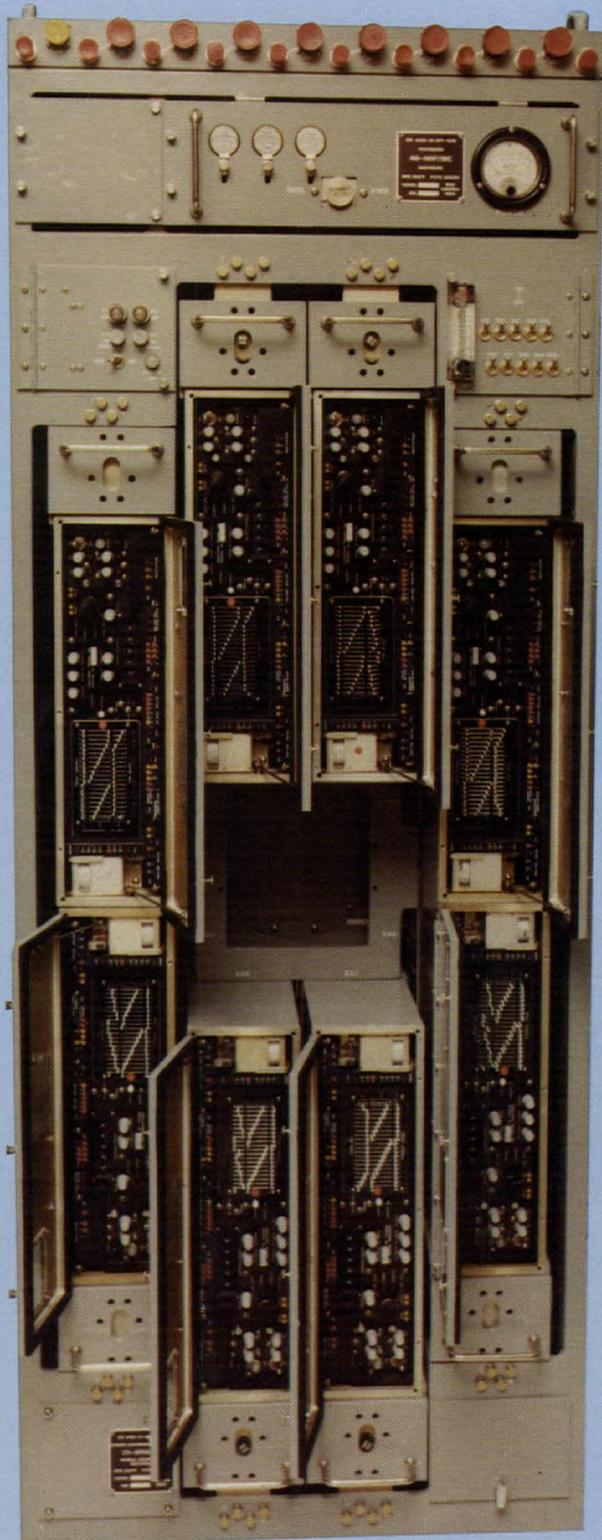
communications equipment for industry and government. Sinclair products — base station and mobile antennae, filters, duplexers, combiners,

isolators, circulators, and multicouplers — are in service throughout the world in military and civilian applications, and in virtually every environment from the Arctic to the tropics. (There are Sinclair antennae at both poles!)

In the provisioning of military communications equipment, Sinclair has established a proven track record for the dependable performance of its products. For example, the OE-5012 (V)/SRC auto-tuned eight-channel UHF multicoupler provides the Canadian navy with unmatched capability to operate simultaneously eight transceivers into a single broadband antenna. The 225-400 MHz transmitter multicoupler, illustrated here, has a 20 preset channel capability; other versions provide 7 000-channel remote operation using either serial or parallel interfaces. This equipment is currently in production for the Canadian Patrol Frigate (CPF) Program.

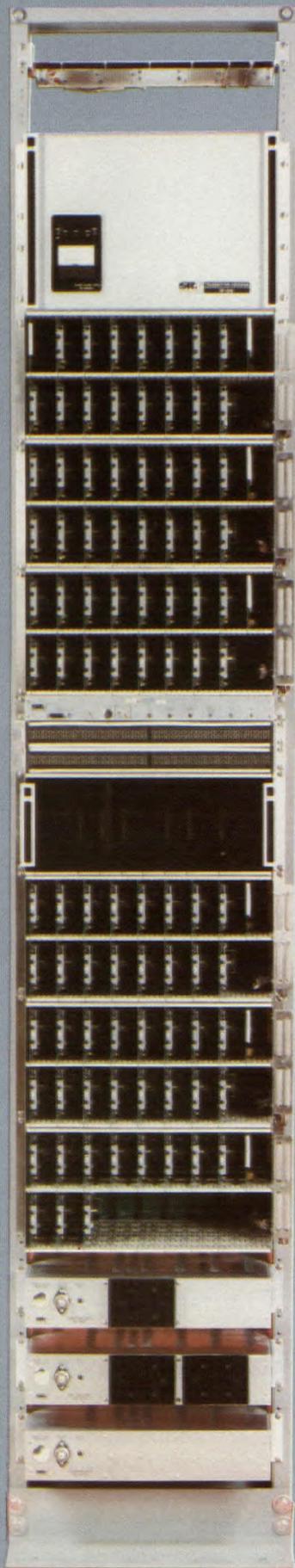
Similarly the Canadian navy, the Royal Navy and Royal Netherlands Navy have all selected Sinclair's SRL246-2 antenna because of its reliability and excellent performance.

The Sinclair ultra high frequency (UHF) multicoupler capable of simultaneous operation of eight transceivers into a single broadband antenna.



SR Telecom Inc.

8150 Trans-Canada Highway
St. Laurent, Quebec, CANADA
H4S 1M5
Tel: (514) 335-1210
Telex: 05-824919



SR Telecom, a wholly Canadian-owned company based in Montreal, produces the unique SR100 point-to-multipoint radio system that provides a new alternative to installing cable to meet permanent or temporary voice and data distribution requirements. The system is ideally suited for communications on weapons ranges and from field exercise areas to administrative base facilities.

Remote terminals (outstations) can be redeployed easily at minimum cost. They are housed in rugged enclosures, require less than 50 watts at 12 V DC or 110 V AC, and have an operating temperature range of +55 to -30°C (+45 to -55°C for the arctic option).

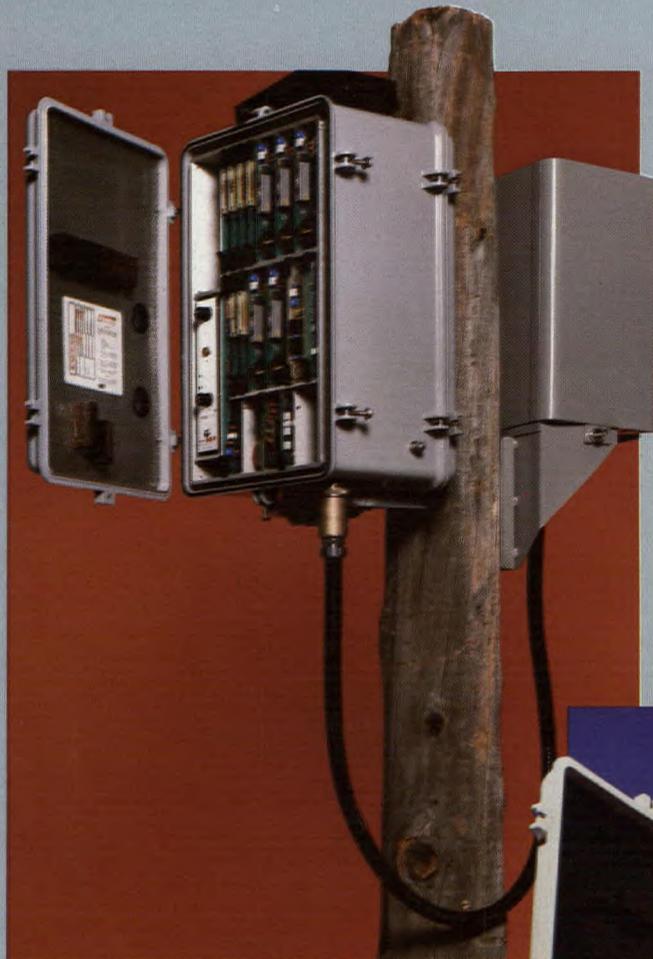
The SR100 system uses time division multiplexing to derive 15 traffic-carrying trunks on a single RF channel.

Trunks may be dedicated for 100-per-cent availability to 15 users, or demand assigned to a maximum of 94 users. A mix of dedicated and demand trunks can be accommodated.

The pulse width modulated time division signal provides an inherent high degree of security. End-to-end encryption can be provided.

The normal system range of an approximately 40-km (25-mile) radius can be extended through synchronous repeaters to 600 km (370 miles).

The SR100 is available in the 1.5, 1.8 and 2.4 GHz bands. Over 250 systems with more than 2 000 outstations are in service around the world in climatic conditions ranging from the Arctic to central Africa. Measured mean time between failures (MTBF) for outstations exceeds 14 years.

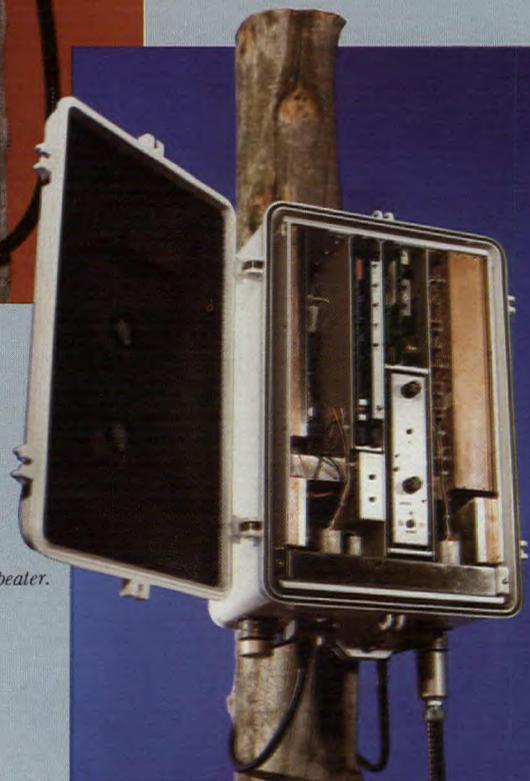


SR100 outstation cabinet.

SR100 central station.

SR100 outstation repeater.

The SR Telecom radio system features a new concept in low density telephone service with defence applications.



Spar Aerospace Limited

Defence Marketing

6303 Airport Road, Suite 403
Mississauga, Ontario,
CANADA
L4V 1R8
Tel: (416) 678-9750
Telex: 069-68923

Spar Aerospace designs, develops, manufactures and services systems and products for space, defence, communications, aviation and tele-operator markets. The company employs more than 2 000 people, including about 600 engineers and technicians.

Defence Systems Division

This division develops and manufactures electro-optical products and electronic equipment, and provides comprehensive engineering and life cycle support for military systems.

Spar has achieved international recognition in the field of military electro-optics and, following more than 20 years of development, has undertaken the engineering development of three naval infrared search and target designation (IRSTD) systems, two for the United States Navy and one for the Canadian Department of National Defence.

An agreement with Honeywell Inc. (U.S.) to transfer development and production technology for MINIFLIR (forward looking infrared) systems to Spar has led to the

development of thermal imaging systems for aircraft and land-based applications.

Aviation Services Division

Spar repairs and overhauls aircraft and helicopter components and sells aviation products and accessories.

The company's large customer base in 25 countries includes military and commercial operators in Canada, the United States, Mexico, Central and South America, the Far East, Europe and Africa.



Spar produces transmissions for Sikorsky H-60 Black Hawk helicopters.

Gears and Transmissions Division

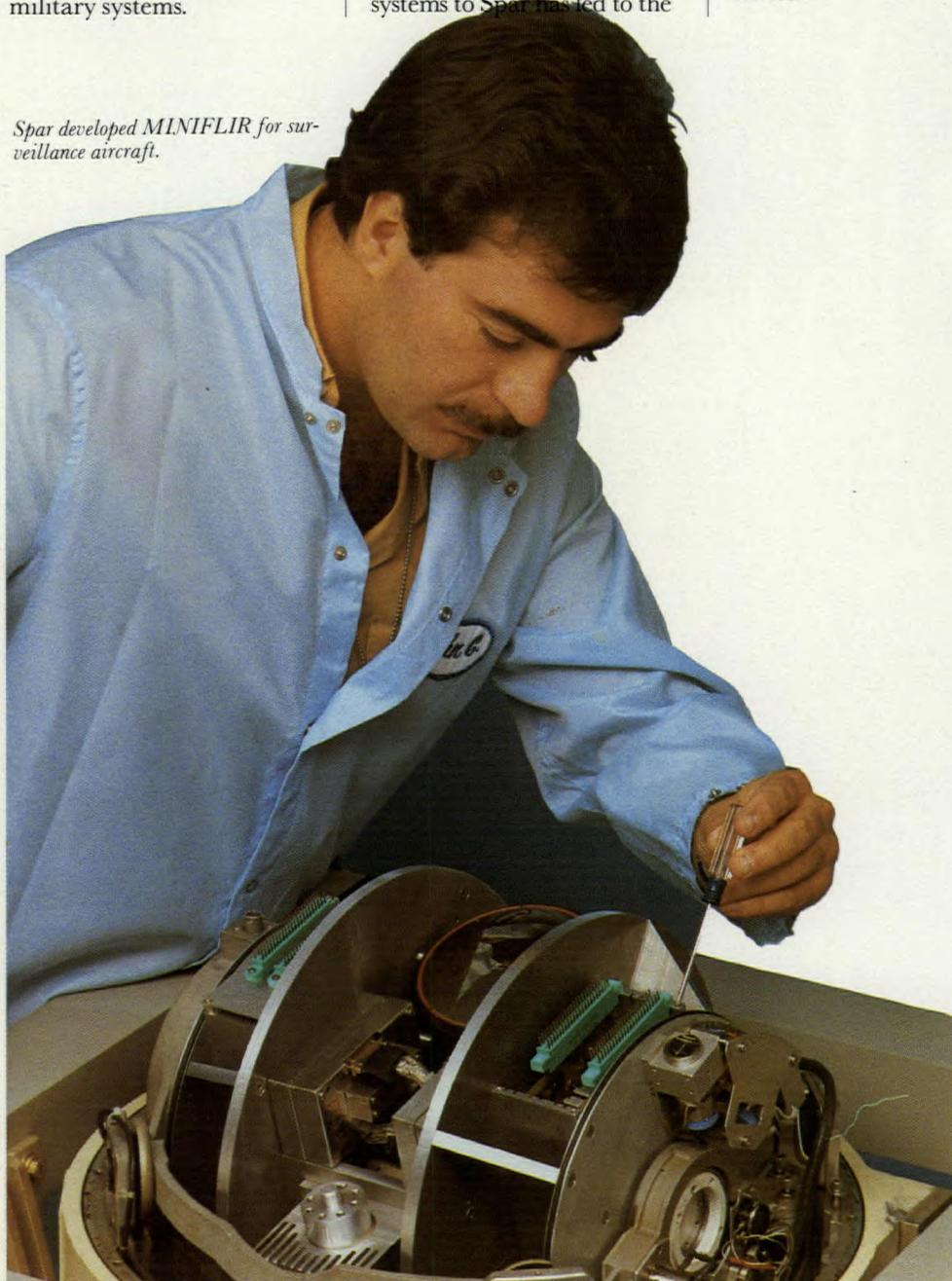
Spar is an industry leader in the production of high-precision aerospace gears and transmissions, in the manufacture and assembly of lightweight, high-speed, high-torque power transmission systems, and equipment for gas turbine engines for fixed and rotary wing aircraft.

Production includes helicopter transmissions for the Sikorsky H-60 Black Hawk, S-76, and Boeing Vertol CH-46 helicopters; turbine engine accessory gearboxes and components for the General Electric T700, C7, CFM56 and J85 engines; and various gears for Lycoming and Hispano Suiza (France).

Communications Systems Division

Spar has worked on more than 240 satellite earth station, subsystem and components projects for installations in more than 40 countries, including international gateway stations in 18 nations.

Spar developed MINIFLIR for surveillance aircraft.

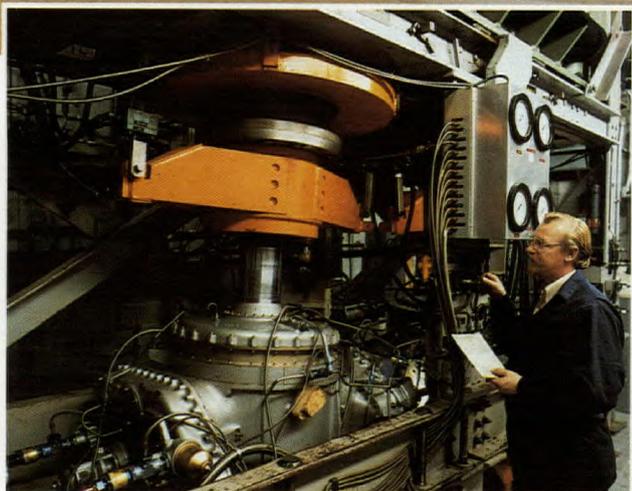


Spar Aerospace Limited

Satellite and Aerospace Systems Division

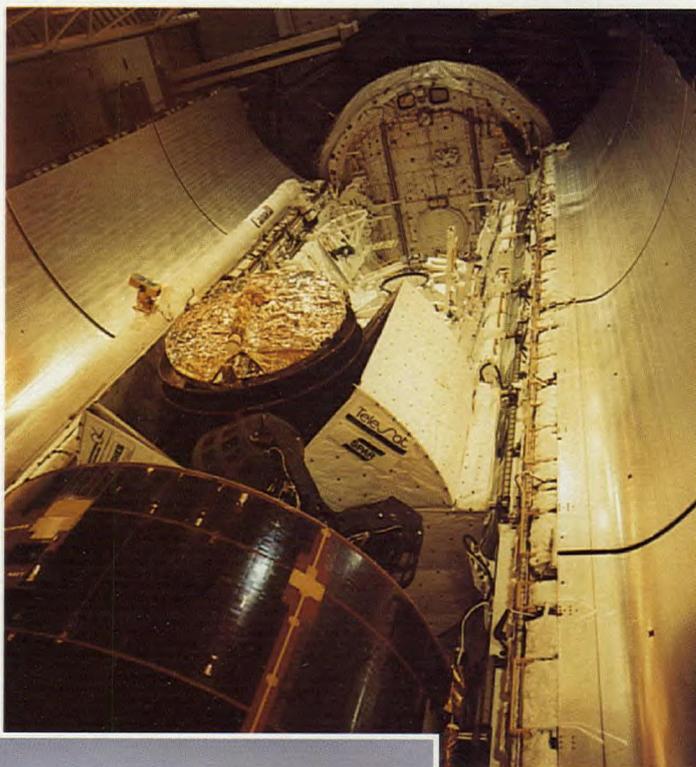
The company is the principal supplier in Canada, and a major international manufacturer, of satellites and satellite subsystems for communications and surveillance markets. The company's capabilities include design, systems engineering, management, integration and testing of satellites and satellite subsystems.

Surveillance technology, on earth and in space, is emerging as an important new market. In 1984, Spar received a contract to design and develop radar sensing technology for the new Canadian Radarsat satellite. This expertise will enable the company to develop commercial and scientific surveillance systems capable of detecting and monitoring natural resources, shipping movements and environmental data.



Sikorsky S-61 Sea King main transmission undergoing testing in a 2 500-HP cell.

The acquisition of Commercial Telecommunications Corporation (COMTEL) significantly broadened Spar's product line and strengthened its market presence. The company's 120MGB time division multiple access/digital speech interpolation (TDMA/DSI) equipment is designed to improve the efficiency of Intelsat gateway stations. In addition, Spar can now offer domestic TDMS systems from 1.5 to 60 MGBS from its COMTEL Division. Other products include a full range of digital and analog SCPC systems; SPARCOM, a line of low-cost business terminals; and SPARMARINE, a new class of stabilized earth stations for use on offshore oil rigs.



Spar built Anik 'D' satellite and "Canadarm" in Shuttle bay. (Nov. 84 launch)



SPARCOM terminal.

Sperry Inc.

Defence Products Group

85 Albert Street, Suite 1505
Ottawa, Ontario, CANADA
K1P 6A4
Tel: (613) 234-3321
Telex: 053-3665



Sperry has the most sophisticated manufacturing facilities for advanced software, hardware and other microelectronic products in western Canada, supported by expert systems engineering, product engineering, logistics and field engineering resources. Plant capacity has more than quadrupled within the last decade and employment has increased to over 500. In addition to its modern western plant, Sperry has a systems engineering operation in Montreal and maintains the company head office in Ottawa.

Sperry carries out custom work in advanced technology microelectronic systems from built-to-print assembly to full-scale development. Electrical and mechanical design groups, equipped with the latest computer-aided design tools, are available for the development of next generation products. Established diagnostic software, test engineering and associated support facilities ensure an easy transition to production stage.

Sperry has the recognized technological leadership and proven capability to develop software for defence programs. The company's experienced basic software analysis group supports system design and offers its particular expertise in ASW, EW, and navigation. Testing is enhanced by an extensive software simulation capability and a staff dedicated to carrying out testing procedures with stringent accuracy. Sperry's software quality assurance group, which satisfies MIL specification requirements, oversees and monitors the complete development process.

Sperry offers production diversity with both military and commercial manufacturing capabilities. The company has the product mandate for the production and support of the AN/UYK-502 micro-computer, the AN/UYC-501 SHINPADS®* (ship-board integrated processing and display system), serial data bus, and the VIPS (voice information processing station). The AN/UYC-501 and AN/UYK-502 are both key products manufactured for the Canadian Department of National Defence. VIPS is a telephone-based voice processing system capable of satisfying a wide variety of office messaging requirements.

Printed circuit card assembly and automated test, coil wound assembly, core memory assembly, product integration and final test are part of the company's manufacturing activities. Temperature chambers in the Sperry plant meet the complete range of military requirements and can test a total computer system. The manufacturing facility is qualified to DND Quality Assurance Specification 1015 and has Canadian Department of National Defence quality assurance representatives on site.

*SHINPADS® is a registered trademark of the Canadian Department of National Defence.

*Sperry product line.
AN/UYK-502, SHINPADS®/
serial data bus and voice information
processor.*

Sperry Inc.

Aerospace & Marine Group

P. O. Box 1300
Rockland, Ontario, CANADA
K0A 3A0
Tel: (613) 446-6011
Telex: 053-4806

The Aerospace & Marine Group of Sperry specializes in the design and manufacture of modular communications control systems, marine training simulators, time division multiplexers, gyro-stabilized horizon bars, temperature monitoring systems, aircraft navigation systems, environmental sensors and processing systems, and command and control systems to serve mili-

tary and civil requirements. The group maintains complete facilities for the repair and overhaul of gyros, aircraft instruments, service devices and related equipment.

The company also produces visibility measuring equipment, various cable assemblies, distortion analyzers and message test sets for telecommunications equipment and headsets.

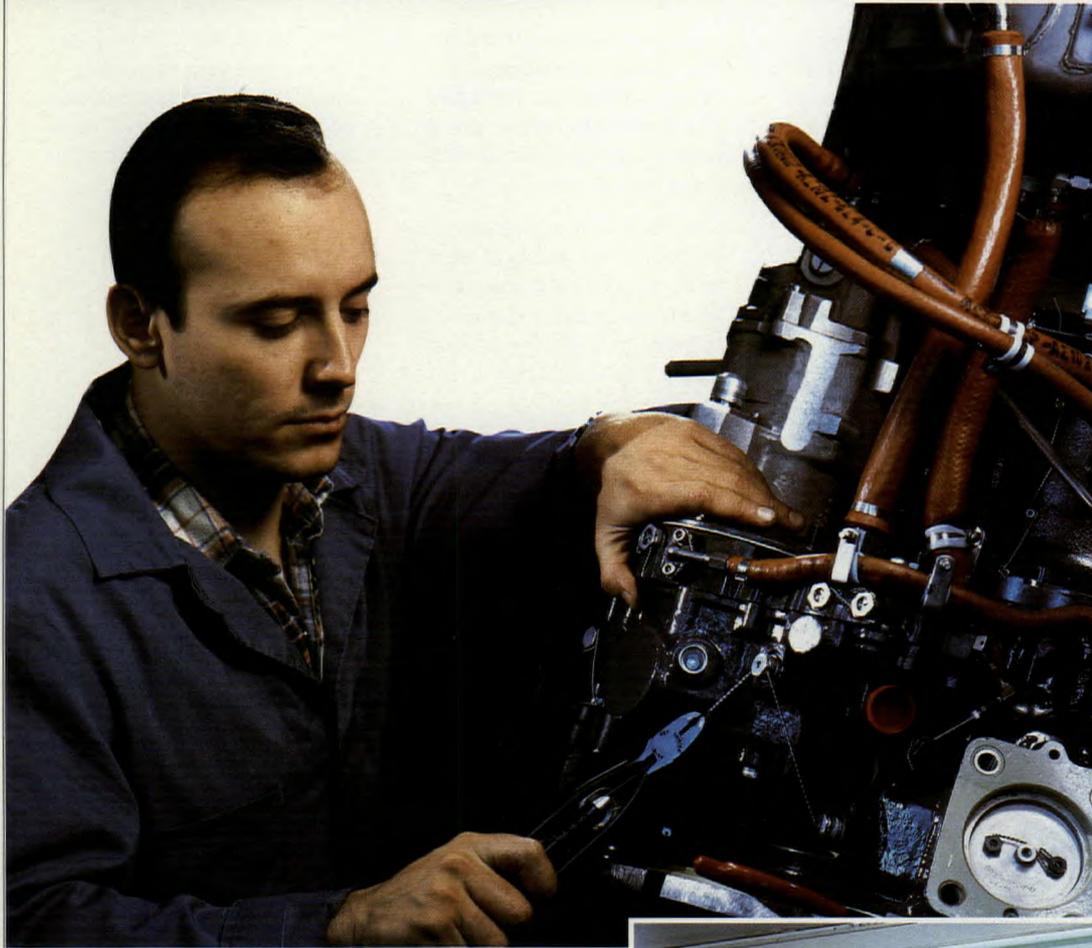
The Aerospace & Marine Group is a major supplier to the Canadian departments of National Defence, Transport, Environment, and to CN Telecommunications.

Sperry's manufacturing plant, Rockland, Ontario.



Standard Aero

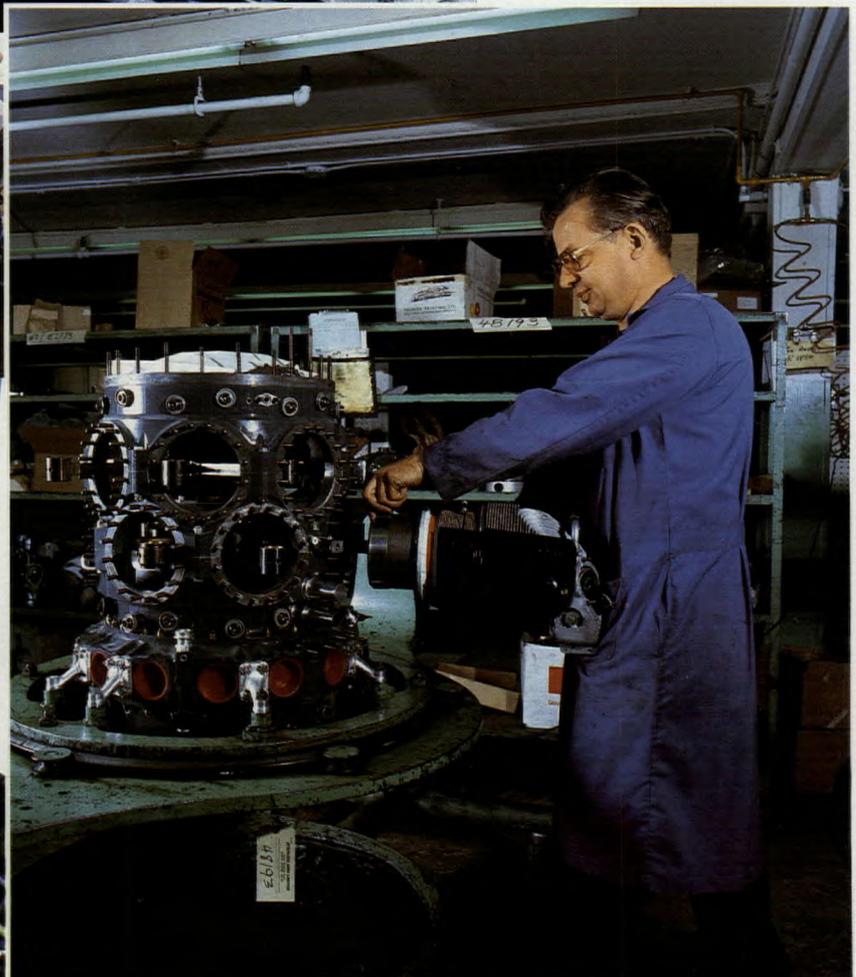
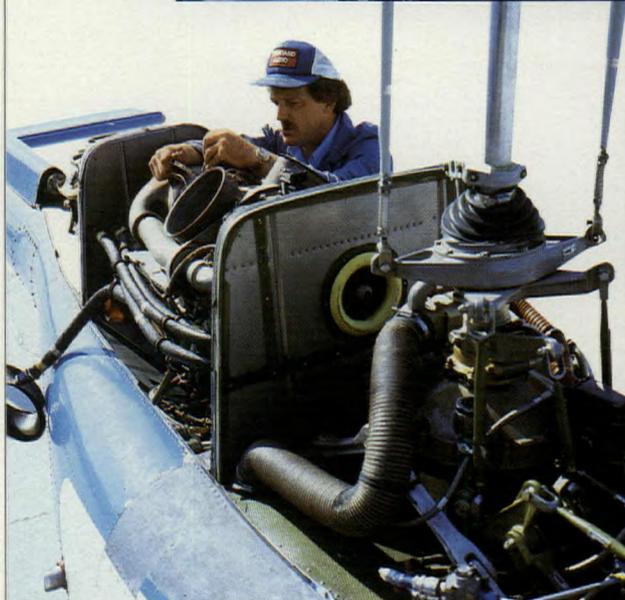
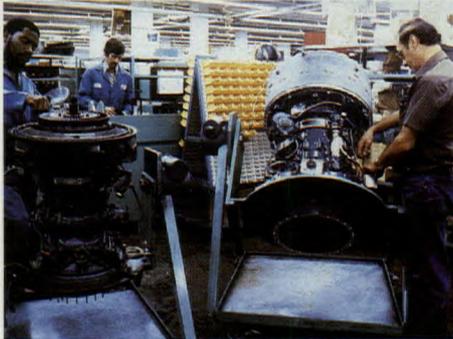
Winnipeg International Airport
Winnipeg, Manitoba,
CANADA
R3H 1A1
Tel: (204) 775-9711
Telex: 07-57878



Standard Aero is the largest aircraft engine overhaul facility and the largest distributor of aviation parts and products in Canada. The company, first formed in 1938 and privately owned, became a wholly-owned subsidiary of Federal Industries Ltd. in 1969.

The company overhauls an average of 500 piston engines each year, ranging from four and six-cylinder Continental and Lycoming engines to the Pratt & Whitney R985, R1340 and R1830. A large inventory of exchange engines is kept available for immediate shipment to customers.

Standard Aero entered the turbine engine field in 1960 with the overhaul of the Allison T56 engine in the Canadian Armed Forces C-130 Hercules aircraft. Since that time, Standard has expanded its turbine engine overhaul capabilities to include the



Standard Aero

Allison 501/T56 and 501K industrial engines, General Electric T58, Lycoming T53 and T55 series, AiResearch auxiliary power units, and Allison 250 series engines.

Recognized as a leader in turbine engine overhaul, Standard Aero's capabilities support the Canadian Armed Forces, and commercial and military operators throughout the world. New tooling and equipment continue to be added to existing capabilities in this ever-changing field of aviation.

In addition to engines, Standard Aero overhauls all related fuel, oil, pneumatic and electrical systems as well as a wide range of airframe components, such as wheels, brakes, actuators, valves, and hydraulic components. Most components are stocked for immediate delivery on an exchange basis.

Standard Aero maintains sales and warehouse facilities at the following nine locations: Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Ottawa, Montreal, Fredericton, and London, England.

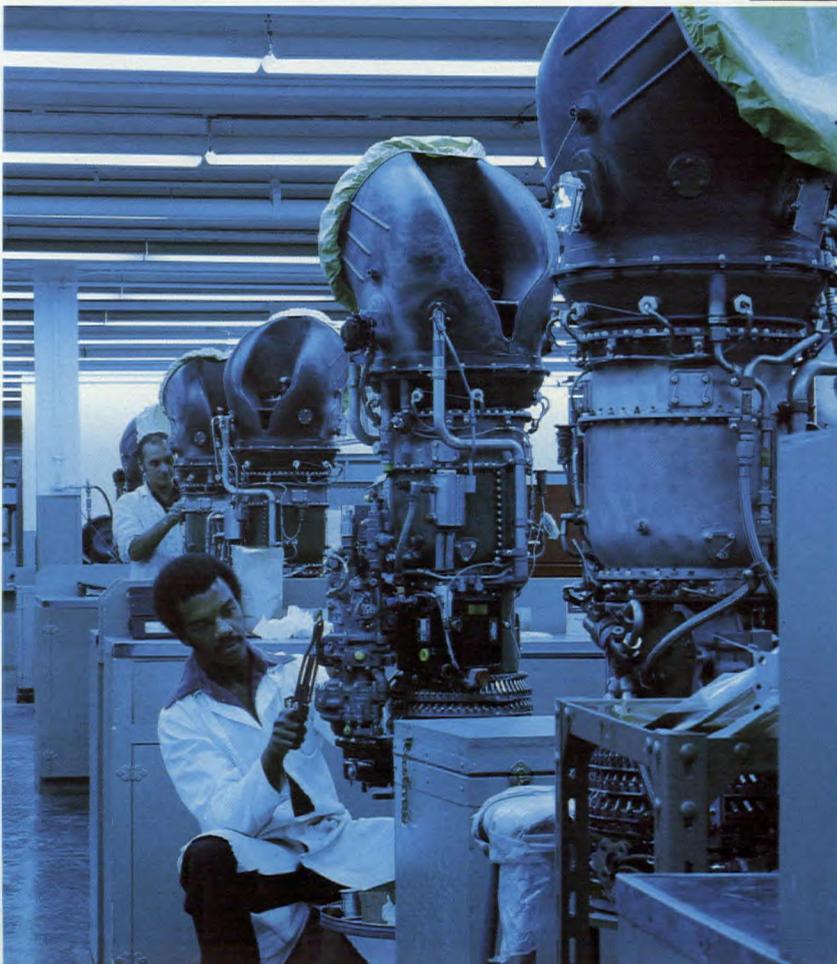
Inventory to support local airline, military and commercial operators is maintained at each branch with backup support from the central warehouse in Winnipeg.

Standard Aero maintains an extensive engineering and service department to provide in-plant technical assistance to all three overhaul divisions and to service customers. As an extension to the engineering and service activities, the engineering and service engineers who are specialists in the various types of engines assist customers in optimizing performance, carrying out scheduled maintenance or

trouble-shooting of engine problems wherever the customer, military or civilian, may be operating.

Field maintenance and trouble-shooting assistance

are provided to all Standard Aero customers. Turbine engine courses are offered at the Winnipeg facility, or at the customer's own location.



Supreme Industries Incorporated

3600 Danforth Avenue
Scarborough, Ontario,
CANADA
M1N 2E6
Tel: (416) 691-2141
Telex: 06-963659



Supreme Industries is a metal fabricating firm that specializes in deep drawing and heavy spinning of aluminum, stainless steel and coated steel products. Permanent mould aluminum castings are also produced from a state-of-the-art foundry.

Aluminum cook set, 5 to 10-man, #15994, consists of 4.7, 6.8 and 13.7-litre (3.5, 6 and 12-quart) pots with covers, coffee pot with cover, five dishes, two handles (covers may be used as fry pans).

Field cook set, #15996, contains 3-quart boiler and smaller snow melting pot. Lid serves as frypan — non-stick coated.

Aluminum pan set mess kit, #15995, contains large and small pots with folding handles (small pot fits inside large).



Presto for cooking, canning, sterilizing is offered in two sizes: 11 litre (10 quart) and 18 litre (16 quart).



Aluminum pressure cooker, #603 MCF, has 5.7-litre (5-quart) capacity, fixed pressure release valve. It is recommended for use with 5 to 10-man cook set.



WEAR-EVER, Canada's finest quality commercial cookware, is the result of constant research, testing and development.

Sprung Instant Structures Ltd.

1001-10th Avenue S.W.
 Calgary, Alberta, CANADA
 T2R 0B7
 Tel: (403) 245-3371
 (Toll free: 1-800-661-1163)
 Telex: 03-826590

Sprung Instant Structures manufactures and supplies a complete range of military shelters for operations in severe climates. These modular structures have proved successful in both polar re-

gions, equatorial jungles, and Middle Eastern desert. They have been used for barracks, mess halls, helicopter hangars, sealed field hospitals, and heavy armoured vehicle sheds.

All Sprung structures are transportable by air and are easy to erect and dismantle. They are designed to shed snow and to withstand high winds. Their all-aluminum frames and tough PVC fabric coverings provide a weight-to-shelter ratio of about 7.3 kg/m² (1.5 pounds per square foot).

There are virtually no limitations to length of structures; clear span shelters are available in 9.14, 12.19, 15.24, 18.29, 27, and 36.58-metre (30, 40, 50, 60, 88.6 and 120-foot) widths. One trained erector with an unskilled crew can assemble up to 180 square metres (2 000 square feet) in an eight-hour day. Comprehensive erector training and support are also available.

One of the largest suppliers of portable military shelters in the world, Sprung offers immediate delivery from over 90 000 square metres (one million square feet) of in-stock shelter. Within days, the company will fill custom orders for a variety of configurations.



Thought Technology Ltd.

2180 Belgrave Avenue
 Montreal, Quebec, CANADA
 H4A 2L8
 Tel: (800) 361-3651;
 (514) 489-8251
 Telex: 055-66458

Audio Heart Rate Monitor

The non-invasive heart rate monitor (AHR) from Thought Technology allows medical personnel to identify and evaluate the injured quickly and efficiently in life-threatening environments. The AHR, first conceived by the Canadian Defence Research Establishment and then developed by Thought Technology, can detect heart sounds through six layers of clothing including NBC garments. The system contains an LED monitor, displaying beat-to-beat heart rate, and headphones for audio monitoring. The microphone pick-up can also be used with a blood pressure cuff to monitor korotkoff sounds from the brachial artery.

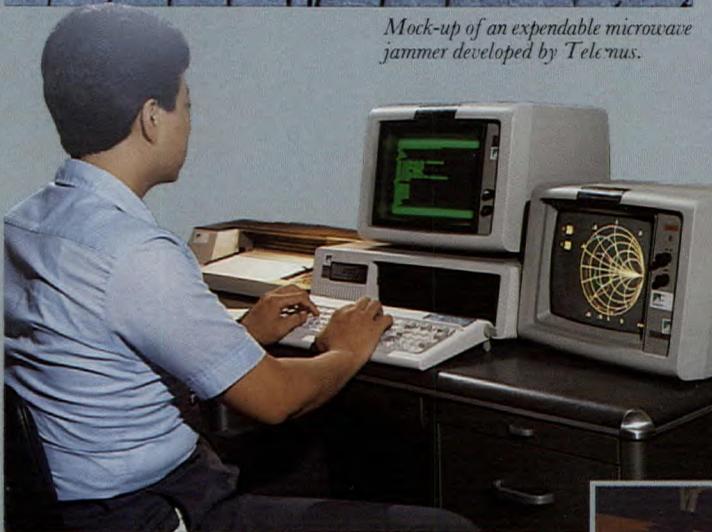
Measures heart rate through six layers of clothing to determine survival on the nuclear, biological chemical battlefield.

Telemus Electronic Systems, Inc.

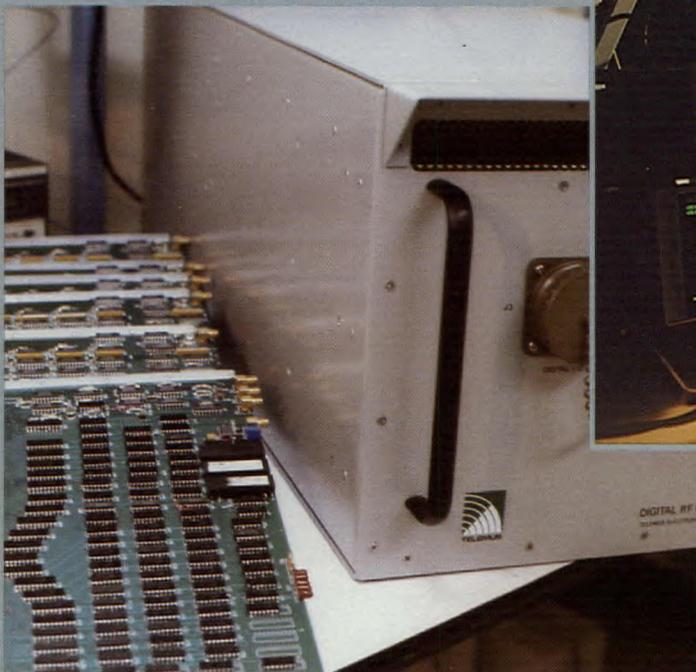
310 Moodie Drive
Nepean, Ontario, CANADA
K2K 8G3
Tel: (613) 726-1102
Telex: 053-4981



Mock-up of an expendable microwave jammer developed by Telemus.

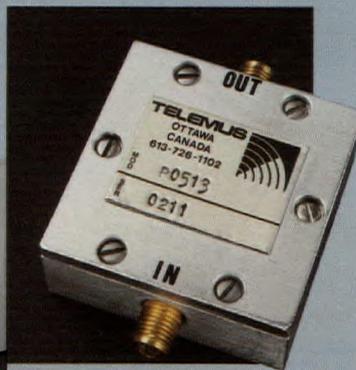


Computer-aided design system used to develop microwave subsystems (MIVCAD).



Telemus, a wholly-owned Canadian company, specializes in the development and manufacture of advanced electronic countermeasures (ECM), electronic support measures (ESM), and sophisticated microwave integrated circuit products (MIC).

As a new entry into the ECM market, Telemus has developed the world class "SMART" digital RF memory (DRFM). This system utilizes a built-in techniques generator to create masking pulses for subtle deception jamming.



The frequency Halver used for down-conversion of microwave signals in synthesizers or RF prescalers.

The SMART DRFM forms the basis of a coherent countermeasure system, presently under development.

Telemus has also been involved in the development of a receiver for fine-grain radar signature analysis for ESM applications and in the development of expendable jammer products.

A unique Telemus microwave MIC product, the frequency "Halver", permits the division of wideband RF signals up to 18 GHz without the drift problems associated with the heterodyning process. The Halver is used as a frequency down-converter in microwave counters, synthesizers and ECM systems.

Telemus brings an experienced and competent blend of engineering, manufacturing and business experience to the Canadian and world markets. The company welcomes dialogue with U.S. and European companies seeking a Canadian partner for participation in joint projects.



Engineering a low phase-noise 1-GHz synthesizer for use in the Telemus DRFM.

Telemus digital RF memory.

Tul Safety Equipment Ltd.

1432 Aberdeen Street
 Hawkesbury, Ontario, CANADA
 K6A 1K7
 Tel: (613) 632-1141
 Telex: 058-39598



Inflatable life raft, with double floor and double canopy for protection from arctic weather.

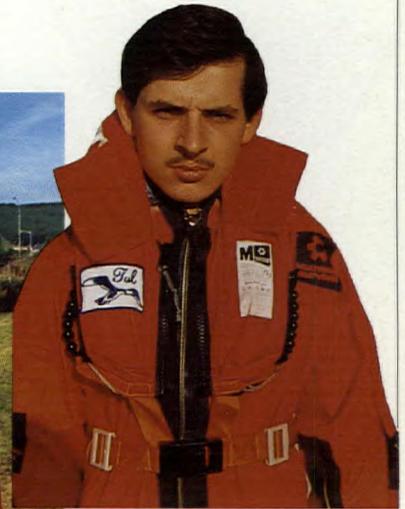


The Maltech mattress, a combination mattress, ground sheet and arctic sleeping bag.

Portable shelter, a commander's post tailored to armed forces vehicles.

Safety equipment manufactured to stringent specifications by Tul is used by the Canadian Armed Forces, Transport Canada, all Canadian air carriers, and most Canadian shipping and fishing fleets. A strong research and development program keeps Tul involved with NASA, the Canadian Armed Forces, and also with industry.

Tul has been approved by Transport Canada for the manufacture of inflatable life rafts and life jackets, and as a repair and overhaul resource. The company has also been approved as supplier to the Department of National Defence. Tul is qualified to service, repair and overhaul helicopter floats and to manufacture aircraft and automobile safety harness and tie-down gear.



Inflatable life preserver and exposure suit.



Tyton Seal

Division of Armet Ind. Corp.

285 Labrosse Avenue
 Pointe Claire, Quebec,
 CANADA
 H9R 1A3
 Tel: (514) 695-8910
 Telex: 05-821778



Tyton bulkhead seal type TR250.

Tyton Seal was founded in 1961 as a partnership with the Huhn Company, Sweden, to manufacture on the North American continent. In 1978, Tyton Seal acquired its own engineering and development capacity and established its independence and a distinct North American identity.

Tyton supplies ships' shaft seals for the following programs: U.S. Navy DD 963; U.S. Navy FFG-7; Canadian Coastguard-Icebreaker; R-Class, 1100 Class and 1200 Class; U.S. CCAE-Hopper Dredge; U.S. Navy-CG47 Destroyer; Canadian Forces-Patrol Frigates.



Tyton test rig for main propulsion shaft seals.

Tyton's products include the following seals:

- Stern tube seals, type TM661: a unique design, with all parts enclosed in the seal housing, that can accommodate shaft movement of up to 19 mm (0.75 inches) radial and 50 mm (2 inches) axial;
- Bulkhead seals, type TR250: automatically activated, independent of an auxiliary system, for maximal radial shaft dislocation of up to 45 mm (1.75 inches);
- Rudderstock seal, type TR 310: tandem seal arrangement, accommodates all shipboard conditions, and permits close monitoring of seal function.

Les Tricots Duval & Raymond Ltée

P.O. Box 310
 Princeville, Quebec, CANADA
 G0P 1E0
 Tel: (819) 364-2927;
 (819) 364-5139
 Telex: 05-838507



Du-Ray is an established name in quality hosiery, gloves and mitts. For nearly 50 years, Les Tricots Duval & Raymond Ltée has produced fine products under that familiar label.

The company specializes in a broad range of socks, including work socks, thermals, virgin wools, wool blends and sport socks. Special lines of gloves and mitts for outdoor workers provide excellent cold weather protection.

The Canadian Armed Forces have long been purchasers and wearers of Du-Ray products, joining the civilian customers who appreciate Du-Ray's quality and workmanship.

Varian Canada Microwave Division

45 River Drive
Georgetown, Ontario,
CANADA
L7G 2J4
Tel: (416) 877-0161
Telex: 069-7502
TWX: 610-492-2641

A world leader in high-technology millimetre-wave microwave products with a defence capability, Varian Canada has developed millimetre-wave extended interaction klystrons (both oscillators and amplifiers), for the frequency ranges from 18 to 280 GHz. These klystrons may be used in secure communications systems, radar modelling, fusion diagnostics, military radars, plasma heating, satellite communications and radio astronomy. A wide-band version of the extended interaction amplifier provides bandwidths to 5 per cent.

Varian-produced klystron high-power amplifiers are used in satellite ground stations or troposcatter systems. Available power levels of up to 10 kW and frequency bands from 2 to 14 GHz permit their use in a variety of world-wide applications.

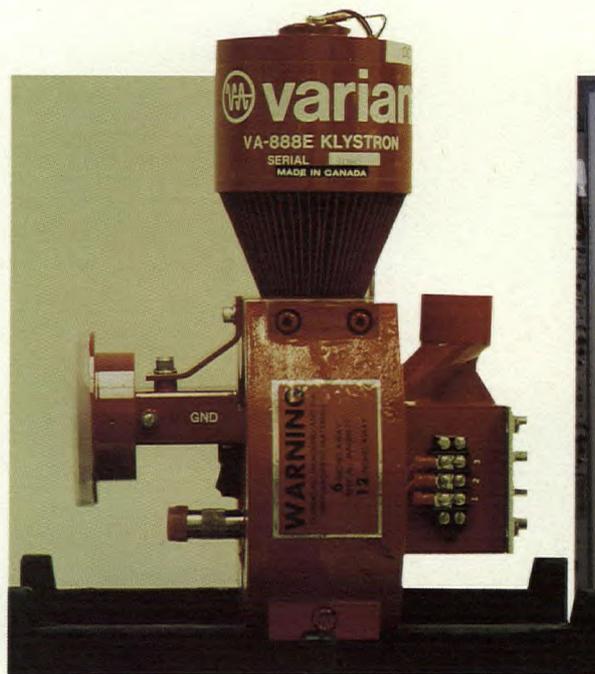
Specialist in high voltage and high power, Varian Canada designs and manufactures a wide range of industrial and military power supplies. Current capabilities range up to 210 kV and 100 kW.



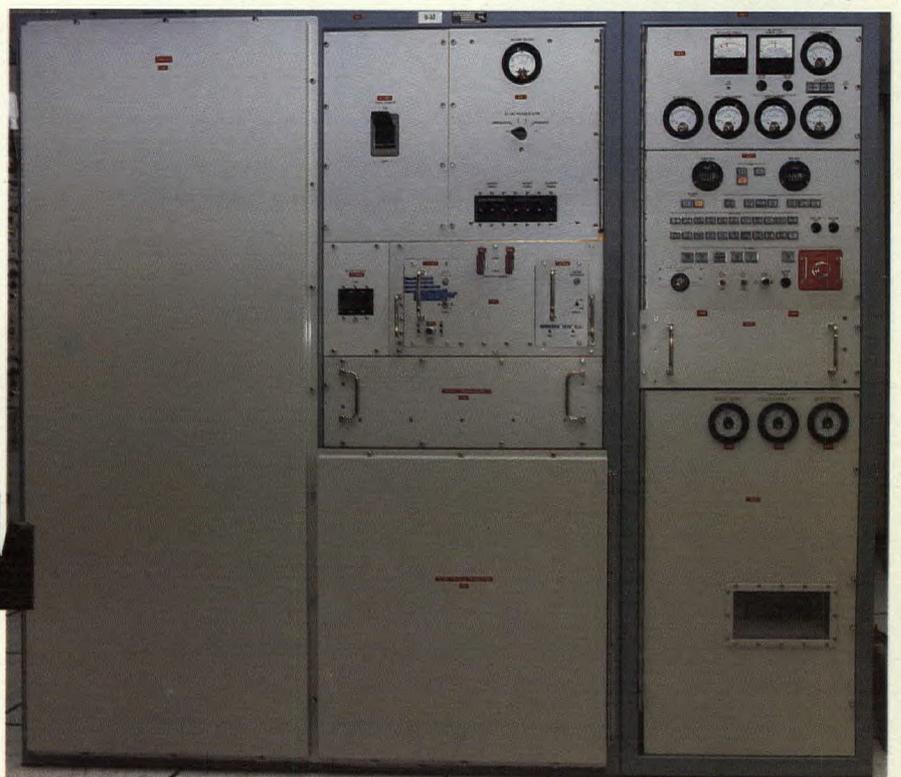
Extended interaction klystron.



Space qualified power supply/ amplifier.



Troposcatter communications power klystron.



Military high-power klystron amplifier.

Valcom Ltd.

P.O. Box 603
Guelph, Ontario, CANADA
N1H 6L3
Tel: (519) 824-3220
Telex: 069-56593

Valcom designs and manufactures MF, HF, and VHF electronic communication systems and meteorological instruments to serve both commercial and military needs.

The Valcom VACG-1kW antenna coupler system has a 1-kW power capability over a 2 to 30 MHz frequency range (128 bands) when employed with a 10.6-metre (35-foot) Valcom vertical antenna. This results in a V.S.W.R. <2:1 on all bands. Outstanding features of the system include remote electronic pretuning, tuning time of less than 15 msec and storage of the tuning data using an electrically erasable PROM. The unique memory unit is immune to power failure and can be unplugged and stored for 10 years without loss of data. The tuning parameters are easily changed from the control unit. The maximum allowable reflected power is programmable from 20 to 300 W. This system (OE-5006/SRC) is now in service with the Canadian navy.

Valcom is recognized as the world's leading manufacturer of high-quality MF, HF, and VHF fibreglass whip antennae. Valcom antennae operate in the 100-kHz to 30-MHz frequency range and are available in sizes ranging from the 10.6-metre (35-foot) AS-2537 C/SR whip that received MIL approval from the United States Navy to a 30-metre (85-foot) unit. The Valcom antennae have a patented integral base design that ensures mechanical strength and electrical stability during operation under the most severe conditions. Valcom's 1 and 10-kW couplers and coupler control units, when combined with the whip antennae, can be easily interfaced to various transmitters.

The United States Navy, U.S. Coast Guard, Spanish Navy and many commercial organizations specify Valcom's free-standing whip antennae for ground-to-air, ship-to-shore, and ship-to-ship applications. The company also supplies a wide range of custom-made antenna accessories to complement its line.



The Fibreglass Products Division of Valcom, established in 1964 to develop the whip antennae, also fabri-

cates other filament reinforced plastic products such as high-tension insulators, housings, shrouds, and extruded tubes.

Skilled staff in Valcom's fully equipped machine shop custom manufactures metal sub-assemblies and machined components for defence and commercial applications. With in-house quality assurance inspectors, the machining experts can meet stringent quality specifications in the production of a few assemblies or thousands of pieces.



Valcom's AS-2537 C 10.6-metre (35-foot) whip antenna, designed and built to U.S. Navy requirements for shipboard use.

One-kilowatt digitally-controlled coupler control 2-30 MHz.



Valcom Ltd.



Directional finding antenna (LF/MF) mounted on helicopter.

The company's success in producing high-quality sophisticated communications equipment demonstrates its competence and ability to custom design complex systems that will withstand the rigours of military use for many years.

Valcom established a repair and overhaul facility to refurbish equipment for the Canadian Department of

National Defence. With this added capability, Valcom offers a complete products/service package with design, production, refurbishment and warranty repair.

Digital line tester VDLT-1: The serial data line analyser/B.E.R.T. section can be used to receive any serial data of start/stop format, and display the type and amount of distortion that the waveform contains. It is also able to generate its own bit pattern, receive it, compare it, and display any errors found.



Ten-kilowatt coupler.



The Valcom 22.5-metre (74-foot) V33070 MF omni-directional antenna.

Versatile Davie Inc.

Member of the Marine and Industrial Group,
Versatile Corporation

P.O. Box 130
Lévis, Quebec, CANADA
G6V 6N7
Tel: (418) 837-5841
Telex: 051-2254
FAX: (418) 833-9492

Decades of shipbuilding in Canada during peace and war have created an international reputation for Versatile Davie Inc. (formerly Davie Shipbuilding Limited) in the construction of commercial and naval ships.

Dedicated to meeting Canadian naval defence and commercial needs, the Marine Division is active in shipbuilding, heavy steel fabrication and machining of ships up to 80 000 deadweight tons. It has built and repaired ships of all kinds: combat and landing vessels; troop carriers and tankers; transport, pas-

senger, cargo and fishing vessels; special purpose vessels such as tenders and tugs; barges and lighter, small craft; pontoons and floating docks, drydocks, dredges and icebreakers.

The general Engineering Division is responsible for industrial projects and military sub-contracts. Special-

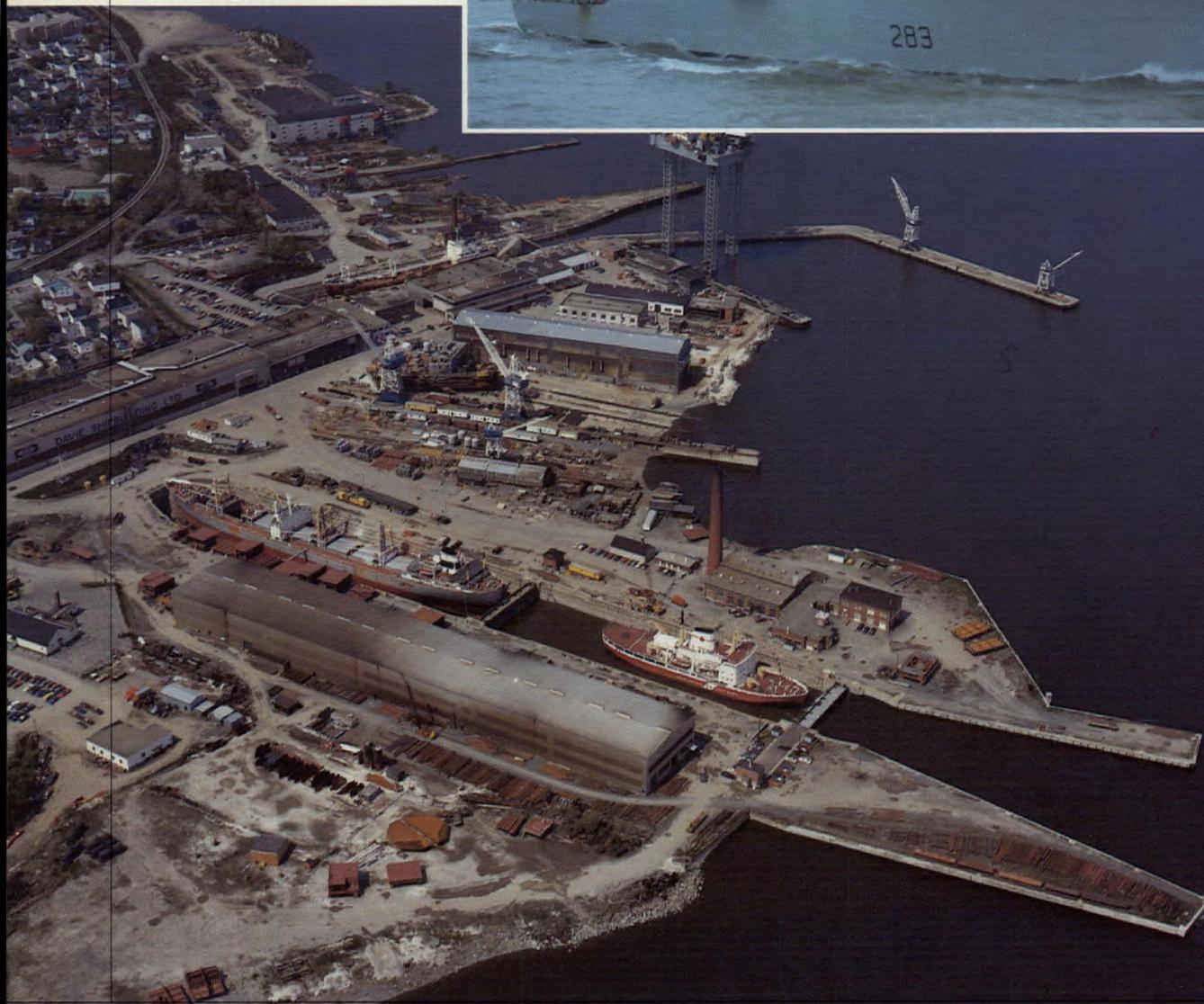
izing in custom-designed steel fabrication for the varied needs of heavy industry, the division produces marine propulsion equipment, booms and masts, hull items and steel buoys; tank cars and hopper cars for the rail transportation industry; components for nuclear reactors; large diameter pipes and

pipelines; metal containers such as storage tanks, tower structures, hydro-electric penstocks and gates, towers for petroleum fractioning; wind tunnels; and commercial and industrial gas cylinders.

H.M.C.S. Algonquin, (D.D.H. 280 Class), typical of naval vessels built and refitted at Versatile Davie Inc.



Aerial view of Versatile Davie Inc. (formerly Davie Shipbuilding Limited) at Lauzon, Quebec.



Versatile Pacific Shipyards Inc.

Member of the Marine and Industrial Group,
Versatile Corporation

P.O. Box 86099
North Vancouver, British Columbia,
CANADA
V7L 4J6
Tel: (604) 988-2111
Telex: 04-352652
FAX: (604) 988-2110

Versatile Pacific Shipyards (formerly Burrard Yarrows Corporation) is fully experienced in shipbuilding, ship repairs, general marine and industrial engineering for both naval and commercial purposes. The company operates from fully integrated facilities on the Canadian Pacific Coast in both Vancouver and Victoria, British Columbia.

Versatile Pacific Shipyards established its reputation and extensive experience in undertaking naval refit work, mainly for the Canadian navy. It has capabilities of building vessels up to 153 metres (505 feet) long and 28 metres (92 feet) wide, and of dry-docking and servicing vessels up to 230 metres (750 feet) long and 45 metres (149 feet) beam in the Vancouver

Division, and 358 metres (1 184 feet) long and 38.4 metres (127 feet) wide at the Esquimalt dock in the Victoria Division.

The Vancouver Division of Versatile Pacific Shipyards Inc. (formerly Burrard Yarrows Corporation).



Versatile Systems Engineering Inc.

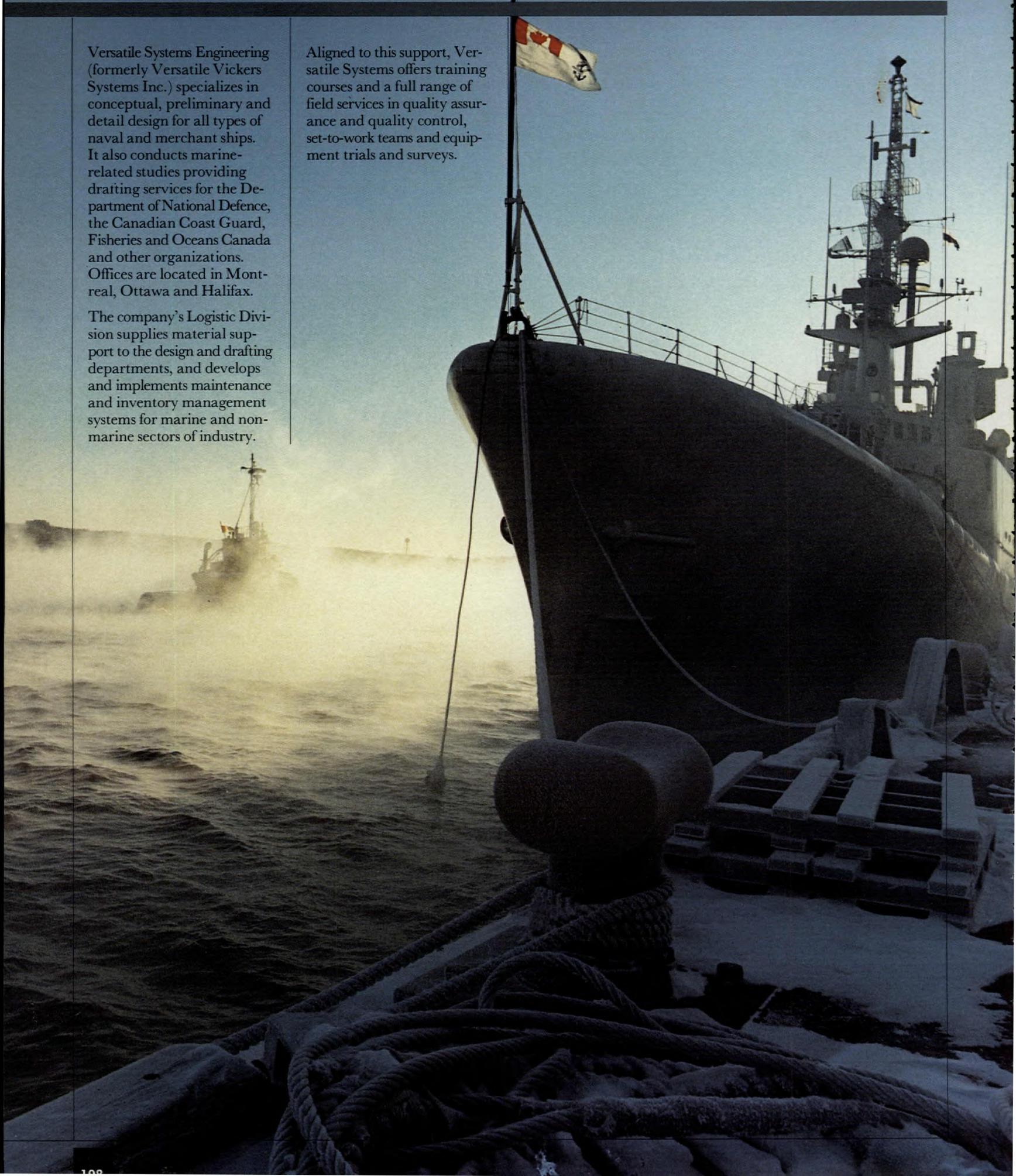
Member of the Marine and Industrial Group,
Versatile Corporation

Suite 700
1600 Carling Avenue
Ottawa, Ontario, CANADA
K1Z 7M6
Tel: (613) 722-2247
Telex: 05-34924
FAX: (613) 722-3505

Versatile Systems Engineering (formerly Versatile Vickers Systems Inc.) specializes in conceptual, preliminary and detail design for all types of naval and merchant ships. It also conducts marine-related studies providing drafting services for the Department of National Defence, the Canadian Coast Guard, Fisheries and Oceans Canada and other organizations. Offices are located in Montreal, Ottawa and Halifax.

The company's Logistic Division supplies material support to the design and drafting departments, and develops and implements maintenance and inventory management systems for marine and non-marine sectors of industry.

Aligned to this support, Versatile Systems offers training courses and a full range of field services in quality assurance and quality control, set-to-work teams and equipment trials and surveys.



Versatile Vickers Inc.

Member of the Marine and Industrial Group,
Versatile Corporation

5000 Notre-Dame Street East
Montreal, Quebec, CANADA
H1V 2B4

Tel: (514) 256-2651

Telex: 05-828735

FAX: (514) 354-4040

Established in Canada in 1911 as a shipbuilder and ship repair firm, primarily for the Canadian navy, Versatile Vickers now has two divisions to serve industrial and defence needs.

Versatile Vickers dry docks capable of handling all vessels that can traverse the St. Lawrence Seaway.

The Marine Division repairs both naval and commercial vessels, and is equipped with drydocks capable of handling all ships that can traverse the St. Lawrence Seaway. Some of its major defence customers are the navies of Canada and other NATO countries and major American shipbuilders under contract with the United States Navy.

The Industrial Division manufactures a wide diversity of highly sophisticated products for both defence and industrial purposes. This division is also highly committed to nuclear energy and produces, among others, CANDU reactor calandria assemblies and their ancillary equipment. Major clients are Atomic Energy of Canada and Ontario Hydro.



Victrix Limited

P. O. Box 1807
Guelph, Ontario, CANADA
N1H 7A1
Tel: (519) 836-1480
Telex: 069-56638

Victrix Limited, a Canadian-owned company, specializes in defence-related hardware in such diverse fields as electronics, telescopic masts, pyrotechnics and modular practice bombs.

Victrix telescopic masts incorporate the latest state-of-the-art technology and are recognized as among the best in the world. The company has also supplied the Canadian military with its

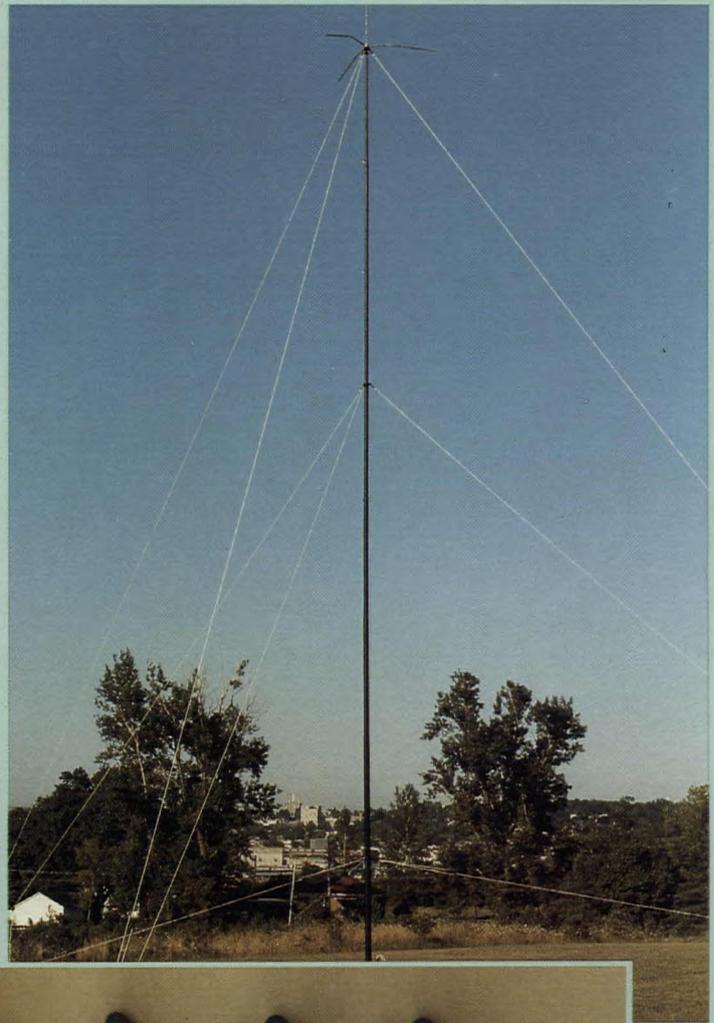
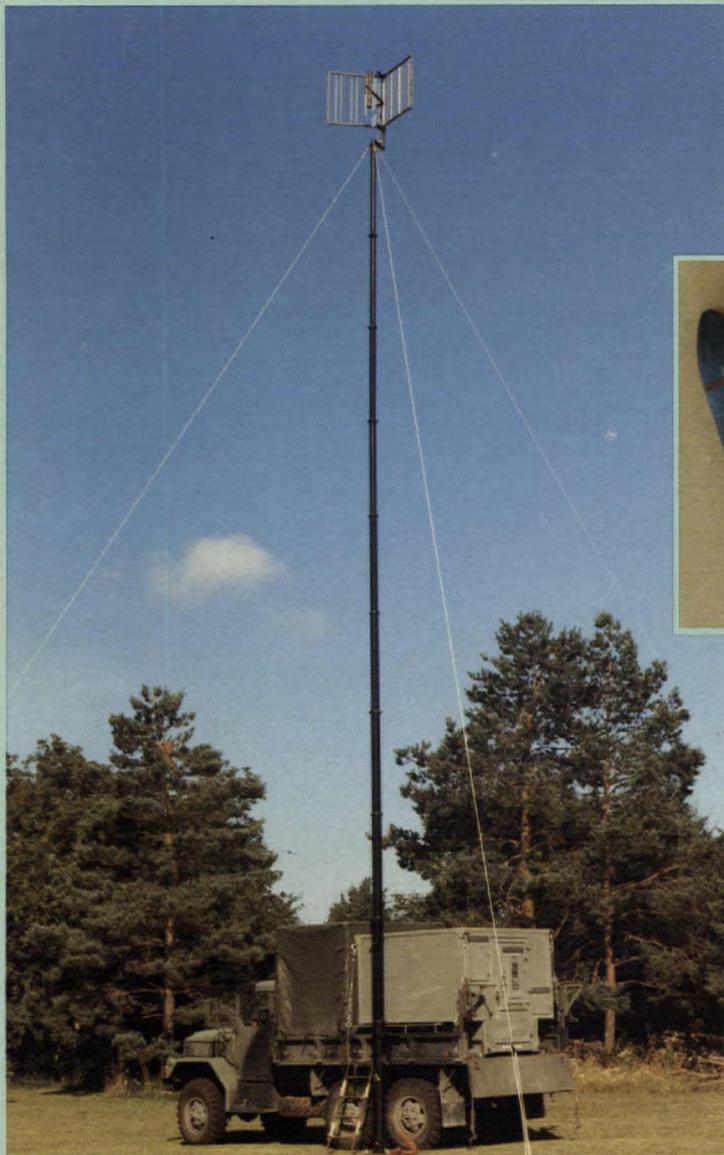
full requirement for modular practice bombs for the last four years.

Victrix currently operates from a new building covering 2 800 square metres (30 000 square feet) of office, manufacturing, engineering and drafting facilities. It is well staffed with both electronic and mechanical engineers and boasts a fully automated machine shop.

Light weight radio relay mast is pneumatically operated with a 45-kg (100-pound) headload capacity. It extends telescopically to 15 metres (50 feet) with an erection time of six minutes.

Vixan 40 telescopic mast is designed for manual erection by two men in five minutes. It extends to a height of 12 metres (40 feet), with a 10-kg (22-pound) headload capacity.

Both telescopic masts shown can be used either vehicle mounted or free standing.



Modular practice bombs are available in high and low drag configurations. Weighing only 2.83 kg (6.25 pounds), these bombs are adaptable for use on most of today's modern fighter aircraft.

Weatherhaven Resources Ltd.

1516 Duranleau Street
Vancouver, British Columbia,
CANADA
V6H 3S4
Tel: (604) 669-7741
Telex: 04-55551



Weatherhaven Resources specializes in the manufacture of totally portable shelters and produces a variety of quality products that range from custom specification tarping to small personnel shelters and large field maintenance units.

The longest piece in any Weatherhaven shelter is 2 metres (6 feet); as a result the shelter can be erected fast under all weather conditions and is totally portable. Units of up to 8 metres by 18 metres (26 feet by 60 feet) can be

assembled in two hours; 4-metre by 5-metre (12-foot by 15-foot) units in 5 to 10 minutes. Weatherhaven shelters also have a compact shipping format (3 cubic metres for the 8-metre by 18-metre unit and 0.5 cubic metres for the 4-metre by 5-metre unit).

The shelters withstand extreme wind and weather conditions and use state-of-the-art materials for the covers, liners, insulation and frames of high-strength steel or aluminum. They can easily incorporate many custom design specifications. Consultation on NBC applications of Weatherhaven shelters is also available.

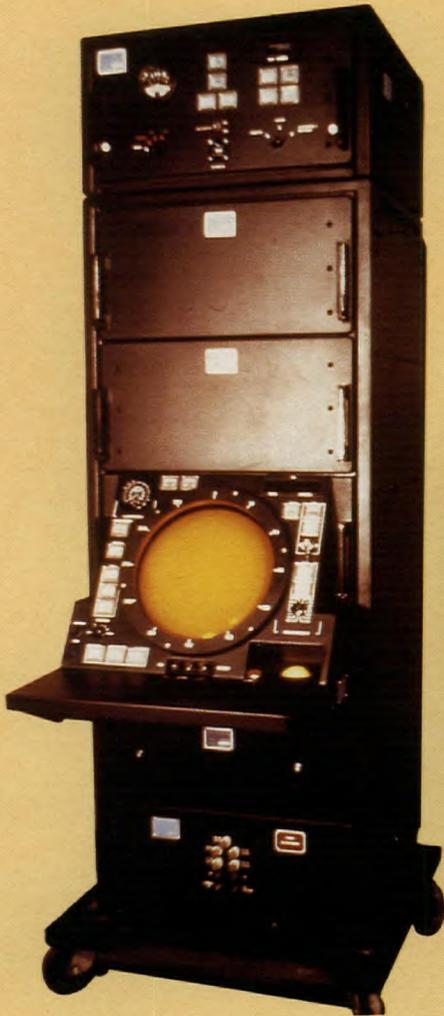
The shelters range from 2.5 metres (8 feet) to 15 metres (50 feet) in width, and their length can be virtually infinite as they can be supplied in modular fashion.

Weatherhaven also provides turn-key services involving the complete installation of major camp facilities with all service hookups.



Westinghouse Canada Inc.

777 Walkers Line
P.O. Box 5009
Burlington, Ontario, CANADA
L7R 4B3
Tel: (416) 528-8811
Telex: 061-8401



HS-1000 display/control console and electronics.

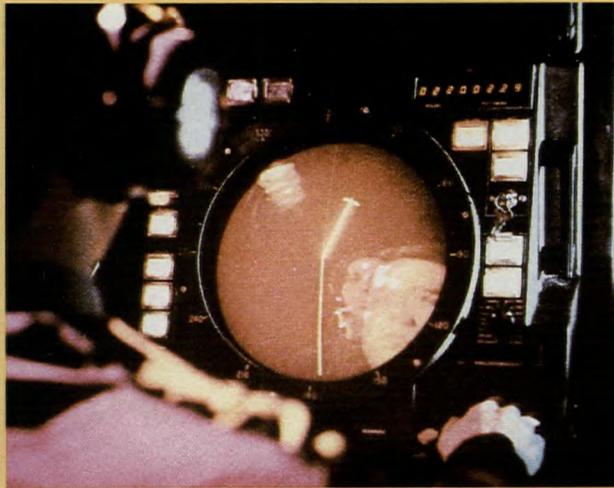
Supported by extensive experience in a variety of military and electronic equipment, Westinghouse is especially involved in the design and manufacture of active anti-submarine warfare (ASW) sonar. The company offers a selection of small and medium-sized sonars capable of meeting various naval operational requirements.

HS-1000 Series Sonar

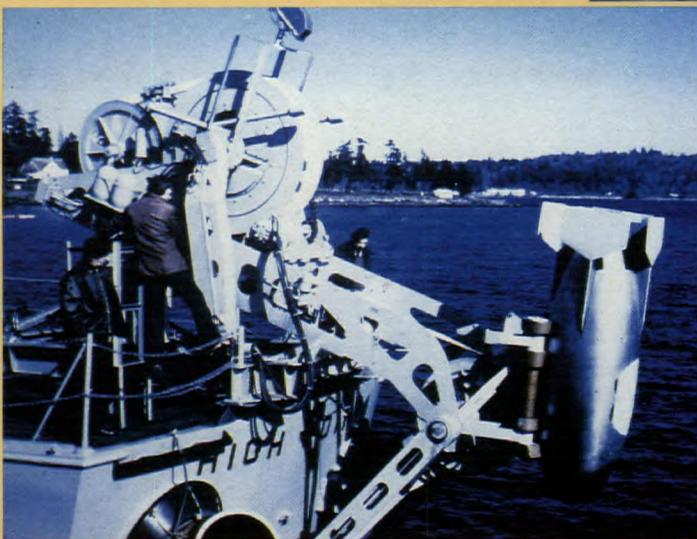
The HS-1000 series is a family of lightweight, omnidirectional ASW sonars that give small and medium-sized naval vessels a modern sonar capability in search, detection, and attack.

The HS-1001 is a lightweight variable depth sonar (VDS); the HS-1002 is a lightweight hull-mounted sonar (HM) designed for use on patrol craft, hydrofoils and corvettes.

The HS-1007, a medium-sized sonar available either in HM or VDS configuration, features higher power and is intended for use on corvettes, frigates, and destroyers.



HS-1000 display.



HS-1001 VDS with body rotating into launch position.



HS-1001 VDS system on high-speed trials on USN PCH-1 High Point.

Westinghouse Canada Inc.

AN/SQS-505 and AN/SS-509 Sonars

The AN/SQS-505, a medium-sized search and attack sonar designed for naval vessels of 1 000 tonnes and above, can be used in a hull-mounted (HM) and/or variable depth sonar (VDS) application.

Each Canadian ship has stand-alone HM and VDS AN/SQS-505 systems. The new "Halifax" class ships will have a redesigned AN/SQS-505V(6) with a new standard digital display.

The Belgian Navy "E-71" class uses an HM configuration with a keel-mounted transducer. The Royal Dutch Navy and the Greek Navy, in their "S" frigate class, utilize an HM configuration mounted in a bow dome.

An updated and lower frequency version, designated the AN/SQS-509, has been acquired by The Royal Netherlands Navy for its most recent "S" frigates.

Sonar Test Set

The sonar test set is a small, portable unit that provides "simulated transducer outputs" to a sonar system, in effect duplicating a planar acoustic wave striking the transducer.

Towing Condition Monitor (TCM)

The TCM is an instrument system to aid in towing a VDS body by providing command and the VDS operator with parameters affecting towing safety and acoustic performance.

Sonar Simulator

Derived from and incorporating the features of the sonar test set, the sonar simulator injects signals and noise into the receiver front-end to simulate transducer stave outputs.

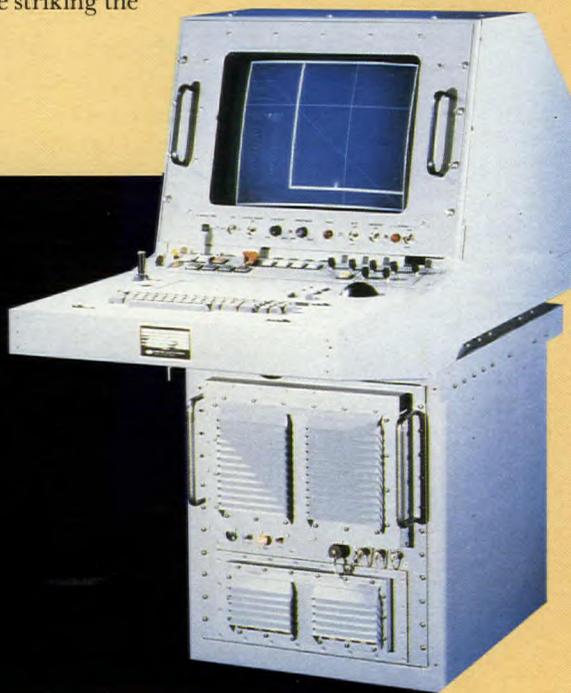
Noise and target signals exercise the signal processing circuits in the receiver, producing video display and audio outputs that operators will experience at sea without masking real-time inputs, or at dockside where sea noise and reverberation are simulated.

Sonar test set.

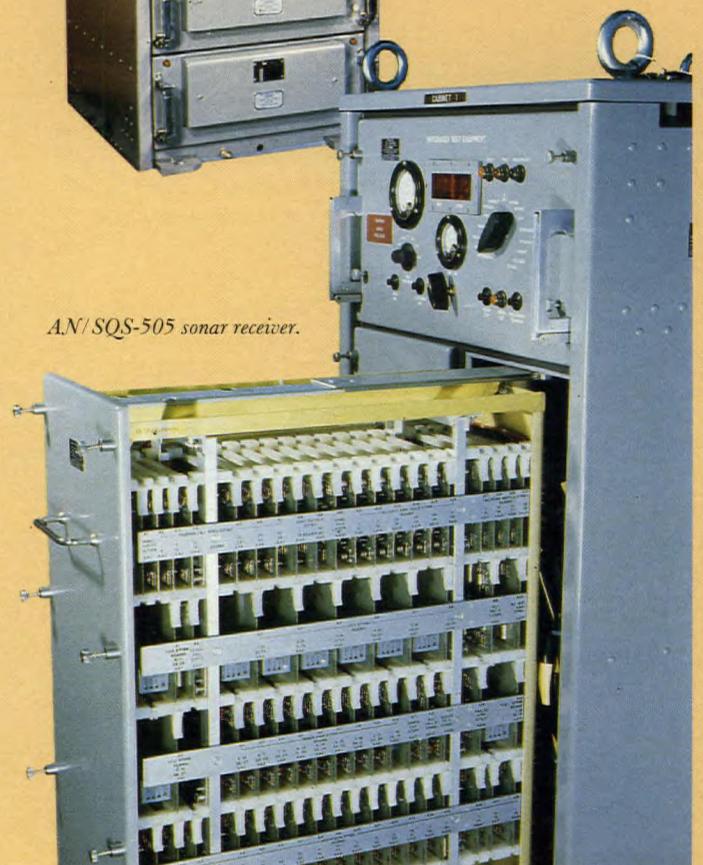


AN/SQS-505 sonar transmitter.

AN/SQS-505 (V)6 digital display.



AN/SQS-505 sonar receiver.



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Sinclair Radio Laboratories Ltd. p 180

Radio, communications system

Dataradio Inc. p 68
RMS Industrial Controls Inc. p 162
Rockwell International of Canada Ltd. p 164
Rohde & Schwarz Canada Inc. p 163

Radio direction-finding system

Rohde & Schwarz Canada Inc. p 163

Radio, line-of-sight

Canadian Marconi Company p 48

Radio, microwave

Harris Farinon Canada, Inc. p 100

Radio, point-to-multipoint

Dataradio Inc. p 68
SR Telecom Inc. p 181

Radio, single/multichannel

Garrett Canada p 88
RMS Industrial Controls Inc. p 162
Rockwell International of Canada Ltd. p 164

Radio spectrum monitoring system

Leigh Navigation Systems Ltd. (LNS) p 136

Radio, survivable

Garrett Canada p 88

Radio systems, field tactical trunk

Canadian Marconi Company p 48

Radio tracking and homing equipment

Orion Electronics Limited p 153

Radio transceivers, UHF

RMS Industrial Controls Inc. p 162

Radomes, flexible planar

Fell-Fab Products p 81

Range equipment, VHF omni-directional (VOR)

Canadian Marconi Company p 48

Receivers, directional

Garrett Canada p 88
Orion Electronics Limited p 153

Receivers, GPS/MLS

Canadian Marconi Company p 48

Recorders, airborne, speech

Leigh Instruments Ltd. p 122
Presentey Engineering Products Ltd. p 158

Recorders, flight data

Leigh Instruments Ltd. p 122

Recorders, precision film image

MacDonald Dettwiler and Associates Ltd. p 138

Recovery assist, shipborne helicopter

Indal Technologies Inc. p 110

Recovery systems

Irvin Industries Canada Ltd., Aerospace Division p 115

Repair and overhaul, calibration services

Bendix Avelex Inc. p 25

Replenishment-at-sea (RAS) systems

John T. Hepburn Limited p 101

Rescue apparatus, multi-person

C-D-N Nordic Int'l. p 61
Empira Systems Corp. p 77
Irvin Industries Canada Ltd. p 115

Restraint systems

Irvin Industries Canada Ltd., Aerospace Division p 115

Rig leg sections, jack-up

Halifax-Dartmouth Industries Ltd. p 98

Rockets, research

Bristol Aerospace Ltd. p 30

Rope, flattened strand elevator

Greening Donald Co. Ltd. p 87

Rope, wire, synthetic

Greening Donald Co. Ltd. p 87

Runway lighting systems

Leigh Navigation Systems Ltd. (LNS) p 136

Safety equipment

Med-Eng Systems Inc. p 143
Tul Safety Equipment Ltd. p 191

Safety wear/body protection

Chain Saw Safety Wear (Bristol Group) p 32
Med-Eng Systems Inc. p 143
Safeco Manufacturing Limited p 168

Satellite communication systems

Microtel Limited p 145

Satellite components and subsystems

Fleet Industries p 84
Magna Electronics (Devtek) p 72
Spar Aerospace Limited p 182

Satellite earth station

SED Systems Inc. p 176
Spar Aerospace Limited p 182

Satellite system ground stations

Canadian Astronautics Ltd. p 42
MacDonald Dettwiler and Associates Ltd. p 138

Scanners, electronic

C-Tech Ltd. p 67

Product List

Screening smokes

HANDS Fireworks Inc. p 99

Seals, marine vessels

Tyton Seal p 192

Search and rescue aircraft

Canadair Limited p 38
The de Havilland Aircraft of Canada, Ltd. p 70

Security and law enforcement training aids and publications

Securesearch p 174

Security systems

DEW Engineering and Development Ltd. p 73
EM Plastic & Electric Products Ltd. p 76
Litton Systems Canada Ltd. p 128
Senstar Corporation p 178

Sensor, Doppler velocity

Canadian Marconi Company p 48

Sensors, remote

MIL-COM Technologies Inc. p 148
MONITEQ p 149
Roy Ball Associates Ltd. p 167

Serial data bus

Sperry Inc. p 184

Shelters, portable, modular

DEW Engineering and Development Ltd. p 73
MIL-COM Technologies Inc. p 148
Norseman Shelters p 152
Sprung Instant Structures, Ltd. p 189
Weatherhaven Resources Ltd. p 201

Shields, ballistic

Med-Eng Systems Inc. p 143

Shipbuilding, design, construction

Bel-Aire Shipyard Ltd. p 24
Halifax-Dartmouth Industries Ltd. p 98
Marine Industries Ltd. p 137
Mason Boats Ltd. p 141
Saint John Shipbuilding Ltd. p 169
Versatile Davie Inc. p 196
Versatile Pacific Shipyards Inc. p 197
Versatile Vickers Inc. p 199

Ship propulsion and control systems

Canadian General Electric Company Ltd. p 46

Ship repair, overhaul

Halifax-Dartmouth Industries Ltd. p 98
Marine Industries Limited p 137
Saint John Shipbuilding Ltd. p 169
Versatile Davie Inc. p 196
Versatile Pacific Shipyards Inc. p 197
Versatile Vickers Inc. p 199

Ships' integrated communications (SHINCOM)

Leigh Instruments Ltd. p 122

Sights, rifle/weapons

Ernst Leitz Canada Ltd. p 124

Signal processing subsystems

COM DEV p 66
Computing Devices Company p 64

Signal simulator, tactical

Canadian Astronautics Ltd. p 42

Simulator, cockpit procedures, instrument procedures

Atlantis Aerospace Corporation p 20

Simulators

HANDS Fireworks Inc. p 99

Simulators, flight and tactical

CAE Electronics Ltd. p 34

Simulators, marine

Sperry Inc., Aerospace & Marine Group p 185

Snowmobiles

Bombardier Inc. p 26

Socks, military

Les Tricots Duval & Raymond Ltée p 192

Software design and development

Roy Ball Associates Ltd. p 167

Solar blankets

Fell-Fab Products p 81

Sonar, anti-submarine warfare

Scannar Industries Inc. p 170
Westinghouse Canada Inc. p 202

Sonar domes, hull mounted

Fathom Oceanology Limited p 80

Sonar, imaging

International Submarine Engineering Ltd. p 113

Sonar, omni-directional

C-Tech Ltd. p 67

Sonar simulator

Westinghouse Canada Inc. p 202

Sonar, structures

Fleet Industries p 84

Sonar test equipment

Westinghouse Canada Inc. p 202

Sonar transducers

C-Tech Ltd. p 67

Sonar, variable depth

Fathom Oceanology Limited p 80
Honeywell Limited p 105

Sonobuoy processor

Computing Devices Company p 64

Sonobuoys, anti-submarine warfare

Hermes Electronics (Devtek) p 72

Space systems

Canadian Astronautics Ltd. p 42

Spectrum management systems

Intellitech Canada Limited p 112

Status display system (SDS)

Canadian Marconi Company p 48

Steering systems, aircraft, nose wheel

Dowty Canada Limited p 74

Storage bins (Quick-Bins), portable silos

Fell-Fab Products p 81

Storage racks, truck mounted

DEW Engineering and Development Ltd. p 73

Surveillance, airborne radar

Canadian Marconi Company p 48
Litton Systems Canada Ltd. p 128
Raytheon Canada Ltd. p 160

Surveillance drone system, unmanned, airborne

Canadair Limited p 38

Surveillance, magnetic underwater

Scintrex p 172

Surveillance, perimeter

Computing Devices Company p 64
MONITEQ p 149

Switchboards

Canadian Marconi Company p 48

Switch gear, electrical

Hewitt Equipment Limited p 104

Target aircraft, RPV

Ballistech Systems Inc. p 22

Target drone engines

Quadra Power (Bristoll Group) p 32

Target recognition

MIL-COM Technologies Inc. p 148
MONITEQ p 149

Target/weapon systems

Boeing of Canada Ltd. p 29

Tarpaulins

Fell-Fab Products p 81
Weatherhaven Resources Ltd. p 201

Technical publications

Northwest Industries Limited p 151
Securesearch p 174

Telecommunications projects and systems, research and development

Microtel Pacific Research p 147

Telemetry

Bristol Aerospace Limited p 30

Telescopic masts

Victrix Limited p 200

Temperature monitoring systems

Leigh Navigation Systems Ltd. (LNS) p 136

Tents

Fell-Fab Products p 81
Weatherhaven Resources Ltd. p 201

Terminals, mobile digital

MDI Mobile Data International Inc. p 142

Test equipment

Aro Canada p 16

Product List

Test equipment, automated

Litton Systems Canada Ltd. p 128
SED Systems Inc. p 176

Test equipment, digital

Atlantis Aerospace Corporation p 20

Test equipment, sonar

Westinghouse Canada Inc. p 202

Thermal imaging systems

Spar Aerospace Limited p 182

Thermal-protected ducts

H.I. Thompson (Fleet) p 84

Thrust computing support equipment (TCSE)

Codalex Ltd./Ltée p 63
Computing Devices Company p 64

Thunder flashes

HANDS Fireworks Inc. p 99

Time division interface units (TIU)

Canadian General Electric Company Ltd. p 46

Time division multiple access/digital speech interpolation equipment

Spar Aerospace Limited p 182

Tire changing system

Hovey Industries Ltd. p 106

Towed arrays

Hermes Electronics (Devtek) p 72

Towing systems, submerged

Fathom Oceanology Limited p 80

Tow tractors, aircraft

Sellick Equipment Limited p 177

Trailers, military

Manac Inc. p 140

Training models, inert

Securesearch p 174

Training program, audio-visual

Securesearch p 174

Training systems, air traffic control

Ballistech Systems Inc. p 22

Training systems, military

The de Havilland Aircraft of Canada, Ltd. p 70
General Cybernetics Group p 94
Honeywell Limited p 105

Training systems, tactical air defence

Ballistech Systems Inc. p 22

Transmission assemblies, wheeled, tracked vehicles

Levy Auto Parts Company p 126

Transmitters, modules

Garrett Canada p 88
Nautical Electronic Laboratories Ltd. p 152
Orion Electronics Ltd. p 153
RCA Inc. p 161

Transports, military

The de Havilland Aircraft of Canada, Ltd. p 70

Tube analyzer, automatic, boiler

CTF Systems Inc. p 62

Turbines, hydro-electric

Marine Industries Limited p 137

Underwater communications system, wireless

Orcatron Manufacturing Ltd. p 154

Valves

Aro Canada p 16

Vehicles, all-terrain, heavy duty, wheeled and tracked

Bombardier Inc. p 26
Canadian Foremost Ltd. p 44
General Motors, Diesel Division p 96
Pedsco (Canada) Ltd. p 155

Vehicles, armoured

General Motors, Diesel Division p 96

Vehicles, crash/rescue

C-D-N Nordic Int'l. p 61

Vehicles, fire-fighting, fire-protection

C-D-N Nordic Int'l. p 61

Vehicles, rail, passenger

Bombardier Inc. p 26

Vehicles, remote controlled

Hovey Industries Ltd. p 106
International Submarine Engineering Ltd. p 113

Vehicles, undersea, remotely operated

International Submarine Engineering Ltd. p 113

Vehicular special equipment kits

Hovey Industries Ltd. p 106

Vest, bullet resistant

Canadian Body Armour Ltd. (Bristoll Group) p 32

Visibility measuring equipment

Leigh Navigation Systems Ltd. p 136

Visual/infrared assemblies

Ernst Leitz Canada Limited p 124

Voice information processing station

Sperry Inc. p 184

Voice interactive system, audio-visual

Honeywell Limited p 105

Wavemaking systems

Davis Engineering Limited p 69

Weapon systems

Boeing of Canada, Inc. p 29

Weapon systems studies

I.M.P. Group Limited p 108

Web products

H.I. Thompson (Fleet) p 84

Winches, marine, motion compensating

Techwest (Fleet) p 84
John T. Hepburn Limited p 101

Wire assemblies, electronic

I.M.P. Group Limited p 108

Wire cloth

Greening Donald Co. Ltd. p 87

Wire screens

Greening Donald Co. Ltd. p 87

Wire, specialty

Greening Donald Co. Ltd. p 87

X-ray screening systems

Corrigan Instrumentation Services Ltd. p 62

Company List

The Acton Rubber Ltd./ Les Caoutchoucs Acton Ltée p 9

Boots, chemical warfare protective
Boots for arctic wear
Footwear, general
Gloves, chemical warfare protective
Overshoes for combat shoes

Advance Power Inc. p 8

Generating sets
Generators, alternators
Ground power units

Aerotech International Inc. p 12

Aircraft maintenance hoists
Canvas ducting
Ground power units
Heaters, portable
Stoves

Aircraft Appliances and Equipment Limited p 14

Air conditioning, aircraft
Converters
Flight controls
Generators, aircraft
Power supplies
Pumps
Search lights
Sensing devices

Anachemia Canada Inc. p 17

Chemical agent liquid detector equipment
Chemical agent nerve vapour detector equipment
NBC detection equipment

Aro Canada p 16

Chemical defence accessories
Gun muzzle reference system
Hoses
Life support equipment
Oxygen regulators
Pressure reducers
Test equipment
Test stands
Valves

Atlantis Aerospace Corporation p 20

Cockpit procedure simulator
Converters, liquid oxygen
Cryogenic equipment
Digital test equipment
Instrumentation/control systems
Instrument procedures simulator
Maintenance trainers
Trainers, simulator

Ballistech Systems Incorporated p 22

Air traffic control towers, fixed, mobile
Ammunition, research and development
Calibre ammunition
Computerized ground control and communication systems
Projectiles, target radar augmented
RPV autopilot
Target aircraft, remotely piloted (RPV)
Training systems, air traffic control
Training systems, tactical air defence

Barrday p 23

Soft body armour, bullet resistant

Bel-Aire Shipyard Ltd. p 24

Shipbuilding

Bell Aerospace Canada Textron p 24

Air cushion vessels
Cargo carrier

Bendix Avelex Inc. p 25

Aircraft fuel controls
Electronic systems, aerospace
Engine accessories, aircraft
Gun alignment and control systems
Navigation systems, vehicle
Repair and overhaul, calibration services

Boeing of Canada Ltd. p 29

Engine components, high temperature
Missiles
Target systems
Weapon systems

Bombardier Inc.

Logistics Division p 26

Motorcycles, military
Snowmobiles
Trucks, cargo, utility
Vehicles, rail, passenger
Vehicles, tracked, all terrain
Vehicles, wheeled

Bristol Aerospace Limited p 30

Aircraft sheet metal assemblies
Fixtures
Nuclear reactor core components
Research rockets, air-to-ground rockets
Telemetry
Test cells, helicopter component
Tooling

CAE Electronics Ltd. p 34

Aircraft and helicopter flight and tactical simulator
Fibre-optic helmet-mounted visual display system
Flight and tactical simulator
Integrated machinery control systems (SHINMACS)
Magnetic anomaly detection (MAD) systems
Magnetometer
Multi-axis hand controllers

Camoplast Inc. p 58

Clothing, military, institutional
Components, rubber, plastic, reinforced plastic

Canadair Limited p 38

Amphibious multi-purpose aircraft
Challenger jet transport aircraft
Surveillance drone system, airborne unmanned

Canadian Arsenals

Limited/Les Arsenaux Canadiens Limitée p 40

Ammunition, medium, large calibre
Armaments
Cartridge cases
Gas masks (NBC)

Canadian Astronautics Limited p 42

Antennae, phased array
HF ionospheric sounder, space borne
Imaging systems
Radar, side looking airborne
Satellite system ground stations
Signal simulator, tactical, EW
UHF antenna, space borne

Canadian Body Armour Ltd.* p 32

Body armour
Vest, bullet resistant

Canadian Foremost Ltd. p 44

Vehicles, all-terrain, heavy duty, wheeled and tracked

Canadian General Electric Company Limited p 46

Aerospace maintenance support equipment
Balancing machine adapters
Data modems
Fixtures, F404
Gas turbine, compressor blades, vanes
Gas turbine engine bases, enclosures

Missile launching tubes
Time division interface units (TIU)

Canadian Marconi Company p 48

Avionics management system (AMS)
Calibration
Caution and warning system
Command, control and communications systems
Data collection unit
Data transfer unit
Distance measuring equipment (DME)
Doppler velocity sensor
Edge-lit panels
Electronic flight manual
Engine instruments
Field switchboards
Flight advisory computer
Instrument landing systems (ILS), MLS ground station
Magnetic devices
Microcircuits, hybrid
Monitoring and display systems, airborne
Multiplexers
Navigation systems, Doppler
Navigation systems, Omega
Omega/VLF navigation system
Opto-electronic vertical scale instruments
Power supplies, avionics
Printed wiring boards
Radar, navigation
Radar, surveillance
Radio systems, field tactical trunk
Radios, line-of-sight
Range equipment, VHF omni-directional (VOR)
Receivers, (GPS)
Receivers, (MLS), airborne
Status display system (SDS)
Telephone switchboard

Canoe Cove Manufacturing Ltd. p 45

Patrol boats

Casey Copter Accessories Limited p 59

Cabin heating systems, aircraft

*Canadian Body Armour Ltd. is a division of the Bristol Group.

Company List

CBTS-Computer Based Training Systems Ltd. p 60

Learning systems, computer-based
Software, specialized

C-D-N Nordic Int'l. p 61

Equipment, fire-fighting
Vehicles, crash/rescue
Vehicles, fire-fighting, fire-protection

Codalex Ltd./Ltée p 63

Military multiplex systems and accessories

COM DEV p 66

Microwave subsystems
Millimetre-wave systems
Signal processing subsystems

Computing Devices Company p 64

Analysis and display system
Computer, digital ballistic
Computer, portable artillery
Display, standard digital
Image enhancement technology
Motion detection system, perimeter security
Signal processing, ASW acoustic
Sonobuoy processor
Surveillance, perimeter
Thrust computing support equipment (TCSE)

Corrigan Instrumentation Services Ltd. p 62

X-ray screening systems

C-Tech Ltd. p 67

Scanners, electronic
Signal and power conditioning inductive components, filters
Sonars, omni-directional
Sonar transducers, multi-element cylindrical
Sonar transducers, multi-element planar array
Standard electronic modulars (SEM)

CTF Systems Inc. p 62

Boiler tube analyzer
SQUID gradiometer
Tube analyzer, automatic

Dataradio Inc. p 68

Radio communications systems, packet
Radios, point-to-multipoint, packet

Davis Engineering Limited p 69

IR suppression systems
Wavemaking systems

The de Havilland Aircraft of Canada, Ltd. p 70

Aircraft, air ambulance
Aircraft, airborne early warning (AEW)
Aircraft, anti-submarine warfare (ASW)
Aircraft, electronic surveillance
Aircraft, maritime reconnaissance
Aircraft, medical evacuation (MEDEVAC)
Aircraft, military cargo/paratroop/VIP transport
Aircraft, military counter-insurgency (COIN)
Aircraft, search and rescue
Aircraft, trainer, navigational
Aircraft, transport, military, STOL

DEW Engineering and Development Limited p 73

Security screens, cargo truck and trailer
Shelters, air, sea, land
Storage racks, truck mounted
Toboggans, equipment carrier

Diemaco Inc.* p 72

Gun barrels, rotary forged
Small arms
Small arms, repair, overhaul

Dowty Canada Limited p 74

Aircraft landing gear, military, commercial
Aircraft nose wheel steering systems
Capstans, lightweight
Hydraulic power pack, constant tension winch
Hydraulic systems, marine
Nose wheel steering systems, steer-by-wire

EDO Canada Ltd. p 76

Data acquisition systems
Integrated marine navigation systems

EM Plastic & Electric Products Limited p 76

Glazing materials, bullet/attack resistant

Empira Systems Corp. p 77

Rescue apparatus, multi-person

Exide Electronics Canada Inc. p 78

Frequency converters
Power systems, uninterruptible

*Diemaco Inc. is a division of Devtek Corporation.

Explosafe America Inc. p 79

Explosion suppression system
Fuel tank

Fathom Oceanology Limited p 80

Cable fairings for submerged towing systems
Hull-mounted sonar domes
Mechanical cable handling systems for variable depth sonar, towed line array and mine countermeasures

Fell-Fab Products p 81

Aircraft cargo nets
Aircraft fire-blocking partitions
Aircraft fire retardant foam cushions
Aircraft fire retardant seat covers
Aircraft wing covers
Bags, water bottle, flight helmet
Container liner systems
Flexible bulk liquid containers
Flexible planar radomes
Geomembranes
Geotextiles
Materials handling equipment
Military back packs
Pads, nuclear reactor, insulator
Portable storage silos
Solar blankets
Tarpaulins

Fleet Industries* p 84

Aircraft structural components
Electronic cabinets
Helicopter and aircraft assemblies
Helicopter blades
Radar antennae/equipment/structures
Satellite structures
Sonar structures

Field Aviation Company Limited p 82

Aeronautical engineering and outfitting
Overhaul, modification, conversion, aircraft, helicopters

Food Machinery Engineering p 83

Bakery equipment
Mobile bakeries

Foundation Instruments p 86

Fibre-optic cable systems, communications, transmission systems

*Fleet Industries is a division of Fleet Aerospace Corp.

Garrett Canada p 88

Antennae, survivable battlefield
Communications systems
Electronic environmental control systems
Film hybrid microcircuits, custom thick, thin
Hybrid microcircuits
Illuminated information panels
ILS (instrument landing system) signal analyzer
Locator beacons, emergency, personal
Peripheral vision display systems
Radio sets, survivable
Radio transmitters and receivers, VHF/AM single channel

General Cybernetics Group p 94

Computer-assisted learning
Military training techniques

General Motors of Canada Limited Diesel Division p 96

Vehicles, armoured, wheeled
Vehicles, tactical

Global Thermoelectric Power Systems Ltd. p 95

Generators, electrical/thermoelectric

Greening Donald Co. Ltd. p 87

Aircraft arrestor cables
Aircraft carrier flattened strand elevator rope
Helicopter haul down assemblies
Perforated metals
Rope, stainless steel mine sweep
Rope, wire, synthetic
Wire, cloth
Wire screens
Wire, specialty

Halifax-Dartmouth Industries Limited p 98

Dynamically positioned drill ship
Jack-up rig leg sections
Offshore drilling rigs, semi-submersible
Ship design, construction
Ship repair, overhaul

Company List

HANDS Fireworks

Inc. p 99

Coloured signal smoke
Flares
Marine markers
Marine pyrotechnic devices
NBC practice mines
NBC simulators
Pyrotechnics
Screening smokes
Thunder flashes

Harris Farinon Canada, Inc. p 100

Microwave radio
Multiplexers, analog
Multiplexers, digital
Radios, analog
Radios, digital

Hawker Siddeley Canada Inc.

Orenda Division p 102

Combustion liners
Compressor casings, stators
Drive shafts
Engine components
Engineering support
Firewalls
Gas generators
Spacers
Turbine discs, cases, nozzles

John T. Hepburn Limited p 101

Capstans
Chain tensioning units
Elevators
Replenishment-at-sea (RAS) systems
Ship cranes
Winches
Windlasses

Hermes Electronics* p 72

Antisubmarine warfare sonobuoys
Electro-mechanical systems, custom
HF communications equipment
Ocean data systems
Towed arrays

Hewitt Equipment Limited p 104

Diesel electric sets
Diesel engines
Generator, auxiliary power, tactical
Generator sets, gas turbine
Pumping units
Switch gear, electrical
Synchronized control modules

*Hermes Electronics is a division of Devtek Corporation.

H.I. Thompson* p 84

Heat-resistant insulated fabric
Heat shields
Insulation blankets, high/low temperature
Insulation components, metal-encased, moulded
Thermal-protected ducts
Web products

Honeywell Limited p 105

Audio-visual voice interactive system
Mines, practice
Navigation system, multisensor
Skills simulator/trainer
Training systems

Hovey Industries Ltd. p 106

Explosive ordnance disposal
Robotic vehicle, remote-controlled
Tire changing system
Vehicular special equipment kits

Ilco Unican Inc. p 107

Locks, mechanical, changeable, combination
Locks, Unican, pushbutton operated

I.M.P. Group Limited p 108

Aerospace engineering
Repair and overhaul, aircraft and helicopters
Weapon systems studies
Wire assemblies, electronic

Indal Technologies Inc. p 110

Hangars, telescopic, shipboard
Helicopter support systems
Shipborne helicopter recovery assist, secure and traversing (RAST) systems

Innotech Aviation p 109

Aircraft modifications
Prototype engineering

Intellitech Canada Limited p 112

Logistics management systems
Spectrum management systems

International Submarine Engineering Ltd. p 113

Cranes, remote controlled
Imaging sonars
Land vehicles, remote controlled
Vehicles, undersea, remotely operated

*H.I. Thompson is a division of Fleet Aerospace Corp.

Internav Ltd. p 114

Loran-C navigators
Loran-C receivers

Irvin Industries Canada Ltd.

Aerospace Division p 115

Aerial delivery systems
Emergency escape systems
Ground handling equipment for air cargo
Inflatable life support equipment
Recovery systems
Restraint systems

Isolation Systems p 94

Data security, electronic
Encrypted dial-up communications

IVI Inc. p 116

Ammunition, small calibre

Kaufman Footwear p 118

Boots, cold weather, military
Boots, protective, military

KB Electronics Limited p 120

Frequency changers
Helicopter starting systems
High-voltage power supplies
Uninterrupted power supply systems (UPS)

Kobelt Manufacturing Company Ltd. p 117

Disc brakes, deck equipment
Marine control components

Landspan International of Canada Limited p 137

Secure communications systems

Leigh Instruments Limited p 122

Crash position indicators, aircraft
Crystal filters, oscillators
Frequency synthesizers
Ice detection systems
Illuminated panels
Recorder, cockpit voice
Recorder, flight data
Recorder, mechanical strain
Quartz crystals
SHINCOM — ships' integrated communications
TACAN beacon

Leigh Navigation Systems Ltd. (LNS) p 136

Air traffic control systems
Communications systems
Emergency measures systems
Radio spectrum monitoring systems
Runway lighting systems
Ships' integrated communications system

Ernst Leitz Canada Limited p 124

Binoculars
Head-up and head-down display optics
Lenses
Muzzle reference systems
Periscopes
Sights, rifle
Sights, weapon
Visual and infrared assemblies for laser rangefinders and designators

Levy Auto Parts Company p 126

Cooling systems, wheeled, tracked vehicles
Drive-train components, assemblies
Electrical systems, wheeled, tracked vehicles
Engine assemblies, wheeled, tracked vehicles
Final drive assemblies, wheeled, tracked vehicles
Transmission assemblies, wheeled, tracked vehicles

Litton Systems Canada Limited p 128

Automated test equipment
Display modules, programmable
Displays, light-emitting diode
Displays, liquid crystal
Displays, multi-function
Inertial navigation systems
Integrated security systems
Radar, airborne surveillance

MacDonald Dettwiler and Associates Ltd. p 138

Automated weather distribution system
Image analysis systems
Integrated mapping and analysis system
Precision film image recorders
Radar, integrated radar imaging system
Radar, spaceborne synthetic aperture radar
Satellite ground stations

Magna Electronics* p 72

Dip-brazed, bonded enclosures (avionics)
Ejection systems, cartridge, powder-activated
Gyroscope components
Satellite grapple fixtures, articulated joints
Satellite mechanical components

*Magna Electronics is a division of Devtek Corporation.

Company List

Manac Inc. p 140

Trailers, military

Marine Industries Limited p 137

Freight cars, railroad
Hydro-electric turbines, generators, railroad
Material handling equipment, railroad
Shipbuilding
Ship repair

Mason Boats Ltd. p 141

Boats, military

MDI Mobile Data International Inc. p 142

Mobile digital terminals

Mechron Energy Ltd. p 141

Power systems, DC
Stand-alone generating systems
Uninterruptible power systems

Med-Eng Systems Inc. p 143

Ballistic shields and panels
Blast suppression containers, blasting cap
Explosive containers
Helmet, explosive ordnance disposal

M.E.L. Defence Systems Ltd. p 144

Electronic countermeasures system
Electronic support measures system
Electronic warfare systems
Radar jammer

Micronav Ltd. p 143

Microwave landing systems (MLS)

Microtel Limited p 145

Data acquisition and control system
Digital access cross connect system
Satellite communication systems

Microtel Limited Manutronics p 146

Printed circuit boards, multilayer
Wired backplanes

Microtel Pacific Research p 147

Research and development of telecommunications products and systems
Very large scale integrated circuits (VLSI), custom and semi-custom

MIL-COM Technologies Inc. p 148

Air mattresses, military
Coated fabrics
Landing bags, portable, inflatable

MONITEQ p 149

Camouflage detection
Chemical warfare agent detection
Electro-optical imagers, programmable
Military mapping
Remote sensing systems
Shallow water depth mapping
Surveillance, border
Target recognition

Muirhead Systems Limited p 150

Computer imaging systems

Nautical Electronic Laboratories Limited p 152

AM broadcast transmitters
MF communication transmitters
Radio beacon systems, non-directional

Norseman Shelters p 152

Portable buildings

Northwest Industries Limited p 151

Aircraft repair and overhaul
Avionics design and systems interface
Technical publications

Optotek Limited p 153

Displays, light-emitting diode
Gallium arsenide monolithic microwave integrated circuits
Photo-detectors, infrared

Orcatron Manufacturing Ltd. p 154

Scubaphone wireless underwater communications system

Orion Electronics Limited p 153

Tracking and homing equipment

Outdoor Outfits Ltd. p 155

Clothing, flight crew
Military clothing
Patrol jackets, topcoats, surcoats
Weatherproof parkas

Pall (Canada) Limited p 156

Canisters for gas masks

Patlon Aircraft and Industries Ltd. p 157

Logistic support, aircraft

Pedeco (Canada) Ltd. p 155

Explosive ordnance disposal, remote mobile investigator (RMI) vehicle

Philips Electronics Ltd. p 158

Quartz crystals

Pratt & Whitney Canada p 159

Engines, small gas turbine
Repair, overhaul, gas turbines

Presentey Engineering Products Limited p 158

Airborne camera annotators
Airborne speech recorders
Memory loop recorders

Quadra Power* p 32

Target drone engines

Raytheon Canada Limited p 160

Air traffic control (ATC) systems
Ground-controlled approach (GCA) systems
Power supplies
Radar, surveillance
Single-board microprocessors

RCA Inc. p 161

Electro-optical components
Infrared emitters
Photo detectors
Semiconductor injection lasers
Transmitter modules

RMS Industrial Controls Inc. p 162

Communication systems, data, voice, video
Electronic data acquisition boards
Radios, single channel, multi-channel
UHF radio transceivers

Rockwell International of Canada Ltd. Collins Canada Division p 164

Automatic airborne direction finders
Communication systems
Radio equipment

Rohde & Schwarz Canada Inc. p 163

Radio direction-finding systems

*Quadra Power is a division of the Bristol Group.

Rolls-Royce (Canada) Limited p 166

Aircraft engines, repair and overhaul

Roy Ball Associates Ltd. p 167

Software design and development for data communications, electronic warfare radar, remote sensing

Safeco Manufacturing Limited p 168

Bomb disposal suit
Hearing protector

Saint John Shipbuilding Limited p 169

Ship construction
Ship design
Ship repair

Scannar Industries Inc. p 170

Sonar systems, anti-submarine warfare

Scepter Manufacturing Co. Ltd. p 171

Ammunition containers
Jerry cans
Plastic fluid containers

Scintrex p 172

Bomb sniffer
Explosive ordnance detector magnetometer
Magnetic underwater surveillance array (MUSA)
Magnetometers
Portable explosives vapour detector
Propylene glycol diniteste (Otto Fuel) vapour detector
Radiation monitor and automatic alarm system
Radiation monitoring equipment

Securesearch p 174

Security and law enforcement training aids and publications

Securiplex Systems Inc. p 175

Fire detection, damage control, and status systems
Fire-suppression systems

SED Systems Inc. p 176

Communications systems design
Earth station systems
Test systems for satellite communications

Company List

Sellick Equipment Limited p 177

Aircraft tow tractors
Boom handlers
Forklifts, rough terrain

Senstar Corporation p 178

Perimeter intrusion detection security systems
Security display and control systems

Sinclair Radio Laboratories Limited p 180

Radio communications equipment:
Antennae
Combiners
Circulators
Duplexers
Filters
Isolators
Multicouplers

Spar Aerospace Limited p 182

Aerospace gears and transmissions
Aircraft and helicopter component repair and overhaul
Digital and analog SCPC systems
Electronic equipment
Engine accessory gearboxes
Forward looking infrared
Radar sensing technology
Satellite earth station
Satellite earth station electronic equipment
Satellite subsystems
Stabilized earth stations
Thermal imaging systems

Sperry Inc. p 184

Microcomputers
Integrated processing display system, shipboard
Serial data bus
Voice information processing station

Sperry Inc. Aerospace & Marine Group p 185

Cable assemblies
Command and control systems
Communications control systems, modular
Distortion analyzers
Environmental sensors, processing systems
Gyro-stabilized horizon bars
Message test sets
Multiplexers, time division
Navigation systems, aircraft

Temperature monitoring systems
Training simulators, marine
Visibility measuring equipment

Sprung Instant Structures Ltd. p 189

Shelters, portable modular

SR Telecom Inc. p 181

Radio systems, point-to-multipoint

Standard Aero p 186

Aviation parts and products
Engine overhaul, aircraft

Supreme Industries Incorporated p 188

Field cook set
Mess kit
Military cookware
Pressure cooker

Techwest* p 84

Antennae stabilization device
Motion compensating cranes and winches

Telemus Electronic Systems, Inc. p 190

Advanced electronic counter-measures design
Electronic support measures systems design
Microwave integrated circuit products

Thought Technology Ltd. p 189

Military heart rate monitor
Non-invasive heart rate monitor

Les Tricots Duval & Raymond Ltée p 192

Gloves, mitts, military
Socks, military

Tul Safety Equipment Ltd. p 191

Life jackets, inflatable
Life rafts, inflatable
Safety harness, aircraft
Tie-down gear, aircraft, automobile

Tyton Seal p 192

Bulkhead seals
Rudderstock seals
Sterntube seals

Valcom Ltd. p 194

Antenna coupler system, HF
Electronic communication systems, MF, HF, VHF
Fibreglass whip antennae
Vertical antenna

Varian Canada Microwave Division p 193

Industrial and military power supplies
Klystrons
Klystrons amplifiers
Millimetre-wave klystrons

Versatile Davie Inc. p 196

Heavy steel fabrication, machining
Industrial engineering
Shipbuilding, commercial and naval
Ship repair

Versatile Pacific Shipyards Inc. p 197

Industrial engineering
Shipbuilding, commercial and naval
Ship repair

Versatile Systems Engineering Inc. p 198

Marine engineering services
Naval ship design, conceptual, preliminary and detail

Versatile Vickers Inc. p 199

Industrial engineering
Shipbuilding, marine and industrial
Ship repair

Victrix Limited p 200

Modular practice bombs
Pyrotechnics
Telescopic masts

Weatherhaven Resources Ltd. p 201

Portable shelters
Tarpaulins
Tents

Westinghouse Canada Inc. p 202

Sonar, anti-submarine warfare
Sonar simulator
Sonar test equipment
Towing condition monitor

*Techwest is a division of Fleet Aerospace Corp.

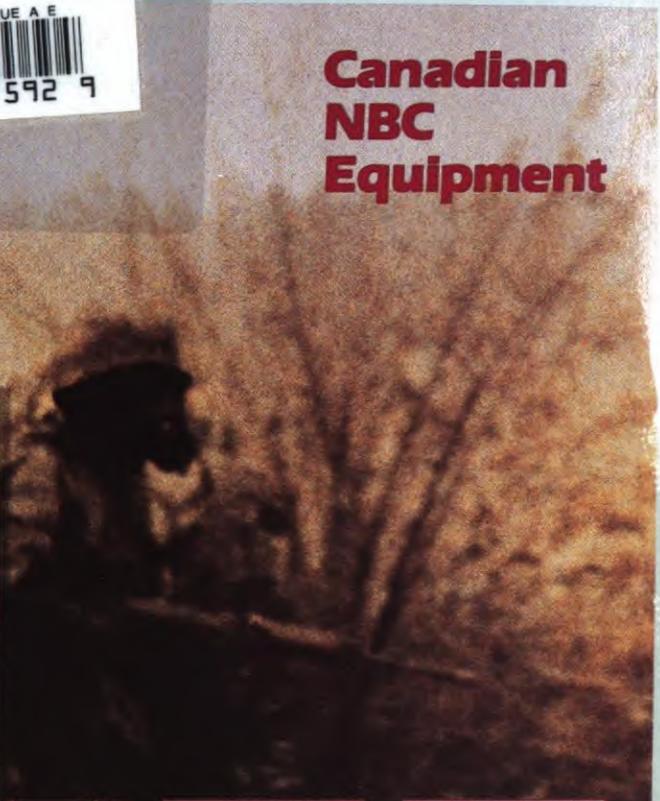
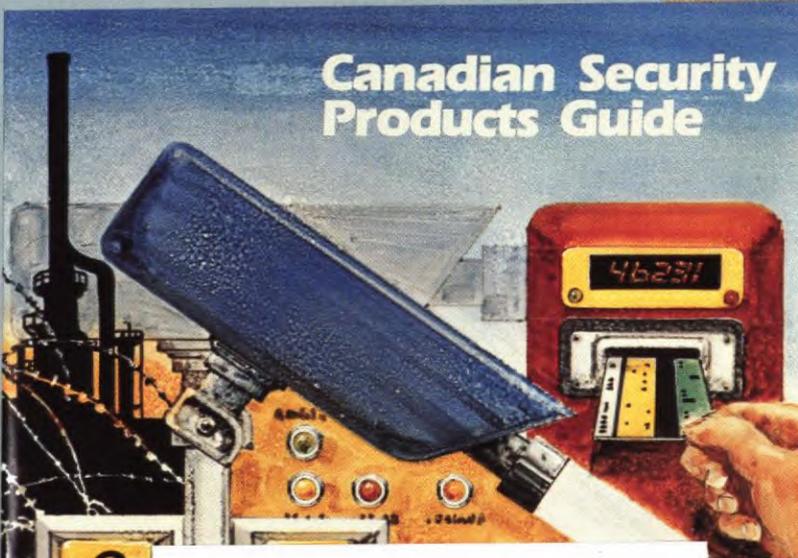


The following publications are available from your nearest Canadian trade office:

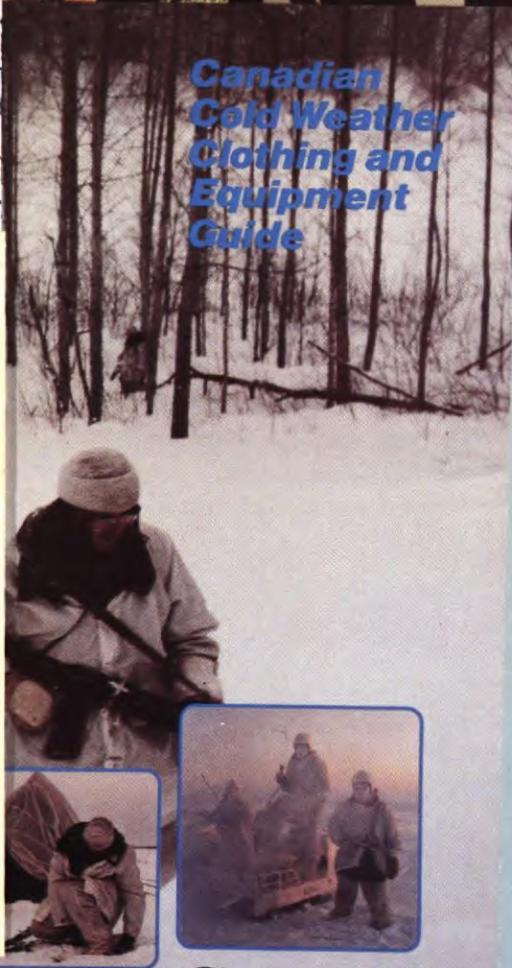
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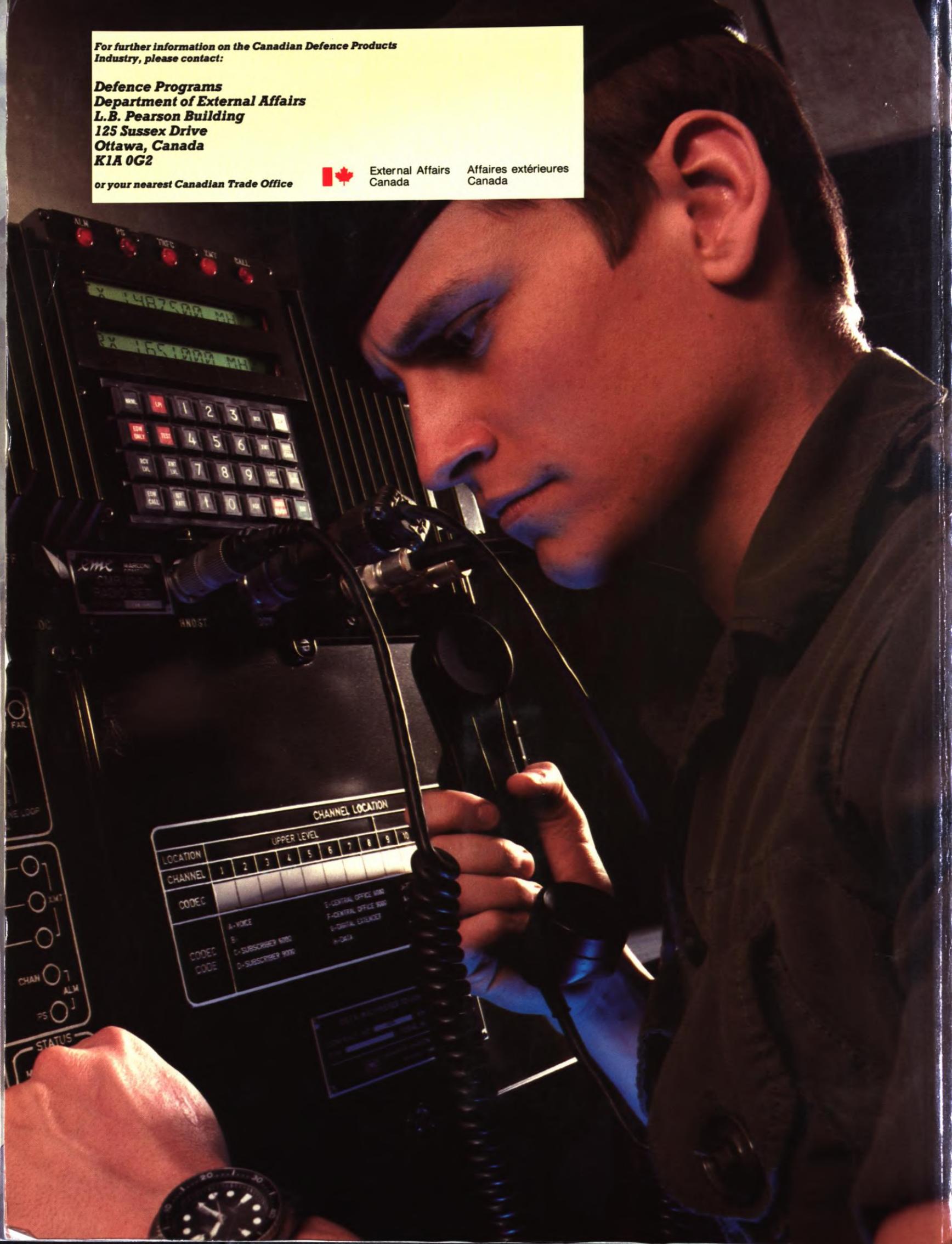
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									G-DIGITAL EXTENDER	
									H-DATA	