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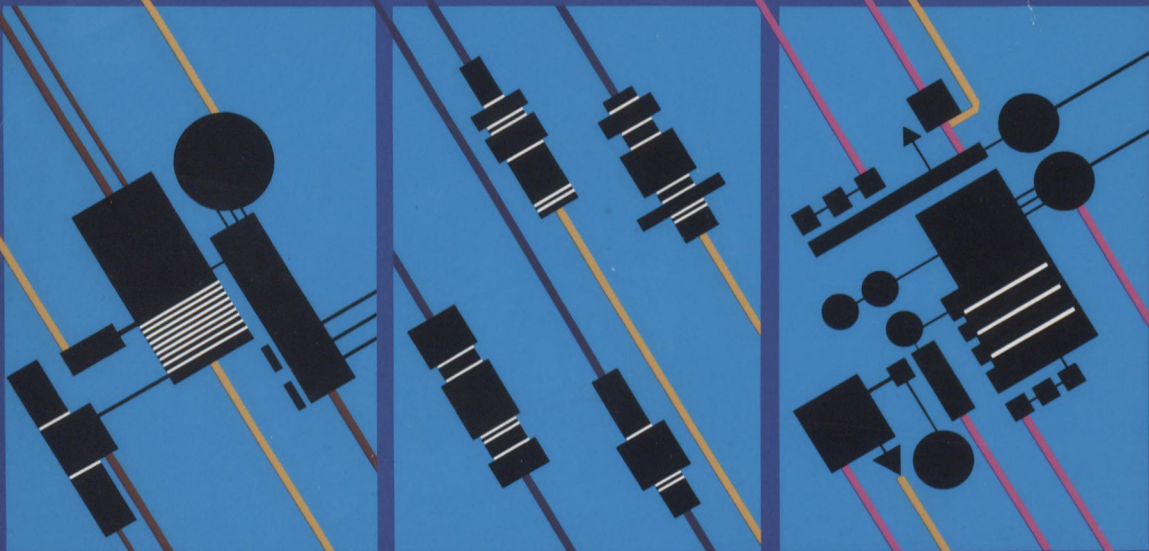
Canada

Power Supplies Connectors Assembly



▶ **A Capability
Guide**

1990





Canadian Capability Guide

- **Power Supplies**
- **Connectors**
- **Assembly**

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Industry Development Directorate
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Industry, Science and Technology Canada

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This brochure presents a profile of the capabilities of companies in Canada manufacturing power supplies and connectors and providing electronic assembly services. It is intended for a variety of users such as major information technologies corporations, in Canada and abroad.

Produced by Mrs. Kiran Mann, Industry Development Officer, under the direction of Mr. N. Ganapathy, Deputy Director, Telecommunications and Microelectronics Division, it is one of a series of capability guides promoting the international competitiveness of the Canadian information technology industry.

This is the second edition of the guide, and the intention is to update it periodically. Should your company wish to be included in future editions, please contact Industry, Science and Technology Canada at the above address.

We wish to thank the companies that provided the information contained in this guide.

Andrew J. Siman
Director
Industry Development Directorate
Information Technologies Industry Branch

April 1990



Electronic components of various kinds are the building blocks for electronic equipment. Companies manufacturing power supplies and connectors and those providing component assembly services form an important segment of the Canadian electronics industry. These companies supply products and services on a competitive basis to commercial as well as military markets in Canada and abroad. Consistent with the predicted growth in the electronics industry as a whole, the components subsector abounds in opportunities for product enhancement, market expansion and new investments.

Power Supplies

Products in this area range from small power supplies used in laboratories to uninterruptible power supplies for defence systems.

Canadian power supply companies are at the forefront in design, engineering and manufacturing techniques. These firms have achieved excellent export performance with state-of-the-art products. In addition to a variety of standard products, companies offer special purpose products such as magnetic amplifiers, regulators, FET switch-mode supplies and various power conversion equipment for standard and custom designs.

Canadian capabilities include the design and manufacture of products meeting various national standards such as CSA, UL, BSI and VDE. Products conforming to DND, NATO and U.S.

military standards are also available from power supply manufacturers in Canada.

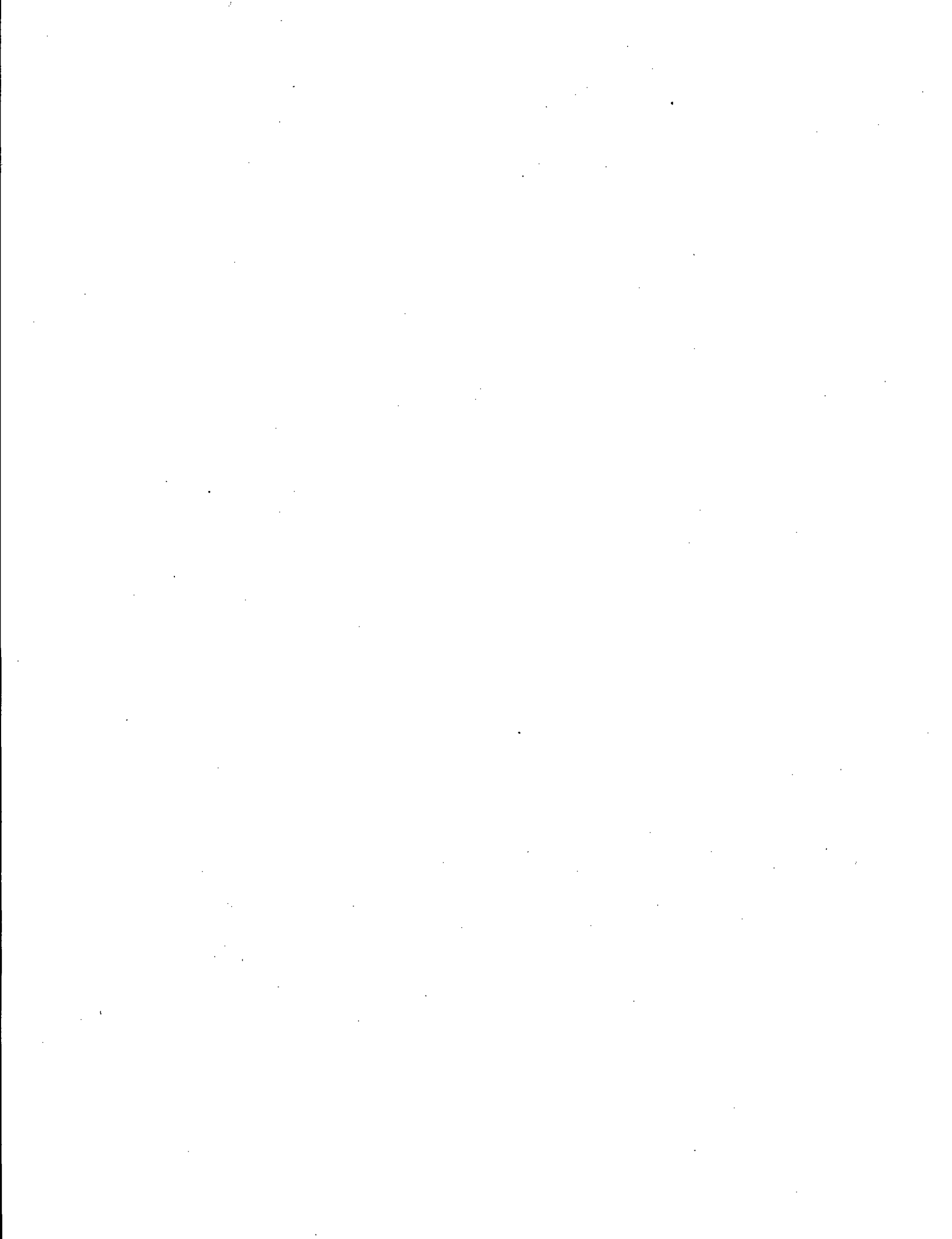
Connectors

Connector manufacturers offer innovative designs, advanced engineering and state-of-the-art manufacturing. The major markets served are telecommunications, business equipment, military, consumer electronics and instrumentation. Products are designed to meet applicable world standards and safety requirements, including protection from electromagnetic interference (EMI) and electromagnetic pulse (EMP).

Canadian companies are proven competitors in world markets, offering quality products with just-in-time (JIT) capability.

Assembly

The Canadian electronic assembly companies offer high quality, quick turnaround contract manufacturing services. Modern plants equipped with state-of-the-art manufacturing systems satisfy various board assembly requirements. These assembly houses work closely with large manufacturers of electronics systems to meet or surpass the most stringent specifications and quality standards as well as provide JIT delivery. The printed circuit board assemblies are used in telephone equipment, computer products, instrumentation and in demanding military applications. Some of these companies have the capability to undertake complex cabling and backplane wiring.



Power Supplies

Absopulse Electronics Ltd. 110 Walgreen Road Carp, Ontario K0A 1L0	3	CTS of Canada Ltd. 80 Thomas Street Streetsville, Ontario L5M 1Y9	12
ALI Technologies Ltd. Discovery Park Building Suite 320-3700 Gilmore Way Burnaby, B.C. V5G 4M1	4	CVDS Inc. 6900 Trans Canada Highway Pointe Claire, Quebec H9R 1C2	13
Alpha Technologies Ltd. 5700 Sidley Street Burnaby, B.C. V5J 5E5	5	Electronic Craftsmen Ltd. 73 Schaefer Street Waterloo, Ontario N2L 4C4	14
Analytic Systems Ware Ltd. 16 East 6th Avenue Vancouver, B.C. V5T 1J4	6	Exide Electronics Canada Inc. 380 Carlingview Drive Etobicoke, Ontario M9W 5X9	15
Brown Applied Technology Inc. 31 Progress Avenue Scarborough, Ontario M1P 4S6	7	Filtran Ltd. 229 Colonnade Road Nepean, Ontario K2E 7K3	16
Canadian Independent Power Products Inc. 7 Barrie Boulevard St. Thomas, Ontario N5P 4B8	8	GFC Power Ltd. 95 Curtis Drive Guelph, Ontario N1K 1E1	17
Canadian Instrumentation & Research Ltd. B7/8-5035 N. Service Road Burlington, Ontario L7L 5V2	9	Glenayre Electronics Ltd. 1570 Kootenay Street Vancouver, B.C. V5K 5B8	18
Canadian Marconi Company 2442 Trenton Avenue Montreal, Quebec H3P 1Y9	10	Global Thermoelectric Power Systems Ltd 400, 407-8th Avenue S.W. Calgary, Alberta T2P 1E5	19
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Modern Power Conversion Inc. 7100 Warden Avenue, Unit 3 Markham, Ontario L3R 8B5	22	Seastar Optics (Division of Seastar Instruments Ltd.) 2045 Mills Rd. Sidney, B.C. V8L 3S1	30
Murata Erie North America Ltd. Custom Power Supply Division 6338 Viscount Road Mississauga, Ontario L4V 1H3	23	Sparton of Canada Ltd. P.O. Box 5125 99 Ash Street London, Ontario N6A 4N2	31
Nife Corporation 125 Nantucket Boulevard Scarborough, Ontario M1P 2N8	24	Standby Electronics Corporation 3111 Woodchester Drive Mississauga, Ontario L5L 1J2	32
Phillek Electronics Ltd. 2471 Vauxhall Place Richmond, B.C. V6V 1Z5	25	Statpower Technologies Corporation 7012 Lougheed Highway Burnaby, B.C. V5A 1W2	33
Pylon Electronic Development Co. Ltd. 2300 Victoria Street Lachine, Quebec H8S 1Z3	26	Tectrol Inc. 39 Kodiak Crescent Downsview, Ontario M3J 3E5	34
Radacs Manufacturing Ltd. R.R.#3 Lakeshore Road Niagara on the Lake, Ontario L0S 1J0	27	Xantrex Technology Inc. 1584 Fell Avenue North Vancouver, B.C. V7P 3E7	35
Reliance Comm/Tec (Division of Reliance Electric Ltd.) 122 Edward Street St. Thomas, Ontario N5P 1Z2	28		

Connectors

AMP of Canada Ltd. 20 Esna Park Drive Markham, Ontario L3R 1E1	39	I.G.G. Electronics Canada Inc. 16, 318 Rg. St-Dominique St-Jerome, Quebec J7Z 5T4	46
Amphenol Canada Corporation 20 Melford Drive Scarborough, Ontario M1B 2X6	40	ITT Cannon Canada (Division of ITT Industries of Canada Ltd.) Four Cannon Court Whitby, Ontario L1N 5V8	47
B&L Coaxial Connections Ltd. 20-3251 Kennedy Road Scarborough, Ontario M1V 2J9	41	Murata Erie North America Ltd. Trenton Operations 5 Fraser Avenue Trenton, Ontario K8V 5S1	48
Burndy Canada Inc. 245 Renfrew Drive Markham, Ontario L3R 6G3	42	Pulse Tronic Connectors Inc. P.O. Box 5196 Ville St-Laurent, Quebec H4L 4Z8	49
Cable-Lock Connectors Ltd. 4272 Weston Road Weston, Ontario M9L 1W9	43	WECO Electrical Connectors Inc. 16805 Hymus Boulevard Kirkland, Quebec H9H 3L4	50
Compar Connectors (Division of DGW Electronics Corp.) 85 Spy Court Markham, Ontario L3R 4Z4	44	Weidmüller Ltd. 10 Spy Court Markham, Ontario L3R 5H6	51
Edac Inc. 40 Tiffield Road Scarborough, Ontario M1V 5B6	45	Woodhead Canada Ltd. 1090 Brevik Place Mississauga, Ontario L4W 3Y5	52



Assembly

Allendale Electronics Ltd. R.R.#1 Lockeport, Nova Scotia B0T 1L0	55	Digico Ltée 1980 Monterey Chomedey, Laval, Quebec H7L 3S3	63
Banton Industries Ltd. 10-2220 Northridge Drive Saskatoon, Saskatchewan S7L 6X8	56	Dowty Canada Electronics Ltd. 2000 Fisher Drive P.O. Box 4525 Peterborough, Ontario K9J 7B1	64
Bridge Integrated Technologies Inc. 951 Alness Street Downsview, Ontario M3J 2J1	57	GOC Electronics Inc. (Division of Ogivar Inc.) P.O. Box 200, 16 Lewis Street Oromocto, New Brunswick E2V 2G5	65
Brock Telecom Ltd. Manutronics 100 Strowger Boulevard Brockville, Ontario K6V 5W8	58	Harmic Design (Division of Three Port Manufacturing Ltd.) 7015 Tranmere Drive, Unit 17 Mississauga, Ontario L5S 1M2	66
Car-San Manufacturing Ltd. 611 Conrad Place, Unit 3 Waterloo, Ontario N2V 1C4	59	HI-Q.A. Inc. 1 Smythe Street, Industrial Park Carleton Place, Ontario K7C 4J4	67
CompAS: Computer Assembly Systems Ltd. 1245 California Avenue Brockville, Ontario K6V 5Y6	60	Iconopower Ltd. 5489 Canotek Road Gloucester, Ontario K1J 9G7	68
Component Mate (459128 Ontario Ltd.) 11-1120 Tapscott Road Scarborough, Ontario M1X 1E8	61	L.G. Technologies Ltd. 3675 Grande-Allée Street Boisbriand, Quebec J7H 1H5	69
Comterm Inc. Electronic Contract Manufacturing Group 545 Delmar Avenue Pointe-Claire, Quebec H9R 4A7	62	Link Technologies (Canada) Ltd. #10 - 8005 Alexander Road Delta, B.C. V4G 1C6	70



Assembly (continued)

LSI Logic Corporation of Canada Inc. 3410, 150-6th Avenue S.W. Calgary, Alberta T2P 3Y7	71	Tasque Technologies (Division of Stetron International Inc.) 141 Don Park Road Markham, Ontario L3R 1C2	78
Northern Telecom Canada Ltd. 100 Industrial Drive Grandview Industrial Park Saint John, New Brunswick E2L 4K8	72	Tech-Rep Electronics Ltd. 7115 Trans Canada Highway St-Laurent, Quebec H4T 1A2	79
Pachena Scientific & Industrial Electronics Inc. 1395 Boundary Road Vancouver, B.C. V5K 4T9	73	Tectrol Inc. Contract Division 39 Kodiak Crescent Downsview, Ontario M3J 3E5	80
Prestec Electronics Ltd. 1386 Star Top Road Gloucester, Ontario K1B 4V7	74	Tektron Equipment Corporation 230 Arvin Avenue Stoney Creek, Ontario L8E 2L8	81
QSDM Inc. 400 Matheson Blvd. East, Unit #34 Mississauga, Ontario L4Z 1N8	75	Tele-Radio Systems Ltd. 121 Hanlan Road Woodbridge, Ontario L4L 3P5	82
Surface Assembly Systems Inc. 30 Furbaucher Lane, #9 Aurora, Ontario L4G 3C9	76	The Surface Mount Technology Centre Inc. 183 Amber Street Markham, Ontario L3R 3B4	83
Task Micro-Electronics Inc. 8497 Dalton Road Town of Mount Royal, Quebec H4T 1V5	77	Zavitz Technology Inc. 104 Nordic Avenue Pointe-Claire, Quebec H9R 3Y2	84



Power Supplies



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Carp, Ontario
K0A 1L0**

**Contact:
Tony Szullo, President**

**Telephone: (613) 836-3511
FAX: (613) 836-7488**

Absopulse Electronics Ltd. designs and manufactures a complete line of power conversion equipment including DC/DC and AC/DC converters, DC output UPS systems, ringing generators as well as complete power systems in 48 cm (19 inch) racks. The company specializes in custom and semi-custom power supplies, made to a customer's exact specifications. Short turn-around time, high quality and competitive pricing are all part of Absopulse's market strength.

Absopulse, founded in 1982 and incorporated in 1984, is a privately owned Canadian company. Since its inception, the company has grown significantly and has recently completed Phase 3 of its 5-phase expansion plan. The third phase tripled manufacturing, testing and burn-in capabilities and allowed additional space for an expanded quality control department.

With 50 employees, Absopulse is small enough to satisfy custom requirements, yet large enough to handle any production quantity. The combination

of in-house trained staff and a close relationship with major assembly houses ensures that production capability is almost unlimited.

In the last two years Absopulse has introduced a range of standard, off-the-shelf converters to complement its custom designs. This has greatly increased its ability to satisfy a wide selection of customers in fields such as telecommunications, public utilities, computers, heavy industry, defense and transportation.

For standard units as well as custom designs, in-house certification for CSA, UL and TUV ensures that customers can ship their end products worldwide. Documented testing, EMI, hi-pot and burn-in procedures enforced by a stringent quality-assurance program ensure that the final product is of the highest quality.

With continuous research and design work, Absopulse strives to supply products that meet the latest requirements of the power supply market.



**Discovery Park Building
Suite 320-3700 Gilmore Way
Burnaby, B.C.
V5G 4M1**

**Contact:
Len Grenier, Vice-President Engineering**

**Telephone: (604) 433-3422
FAX: (604) 433-5712**

Corporate Overview

Advanced Light Imaging Technologies (ALI) is a computer technology company specializing in medical image management systems. ALI has developed a family of products called Optical Memory Subsystems (OMS). These devices are used to capture, digitize, process, database and archive to high-density media, ultrasound and low-contrast radiology images. OMS provides equivalent or superior quality images at lower cost than conventional film or video tape storage.

Power Supplies

The new series of Isolated DC Power Supplies from ALI Technologies Ltd. offers electronics manufacturers and designers the highest level of quality, reliability and flexibility in regulated

power supplies. The units conform to UL544 and CSA22-2 standards for medical electronics. Compact dimensions, lightweight, solid state components and flexible assembly are some of the attractive features of these sub-assemblies.

Applications

- Computers or electronics requiring from 30 to 200 W
- Medical and dental equipment requiring isolation
- Electronics where size, weight and temperature are limiting factors to power supply selection

United States Contact:
Mr. Graham Farley, V-P Marketing, Los Angeles
Toll-Free (Can. and U.S.): 1-800-663-2533

**5700 Sidley Street
Burnaby, B.C.
V5J 5E5**

**Contact:
Barry Oliver, International Sales Manager**

**Telephone: (604) 430-1476
FAX: (604) 430-8908**

Alpha Technologies Ltd. designs, manufactures, and markets a complete line of AC and DC power products for computer, telecommunications, and cable television applications.

These include a broad range of UPS systems, standby power supplies and line conditioners providing complete protection against power problems such as blackouts, brownouts, surge spikes, and noise. Telecommunications products

include rectifiers/battery eliminators, DC-DC converters and complete power boards.

Alpha Technologies has manufacturing facilities in Canada and the United States which serve markets in North America, Europe, the U.K., the Middle East, and northern Pacific Rim countries. All of Alpha Technologies' units are available in a variety of voltages and frequencies and are built to meet international standards.

Telex: 04-356760



**16 East 6th Avenue
Vancouver, B.C.
V5T 1J4**

**Contact:
J. Lloyd Hargrove**

**Telephone: (604) 875-0080
FAX: (604) 875-9117**

Design and Manufacture of Custom and Special Purpose Power Supplies and Power Line Conditioners.

Standard Products

- Model 7604-7F
 - 32 VDC to 13.6 VDC converter
 - 20 A continuous
 - 37 A peak

These products feature extremely low conducted and radiated noise for use with 150WSSB radio transceivers and other loads.

- Model 85174
 - Any DC to DC as required up to 500 W
 - Isolated input and output
 - Original product
 - 100 to 150 VDC in, 12, 24, or 48 V out, 35, 20, or 12 A

Isolating Power Conditioners

- Amtek Models 25 and 50
 - 300 VA and 600 VA, non-regulating
 - 65 db normal mode attenuation
 - 100 db common mode attenuation for IEEE 587 spikes
 - 15 kV PRI/SEC Isolation



**31 Progress Avenue
Scarborough, Ontario
M1P 4S6**

**Contact:
Don Eckhart, President**

**Telephone: (416) 298-0560
FAX: (416) 298-0806**

Brown Applied Technology designs, manufactures, and sells custom, semi-custom and standard Switch Mode Power Supplies (SMPS). Brown is related to the Stanford Applied Engineering worldwide family of companies, with facilities in California, Hong Kong, Colorado, China, New York and Toronto. Brown is a fully integrated company with in-house capabilities for all aspects of power supply manufacture, including magnetics at the Scarborough facility and high-volume low-cost assembly in the company's Hong Kong and China plants.

Brown's present customer base includes producers of the following products: Supermicrocomputers, Printer/Plotters, Disk storage systems, Engineering workstations, Network file servers, Portable personal computers, Mainframes, Modems, and Telecommunications products. Brown power supplies are known for advanced technologies with outstanding high quality and reliability with field-proven MTBF in excess of 300 000 hours.

In-house CSA certification, UL Compass Program, and designs to exceed major international regulatory standards such as VDE, IEC, TUV and FCC allow customers to ship their products worldwide with a certified power supply. Brown's facility operates under Martin Marietta workmanship quality standards with an MRP II inventory tracking system with SPC on all major process points.

The following features have been incorporated into Brown's products: 2-1 000 V output,

35-3 500 W total power, 85-264 V input continuous, auto selectable or by switch, 50-400 Hz input, greater than 0.244 W/cm³ (4 W/cu. in.) output, DC-DC, power factor conditioning, single phase active or three phase active or passive, integrated UPS capability (battery back-up), high voltage DC input.

Three different proprietary magnetic amplifier technologies are utilized for highly efficient rugged auxiliary output post regulation. High frequency current mode or resonance designs using MOSFETs, epitaxial and Schottky rectifiers and low loss ferrites yield small size, light weight, and fast response. A number of designs use Forward Converter topologies featuring high frequency (100 kHz) dual-MOSFET current mode operation. High and low volume custom designs are available with fast turnaround from design to production for cost effective projects. Brown's Engineering department can provide assistance for application review to help in packaging, thermal design, safety specs., cost reductions, total system integration. Brown provides the novel design approach to meet tough specifications with proven work-the-first-time designs. Brown's designs have a high peak-to-average ratio, enabling smaller power supplies to support large start-up currents for disk drives.

Brown Applied Technology Inc. provides power supplies to meet any system requirement and technological advantages to give your product a real competitive edge in the market.

Canadian Independent Power Products Inc.



**7 Barrie Boulevard
St. Thomas, Ontario
N5P 4B8**

**Contact:
John A. MacArthur, President and General Manager**

**Telephone: (519) 631-9133
FAX: (519) 631-4406**

Canadian Independent Power Products (CIPP) is a wholly owned Canadian company established in 1982 to serve the telecommunications market. CIPP is the sole distributor of Warren/Fiskars power equipment in Canada. In addition the company designs and manufactures power equipment in-house at CIPP's plant.

CIPP's product line includes

- Single-phase and Three-phase Controlled Ferro-resonant Rectifiers, 24 V or 48 VDC
Output ranging from 15 A to 800 A
- Single-phase High-Frequency Switch-Mode Rectifiers 24 V or 48 V
8 A to 100 A
- Ringing Generator Assemblies, including interrupters and tone generators for telecommunications

- High Frequency DC to DC Converters with various input voltages to 48 V, various output voltages to 130 V with outputs to 1 000 W
- DC to AC Inverters - 115/230 V - 500 VA, 1.5 kVA, 2.5 kVA, 5 kVA. Input voltage - 48 V
- Custom-made Power Distribution Plants

CIPP has the R & D capability to customize any of the above products to meet the customer's needs. In addition, the company can develop and manufacture specialty items.

All Sales, Marketing, and Production are located in CIPP's St. Thomas facilities.



**B7/8-5035 N. Service Road
Burlington, Ontario
L7L 5V2**

**Contact:
Michael Failes, President**

**Telephone: (416) 332-1353
FAX: (416) 332-1808**

Canadian Instrumentation & Research Ltd. manufactures a range of fibre optic products for both telecommunications and sensor applications. The company specializes in polarization-preserving components in high birefringence fibre for interferometric systems using optically contacted evanescent wave couplers and piezo-electric modulators. Canadian Instrumentation & Research also makes variable ratio couplers, fibre coils and sub-assemblies.

Other optical components include laser diode to fibre coupling optics, Fourier Transform lenses and a design service for custom optics.

The company manufactures laser diode power supplies, thermo-electric cooler control units and a variety of electronic board products for signal processing and fringe tracking. Complete turn-key fibre optic interferometers are produced to customer specification for sensor investigations and development.

**2442 Trenton Avenue
Montreal, Quebec
H3P 1Y9**

**Contact:
Rolf Seiler, Div. Business Development Manager**

**Telephone: (514) 341-7630
FAX: (514) 340-3100**

Canadian Marconi Company (CMC) manufactures innovative and highly reliable systems and components for commercial and defence applications in avionics, communications and radar. Over 80% of its products are exported, to markets in more than 100 countries worldwide.

Power Systems and Specialized Electronics Components Group

This group fully complies with the stringent power and signal conditioning needs of the military/aerospace industry in North America and overseas. The group is completely self-contained in terms of engineering design and manufacturing.

As part of the Components Division, it is strategically nested in an organization that designs and manufactures the critical components required to produce high reliability power systems. These critical components include hybrid microcircuits, printed circuit boards, transformers, chokes and precision metal parts. A complete MIL environmental testing facility supplements the group's capabilities. This vertical

integration permits cost competitiveness, excellent quality control and delivery performance for the design and manufacture of complex power systems.

The group's product range includes very high power density, power conditioners (0.488 - 0.610 W/cm³ or 8-10 W/cu. in.), regulators, multi-channel power supplies for land (both fixed and equipment) and airborne applications. In addition, the group designs a wide range of MIL components that includes magnetics, RF filters, power dividers, EMI filters and special hybrid packages, combining magnetic and RF devices.

CMC is approved to WS6536E, AQAP-1 and intends to upgrade to MIL-STD-2000 in the near future.

Canadian Marconi is a valued supplier of power systems and magnetic products for such companies as CDC, Northrop Corp., General Dynamics, Rockwell, etc.

Telex: 05-827822



**30 Progress Avenue
Scarborough, Ontario
M1P 4W8**

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Peter Soma, General Manager**

**Telephone: (416) 299-6666
FAX: (416) 299-8398**

Criterion Instruments Limited has been manufacturing power supplies for more than 50 years. These include units with AC or DC outputs, covering a very wide range of voltages, currents, and power. Both regulated and unregulated models are available. Other features and options available on most or all models include:

- Fixed or Variable Output
- Short-circuit Protection
- Analog or Digital Meters
- Linear Regulators (DC) — very low EMI
- Overvoltage Protection
- Reverse Voltage Protection
- Remote Sensing
- Timers
- Special Alarm Circuits
- Current or Voltage Trip Relays
- Regulation of Voltage, Current or Power

Criterion Instruments' customers include governments, public utilities, universities, manufacturing companies and laboratories. In addition to a range of standard models Criterion Instruments thrives on "specials" — units custom-built to your specific requirements — whether you need only one, or hundreds.

Criterion Instruments is recognized by CSA, the Electrical Manufacturing Industry and the Electric Utility sector as a qualified manufacturer of custom test equipment to satisfy the ever-varying requirements brought about by more stringent test specifications imposed upon current electrical products for reasons of improved quality, energy management and user-safety considerations.

Automatic Test Equipment - Custom Designs

A broad variety of both manual and automatic sequential testers is offered to satisfy the needs of both high and low volume applications. High voltage, high current, leakage current, insulation resistance, element resistance, ground continuity and operation timing are some of the features that can be combined in these units.

Cable: Canexia Toronto

**80 Thomas Street
Streetsville, Ontario
L5M 1Y9**

**Contact:
R.J. Holmes, Operations Manager**

**Telephone: (416) 826-1141
FAX: (416) 858-9058**

CTS ... specialists in custom and standard designed power solutions.

From micro-computers to warships ... nuclear generating stations to telecommunications systems ... today's power engineers and consultants are challenged by more demanding and stringent power supply requirements than ever before. Knowledgeable users look to CTS as the Canadian source of Static Power Conversion products to fulfill their requirements. CTS applications engineers are available to discuss your individual needs. The CTS solution will be based on 40 years of supplying static power conversion equipment to Canadian industry. CTS custom or standard designs, utilizing state-of-the-art techniques, will provide reliable and maintenance-free equipment tailored to your unique requirement.

Product Line

- DC Power Supplies
- Battery Chargers
- Degaussing Rectifiers
- Helicopter Starting Rectifiers
- DC-DC Converters
- AC-AC Frequency Converters
- AC Power Supplies
- DC-AC Inverters
- Static Switches
- Uninterruptible Power Supply

Telex: 06-97508

**6900 Trans Canada Highway
Pointe Claire, Quebec
H9R 1C2**

**Contact:
Gerry Sullivan**

**Telephone: (514) 694-9320
FAX: (514) 694-0786**

CVDS Inc. specializes in the custom design, development and manufacture of a wide range of sophisticated electronic equipment including voice/data communications equipment, control and monitoring systems, and high reliability switching power supplies.

CVDS has developed a very strong expertise in the field of power conversion, producing a great variety of open-frame and encased switching power supplies, whether OEM or custom designed. CVDS has the capability to manufacture reliable, high-efficiency power supplies in great volume.

CVDS employs some very innovative circuits and advanced technologies such as current-mode PWM controllers and cross-regulation techniques. Other features are: low component count, high reliability, low stress factors, high efficiency levels, built-in test (BIT), output and input supervision circuits, very low output noise. EMI performance is planned during the design phase to meet the requirements of MIL-STD-461 and MIL-STD-462.

CVDS's application of state-of-the-art techniques in the synthesis of new switching topologies has resulted in the production of a series of standard

circuit modules that can be tailored to customer specifications. Design and manufacturing are supported by a fully documented and approved Quality Assurance program and strict quality control procedures. Military requirements for deliverable data, component traceability, and MTBF analysis techniques receive full compliance.

CVDS high-efficiency power supplies are certified with major regulatory agencies such as CSA and UL and are approved by VDE in their specific applications.

The CVDS Engineering department is geared to handle the most challenging product development tasks in all areas of electronics engineering for military or industrial applications:

- DSP and Microprocessor Design
- Hardware and Software Design
- System Design and Integration
- Radio Frequency Communications
- Analog and Digital Telecommunications
- Optical Integrated Broadband Communications

Toronto - Marla Kalapati
Telephone: (416) 840-0600
FAX: (416) 840-0881
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**73 Schaefer Street
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**Contact:
Alex Leslie, Chief Engineer**

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Electronic Craftsmen Ltd. is a specialist in the development, design and manufacture of a wide range of magnetic components. Each application is considered a special case and is scrutinized to optimize the design both electrically and mechanically. The fully equipped lab at Electronic Craftsmen facilitates full testing of each design before and during production.

Electronic Craftsmen's Production and Quality Control departments work in conjunction with the Engineering department to produce components of the highest quality on some of the most sophisticated equipment available today.

Electronic Craftsmen is able to offer: design and prototype or design, prototype and manufacture, as well as built-to-print for a vast array of magnetic components and power supply products.

Magnetic Components

- Power Transformers:
CSA-approved custom transformer program
- Inductors:
High, low, band pass filters up to RF ranges
- Switch Mode Magnetics:
Transformers: push-pull, forward converters, flyback. Output Inductors
- Audio Transformers:
Voice, data, applications-hybrid types, high fidelity for studio applications

- Control Transformers:
25 VA and up to 3.6 kVA
- Current Transformers:
Torroidal and laminated types
- Ferro-Resonants and Constant Voltage Transformers: AC feedback types, rectifier units matched 3 phase units 20 VA to 3 kVA 50/60 Hz
- Three Phase Transformers:
Up to 6 kVA conventional, up to 12 kVA auto-transformer types

Electronic Craftsmen also has facilities to varnish, vacuum impregnate, mould and cast all of the above parts.

Power Supplies

- Switch-Mode: Open-closed frame
Up to 2 000 W
AC to DC
DC to DC
To CSA, FCC, UL and VDE standards
- Linear Supplies: Open - closed frame
To 2 000 W
AC to DC
To CSA, FCC, UL and VDE standards

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**Contact:
Mike McLagan, Vice-President & General Manager**

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Exide Electronics Canada Inc. manufactures a range of static uninterruptible power systems (UPS) in the range 10 to 750 kVA, 50 and 60 Hz three phase, 350 VA to 10 kVA single phase and 50/60 to 415 Hz frequency converters. High reliability solid-state modular design with built-in diagnostics and self-test features permit ease of maintenance with minimum downtime. Exide Electronics' systems provide back-up power for a broad cross-section of utility, transportation, hospitals, defence and security installations, as well as for telecommunications requirements.

Exide Electronics' systems are used by major Canadian telephone companies and banks. The company is a prominent supplier for projects initiated by the Canadian International Development Agency and OEM turnkey suppliers. Recent large contracts include the supply of: Megawatt

UPS for Romanian reactors; 21 systems to Spar Aerospace for earth satellite systems in China; and an on-going supply of systems to Hughes Aircraft for integration into earth ground stations around the world. The company has exported to the U.S., Swaziland, Bermuda, the Caribbean and Central/South America. Exide Electronics Canada Inc. is a wholly owned subsidiary of U.S.-based Exide Electronics Corporation, and has been established in Canada for over 15 years. Exide Electronics is involved in research and development and produces a range of UPS equipment for computers. These systems range from 350 VA single phase to 750 kVA three phase in single units. Larger modules may be paralleled for redundancy or for higher power configurations.

**229 Colonnade Road
Nepean, Ontario
K2E 7K3**

**Contact:
P.W. White**

**Telephone: (613) 226-1626
FAX: (613) 226-7124**

Filtran Limited was founded in 1969 to produce filters, frequency selective networks, and transformers of all kinds with special attention to telecommunications applications and a broad range of inductors and related products.

Filters

- Passive or active, Band pass, Band stop, High pass, Low pass

Transformers

- Power transformers with power rating from a few Watts up to 30 kVA
- Audio frequency
- RF and IF
- Special telephone coupling transformers (Filtran is the approved manufacturer for all current ISDN applications.)

Inductors

- Power chokes
- Precision
- Tunable
- Miniature

Power Supplies

- Linear and switched mode, DC-DC converters

Filtran designs and produces filters, transformers and inductors for almost every equipment manufacturer in Canada. It exports all over the world and its telecommunications products are standard with many post and telegraph administrations.

As a natural outgrowth of its ability to design and manufacture magnetic parts for power supplies, Filtran now designs and manufactures complete supplies to customers' specifications. These can be linear or switched mode of all types. The power supplies can be built to CSA, UL or any other international standard. Construction is to the best commercial or military standards.

Filtran has a comprehensive Quality Assurance program based on AQAP-4 and has applied for approval to AQAP-1 less part 207.

**95 Curtis Drive
Guelph, Ontario
N1K 1E1**

**Contact:
David Oliver, Director of Sales**

**Telephone: (519) 763-3051
FAX: (519) 822-9537**

GFC Power Ltd. is active in two main areas:

- Open Frame Linears - Standard Catalogue Products; and
- Multiple Output Open Frame Switches - Standard and Custom Products.

Linears

GFC Power's "Global Series" linear power supplies are designed and manufactured to meet international specifications and safety requirements and are certified by CSA, UL, IEC and TUV. The Global Series encompasses 42 models of single, dual and triple output units which are all interchangeable with standard open-frame linear supplies from other sources around the world. These competitively priced supplies have some unique standard features such as delayed re-entrant current limiting, forced current sharing and remote inhibit.

Switchers

GFC Power's standard group of switchers ranges between 50 and 400 W, from which the company produces a wide variety of "modified standard" products tailored to specific customer re-

quirements. In addition, GFC Power designs and manufactures custom supplies. This double-barrelled approach to satisfying customers' requirements quickly provides customers with quality, proven designs in a time frame acceptable to meet project needs.

The company's modern, air-conditioned factory in Guelph is equipped with the latest production and automatic test equipment for high quality products delivered on time at competitive prices.

In addition to the design and manufacturing facility in Guelph, GFC Power also provides high volume manufacturing from a Far East facility in Seoul, South Korea, a 51% owned joint venture.

**1570 Kootenay Street
Vancouver, B.C.
V5K 5B8**

**Contact:
Patrick McNamara, International Sales Manager**

**Telephone: (604) 293-1611
FAX: (604) 293-4340**

Glenayre Electronics Ltd., with headquarters in Vancouver, BC, specializes in the engineering, manufacture, and installation of advanced communications systems, including mobile and fixed radio-telephone, radiopaging, data and text management systems, RF base stations, transmitters, transceivers, repeaters, radio modems, and ultra reliable power conversion equipment.

The power products fall into two families:

The GL 2900 Series offers a range of lightweight DC-DC converters designed for continuous duty service on railroad engines and other transit systems. Designed to deliver a clean, well-regulated 13.6 VDC output, these converters will power even sensitive electronic equipment or accessories. The 2900 converters feature very high efficiency circuitry, and superb surge and transient suppression techniques. All output loading conditions are managed by an advanced

electronic current-limiting circuit. The series is available in a variety of input voltages from 36 to 130 VDC, output currents to 16 A, and is a standard with the American Association of Railroads.

The GL 2860 Series is designed as a complete range of general purpose DC-DC converters ideally suited to mobile radio, telecommunications, and other industrial applications requiring a regulated 12 VDC supply. Adjustable over the range of 12-14 VDC, at currents up to 15 A, this switched mode power supply is fully isolated input to output to chassis. The unit may be paralleled for high current output.

Both series are available with standard and custom mounting options including alarm and metering for specialized applications.

Telex: 04-354808 GLENAYRE

**400, 407-8th Avenue S.W.
Calgary, Alberta
T2P 1E5**

**Contact:
W.G. Lancaster, President**

**Telephone: (403) 264-4343
FAX: (403) 262-5279**

Global Thermoelectric Power Systems is a supplier of highly reliable, low maintenance power systems. Using thermoelectric generators and solar panels, Global provides power for applications requiring from 10 W to 6 000 W. Global provides power supplies for numerous applications including cathodic protection, remote radio repeaters, data gathering, SCADA and navigational aids.

Thermoelectrics turn heat directly into electricity without any moving parts. Global manufactures portable and stationary thermoelectric generators. The generators require very little maintenance,

are silent and have an extremely long operating life. The generators burn gaseous fuels such as propane and natural gas or liquid fuels such as diesel.

Global's products are in use on all seven continents. Innovative, state-of-the-art thermoelectric devices are currently under development, and Global has an on-going commitment to continued research and development in the application and enhancement of thermoelectric technology and other power conversion methods.

Telex: 03-824680 GLOBAL TEG CGY

**5489 Canotek Road
Gloucester, Ontario
K1J 9G7**

**Contact:
Connie Grace, President**

**Telephone: (613) 744-3670
FAX: (613) 744-8452**

Custom-Designed Switching Power Supplies with Power Ratings of 25 to 500 W and Up.

Iconopower started to design and manufacture switching power supplies in 1983 at the request of customers who were using power semiconductors in harsh environments. Since then, Iconopower has incorporated the most reliable components available and designed mechanical configurations that will operate in extremes of temperature, sustained vibration and repeated shock.

Iconopower's designs comply with popular North American and European standards. Packaging includes U-channel, open frame, Eurocard and modular. Power density of up to 0.18 W/cm^3 (3 W/cu. in.). Output voltages range from 12 to 400 VDC. Multiple outputs with parallelling capabilities and modular systems to increase output ranges are also available.

Iconopower's power supplies are now being used in the following areas:

- Electrical utilities in Canada and the U.S. in load management systems

- Telecommunications companies for satellite ground terminals
- Railroads for locomotive instrumentation
- Grain elevators for automatic weighing systems
- Mining companies for remote underground vehicles
- Rapid transit systems for public address systems
- Microprocessor controlled systems
- Ground-to-air communications in air traffic control
- Telephone systems for coordinating emergency services

To keep ahead in today's competitive market place, Iconopower is involved in constant R & D to improve power densities and efficiencies and to increase the output power of single supplies.

Telex: 053-4898

**150 Bluewater Road
Bedford, Nova Scotia
B4B 1G9**

**Contact:
Leamund Williams, Program Manager**

**Telephone: (902) 835-7268
FAX: (902) 835-6026**

Manufacturer of Electronic Equipment for land, marine and aviation applications.

KB Electronics designs and manufactures state-of-the-art, static electronic conversion equipment in its modern 3 716 m² (40,000 square foot) facility located in the suburbs of Halifax, Nova Scotia. Its facilities are self-sustaining and include CAD systems, a computer-based environmental test facility, a light metal fabrication shop with painting and plating capability, and a modern assembly department. Its quality system is documented to comply with the requirements of the NATO countries and is recognized by major North American contractors in the defence industry.

KB's military products are designed specifically to provide superior performance and reliability in a demanding environment. By applying advanced solid-state technology and the use of modular

components to the complex and sophisticated requirements demanded of defence systems, KB's products offer major benefits to its customers. Furthermore, the equipment has been designed to minimize the weight and size of the units, and to withstand severe physical and environmental operating conditions. KB's military product lines include:

- Uninterruptible Power Supplies
- Static Frequency Changers
- Helicopter Starters
- Battery Chargers
- Power Supplies

KB Electronics also designs and manufactures power supplies, converters, inverters, and battery chargers for commercial and industrial applications.

Telex: 019-21779

**7100 Warden Avenue, Unit 3
Markham, Ontario
L3R 8B5**

**Contact:
Paul Tennyson, Sales Manager**

**Telephone: (416) 477-3387
FAX: (416) 477-0482**

Modern Power Conversion (MPC) has long been recognized as a leader in FET switch mode power supplies. The initial prototype took a full three years to develop. That project established a total approach to quality – a pattern for perfection that continues today.

Modern Power Conversion is constantly striving for greater power supply performance. The company invests heavily in research and development and works closely with OEMs. MPC's success in meeting challenge after challenge has earned it some of the industry's most sought-after contracts.

Modern Power Conversion produces power supplies for a variety of applications including telecom, consumer, medical and the computer-related equipment industry. Power FET technology at MPC has resulted in power supplies that are more power-efficient, run cooler, and are easier to adapt than their bipolar counterparts.

Products

Standard: Single and multiple output, selectable international AC inputs, 100 to 600 W.

Modified Standard: All standard products are extremely flexible by design and can be adapted to new applications very quickly.

Custom: DC-DC converters and industrial, mobile, medical, high temperature, and high density custom power supplies are MPC's specialty.

Capabilities and Facilities

MPC can meet virtually any customer requirement, whether for an off-the-shelf power supply or a completely purpose-built unit. All units are

rigorously tested, burned-in and subjected to quality-control inspections at every stage of production.

Quality Assurance

Producing the most technologically advanced power supplies demands a state-of-the-art quality assurance program.

Modern Power Conversion's system flow complies to AQAP-4 (MIL-I-45208A) with integration techniques to the AQAP-1 level. All components and raw material are subjected to an acceptable quality level of 1.0 in conjunction with MIL-STS-105D inspection sampling procedure.

Adhering to the CSA Custom Rectifier Program, MPC is authorized to do all testing in-house with final approval by CSA. Production practices are referenced through a Workmanship Standards Manual and conform to the specification set by MPC's engineering department.

The calibration program AQAP-6 (MIL-C-45662A) provides control and accuracy of measuring and test equipment to ensure that MPC's power supplies conform to every possible technical requirement.

Approvals

Modern Power Conversion designs standard power supplies to conform to the requirements set forth by the world's major safety agencies. MPC's approval operation is involved with CSA, UL, VDE, and 3-CFTSA DND Military certifications.

Custom Power Supply Division
6338 Viscount Road
Mississauga, Ontario
L4V 1H3

Contact:
Greg Anderson, Sales and Marketing

Telephone: (416) 676-9484
FAX: (416) 673-1952

Murata Erie's modern well-equipped custom power supply operation has been serving the industry for over twenty years. Originally started in Trenton, Ontario, this forerunner in the field of modern power supply and custom packaging technology has emerged as an industry leader in the fields of military, medical, commercial and industrial electronics.

Design Capabilities

- DC-AC Input(s) - 5 V to 270 V
- Low Voltage Outputs - 1V to 1 000 V
- High Voltage Outputs - 1 000 V to 140 kV

- 100% Military Low Voltage Power Supplies - Semi-Custom and Custom
- 100% Military High Voltage Power Supplies - Semi-Custom and Custom
- 100% Military DC-DC Converters - Semi-Custom and Custom

- Hi-Rel/Medical Low Voltage Power Supplies - Semi-Custom and Custom
- Hi-Rel/Medical High Voltage Power Supplies - Semi-Custom and Custom

- Sub-Contract Assembly - Surface Mount Technology (SMT)

Technology

As a leader in the fields of advanced ceramics, metal engineering, electronics, electrochemistry, and electromechanics, Murata Erie applies complete scientific understanding to every aspect of the power supply design and manufacturing process.

Joint Custom Designs/Short Lead Times/Quality Assurance

Short development/manufacturing lead times are achieved through state-of-the-art circuit and manufacturing technologies combined with advanced design tools, including CAD and CAE. Murata has a full range of in-house facilities for environmental and other reliability tests. This, combined with formal design release test plans, assures uncompromised product design verification. Vertical integration of existing Murata Erie devices with in-house coil winding and encapsulation facilities provides superior control of critical components for the end product.

Telex: 06-968013

**125 Nantucket Boulevard
Scarborough, Ontario
M1P 2N8**

**Contact:
Gary Pollock, International Sales Manager**

**Telephone: (416) 757-5151
FAX: (416) 752-4514**

Nife Corporation, founded in 1944, manufactures Uninterruptible Power Supplies, Battery Chargers/Rectifiers, Power systems for Telecommunications, Industrial Truck Chargers, and AC Voltage Regulators. Nife also owns the patents of Thomas Edison and Waldemar Jungner for Nickel Cadmium batteries.

Nife Corporation is a designing, engineering, and manufacturing facility, part of a worldwide group of 20 related companies, all of which are solely involved in the power electronics/batteries field.

Product Descriptions

UPS:

- Custom-built and standard designs from 500 VA to 225 kVA. Transistorized PWM and traditional ferro-resonant designs are employed. These are commonly used for industrial applications involving non-linear computer loads and harsh electrical environments. Client list is international.

Battery chargers/Rectifiers:

- SCR type devices for use with or without batteries. These designs encompass single phase, two SCR configurations to three phase twelve SCR configurations. Supplied to the international market.

Telecommunications:

- Custom built power plants utilizing switch mode rectifiers. Systems are operating in central offices, microwave repeater stations, underground installations, and fibre optic applications. Outputs of 24 VDC and 48 VDC from 15 to 2 000 A are standard. They are fabricated for an international market.

Industrial Truck chargers:

- Automatic charging of lead acid batteries utilizing a microprocessor control system that matches the rectifier to the batteries and application.

AC voltage Regulators:

- Solid state regulator that is used to filter line variations for critical loads in harsh electrical environments. The client list is international.

Telex: 06-963757

**2471 Vauxhall Place
Richmond, B.C.
V6V 1Z5**

**Contact:
Philip Pong, President**

**Telephone: (604) 270-4642
FAX: (604) 270-8343**

Philtek Electronics Ltd. was established in 1976 in response to the need for high quality power conversion equipment. Manufacturing plants in Canada (Richmond, B.C.) and the United States (Bellingham, Washington) now produce a range of products including:

- Uninterruptible power supplies (UPS) — sizes from 300 VA to 20 kVA
- DC to AC inverters—sizes from 300 VA to 10 kVA
- AC to DC power supplies
- Industrial battery chargers
- DC to DC converters
- Battery enclosures
- Frequency converters
- Custom-designed power conversion equipment

Philtek has extensive experience in the design, engineering and production of these devices. This experience, and ongoing research and development of conversion equipment, assures advanced-design products and continuous improvement of our standard units.

All Philtek manufacturing facilities are certified by the Canadian Standards Association (CSA) — an internationally recognized testing laboratory.

**2300 Victoria Street
Lachine, Quebec
H8S 1Z3**

**Contact:
Louis Mandel, General Manager**

**Telephone: (514) 637-1186
FAX: (514) 636-1970**

Pylon designs and manufactures power conversion equipment and systems for the telecommunications and utilities business. This year, the company celebrates 35 years of continuous service to these industries. With a strong emphasis on Research and Development, Pylon has maintained a leading edge in power conversion technology. Sales are mainly to North American markets; however, a significant proportion of products are destined for overseas markets worldwide.

Standard products include a line of DC to AC inverters, ranging from 250 VA to 3 000 VA for single units, in the 24 VDC to 250 VDC input voltage range. Custom input and output voltages as well as output frequencies are available. Units can be paralleled for redundancy or for increased power, and maximum system power output currently offered is 12 kVA.

Battery Chargers include both linear and switch mode, available in either 24 VDC or 48 VDC. Specially designed battery test sets permit the verification of battery integrity of large capacity cells, such as those found in Telephone Central Offices. Telecommunication grade Battery

Eliminators (power supplies) are also available in 24 and 48 VDC.

A line of standard DC to DC converters ranges from 12 VDC to 250 VDC. These are delivered either as single units or in multiples as complete systems.

An extensive choice of fusing, distribution and alarming panels can be added as accessories to provide a "turnkey" power plant.

The company also manufactures a line of true uninterruptible power supplies (UPS), ranging from 150 VA to 1 200 VA. Backup times are available to suit individual applications. Pylon UPSs may also be used as frequency converters such as 50 Hz to 60 Hz and vice versa.

Pylon manufactures equipment to comply with numerous standards and practices such as Martin Marietta workmanship, CSA, UL, Bell Northern, AQAP-4 and certain MIL standards.

Telex: 05-821680

**R.R.#3 Lakeshore Road
Niagara on the Lake, Ontario
LOS 1J0**

**Contact:
Peter Wiertz, General Manager**

**Telephone: (416) 937-3464
FAX: (416) 646-5909**

Radacs Mfg., located in Niagara on the Lake, Ontario, specializes in the design and manufacture of regulated DC power supplies and transceiver remote control equipment. DC power products are low-noise types developed for radio and telephone communications systems, as well as voltage conversion for mobile radio installations. The power products fall into three categories:

Linear Regulators

These power supplies are operated with 120 VAC inputs and provide well-regulated and very low noise outputs of 13.8 VDC. All Radacs linear power supplies feature high efficiency, high reliability and output protection circuits to ensure fail-safe operation. Radacs linear power supplies are available up to 60 ADC (830 W).

Switching Regulators

Radacs presently manufactures a high efficiency 24 to 12 VDC converter with output current

capability of 12 ADC. It is output protected, and designed to withstand high mechanical vibration and ambient moisture levels without failure. A positive ground to negative ground switching converter is also available featuring the same rugged construction and reliability.

Battery Backup Systems

Radacs Mfg. produces battery backup systems for use with 12 VDC regulators. These systems provide controlled charging of battery banks and voltage sensing circuits to transfer loads in the event of a power failure. Alarms for transmitter modulation are incorporated in these products, ideally suited to radio communications installations. Radacs battery backup systems are available for switching up to 30 A of load current.

(Division of Reliance Electric Ltd.)
122 Edward Street
St. Thomas, Ontario
N5P 1Z2

Contact:
Dan Erskine, General Sales/Marketing Manager

Telephone: (519) 631-0780
FAX: (519) 631-0359

Reliance Comm/Tec handles the complete line of products categorized below for the Canadian Market.

Lorain Products:

- Rectifiers, powerboards, DC-DC Converters, Ringing and Tone Equipment, Inverters, UPS, Power Supplies.

R-Tec Systems:

- Loop Extenders, Voice Frequency Repeaters, Analog/Digital Loop Carrier System, Advanced Fibre Optic Transmission Systems, Credit Card Paystations.

Reliable Electric/Utility Products:

- Central Office Apparatus, Interface/Cross Connect Terminals, Splicing and Distribution Products, Station/Building Entrance Equipment, Distribution Fittings and Tools.

Test Systems:

- Automated Subscriber Loop Test System, Digital and Optical Fibre Test Systems, Facility Monitoring and Reporting Equipment.

Manufacturing

Reliance Comm/Tec has been manufacturing telecommunications equipment in Canada since 1959. The plant in St. Thomas includes 4 831 m² (52,000 square feet) of manufacturing space and administrative offices; it currently employs 200 people.

In addition to final assembly and testing of finished units, Reliance Comm/Tec also fabricates all the sheet metal parts, magnetic units, PC board assemblies, wire harness and sub-assemblies required on the company's products.

Major Customer Listing

- Bell Canada
- B.C. Telephone Company
- Alberta Government Telephones
- Saskatchewan Telecommunications
- Manitoba Telephone System
- Maritime Telephone & Telegraph Co. Ltd.
- N.B. Telephone
- Honeywell Ltd.
- Quebec Telephone
- Newfoundland Telephone
- Cantel
- Bell Cellular
- B.C. Cellular

Engineering

The Engineering department in the St. Thomas facility has nine people supporting the traditional Comm/Tec product lines and providing customized power designs to suit the Canadian Telecommunications market. R & D employs an additional 5 people. In addition to the in-house resources, Reliance Comm/Tec contracts Canadian research and development consultants on an as-required basis. The company is also supported by the extensive resources of a sister division in Lorain, Ohio, with an Engineering staff of 126 people.

**196 Queen Street N.
New Dundee, Ontario
N0B 2E0**

**Contact:
Ed Ritz, General Manager**

**Telephone: (519) 696-2616
FAX: (519) 696-2670**

Ritz Electronics Ltd. has been in business for 17 years. It is comprised of three divisions: electronic, metal and wood fabrication.

The electronic section has R & D prototype facilities, including capabilities for production runs.

Ritz Electronics specializes in the design and production of linear power supplies in cabinet and open-frame versions including off-the-shelf and custom units.

Magnetic regulated power supplies in the same configurations as the linear units are also available. These units are especially adapted to

the communication and car audio market, and are rugged and service-free.

To back up the electronics division, the company has a modern, computerized metal division to fabricate metal work required in the power supplies and to supply precision metal work to the electronic and electrical trades.

Ritz Electronics' power supplies are used in the car radio displays manufactured by the wood division.

(Division of Seastar Instruments Limited)
2045 Mills Road
Sidney, B.C.
V8L 3S1

Contact:
Peter G. Berrang, President

Telephone: (604) 656-0891
FAX: (604) 655-3435

Seastar Optics specializes in the manufacture of (a) ultra low noise power supplies for laser diodes of all types, and (b) electro-optic connectors for interfacing laser diodes to optical fibres.

Seastar Optics operates an advanced production and testing facility and can respond quickly to solve the often unique fibre optic/laser diode requirements of industrial, military and commercial organizations.

Optical fibres are being used in increasing quantities for high (and low) speed data links and

directly as sensors (such as fibre gyros). Due to the very small core diameter of optical fibres, the use of electro-optical on fibre-to-fibre connectors requires very high precision devices. Seastar Optics produces both the ST (AT&T) and FC world standard receptacles in a single mode and multimode versions. Other custom (fixed) laser diodes/fibre optic connectors are also available.

Telex: 049-7526

**P.O. Box 5125
99 Ash Street
London, Ontario
N6A 4N2**

**Contact:
Robert H. Irvine, Sales/Marketing Manager**

**Telephone: (519) 455-6320
FAX: (519) 452-3967**

Sparton of Canada Limited provides services and products in a wide range of technologies. A solid background in defence-related development has directed Sparton further into the electronic and electromechanical product fields, serving both government and industry. Sparton designs, develops, tests and manufactures high technology, low-cost products to customer specifications.

Sparton provides an extensive Canadian resource of engineering talent and technical specialties. The company maintains equipped laboratories, fully instrumented facilities and comprehensive technical libraries. Computerized systems permit rapid turnaround of engineering projects and optimize response times.

Test procedures and facilities are extensive, providing critical data requirements for advanced product development. Sparton provides creative, workable, cost-effective solutions to customer product problems.

Sparton of Canada's engineering talents encompass electronic, electrical, mechanical and industrial disciplines. Capable personnel such as digital and analog circuit designers, radio frequency and power product designers, acoustic, seismic and hydrodynamic specialists, microprocessor and servo experts and highly trained production employees assure product quality, reliable delivery and competitive prices.

Sparton of Canada has earned an industry-wide reputation for product reliability through the use of dedicated employees utilizing automated production and test equipment. Sparton is qualified to meet the requirement of DND 1015/AQAP-1, NATO STANAG 4107/4108, US MIL-Q-9858A and CSA Z 299.3.

Sparton serves its markets with a broad range of products/services that include:

- Sonobuoys
- Contract Manufacturing
- Transducers
- Acoustic Projectors
- Switch Mode and Linear Power Supplies
- Energy Management Systems
- Cable Pressure Monitoring Systems
- Intrusion Detection Systems

Switch Mode Power Supplies

Sparton of Canada addresses the Switch Mode Power Supply market globally by providing custom design and prototyping capabilities, as well as production manufacturing within the Sparton group. Sparton of Canada, with its extensive engineering capabilities, can design and build Switch Mode Power Supplies to meet the requirements of virtually any regulating authority.

**3111 Woodchester Drive
Mississauga, Ontario
L5L 1J2**

**Contact:
Gunther Hubel, President**

**Telephone: (416) 828-6981
FAX: (416) 820-3681**

Standby Electronics Corp., founded in 1965, manufactures standby power equipment for the cable TV and diesel generator control industry.

Standby Electronics' product capabilities include:

- Cable TV Ferro-resonant 14 A, 60 V power supply with approved service entrance to connect utility power directly to internal circuit breaker compartment. Accessories include plug-in delay timer, ammeter and MOV protection. Polemount enclosures are made of epoxy-baked aluminum and pedestal enclosures are paint over galvanized steel. Enclosures are lockable and breaker compartments are sealable.
- Cable TV battery backup standby power supply, with selectable input voltages and 60 V output at 900 W with up to 5 hours standby time. This unit features modular design for ease of maintenance and upgradability. Other features include alarm indicators, programmable battery charger, power outage statistical information display, and available industry compatible remote status monitoring.
- Battery charger available in 12 V or 24 V models featuring full metering, output regulation, automatic current limiting, thermal break, and reverse polarity protection for safe operation.

This unit also features status alarms and available battery equalize exercise timers.

- Engine generator control panels suitable for generator unit or wall mounting. These units include Volt, Ampere, Hertz, elapsed time meter, Volt/ammeter switch and engine monitor controller.
 - Engine monitor controller features reliable mini relays and LED indication. The controller has 2 running indicators with up to 12 monitor alarms or shutdown points. A flush lexan front with lamp test is standard. Accessories include plug-in provision for separate modules in DIN casings such as electronic speed sensor, start and cooldown timer, DC high and low voltage sensor, cranking and multi-crank timer. All plug-in units are suitable for 7-30 VDC to accommodate 12 and 24 V installations, for ease of service and inventory. Unit is compatible with fuel system energized to start or energized to shut down.
-

**7012 Lougheed Highway
Burnaby, B.C.
V5A 1W2**

**Contact:
Konrad Mauch, President - Custom Products**

**Telephone: (604) 420-1585
FAX: (604) 420-5941**

Statpower Technologies Corp. develops, manufactures, and markets power electronic products. The company's mission is to serve both industrial and consumer markets by manufacturing and selling quality products that convert and control electric power. Statpower specializes in DC to AC inverters, uninterruptible power supplies and other products associated with mobile or power backup applications.

Statpower Technologies is a member of the Nexus Group of Companies, a group of five companies involved in the manufacture and distribution of electronic products. The members of the Nexus Group employ approximately 225 people at a modern 6 500 m² facility in Burnaby, British Columbia. Each company has its own management team, marketing organization and R & D group. The companies share manufacturing facilities and support services such as purchasing, accounting, credit and collections, payroll and drafting.

The Nexus Group has a strong international focus. The Group has an international sales team that sells its products to more than 60 countries around the world. More than 70% of Statpower's production is exported.

Pocket Power Inverter

This is a very compact DC to AC inverter that allows AC-powered equipment (to 100 W) to be operated from the cigarette lighter socket of a vehicle or from a 12 V battery pack. Small enough to hold in the palm of a hand, the Pocket Power Inverter is used to operate computers, fax machines, test equipment, and other electronic equipment in a mobile environment. The Pocket Power Inverter is available with 230 V/50 Hz output.

PROwatt 600 Inverter

This is a compact 600 W DC to AC inverter that is

designed for permanent installation in recreational vehicles, service vehicles, and boats. The PROwatt 600 operates power tools, kitchen appliances, and a wide range of other AC-powered electrical and electronic equipment in a mobile environment.

Statpack-8 Battery Pack

This is a rechargeable battery pack for use with the Pocket Power Inverter. The battery, and an integral charger, are housed in a high quality water-resistant nylon shoulder pack. Used with the Pocket Power Inverter, it provides totally portable AC power.

Uninterruptible Power Supplies (UPS)

These compact, lightweight on-line uninterruptible power supplies, rated at 100 W and 150 W, provide complete protection against line voltage spikes, surges, sags, brownouts, and blackouts. Applications include desktop computers, point-of-sale terminals, telephone equipment, and industrial control equipment.

Statpower Technologies designs and manufactures custom inverter, battery pack, and UPS products for customers in North America and Europe. Current customers include major test equipment manufacturers, portable fax machine manufacturers, and computer accessory suppliers.

Statpower Technologies is one of the first companies to apply high frequency power conversion techniques to the design of DC to AC inverters and uninterruptible power supplies. Its products are typically 1/5 to 1/2 the size and weight of competitive products designed with standard 60 Hz technology. Since it designs and manufactures products for consumer, commercial, and industrial markets it can offer cost-effective, high quality designs to meet your particular needs.

**39 Kodiak Crescent
Downsview, Ontario
M3J 3E5**

**Contact:
Martin Gelb, President**

**Telephone: (416) 630-8108
FAX: (416) 638-0553**

Design Capabilities

With over 20 years of switching power products experience, Tectrol offers a wide variety of products, including:

- Standard Products
- Semi-Custom and Fully Custom Engineered Designs
- Military Products

Switching Power Supplies, DC-DC Converters and Inverters covering a power range of 1 to 2 000 W are available in various topologies, configurations and packages complying with the most exacting customer specifications.

Technology

Leading-edge technology has always been Tectrol's driving force. The following technical achievements are synonymous with the name Tectrol.

- Tectrol pioneered and perfected magnetic amplifier regulators.
- Tectrol's modular and semi-modular power supplies using off-the-shelf modules provide a high degree of user flexibility and short production lead times.
- Many of Tectrol's products are parallellable, provide precise load current sharing, and can be used in parallel-redundant (N+1) configurations. Master-Slave and all Slave systems are also available.

- Tectrol has developed High Frequency Resonant Converters, operating at 1 MHz, with power output up to 1 KW and Power Factor Correction.
- Tectrol has a global line of products operating at any input voltage from 90 to 264 VAC, without changeover.
- All Tectrol's products are designed to meet UL, CSA, VDE, BSI safety requirements, and conform to FCC and/or VDE Class A & B emission standards. Most designs are presently approved.
- Tectrol designs and manufactures power products to U.S. and NATO Military Standards.

Production Capabilities

Tectrol's 7 432 m² (80,000 sq.ft.) wholly owned Toronto production facility employs approximately 400 people with excellent capabilities as follows:

- High volume production, using automatic axial, radial DIP and SIP insertion equipment as well as pass-through production assembly lines.
 - Surface Mount (SMT) facility
 - Transformer and toroid winding facilities.
 - Automated functional testing and burn-in facilities.
 - Rigid quality assurance programs including SPC, ORT and ESS.
-

**1584 Fell Avenue
North Vancouver, B.C.
V7P 3E7**

**Contact:
Nazir Mulji, Marketing Manager**

**Telephone: (604) 984-4268
FAX: (604) 984-9758**

Xantrex is a power conversion specialist, designing and manufacturing a family of power supplies for a wide variety of applications in industrial, educational, and R & D environments. Xantrex has been associated with power supply manufacturing for more than 20 years and designs and manufactures laboratory, system, and custom OEM power supplies in its own facility in North Vancouver, British Columbia.

The company has followed an aggressive product development policy. It has utilized advances in switchmode technology, high power density design, packaging, control and measurement functions to deliver several new series of power supplies with a host of options to the North American market.

Products

- XT Series
60 W Linear Laboratory and System supply. Seven fully adjustable voltage/current combinations from 0-7 VDC to 0-250 VDC at 0.25 A to 6 A
 - HPD Series
300 W High Power Density Laboratory and System supply. Three fully adjustable voltage/current combinations from 0-15 VDC to 0-60 VDC at 5 A to 20 A
 - XKW Series
1 000 W System and Burn-in supply. Nine fully adjustable voltage/current combinations from 0-8 VDC to 0-600 VDC at 1.7 A to 125 A
 - Option M9A
Internal IEEE 488 interface card. Allows extensive control of the XT, HPD and XKW series power supplies via the IEEE 488 interface
 - OEM
Custom power supplies. 50 to 2 000 W single or multiple output linear switching supplies with AC or DC inputs
-



Connectors



**20 Esna Park Drive
Markham, Ontario
L3R 1E1**

**Contact:
Barrie Whittaker, General Manager**

**Telephone: (416) 475-6222
FAX: (416) 474-5519**

AMP of Canada is the leading electrical/electronic connector and interconnection device supplier in Canada.

As a subsidiary of AMP Incorporated -- the world's leading producer of connectors, with nearly 160 facilities in North America and 26 other countries -- AMP offers the most advanced thinking about interconnections anywhere in the world. AMP's yearly Research, Development and Engineering expenditure is in excess of \$250 000 000(Cdn).

AMP supplies the broadest range of Quality connectors; over 100 000 types and sizes of

terminals, splices, connectors, cable assemblies, switches, touch screen data-entry systems and related application tooling to a vast variety of markets including: telecommunications; military; aerospace; utilities; consumer and automotive electronics; computers; etc.

AMP of Canada has many ongoing training and quality improvement programs in place throughout every aspect of the company, and in 1989 received a Certificate of Merit of Quality in the Canada Awards for Business Excellence.



**20 Melford Drive
Scarborough, Ontario
M1B 2X6**

**Contact:
Mark Michalak, President**

**Telephone: (416) 291-4401
FAX: (416) 292-0647**

Amphenol Canada Corp. is a manufacturer of electronic filter connectors for military, aerospace, computer and telecommunications applications. These products are high-reliability devices designed and developed in our facilities using the latest state-of-the-art technologies to achieve maximum protection from EMI (electromagnetic interference) and EMP (electromagnetic pulse) interference. By using

patented processes, these connectors employ stress isolation to ensure their ruggedness while providing the required electrical performance to meet military or FCC and VDE specifications.

Amphenol Canada Corp. has the engineering and manufacturing capabilities to provide custom design filter connectors for the military and industrial markets.

**20-3251 Kennedy Road
Scarborough, Ontario
M1V 2J9**

**Contact:
Alan Little, General Manager**

**Telephone: (416) 292-3906
FAX: (416) 298-1637**

B&L Coaxial Connections Ltd., located in Metropolitan Toronto, manufactures coaxial type connectors in BNC and TNC styles.

These connectors are produced for "Twist-On" applications in a unique manner designed by one of the company's founders. The connectors are also produced for applications in the standard "Crimp-On" form.

The range of products in both Twist-On and Crimp-On styles include straight plugs, straight jacks, and cabled bulkhead jacks for all popular standard and miniature coaxial cables. Also included in the range of products are right-angle twist-on plugs, chassis-mount receptacles, adapters and resistive terminators. All products are available in 50 ohm and 75 ohm impedances.

B&L Coaxial Connections Ltd. also produces a limited range of UHF and TWINAX products and supplies crimp tools and coaxial wire strippers for all products sold.

B&L Coaxial Connections Ltd. takes great pride in the service it is able to provide, offering stock to two week deliveries on all standard items in production volume quantities. Full line catalog available on request.

The product line is continually being expanded. Please contact the company for further information on new, special or custom products.

Telex: 065-25165

**245 Renfrew Drive
Markham, Ontario
L3R 6G3**

**Contact:
D.V. (Doug) Goodridge, Marketing Manager**

**Telephone: (416) 940-3333
FAX: (416) 940-0959**

Burndy Canada has been a leading connector supplier since its founding in 1949. Over the years the company has earned a reputation for offering Canadian and international customers innovative designs, cost-effective manufacturing, high quality products, and responsive customer service.

Burndy designs and manufactures a broad range of connectors to serve the electrical and electronic original equipment manufacturer (OEM). Major markets include data systems and business equipment, telecommunications, industrial controls and instrumentation, military/aerospace, and consumer and automotive electronics.

Burndy Canada has recently constructed a 5 574 m² (60,000 square foot) engineering and manufacturing complex in Markham, Ontario. This ultra-modern facility includes a fully equipped development laboratory with state-of-the-art design and testing equipment for plastic, metal and plating technologies. Expanded manufacturing capacity includes high speed stamping,

injection moulding and fully automatic high speed assembly capabilities.

To respond to customer requirements, Burndy design and sales engineers can provide connectors and related products from an inventory of over 80 000 available standard items. Burndy design engineers can also create custom designs, utilizing state-of-the-art technologies including CAD.

Burndy Canada employs a national sales force located in 11 Canadian cities, supported by a team of highly trained field engineers.

Burndy Canada, through its parent company, Burndy Corporation (Norwalk, Connecticut, U.S.A.) has access to the research, development, technology, and products of 29 manufacturing facilities around the world. The Canadian operation can also support multinational accounts through an international network of direct sales offices and manufacturers representatives on six continents.

**4272 Weston Road
Weston, Ontario
M9L 1W9**

**Contact:
Carl Watzeck, President**

**Telephone: (416) 741-7678
FAX: (416) 741-3689**

Cable-Lock Connectors Limited, a manufacturing company established in 1969 and located in Ontario, specializes in precision coaxial connectors, used in the frequency range of 5 MHz-1 GHz in television sets, cable television distribution networks and associated equipment, including amplifiers, subscriber taps, channel converters, satellite receivers, computer local area networks, etc.

Cable-Lock has supplied connectors to cable television equipment manufacturers and cable systems in Europe and North America for 20 years, and in that time has gained a solid reputation for excellence in engineering and quality. An extensive line of coaxial connectors are offered for RG-type drop cables and main trunk cables, both copper and aluminum types.

The company also offers a very wide selection of specialized small connectors, with excellent electrical performance, for use in television distribution equipment.

Engineering assistance is readily available to project engineers developing new equipment and to cable companies planning new or upgraded systems.

The company operates an up-to-date machine shop, with the most modern high speed precision machines available that turn out high quality parts with economy.

Cable-Lock also designs and manufactures coaxial connectors for higher frequencies than 1 GHz and higher power levels for specific applications, such as transmitters.

The company manufactures many items that are machinable, such as brass, steel, aluminum, hard plastics, etc., made to electronic industry customers' specifications.

Telex; 06-986766 TOR

(Division of DGW Electronics Corp.)
85 Spy Court
Markham, Ontario
L3R 4Z4

Contact:
Rick Lewis, General Manager

Telephone: (416) 475-8500
FAX: (416) 475-4158

Compar Connectors (Division of DGW Electronics Corp.), is a Canadian manufacturer of card edge connectors, D-subminiature (D-Sub) connectors, tools and accessories. Serving the Canadian and international telecommunications and computer markets, Compar works on the simple philosophy of providing the highest quality connector products available.

Compar, originally the manufacturing arm of Weber Electronics, was established in 1976, and began shipping its first product in 1977 under a licensed agreement with a U.S. corporation. Within a year and a half, Compar engineers developed their own tooling and began to source their own suppliers, becoming independent of the U.S. company.

In 1981, Compar expanded its product line and entered the D-subminiature market. Although a relative latecomer, Compar was the first manufacturer to incorporate a threaded insert onto the metal shell of the connector, successfully meeting industry-standard torque requirements. Customers benefit through the elimination of spare hardware, saving as much as five minutes of labour per connector in the plant.

The company's reputation for the highest quality products has grown through association with major computer and telecommunications companies that consistently demand such quality. High profile organizations, including AES, Amdahl, Gandalf, Mitel and NCR, are loyal customers of Compar. Northern Telecom named Compar a "Certified Supplier" of D-Sub connectors in December 1986, meaning Compar

products are no longer subject to incoming inspection due to their consistently high quality.

The semi-automated plant in Markham allows Compar a wide manufacturing flexibility not found in most mass production plants. With a certain amount of tooling design done in-house, customers benefit from faster turnaround times and greatly reduced tooling costs since changes can be made on the same machine.

Quality and reliability are of the utmost importance at Compar. Utilizing a state-of-the-art Fluoroderm microcomputer X-ray instrument, Compar engineers monitor the thickness of gold on their connectors to ensure they surpass the minimum gold plating requirements. This enables Compar to provide a 100% guarantee on their connector products and boast a defect ratio of 0.22%.

Compar has embarked on a major R & D program to build upon its existing product line. By venturing into new connector technologies, Compar hopes to increase its market share and tap new markets for long term growth. As part of this expansion, Compar will be looking to enlarge its facilities to accommodate expected vertical integration .

Compar is proud of these accomplishments and is confident that the commitment to quality will continue to be the company's main reason for success in the connector industry.

Telex: 069-66600

**40 Tiffield Road
Scarborough, Ontario
M1V 5B6**

**Contact:
Tony Smith, President**

**Telephone: (416) 754-3322
FAX: (416) 754-3299**

Edac Inc. is a designer and manufacturer of card edge, metal-to-metal, rack and panel connectors for the electronics industry.

Located in Scarborough, Ontario, Edac Inc. has been a Canadian manufacturer of electronic connectors for over 22 years. Edac has successfully supplied the connector needs of OEMs and manufacturers in all sectors of the electronics industry worldwide.

Edac has the necessary capabilities, resources, and experience to work closely with the user at all stages of the procurement process. An experienced staff of professional engineers is available to provide cost and time-effective packaging solutions.

Utilizing CAD schematics for design verification, prototypes for form, fit, and function approval, independent test reports and production first article for final approval, Edac has quick reaction facilities dedicated to immediate response to design changes, application engineering support,

technical support, or samples. Edac's worldwide experience allows the company to enter into international pricing agreements and contracts.

A professional and well-qualified quality assurance department, utilizing state-of-the-art equipment such as the XR300 Fluoroderm X-Ray Fluoroscope and the implementation of an SPC program allows Edac to offer "dock to stock" performance to connector users. As well, Edac enjoys qualified vendor status with most key users worldwide. Edac's proven capability to comply with JIT programs assures on-time delivery to any user in days +/- a window.

Edac's Ultra-Mate "700" series compliant Pin Edge Card connector offers unique double-compliance design, which results in simple installation, using "flat-rack" tooling, without causing any damage or deformation of the plated through-hole. Individual contacts may be removed and re-inserted using simple hand tools, causing no damage to board or connector.



**16, 318 Rg. St-Dominique
St-Jerome, Quebec
J7Z 5T4**

**Contact:
Ronald Gauthier, General Manager**

**Telephone: (514) 437-3257, (514) 432-2945
FAX: (514) 432-9220**

Founded in 1985, located at the foot of the Laurentian mountains, I.G.G. is dedicated to manufacturing and developing standard and custom connectors.

I.G.G.'s main production activity is manufacturing D-Subminiature connectors — for military and commercial applications — in all sizes and varieties, using machine and stamped contacts.

Production also includes filtered, dual port piggy back, P/C mount snap-in one shot reflow types, plus a complete variety of mounting possibilities, mostly custom to customer design.

**(Division of ITT Industries of Canada Ltd.)
Four Cannon Court
Whitby, Ontario
L1N 5V8**

**Contact:
R. Wayne Small, Manager - Marketing and Sales**

**Telephone: (416) 668-8881
FAX: (416) 668-4152**

ITT Cannon Canada, a subsidiary of ITT Industries of Canada Limited, is a leader in the design and manufacture of electronic connectors and assemblies.

ITT Cannon's 6 967 m² (75,000 sq.ft.) plant has a world mandate for high reliability, high temperature and high pressure connector products suited to the hostile environments encountered in aerospace, nuclear, military and geophysical applications.

The company offers comprehensive marketing and sales support with a complete range of services including:

- R & D Engineering
- Tool and Die Design and Manufacture
- Model Shop
- In-house Electroplating
- Assembly Manufacturing
- Glass-to-Metal Hermetic Sealing Capabilities

In addition, ITT Cannon Canada has extensive mechanical and electrical engineering capabilities together with temperature and metallographic investigative abilities. A large and thoroughly equipped machine shop with speed precision machining capabilities and a modern model shop allow rapid turnaround time on new prototypes, with the added benefit of in-house plating and assembly operations.

A comprehensive Quality Assurance Program is in place to monitor procedures and processes with NATO AQAP-1 and U.S. MIL-Q-9858 approvals. A detailed company profile is available upon request.

Telex: 06-981357

Trenton Operations
5 Fraser Avenue
Trenton, Ontario
K8V 5S1

Contact:
Gerry Quick, Customer Engineering Manager

Telephone: (613) 392-2581
FAX: (613) 392-0701

Murata Erie is an EMI Filter manufacturer dedicated to the design and production of high quality EMI filters and filtering systems for the electronics industry. In-house facilities include a complete design and manufacturing capability for EMI filters, a Quality Assurance System meeting or exceeding the requirements of MIL-Q-9858 and DND-1015, and a fully equipped and qualified calibration laboratory. To complement

this design and manufacturing expertise, Murata Erie has a complete Customer Service and Customer Engineering staff that offers comprehensive customer application assistance.

For additional information or application assistance, contact your local Murata Erie Sales Office or the Customer Engineering department in Trenton.

**P.O. Box 5196
Ville St-Laurent, Quebec
H4L 4Z8**

**Contact:
George Lengyel, President**

**Telephone: (514) 747-6028
FAX: (514) 748-2188**

Pulse Tronic was established for the sole purpose of manufacturing top-of-the-line D-Subminiature connectors and accessories.

Due to the ongoing evolution of technology, Pulse Tronic Connectors, with its qualified staff of engineers, has expanded its product line to include modular adapters, plugs, jacks and sockets to satisfy the market.

With electronic consumer products being constantly re-designed and introduced in smaller versions, Pulse Tronic Connectors has dedicated its R & D department to develop high density connectors.

Pulse Tronic also welcomes any custom design requirements.

**16805 Hymus Boulevard
Kirkland, Quebec
H9H 3L4**

**Contact:
Heiner Kammann, President**

**Telephone: (514) 694-9136
FAX: (514) 694-0956**

WECO is a good name to know when it comes to connectors and electronic modules that conform to the demands of the electrical and electronic industries in Canada, the United States and worldwide.

WECO continues to be a leading innovator and custom designer in the connector industry. A patent for jacket clamps as a joining element for electrical installations was the beginning of success for the WECO company, founded in Hanau, West Germany in 1921.

Related technologies have necessitated improvements and further developments in the area of electrical and electronic connectors. WECO was the first company to employ thermoplastics in coupling and splicing techniques. Special designs were developed by WECO for use in the pharmaceutical and petrochemical industries, computer technology, automotive and household appliance manufac-

ture, high-risk mining, electrical/electronic switching and control elements for nuclear power plants.

Today WECO offers customers worldwide more than 10 000 products made with the most modern engineering and manufacturing methods. All our products are designed according to international requirements, particularly VDE, UL and CSA.

Manufactured in four plants on three continents, WECO products are identical in design and performance around the world, where they are sold to diverse industries for a variety of applications.

In North America, WECO provides products from both manufacturing and distribution points, through a network of industry-knowledgeable distributors and representatives, a complete listing of which is available upon request.

**10 Spy Court
Markham, Ontario
L3R 5H6**

**Contact:
T.A. Cordes, President**

**Telephone: (416) 475-1507/8
FAX: (416) 475-2798**

Weidmüller, a worldwide corporation headquartered in Detmold, West Germany, stands among the global market leaders for electrical and electronic interface systems for energy and control systems applications. The Weidmüller range encompasses terminations, electronic interface modules and sensor systems which form the basis for complete system solutions.

Terminations

With its vibration-proof screw-clamp connection system design, Weidmüller is regarded as a world market leader in this sector. Weidmüller's complete line of space-saving DIN-rail terminal blocks includes single and multi-level blocks, fuse blocks, disconnect terminals, and many special purpose blocks that mount directly to panels.

Printed Circuit Board Connectors

Printed circuit board terminals and connectors with a wide scope of connection systems are available with a fixed number of poles or as modules which come in horizontal, vertical and 45 degree versions with top and side-wire entries. The customer can select the mounting direction, pitch, signal display and accessories to match individual applications.

Electronics

Connector transition modules, line and use indicators, relay socket assemblies, diode arrays, analog converters, optocoupler modules and circuit card holders are only a few of the interface modules available from Weidmüller. Electronic interface modules, which display circuit status, protect plants from interfering voltages, standardize signals and ensure the serial transmission of process data, form the core of our product range.

At Weidmüller Canada, custom electronic interface products can now be built to customer specifications. A complete package is offered, including circuit design (from conceptualization, prototyping to finished design), artwork, PCB production, component sourcing and purchasing, assembly, testing, CSA certification and packaging. Quality control standards are in accordance with CSA Z299.3.

Sensor Systems

Weidmüller's non-contact capacitive sensor system represents the system solution for optimal focal point control designed to be used with two- or multiple-axis laser cutting machines. The copper nozzle of the laser cutting head acts as the electrode of the clearance sensor which responds quickly for clearance variations due to variations in workpiece thickness, uneven workpiece surfaces and workpiece contour variations. Cutting quality and productivity is improved.

To supplement the basic connection system, Weidmüller offer a complete range of manual and electrical tools, including wire cutters, strippers, crimp tools and screwdrivers; heavy duty connectors with housing and hoods for wire termination; marking tag systems for labeling needs; and plastic and aluminum enclosures which offer reliable mechanical protection in all application fields of electrical and electronic engineering. Pre-assembled terminal blocks or module service on DIN-rail or within an enclosure are also available to customers to reduce or eliminate design, labour, tooling and inventory costs.

Telex: 06-986935
Montreal: (514) 365-3255
Calgary: (403) 261-3682

**1090 Brevik Place
Mississauga, Ontario
L4W 3Y5**

**Contact:
R.W. Norrey, President**

**Telephone: (416) 624-6518
FAX: (416) 624-9151**

Convenient, Efficient 'Brad Harrison' Soft Wired Connector Systems

The Brad Harrison quick-disconnect soft wiring system provides manufacturers and maintenance/repair operations with a cost-efficient, reliable, and safe method for maximizing product and production line availability. It is designed to provide error-free connection of multiple-wire systems in a fraction of the time it takes to hard wire. Woodhead Canada's molded plugs and potted receptacles provide a reliable seal against moisture, dust and chemicals. Since all connections are pre-wired, Brad Harrison Connectors save you money by reducing labour and downtime. The Connectors' plug-in replacement system is also much safer than hard wiring because it minimizes personnel exposure to adverse working conditions.

Brad Harrison Mini Change Connectors are designed for wiring control circuit applications such as pilot-actuated hydraulic valves or conveyor system controls of 7 to 13 A, 2 to 12 poles.

Micro Change Connectors are designed for use with 8 mm and 12 mm miniaturized switches in 2 to 5 pole configurations. Quick Change Connectors are designed for power circuit applications such as fractional horsepower motors or heaters of 12 to 20 A, 2 to 4 poles. Oval Push-Pull Connectors are used for heavy duty power transmission. Control Connectors are designed for heavy duty control circuit applications that require 7 to 20 A, 3 to 12 poles.

Brad Harrison Molded Connectors have been designed for specific equipment, applications and environments. Consult the specification charts in each category and available configurations.



Assembly

**R.R.#1
Lockeport, Nova Scotia
BOT 1L0**

**Contact:
Ben Pooley, President**

**Telephone: (902) 656-2662
FAX: (902) 656-2158**

For over 12 years, Allendale Electronics Ltd. has offered prototype and short-run assembly for quantities from one board to several thousands. Allendale Electronics' skilled staff takes pride in producing high quality work with hand or wave soldering. The company is now adding short-run surface mount assembly. Every board assembled is inspected and can be tested to your specifications, if required. Allendale Electronics offers the personal service and flexibility of a small company, for fast delivery and rapid attention to design changes.

Allendale Electronics also offers printed circuit layout from customers' schematics. This, combined with board and component purchasing, gives customers one-stop shopping from schematic diagram to finished boards.

**10-2220 Northridge Drive
Saskatoon, Saskatchewan
S7L 6X8**

**Contact:
Pete Tonner, President**

**Telephone: (306) 934-7466
FAX: (306) 934-3930**

Electronic Assembly Specialists

An innovative and capable custom assembly house, Banton Industries offers clients a team of electronic assembly specialists. Recently, these specialists manufactured the world's largest parallel processing computer employing 1 041 individual computers and 3 Gigabytes of memory. This is the world's fastest computer as well. Banton's facility in Western Canada has the capability and know-how to manufacture the large (45 cm x 40 cm/18" x 16" eight layer) PCBs involved. Other products include industrial, agricultural and test equipment, data sets, SCADA equipment, and government & Mil Spec Work.

Banton also provides mechanical assembly, cable and harness assembly, turnkey jobs and build to print contract work.

Clients of Any Size

Firms of any size can benefit from utilizing the services of Banton. Small firms can avoid the capital cost of developing their own facilities and large firms are able to avoid excess plant capacity and can look forward to generally lower costs due to the smaller overheads at Banton Industries Ltd.

Automated Assembly

Banton Industries is striving to provide the best and most cost effective automated assembly services in Canada. It has a fully automated through-hole facility and is in the process of automating its surface mount capability.

Quality

Banton works to an AQAP-4 quality assurance level.



**951 Alness Street
Downsview, Ontario
M3J 2J1**

**Contact:
G.M. Newman, President**

**Telephone: (416) 739-7666
FAX: (416) 739-7670**

Bridge, an Ontario publicly traded company (COATS symbol BITS), has three operating divisions, of which two are engaged in the development of the company's own product lines. The McPhar Radiometrics Division has patented technology and produces radiation monitors and personal alarming dosimeters and holds licences from Atomic Energy Canada Ltd. for the manufacturing and marketing of the Radmon 3 monitor. The Captron Closed Captioning Division produces hardware and markets systems under licence from the Canadian Closed Caption Development Agency for television and video producers who close caption programming for the hearing-impaired and education markets.

The Printed Circuit Board Assembly Division is the largest and most active unit, producing for the other two mentioned units, but principally employing its modern surface mount and through-hole operations in contract assembly work for the computer, automotive and appliance industry. JIT, zero deficiency rates, testing and full part procurement are all undertaken for both long-term continuous contracts and short-run prototype manufacturing. In 1990 the company will expand its automatic insertion and manual assembly lines to maintain state-of-the-art shop status.

Manutronics
100 Strowger Boulevard
Brockville, Ontario
K6V 5W8

Contact:
Bob Gillett, Operations Manager

Telephone: (613) 342-6621
FAX: (613) 342-4346

Manutronics, a division of Brock Telecom Ltd., was formed in 1980 to meet an identified marketplace need and fully utilize Brock Telecom's state-of-the-art telecommunications manufacturing equipment and technically skilled personnel.

Brock Telecom Ltd. is a telecommunications equipment, design and manufacturing subsidiary of Northern Telecom Ltd.

Manutronics customers and Brock Telecom both benefit from Manutronics "do it all" capability, offering a complete range of electronic manufacturing facilities under one roof.

By filling an immediate market need and meeting customer demands with high quality military custom electronic manufacturing, Manutronics' military sales grew from \$2 million in 1983 to \$10 million in 1987.

Customers dealing with Manutronics enjoy unique advantages:

- Manutronics' production capacity expands to meet the customer's increase in production.
- Corporate buying power through Northern Telecom.

- Rigid standards of Quality Assurance.
- In-house design and engineering capabilities.
- Open communication between Manutronics and the customer at all times.

The manufacturing facility located in Brockville, Ontario (2 787 m²; 30,000 sq.ft.) provides complete "blackbox" assembly in addition to cabling, PCB assembly and backplane wiring. This facility is certified to MIL-I-45208, and Weapons Spec Soldering WS-6536 and MIL-STD-2000.

The Manutronics solution can be applied to military manufacturing problems from sub-assemblies to complete black box systems.

Manufacturing Capabilities

- Printed Circuit Card assembly, including surface mount
- Printed Circuit Card testing
- Automatic, Semi-automatic and manual wiring and testing
- Total package assembly and test
- Cable fabrication
- Soldering to WS-6536
- Quality System to MIL-I-45208

**611 Conrad Place, Unit 3
Waterloo, Ontario
N2V 1C4**

**Contact:
Clarence French, President**

**Telephone: (519) 885-0403
FAX: (519) 885-2604**

Car-San Manufacturing has been providing various electronic and mechanical assembly and design services for over five years. The company's management and staff have the necessary experience required to serve customers.

Services Offered

- Design Engineering
- Product Development

- Printed Wiring Board Design and Layout - CAD
- Full Documentation - CAD/WP
- Assembly, Wavesoldering, Component Prepping
- Inspection and Testing
- Component Procurement

Car-San Manufacturing offers a complete range of services from design through manufacturing and final test.

CompAS: Computer Assembly Systems Ltd.



**1245 California Avenue
Brockville, Ontario
K6V 5Y6**

**Contact:
Bill Fraser, President**

**Telephone: (613) 342-5041
FAX: (613) 342-1774**

Computer Assembly Systems Ltd. (CompAS) occupies over 13 935 m² (150,000 square feet) of manufacturing space between its main plant in Brockville, Ontario and subsidiary plant in Ogdensburg, New York. As Canada's largest and most diverse electronic contract manufacturer, CompAS employs state-of-the-art assembly technology to provide printed circuit board assembly, surface mount technology assembly, and finished product assembly services. With a staff of over 900 highly-trained personnel and automation systems which provide a virtually paperless factory, CompAS is capable of production runs ranging from prototype to high volume, continuous-flow production.

CompAS will operate on a consignment basis, or, will provide full turnkey services including design, component procurement, PCB assembly, in-circuit and functional testing, mechanical and final product assembly, and final systems testing, including static or dynamic burn in.

CompAS currently provides services to a wide range of Fortune 500 and emerging companies across a broad spectrum of product requirements including computer, telecommunications, medical, RF (radio frequency), military, and instrumentation systems.

**(459128 Ontario Ltd.)
11-1120 Tapscott Road
Scarborough, Ontario
M1X 1E8**

**Contact:
Larry Debono, Vice President/Sales**

**Telephone: (416) 754-0574
FAX: (416) 754-1516**

Component Mate has been providing electronic assembly services for over nine years. The company's management, sales, and production staff have gained the experience necessary to better serve customers.

Component Mate can provide

Surface Mount Technology

- Prototype and Production Assembly
- Automated Equipment
- Vision Inspection and Hot Air Repair Stations

Plated Through-hole

- Prototype and Production Assembly
- Wave Soldering and Automated Equipment

Quality

- 100% Inspection-Guaranteed
- ESD Environment
- Quarantine Stock Area
- Production Control Program

Service

- Prototype SMT and PTH Assembly
- Component and Board Sourcing
- Design Through Finished Product

Component Mate has moved to a larger facility to accommodate the company's expansion plans and to better service clients.

Component Mate would be pleased to discuss your assembly requirements with you. You can rely on quality, service, and the attention you expect.

Electronic Contract Manufacturing Group
545 Delmar Avenue
Pointe-Claire, Quebec
H9R 4A7

Contact:
Guy St-Pierre, Vice-President

Telephone: (514) 694-3030
FAX: (514) 695-8623

Usually, electronics manufacturers vertically integrate operations involving Research and Development, Engineering, Finance, Purchasing, Assembly, Testing, Marketing and Distribution.

Establishing an assembly operation is one of the more difficult and costly aspects of such integration since it involves not only the acquisition of space and equipment, but also the training of personnel. Recognizing the need for an assembly service, Comterm's Electronic Contract Manufacturing Group decided to offer this service in mid-1986, in its manufacturing facility in Pointe-Claire, Québec.

Well aware that the electronics industry required a modern electronic assembly facility, Comterm consolidated an Electronic Contract Manufacturing Group, with qualified personnel and modern equipment to satisfy the industry's needs.

Comterm's main objective is to supply top quality assemblies to customers as quickly as possible.

Many satisfied customers have appreciated the advantages of such a service.

Comterm is convinced that you could also benefit from such an assembly service and invites you to contact the company concerning your assembly projects.

Printed Circuit Board (PCB) Assembly

- Automatic, manual and special forming of different required components
- Automatic insertion and semi-automatic insertion
- Semi-automatic axial insertion
- Automatic mold seal applicator (Comterm technology)
- In-line manual assembly with shop aids (keycards)
- Equipment in place to insert turret terminals, eyelets, connectors, etc.
- Experienced and competent operators, quality oriented and verify their own work
- Automatic wave solder and cleaning machine
 - Daily, weekly and monthly verification of parameters such as flux, solder, pre-heater, etc.
 - Solder analysis
- Omega machine
- Able operators for touch-up (if required) modification and implementation of ECOs as required
- Facilities and expertise on programmed and burning of PALS, EPROMS, decoders
- Facilities and expertise on erasing EPROMS and reprogramming
- Automatic label printing facilities for revision level, serial number, model, etc.

Telex: 05-821812

**1980 Monterey
Chomedey, Laval, Quebec
H7L 3S3**

**Contact:
Chérif Rizkalla, Technical Representative**

Telephone: (514) 686-0200

FAX: (514) 686-0339

Digico Limitée is a privately owned Canadian company founded in 1978. Digico started as a small family business specializing in electronic subcontracting. A decade later, Digico alone counts 70 employees and has created or acquired a total of six other Canadian corporations.

Digico still specializes in electronic subcontracting from PCB (Printed Circuit Board) assembly to

system assembly and testing. Digico also provides design services, prototype and model making, surface mount assembly services and other technical services. High quality standards are responsible for Digico's steady growth.

Recently, Digico has begun exporting subcontracting services to the United States and foresees substantial growth in other foreign markets.

**2000 Fisher Drive
P.O. Box 4525
Peterborough, Ontario
K9J 7B1**

**Contact:
David J. Crook, General Manager**

**Telephone: (705) 743-6903
FAX: (705) 745-1394**

Dowty Canada Electronics Ltd. offers high quality, quick turnaround contract manufacturing services. Since 1976, the company has assembled and tested several million printed circuit boards and assemblies. Dowty's automatic lead forming, state-of-the-art, variable-width palletless wave soldering equipment and modern fully anti-static equipped facility is operated by highly motivated production staff to provide customers with turnaround times and flexibility impossible in an automatic machine insertion environment. Customer changes and material shortages are accommodated with minimum of delay and cost impact.

Dowty deals with North American and offshore component suppliers in volumes that command attention. The company's growth, financial stability and reputation provide significant leverage.

Dowty has current experience in the assembly and testing of aerospace, mass transit, medical, computer, consumer goods, displays, test equipment and thermal power station controls.

Dowty has added full military quality computerized environmental test facilities, capable of a very wide range of temperatures and vibration/shock testing.

The company's highly skilled quality control and test personnel rigorously apply the controls at each stage of manufacture that assure product to AQAP-1 (MIL-I-9858A) or CSA Z 299-3 levels.

Dowty's production facility is one of the very few facilities that is fully qualified to the extremely strict U.S. Navy soldering specification WS-6536E and is currently being updated to DOD-STD-2000.

Dowty can provide formal, written, firm fixed quotations in response to your requirements that can vary from free issue assembly to complete design, procurement, assembly, test and pack/drop shipment.

The availability of in-house engineering competence greatly reinforces the company's manufacturing excellence and flexibility.

As a member of the Dowty Group of Companies, Dowty Canada Electronics brings to bear the resources and advantages of a \$1 billion annual sales multi-national whilst retaining autonomy and flexibility.

(Division of Ogivar Inc.)
P.O. Box 200, 16 Lewis Street
Oromocto, New Brunswick
E2V 2G5

Contact:
James S.F. Sutherland, President

Telephone: (506) 357-8438
FAX: (506) 357-7220

GOC Electronics Inc. is a division of Ogivar Inc. of St. Laurent, Quebec. The company was established to manufacture Printed Circuit Boards and other electronic assemblies for Ogivar and other OEMs.

Products and Services

- Specializing in automated and semi-automated assembly of printed circuit boards.
- Exclusive design products and high volume sub-contracting.

Major Equipment List

- Dynapert EK2 automatic DIP and socket inserter
- Hollis 40 cm (16") wave solder machine
- Hollis polyclean 4 stage washer
- Dynapert Axial VCD inserter (Model V12000)
- Dynapert Sequencer (Model UCSM-G 30 Station)

- PACE 'Craft 25' surface mount solder reflow and placement system
- High speed lead trimmer
- Airvac desoldering station
- Zehntel TS800 Automatic test system with 1024 I/O Pins

Quality Control Programs

- Presently operating to Z299.3 Standards.
- Capable of upgrading to Z299.2 if required.

Major Client List

All sales and marketing functions are performed by Ogivar Inc., whose customer list includes:

- Noranda
 - Quebec Provincial Government - all ministries
 - Federal Government - all ministries
 - 12 major U.S. distributors
-

**(Division of Three Port Manufacturing Ltd.)
7015 Tranmere Drive, Unit 17
Mississauga, Ontario
L5S 1M2**

**Contact:
Rodney E. D’Croix, General Manager**

**Telephone: (416) 677-1677
FAX: (416) 677-1547**

Harmic Design is located in a brand new facility in Mississauga, Ontario.

Harmic Design’s environmentally controlled plant offers optimum conditions for quality electronic design and assembly.

Harmic Design specializes in electro-mechanical and PCB assembly and offers a complete turnkey service.

The company’s goal is to deliver a certified finished product — from engineering design to final testing, on time, every time.

**Printed Circuit Board Assembly —
From Prototype Quantities
to Production Quantities**

- Wave Soldering
 - Automatic testing
 - PCB Assembly
 - In-circuit Testing and Repair
 - 100% In-process and Final Inspection
-

**1 Smythe Street, Industrial Park
Carleton Place, Ontario
K7C 4J4**

**Contact:
Barbara Angell**

**Telephone: (613) 257-2802
FAX: (613) 257-8804**

HI-Q.A. was formed in 1983 to provide the Canadian electronics industry with a high quality assembly facility. From its inception, HI-Q.A. has grown steadily. Customers now look to HI-Q.A. for professional standards in assembly workmanship.

Today, HI-Q.A. provides electronic assembly services to international, national and regional companies. The services range from assembly for prototypes, high and low volume production runs, and short run emergencies.

HI-Q.A.'s professional assemblers have become known for their quality workmanship, performing such skills as printed circuit board assembly, cable harnessing, wirewrapping, chassis assembly, cable assembly and testing, and surface mount. HI-Q.A. also provides highly skilled assemblers to work at customers' facilities on a contract basis.

The company's excellent Quality Control station and final inspection department have created many satisfied customers.

**5489 Canotek Road
Gloucester, Ontario
K1J 9G7**

**Contact:
Connie Grace, President**

**Telephone: (613) 744-3670
FAX: (613) 744-8452**

Iconopower has broad experience in the manufacturing of high power silicon assemblies. Custom heat sinks in aluminum and copper for air or water cooling with isolated mounting pads can be provided.

Iconopower will rebuild any large rectifier assembly on-site, as many outdated installations use obsolete power semiconductors which have higher forward conduction losses compared with current technology. Also, older assemblies may have corroded connectors and heat sinks that reduce their overall efficiencies. Renovated equipment will be more reliable, and have lower energy consumption.

Examples of some of the power configurations built by Iconopower are

- Single phase diode bridges 25 A to 1 440 A
- Six phase diode assemblies 60 A to 4 060 A
- Single phase fully controlled bridges 25 A to 830 A
- Single phase half controlled bridges with FWD 25 A to 100 A
- Single phase AC regulators 30 A to 3 020 A
- Three phase diode bridges 30 A to 2 000 A
- Six phase thyristor assemblies 70 A to 2 320 A

- Three phase fully controlled bridges 35 A to 1 500 A
- Three phase half controlled bridges with FWD 35 A to 1 000 A
- Three phase AC regulators 30 A to 1 200 A

Iconopower's customers include

- Users of rectifiers for electrolytic separation in metal refining, gas separation and electroplating.
- Users of high power rectifiers for trackside power supplies.
- Users of electric heating controls for paint drying, glass melting and stress relieving.
- Users of high powered AC switching.
- Manufacturers and users of induction heating inverters using thyristors switching at frequencies up to 20 kHz.

Iconopower also offers protection devices such as RC snubber networks, surge suppressors, fuses and thermal sensors. Firing circuits for burst firing or phase control are available. Enclosures with buswork have also been supplied.

Telex: 053-4898

**3675 Grande-Allée Street
Boisbriand, Quebec
J7H 1H5**

**Contact:
Gilles Lauriault, President**

**Telephone: (514) 433-9100
FAX: (514) 433-9807**

L.G. Technologies Ltd. is a growing company which is exclusively dedicated to subcontract manufacturing.

L.G. Technologies Ltd. offers services from conventional through-hole assembly work to state-of-the-art surface mount technology assembly, system integration, prototyping, engineering and testing.

L.G. Technologies Ltd. provides work to approximatively 50 employees.

L.G. Technologies Ltd.'s growth is based on experience backed by a solid technical background in aspects of operations.

Services offered

- Components preparation
- Assembly
- Wave soldering
- Surface mount technology
- Mixed technology
- Test and burn-in
- Other services such as harnesses etc.

Components preparation:

- Fulfilled by automated lead forming machines.

Assembly:

- Conducted under fully anti-static and environmentally controlled conditions.

Wave soldering:

- Procedures are effectively combined with rigorous attention to workmanship standards.

Surface mount technology:

- Complete service is offered for prototype assembly and high volume assembly using the following soldering techniques:
 - Vapour phase
 - Infra-red
 - Turbulent wave

Mixed technology:

- Includes both through-hole and surface mount manufacturing methods.

Test and burn-in:

- Fulfilled at 100% compliance with customer's specification.

Quality assurance:

- L.G. Technologies Ltd. quality assurance program complies fully with National and International Standards such as AQAP-4, ISO-9002, MIL-I-45208A, CSA Z299.2.

Manufacturing:

- In accordance with IPC and Martin Marietta Workmanship Standards.

Link Technologies (Canada) Ltd.



**#10 - 8005 Alexander Road
Delta, B.C.
V4G 1C6**

**Contact:
Tom Gibb, President, Sales**

**Telephone: (604) 946-9666
FAX: (604) 946-7611**

Link Technologies is a custom electronic assembly company, incorporated in August of 1987. The company provides customers with a quality product with excellent turnaround time, using state-of-the-art automated insertion equipment. Link will provide board assemblies or a full turnkey package product, depending on the client's specific needs. A complete turnkey package proves advantageous to the customer, based on Link Technologies' buying power and excellent inventory controls.

The company provides the market with printed circuit board assembly, wave soldering, testing, and all shipping requirements while maintaining a competitively priced quality product.

Should you require a quality product, excellent service, and close client attention, Link Technologies will be happy to discuss your assembly requirements.

LSI Logic Corporation of Canada Inc.



**3410, 150-6th Avenue S.W.
Calgary, Alberta
T2P 3Y7**

**Contact:
Brian Mackie, Vice President, Marketing**

**Telephone: (403) 262-9292
FAX: (403) 262-9494**

LSI Logic Corporation of Canada Inc. is a leading commercial designer and manufacturer of Application Specific Integrated Circuits (ASICs). In addition to ASICs, LSI Logic offers a full range of products and services, including PC chip sets, RISC microprocessors, IC design CAD software, image and signal processing products and fully automated surface-mount and through-hole printed circuit board assembly.

LSI Logic utilizes a Sanyo SMT line, noted for its high quality and full integration capability, to assemble both single and double-sided boards. Extensive board testing is performed using various methods depending on customer requirements. Functional tests are performed by exercising the boards under actual operating conditions. In-circuit testing can be performed through bed-of-nails testing using both analog and digital signals. Reliability testing under various temperature and humidity conditions can be performed in an environment chamber.

Quality standards are strictly monitored by an ongoing internal quality program. All assembly personnel and process engineers must attend

extensive quality training programs. Particular attention, throughout the facility, has been paid to ESD avoidance.

LSI Logic can provide either board assembly from kits provided by customers, or full turnkey service including component procurement. By selecting LSI Logic for a full turnkey solution, customers get the purchasing power of a worldwide organization with a proven track record for purchasing in the electronics industry.

In addition to its Edmonton facility, LSI Logic has a manufacturing facility in Sydney, Nova Scotia. This facility offers services that include volume through-hole assembly, reclamation and rework.

Printed Circuit Board Assembly
150 Karl Clark Road
Edmonton, Alberta
T6N 1E2
Telephone: (403) 450-4400
FAX: (403) 450-4411

**100 Industrial Drive
Grandview Industrial Park
Saint John, New Brunswick
E2L 4K8**

**Contact:
A.N. O'Rourke, Director of Maritime Operations**

**Telephone: (506) 632-8220
FAX: (506) 632-8233**

Northern Telecom Canada Ltd. now offers the resources and skills of its plants in the Maritimes, to design and manufacture electronic products for outside clients.

The four Maritime facilities produce a broad range of transformers, inductors and torroid magnetic devices for use on printed circuit packs and power supplies assembled in other Northern Telecom facilities throughout the world. Other products include fuse blocks and cables.

In addition the facilities manufacture printed circuit packs and electronic assemblies for Northern Telecom use and for outside clients.

Capability

The Maritimes Operations can provide a complete manufacturing service for electronic printed circuit packs and assemblies utilizing plated through-hole technologies.

Projects may involve manufacture of existing designs or a complete turnkey approach for new or redesigned equipment.

Close relationships with Bell Northern Research in Ottawa and with several other excellent design facilities in Atlantic Canada allow the Maritime facilities to provide complete design and development support.

Upon receipt of function specifications, Northern Telecom can progress quickly from detail design, to prototyping and to full production quantities.

Advantages Offered

The commitment engendered in the name: Northern Telecom is a multi-national corporation with a world wide reputation for quality and service. It is the leading-edge global supplier of fully digital telecommunication equipment.

High Quality Product:

The Amherst plant utilizes leading edge methods of process and quality control to ensure consistent high quality products.

People:

The people in the Maritimes Operations are dedicated to providing service to customers.

Support Staff:

Northern Telecom's wide involvement in state-of-the-art technologies and R & D facilities allows the facilities access to a vast resource base for advice and consultation.

Economical Material Supply:

Extensive corporate testing programs and procurement leverage ensure economical, high quality material supplies.

**1395 Boundary Road
Vancouver, B.C.
V5K 4T9**

**Contact:
Michael Morley, Executive Director,
Marketing and Sales
Telephone: (604) 291-2025
FAX: (604) 291-1567**

Since its inception in 1979, Pachena has been providing contract design and manufacturing services to the commercial electronics marketplace.

Controlling interest of Pachena is held by Microtel Ltd. Microtel is a leading manufacturer and supplier of telecommunications equipment and technology in Canada and is the manufacturing subsidiary of the British Columbia Telephone Company — part of the Worldwide GTE Corporation.

The capabilities and services of Pachena allow for strong growth. Today, its facility in Western Canada is capable of providing turnkey, automated, through-hole and surface mount assembly, test and packaging services.

As proof of its continuing commitment and to ensure on-going high-quality standards for its customers, Pachena's facility is certified to CSA Quality Assurance Standard CAN3-Z299.3-1985.

Pachena's manufacturing capabilities include:

- Automatic and manual printed circuit card assembly using through-hole, surface mount and mixed technologies,
- Final product and system assembly,
- Automatic, semi-automatic and manual component, board, and product level test,
- Burn-in and packaging.

From within the BC Tel Group, Pachena can also offer customers single point access to a very broad range of services and capabilities.

Including, for example, an advanced technology facility with capabilities that include CAD/CAM-based electronic circuit design, layout, mechanical design and regulatory testing for FCC, DOC, CSA, UL and others.

Eastern Sales
Telephone: (416) 475-8660
FAX: (416) 475-1171

**1386 Star Top Road
Gloucester, Ontario
K1B 4V7**

**Contact:
Darwin Stephens, Vice-President**

**Telephone: (613) 744-3043
FAX: (613) 744-0680**

Prestec Electronics Ltd., incorporated in 1980, is a diversified manufacturing and custom assembly facility. Its capabilities include:

- Standard and custom cables
- Wire harnesses
- Flat cables
- Pressfit backpanels
- Complete product assembly
- Printed circuit board assembly

Cable, Wire Harness, and Flat Cable Assembly

Prestec Electronics Ltd. combines a state-of-the-art manufacturing facility, with a skilled and experienced assembly and quality assurance staff, dedicated to meeting customer requirements on time. Prestec is recognised for expertise in component procurement, and prototype as well as high volume production of tested cables, meeting both CSA and UL requirements.

Pressfit Backpanel Assembly

Prestec Electronics Ltd. provides full service for pressfit backpanel assembly. Working from supplied art work and assembly drawings, this service includes all material procurement and complete assembly.

With ten years of experience combined with up-to-date presses, equipment, and tooling the company is able to press most manufacturer's products for prototype or volume production. This capability is supported by experienced solder facilities, to complete products as required.

Complete Product Assembly

As an assist to both small and large Design organizations, Prestec Electronics Ltd. offers a complete manufacturing capability for full product assembly. Beginning with material procurement, this service can provide a completed product, tested to the customer's requirements.

Printed Circuit Board Assembly

Prestec Electronics Ltd. provides printed circuit board assembly for small and medium size runs. This service is of special interest to customers who have quality hand-soldering requirements.

Summary

Prestec Electronics Ltd. has built its reputation by providing on-time delivery of high quality assemblies. Its manufacturing facility is equipped with modern automatic and semi-automatic equipment.

All products are built to high quality standards, in accordance with a quality procedure manual.

Experienced personnel are available to assist the sourcing and procurement of components to ensure economical on-time supply of custom assemblies.

**400 Matheson Boulevard E.
Unit #34
Mississauga, Ontario
L4Z 1N8**

**Contact:
Conrad W. Zalai, President**

**Telephone: (416) 890-1818
FAX: (416) 890-5098**

QSDM has been in operation since 1980 providing engineering, design, layout, prototyping and production services to customers in the automotive, industrial, aerospace and military fields. QSDM has engineering staff experienced in both analog and digital design, drafting personnel specializing in PCB layout, and trained assemblers to provide high quality service, from initial design through final product.

Equipment at the Mississauga facility includes a complete CAD system for drawing package generation, a palletless dual wave soldering machine, a mass lead trimmer and vapour degreasing equipment.

QSDM can provide services ranging from free-issue assembly to complete product design, procurement, assembly and testing. QSDM's staff will interface with your personnel at all levels to ensure projects proceed smoothly and efficiently. Drawings are generated as required to provide full documentation at every phase.

QSDM specializes in satisfying the need for high quality custom products required by demanding applications.

QSDM would be pleased to discuss your requirements and respond with formal quotations on a firm fixed price basis.

**30 Furbaucher Lane, #9
Aurora, Ontario
L4G 3G9**

**Contact:
Ian Chappell, President**

**Telephone: (416) 727-1776
FAX: (416) 727-6068**

Surface Assembly Systems Inc. (SAS) provides a state-of-the-art contract assembly service, specializing in SMD technology.

Recognizing that most customers have board runs of less than 10 000 pcs, SAS assembled a line of equipment that is flexible and accurate.

The line is capable of placing 80 000 parts a day. From 0805 to QFP's with .025 spacing, SAS is ready to fill your requirements.

SMD Equipment

- (2) semi automated printers
- (2) medium speed pick and place machines
(5 placement heads, 100 feeders)
- (1) Automated glue/paste dispensing system
- (1) I/R Reflow oven
- (1) Vapour cleaner

Through-Hole Capability

Since few products can be designed fully Surface Mount, the board assembly is finished on the through-hole line, wave soldered or hand soldered as required.

Experience

The company's expertise includes single and double sided SMD production, gluing and mixed technology boards. (SMD and Leaded)

Run Size

SAS is dedicated to assisting you from initial prototype products, through to production.



**8497 Dalton Road
Town of Mount Royal, Quebec
H4T 1V5**

**Contact:
Nick Tasker, President**

**Telephone: (514) 345-9755
FAX: (514) 341-2555**

TASK Micro-Electronics was incorporated in 1987 by an experienced group of hybrid manufacturers to meet the ever increasing demand for quality assembly and automated contract manufacturing in the following areas:

Surface-mount Assembly

- single sided
- double sided
- mixed technology (SMT & through-hole)
- chip-on-board assembly

Thick-film Ceramic Hybrid

- simple
- complex multi-layer
- plated through-hole
- chip-and-wire hybrids

Other Services

- solder stencil manufacturing
- design and prototyping
- laser trimming
- environmental screening/testing
- component and board procurement

Being the Approved North American Design Centre for an international MIL-1772 approved corporation, TASK's capabilities incorporate the highest level manufacturing standards in the world.

TASK offers full turnkey solutions, from engineering support, through Computer-Aided-Design (CAD) and prototyping, to complete assembly and test -- all with the highest level of quality and customer commitment.

TASK can apply a JIT philosophy together with Statistical Process Control to ensure the customer of quality products exactly when required.

**(Division of Stetron International Inc.)
141 Don Park Road
Markham, Ontario
L3R 1C2**

**Contact:
Ron Hogwood, Vice-President, Operations**

**Telephone: (416) 475-6241
FAX: (416) 475-1926**

Tasque Technologies is a modern, contract manufacturer of electronic products, with a facility dedicated to offering the widest range of services to its customers. Whatever your manufacturing needs, Tasque has the on-site capability.

Ask Tasque about its fully automated:

- Surface Mount capability
- Through-hole capability
- Soldering capability
- MDA and Functional Testing capability

Ask Tasque about:

- Dedication to Quality
- On-time Delivery
- Design knowhow
- Full range of Customer Services

Ask Tasque about its ability to get a quality job completed to your satisfaction, on time and at a competitive price.

**7115 Trans Canada Highway
St-Laurent, Quebec
H4T 1A2**

**Contact:
Bill Pinizotto, Vice-President**

**Telephone: (514) 337-6046
FAX: (514) 335-0288**

Tech-Rep Electronics Ltd., was founded in 1976 with a goal of servicing the OEM markets in Canada. Tech-Rep currently offers services in sub-contract manufacturing in both surface mount technology and conventional board assembly, using state-of-the-art automatic pick and place equipment and automatic test equipment. The company offers expertise in power supply design and manufacturing and is committed to engineering support in custom design equipment. Its R & D facility, staffed by software and hardware engineers, allows Tech-Rep to attract customers interested in:

- Sub-Contract Assembly
- Build to Print (Systems)
- Design & Development

As a secondary service Tech-Rep also offers support in:

- Prototype development
- Design expertise
- Procurement
- Testing/Engineering

Tech-Rep also represents a full line of multi-contact connectors, Terminal Junction Modules, Round Earth Modules, Hermetically Sealed Relay Sockets, Bus Bars and Terminal Blocks.

Contract Division
39 Kodiak Crescent
Downsview, Ontario
M3J 3E5

Contact:
Martin Gelb, President

Telephone: (416) 630-8108
FAX: (416) 638-0553

Tectrol has been assembling a variety of products for the electronics industry for 16 years and making switching power products for over 20 years.

Automation & High Volume Production

- Tectrol uses automatic axial radial and DIP insertion equipment as well as pass-through production lines to provide consistent product quality, high volume, timely deliveries and competitive cost for the benefit of customers.
- Surface Mount Assembly (SMT) line
- Continuous flow manufacturing techniques are employed.
- Tectrol uses automatic testers, burn-in rooms and data acquisition systems to ensure conformance with customer specifications.
- All key manufacturing steps are monitored by highly-trained Quality Assurance personnel.

Production Facilities

Tectrol occupies a 7 432 m² (80,000 sq.ft.) wholly-owned building in the Toronto area. A second assembly plant is located in the Montreal area. Tectrol employs approximately 450 people at the two locations.

or Contact:
Tom Parent, Production Manager-Montreal
9186 Viau Street
St. Leonard, Quebec
H1R 2V8
Telephone: (514) 327-6719
FAX: (514) 327-6925

**230 Arvin Avenue
Stoney Creek, Ontario
L8E 2L8**

**Contact:
Eugene Tekatch, President**

**Telephone: (416) 662-7820
FAX: (416) 662-8436**

Tektron Equipment is dedicated to supplying a complete line of printed circuit board services. From design to manufacturing of PCBs to component assembly, Tektron has the required technology and expertise.

Established in 1972, Tektron has grown to one of Canada's largest producers of high-volume, low cost printed circuit boards and assemblies and utilizes a 3 257 m² (35,000 sq. ft.) facility.

**Tektron Equipment Corporation
can provide:**

Design Services

- Electronic product research and development
- Circuit board artwork generation
- Production Engineering
- Custom test fixture development

Circuit Production

- Single and double sided printed circuit boards
- Membrane switches, custom screening

- Prototype to high volume production (5 M/yr.)
- N/C drilling / routing (22 spindles)
- Underwriters Laboratory approved
- JIT deliveries
- Statistical Process Control

Assembly Services

- Through-hole component assembly
- Prototype to high volume
- Sequencing and auto insertion equipment
- IC insertion equipment
- Microprocessor controlled soldering equipment
- In-house testing and repair
- Statistical process control
- Zero defect shipping

Tektron has a fully trained staff to assure high standards of quality workmanship at every stage of the process.

**121 Hanlan Road
Woodbridge, Ontario
L4L 3P5**

**Contact:
Trevor Babbs, Sales Manager**

**Telephone: (416) 851-2231
FAX: (416) 856-1005**

Tele-Radio Systems Ltd. provides contract electronics and electro-mechanical manufacturing services to clients whose products serve in applications demanding a high-degree of reliability. Established in the late 1950's, Tele-Radio has developed a reputation for manufacturing excellence by focusing on the nuclear power, telecommunications, aerospace and computer industries.

The company's modern plant is located in the Metropolitan Toronto area and is staffed by an experienced work force that is supported by an independently audited CSA Z299.2 Quality

Assurance Program. Tele-Radio offers a range of services including engineering design support; parts procurement and incoming quality assurance; electronic and electro-mechanical assembly; testing to component, functional and system levels; environmental stressing; conformal coating; custom packaging and direct-to-user shipping.

Quality manufacturing, finished product reliability, on-time delivery and customer service are the foundation of the company's success.

Toll-Free: 1-800-263-2352

**183 Amber Street
Markham, Ontario
L3R 3B4**

**Contact:
Paul Walker**

**Telephone: (416) 479-1810
FAX: (416) 479-1877**

Design Division

- CAD Design
- Photoplotting
- PCB Design/Conversion
- Design Guidelines
- Prototype Boards and Assembly

Assembly Division

- SMT and Through-hole Assembly
- SMT Workshops
- Components Procurement
- Turnkey Product Development
- Cable Assembly

The Surface Mount Technology Centre has a manufacturing facility of 1 858 m² (20,000 square feet) located in the greater Toronto area. The facility is equipped with axial and dip insertion machines that handle high volume production runs. The facility also has manual work stations/

lines capable of handling low to medium volume production runs.

The facility has three complete SMT lines capable of building products from low/medium volume to fully integrated high volume manufacturing.

The Surface Mount Technology Centre has experienced tremendous growth since its inception in the fall of 1985. This was made possible by the company's policy: "Our Quality is Our Signature".

Montreal
1405 Transcanadienne, Suite 200
Dorval, Quebec
H9P 2V9
Telephone: (514) 421-3654
FAX: (514) 421-3839

**104 Avenue Nordic
Pointe-Claire, Quebec
H9R 3Y2**

**Contact:
Peter Kuzak**

**Telephone: (514) 694-4696
FAX: (514) 694-5644**

Zavitz Technology Inc. has a fully integrated 700 m² manufacturing facility in Georgetown, Ontario which offers the following services:

- Design engineering
- Product development
- Printed wiring board layout
- Full bare printed wiring board manufacturing (silkscreening, copper, tin-lead, nickel and gold plating)
- Limited machine shop facilities
- Prototype sheet metal with aluminum chromate capabilities
- Printed wiring board assembly, including 35 cm (14 inch) wave soldering and aqueous cleaning
- Wire cutting and termination capabilities
- Finished product testing

These services provide Zavitz's customers with a wide variety of alternatives for their single and double-sided printed circuit board requirements, from prototype development to complete manufacturing and assembly of the board.

Manufacturing Facility:
14 Todd Road
Georgetown, Ontario
L7G 4R7
Telephone: (416) 877-2256
FAX: (416) 877-2257

