October 1981

CANADIAN DATASYSTEMS

12th Annual Canadian Computer Show & Conference

- APL seeks wider user appeal
- Let's be realistic about EDP salaries
- Enhanced data network helps run ferry service
- ELECTRONIC MAIL
  Making strides towards a promising objectiv

"We have used ten XT 100 Terminals, and we are recommending them to all our existing and future Word 11 clients."

Mr. Ron Dutton
General Manager,
North West Computer Services

"We are pleased with the XT 100 Terminals, as they are fully compatible with RSTS on our 11/70."

Mr. Logan Ragan
Manager, Computer Services
Bridge Brand Food Services Ltd.

"We have been extremely happy with the performance of our sixteen XT 100 Terminals. They are fully compatible with RSX 11M and IAS, on our PDP 11/34-40 and PDP 11/70."

Mr. Lorne Sunley
Operations Manager,
Yamaha Canada Music Ltd.

"The XT 100 Terminal is 100% compatible with our Dec systems, and it allows IST to have better client pricing in new offerings."

Mr. Gerard Briere
Director of Marketing,
IST

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Once you have put your Lanpar XT 100 Terminal into production, we'll make sure it stays in production. Only Lanpar has Service Power.® Service Power® offers you 14 service centres located all across Canada, and field engineers who will be on site within 2 to 4 hours, on average, should your terminal need servicing.

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Reader Service Card Number 187

Lanpar has the technological expertise to customize any of its terminals. Our R & D Team has an impressive record of successful adaptations: Over 1000 custom terminals last year alone.

With Lanpar's financial power, lease-purchase plans, Service Power® and technological expertise, it's easy to see why at Lanpar, terminals are just the beginning!

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At Lanpar we custom-tailor short term rental and lease-purchase plans to suit your needs. Our "No Stranglehold Lease" offers you low, long term rates, yet with one day cancellations. Most plans offer you generous credits towards purchase. Our lease rates can be adapted to include service, installation and delivery. And that's just the beginning!

Once you have put your Lanpar terminal into production, we'll make sure it stays in production. Only Lanpar offers Service Power™. With service centres located nation-wide, we can have an experienced field engineer on site in an average of 2 to 4 hours. Our meantime to repair (MTTR) averages ½ hour. So you can feel at ease even when setting up your own coast-to-coast terminal network.

Lanpar has established an Application Group to help you interface your terminal with different systems. Our R & D team has an impressive record of successful customizations: Over 1,000 custom terminals last year alone.

You can also look to Lanpar for custom-made equipment, options, cables, modems and switches to help you increase the productivity of your particular unit.

And, by using Lanpar's financial power, we leave you free to use your capital in other areas.

So, by having one company offer you flexibility, service expertise, R & D, Application Support and financial strength, it's easy to see why at Lanpar, rentals are just the beginning!

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CANADIAN DATASYSTEMS

OCTOBER, 1981 VOLUME 13, NUMBER 10

DEPARTMENTS

NEXT MONTH:
The trend to self-serve banking is gaining momentum as Canada's financial institutions opt for more automation. Next month's cover story will assess this trend.

ID-100 VIDEO COLOR

Character & Symbol Graphics Terminal

VT100V²G®
Virtual Vector Graphics black & white terminal

ID-100V²G
Virtual Vector Graphics color terminal

CENTRONICS 6080
Band Printer

With noise level below 60 decibels, the new 6080 band printer is designed for quiet operations in offices and computer rooms. Compatible with other equipment in Centronic's 6000 Series, the 6080 prints 600 lines per minute. Under control of the optional IBM 3780 interface, the 6080 is an ideal remote volume printing device for both office and computer room environments. Similar programable interfaces are available for Univac, Burroughs, NCR, Honeywell and Digital Equipment users. All paper handling, feeding and stocking occurs inside the printer enclosure so confidential printouts like payrolls and financial statements are protected.

ISI MODEL 387

The ISI Model 387 is fast and reliable. It replaces any IBM 3287 printer without software changes. Just plug it in and run your application. The ISI 387 purrs along at 180 cps. More compact, portable and quieter than the IBM 3287, it's ideal for any office environment. The ISI 387 is available either as a type B device (3286 or 3287 feature 8330 - 3271/3272 attachment) or a type A printer (3287 feature 8331 - 3274/3276 attachment). The type A - 387 is SNA compatible and processes SCS commands as a standard feature.

VT101® DECSCOPE®

Priced substantially below the popular VT100®, the VT101® is available for users who do not require the flexibility of upgrading their video terminal.

The VT101® has all the features of the standard VT100® including the built-in reliability and performance of all Digital Equipment terminals. At last, the price conscious buyer can get the real thing for the price of a copy.

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Reader Service Card Number 130

WHAT'S NEW

Designer M system

MBS-3000

Inforex 9000

MCM Micropower

COMPUTERS

Processing plus D/E

The Product: distributed data processing system
Supplier: Inforex Inc.
Features: The System 9000 combines traditional distributed data processing capabilities with file management, data entry, and multi-user Cobol programming.

Data entry and data management functions require no user programming, but are supported by Inforex software systems. Universal Data Entry offers source and volume data entry capabilities, while Infobase provides information management programs. Local networking is controlled by Ultranet.

Hardware includes a 248-Kbyte processor, up to 180 million bytes of disc space, an optional nine-track tape unit, and a Universal Workstation which features a multi-function terminal.

Reader Service Card Number 1

Bit-slice technology

The Product: microcomputer
Supplier: MCM Computers Ltd.
Features: Micropower is designed to compete with Radio Shack and Apple systems. It offers virtual memory and compressed data storage, and uses bit-slice technology for greater speed than conventional microcomputers.

A basic configuration includes a single-user processor and one million characters of floppy disc storage. Software packages are available for small business applications, and the system can be upgraded to MCM's Power distributed processor.

Reader Service Card Number 2

Basic Four links

The Product: business computer
Supplier: Mercator Business Systems
Features: The MBS3000 desktop computer is aimed at the first-time business user. It is compatible with Basic Four systems and software, and Mercator also offers seven general-purpose accounting packages, and software for such industries as construction, insurance, as well as the medical and legal professions.

The computer is based on a 16-bit microprocessor with 64K bytes of RAM. Memory storage is on 10 or 20 megabyte eight-inch Winchester discs. Four display terminals and one printer can be handled, and an optional SDLC port allows communication with a host computer.

Reader Service Card Number 3

Lower cost CAD/CAM

The Product: CAD/CAM system
Supplier: Computervision Corp.
Features: The Designer M medium-scale CAD/CAM system is said to offer the same high level of performance and function as the company's large-scale Designer IV system. Package systems are available for the following applications: mechanical design and drafting; manufacturing engineering/numerical control; printed circuit design, plant and piping design; cartography; and integrated circuit design.

All these packages, except the last, are subsets of CADDS3 software and are supported by a common database. A maximum of three tasks, two interactive and one batch, may be used simultaneously on a system. The integrated circuit package is offered as a single application system only.

A Designer M system comprises: a CGP-80 graphics processor with a fixed media disc and tape drive, two raster scan interactive design workstations, the Graphics Operating System, a system console, and one application.

Reader Service Card Number 4

TERMINALS

For lengthy reports

The Product: keyboard/printer terminal
Supplier: Applicon Inc.
Features: The TX120 is a 180-cps keyboard/printer terminal designed for Applicon's CAD/CAM systems. It is said to be especially suited to lengthy reports such as bill of materials, wire or net lists, or APT or CL source files.

Reader Service Card Number 5

Programmable color

The Product: intelligent terminal
Supplier: Matrox Electronic Systems Ltd.
Features: The CTM-300 is a serially interfaced (RS-232C) ASCII terminal, with an optional eight-color monitor. Standard format is 80 x 25, but users can program other formats, as well as customize terminal functions by program downloading from the host computer.

continued on p. 10

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Reader Service Card Number 218

Data Communications Managers:

Here's a sample of what Dataswitch can do for you ...

Develcon's Dataswitch is an intelligent central switching system which will provide network efficiency for your computer service installation.

Capacity
- Over 2 000 subscribers (terminals, ports or modems)
- Over 1 000 simultaneous connections
- 64 classes of service
- 31 programmable messages
- 64 account names

Transmission
- Speed — 2.4 Mbps (total)
  — Autobaud to 19.2 Kbps (individual)
- Method — ASTSDM

Interface
- RS—232—C
- RS—366—C
- RS—422—C
- 4-wire LDDS

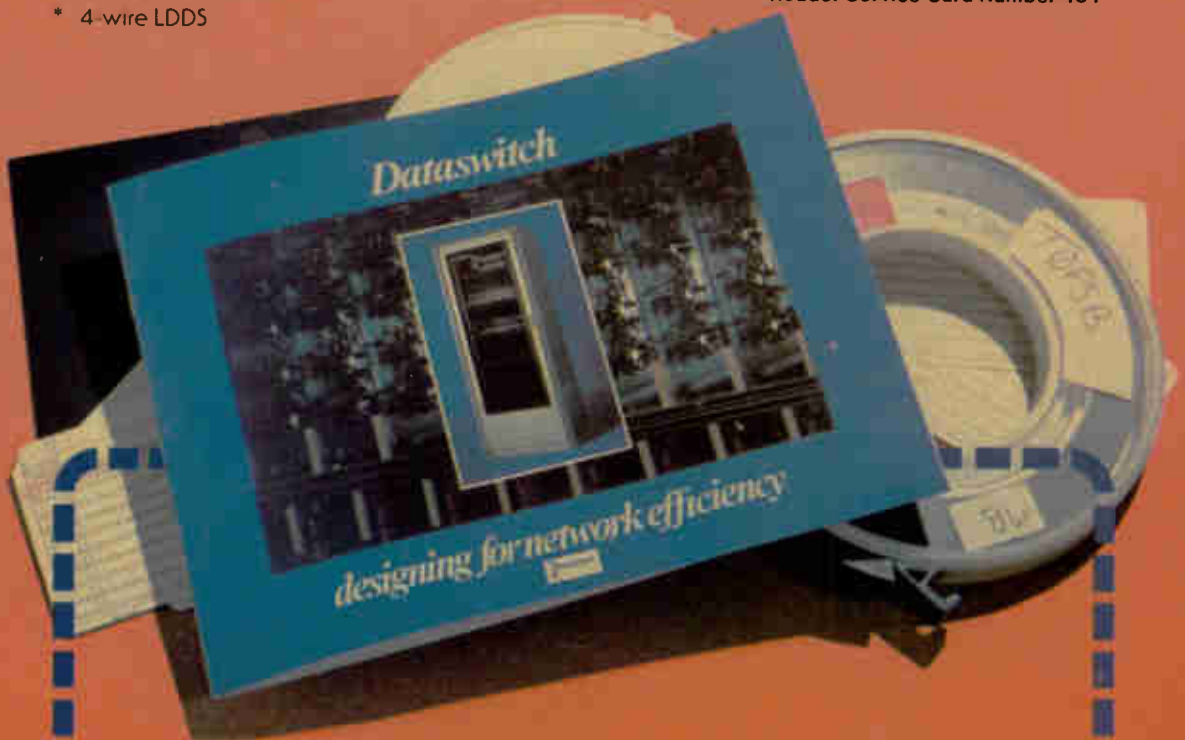
Command Language
- Format — English
- Size — 31 primary commands
  — 29 sub commands

Access Control
- Computer controlled, manually assigned
  — Via parameters
  — Via restrictions
  — Via accounting
  — Via priority

Flexible Connection
Full Statistics Output

Develcon ELECTRONICS

Reader Service Card Number 151



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Use this handy coupon to get your free copy of our new booklet **Dataswitch: Designing for Network Efficiency.** Or call us at (306) 374-2202.

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CDS-10-81

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Multiwriter IV

A daisywheel terminal for the discriminating user

Multiwriter IV combines superb print quality with advanced word-processing features to add the professional touch to any computer output. Crisp, fully formed characters greatly improve document readability. Built-in functions for centering, right margin justification and paging provide simple and effective formatting. Finally, proportional spacing gives reports, documents and letters the classic appearance of type-set text.

First time users will appreciate the straight-forward ease with which the Multiwriter IV can be used to process computer output into professional looking text.

For experienced programmers, total access to all terminal functions will satisfy the most demanding applications. Multiwriter IV is easily integrated into existing text editing or word processing software.

Whether your needs be simple or sophisticated, Multiwriter IV represents the most cost effective way to add word processing output to your present computer.

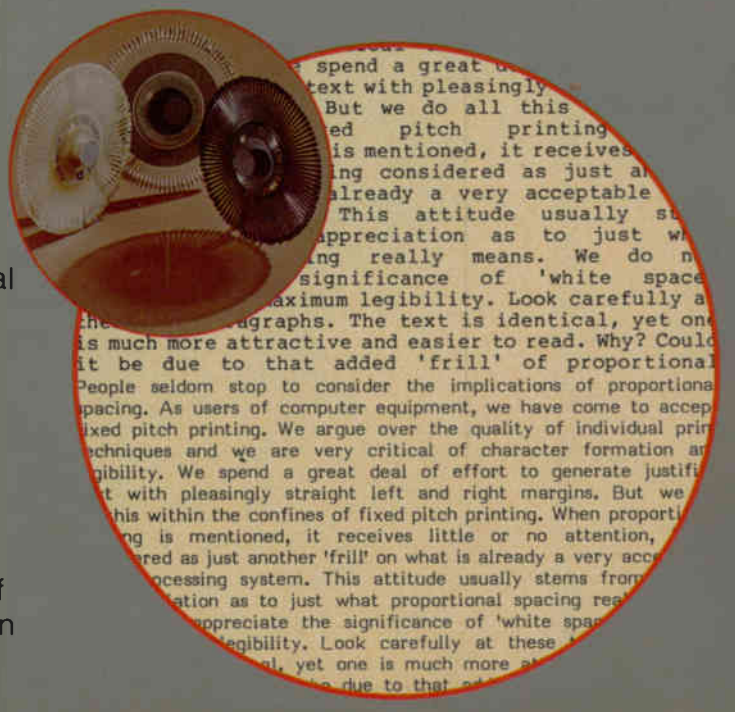
Plastic or metal printwheels ... in fixed-pitch or proportionally spaced fonts

Multiwriter IV is compatible with printwheels produced by Qume and Diablo. Plastic and metal printwheels may be freely interchanged without any mechanical adjustment.

Eight selectable printwheel tables accommodate most printwheel types. A user-generated table may be programmed and stored in non-volatile memory for special requirements of hammer energy and character mapping.

Proportionally spaced fonts are printed with **true proportional spacing.** "PS values" for each character are contained in the printwheel tables and are used to control character spacing when "PS" mode is selected.

Proportionally spaced text is the easiest of all to read and the most difficult to produce in normal computer output. Multiwriter IV will do it automatically.



A keyboard full of convenience

Word processing enhancements reduce computer loading

Multiwriter IV contains within it the most commonly used word-processing functions for daisywheel terminals. These functions reduce computer loading and increase throughput. This is most apparent in proportional spacing mode where printer calculations are in "PS units" rather than columns.

Bold print, shadow print and underline are called by simple "start" and "stop" commands. Titles may be centered between margins or about a horizontal location.

Multiwriter IV readily justifies single lines or paragraphs to the right margin. Special functions provide ragged right margin, programmed blank spaces and partial line justification.

Paging function print titles and number pages. Programmable top and bottom margins are used for automatic page advance.

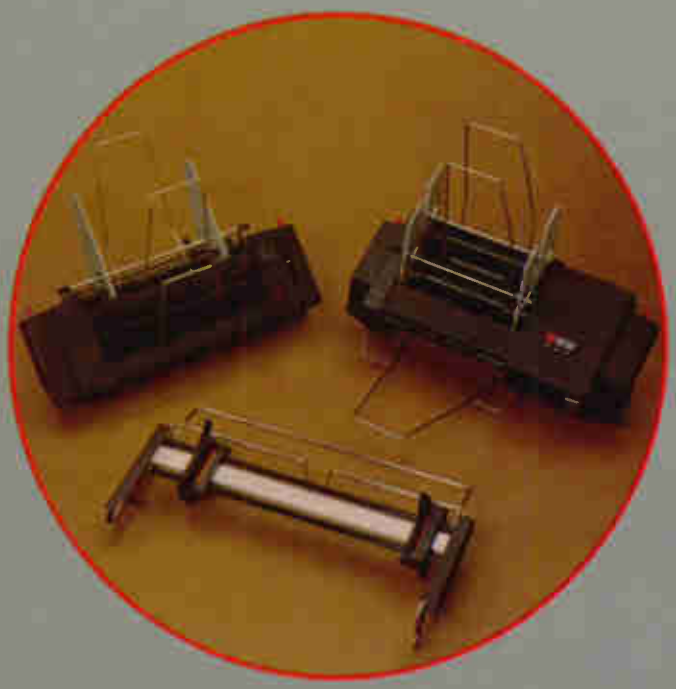
A simple "Offset" command shifts all text to the right without requiring changes to any embedded commands.

Paper handling options for all requirements

A bi-directional forms tractor moves continuous form paper smoothly in either direction.

Cut sheets and letterhead 6 to 14 inches long are handled automatically by single or dual-bin sheet feeders.

Paper-out sensing coupled with flow control assures unattended operation without loss of data.



Reader Service Card Number 107

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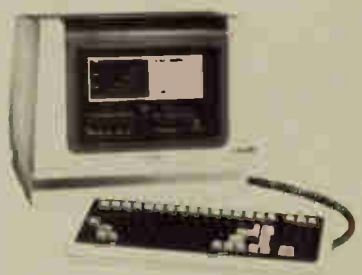
WHAT'S NEW

Matrox CJM-300

Alphacom Sprinter

Kern GP-1

Autograph-150



From page 5

The terminal's features include: numeric keypad, 18 definable keys, light pen interface, printer interface, 256-character upper/lower case font, graphics characters, European characters, and interface speeds up to 19.2K baud.

Reader Service Card Number 6

Tektronix compatibility

The Product: graphics terminal
Supplier: MQI Computer Products
Features: The Autograph 150 emulates the Tektronix 4010 and 4012 terminals. It features: Plot 10 software compatibility, 250 x 512 resolution, selective graphic erase white-on-black or black-on-white display, 24 x 80 AS-CII alphanumeric character set, block and conversational mode options, protected fields, full-editing capability, and communications options.

A detached keyboard, a display that tilts and rotates, an anti-glare screen, and a 25th status line are offered for the user's convenience.

Reader Service Card Number 7

PRINTERS/PLOTTERS

Low-end hard copy

The Product: printer/plotter
Supplier: Alphacom Inc.
Features: The Sprinter models are high-speed, thermal printer/plotters designed for users of TRS-80, Apple II, Atari 800, Commodore Pet, Mattel Intellivision and other personal computers.

All models feature: parallel or RS232C serial interface, eight baud rates, character or graphics mode, and print speeds ranging from two to four lines per second.

The three models available offer 80, 40, and 20 characters per line.

Reader Service Card Number 8

Greater throughput

The Product: plotter
Supplier: Kern Systems Inc.
Features: The GP-1 Master X, Y plotter is said to be a very accurate, though reasonably priced plotter. Its 0.6g acceleration curve gives the plotter a throughput said to be as much as six times greater than that of other plotters with the same drawing speed.

The GP-1 has a four-position drawing head, can be controlled directly by a computer or by a tape, and has a standard serial interface.

Reader Service Card Number 9

Three print speeds

The Product: printers
Supplier: Data Engineering Inc.
Features: The company has introduced three high-speed printers for use with Harris Corp. computers. The P4750 is a 48-character, 2,000-lpm model, the P4740 offers 64 characters and 1,600-lpm printing speed, and the P4760 model offers 96 characters and a 1,200-lpm speed. All three have a 132-column format.

The printers are based on Control Data's Fastrain, and include a CDC power stacker and a controller which is compatible with Harris' PIOC/IOC-IC channels.

Reader Service Card Number 10

DATA COMM

Color is option

The Product: monitor
Supplier: Associated Test Equipment Ltd.
Features: The Questronics Model 400 monitors bi-synch/SDLC-SNA operations, handling such operations in four modes: all stations (on-line), single station (of those on-line), specific device (a single terminal) and transaction type.

The monitor ports consist of three RS-232C female connections and the data output port is a single RS-232C connection with asynchronous protocol.

Optional accessories are a dot-matrix printer and color monitor with color graphics.

Reader Service Card Number 11

Tracks 32 links

The Product: data communications monitor
Supplier: Timeplex Inc.
Features: The Alpha Star network manager is a floppy-disc based microcomputer that monitors and controls a statistically multiplexed data communications network of up to 768 channels transmitting over 32 independent data links.

At the operator's command, or automatically every 24 hours, a status report is generated. This report indicates whether any links are degrading and shows the use of each link.

The ASM-1 configuration consists of a controller, video terminal, printer and desk console. The ASM-2 system consists of a rack mountable control unit and a terminal.

Reader Service Card Number 12

COMPONENTS

Has debugging monitor

The Product: development microprocessor
Supplier: Fairchild Semiconductor
Features: The F68 PEP system is a single-board microcomputer which helps users design, create prototypes of, and debug microprocessor applications using either a 6802/6808 or 6809 CPU. A ROM-based debugging monitor provides commands for troubleshooting machine language programs and for developing and testing peripheral circuits and custom interfaces.

Reader Service Card Number 13

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Reader Service Card Number 193

TI Announces E a Growin

Introducing the new DS990 Models 7, 9 & 29 with fixed and removable disk storage.

If you're looking for ways to get more out of your computer systems, Texas Instruments has got some great things in store for you. Introducing the new members of our DS990 family—the DS990 Models 7, 9 and 29. Powerful computer systems that put the bite on disk storage costs.

New disks for easy back-up.

Flexibility is not forgotten at TI. That's why each of these new DS990 computer systems feature disk storage systems with both fixed storage and a removable cartridge. Fixed disk storage allows easy access to day-to-day information, while removable cartridge disks let users change information when needed. The removable cartridge disk also provides users with a safe, easy, and inexpensive way to back-up information without purchasing another disk drive or magnetic tape drive.

Both the DS990 Models 7 and 9 combine these disks with the power and field-proven reliability of TI's 990/10 CPU. The DS990 Model 7 provides 16 fixed and 16 removable megabytes of disk storage. For greater storage capacity, the DS990 Model 9 includes a disk drive with 96 megabytes of storage — 16 removable and 80 fixed. Should you need it, a second identical disk can be added to either system on the same controller for additional storage.

The DS990 Model 29 features a new, low-profile, 60-inch cabinet and offers the processing power of TI's 990/12 CPU — the strongest central processing unit ever developed for a DS990 computer system. With one disk drive, the Model 29 provides 96 megabytes of storage — 16 removable and 80 fixed. And you can double your capacity by adding a second drive on the same controller.

New members of a proven family.

The DS990 Models 7, 9 and 29 fit right into the DS990 computer family. So you can upgrade your system at any time with a minimum of cost and effort, they're upward-compatible with the other members of the DS990 family— from the microcomputer - based Model 1 to the highly-advanced Model 30.

With proven software.

As members of TI's versatile DS990 family, the new Models 7, 9 and 29 are available

xtra Storage for g Family.

with proven software, including COBOL, BASIC, FORTRAN, RPG II and Pascal. They also have valuable time-saving software utilities, including a powerful data base management system with query and report-generation facilities as well as TIFORM, TI's uniquely efficient screen-formatting language. Word processing software is also now available to let these systems perform a wide variety of office-oriented tasks.

With our communications software and hardware, these new systems will easily fit into your existing distributed processing environment. IBM 3780/2780 batch communications as well as 3270 interactive communications let our systems talk to other systems whenever information needs to be shared.

Worldwide service and support.

Every member of our DS990 family is backed by an extensive service organization with field locations worldwide.

Our customer representatives are skilled professionals with technical educations, formal TI equipment training, and in-field experience.

As a TI customer, you can take advantage of a wide variety of service and maintenance plans so you can pick the plan that meets your business needs.

By dialing our Customer Support Line, for example, you can talk directly with a selected staff of senior engineers and programmers at our computer headquarters in Austin, Texas. So your questions can be answered quickly and directly.

Also among our varied services are fully staffed Education and Development Centers in Austin and Chicago, which provide a wide variety of classes on the use of TI computer hardware and software. We even offer special classes designed for the needs of our OEMs.

For more information about our new DS990 Models 7, 9 and 29, contact the TI sales office nearest you; Richmond Hill, Ontario, (416) 884-9181; Richmond, B.C. (604) 278-8474, or Ville Saint-Laurent, P.Q. (514) 334-3511.

We put computing within everyone's reach.

Reader Service Card Number 223

TEXAS INSTRUMENTS
INCORPORATED

Any new venture involves a risk;

Qantel lets you look before you leap.

Most business computers let you see where you stand... a perspective that Qantel provides you with ease. But you don't grow by standing still. You grow by aggressively attacking your particular marketplace, and consistently breaking new ground.

Which ofttimes involves a risk. However, if you can foresee possible outcomes of an anticipated move, and can prepare alternative approaches, you greatly enhance your possibility of success.

So Qantel puts you on top of your present position, then keeps you one jump ahead. With QICPLAN...a forward-planning management tool that lets you see where you want to grow. Like: Should you introduce that new product, or wait? Will your cash flow support your new venture? Do you have an accurate assessment of the new market size, or are you flying by the seat of your pants?

It's correct decisions to questions like these that put you on top of your mark. Qantel with QICPLAN can help. To investigate this invaluable management tool, write, or call us.

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CDS 11/80

Reader Service Card Number 142

OUR SMART TERMINAL IS ONE TOUGH COMPETITOR.

It's not easy buying a terminal today. There's a lot of names to choose from. So consider the facts, then make your decision.

THE AMPEX DIALOGUE 80™ TAKES THE COMPETITION ON.

The Dialogue 80 is one tough competitor. Comparing our interactive, desk-top editing terminal to most other terminals costing hundreds of dollars more is very revealing.

For instance, most do not offer a detached keyboard. We do! Most do not offer a self test. We do!

And most do not offer a status line. Ours comes with a continuous display of current operating modes, functions, error/fault conditions and more!

The list continues with third and fourth memory pages. We have it! Most of the others do not.

And truly programmable function keys? Once again, we have it. Most of the others do not.

For hundreds of dollars less, the Dialogue 80 gives you a host of standard features the others do not. When you take a closer look, the Dialogue 80 is the smart terminal buy!

ENGINEERED FOR TODAY.

With everything the Dialogue 80 has going for it, you'd expect it to be designed for today's needs. And it is. With a long list of "friendly" features that make operation easy and comfortable.

That means machine and man interact successfully. And it also means the Dialogue 80 contributes to a productive environment.

CALL US TODAY. WE HAVE THE ANSWERS.

We're confident we have the right terminal. From our Dialogue 80 to our Dialogue 30, one of the best priced terminals on the market today.

So, if you still have questions on which is the best terminal buy, call us. Ampex has the answers with the Dialogue 80 designed and priced for the OEM and systems house.

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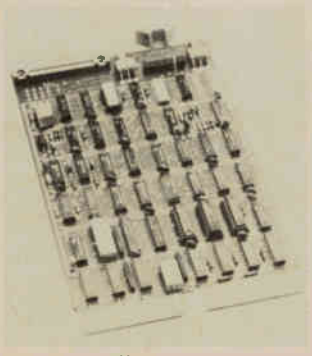
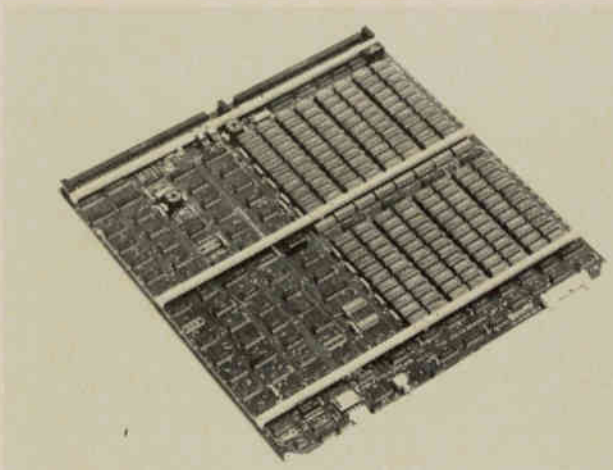
Reader Service Card Number 113

WHAT'S NEW

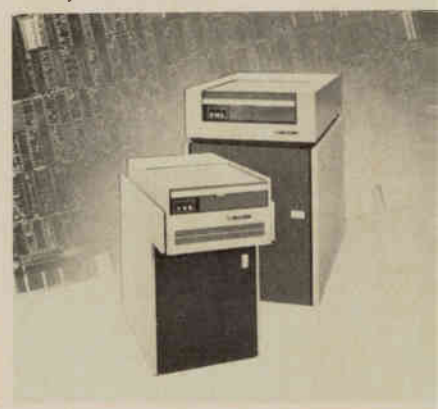


MDB controller



Macrolink module

Plessey PM-DC1102



Add-in for DEC

The Product: memory card
Supplier: National Semiconductor Corp.
Features: The NS70/75 is a 256K byte, board level, add-in memory card which plugs into DEC VAX-11/750 memory backplanes and PDP-11/70 MK-11 MOS memory backplanes. Since it is compatible with both, users who upgrade can transfer the card from system to system. The memory can be electrically removed from the backplane by a switch during diagnostic operations.

The card is made with preconditioned ICs and comes with a two-year warranty. A spare RAM is included on every board in the event of RAM failure.

Reader Service Card Number 14

Self-testing model

The Product: line printer controller
Supplier: MDB Systems Inc.
Features: The company's LSI-11 line printer controller will interface a DEC LSI-11/2 or LIS-11/23 to almost all major printers. It is also equipped with full self-testing capabilities—said to be the first such line printer controller available.

One testing feature, PrinTest, causes the controller to transmit to a connected printer a prescribed pattern that will check all features of an operational printer except VFU functions.

Reader Service Card Number 15

STORAGE

Expands core

The Product: memory module
Supplier: Macrolink
Features: The Macrolink 256-Kbyte memory module allows Perkin-Elmer 7/32 users to have one megabyte of internal memory without filling up all their memory slots. The Macrolink modules occupy four slots and require no expansion chassis or local memory bank interfaces.

They meet the 750 ns core timing specifications so may be used with other 64-Kbyte cards.

Power consumption is reduced as well. The module uses 25 watts, compared with the 100+ watts for active 64-Kbyte core cards.

Reader Service Card Number 16

Disc interface offered

The Product: storage interface board
Supplier: Data Systems Design Inc.
Features: The company now offers a quad-wide PDP-11 interface board that fits any SPC slot, and allows the DSD 880 Winchester/floppy disc storage system to be used with the DEC computer.

The interface board controls the data transfer between the 880 interface bus and the PDP-11 UniBus, and arbitrates RL01 and RX02 command transfers between the controller and processor.

Reader Service Card Number 17

PDP-11 disc emulation

The Product: disc controller
Supplier: Plessey Peripheral Systems
Features: The PM-DC1102 disc controller can be used with Plessey storage module drives to emulate DECs RM02 or RP06. The controller plugs into two SPC slots of the PDP-11 computer, and features: integral LED error message display, micro-controlled throttle, ECC and CRC error detection, internal self-test, and on-board connectors to support four drives.

The PM-DS02D subsystem combines the controller with a PM-DD11/80 disc drive for RM02 emulation. Maximum capacity of this system is 268 Mbytes.

RP06 emulation is available with the PM-DS06E subsystem, which uses the controller with the PM-DD11/300 disc drive for a total capacity of more than 1,000 Mbytes.

Reader Service Card Number 18

Disc plus tape

The Product: disc drive
Supplier: Hewlett-Packard (Canada) Ltd.
Features: The HP 7908 drive consists of a 16M byte Winchester disc for mass storage and a ¼-in. cartridge tape drive for personal I/O and back-up. Average access time for the disc is less than 50 ms.

An intelligent integral controller manages most disc and tape operations, including disc-to-tape and tape-to-disc data transfers.

The unit is available rack-mounted or in a stand-alone cabinet.

Reader Service Card Number 19

ACCESSORIES

High-voltage switches

The Product: switches
Supplier: RPS Electronics Inc.
Features: Silicon General's high-voltage Darlington switches are pin-for-pin replacements for Sprague part numbers ULN-2064 through ULN-2077. They are intended for interfacing low-level logic peripheral loads such as relays, solenoids, dc and stepping motors, multiplexed LED and incandescent displays, heaters, and similar high-current loads.

Reader Service Card Number 20

Fights build-up

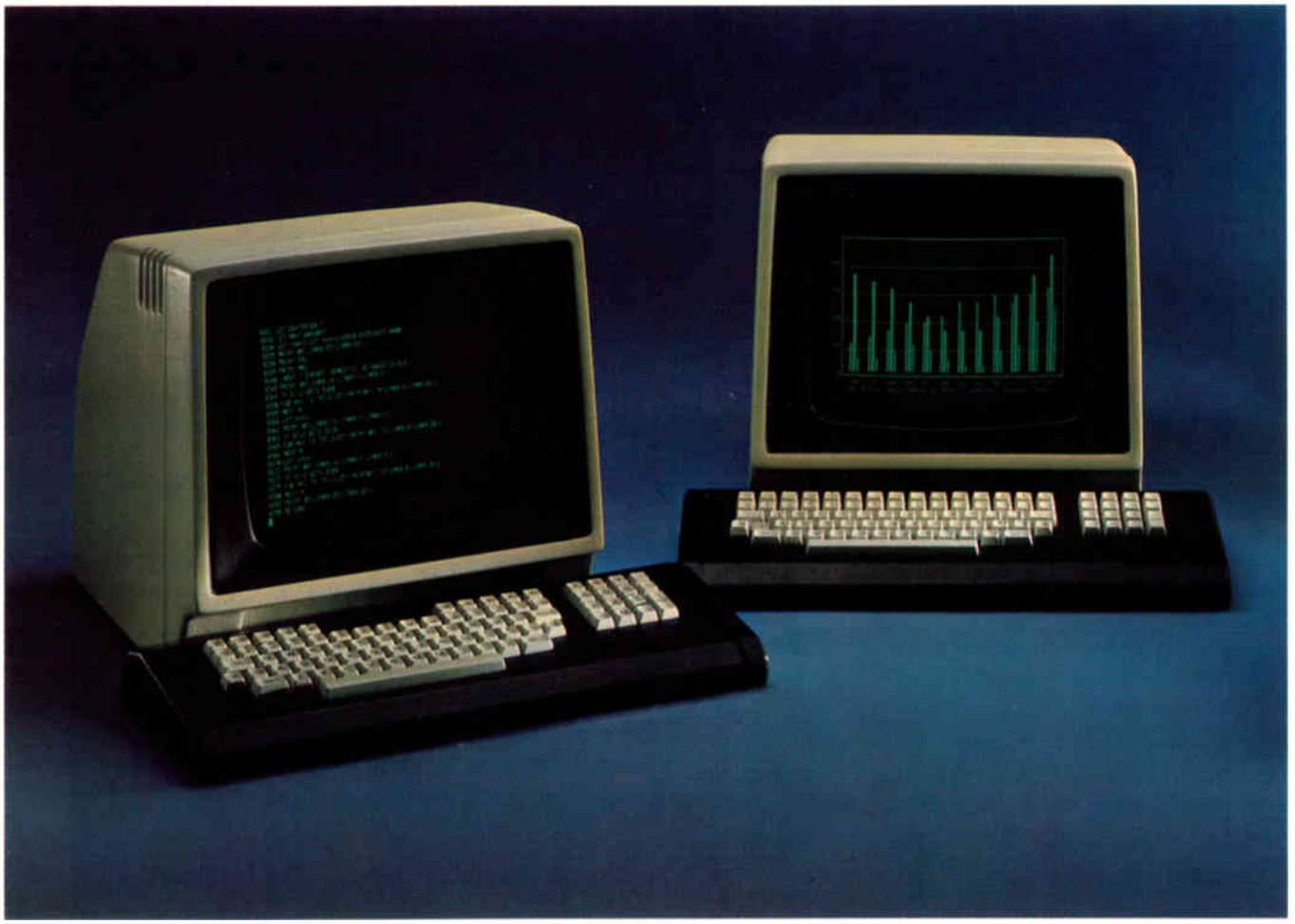
The Product: air conditioner
Supplier: Kolostat Inc.
Features: The K-series of computer room air conditioners is designed for small to medium sized rooms. A unit offers steam humidification with timed flush cycles to eliminate mineral build-up.

The equipment has built-in controls, and features easy access to all components.

Reader Service Card Number 21

CYBERNEX

VIDEO TERMINALS



Standard Features of Cybernex Terminals

General

Cybernex terminals are designed for functionality, adaptability and user comfort. Quality has not been sacrificed to achieve low production costs. High engineering standards and rigid quality control result in one of the most reliable and competitive video terminal product lines available.

Microprocessor Design

Proven 6800 microprocessor based logic design with buffered keyboard and RS ports for ESD immunity. The sophisticated microprocessor design provides for operation at any baud rate with no spurious flashing of displayed data. An EMI power line filter is built into every terminal to eliminate possible disturbances from noisy power lines.

Screen

All models feature a 12 inch or larger P31 green phosphor CRT. The face of the CRT is etched to reduce glare without affecting focus. White and amber CRTs are available on special order.

Keyboard

Operator comfort has been maximized in the detachable keyboard design. Any unused length of keyboard cable slides out of sight under the display. The low profile enclosure has convenient resting places on each side — free of sharp edges. The solid feel, sound and comfort of this keyboard gets many compliments from satisfied customers.

The keyboard is equipped with 82 or 87 keys, depending on model. A rugged, round cable is used which is shielded for ESD and EMI immunity. The key switches used are a field proven, high reliability gold plated mechanical crossbar design. The individual switches are mounted into a steel switchplate which mounts on a steel base panel. This protects the pcb from being stressed during normal use or abuse.

Alternate Keyboard

On special order, most models can be supplied with a larger keyboard. This is a 107 key keyboard with a numeric pad and two rows of function keys, 16 keys per row.

Display

All models feature an 80 character, 24 line display format. Some models have a 25th status/ message line. Operation in page overwrite or scroll mode is selectable. High quality components assure good focus over a large raster. This maximizes character size for good legibility. Operator control of intensity is provided for adjustment to suit ambient light conditions.

Maintainability

Maintainability is exceptionally good with separate keyboard, power supply, video amplifier and terminal logic modules. A self test routine is performed on power up, with a power up or fault message written on the screen. Keyboard switches are individually replaceable. A single accessible logic board is used to minimize interconnections. The location of the logic board allows in-service trouble shooting without the use of extenders. Proms can be changed without disassembling the enclosure.

Emulations

Several accurate and thorough emulations have been developed in response to market demands for superior replacement products. Please consult a recent product list for an up to date list of emulations.

Customs

Cybernex has developed many custom variations of its terminals for OEMs and large end user customers over the years. A Datapac compatible block mode version of our MDL-110 was developed to meet Bell Canada's specific requirements. A Hewlett Packard compatible block mode version of an MDL-120 was developed to meet the special needs of Xerox. Contact Cybernex to discuss your requirements.

XL-80 Series

Designed with the adaptability required for OEM and export applications, the XL-80 Series is a lower cost second generation microprocessor based terminal line, featuring Smooth Scrolling. Other features available on various models of the XL-80 Series include split screen scrolling, line drawing, pseudo graphics, multiple attributes, forms creation, form filling, screen editing and block mode operation.

MDL-100 Series

This innovative high speed, high resolution, multi page terminal line was first introduced in 1978. Since then its solid performance has made it the backbone of the Cybernex product line. The MDL-100 Series has become a favorite with OEMs because of its speed, its legibility and its many selectable operating modes. Multiple attributes, form filling, screen editing and buffered operation modes make it ideal for many varied applications. After three years, the MDL-100 Series is still an industry leader.

APL-100 Series

The APL-100 Series is a sophisticated dual purpose ASCII/ APL terminal line. The operating mode is host or operator selectable. Simultaneous display of two pages of screen memory, one for the original character and one for the overstrike, provides *true unlimited overstrikes. True* means that the final visual effect is an accurate combination of the two overstruck characters. *Unlimited* means that all overstrikes are valid — any character can overstrike any other character. The high resolution dot matrix allows even the most complex overstrikes to be legible.

The Company

Cybernex Limited was founded in 1974 by four engineers to design, manufacture and market electronic equipment for the data processing industry.

The company philosophy is to provide a high quality product line with the adaptability required to meet the varied needs of a broad and sophisticated customer base.

All Cybernex products are designed, developed and manufactured in house by Cybernex Limited.

Product History

1974 Cybernex introduced the D1600 digitizing video terminal for the aero photogrammetry industry

1975 Cybernex introduced the compact, low cost, LTL Series of video terminals

1976 Cybernex introduced the LGR Series of 12 inch video terminals

1977 Cybernex introduced the LC Series OEM microcomputer/ floppy disk system

1978 Cybernex introduced the MDL-100 Series of microprocessor based video terminals

1979 Cybernex introduced the innovative APL-100 microprocessor based terminal to meet the needs of the growing APL market

1980 Cybernex introduced the XL-80 Series of second generation microprocessor based video terminals to replace the LTL and LGR Series

1981 Cybernex continued its participation in the aero photogrammetry industry by introducing the D1605 microprocessor based digitizer

Ongoing Product Development

Cybernex continuously introduces product improvements and developments to keep pace with changing industry requirements. A flexible new line of synchronous/ asynchronous, clustered/ stand-alone terminals will be introduced in the fall of 1981. Other products in the planning stages include high resolution graphics, 132 column and field verification terminals. Keep in touch for the latest product information.

Sales and Service

The standard Cybernex video terminal product line is available through an expanding network of stocking and servicing distributors throughout the world. For the distributor in your market area, please contact us.

Distributor inquiries should be directed to the Vice President of Marketing, Cybernex Limited, in the Mississauga office.

CYBERNEX LIMITED

Manufacturing, Sales and Service
1257 Algoma Road
Ottawa, Ontario
Canada K1B 3W7

Telephone: (613) 741-1540
Telex: 053-4419

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MSA

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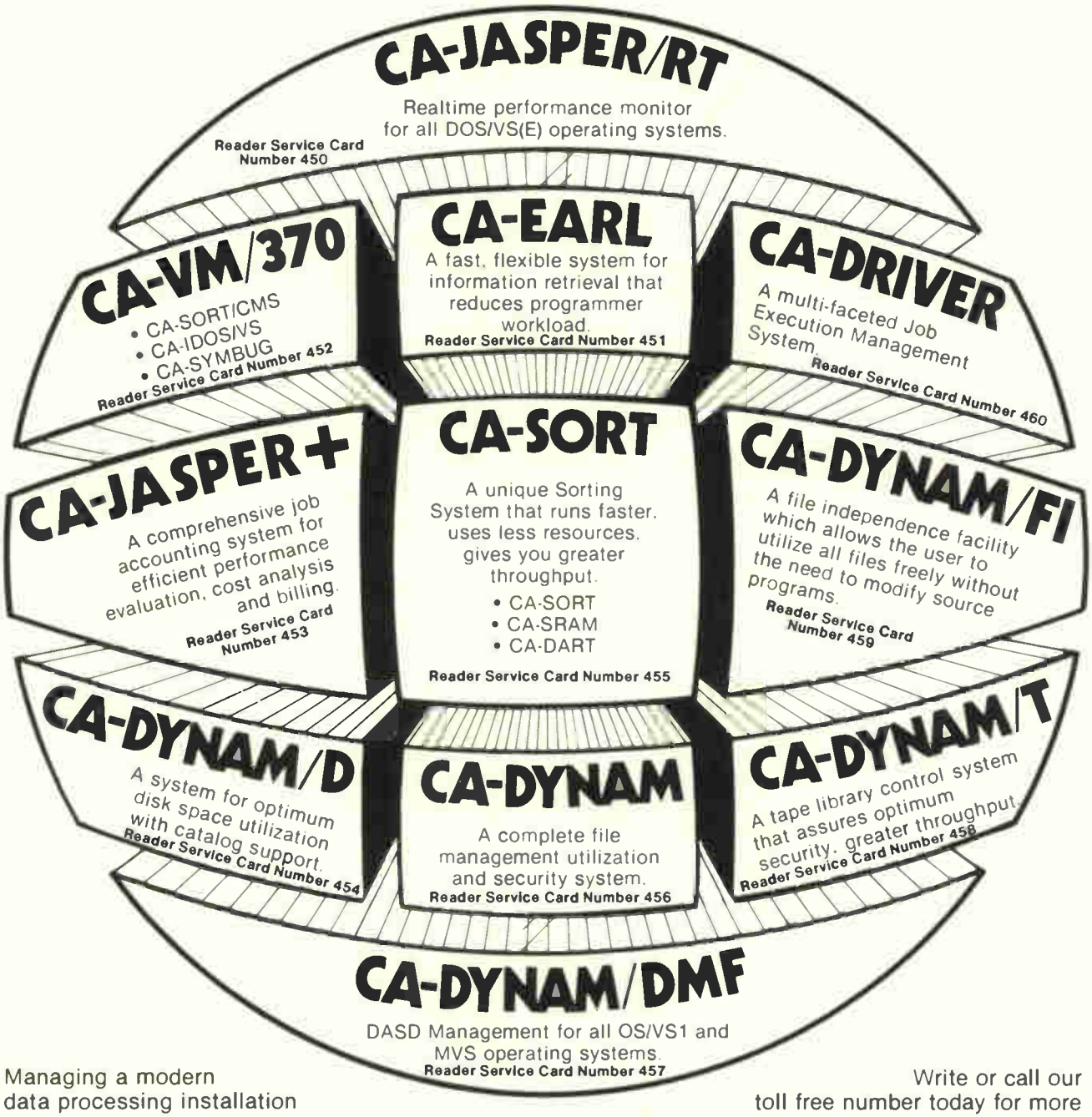
A Global Software Solution.



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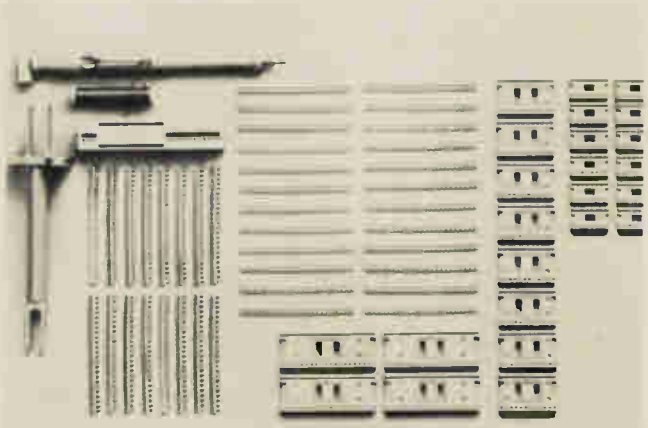

Scotchflex breadboard

Facit tray

Burroughs System 315

AES Alphaplus

Creates more room

The Product: CRT tray
Supplier: Facit Inc.
Features: The Facit CRT sliding tray can hold most CRT terminals so that they can be pushed to the back of a desk when not needed, and brought forward when in use.

The tray is made of steel, with a heavy-duty ball-bearing suspension system, and has a surface of light oak veneer. It can be adjusted up or down to eliminate glare.

Reader Service Card Number 22

Trims forms

The Product: form cutter
Supplier: Davlin Business Systems Inc.
Features: The Kern continuous form computer output cutter will replace mid-volume burster equipment, producing neatly trimmed sheets from continuous forms. Maximum speed is about 300 feet per minute, and the trim size is adjusted by a dial. The cutter handles single and multi-part forms of a maximum width of 48 cm.

Reader Service Card Number 23

Customized PCBs

The Product: breadboard system
Supplier: 3M Canada Inc.
Features: The company has expanded its solderless Scotchflex breadboard system for fabricating prototype or custom printed circuit boards. The new model simplifies plug and connector fabrication by accommodating sockets sized from 8 to 40 conductors. Plug strips and solder strips come in 24-contact sizes, but any number of contacts can be snapped off to fit a custom pattern in the PC board.

Standard kits contain 24 24-contact plug strips, 16 24-contact solder strips, and dual sockets ranging from 16 to 40 pin sizes. Optional kits add a microprocessor board.

Reader Service Card Number 24

Postal protection

The Product: shipping envelope
Supplier: Dennison KYBE Corp.
Features: The company offers envelopes for mailing 5¼-in. and 8-in. flexible discs. Each envelope will hold two discs, and is made of rigid cardboard lines with a dust-free, anti-static plastic.

Reader Service Card Number 25

TEXT PROCESSING

No more misspellings

The Product: word processor
Supplier: Compucentre
Features: Compucorp's word processors come equipped with a Correct 'N' Spell dictionary which automatically locates misspellings and typing errors and then automatically corrects them.

The operator can use this feature while typing or can wait until finishing a document before correcting spelling mistakes.

Reader Service Card Number 26

Price competitive

The Product: word processor
Supplier: AES Data Ltd.
Features: The Alphaplus stand alone word processor is said to be competitively priced with electronic typewriters. It has a 16-line display screen, a detachable keyboard, and a built-in 30-cps daisy wheel printer. Memory is 64K.

The Alphaplus 10 performs all standard word processing functions and comes with one diskette drive. The Alphaplus 12 adds the ability to list and repaginate and comes with two diskette drives. Optional software for this model makes line drawing, proportional printing, string, search and replace possible as well as providing a glossary.

Both models are compatible with other AES systems.

Reader Service Card Number 27

First-time WP

The Product: text writer
Supplier: Burroughs
Features: The RIII System 315 text writer is designed for the first-time word processing user. It comes equipped with a 35-cps printer and a single diskette drive, and is compatible with more advanced systems in the same series.

Features include: automatic letter writing, file security, proportional printing, window control, and highlighting.

Reader Service Card Number 28

Speed suits uses

The Product: printer
Supplier: Printronix Inc.
Features: The Taskmaster MVP2 impact printer offers variable print speeds for different applications. For correspondence and word processing applications, the print speed is 80 lpm at a density of 100 x 100 dots per square inch. The speed increases to 150 lpm (60 x 72 dpi) for data processing output, and to 200 lpm (66.7 x 66.7 dpi) for compressed character printing on small forms.

Noise from the printer is less than 60 dba—suitable for office operation. Standard features include: six-part form handling; business graphics; plotting; forms generation; labeling; OCR and bar codes; double-height printing; underlining; and electronic vertical formatting.

Reader Service Card Number 29

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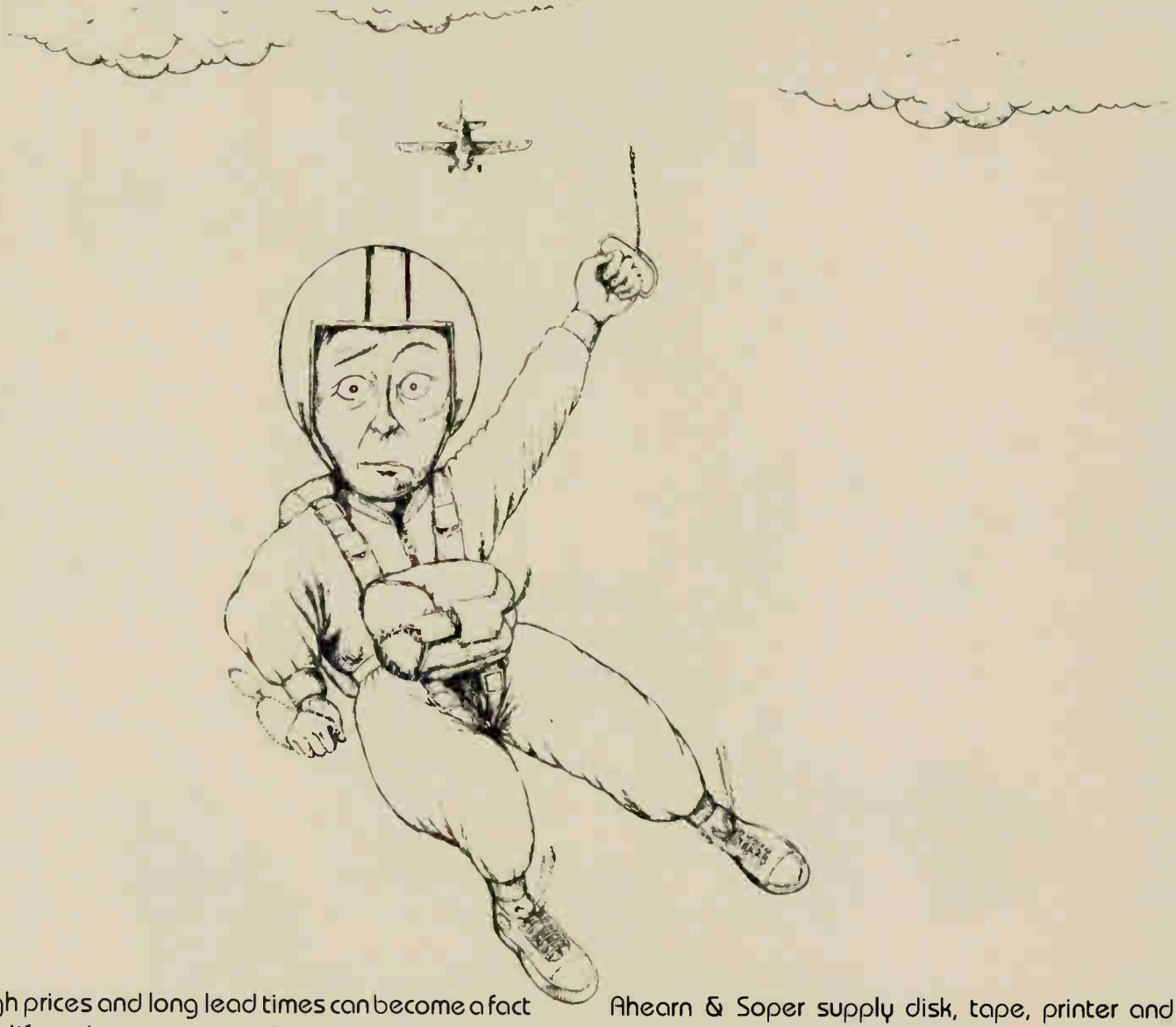

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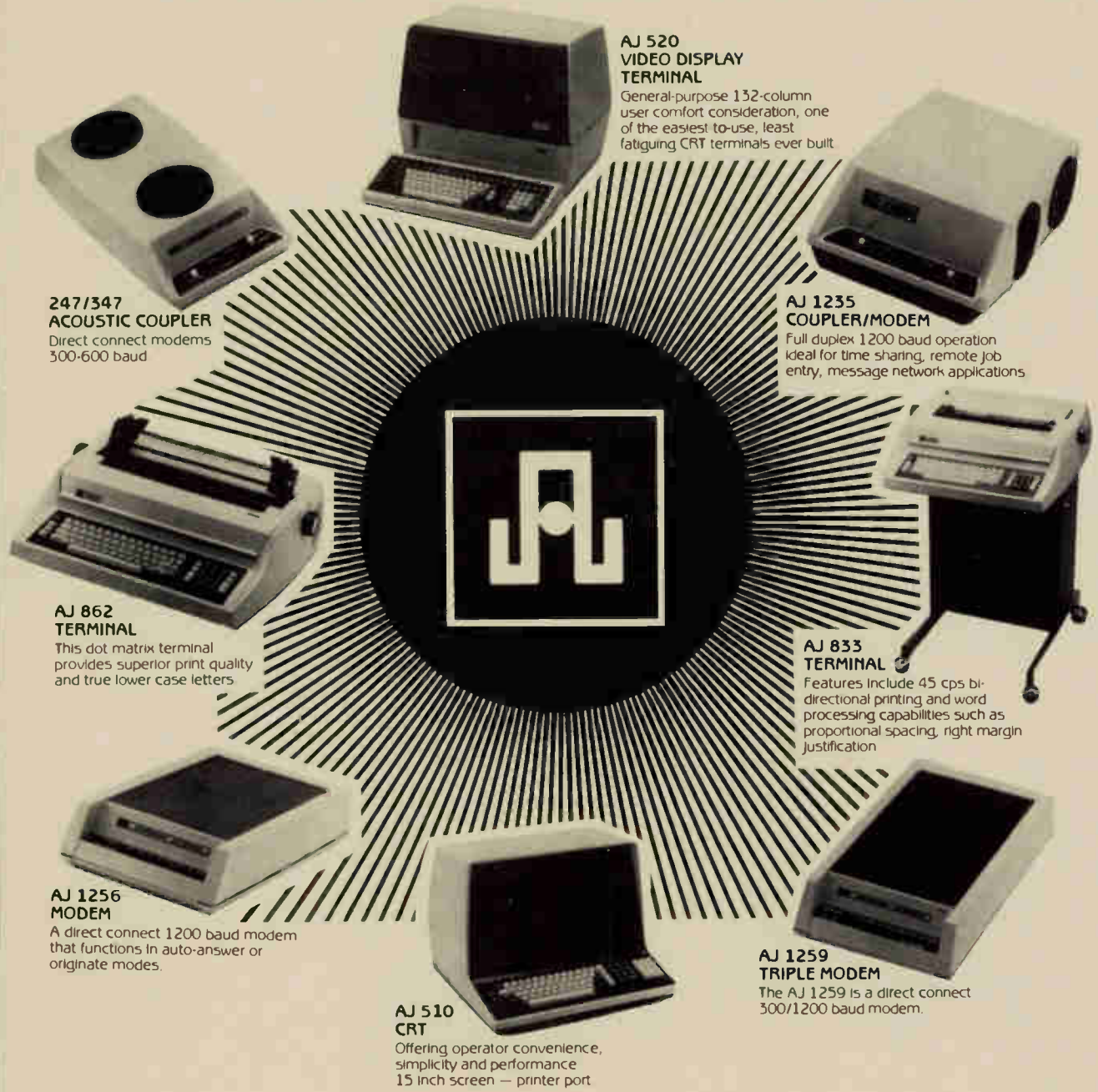

AJ 520
VIDEO DISPLAY TERMINAL
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247/347
ACOUSTIC COUPLER
Direct connect modems 300-600 baud

AJ 1235
COUPLER/MODEM
Full duplex 1200 baud operation ideal for time sharing, remote job entry, message network applications

AJ 862
TERMINAL
This dot matrix terminal provides superior print quality and true lower case letters

AJ 833
TERMINAL
Features include 45 cps bi-directional printing and word processing capabilities such as proportional spacing, right margin justification

AJ 1256
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A direct connect 1200 baud modem that functions in auto-answer or originate modes.

AJ 1259
TRIPLE MODEM
The AJ 1259 is a direct connect 300/1200 baud modem.

AJ 510
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Offering operator convenience, simplicity and performance
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Reader Service Card Number 114

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The Tektronix 4114 Computer Display Terminal

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An optional colour enhanced refresh display keeps refreshed information in an easy-to-view, contrasting colour.

Why waste time on the line for what you can now see locally? See your Tektronix Sales Representative, or use the coupon below, for complete details.

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See us at Booth Island "U"

Reader Service Card Number 221

SOFTWARE UPDATE

news of software and services

Entry-level graphics

The Product: graphics system
Supplier: Intergraph Systems Ltd.
Features: The company has developed an entry-level graphics system, designed for use as a stand-alone machine or as a node in a distributed network. The system can create, manipulate, display and plot any form of graphics information and simultaneously manage data. It is compatible with the firm's other graphics equipment.

A typical configuration consists of a DEC 11/23 CPU, one megabyte of memory, an Intergraph file processor and communications concentrator, a 160 megabyte disc drive, a nine-track tape drive, an alphanumeric control console and two monochromatic, dual 19-inch raster-screen workstations.

Reader Service Card Number 30

Optional parameters

The Product: file utility
Supplier: Dataware
Features: Filecomp is a file compare utility for IBM DOS and OS systems. It is written in IBM Assembler and offers several optional parameters.

Report options allow printing in both character and hexadecimal format, and field options permit key fields for file alignment to be specified after missing or extra records.

Reader Service Card Number 31

Produces rental reports

The Product: application software
Supplier: Compu-Share
Features: The company's Management Reporting System is an interactive system, programmed in Extensive Basic, for the construction equipment rental industry. It provides detailed information about each rental item, including its use, repair to earnings ratio, accumulated earnings, repairs and depreciated cost. Summaries by subgroups and major groups of equipment for all locations are generated monthly.

Reader Service Card Number 32

Reads video screen

The Product: voice output system
Supplier: Cyberon Corp.
Features: The Cybertalker-I will verbally read, character by character, the video screens of most computers. It is suitable for computer programming and debugging as well as word processing.

The machine handles baud rates from 110 to 4,800, can differentiate between upper and lower case letter if desired, can recall lines or characters from its buffer, and can receive data while reading. Options include a larger buffer and the ability to accept non-ASCII code.

Reader Service Card Number 33

Runs general ledger

The Product: financial planning system
Supplier: Cado Systems Corp.
Features: The BusiPlan financial planning package provides comprehensive automation of budgeting, forecasting, loan analyses, investment analyses, cash flow analyses, and other "what-if" analyses.

The new system runs on any of the Cado 20/20 family of small business computers and is integrated completely with the firm's standard general ledger program. The system generates analyses either in tabular or in graphic displays or printouts.

Budgeting and budget analysis can be performed on current actuals and the system provides side-by-side comparison of projected-to-actual figures, thereby enabling the planner to modify budgets and/or project new year-end totals based on current performance data.

The package calculates forecasts for up to 99 levels of operation, enabling all cost centres for even the largest corporations to be consolidated by region, division, or to compare company-wide totals.

Reader Service Card Number 34

Graphics for VAX

The Product: mapping system
Supplier: Kongsberg North America Inc.
Features: SysScan is a computerized mapping system that operates on DEC VAX computers. Its interactive operation guides the user to the next possible program step.

The system includes: GINIS (Graphic Interactive Information System), which is a software program to handle graphic data and associated administrative data; Graphic 7, an intelligent refresh terminal providing interactive communication with the data base; KartoScan, an automatic digitizing system; and raster to vector software.

Reader Service Card Number 35

Modify visually

The Product: graphics software
Supplier: Control Data Canada Ltd.
Features: The Unistruc II (Unified Structural Analysis) interactive graphics system is now available through the Cybernet network.

This pre- and post-processing system helps engineers generate finite element models and analyze results of structural analysis program output.

Functions such as rotation zooming and sectioning, allow users to modify a model visually. The system's post-processor creates deformed structure and stress distribution plots.

Reader Service Card Number 36

Reduces errors

The Product: data entry terminal
Supplier: Perception Technology Corp.
Features: The Touch Tone terminal allows operators to enter alpha characters without using the error-prone special coding conventional touch-tone telephones require.

The equipment consists of a power supply unit and a 40-button keypad with acoustic coupler. The coupler is attached to the telephone mouthpiece and functions as the transmitter for data input.

Reader Service Card Number 37

Finance features

The Product: Materials management package
Supplier: Hewlett-Packard (Canada) Ltd.
Features: New financial capabilities and European-language versions have been added to the H-P materials management/3000 application software package.

The new financial capabilities are designed to help manufacturers integrate the materials planning and control features of the software package with existing or new financial software.

The new Financial Interface is a set of programs and procedures that can be used to transfer records of inventory movement into costed journal entries, which in turn can be accessed by a conventional general ledger software package for further processing. The form of the journal entries can be established to conform to a manufacturer's specific accounting structure by using the package's customization features.

Reader Service Card Number 38

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Hewlett-Packard's new 8-pen plotters bring true color capabilities to hard copy graphics. There are ten beautifully coordinated colors to choose from, all carefully selected for shading compatibility and line differentiation. And each pen color comes in two line widths.

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HP makes a family of hard copy graphics products and software to meet a wide range of needs on a wide range of systems For more information call your local HP office listed in the White Pages or write to Paul Mosley, Hewlett-Packard (Canada) Ltd., 6877 Goreway Drive, Mississauga, Ontario, L4V 1M8.

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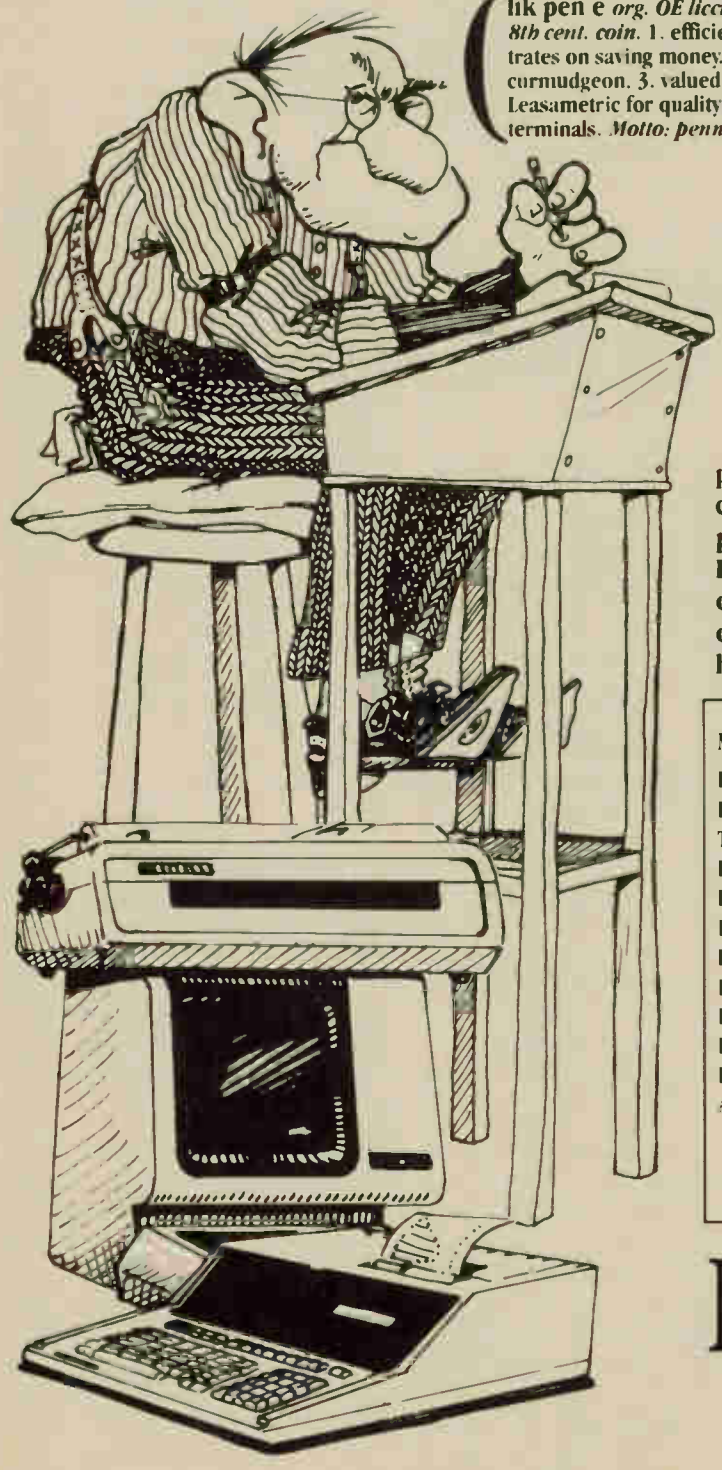

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HP	9895A	Dual Disk Drive
HP	9874A	Digitizer
HP	2631G	Graphics Printer
HP	2647A	Graphics Teminal
HP	2624A	CRT Terminal
HP	2626A	CRT Terminal
Atlantic Research	4500	Interactive Test System

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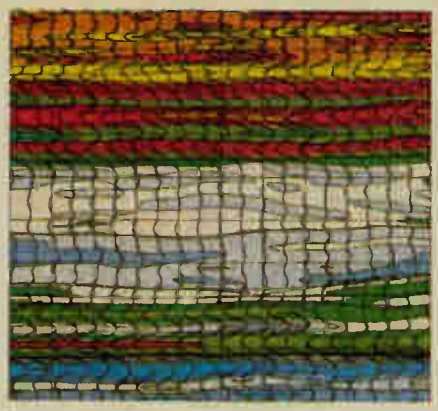

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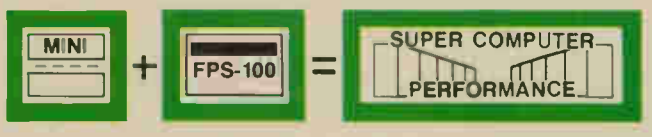

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New software line aimed at home/business micros

A major move to provide software programs for home and business microcomputers is being launched by Heath Co., Mississauga, Ont.

According to general manager Brian Winks, the new software line, called 'Softstuff,' is designed for users who require documented programs to expand the capabilities of their computers for home and business use.

The first applications programs include a full screen editor and an improved text formatter; a file transfer utility with on-line access to MicroNET Information Services; education and entertainment packages; and problem-solving software, including office management, word processing, telecommunications and office communications.

Among initial offerings will be an enhanced programming language, C-Basic. More languages are now under development, notes Heath.

Initial Softstuff programs operate under the Heathkit Disk Operating System (HDOS). Programs operating under CP/M will be introduced by year end.

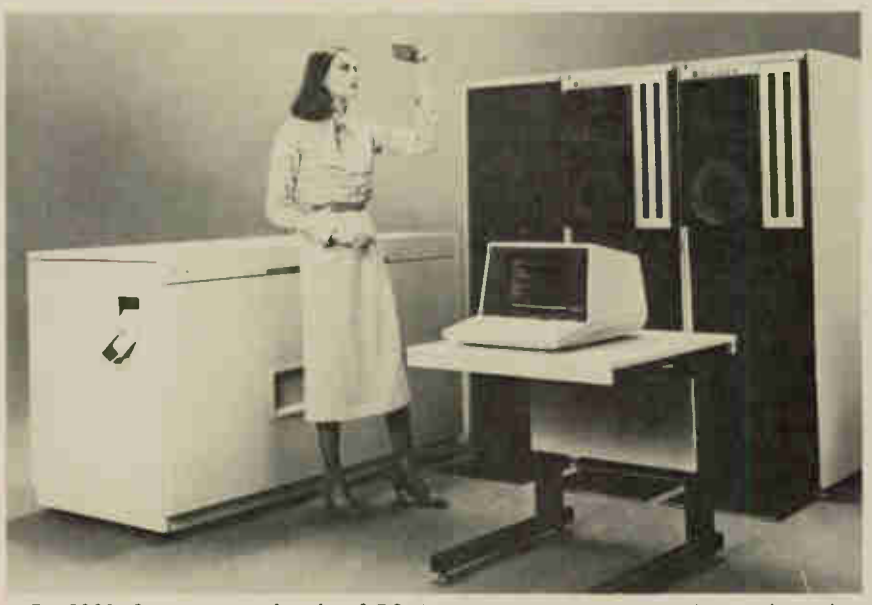
Programs have been developed by the Heath Users' Group and Heath specialists.

Semiconductor disc helps boost CPU productivity

The speed and performance of traditional disc technology have not kept pace with the data transfer requirements of current operating systems, thus limiting a CPU to a portion of its capabilities. To cope with this, Intel Corp. has developed a semiconductor disc (FAST-3805), to eliminate the mechanical and rotational delays associated with traditional paging devices.

According to Intel, the semiconductor device helps increase system resource productivity; reduces terminal response time; increases the number of active users; improves programmer productivity; and helps manage application backlog while controlling growth.

The new device has several optional 'personalities' which enhance its use, says Intel. Implemented as an IBM device, the FAST-3805 emulates a 2305. A 'Native Mode' microcode option is a special personality which enables the semiconductor disc to minimize channel-driver overhead and improve mainframe performance. The 'Native Mode' feature can boost storage capacity by 30 per cent without loss of interrecord gaps and other formatting inefficiencies associated with rotating discs, says Intel.



NCR 5330, first in a new family of COM systems, converts magnetic tape input into archival quality microfiche. Film alignment, exposure and chemical processing are controlled automatically.

New COM system by NCR uses 10 mbytes storage

The first member of a new line of microprocessor-based COM systems from NCR Canada Ltd. includes 10 megabytes of hard disc storage, one or more medium of high-density tape handles, a display terminal, thermal printer and a microprocessor-controlled fiche processor.

Designated the 5330, the system's processor is self-contained with 128,000 characters of memory and what NCR describes as the fastest COM camera system in the industry. It employs a vacuum system for film handling.

According to NCR, the first cut and dried fiche is produced in about four minutes and subsequent fiche are produced at about one-minute intervals, depending upon format and tape density.

System operation is controlled by Micrographic System Executive (MSX) software that accommodates magnetic tape input from all major vendors. The system operates in either an interactive mode or a direct entry mode. Job parameters, once defined, are stored on disc for future use. Supporting software includes utility routines that analyze tape contents and diagnostic programs for component-level fault isolation.

Plasma etching to change semiconductor production

By 1985 over 95 per cent of the etch and strip segment of the semiconductor processing market will use plasma equipment, says Strategic Inc.

This growth in plasma equipment is due to the disadvantages of wet-etching process equipment, the present mainstay of the etching step in semiconductor manufacturing. Currently, etching is achieved by dunking wafers in an acid bath. The acid solution etches away certain areas of each integrated circuit on the wafer to produce the transistors which form the IC in the final product.

Problems with wet etching include the equipment that is bulky and requires much floor space in a production facility. Acids and other chemicals pose health hazards to production workers and the wet-etching process is fast becoming inadequate for the ever-smaller geometries required in the newest-generation VLSICs.

With the previous generation of ICs, wet etching was adequate for processing transistors whose component parts were 4 to 5 microns in size. In the next few years, transistor components five times smaller, around 1 micron in size, will be prevalent in ICs. Wet-etching cannot reach this fine definition.

Plasma eliminates this problem. Plasma exists only in the presence of an electrical charge. Thus it can be switched on and off with a flip of a switch, unlike wet chemicals which continue to react even when the bulk of the chemical is washed from the wafer surface.

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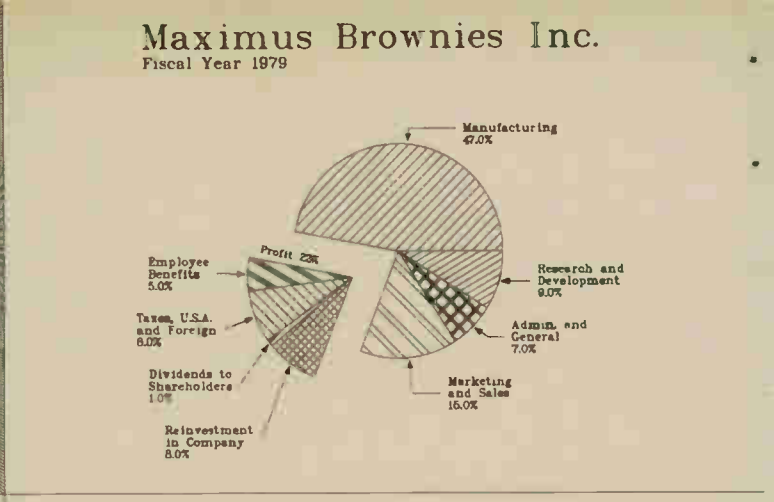

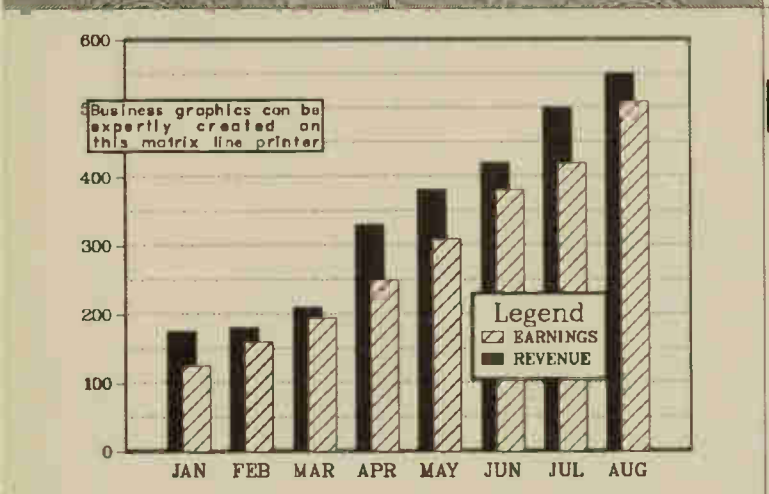

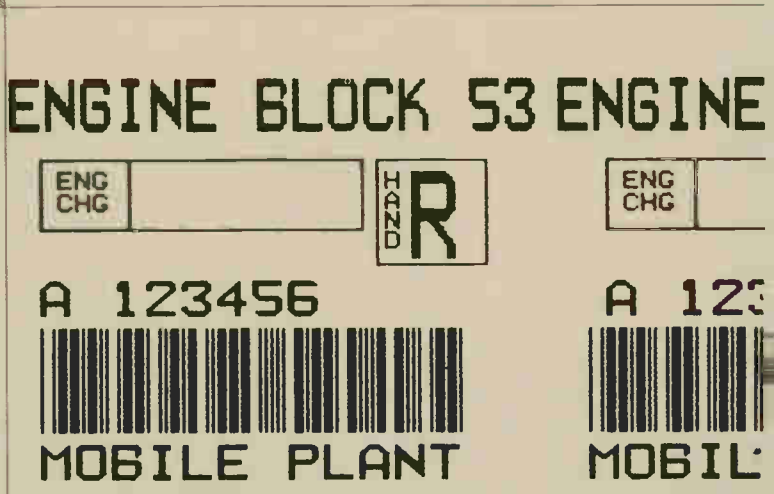

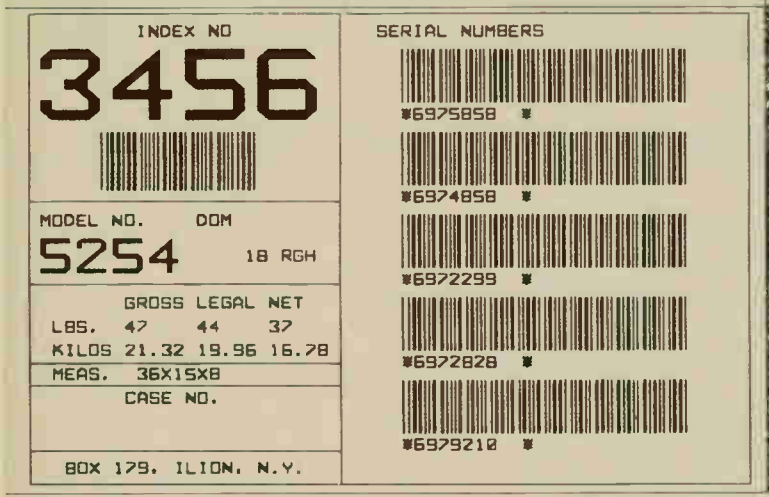

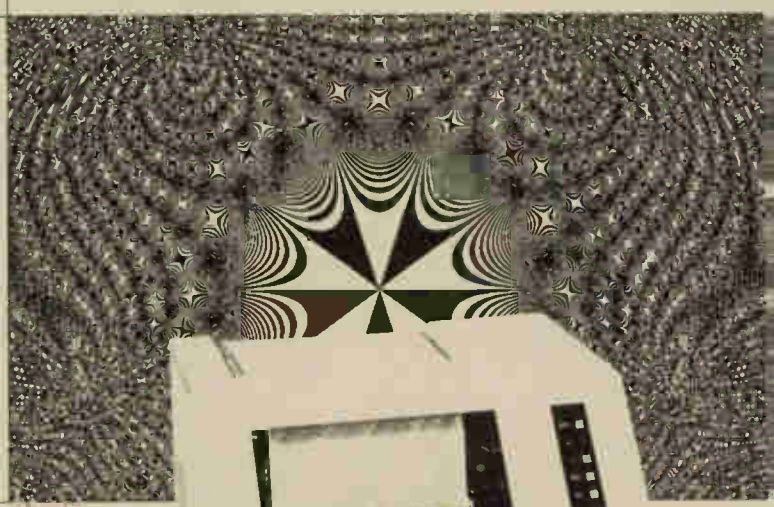

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EDP WORLD

news of DP developments overseas

Strong market Down Under for telecommunications sales

An annual growth rate in telecommunications equipment demand is seen for the nation-continent of Australia, in the opinion of officials at Gandalf Data Communications Ltd., Ottawa.

"Telecomm sales in Australia will grow by more than 30% per annum," v/p marketing Peter Kawchak feels. "Our firm has recorded year-to-year sales increases in excess of 50% since we entered the market in 1978."

Addressing a group of Australian journalists and telecommunications industry leaders who recently visited Canada, Kawchak noted with satisfaction the international reputation Canada is enjoying as a producer of high-quality data communications equipment.

Gandalf is represented in Australia by Datamatic Pty. Ltd., and has sold systems to the University of Sydney, Melbourne University, the Commonwealth Scientific Industrial Research Organization, Armidale University, and the Australian National University.

British terminal attachment cuts on-line costs by 50%

A new terminal attachment from Williams & Nevin, Britain, has been developed to simplify on-line computing and reduce on-line costs. Known as the Userkit, the attachment facilitates access to on-line systems by permanently storing the system addresses, the log-on messages and the passwords so that contact with an on-line system can be achieved using no more than two or three keystrokes.

The device also has temporary storage so that statements can be entered, checked and corrected before connecting to the on-line system, and can then be sent using one keystroke per line at the full transmission speed of the terminal.

In the standard U.S. version, all the addresses of the international information systems are permanently stored together.

The company claims the attachment helps to achieve more than 50 per cent savings in connect time for searches which use off-line printing. In an industrial environment with on-line printing, savings of 20 to 25 per cent are possible, according to the company. The savings are achieved with the system's transmitting rate of 30 to 120 characters/sec as opposed to a user's typing speed of one or two characters/sec.

The user can interact directly with the system at all times without taking special action. If the user chooses not to activate the command key, messages are sent directly to the on-line system as if the attachment were not present.

The terminal attachment contains 8K of ROM programs and stored information and from 1K RAM memory for the information entered by the user. The device will connect to any terminal, modem, and acoustic coupler with an RS232 interface.

Computer Associates broadens marketing base in France

In a move to bring sales and technical support services directly to a growing number of computer users in France, Computer Associates, Jericho, NY, has established a marketing subsidiary near Paris.

Previously distributed and supported in France by the Carus organization, CA's line of system software has been marketed directly by the company since April 1, 1981. According to the firm, there are currently 600 CA product installations in France and a total user base of 400.

The company's immediate goal is to provide users with the same level of technical support given to CA product users in other countries, says Guy Porre, recently-appointed manager, CA. Support staff will initially include five system engineers. The company also plans to install an IBM 4331 for staff support.

SE Asia distribution set for MAI business computers

MAI Basic Four Systems will be distributed in Hong Kong, Singapore, and Malaysia by Datarep (Holdings) Ltd., following signing of an agreement between Management Assistance Inc. (MAI), New York, and the Southeast Asian distribution firm.

"This agreement with the Datarep group broadens our distribution capability in Southeast Asia," according to MAI vice-president Joseph Barsa, "and further emphasizes our presence there. With our subsidiary in the Philippines, distributors in Taiwan, Australia, and Japan, and the coverage provided by Datarep, we believe we are well-positioned to expand our penetration of the Asian market."

Chilean data network installed by GTE

GTE Telenet Communications Corp., Vienna, Va., was recently contracted to design and build a public data communications system in Chile, scheduled for commercial operations by summer, 1981.

The network is operated by Empresa Computacion, an agency of the Chilean government, and provides communications for computers and data terminals at speeds up to 56,000 bits/sec.

GTE will also install packet-switching exchanges in Santiago, Valparaiso, and Concepcion and provide network management services. The network equipment supplied by the company includes multi-microprocessor systems compatible with CCITT standards for public data networks worldwide.

Norwegian computer gives 80% performance jump

The ND-100/CE is the latest computer from Norsk Data, Oslo, Norway, and represents the third in a series including the NORD-100 and NORD-500.

The computer is built around an ND-100 CPU and is equipped with a "fast cycle" and "cache" memory. The model has an extended instruction set including BCD arithmetic and special 'call' and sub-routine functions coded into the hardware.

These extensions are designed to increase performance especially for users of Cobol programming. For these users, the computer is claimed to provide between 80 and 130 per cent more capability at an approximately 10 to 15 per cent higher price.

The company has also introduced a Cobol compiler claimed to be three to five times faster than the previous one. The compiler is equipped with several functions which make it possible to run bigger programs. The compiler generates code so that programs can contain both 128K of program and 128K of data.

Variable record length and the use of up to five keys is standard. The compiler also uses a new "debug" system developed by the firm which can be used from several compilers.

VOLUME II, NO. 4, WINTER 1981

INFO

CONTROL DATA

- **CYBER 720 at Atomic Energy**
- **Control Data at the Canadian Computer Show**
- **PLATO Demonstration**
- **UNISTRUC II Available Worldwide**
- **ComDev Wins Nimrod Contract**

Canadian-Made Control Data Cyber 720 Gives Atomic Energy Full Interactive Capability

The ability of AECL to remain in the forefront of applied technology depends to a large degree on the quality of its underlying research. Control Data's CYBER 720 is a valuable part of the day-to-day contribution made by the Engineering Company of AECL.

Control Data Canada, Ltd. has announced the installation of a Canadian-made CYBER 720 computer system at the Atomic Energy of Canada Limited Engineering Company (AECL) Sheridan Park site in Mississauga, Ontario.

The CYBER 720 computer system is being used as a front-end processor to the computer systems at the Chalk River site where most of AECL's batch work is carried out for nuclear power research and development.

"The new CYBER 720 allows us to do our job preparation here at Sheridan Park instead of using long distance communication lines to the Chalk River Nuclear Laboratories," says Joel Newman, senior analyst, Technical Support, Computer Services Department for AECL's Engineering Company. The Engineering Company employs 2,200 people at various Atomic Energy sites in Mississauga and 400 people in Montreal.

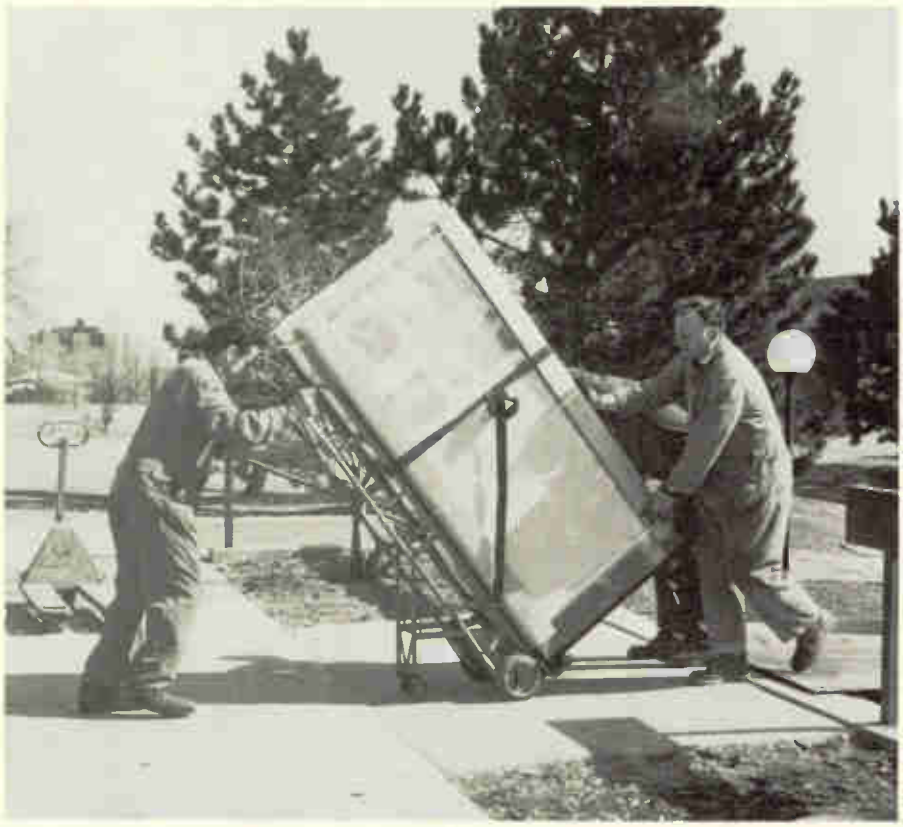
The entire system was installed during a weekend despite some elaborate moving techniques required to move the central processing unit down a stairway to a basement location.

"Prior to the installation we were using several interactive terminals and 14 long distance communication lines to Chalk River," says Mr. Newman, "and we found it was just too expensive as well as unreliable. Now all the terminals are connected to the CYBER 720 and we can add extra lines more easily. The new CYBER now provides us with full interactive capability.

All of AECL's batch job processing is carried out at Chalk River on a CYBER 175 and a Control Data 6600. There is presently a Control Data 3300 on the front end of the Chalk River System but that is being replaced with a CYBER 720," he said.

Control Data's highly successful series, the CYBER 170, Series 700 large-scale computer systems, includes models 720, 730, 740, 750 and 760. These systems are fully compatible with software and peripherals used with other models in the series and they can be upgraded in the field to the top end of the series.

Atomic Energy of Canada Limited is a Crown Corporation established in 1952 to develop the peaceful uses of nuclear power for the benefit of Canadians and for export. The efforts of AECL are concentrated in three areas: 1) nuclear-electric



A total of 33 pieces of equipment were unloaded including the central processing unit, two magnetic tape transports, four 844 disk storage units, one 512 line printer, two peripheral controllers, one frequency convertor, one CYBER 170 display station and a 405 card reader.

It takes know-how and perseverance to successfully install a large-scale computer system over a weekend. The successful CYBER 720 installation was due to this crew made up of Control Data and AECL personnel. Left to right, Ron Thomas, Control Data; Ross Hoffman, Control Data; John Duff, Control Data; Andy Issacs, Control Data; Don Ross, Control Data; Bob Kay, AECL; Dilip Dave, Control Data; and Joel Newman, AECL.

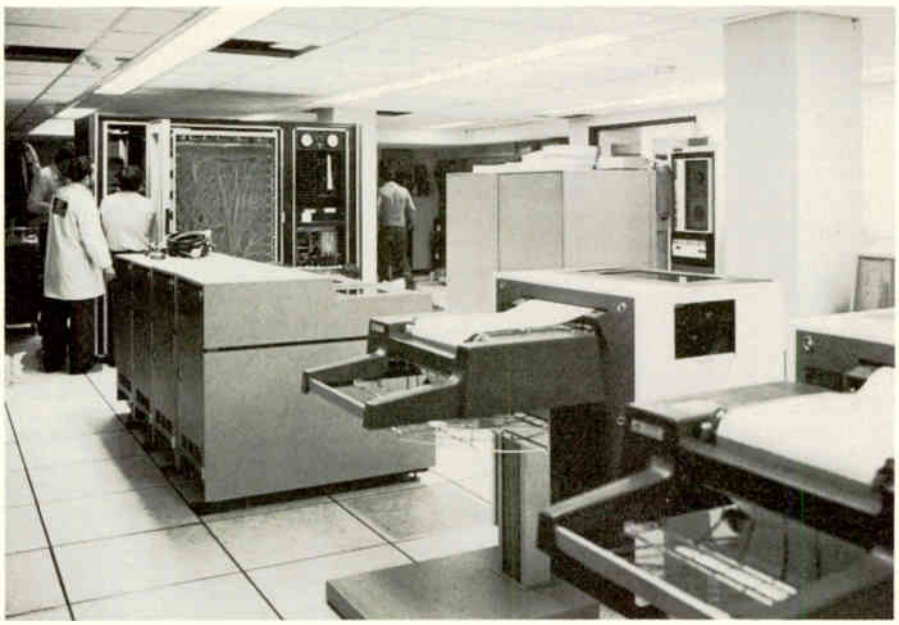
The entire system was installed during a weekend despite some elaborate moving techniques required to move the central processing unit down a stairway to a basement location.

power, including research and development in waste management and safeguards; 2) medical and industrial applications of radioactive isotopes and particle accelerators; 3) underlying research in selected fields necessary to support the applied development work.

The research and development work is concentrated at two sites: Chalk River, Ontario, and Whiteshell Nuclear Research Establishment at Pinawa, Manitoba. The principal products of the research and development activities of AECL are the CANDU reactor system and the skills that produced it. CANDU is one of the world's four commercially-proven nuclear generating systems. In lifetime performance there are six CANDU stations in the top ten of more than 100 world nuclear power plants of over 500 MW capacity.

The ability of AECL to remain in the forefront of applied technology depends to a large degree on the quality of its underlying research. Control Data's CYBER 720 is a valuable part of the day-to-day contribution made by the Engineering Company of AECL.

The control Data CYBER 700 series offers versatile, multipurpose computer systems providing real-time/time-critical network, scientific, commercial, and data management capabilities. The series is also particularly well suited for applications found in manufacturing, utilities, education, petroleum and mineral exploration, mining and weather prediction operations. □



The AECL computer room during the weekend installation.

CONTROL DATA

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Control Data Canada, Ltd.

November 16, 17, 18 & 19

Business Products

Control Data helps data processing professionals use and manage their resources with optimum efficiency. Our reputation as a leading computer manufacturer is one big reason more and more users are turning to the Control Data Business Products Division for their data processing supplies.

Disk Packs and Disk Cartridges

All Control Data disk packs and cartridges are engineered and manufactured with a high degree of excellence. They provide high-quality data storage and significant performance. Customer Engineering packs and cartridges are also available.

A specially developed spin-coating process ensures disk coating thickness and surface finish to provide the utmost in constant-amplitude characteristics and high-resolution performance. The coating will not chip, peel or adversely affect read/write heads in normal operation.

Data Processing Cards

A comprehensive line of top quality data processing cards for a wide spectrum of applications is available.

- standard 80-column cards
- special application cards (2 colors, 2 sided)
- 96-column cards (System 3)
- cards for OCR applications

Magnetic Tape

Total Service Tapes are tested and warranted to meet or exceed industry standards. Their durability is reflected by consistent reliability through extensive use.

All Control Data tapes must pass a critical manufacturing test - the Data Certification process. This ensures that Alpha/tape meets the stringent performance levels of modern high-density tape systems and large-volume data storage requirements.

Flexible Disks

Control Data offers a comprehensive line of flexible disks for most manufacturers' drives and for a wide spectrum of applications.

Printer Ribbons

Control Data manufactures a full line of printer ribbons to complement every aspect of your printing requirements.

Stock Tab Forms

Control Data Canada began manufacturing stock tab forms four years ago and has quickly become a very viable supplier in the Canadian marketplace. Our large customer base is serviced through distribution centres across Canada, enabling us to accommodate rush orders on a same-day basis, in virtually every major city.

For more information, contact Control Data Canada, Ltd.'s

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Scarborough, Ontario
M1S 3Y3 (416) 291-7151

OEM Sales Office:
45 Commander Blvd.
Scarborough, Ontario
M1S 3Y3 (416) 492-4078

INFO

at the Canadian Computer Show

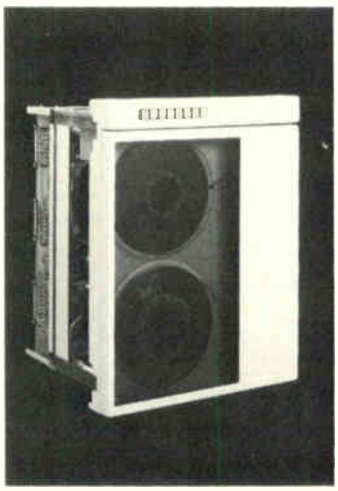
Booth "T" International Centre, Toronto

OEM

As the world's largest independent supplier of peripheral equipment, Control Data offers a full line of OEM peripherals that provide you and your customer with performance, reliability and low cost of ownership.

Lark Module Drive

Solve the backup problem in small systems with the Control Data Model 9455 Lark Module Drive (LMD), an eight-inch drive that offers the high performance usually found only in 14-inch drives.

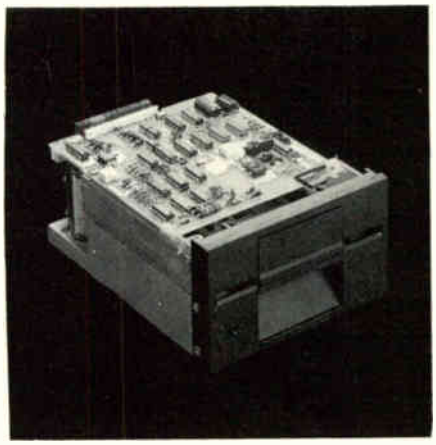


Tension Arm Tape Transport

State-of-the-art innovations in the Control Data 9214X tension arm tape transport bring increased reliability to low-speed (up to 45 inches per second) tape units.

Band Printers

Represent your system's quality with unsurpassed printout from a Control Data band printer. Combine up to 1440 line-per-minute printing with the reliability and maintainability.



Flexible Disk Drives

Control Data flexible disk drives offer media interchangeability with IBM formats in many applications.

9410 Finch Disk Drive

The Control Data Model 9410 Finch Disk Drive is an eight-inch rigid disk drive that provides 8 or 24 megabytes of unformatted storage on fixed, lubricated media in a sealed recording environment.

The Module Family

You can meet the storage requirements of almost any application with a Control Data Module Drive. The Module family offers fixed media, removable media and combination fixed/removable media drives that provide 2.5 megabytes to 675 megabytes of storage.

CYBERNET Services Announces Enhanced Nuclear Safety Application

Control Data's CYBERNET Services has announced a new software program for analyzing the consequences of small breaks developing in nuclear reactor and other pipe systems. The new application is the Reactor Transient Analysis Program (RELAP5).

RELAP5 is a public domain program that has been greatly enhanced by Control Data. The program was originally developed at the Idaho National Engineering Laboratory, Idaho. RELAP5 is a major rewrite of RELAP4, the industry's current standard for nuclear reactor analysis. Major enhancements include a control system mode, reactor kinetics, a link to REPIPE and a steady-state feature. REPIPE, combined with RELAP5, computes time-history fluid reaction forces in a system for use in structural piping analysis programs.

RELAP5 is designed to analyze slow-leak types of accidents such as the one at Three Mile Island in 1979. It features a feedback control system that automatically sequences events in an accident. A new kinetics package enables the operation to simulate what goes on inside the reactor core and determines how nuclear fuel behaves under slow-leak or small break conditions.

Other Uses of Program

RELAP5 can also calculate the thermal-hydraulic response of a generalized pipe network. Because of its general nature, it is not restricted to nuclear reactors, but can analyze any steam/water network. It can further be used to compute reaction forces on pipe walls resulting from rapid transients in fluid flow. The program computes the reaction forces resulting from valve closures (water-hammer, steam-hammer), pump stoppage, valve opening, and line breaks. □

CYBERNET Services Announces Microwave Design Applications

Control Data Canada's CYBERNET Services has announced five applications to design microwave circuits for communications, radar and consumer products. These applications provide easy-to-use microwave design tools for designing amplifiers, filters and transmission delay lines.

CYBERNET Services is part of a worldwide data processing network developed by Control Data making use of the industry's most powerful computers.

The five new programs designed for highly sophisticated microwave technology were developed by Compact Engineering, Inc. of Palo Alto, California.

These programs draw from a data bank of parts to help optimize design using a minimum of parts or materials. Their flexibility allows the engineer to try new ideas quickly and easily. The applications also provide capabilities for microstrip design and worst-case analysis.

The five programs are computer-aided design synthesis (CADSYN), lump element matching network synthesis (AMPSYN), radio frequency optimized — computer optimization of passive and active circuits (RFOPT COMPACT), filter synthesis (FILSYN) and delay equalization network (DEELAY).

CADSYN, a distributed matching network synthesis program, offers the user capabilities for equal-length transmission line network design.

AMPSYN is a direct-synthesis program for designing high frequency and/ or microwave-matching networks, including input, output and interstage circuits.

RFOPT (Compact) provides capabilities for circuit, stability, sensitivity, variable, statistical analyses, mapping and optimization of up to 15 variables. The optimization feature provides options for minimizing or maximizing certain network parameters as a function of circuit component values.

FILSYN is a general-purpose filter synthesis program for calculating lowpass, highpass, linear phase lowpass or bandpass filters to final element values. The program designs passive inductance/ capacitance (LC) filters, infinite impulse response digital filters, and cascade or multi-feedback active resistance/ capacitance (RC) filters. The passive design also serves as an intermediate stage for more sophisticated active RC and digital filter synthesis methods.

DEELAY is an interactive circuit-design program enabling the engineer to provide group delay equilizer networks for compensating the delay distortion of filters.

RFOPT (Compact) combines the efficiency of two-port analysis and the flexibility of nodal analysis. The circuit library includes lumped and distributed elements (lossy or lossless) as well as active devices described by two-port scattering or y-parameters. □

Unistruc II Available Worldwide

Control Data CYBERNET Services has announced the availability of UNISTRUC II (Unified Structural Analysis) on its worldwide data processing network.

This interactive graphics pre- and post-processing system helps engineers generate finite element models and analyze results of structural analysis program output.

Availability of UNISTRUC on the CYBERNET network means interactive graphics modelling, finite-element analysis and interactive processing now can can be executed on a single CYBERNET computer system. This eliminates the need for linking to other mainframes or computer centres.

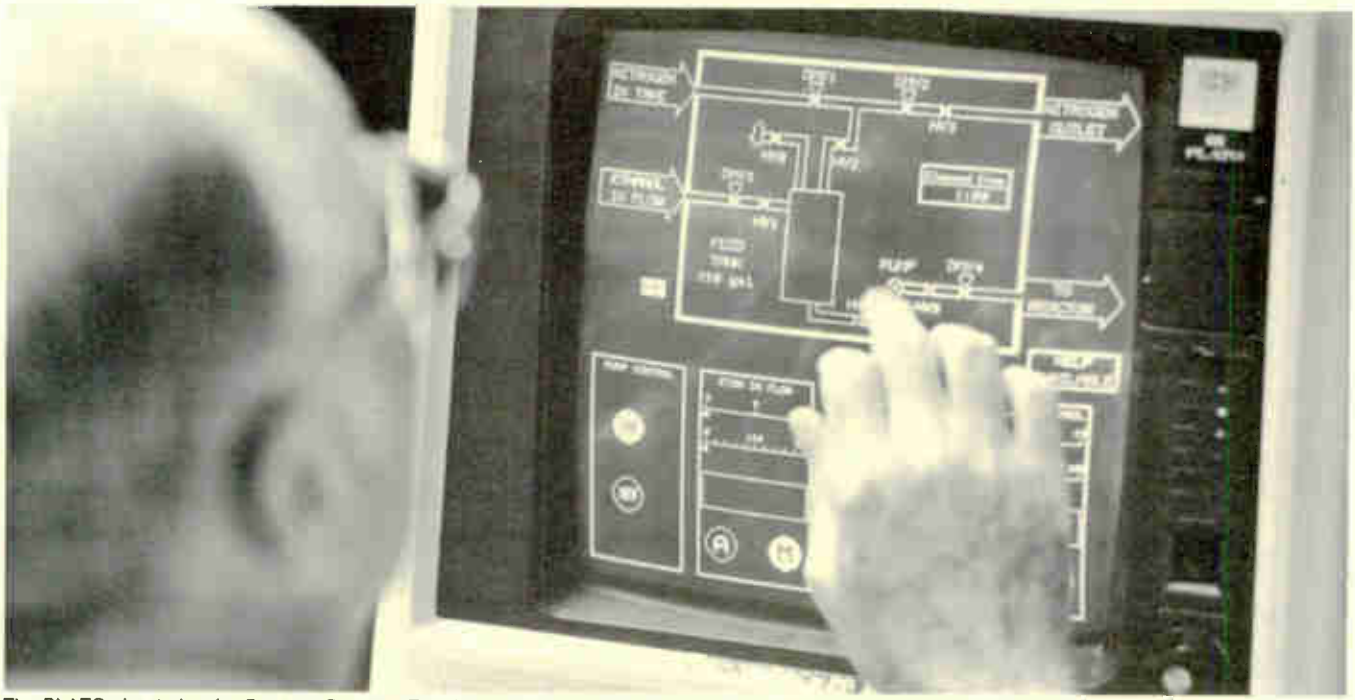
With UNISTRUC, users quickly can generate data for a structural model. Visual display allows engineers to verify model geometry and correct errors before processing. Interactive graphics provides rotating, zooming and sectioning of the entire model or selected portions of it. This allows engineers to review and modify the model visually.

CYBERNET remote computing services provide engineering, scientific and supporting computer applications as well as support (such as analyst services, consulting and training). CYBERNET Services operates 20 computer centres in North America, Europe, Africa and Australia/Japan.

Local telephone access to these centres is available through a network that covers 250 cities. □

PLATO Demonstration at Training Seminar

A hands-on demonstration of Control Data's PLATO Computer-based Education System was recently conducted for 25 trainers and operations managers from the Esso Chemicals division of Imperial Oil Limited at the University of Alberta's Learning Resource Centre in Calgary.



The PLATO simulation for Process Operator Training requires the student to pump ethanol through a tank using automatic controls until the system is running smoothly. Then the variables are changed to test reaction.

Computing Devices Wins Nimrod Contract

Computing Devices Company, a division of Control Data Canada, Ltd., has been awarded a contract to supply a portion of the mission support system for the Nimrod Mk 2 maritime patrol aircraft. The Nimrod is used by the Royal Air Force to provide surveillance of surface ships and submarines.

Computing Devices will provide the acoustic processor, one of the four subsystems that make up the mission support system. According to D.W. Thompson, vice-president, Ocean and Ground Systems Marketing, Computing Devices, the acoustic portion of the system is a dual configuration, each comprised of four input signal conditioning units, two floating point array processors and a host computer.

Computing Devices is a major research, development and production facility with an international reputation for designing systems and equipment to exacting requirements for defence in air, sea and ground environments. □

The computer people at Control Data. Problem solvers you can build with.

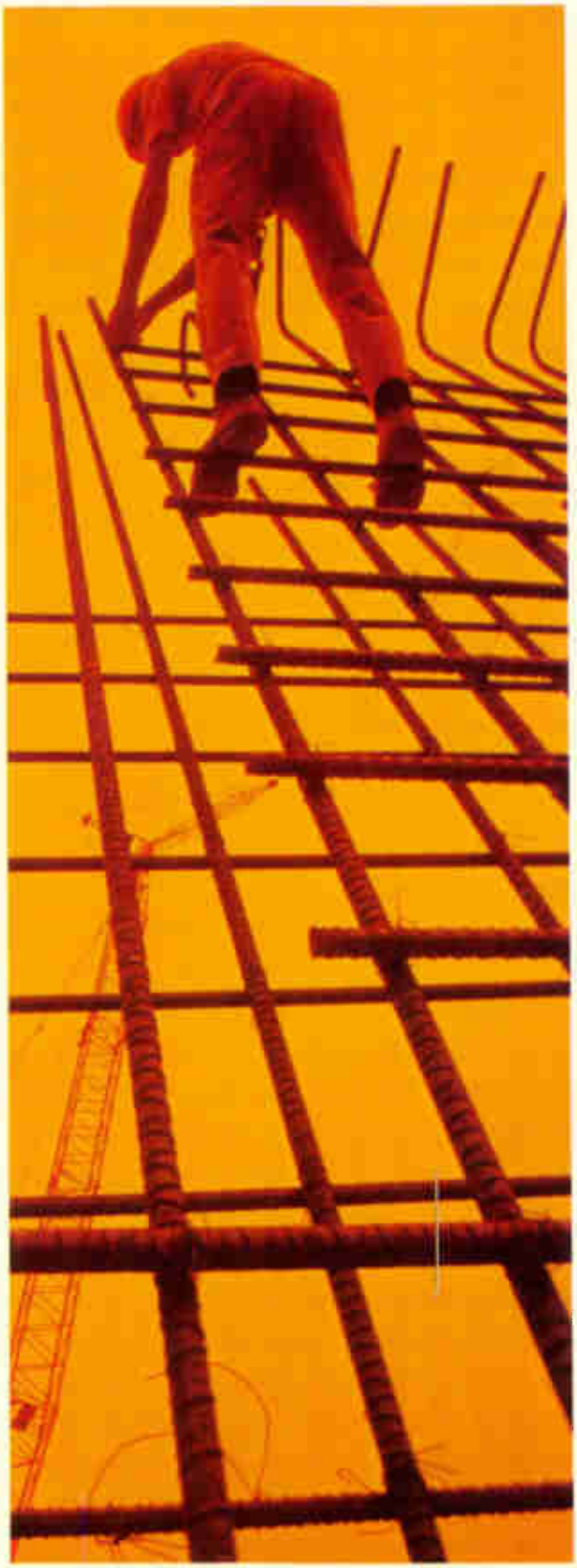
When the challenge is to build better structures at lower costs, the first thing more and more engineers are doing is turning to Control Data computer technology for assistance.

Our Canada-wide network of computer time-sharing services has a broad range of applications in many fields, including engineering.

Among the many services our CYBERNET staff of experienced structural consultants and analysts offer are: solving complex structural analysis problems; computer-aided designing and modelling; testing stress points; as well as electronic design; analysis of power needs; the locating of environmentally sensitive structures; sorting and analyzing vast amounts of information.

Programs we've helped run have saved our clients money and time.

In Canada, as around the world, Control Data is an acknowledged leader in designing and manufacturing computers and providing data services.



Over the years, we have channelled our computer technology, financial resources and industry expertise into problem-solving capabilities not normally expected of a computer company.

By focusing our highly-sophisticated computer applications expertise on specific needs and problems in many fields of human endeavour, we at Control Data Canada are helping to improve productivity and the quality of life for all Canadians.

Tell us your problem, and we'll tell you how you can build with us.

CONTROL DATA

Control Data Canada, Ltd.,
1855 Minnesota Court,
Mississauga, Ontario
L5N 1K7

Reader Service Card Number 259

Developments in microprocessor technology, applications

TI has HDLC software for micro components

Texas Instruments Inc., Dallas, Tex., has released an HDLC (high-level data link control) software package to support packet communications in distributed networks that use TI's TMS9900 family of micro chips, the TM990 family of microcomputer modules, and PM550 programmable controllers.

The software is compatible with the existing HDLC packages used on the firm's DS990 computer systems. HDLC provides an efficient interface among hardware nodes in a network, with only single bits being needed to separate the packets of data being transferred in the network, rather than entire characters. Therefore, rapid transmission of large blocks of data is facilitated.

HDLC data transfers take place over a twisted-pair line interface or an EIA RS232C-compatible interface, with the necessary interface hardware depending on the application. The TMS9900 microprocessors and TM990 microcomputer modules require a TM990/308 communications board, while PM550 programmable controllers require a communication interface (CIM) board. The Texas Instrument hard-disc Multi-AMPL development system uses a four-channel communications controller (FCCC) interface board. All boards are available from TI.

Reader Service Card Number 39

Micro development system all in one CRT terminal

The microsystem4 is an integrated STD-Z80 development system that has all functions incorporated in one CRT terminal, including I/O terminal, computer mainframe, and mass storage device functions.

Claimed to be the first of its kind for STD bus applications, the standard version is intended to provide the industrial or scientific user with a fully operational STD-Z80 development system for operating environments that include process control, word processing, data logging, engineering, and distributed processing.

The unit has a 4-MHz CPU, 60K of program memory, one megabyte of double-density floppy disc storage, hall-effect keyboard, serial RS232C and programmable parallel I/O, and the user's choice of either CP/M-2.2 or AForth disc operating systems. The 80-character x 40-line CRT screen offers programmable attributes for each character, including reverse/normal video, underscore, blink, and half/full intensity. Two EPROM-resident 7x12 character sets are provided with each system.

The microsystem4 offers a 16-position rack-mountable card cage, into which any presently available STD BUS-compatible circuit card may be inserted.

Options to the system include a 5¼-in. hard disc, joystick, alphanumeric keypad, and EPROM programmer panel. Other planned options include full graphics and two-dimensional video systems.

Reader Service Card Number 40

Commander microcomputers adds Ontario sales rep

Repron Scientific Instruments, Hamilton, Ont., has announced that it now is Canadian representative for the 'Commander' line of microcomputers manufactured by Columbia Computer Systems, Columbia, Md.

The Commander family includes the dual-Z80A Model 964 stand-alone CRT unit, plus the Model F64 and Model M64, which are double and single floppy-disc units without a CRT or keyboard.

Repron may be contacted at P.O. Box 939, Stn. A, Hamilton, Ont. L8N 3P9, tel.- (416) 529-1566.

First shipments completed for Systems' 32-bit mini

Systems Engineering Laboratories, Ft. Lauderdale, Fla., has begun shipments of the Concept 32/87 minicomputer, which was billed as the world's most powerful 32-bit mini when the firm announced it last spring.

Systems Engineering expects to deliver about 40 of the new units by the end of 1981.

The Concept 32/87 incorporates ECL's 10,000-Series logic and has a four-stage pipeline architecture which together allow the computer to execute up to four million instructions per second.

New publication aimed at DEC minIcomputer users

'Hardcopy' magazine is a new publication from Seldin Publishing, Anaheim, Cal., that is intended specifically for users of hardware from Digital Equipment, or DEC-compatible suppliers.

Hardcopy is to be circulated among users, OEMs, and manufacturers concerned with DEC equipment, and fill focus on news of peripherals, software, components, and so forth. Another section will talk about activities of persons and firms in the DEC marketplace. The magazine is to be published bi-monthly, and a one-year subscription is listed at $16 (US).

More information is available from Hardcopy Magazine, P.O. Box 759, Brea, Cal. 92621.

Which information processor

At last, here's an information processor that gives you everything you need. All in one small package. And at one small price.

It's the 503: the newest member of Northern Telecom's DDP family.

Just check out the check list.

Powerful, state-of-the-art DDP? Check.

Full-function word processing (using our exclusive Omniword™ software)? Check.

A wide range of networking communications, so you can share information with a remote host as well as other Northern Telecom family members? Check.

FEATURE	DATAPOINT 1536	IBM 5285	MDS 21/10	XEROX 860	NORTHERN TELECOM 503
STORAGE— BASIC SYSTEM	500K	246K	243K	184K	1,638K
BASE PRICE UNDER $6,500		✓		✓	✓
SPACE-SAVING DESKTOP DESIGN	✓	✓			✓
BASIC LANGUAGE	✓			✓	✓
UNATTENDED NETWORK CONTROL SYSTEM	✓		✓		✓
WORD PROCESSING	✓		✓	✓	✓
EASY-TO-READ FULL 15" CRT			✓	✓	✓
SIMULTANEOUS DUAL TASK OPERATION	✓	✓	✓		✓
PROGRAMMABLE OPERATOR HELP KEY					✓
3270 SDLC EMULATION		✓	✓		✓
DUAL PRINTER CAPABILITY		✓		✓	✓

Based on information available at date of publication.

Reader Service Card Number 209

checks out across the board?

And that's just part of the picture.

This amazing little machine checks out on friendliness, too. It's simple to use and human-engineered with all kinds of features like a non-glare display with clear, readable text and a keyboard that doesn't tire you out.

Why don't you check out the 503 for yourself? Call your local Northern Telecom sales representative or write Dave Smith, Northern Telecom, Inc., P.O. Box 1222, Minneapolis, MN 55440.

You'll see there's no other information processor like it.

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Introducing the 503 from Northern Telecom

ATLAS

TO PROTECT YOUR COMPANY'S MOST VITAL ASSET.

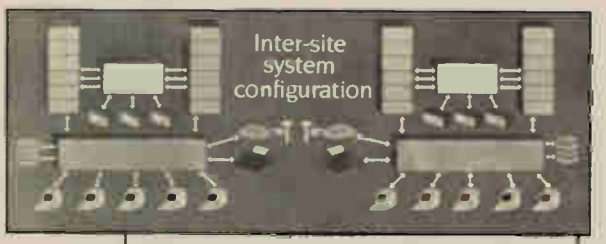
Information. It's vital. That's why your data communications network needs ATLAS—the Automated Total Link Access System.

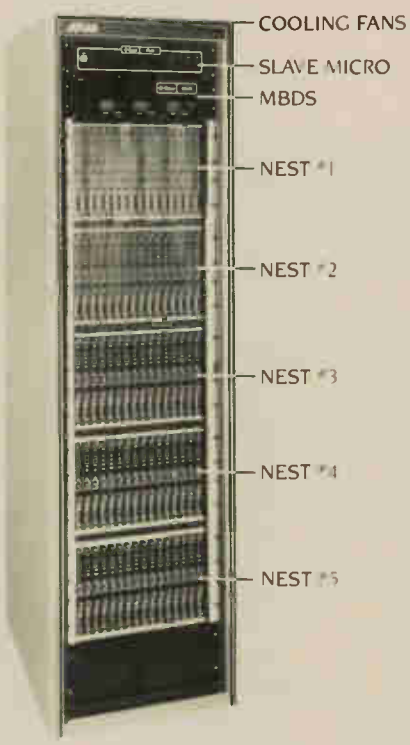
Today's managers have come to depend on electronic data processing to control the day to day flow of information. But for all its inherent qualities, EDP has put information in a precarious position.

Every communications system, no matter how reliable, is susceptible to equipment malfunction, atmospheric conditions, intermittent data flow and human error. ATLAS, operating in your communications network will keep you in constant touch with your data flow, giving you hands-on control of your network operations and protection against possible loss or misinterpretation of data.

ATLAS reacts immediately to all actual or potential problems.

Each ATLAS system enables up to five network operators to work independently. An operator may enter commands through a control console to switch lines in groups or individually, locally or remote. Lines can be assigned to one of three test locations for passive monitoring or active diagnostic testing. ATLAS provides for user-programmed visual and audible alarms for up to eight of the most important EIA RS-232 leads, in any combination. Alarm delays can be set to suit individual needs.





Flexible, economical configuration eliminates duplication.

In a system operated under control of ATLAS, up to four CPUs can be supported by a single back-up CPU.

The modular design of ATLAS equipment allows line cards to be added or removed without affecting the system. A basic system can be expanded according to needs, even to additional sites if necessary. Equipment installed at different sites can be integrated into a single ATLAS NETWORK with all system activites and functions controlled and coordinated from one master location.

Three-level back-up ensures the utmost protection and control.

Although ATLAS is operated under microcomputer control, there are two additional back-up levels. If for any reason the system should fail at the main micro, the operator's terminal can be connected directly to the individual line cabinet. In addition, if necessary, lines can be switched manually—individually or in groups.

For more information on how the Omni ATLAS system can protect the integrity of your data communications network, call or write Vince Catling.

Omni

OMNI DATA SYSTEMS INC.

5 Denison Street, Markham
Ontario L3R 1B5

Telephone: (416) 495-1664

Reader Service Card Number 211

At General DataComm we can open doors that will lead to more effective and efficient data communications. We've been doing it for years to the benefit of the common carriers, major corporations and communications networks in many parts of the world. Now we are providing that experience and product quality to you as well; the individual computer user.

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ITC ASSISTANCE AVAILABLE TO OFFICE PRODUCT RESEARCH/DEVELOPMENT

New-product R&D associated with the 'office of the future' will be eligible for assistance through the Enterprise Development Program of the federal Dept. of Industry, Trade & Commerce. The announcement was recently made by industry minister Herb Gray on occasion of the announcement of a $2.18-million grant to AES Ltd. to assist in the research and product development work needed to integrate the electronic mail and electronic filing aspects of the automated office with a central work station.

WANG CANADA REDUCES PRICE BY 15% ON WANGWRITER WORD PROCESSORS

The Wangwriter will now be priced at $8,200 (including FST, duty), a reduction of nearly 15 per cent. The company also states that quantity discounts will be given of five per cent on 3-9 units; 10 per cent with 10-29 units; 15 per cent with 30-99 units; and a 20 per cent discount with purchase of 100 or more units. Additional discounts are available to customers with national account agreements, says Wang Canada.

The company also indicates that a number of related announcements will be made over the next few years, dealing with the Wangwriter's ability to support TTY,3270, a second diskette device, advanced text editing, and the CP/M operating system, all upgradeable from present units.

CNCP TELLS GOV'T THAT TELESAT SHOULD REMAIN JUST A WHOLESALER

CNCP Telecommunications has submitted a brief to the federal Cabinet arguing that it should appeal a decision by the Canadian Radio-Television and Telecommunications Commission that would allow Telesat Canada to provide satellite communications services directly to customers instead of wholesaling them to existing common carriers.

In urging the Cabinet to launch an appeal against the CRTC decision, CNCP says that the expanded Telesat activity would seriously damage competition in the telecommunications industry in Canada, and reminds the government that the original legislation creating the satcom agency clearly stated that it was to be a 'carrier's carrier', and not provide end-user service, except for broadcasters, who could be served directly.

NORTHERN TELECOM URGES SUPPORT FOR ITS RELATIONSHIP WITH BELL CANADA

Northern Telecom Ltd. maintains it would be 'monumental folly' to break up its special supplier relationship with Bell Canada and force Bell to open its procurement activities to competitive tenders from other manufacturers, as suggested by the federal Combines Investigation department.

In a presentation to the Restrictive Trade Practices Commission in Ottawa, Northern Telecom says that such action would allow the Canadian telecommunications market to be overrun by foreign competitors, and the substantial manufacturing capacity of the Canadian telecommunications industry would be harmfully fragmented.

The firm says it is already generating the maximum level of direct and indirect employment in Canada that could be created by any other combination of suppliers to Bell Canada, unless efficiency and competitiveness were to be sacrificed. Instead of breaking-up the Bell-NT family, Northern Telecom suggests that Canada should analyze the facts behind the success of this arrangement, and apply the results to other Canadian industries.

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Reader Service Card Number 173

IN BRIEF:

Copier supplier Savin Canada Inc., which began operations here in July 1980, says it is now the second-largest marketer of copiers in the country. Revenues for FY 1982 are expected to be more than double the $10 million recorded last year, thanks in part to recent major contracts from the federal and Quebec governments.

Northern Telecom Ltd., Toronto, has announced a considerable rise in consolidated revenues for the second quarter of 1981 compared to the performance of the same period of 1980; current income is up 14.4% to a level of $641.6 million versus $560.6 million in the year-before period. The biggest news is in consolidated net earnings, which were $35.3 million ($1.02/share) for 2/Q 1981, a vast improvement over the $0.7 million ($0.02/share) figure for 1980.

Omnitech Graphics Systems, Ottawa, has placed a $1.25 million order for the Computer Automation Naked Mini LSI 2/40 computer. More than 145 of the units will be used in the firm's Symbol computer-aided design and drafting system and its Feature manufacturing system.

Anderson Jacobson Inc., maker of computer terminals and data communications equipment, notes that its European and Canadian subsidiaries were particularly successful over the past year. Revenue from the two subsidiaries increased to $15.17 million in fiscal 1981, compared to $11.12 million in fiscal 1980. This represents 31 per cent of the firm's total revenue. Canadian figures were not broken out in the firm's financial report.

PolyCom Systems Ltd., a Toronto-based computer service firm, now provides access to a series of lighting analysis and design programs. No other single source provides this range of capabilities in this area, notes the company. Access to a library of lighting programs is available through the firm's interactive service from any major centre in Canada.

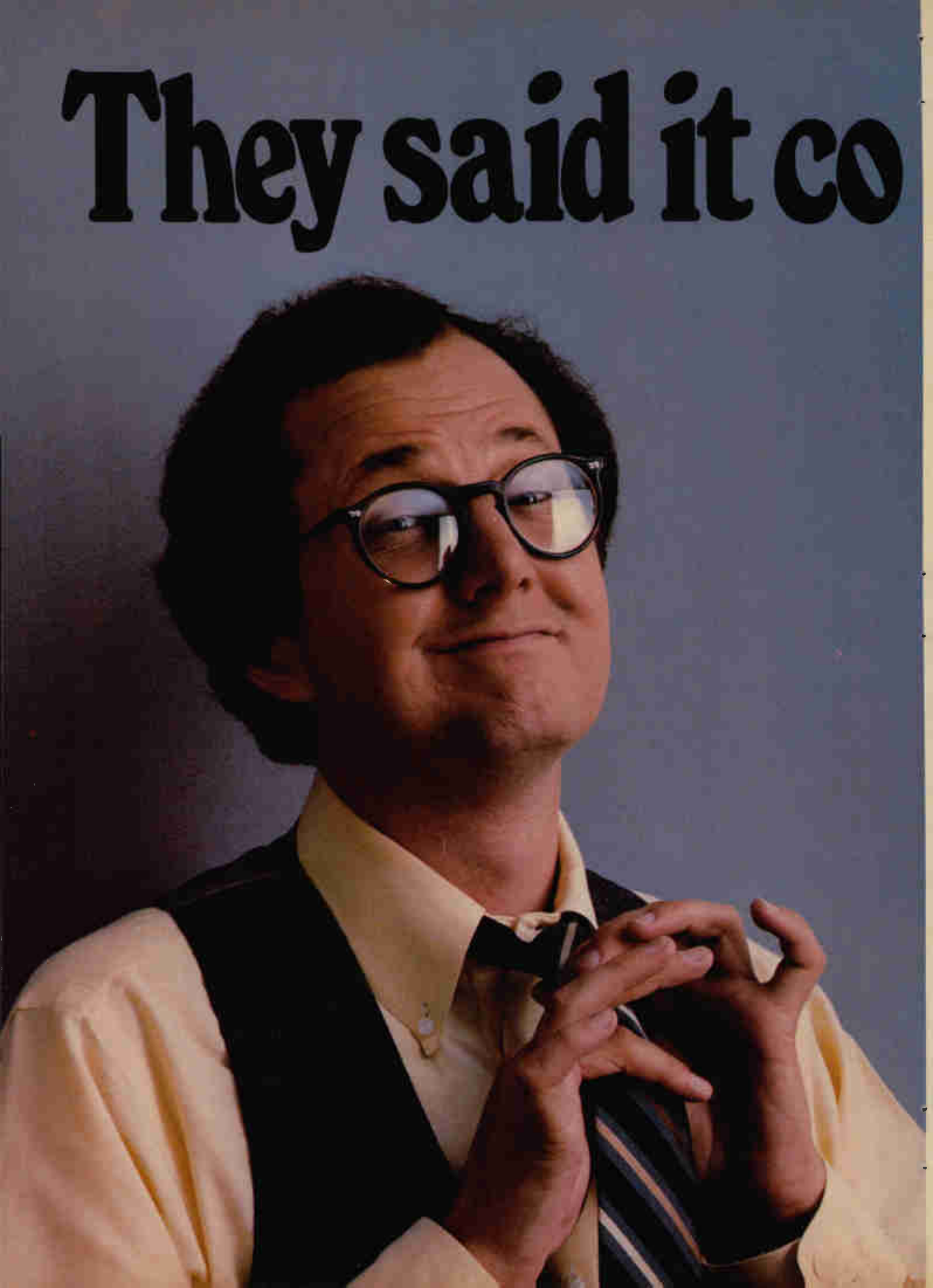
ESSNA LTD., has relocated its headquarters to 21 Progress Court, Scarborough, Ont., to accommodate increased business for its Epson printer line.

The Bi/Data on-line database of international statistics from Business International Corp. will be available by year end in Canada through the I.P. Sharp Associates network.

The Plessy Co. Ltd., London, UK, has announced results for the fiscal year ended this past April that show earnings of $115.8 million (US) compared with $77 million for FY 79-80. Total revenue was $1.9 billion, up from $1.7 billion.

Coopers & Lybrand National Ltd. is aquiring a computerized Canadian payroll system from System Dynamics Corp., Toronto, to convert a payroll system written in Cobol for Honeywell computers to DEC equipment to process its internal payrolls. System Dynamics retains title to the software package and will continue to market both the Honeywell and DEC versions of the software package. The company is an authorized dealer of the Honeywell minicomputer line, with software packages for business management, manufacturing and other business applications.

They said it co



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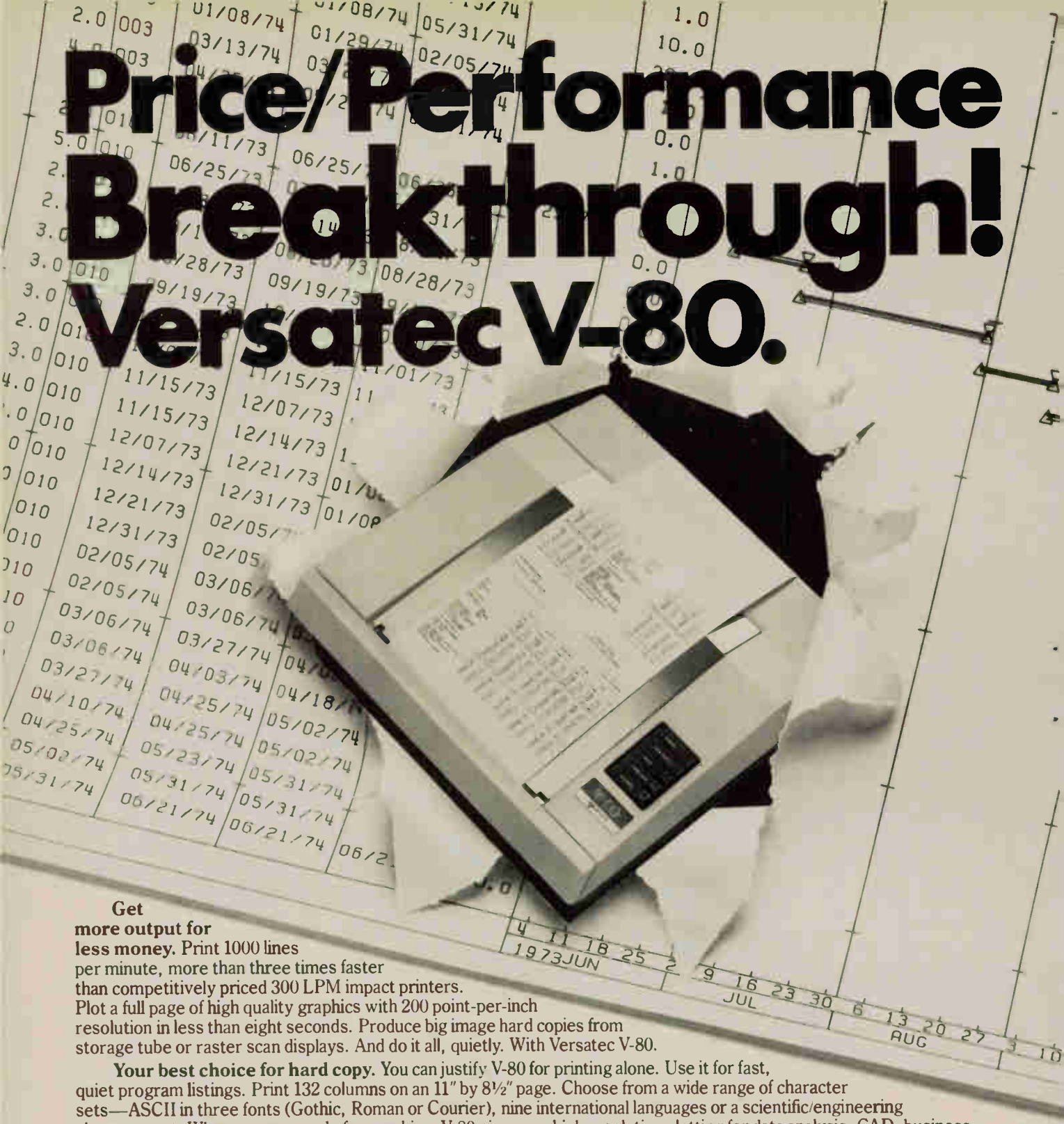

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The fine art of contract negotiation

There's no need to just sign a vendor's boiler plate contract. But then one shouldn't waste too much time playing negotiating games either, suggests lawyer Dan Mersich.

By DAN MERSICH

The art of contract negotiation has received much treatment in the pages of computer journals over the years, therefore one might expect that there is nothing new to be said about the subject.

Recently, one of my clients, a hardware supplier, presented me with a list of demands made by a potential customer. It tracked identically with a list of negotiating points in a well known EDP reporting service.

Well, I suppose one must start somewhere, so why not ask for everything—after all, if you don't ask, you don't receive. But one should also realize that such a tactic is not without its costs especially if it is pursued after the first round.

Established vendors have discovered over the years that a customer who continuously tries to squeeze the last drop out of a supplier is not worth having. That kind of thinking is especially true at the smaller end of product lines because profit margins simply do not allow for a great deal of pampering.

Also, suppliers (large or small) are becoming far more profit-conscious than in the past, and it is no longer enough just to meet sales goals—those sales must be profitable from the outset. It is also no longer acceptable business practice to sell the first one at a loss, on the hope that the loss can be recouped on subsequent sales to that customer. Experience has shown that the second or third systems with the same customer must be bid just as competitively as the first.

Does all this mean that an EDP buyer should just capitulate and sign the vendor's boiler plate contract? No, but it does mean that the buyer should not waste too much time playing negotiating games. Identify those two or three items which are of critical importance and make it clear to the supplier that there is no deal unless some kind of satisfactory solution can be found.

For example, if a user has one particular application which absolutely must be run without fail, he should not demand from the supplier that hardware have an up-time availability of 99.99%, because established suppliers will not agree to such a demand. Rather, the user should get the sales rep to line up two or three other nearby users with whom reciprocal back-up can be arranged. Thereafter, the user should from time to time have a "fire drill" to see whether the back-up arrangement actually works.

Which is better—trying to recover a loss from a supplier against whom you have doubtful legal grounds, or preventing the loss in the first place through good back-up?

Another point on which suppliers will not relent is liability for damages beyond a return of the purchase price. "What happens if your system doesn't work and I lose business?"

The answer is simple—don't use a computer; stick with what you have. If that is a manual system of course, a strike would have the same effect as a downed system, but would most likely last much longer.

Another answer is to buy business interruption insurance. Suppliers are unable to purchase product liability insurance because of the general purpose nature of their products, i.e. insurance companies are unable to measure the risk potential in advance of the sale. However, that is not true once a system has been placed because its purpose becomes known and the potential losses can then be measured.

Therefore, if business loss due to computer failure is truly an important consideration to an EDP buyer, he should talk to his insurance man about it, not the hardware supplier.

The list of examples goes on, but space does not permit an exhaustive examination. In summary, therefore, one is well advised not to waste time with cute negotiations. Established suppliers have no time for it, and those suppliers who are desperate enough to accede to such demands probably could not make good if they were ever called upon to do so. □

Dan Mersich is a Toronto lawyer whose private practice is restricted to computer-related matters.

Volume 2 — Number 4
Third Quarter 1981

CCG DataCommunicator

CCG Announces Satellite Net

On Tuesday, June 16 in the VIP lounge at the Winnipeg Convention Centre, CCG held a press conference to announce plans for an Integrated Satellite Business Network, to be available in early 1983. At the same time, CCG announced that a trial of the time division multiple access (TDMA) satellite technology involved in this new service would be conducted next year with The Bank of Nova Scotia.

Gordon Holland, general manager of the Manitoba Telephone System, hosted the press conference, introducing as participants Terry Heenan, president of the TransCanada Telephone System; John Farrell, director, CCG; and George Hare, general manager, operations, Scotiabank. Via satellite from Montreal, Eldon Thompson, president, Telesat Canada, also addressed over 100 executives, computer specialists and media attending the DATA '81 conference in Winnipeg.

The planned network will use TDMA technology which allows voice, data and video to be converted to an integrated digital bit stream and transmitted via satellite to a network of earth stations.

"This Integrated Satellite Business Network will be a total national service," said John H. Farrell, director of CCG, "designed to meet the needs of large and medium-size companies and organizations with a full range of voice, data and video communications needs.

"In fact, we expect that it will be the catalyst for a whole range of new communications services such as high-speed document transfer across the country, high-speed data transmission between computers and video conferencing right on the users' premises."

The CCG director indicated that development of this network was intended to bring the "tremendous transmission capabilities of satellites" closer to the corporate communications user, even to the extent of earth

Funds for Tomorrow

Gordon Thompson

Our familiar industrial economy seems hard pressed to generate the economic surplus for the social services we now demand of an economy. The solution is not abundant and cheap energy, for beyond the constraint of rising energy costs lie the limitations of other resources and environmental pollution. Our present lifestyle can't be extended to include the whole globe's population. Gentler life styles must emerge. We must learn to shift more and more of our transactions away from exchanges of tangible goods towards exchanges of ethereal goods, where such exchanges involve little or no energy. Enter Information Technology.

Unfortunately, much needs to be learned before Information Technology can really help. We must learn to create wealth by using the technology rather than by making it. To reap the benefits, we must respond to the newness of the wine that is this new technology, and not force it into old conceptual skins, as we are so wont to do. Information Technology demands new conceptual skins, new thinking.

Four basic things need to be learned. The first, and probably the most important, is how an information society might really work. Although the economics of tangible goods is well understood, an economics of ethereal goods is just now beginning to emerge.

Secondly, we must all learn to appreciate the new technology, and how it can stimulate, amplify and augment our abilities. Put simply, we must become as familiar and infatuated with communicating computers as we are with automobiles.

Thirdly, we need to learn a lot about big systems that incorporate both information technology and people. We need to learn how such systems can help us get better solutions to some of the fundamental problems that have always faced societies, such as the evaluation of the society's information. Today, all too often, it is the attention-getting capacity of information that determines its value. We "trust" what appears in our newspapers or on our TV, where attention-grabbing is all that counts. This is a poor basis for evaluating information about nuclear energy, or cancer cures, for example.

Finally, we owe it to ourselves to explore new "written" languages that exploit the graphics capability of the new technology. The new technology could shatter the inefficiencies and high costs that, in the past, have been associated with iconic or picture writing. It is hard to imagine all the consequences of liberating our brains' right hemispheres by making available an adequate communications means for that hemisphere. It could be the beginning of a whole new renascence.

stations on top of a company's own downtown office buildings or via a centrally located earth station shared by several users, integrated with terrestrial facilities and operated by the TCTS member telephone company in that city.

The network will provide communications within Canada, between Canada and the United States as well as overseas via Teleglobe.

The major benefits to Canadian organizations of this satellite network include: enhanced communications capabilities, increased diversity in available transmission paths, and, in some cases, lower communications costs.

To assess the TDMA technology, specific equipment, and potential financial and business applications under real conditions, CCG also announced a market/technology trial with The Bank of Nova Scotia.

"From this trial, we expect to learn how best satellites might be used in our overall information transfer system," said George Hare, general manager, operations, The Bank of Nova Scotia. "Scotiabank has a wide range of communications needs, including voice and data, and we expect to take

George Hare

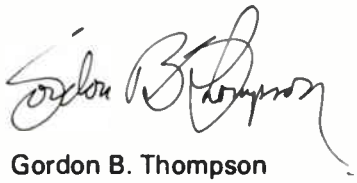
advantage of advances in video-conferencing to reduce our travel costs and improve our productivity.

"Any increased efficiency which we can take advantage of in our operations through the use of this new technology can lead to improvements or additional services which we may provide to our business and individual customers."

To begin in June 1982, this six-month test conducted by CCG and Telesat Canada would utilize TDMA satellite technology for a number of high-priority financial applications, including remote data entry, voice telecommunications and on-line banking.

A trial network will consist of an earth station on the bank's premises in Toronto, other earth stations in Halifax and Calgary and the Anik B satellite. This network will carry voice, video and data communications signals between Scotiabank offices in these three cities.

Learning costs money, and usually lots of it. As this learning could be the way to resuscitate our moribund economy, it seems important that we fund it adequately. Perhaps Canadians should give serious consideration to using their disputed oil revenues, that seem to be causing so much dissension, to fund this learning. If we could give our children the basis for a meaningful lifestyle that is less dependent upon oil and its relatives, it might be a fair compensation for our past excesses. Such a funding program might be called "Funds for Tomorrow".



Gordon B. Thompson
Bell-Northern Research

The views of the guest editorialist are his own opinions and may not reflect, in all aspects, the stance of CCG.

Datapac & TRS-80 Micro Join Forces for Radio Shack

When the biggest name in little computers wanted to automate an order entry system, it came to the biggest name in digital data networks.

Datapac, CCG's national packet switching network, has enabled Radio Shack Canada to employ its own TRS-80 in a coast-to-coast, computerized, inventory ordering system.

The company, a division of Tandy Electronics Limited, now has a network of 425 Radio Shack stores across Canada linked via Datapac to a TANDEM mainframe computer in Barrie, Ontario.

The network includes retail outlets, district and regional offices as well as 15 specialized computer centres which sell the very popular TRS-80 microcomputers, associated software and peripherals.

The Datapac/TRS-80 link replaces a manual stock ordering system which had store managers filling out forms and mailing them back to Barrie, a process which could take up to two weeks — or longer.

"Where before there was five-day delivery, there's now a three-day turnaround in most instances," says Jerry Colella, vice-president and managing director of Radio Shack Canada. "We cancelled our demand for purchase order forms, we don't need the mail and the savings of time and money for Radio Shack has been phenomenal."

Reliability was a key factor in going to Datapac, affirmed Colella. "There was no reliability in the Canadian mail system — it was so undependable that a letter or order could take from 5 days to 21 days to be delivered. We needed a safeguard and this sophisticated computer communications system was invaluable during the postal strike."

System Development

Dave Chalmers, director of computer services for Radio Shack Canada, says: "Using 16 stores as our test base, the system took seven months to develop then another three months to get 400 stores online — two months ahead of schedule."

Getting on-line through Datapac does not involve any long distance charges for most stores and once the manager enters his order through his TRS-80 Model III microcomputer, the data is transmitted in seconds to the TANDEM host computer in Barrie.

Each store has one designated day a week in which to input orders, as well as any time during off-hours. Chalmers estimates that the computerized order entry system has improved order completions by up to ninety per cent.

"The store manager knows what is available and he knows he's going to get what he ordered," says Dave Chalmers, sumarizing two major user benefits of the computerized inventory ordering system.

Datapac enhanced Radio Shack's use of its own microcomputer product. Call CCG and perhaps our communications services can help your organization develop its own new business applications, too.

American Express Gives Credit to CCG's Vutran and Datapac

In a move to increased cost-efficiency, American Express Canada Inc. (Amex) has switched its electronic credit authorization to a CCG system comprised of 400 Vutran terminals utilizing the Datapac network.

Imre Csepreghi, vice-president, systems and data processing of the American Express card division, gives the following reasons why Amex selected Vutran: "Using Vutran and Datapac has made our system more cost-effective, and now we have a Canada-wide network. Datapac allows us to implement electronic credit authorization in areas we couldn't reach before because it was too cost-prohibitive. Now, virtually every call is a local call."

Amex is using Vutran and Datapac to replace its Express III terminals which communicated with a private network via dedicated lines. The Express III terminals were considerably more expensive than the selected Vutran terminals and Express III maintenance was less than ideal because the manufacturer was U.S.-based.

Mr. Csepreghi says CCG's fast service anywhere in Canada was another important reason American Express opted for Vutran: "We were looking for a Canadian alternative from a large company which could service our terminals fast. Vutran and CCG provided both."

CCG also helped Amex solve its network problems. Transmission of data through the former network was analogue, so the possibility of errors was greater than with the current Datapac network, which uses digital technology for inherently more reliable data communications.

Because of the geographical limitations of Amex's private network, the company's electronic credit authorization system could only be implemented in 14 Canadian cities. Any connections outside those cities were cost-prohibitive. Datapac service is available in 61 cities, so American Express can automate credit authorization in virtually every city.

All credit authorizations for the American Express card originate from the company's central computer in Phoenix, Arizona. CCG provides the Vutran terminals and the Datapac network, linking each terminal to the American Express host computer in Phoenix.

American Express Canada Inc. is using CCG's Vutran in conjunction with the Datapac network for fast, easy and discreet credit authorization in hotels, restaurants and other service establishments across Canada.

Credit authorization using Vutran is fast and easy. All American Express cards have a magnetic stripe encoded with the card's number and expiry date. To receive credit authorization, the Vutran operator slides the card through the magnetic stripe reader, enters the amount of the transaction on the Vutran keyboard and automatically dials into the Datapac network. The telephone number as well as the Service Establishment identifier is permanently stored in the Vutran's memory. Once the terminal is linked to the Datapac network — within seconds — an authorization or a referral code appears on the Vutran's LED (light emitting diode) display.

American Express Canada first installed 68 Vutran terminals for a three-month pilot trial in Toronto early in 1981. Mr. Csepreghi says a users' survey at the end of the trial proved the Vutran system ". . . totally successful. The users were extremely satisfied with the whole system, so after the survey, we decided to go full-fledged, implementing Vutran across the country."

Adds Mr. Csepreghi: "Because our system stretches across Canada, the quality of the terminals and maintenance of the system were very important considerations. I must say we have been very impressed with Vutran and Datapac in these respects."

By the end of 1981, 400 terminals will be installed in businesses across Canada where the American Express card is honoured. "After that," says Mr. Csepreghi, "we plan to become even more aggressive in implementing a more extensive credit authorization system using Vutran and Datapac."

Datapac 3305 Service Approved

On July 21, the Canadian Radio-television and Telecommunications Commission (CRTC) approved the rates for a new access service for Datapac, CCG's packet-switched data transmission network. These rates, filed with the CRTC on October 15, 1980, came into effect on August 1, 1981.

This service, called Datapac 3305, is designed to support hosts (centralized computers), remote job entry (RJE) terminals, and communicating word processors (CWP) which emulate the IBM 2770/2780/3740/3770/3780 types of terminals. Communicating word processors include such devices as the IBM Office System 6, Wang model WP5528, Xerox model 850 and other models.

Customer response to this new service has been extremely positive, because it addresses that crucial requirement to serve the remote batch market. And already Datapac 3305 has its first user.

Control Data Canada Ltd. recently negotiated a contract with CCG to hook-up remote batch terminals in major centres across Canada to the Datapac packet switched network through Datapac 3305.

As one of Canada's leading computer systems and services companies, with annual revenues in excess of $162 million, Control Data Canada is well known as an innovative leader in its field.

Carl Closs, Canadian tele-communications manager of Control Data Canada Ltd., says: "It was only natural, as innovators in our field, that we wholeheartedly support CCG's newest access service.

"Control Data Canada will be using Datapac 3305 service to provide a more economical solution, to meet an increasing demand for remote batch access."

CCG and Global Travel Take Off Together

With the help of CCG, North America's largest provider of travel computer services has developed a system which allows travel retailers more time to do what they're in the business of doing: selling travel.

Global Travel Computer Services, which processes more than half a billion dollars in sales annually for over 300 travel agencies in Canada, is using CCG's Datapac 3000 access service to provide these agencies with automated, on-line reservation access and ticketing, accounting and management services, to help them operate more effectively as travel consultants.

Ian Lang, director of customer services for Global, says: "Automation is essential for the survival of agencies. Already one-third of Canada's travel agencies use some form of automation. And in the future, only automated agencies will be able to compete effectively.

"Global's business is to help travel agencies in an area they shouldn't be expected to be experts in. We keep them out of the computer business, yet provide them only with its benefits."

Global's Computer Services

The TCS II system offers four basic services to travel agencies, all of them possible because of Datapac's cost-efficiency: An automated client file service, which is always up-to-date, accurate and can't get lost; an accounting system, whereby financial statements, general ledger, accounts receivable and payables, cheques, etc. are all handled by Global; an up-to-date management information service, including cash reports, supplier sales summaries and commercial accounts information; and a supplier access service.

This last service is being implemented in two stages. The first is an airline reservation access system, which allows travel agencies serviced by Global to directly access British Airways' and Canadian Pacific's reservation systems (and Wardair's and others' in the future) just as any of their reservation agents would. The second stage, still to be implemented, will allow the same kind of access for reservations with car rental agencies, hotels, cruise lines and tour agencies.

As Mr. Lang says: "TCS II allows the travel consultant to complete a simple booking in less than half the time it would take to do it manually, by telephone. This improves efficiency and client service, reducing time lost in administrative tasks and leaving more time for the agent to spend with their customers. And a direct result of time saved and customer satisfaction is increased profits."

Roger Jarvis, president of Jarvis Travel in Calgary, says that in his commercial branch alone, where there are 14 CRTs to handle travel arrangements for Calgary businesses, TCS II has completely transformed his way of doing business. "We've had a dramatic increase in revenue, going from less than $1 million per month to $1.2 million per month since we started using the system. It allows increased efficiency and productivity, and has also helped staff morale."

Officially on-line since October 1980, TCS II will encompass approximately 350 travel agencies across Canada by the end of 1982, including the travel chains Lawson, Eatons and Thomas Cook.

Datapac 3000 Access Service

A typical travel agency linked to TCS II has three CRTs, a ticket printer for airline tickets, and another general document printer for client itineraries, customer vouchers, cheques and many other applications.

All terminals are linked to Global's system in Toronto via Datapac 3000, Canada's most extensive and universally available packet switched data network. The information is then sent along to be processed in Global's series of Honeywell mainframe DPS6 computers for accounting and management services, or to a supplier's host (such as British Airways) via CCG-provided conventional analogue data channels, for reservations and ticketing purposes. Data is transmitted from the terminal end at 2400 bps and is accepted at Global's host via Datapac at 9600 bps.

This branch of P. Lawson Travel in Mississauga, Ontario, is just one of the many travel agencies across Canada linked to Global Travel's CCG-provided computerized travel service.

A Cost-Efficient Network

Ray Christopher, vice-president and general manager of Global, says: "Datapac is a superlative system. It's not distance-sensitive and clients aren't penalized for using it because it's a packet switched network. Agencies pay only by packet-volume, not time-usage, resulting in lower data transmission costs.

"And Datapac's low cost and accessibility in 61 Canadian cities will allow smaller agencies to survive. Without Datapac, we probably couldn't have offered TCS II . . . The costs to travel agencies would have simply been too high. Because of CCG's nationwide service, we're able to provide access to TSC II to agencies in virtually every location. And that has allowed us to be a better Canadian company, because we can bring them onto the system with little concern for their location, and without penalizing them for doing business in a small town."

CCG TransCanada Telephone System

DataCommunicator is a quarterly newsletter about technology, applications and new developments in the data communications field.

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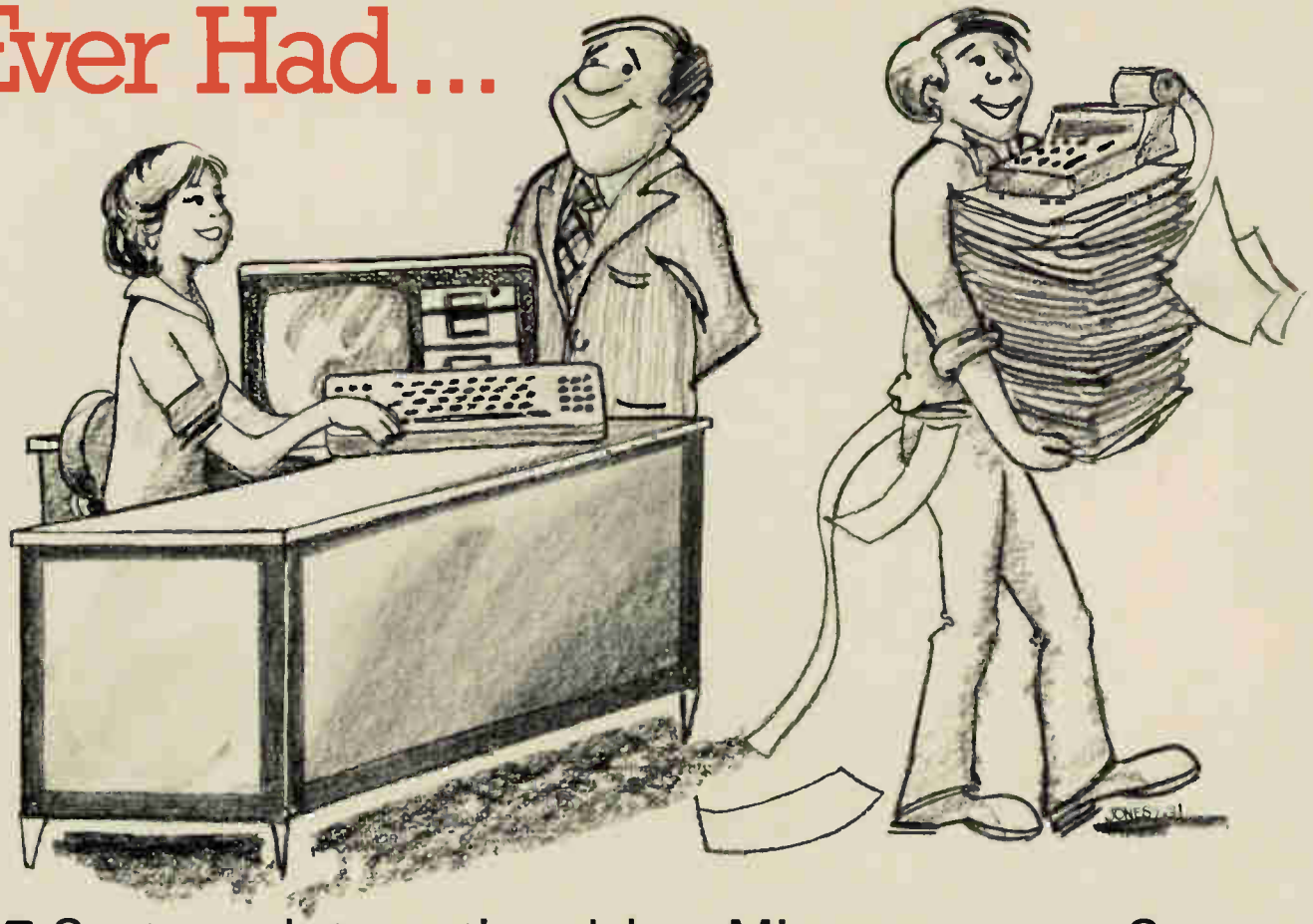

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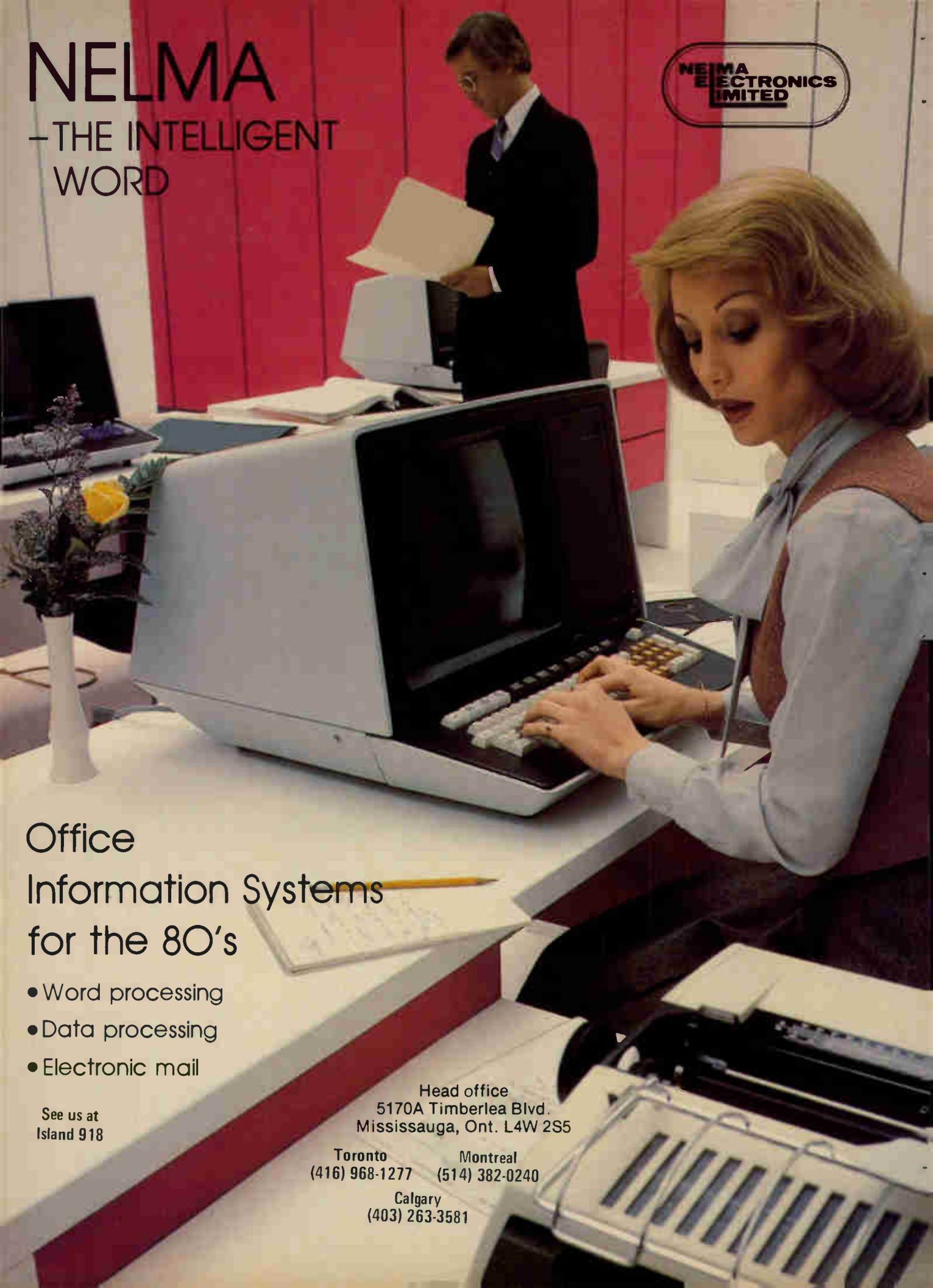
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Statistics show EDP accounts for major share of electronics market

Recent statistical data on the Canadian electronics industry from the federal Industry, Trade & Commerce Dept., indicates that the computer and office product sectors of the Canadian market retain a major position.

According to data from IT&C, the domestic electronics market burgeoned by almost $1.2 billion or 21 per cent in 1980. Greater yet was the relative increase in imports at $9.25 million or 26 per cent, and they accounted for two-thirds of the Canadian market.

Rising imports also caused the trade deficit for that year to rise by $549 million or 27 per cent to the level of $2.5 billion. The deficit figures are large in relation to those of a decade ago, notes IT&C. The 1980 deficit of $379 million was much lower than the increase in 1980, and less than one-sixth of the 1980 $2.5 million deficit.

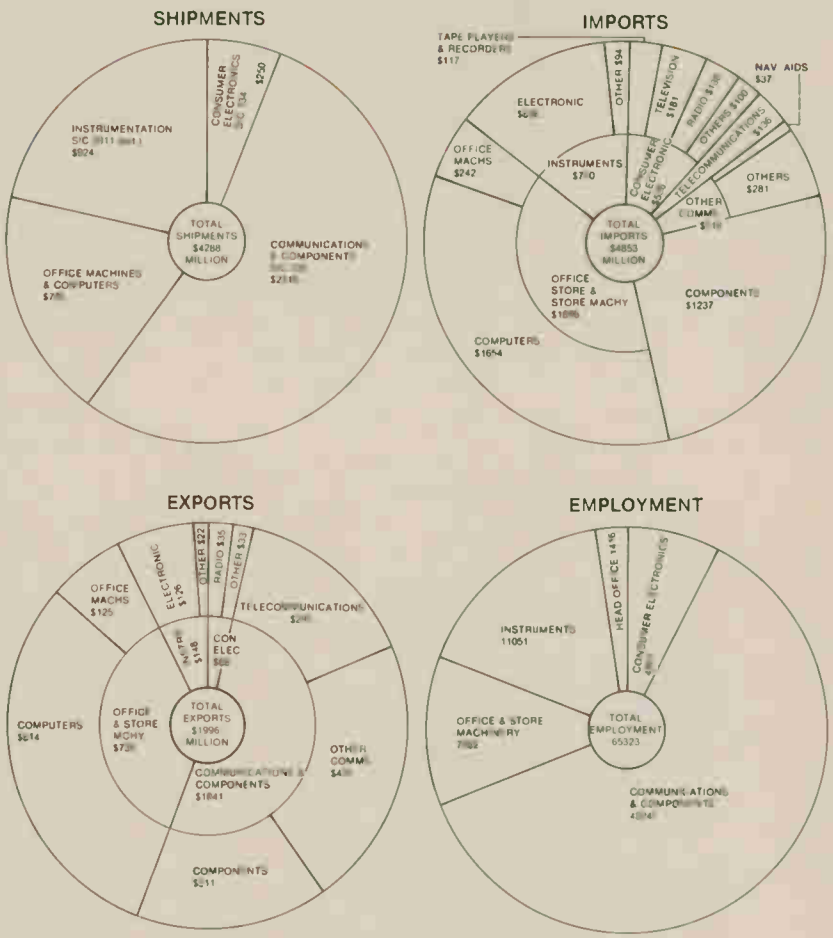
The IT&C statistics show that shipments rose by 17 per cent or $625 million as compared with $1.2 billion for the Canadian market. Exports rose 23 per cent or $376 million to somewhat offset the $925 million rise in imports.

The office machine market is very much the preserve of imports, notes IT&C, and as this market boomed in 1980, so did the imports. In 1979 for example imports in this sector accounted for $1,175 million in a $1,235 million market. In 1980, the market was $1,765 million, with imports of $1,709 million.

While shipments for the electronics industry increased $93 million and exports increased $97 million, these increases were quite small in relation to the $534 million increase in imports. As a consequence, the trade deficit rose to $970 million from $533 million.

Communication equipment was the only sector to reduce the size of its trade deficit says IT&C. Down to $555 million from $593 million, the trade deficit was lower than that of both office machines and instruments which are much smaller in terms of the size of Canada's market and manufacturing industries. The sector's exports are approximately 70% in equipment and 30% in components whereas imports are about the same percentages the other way around.

The two largest commodities, telephone equipment and parts, and commercial communications equipment led the exports. The former was up by 29 per cent or $66 million and the latter was up 48 per cent or $80 million. On the imports side, it was again semi-conductors and integrated circuits which flooded the Canadian market. □



Canada's electronic industry's 1980 performance. Computers, office machines and communications account for major portion of industry's activity. Source: Industry, Trade and Commerce, Government of Canada.

1979 Computer Service Industry (S.I.C. 853) Revenue	Computer Service Suppliers	Hardware Suppliers	Total
Number of establishments	689	30	719
Employment	14,370	9,468	23,838
Revenue Type: ($000)			
Processing Services	356,955	*	—
Input Preparation	39,941	*	—
Software & Systems Services	135,805	29,197	165,002
Other Computer Services	37,188	*	—
ADP Hardware Sales & Rentals	50,548	764,790	815,338
Equipment Maintenance Services	4,438	83,412	87,850
Unidentified & Other	13,163	52,512	65,675
Total Revenue	638,038	929,911	1,567,949

*—included in unidentified and other.
Source: Statistics Canada—Cat. 63-222.

Recently released statistics from the federal Dept. of Industry, Trade and Commerce summarize 1979 revenue of computer service industry.

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ELECTRONIC MAIL

Making strides towards a promising

Technically, electronic mail works, but the task remains to convince business that it is cost effective and conducive to increased productivity. Here's a look at current developments and applications.

When Samuel Morse demonstrated the telegraph in 1837, it essentially marked the start of electronic mail. Since then, Telex, facsimile, satellite data transmission, have arrived and today's communicating word processors and computer-based message switching services are the latest development in electronic message systems.

Electronic mail, in essence, is the transfer of information from one point to another linked by computer-data transmission. The more advanced systems enable a user (who's likely to be an executive) to receive all internal messages at his office terminal. He then can answer, pass, delete, or send a message on his keyboard. Messages are available in hard copy, if needed.

The obvious advantage of an electronic mail system is that it saves time. Information can be sent quicker when there is no need for dictation or typing. Nor are there busy signals, time-zone constraints or unanswerable calls to contend with. Messages can even be received away from the home office as long as you have access to a terminal.

Making strides

The electronic mail market in Canada is still in an embryonic stage but it is clearly making strides. Equipment manufacturers are offering it as a standard feature on their communicating word processors; time-sharing bureaus have offered it for over a decade, and a small nucleus of companies have adopted it as part of their approach to the integrated electronic office. The rosy prospects of electronic mail have also enticed CNCP Telecommunications, Bell Canada and Canada Post into marketing electronic mail systems.

For now, it's those companies already with data processing networks that are showing the most interest. For them, the cost of terminals does not have to be justified when calculating the expense of computer-based message systems. For instance, at I.P. Sharp Associates Ltd., a Toronto-based time-sharing bureau, the "electronic mailbox" option has been available since 1970. Leslie Goldsmith, an assistant programmer of the APL Development Group, says it's those clients already sold on other services who would be most interested in electronic mail.

"By and large," he says, "it's acceptable as long as you don't force it on people. Those who use it often eliminate hard copy, but it really depends on the individual."

One disadvantage executives face, he notes (and this holds true for even the written letter), is the lack of a personal touch. "You lose the voice inflections, intonations and that may lead to misunderstanding."

The key to electronic mail, it seems, is acceptance by senior managers. Unfortunately there is an aversion by some to have anything to do with a computer keyboard. One way to get around such sentiments, suggests Goldsmith, is to make electronic mail a status symbol. "You indicate only upper management can use it," and this can often sweep away initial resistance.

Better utilization of managers' time is a key reason why Imperial Oil Ltd. is planning to implement electronic mail.

"We want to get away from the pink message slip game," says Fred Reichl, operations manager for the EDP department.

A final decision has not been made on the extent of the electronic mail project. Nonetheless, a pilot mode is being conducted on the COMET (COmputer MEssage Transmission) system, developed by the Computer Corporation of America and distributed here by Canada Systems Group. The system "allows you to communicate without always be-

Electronic 'Yellow Pages' may bring mail hook-up

A recent market study from International Resource Development Inc., Norwalk, Conn., foresees a boom for product/service information provided in electronic form, with likely U.S. market value to hit $200 million by 1985 and $2.5 billion by 1990.

The availability—and widespread usefulness—of electronic 'yellow pages', the report feels, will help stimulate installations of home terminals for other teletex uses as well. These same terminals will also be increasingly used for sending and receiving electronic mail.

The report notes that dedication to implementation of electronic information exchange is quite strong in countries outside North America, as well, with France, for example, committed to a plan whereby paper telephone directories will be eliminated in the home by 1995, to be replaced by inexpensive keyboard-CRTs that would be used to request directory information on-line from a central data bank.

By ANDREW TAUSZ

objective

ing in the office when the other guys call," says Reichl.

Inherent savings

Communicating more effectively can translate into savings. For instance, if a $60,000-a-year executive saves only three minutes a day by using electronic mail rather than wasted phone calls, he would save his company $360 a year.

One company that embarked successfully on electronic mail is Canadian Pacific Ltd. The company's software program, which was integrated in April 1980, can link approximately 1,000 terminals throughout the system. Known as MERLIN (Multi-Function Electronic Mail Report Retrieval Linked Information Network), the software was developed in only three months.

"We did it because we have the network base and we could put electronic mail in," notes George Sekely, director of information systems. The base includes IBM architectured hardware, IBM software and file management methods, STC disc and drives, Amdahl computers, and IBM and Memorex displays.

No more letters

MERLIN is integrated with electronic filing and graph display features of CP's system. "It gives us a sense of urgency; we are always on top of our jobs," comments Sekely. So far, electronic mail is used mainly by the information systems department with senior executives of CP Rail using it extensively for reports, proposals and messages.

For someone like Sekely, who commutes frequently from his office in Montreal to Toronto, electronic mail allows him to get messages at any terminal as long as he defines his password which he can set or reset anytime.

"In my department," Sekely explains, "there are 400 people and we just don't use letters anymore. No one misses paper." All external mail, however, still goes through the postal system.

Another company that has put electronic mail to good use is the Ottawa-based Bell Northern Research Inc. Its Corporate Communication System, otherwise known as COCOS, was developed in 1978 and installed the following year. According to Stephen Maveety, manager of customer services integration, the system delivers about 30,000 messages a month.

Total registered users, says Maveety, number about 1,000 with a total addressable population of about 4,400 people. Currently BNR employees in Toronto, Ottawa, Montreal, Edmonton and Palo Alto, Calif. are on the system. Four nodes are connected in the system (one in Toronto, three in Ottawa): three PDP-11's running on a UNIX operating system and one IBM 3033 running on a VM operating system.

Integrated system

From the outset, BNR decided to integrate electronic mail with word processing functions and electronic conferencing; in short, to design an electronic office system.

The service had to run both on PDP-11 computers, dedicated to the service, and on an IBM 370 series computer, time-shared with other functions. The PDP version, remarks Maveety, is intended for the non-technical users while the IBM version is targeted for more technically-oriented users. The service is designed so the systems are connected and anyone on one system can send mail to someone using another without being aware of what system he's on.

The primary users of COCOS are managers and scientists, who have readily adapted to the system. COCOS, says Maveety, incorporates most characteristics of electronic mail systems and then some. On it, you can create, send, receive and file messages.

In the computer, you are provided with an Inbox and Outbox for incoming and outgoing mail. The computer is responsible for sorting and distributing messages according to whom they are addressed. A message sent to someone not registered on COCOS is printed out at a local mailroom and then delivered by the regular mail service.

You can read, write, reply to, file, throw away (and retrieve again) messages as you would with ordinary mail. If there's need for printed paper, you can have messages printed out and delivered by regular mail service. The system keeps cross-referenced indices of mail kept in the computer, so you would be able to scan the mail for a message from someone or about a particular subject. Each message is uniquely defined by the name of the box it is held in (users can have

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Electronic public mail in action. Correct codes are entered into computer for transmission of Intelpost message from Canada to London, England. Material to be transmitted from Canadian centres is scanned, then stored in disc memory. Digital signals representing message go via satellite to earth station in receiving country, where message is received for delivery. Intelpost operates from Edmonton, Calgary, Winnipeg, Montreal, Ottawa, Toronto and Halifax.

Electronic mail making strides

From page 73

many boxes, each with a separate name), and by the sequence number it is filed by. With the box name and the message sequence number, you can locate any of your messages in the system. Of course, users do not have access to anyone else's messages.

Unlike CP's MERLIN system, COCOS is not planned to be marketed elsewhere. Whereas these two systems are quite advanced, most companies that have electronic message systems tend to use less sophisticated means. Often computerized message switching capabilities can do the trick.

Reducing delays

In Montreal, the headquarters for Maislin Industries Ltd., one of Canada's largest transport companies, internal message switching has been a prominent feature since 1974. The company has in excess of 100 trucking terminals spanning the eastern half of North America and managers tend to be mobile. Administrative messages can be transmitted to key individuals or to a number of terminals simultaneously.

All message switching is routed to the computer system centred in La-Crosse, Wisconsin where an IBM 3705 telecommunications controller is located which has power of two million bytes. Says Steven Maislin, vice-president of corporate affairs: "Our concern is speed and accuracy. The mail service may cause a delay for one or two weeks. With message switching an individual can be reached in 15 minutes."

Linking systems

Companies are finding it relatively easy to communicate within their own computer systems, but what about receiving and sending to other companies? That is not as simple; since facsimile devices, often used for intercompany communications, can be incompatible—making electronic mail between companies on different systems impossible. The lack of a common protocol for communicating word processors further aggravates the situation.

To combat these problems, CNCP Telecommunications has teamed up with Canada Post to offer a domestic service whereby a company can send a Telex message to the Post Office nearest its eventual destination for delivery.

For overseas messages, Canada Post, CNCP and Teleglobe (a crown corporation) offer a high-speed facsimile service called Intelpost. This is the first international electronic mail service of its kind, which first linked London, England to Toronto in June 1980. Since then, 13 Canadian, American and European cities have been linked.

The cost of Intelpost is $4.00 a page in Canada and $5.00 a page for international messages. You can take the message to a post office and from there it's sent along CNCP's microwave network and Teleglobe's international satellite facilities.

New approaches

On the horizon are two initiatives—if and when approved by government regulators—that would make electronic mail more commonplace. One of the proposals before the Canadian Radio-television & Telecommunications Commission (CRTC) is from the Computer Communications Group, a unit of Bell Canada. The system called Envoy 100, developed by the TransCanada Telephone System, would operate over the public telephone lines rather than private or dedicated lines.

The other proposal is from CNCP Telecommunications. It is awaiting CRTC approval for its Infotex service which would provide for electronic mail on coast-to-coast telecommunications lines that already carry Telex, computer data and fascimile transmissions.

The Envoy 100, says product manager Stephen Caswell, will use CCG's packet switched network, Datapac, as the prime communications medium.

"Envoy allows you to use any terminal that adheres to the ASCII protocol, he says, "and almost all of the time-sharing companies adhere to ASCII."

The terminal compatibility feature will enable terminals of different types and speeds operating on the Dataphone (DDD), TWX, as well as Datapac networks to communicate with each other. Customers would then be able to choose the terminal which is the cheapest to use.

Envoy 100 is geared not only to administrative messages but sending business information such as sales orders, inventory up-dates and payroll statistics as well. Comments Caswell: "Envoy allows you to have person-to-person, direct messages with no middle man. You enter it indirectly and the information is stored in the mailbox until requested."

Bell Canada hoped to have a CRTC decision on Envoy 100's tariff application by early summer. As of this writing, that decision has not been delivered. Envoy 100 is part of the advanced communications services to be marketed for the business community, and it was introduced near the same time Bell Canada unveiled its Displayphone, a general purpose communications instrument to be used in what is nowadays referred to ubiquitously as the "office of the future."

Merging technologies

The goal of the office of the future is to merge word processing and data processing functions so that all information presently handled on paper will be processed, edited, stored, retrieved and transmitted electronically. The payoff for business is increased levels of productivity. At this stage, the degree of productivity is still open to conjecture.

CNCP's entry into the office of the future, its Infotex service, would link communicating word processors and intelligent typewriters to its computer-controlled, digital-switching network. Infotex will be capable of handling 2,400 bits per second; so a 300 word letter could be sent within seven seconds. The system was demonstrated at field trials on CNCP's Infomode 800WP terminal, and other word processors such as the AES C-20 and Micom 2001 for instance, are also compatible. According to spokesman John Gibson, CNCP would like to win the CRTC's approval for Infoxtex sometime later this year.

The evidence is on the table that, technologically-speaking, electronic mail works. The task industry faces is to convince business that electronic mail is cost effective and conducive to increased productivity. If that can be done, in the framework of the integrated electronic office, of which electronic mail is an intrinsic part—the 1980s will spell a decade of burgeoning sales. □

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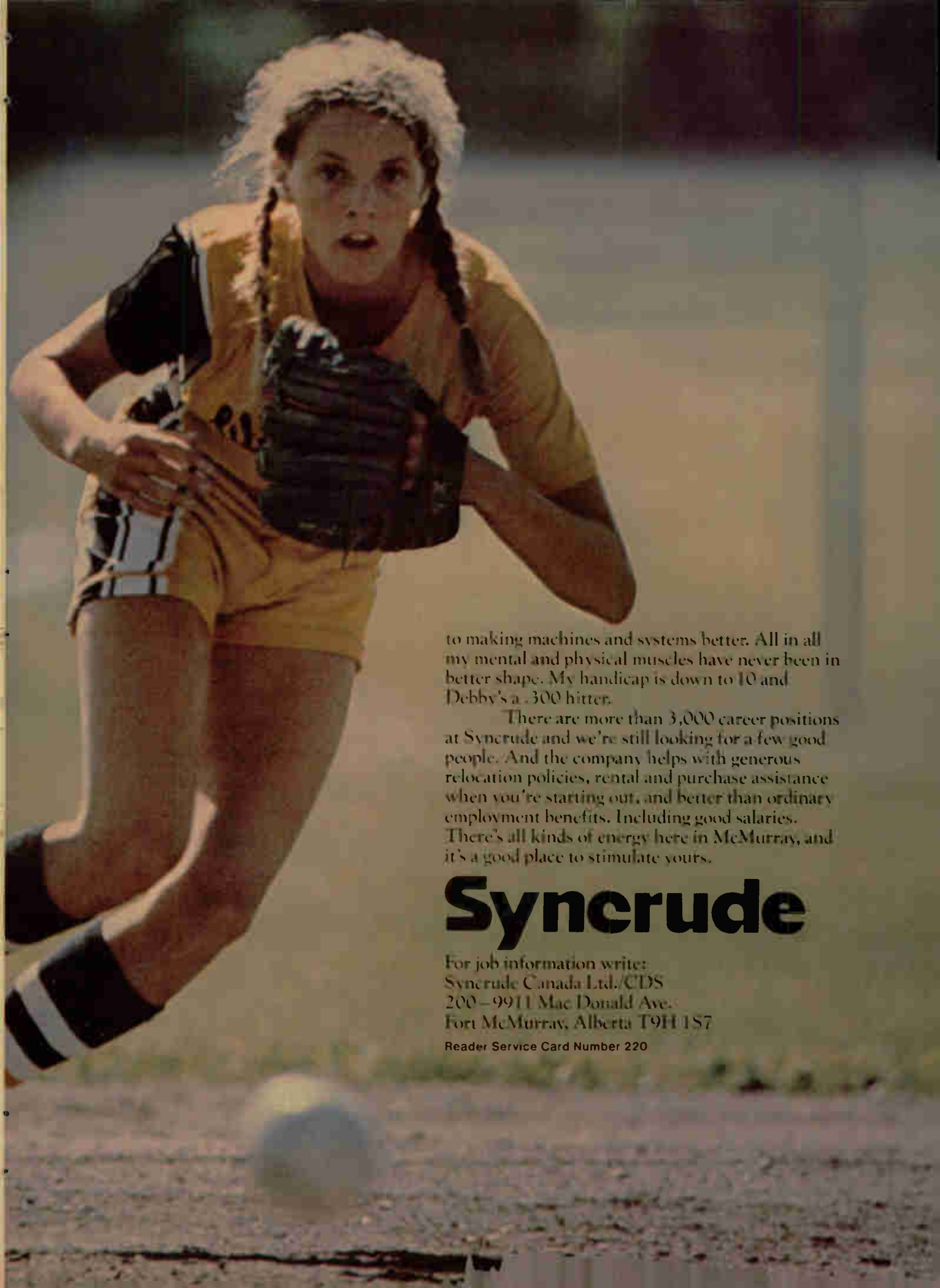

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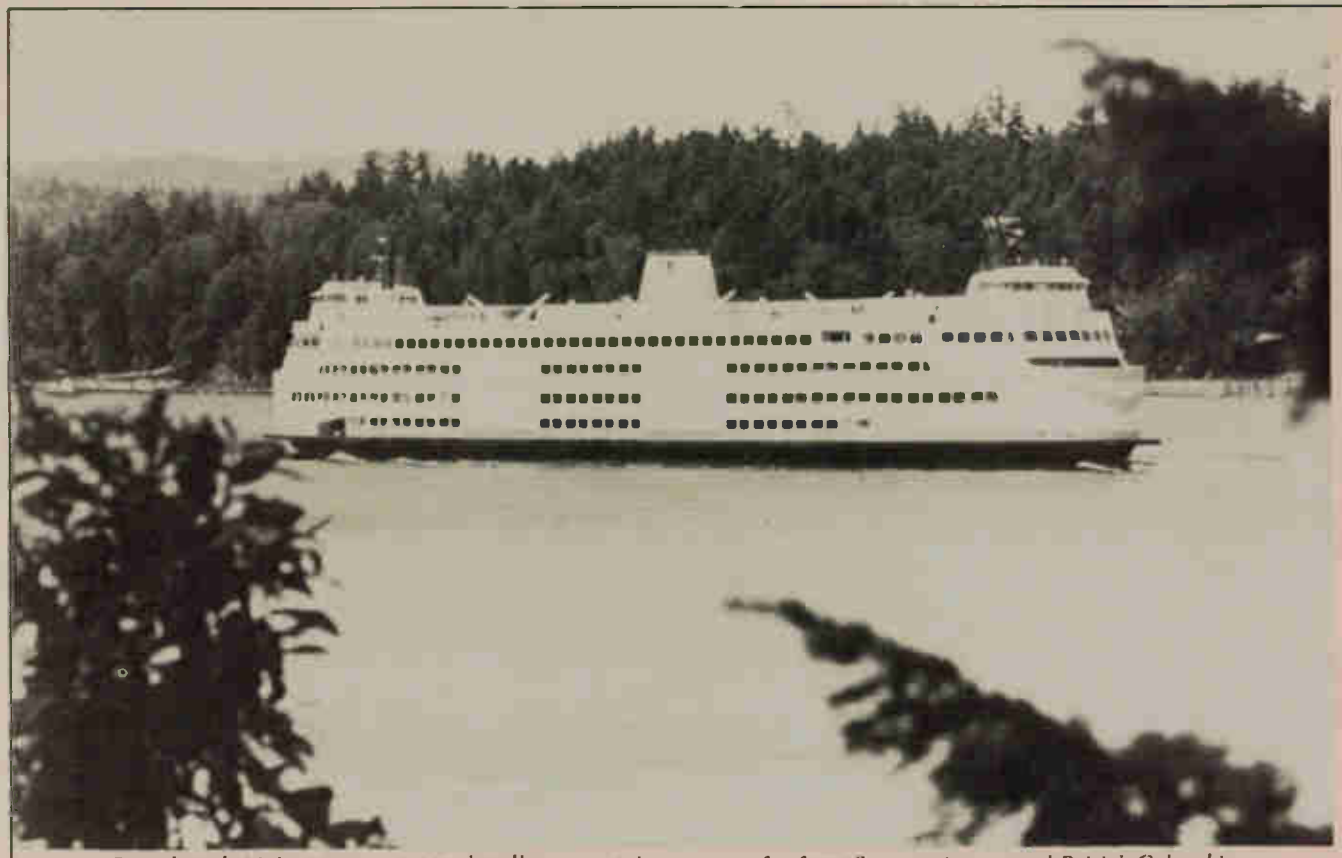


Distributed minicomputer system handles reservation process for ferry fleet serving coastal British Columbia.

Enhanced data network helps run ferry service

Distributed network with the control and back-up qualities of a centralized system helps run BC Ferry Corp. fleet of 25 ships. Increasing demand for more DP services calls for enhancement of current network.

When you operate a public ferry system as large as the British Columbia's Ferry Corporation, access to information is vital, whether you're a passenger in Vancouver planning a trip to Victoria or an operations executive scheduling ferry maintenance times and requirements.

Since 1977, the ferry fleet has grown to 25 ships with a total per trip capacity of over 4,000 vehicles and more than 18,000 passengers. Ferries range in size from a 42-ft. craft to the newest 457-ft. "Queen of Surrey and "Queen of Oak Bay" providing daily sailings between Vancouver Island and the mainland.

"In the beginning," explains Systems Development Manager Ken McLeod, "all our data processing was performed using government computing services. Included in those was the on-line information system which, prior to June 1979, was running under CICS on an IBM mainframe. The system was supported by the British Columbia Systems Corp. and, depending on the activity, the monthly costs ranged from $12,000 to $15,000."

During the summer of 1979, the corporation installed a Datapoint distributed minicomputer system in Vancouver. The system, which basically replaces the previous one, consists of a 6600 processor with 20 megabytes of disc and a small printer. It supports eight inhouse, and four remote Datapoint 8200 CRTs. This standalone distributed system was linked via Dataroute to the ferry corporation's Datapoint ARC (Attached Resource Computer) system in the Victoria head office.

Communication with the remote CRT terminals, located at various ferry boarding terminals along the coast, used Gandalf's LDM 414 modems operating over leased facilities at 4,800 bps. The net effect of the conversion was a fixed cost system of approximately $6,000 per month, a reduction in costs of more than 50%.

Enhanced system

A year later, it was decided to enhance the information system to include the reservation process, which had been handled manually for many years. Basically, the computerized system would allow information clerks to make reservations for passengers wanting to travel to the Gulf Islands or for routes with far northern destinations. Since this expanded service would require more computer hardware operating in a relatively complex environment, consolidation of Vancouver-based and Victoria-based hardware was considered.

"In June of 1980, the stand-alone equipment in Vancouver was relocated and brought into the existing ARC environment at head office in Victoria," noted Mr. McLeod. "This decision was made to capitalize on the in-house expertise in Victoria and to eliminate staff duplication which would have been necessary to maintain systems in both cities.

"The tradeoff was a capital investment in modems, multiplexers and leased lines versus the personnel required to support the system from 6 a.m. to 10 p.m., 7 days a week," said Mr. McLeod. "Since the technical staff already existed in Victoria, it was more cost effective to locate all the processors under one roof in the Victoria headquarters while maintaining a distributed processing operating environment. Incidentally, from the user point of view, the disruption in service resulting from the relocation of the actual processing site was a little less than one hour."

More than 2,800 employees are responsible for moving the four million vehicles and 12 million people that use the ferry system each year to sail to 17 destinations. "The corporation has a very high public profile, and we have to constantly provide the most efficient scheduling and information services possible to the public while maintaining a strict control over expenditures of the public's money."

To meet this objective, B.C. Ferry chose the Datapoint ARC environment (a number of individual processors linked by coaxial cable) instead of the more traditional mainframe route. The net effect is a distributed network with the control and back-up qualities inherent in a centralized system as well as the flexibility of having several interchangeable minis doing specific tasks. Purchasing Gandalf data communications equipment and leasing telephone lines rounded out the integrated system and was a key factor in lowering overall monthly operating costs while still maintaining the speed associated with the stand-alone system.

As part of a total communications package, the corporation selected 3-8 channel PIN 9103 multiplexers. "Because of the fast response and high reliability factors set by the user, we decided on three Gandalf eight-channel multiplexers instead of one box with 24 channels," explains Mr. McLeod. "Going this route provides at least some cushion should we lose a communications link and at the same time it allows growth if and when it is required."

Current network

Today, the corporation has 18 processors in the ARC system of 2,176K of memory serving a terminal population of 46 CRTs and three remote printers. Computer terminals located at Departure Bay, Horseshoe Bay, Tsawwassen and Langdale communicate with B.C. Ferry's Vancouver office over leased lines using Gandalf LDM414's and 3414's to the PIN 9103 statistical multiplexers and concentrated onto three 9,600 bps lines using Gandalf SM 9600 superModems.

In Victoria, the signals are received by racked superModems and

Turn to page 82

Instead of going the more typical mainframe route, BC Ferry Corp. opted for minicomputer network, notes Ken McLeod, Systems Development Manager.

Three 24-channel multiplexers and three SM 9600 superModems are part of datacom equipment. LDM 414 unit on top of cabinet supports communications between Victoria headquarters processors with CRTs at Swartz Bay, 17 miles distant.

Central computing facility is devoid of mainframes or front-end processors. Series of minicomputers are tied together into flexible data network.

Can your company afford to do everything twice? to do everything twice?

How many times does your staff use the same set of figures? Or the same words? And what happens when they have to combine those figures and words—in customized letters to customers or employees, for example?

Your staff works with the same information again and again. And when they have to type it again and again, it's deadly. It kills productivity and wastes money.

Introducing the Nixdorf 8845 Integrated Office System.

It's one solution that lets you do everything once.

That's because the 8845 combines data entry, data processing *and* word processing capabilities in one automated office system.

Word processing can draw on data files. Data processing can draw on words. The minute you enter anything, you never have to enter it again. And because the 8845 makes all these capabilities accessible through one typewriter-style keyboard, it puts an extraordinary amount of power in the hands of the operator.

Office people can do the work of technical people.

The Nixdorf 8845 is so easy to use that office people can take a lot of the burden off your data processing people.

Secretaries or clerical people can enter data quickly and accurately while over 15 checks and edits keep on alert for errors. (In fact, for data entry, it's one of the easiest-to-use systems on the market.)

They can call up standard screen formats at will, and create one-of-a-kind jobs with ease.

They can build, access, and update files.

They can merge data processing and word processing with a single command.

And if they ever forget where they are, they can immediately call on the Nixdorf-pioneered HELP button to find their place.

It not only saves time, it saves money.

Because the 8845 was conceived as an integrated system, you get the benefit of all these capabilities without expensive add-ons or extra software.

Your everyday programming needs can be handled by your own people, lessening the need for costly technicians or consultants. In fact, you can start using the 8845 the day it's delivered.

The 8845 can easily communicate with a host computer, or it can stand alone, lessening your dependence on expensive centralized data processing facilities.

What's more, it lets you save money by building at your own pace to a completely automated office system, starting with a central processor and adding work stations, serial, line, or letter-quality printers, disk storage and magnetic tape storage as needed.

A company as solid as its equipment.

Nixdorf stands behind over 70,000 installations worldwide, and over 100 sales and service centers throughout the U.S. and Canada

The Nixdorf policy of customer support means total responsibility for everything from advance planning and installation to training and service.

Instead of depending on one company for hardware, and another for software, you need go no further than your Nixdorf field specialist to handle any questions.

If you would like to know more about the 8845, write for details to Nixdorf Canada Ltd., Suite 102, 505 Consumers Rd., Willowdale, Ontario, M2J 4V8.

After all, repetition may be effective in advertising, but in your business, it hurts.

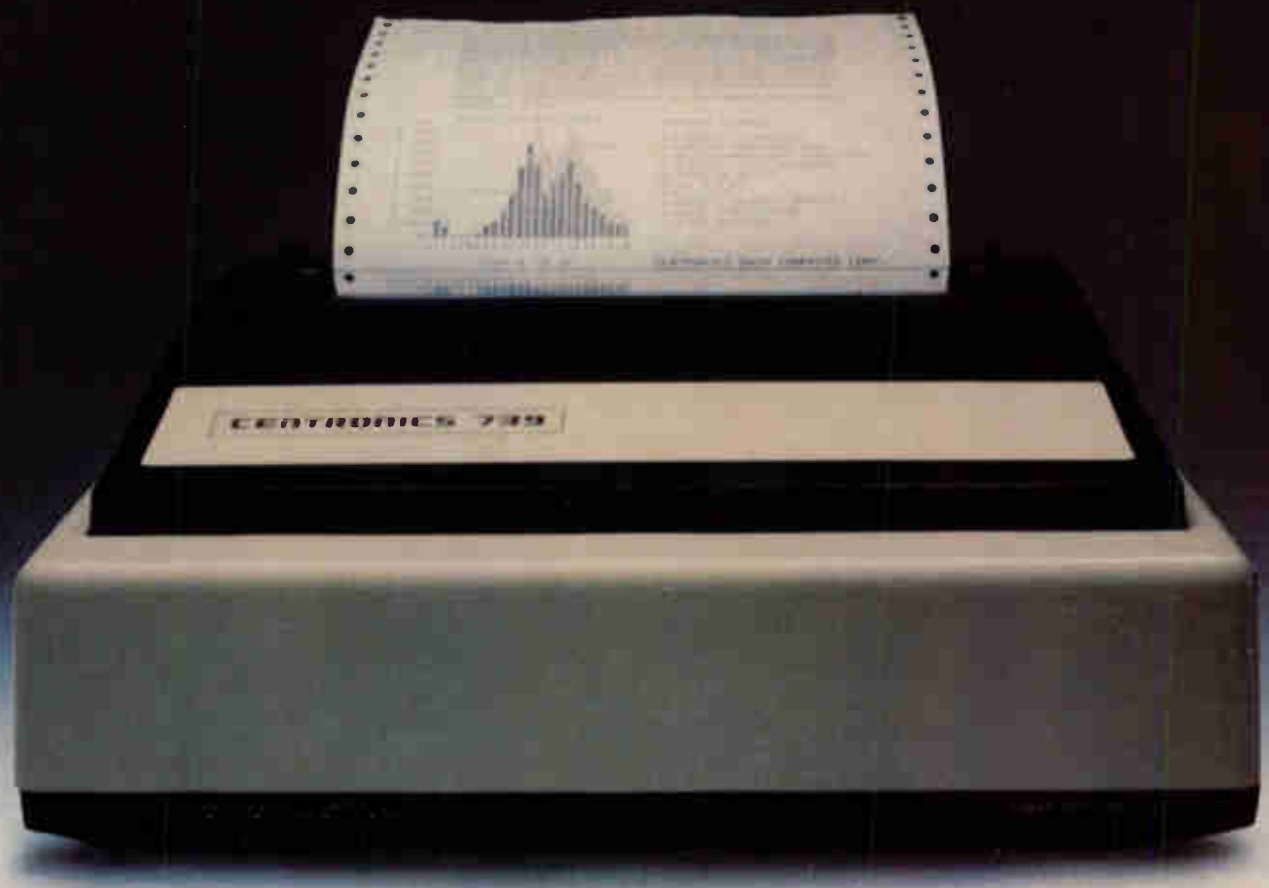
You can't afford to do things twice forever. Forever.

NIXDORF COMPUTER

Reader Service Card Number 449

Reader Service Card Number 129 ⟶

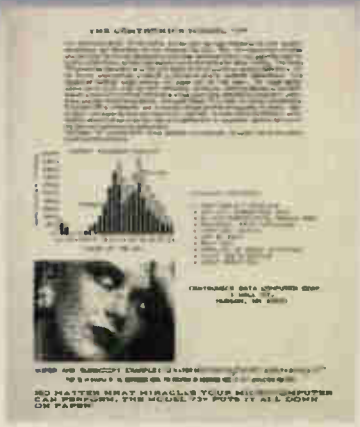
THE CENTRONICS 739. IT'S MORE THAN YOU'D EXPECT FROM AN INEXPENSIVE DESK-TOP PRINTER.



Inexpensive doesn't have to mean incomplete, and the quiet, dependable Centronics 739 is the classic example. It's complete in capability and because it's from Centronics you can expect it to perform just like the workhorse printers that have made Centronics a leader in the business for more than a dozen years. So when you shop for a desk-top printer and compare features, here's what you can expect from a 739:

CORRESPONDENCE QUALITY—Clear, high density characters plus right justification and proportional spacing that produce correspondence, direct mail, and other important documents that demand a "custom" quality appearance.

BUSINESS GRAPHICS—What good is a printer that can't print your technical business/management information? The 739 produces a range of graphics—from bar charts and curves to illustrative material—almost anything your computer can produce.



3-WAY PAPER HANDLING—Cut sheets for correspondence; roll paper for day-to-day operations; fan-folded forms for normal data printout.

DEPENDABILITY—You depend on your printer for hard copy of timely information and that means it must operate dependably. With Centronics reputation behind the 739, reliability is a foregone conclusion. More than 350,000 Centronics printers sold worldwide is the proof.

SERVICE—Someday you may need it. Where do you find it? With Centronics worldwide network of service locations it's not very far. And now, there are authorized Centronics sales and service dealers, and "walk-in" service centers in an expanding number of key cities throughout Canada.

When it comes to printers, Centronics is the leading independent printer manufacturer—chosen by computer professionals in major industry brand preference studies. So when you look for an inexpensive printer don't settle for incomplete. Choose the Centronics 739. It comes complete with a commitment—to performance, dependability and service. See it at your Centronics dealer. Or write for information.

CENTRONICS® PRINTERS

Centronics Canada Inc.
5170 Timberlea Blvd. Unit B
Mississauga, Ontario L4W2S5

Data network helps run ferry service

From page 79

sent to the racked PIN 9103's for unscrambling to the Datapoint processors.

"We liked the superModems because of their capability to transmit and receive data at 9,600 bps over normal telco circuits at reasonable costs, and still retain the capability of driving all eight devices connected through the PIN 9103's at 4,800 bps," notes Mr. McLeod. For those boarding terminals located near Victoria (eg. Swartz Bay) data is transmitted directly to the Datapoint gear over leased lines at 4,800 bps using Gandalf 414 series modems.

"The Information/Reservation Centre (INFORES) is in full operation 16 hours per day, 7 days per week. Although the number of clerks on duty varies according to the incoming telephone traffic, at times there could be as many as 15 clerks answering calls from the public at any one time and they must be able to satisfy about 3,000 calls per day.

"From each work station, the information clerk can respond to questions such as: How does one get to a given boarding terminal; when are the next sailings; what bus connections are available; are there any weight or special restrictions at loading docks; and, other questions relating to ferry travel. That same clerk may, if the calling party desires, check on sailing to the Gulf Islands and reserve space for the patron and their vehicle. This Fall, the corporation expects to be able to use the computer to make more complex reservations on longer 'North coast' runs to allow for passenger, vehicle and stateroom bookings."

To make information about ferry crossing more available to the public, the corporation recently installed slow speed terminals and communication facilities to eight radio stations in Vancouver and two on the island. This is a two-wire, multi-drop circuit which is linked to a time sharing port on one of the Datapoint processors. Every ten minutes, the computer interrogates its files, formats a full screen containing news bulletins and current sailing information for up to eight boarding terminals and transmits the data to all drops on the line.

Future network plans

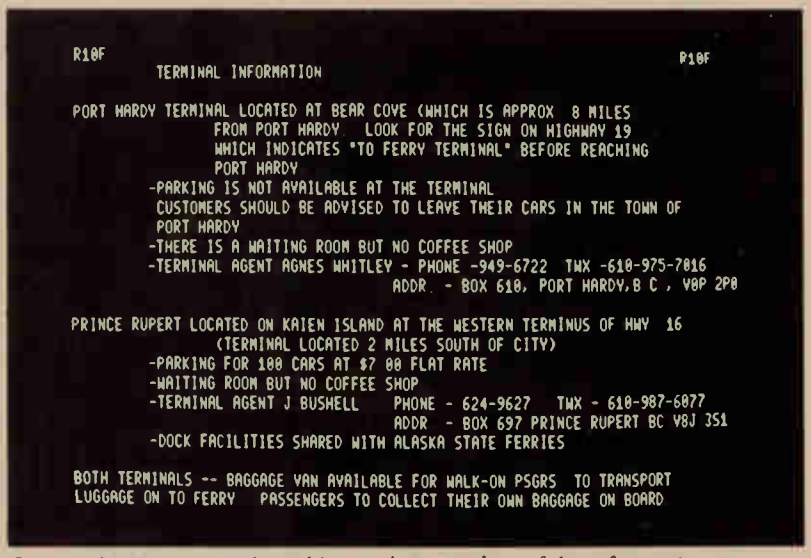
Currently the Corporation is in the process of developing a new on-line payroll/personnel system which will run on the Datapoint ARC network and interface directly with the Financial Information Systems already in place. This new development will have a significant impact on the current communications network since a major portion of the system will be user-interactive from the major boarding terminals. Also, and at approximately the same time that the payroll/personnel system is in the first phases of implementation, the corporation will start using the services of a chartered bank to process the net pay on a remote mainframe.

"In order to satisfy this increased demand, we are planning a major enhancement of our current communication network," says Mr. McLeod. "We will be introducing four and eight-channel multiplexers at the major sites, adding additional telephone circuits to further sites and tieing them back through individual ports on the multiplexers. By upgrading with more sophisticated devices, we will be able to drive a number of additional individual devices from separate ports on the computer with no increase in the monthly communication costs for boarding terminals currently on-line.

"To handle the increased traffic from the mainland, we will be installing a pair of Gandalf rack-mounted four-channel SM 9600's on a new circuit between Victoria and Vancouver," notes Mr. McLeod. "One channel of this modem will be dedicated to the new net pay process while the other three will act as individual trunks to major boarding terminals where 2,400 bps modems will be coupled to four-channel multiplexers. Each of the four superModem channels will operate independently at 2,400 bps over one telephone circuit. With this type of communications network, we will be able to respond to the user needs in a manner which is both expedient and cost effective.

"As for the future, we can expect even more in the area of telecommunications," he states. "Inventory and revenue reporting immediately come to mind, for example and, because of the nature of our business, which is spread all over the coast from Victoria to Prince Rupert, we will have to develop systems which serve the user from remote sites."

B.C. Ferry has had substantial growth over the last ten years and this growth is expected to continue. "With this expansion, there is little doubt that our network requirement will expand accordingly and the most effective ways for us to meet those new commitments is through the Datapoint ARC network and to interface that gear with Gandalf communications equipment. By purchasing, as opposed to leasing, we have been able to reduce our overall communications costs. And equipment reliability has taken a major worry out of operating that aspect of our network." □



Getting the message to the public is a key mandate of the information system at BC Ferry Corp. This is one of several screens available to reservation terminal operators.

The way it works is incredibly simple. The work it does is simply incredible.

Be honest for a moment. You believe word processing is too complicated and too expensive for your business.

So AES is introducing the Alphaplus to change your mind.

The new Alphaplus typing system gets words on paper with remarkable simplicity. In fact, there are some people already calling it the world's simplest word processor.

To start with, the Alphaplus is simple to learn and operate. Its keyboard is designed just like the typewriter your secretary is using now.

Incredibly simple.

The Alphaplus story gets even simpler. It's so compact, you get screen typing, electronic keyboarding and high speed printing – all in the space of a typewriter.

Simply incredible.

What's more, the printer is built right in. So the Alphaplus functions as a complete, one-stop typing centre.

So while the Alphaplus is turning out faster, neater documents, your business productivity is increased. And that means you're saving time and money.

One last word. As your business needs grow, the Alphaplus can grow along with you. It can be used with all our other AES Word Processors. So you can easily add to the Alphaplus as new features are developed or are required by your business.

Move up from your current typing system to all the advantages of word processing. The new Alphaplus now makes it uncomplicated and affordable.

All you have to do is fill out the attached reply card. Or send your business card with this ad to AES Data Ltée/Ltd., 570 McCaffrey Street, Montreal, Quebec H4T 9Z9.

It's that simple.

AES

Alphaplus

Incredibly simple. Simply incredible.

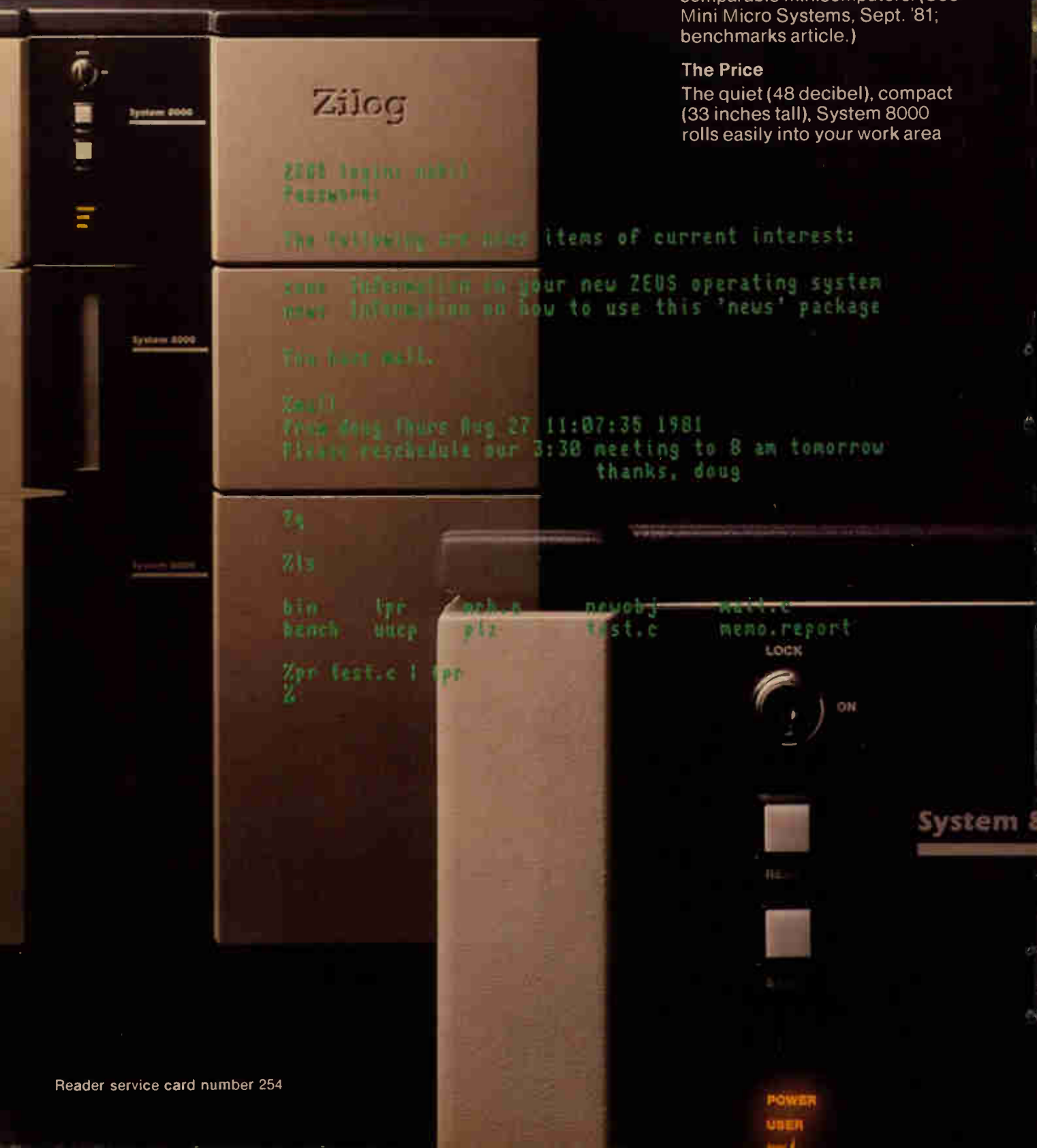
Reader Service Card Number 106

Zilog's System 8000™

If you want to establish a low-cost UNIX*-based system, or need additional UNIX productivity on your current system, Zilog's System 8000 is the perfect choice. System 8000 is a modular, free-standing unit built for multi-user office and laboratory application. Based on Zilog's reliable, high performance Z8000™ microprocessors, System 8000 delivers supermicro power at prices far below those of comparable minicomputers. (See Mini Micro Systems, Sept. '81; benchmarks article.)

The Price

The quiet (48 decibel), compact (33 inches tall), System 8000 rolls easily into your work area



Reader service card number 254

the Supermicro.

and requires no special environment. Zilog provides a complete eight user system, including system software, 256 KB of main memory, a 24 MB Winchester disk and 17 MB tape cartridge back up, along with expansion capabilities, all for only $29,950. (U.S. list.)

The Performance

The System 8000 runs the ZEUS operating system, which is a faithful enhancement of the seventh edition of UNIX, perfected through Zilog's extensive UNIX experience. Because ZEUS is a high performance implementation of UNIX, any program that runs under UNIX, written in C, COBOL, or Pascal, can be easily ported to System 8000. Programs comprising the utilities and development tools provide user access, command processing, file management status information, and communication with other devices or systems. ZEUS also includes text processing software, libraries, a symbolic debugger, programming languages (standard C, PLZ/SYS, PLZ/Assembler, plus optional COBOL and Pascal), and more than 100 other utilities.

The Future

System 8000 plans include hardware and software expansion as well as compatibility with future generations of microprocessors. Soon the System 8000 will become integrated with Zilog's Z-NET™ Local Area Network (LAN) for commercial distributed data processing. No other manufacturer offers a UNIX-based system with the price and performance of the System 8000. So, if you're seeking the right UNIX solution, System 8000 is the perfect choice.

For more information, write Zilog, Inc. General Systems Division, 10460 Bubb Road, Cupertino, CA 95014. Or call the office nearest you.

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Zilog
EXXON COMPUTER SYSTEMS

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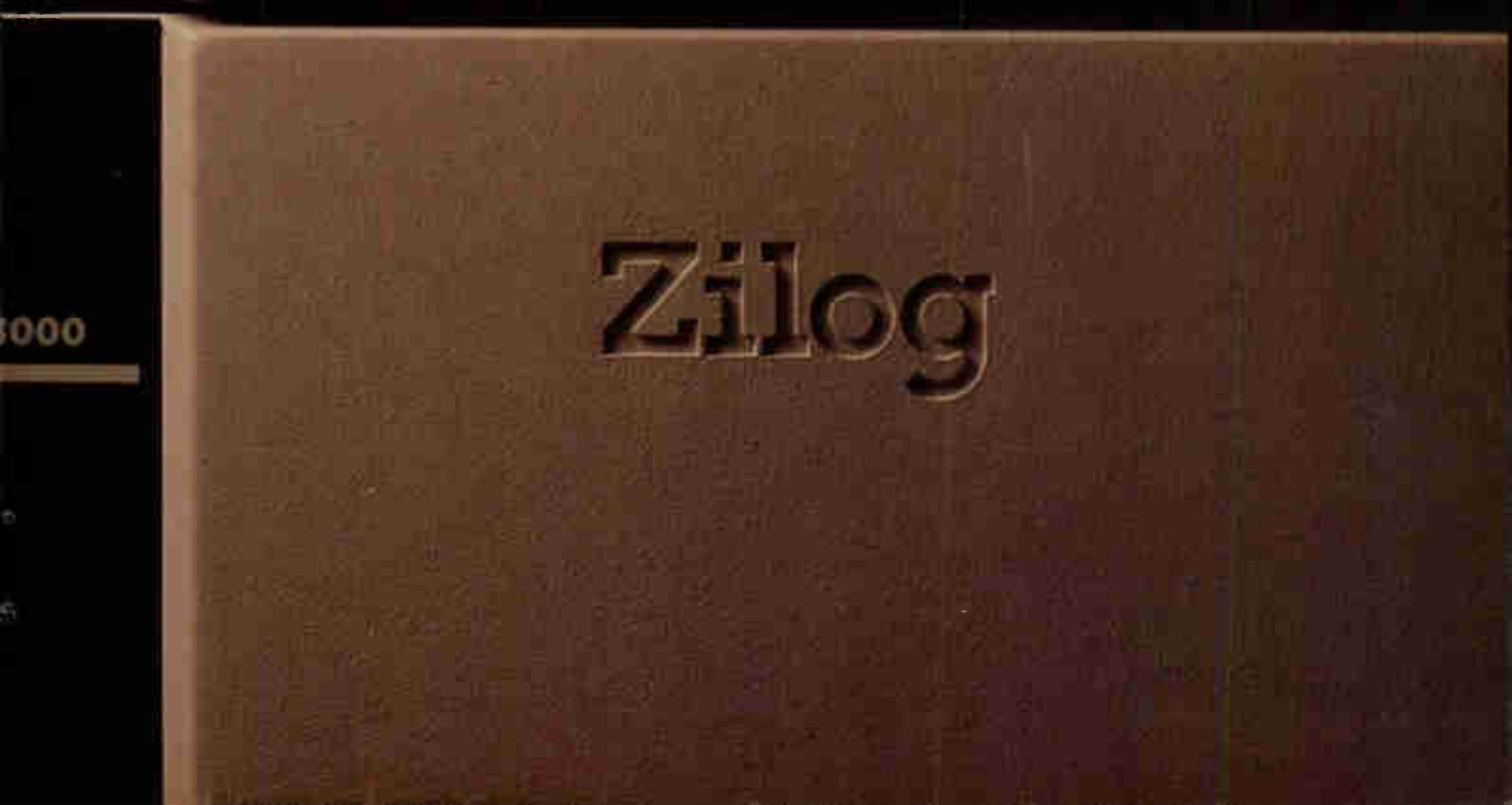


IBM's entry into the personal computer market comes in several versions, starting with a $2,300 basic system. Expanded system for business, with color graphics, two diskette drives and printer retails for about $6,620.

IBM's personal computer aims for home, office

THE long-anticipated move by IBM into the personal computer marketplace has now been made with the firm's announcement of a unit called simply . . . the IBM Personal Computer.

Designed primarily for the small-business, educational, and home environments, the system is built around a 16-bit Intel 8088 microprocessor and the Microsoft Basic language, and offers 40K of ROM and 16K of RAM in the basic, least-expensive configuration. The system will be sold and serviced through the ComputerLand chain of retail computer stores, as well as at IBM's first retail store in Canada, the IBM Product Centre at Toronto's Royal Bank Plaza.

The Personal Computer is available in several versions, starting with a $2,300 (Cdn.) basic system consisting of just an 83-key keyboard and a CPU module. This would require hook-up to a home television set and a cassette tape recorder. A 'more typical' 64K system, with CRT and single floppy-disc drive, will cost $4,420, while an expanded system for business, with color graphics, two diskette drives, and a printer would retail for about $6,620.

The dot-matrix printer available with the system is a bi-directional 80-cps unit offering 12 type styles, page-spacing and column-skip features, and self-diagnostics.

The CRT (in the monochrome model) offers 25 lines of 80 characters on an 11½-in. screen, with underlining, high-intensity blinking, and reverse image, among other features. The color graphics option allows display of 256 characters in any of 16 foreground and eight background colors. It can also display graphics in four colors.

The system software available with the IBM Personal Computer includes an interpreter for Microsoft Basic in cassette, diskette or advanced versions; Disc Operating System (DOS); a Pascal compiler; and the CP/M-86 and UCSD p-System operating systems.

Six application software packages are immediately available: VisiCalc, the popular 'electronic worksheet' from Personal Software Inc.; general-ledger, accounts receivable and accounts payable programs from Peachtree Software Inc.; EasyWriter, a word-processing package from Information Unlimited Software Inc.; and Microsoft Adventure, a fantasy-world home entertainment game.

More software programs, many to be designed in-house by IBM, will be forthcoming, the company says.

The Personal Computer also has communication capabilities that allow access to outside data services such as Dow Jones 'News/Retrieval' and 'The Source.' IBM says it plans to shortly provide a full subset of 3270 emulation capabilities to enhance ability to 'talk' with larger systems.

First deliveries of the Personal Computer will be made late this autumn. □

IBM creates software publishing department

To support the launch of the IBM Personal Computer, the company has also announced the creation of a Personal Computer Software Publishing Department, where both IBM employees and outside authors—from professionals to hobbyists—can submit programs for consideration.

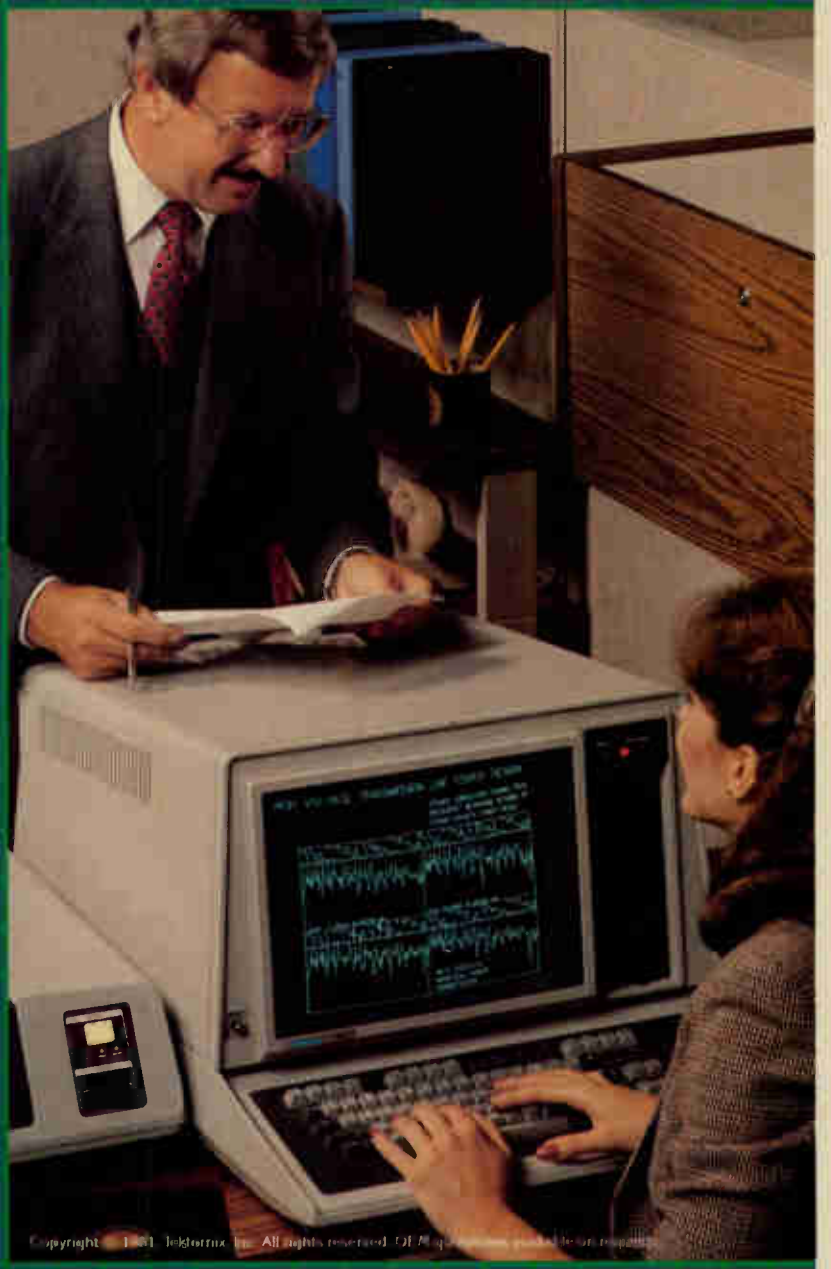
The department was formed to offer an outlet to these individuals, as well as to ensure an ever-increasing library of software for the Personal Computer, to supplement commercial programs marketed by outside firms.

Information packets for would-be authors will be available from IBM after Sept. 30, 1981, and the information in them must be studied before any submissions may be made.

Packet requests should be addressed to: Canadian Patent Operations, Dept. 908, IBM Canada Ltd., 220 Duncan Mill Rd., Don Mills, Ont. M3B 3J5.

Zoom and pan. Overlays and gray scale. Retained segments and panel flooding.

The Tektronix 4112 Computer Display Terminal



THE GRAPHICS STANDARD

The new 4112 not only reduces host connect charges and transmission traffic. It does things no raster terminal has ever done before. With its 16 million point addressability, you can zoom and pan off-line to see many times more intricate detail.

You can define a dialogue area anywhere on the 4112's 15-inch screen to keep commands from cluttering the workspace.

You can work with up to three display layers, and enhance displays with up to eight shades of gray.

You can define, store and recall up to 32,000 picture elements in RAM and on optional integral flexible disk. Or interact with the host at speeds as fast as 9600 baud.

The 4112: If it sounds like good news so far, let us show you the whole story. See your Tektronix Sales Representative, or use the coupon below for more information.

Please send me full details on: The new 4110 Series Computer Display Terminals

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See us at Booth Island "U"

Burrough's new OFIS 1 office automation system is designed to serve various departments, including management. First deliveries are scheduled for early 1982.

Office system links DP functions to gain automation

Aimed at extending office automation benefits to the managers and decision makers in a business, rather than just making secretaries more efficient, the OFIS 1 office information system from Burroughs provides an integrated electronic base for a wide range of office functions.

Scheduled for first deliveries the first quarter of 1982, the system features such key functions as word processing, automatic filing and retrieval of documents and information, resource sharing, personal records management, electronic mail, and communications between departmental systems and host computers.

The system includes several key components. For example, documents are prepared and edited on OFISwriters, which are advanced word processors available with half-page or full page display screens and a range of features including extended memory, multiple diskettes, and communications.

Draft text can also be prepared on conventional electric typewriters and entered into the system via the OFISreader, a high speed OCR page reader. In this way, the system can upgrade typewriters into input stations for word processing. The OFISreader is also an input channel for other types of word processors. A new model, the 1240, is capable of reading multiple type fonts.

Hard copy in draft or letter quality form is produced on desktop printers. One printer can be shared by several OFISwriters. Two basic levels of electronic mail service are provided by communications-equipped OFISwriters and the company's "dex" facsimile systems and networks.

The OFISfile allows all types of business documents to be filed automatically and retrieved on demand. The file eliminates the clutter of filing cabinets and the delays encountered in searching through them. One file can house the equivalent of 80,000 typewritten pages, but occupies no more space than a two-drawer file cabinet.

The file can locate any document or group of related documents with nothing more than an instruction phrased in common English and containing a name, date, or other words in the text being sought. Words may even be misspelled, be in a different order, or take alternate forms.

The file operates on-line with the readers, writers, with other makes of word processors, and with the OFISterminal, a new inquiry and display station intended for use by managers.

The system also includes an information processor, the OFISdirector. This unit facilitates office information management, including access to computer-stored data, by extending the system's resource sharing capabilities. It enables users to share working files, a central printer, the file and the readers. A single director can connect several OFIS-equipped departments.

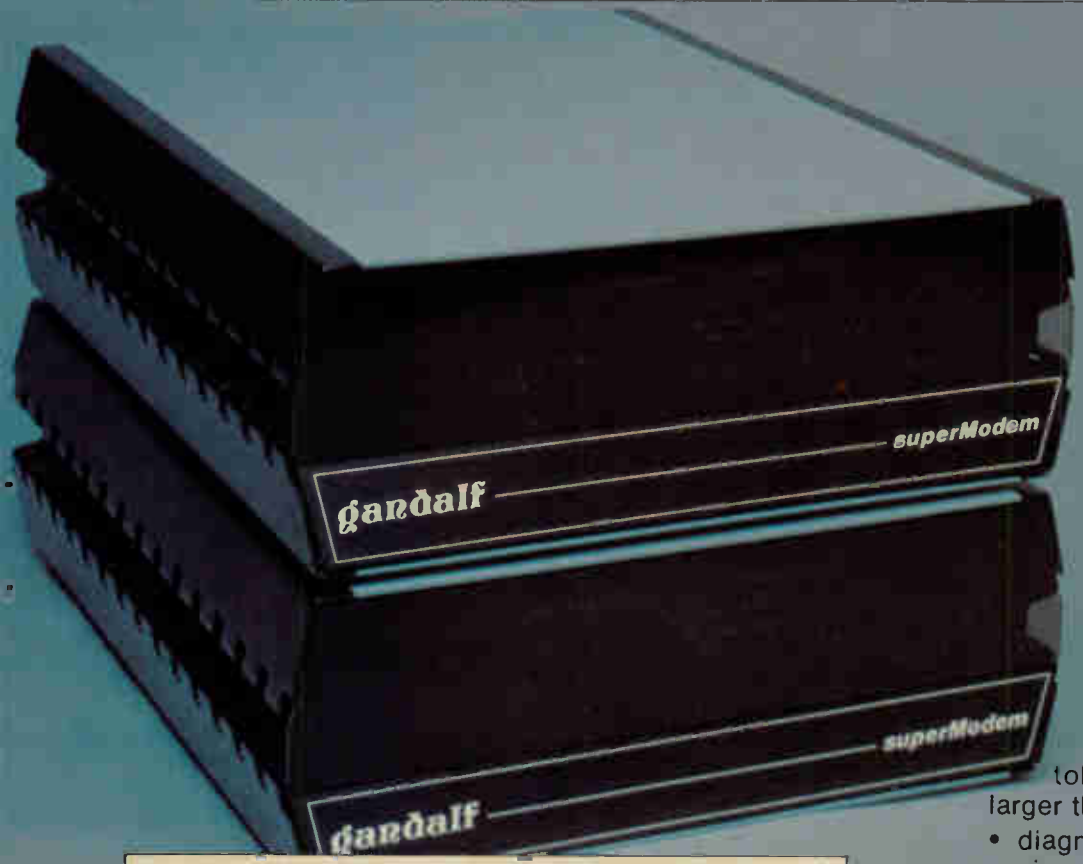
The director also provides connectivity to Burroughs' OFISworkstation keyboard/display units and to Burroughs' general purpose display terminals.

The system can be installed either incrementally or as a complete system. Its compatibility with other makes of office equipment is intended to protect users from unnecessary "start over" costs, and its open-ended design allows the addition of other capabilities and equipment that Burroughs is scheduling for future availability.

To further integrate office automation and data processing functions, the company will soon announce a series of host computer software systems for corporate-wide information management, business planning, modelling, statistical analysis, information sharing and communications. These software packages will operate with a Burroughs mainframe computer and will become accessible either directly or through networking links, to equipment components of the OFIS 1 system.

superModem.

The Only 9600 bps Modem With A Built-In Line Analyzer



Great impulse noise performance AND diagnostics which let you spot potential problems before they occur — the best of both worlds!

With superModem, you can:

- save money by sending synchronous data at 9600 bps over standard voice grade lines
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- diagnose line performance and impairments in terms you can discuss with your common carrier
- ensure your data gets through with both 4800 bps fallback operation for marginal lines and two call dial back up in case of failure
- order standalone and rack mount models, or choose the optional four channel multiplexer version

And you get all this capability for a price you would normally expect to pay for just the modem alone!

Interested? Just fill in the response coupon or call your nearest Gandalf representative today for more information.

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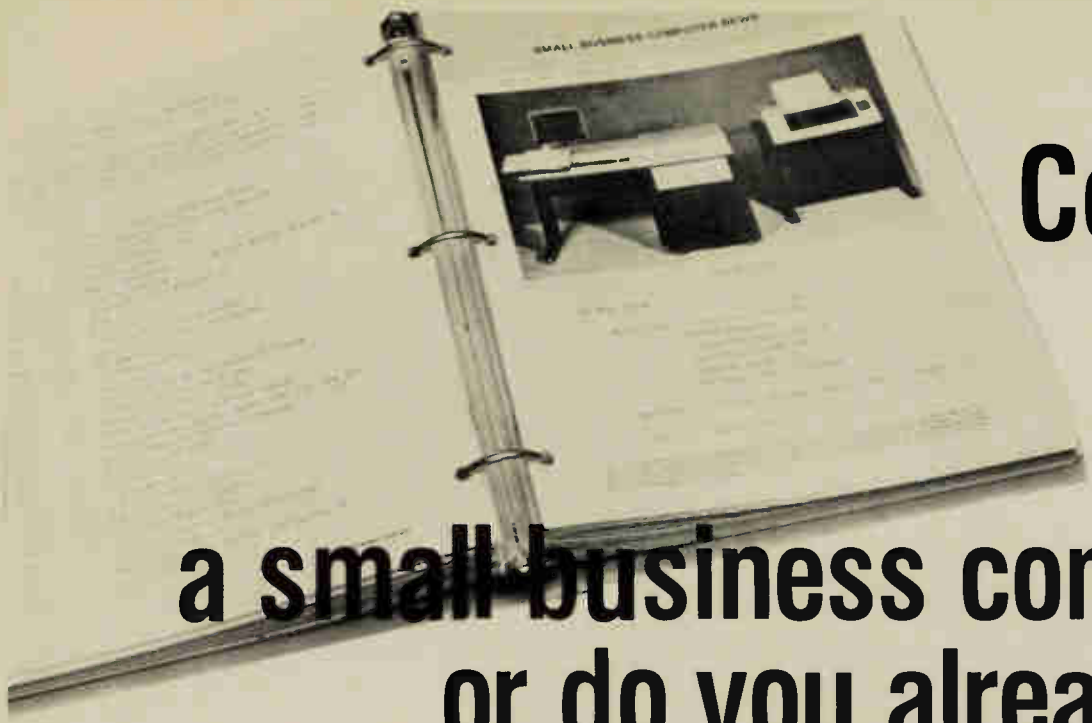

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Small Business Computer News thoroughly describes the system hardware and peripherals, system software, lists pricing, and evaluates small business systems, letting the buyer know in no uncertain terms the advantages and disadvantages of various computers. The publication covers inexpensive microcomputer systems which have pricetags of less than $10,000, to large minicomputer systems, which cost in the tens of thousands of dollars.

Small Business Computer News is written for the businessperson in clear, everyday language. In addition to the objective evaluations, the **Small Business Computer News** subscription service includes:

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the Norpak Visual Data Processor

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Whether your application is imagery or graphics; rely on NORPAK, Canada's leading manufacturer of computer display products, for your Visual Data Processor (VDP).

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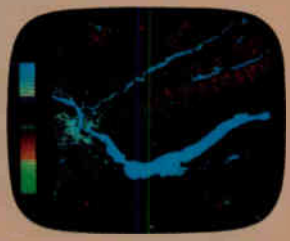
●Advanced bit-slice micro-processor technology ●High-speed ECL video logic ●Wide-bandwidth internal graphics bus and host DMA link



Remote Sensing (Landsat)

Features

●Three basic systems support various spatial resolution formats; **1.** System 2 - provides 512 (480) x 512 (640) pixels up to 10 bit planes deep with optional Real-time Video Digitization (RVD) **2.** System 3 - provides 512 (480) x 512 pixels up to 48 bit planes deep (32 simultaneously displayable) **3.** System 4 - provides 1024 x 1024 pixels up to 12 bit planes deep ●Both monochrome and colour video output ●Programmable look-up tables (PLUTs) for grey scale, pseudo colour and full colour display ●Interface for communication and interactive devices ●RGB video-out with external sync capability ●Extensive image/graphics instruction set

CAD/CAM and Process Control

Service

●Built-in test software (BITS) ●Access to modules through sliding rack mounts ●Rugged modules designed on "multiwire" process

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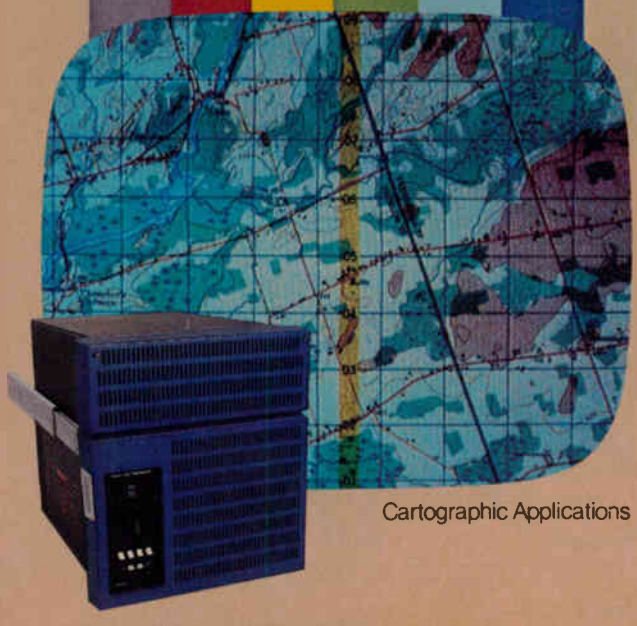

Cartographic Applications

norpak

SaskComp boosts its processing power

From page 94

service to various sectors of government in response to the existing needs. We can respond to needs individual agencies might not have been able to meet on their own, and we are only trying to supply services that are not otherwise available."

SaskComp service, incidentally, is not restricted to the public sector, but also available to private business, although this currently acounts for only about 5% to 10% of the total.

"We optimize the service and cost of computing through a service bureau environment," Poulin says.

Currently, the main computer centre is in Regina, with an IBM 3033, 3032 and a 168. A second computer centre is located in Saskatoon, with a 4341 and a 158.

In addition, SaskComp maintains a number of smaller facilities around the province. For example, a Honeywell Sigma 9 is installed at the University of Saskatchewan, which is available for time-sharing services; a 4341 at Sask Power, dedicated primarily to that organization's use, is also available for other shared service; at the Saskatchewan Technical Institute in Moose Jaw, a DEC PDP-11/70 serves the educational environment on a time sharing basis; and the Department of Urban Affairs at Saskatoon has a Hewlett-Packard HP 3000, also available to other users through SaskComp.

Quick remedial action can be initiated from "hot room," following customer report of malfunction, through monitoring of on-line systems.

"It is often advantageous for these agencies to use the support expertise we have and, in turn, we get the opportunity to use these facilities on a shared basis," Poulin explains.

The main categories of service now available from SaskComp include VM/CMS and TSO time sharing services; large-scale on-line transaction processing such as CICS and IMS/DC, and batch service, including a large volume of remote batch service.

Some of the ancillary services include computer output on microfilm and plotting.

Expanding facilities

Here are some examples of the kind of action SaskComp saw last year:

- The capacity of the Regina Regional Computing Centre was increased by about 75% with the addition of the IBM 3033;
- A time-sharing service (VM/CMS) was commenced from the Saskatoon regional computing centre, with applications such as APL, MPSF, BASIC, a Fortran, ADRS, and FPS all available on this system;
- Phase I of an interconnection between telecommunication front-end processors in Regina and Saskatoon is being considered;
- A time-sharing service was initiated on an HP3000, with application programs including general ledger, accounts payable, inventory control, accounts receivable, order entry, and purchasing;
- A variety of end-user products were installed, including ADF, Mark IV, SAS, DCF;
- Direct access storage on disc was increased by 12% and mass storage by 371% at the regional centres, bringing the on-line file storage capacity to 27.8 billion bytes on disc and 13.2 billion bytes on mass storage;
- The tape library was increased by 17%, bringing the total to 27,631 volumes at the regional centres;
- There was a 23% increase in interactive terminals connected to the regional centres, bringing the total to 606;
- RJE terminals were increased by 13%, bringing the total to 84;
- A new COM duplicator was installed, and the use of COM services increased by 14%.

More on-line services

One of the corporation's main efforts currently is in the area of customer service, particularly related to the trend to on-line services. Whereas in 1978, according to a

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SaskComp's processing power at a glance

SaskComp's shared services are based on hardware systems at two data centres in Regina and Saskatoon. Processors available for general use include the IBM 370/158 (SVS), 370/168 (MVS), IBM 4341 (CMS), IBM 3032 and 3033 (MVS), Honeywell Sigma 9 (CP-V) and the Hewlett-Packard HP3000-III (MPE). All are integrated to provide a single user environment.

Major hardware additions for this year include an IBM 3081 and a second 4341.

The combined processing power of the services is described as being capable of handling 15 million instructions per second (MIPS).

On-line storage capacity of the centres permits the handling of 38 gigabytes of data, or the equivalent of 38,000 400-page novels, notes SaskComp.

Operating philosophy is for each centre to specialize in certain areas.

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BC Hydro's computer use expands at 30% annual rate

Computer installations at the B.C. Hydro and Power Authority, Vancouver, are growing at about 30 per cent a year, according to John Ashurst, Manager, Technical Systems.

The main trend on both the commercial and engineering sides is to on-line systems and distributed data processing (DDP), requiring a continuing increase in interactive terminals.

Says Mr. Ashurst, "On the commercial side the spread of DDP supports increased productivity by making information available in a more timely fashion as well as providing improved processing capability to the user.

"On the engineering side it provides for customizing the hardware and software to the specific project requirements as well as providing all the functions of the central site operation.

"We have progressed from batch oriented to on-line systems and are now moving towards DDP and source data collection." The firm's Vancouver data centre handles over 100,000 on-line transactions a day on the commercial side alone. These include everything from customers' names and addresses to billing and service requirements.

The computer centre relies on an IBM MP168 linked to an IBM 3033 and a further major upgrade is scheduled for 1982/83.

Currently over 450 terminals provide access to the system for personnel at Head Office, District Offices and other Hydro locations in Vancouver and throughout the province.

On the commercial side computers are used for materials management, human resources, customer services and financial systems.

B.C. Hydro's use of computers now breaks down into 60 per cent commercial and 40 per cent engineering. But the leading edge of application of computer technology to the company's applications is on the engineering side.

B.C. Hydro is pressing ahead with the introduction of interactive graphics systems which will enable them to map their facilities across the province giving them an instant up-to-date inventory.

This capability will also help in other fields such as maintenance, scheduling, and simulating extensions or change to the power system.

The mapping systems can record everything from the location of mains to the type of vegetation and even animal life likely to be found in the path of transmission lines.

Another important area of expansion is photogrammetry—the process by which data is extracted from photographs to assist for example in the selection of right-of-ways for transmission lines.

Even though computers now have widespread application on the commercial side of B.C. Hydro's operations, DDP will result in further productivity benefits. "In the future we envisage work stations which will incorporate time sharing, customer enquiries, file management, text management, word processing and electronic mail," said Mr. Ashurst.

"Over the next five or ten years we will move out from a central location and take the collection of data to remote locations," he noted. "Users of computers are becoming much more sophisticated and many of them now develop their own programs. What we are moving towards is the management of data and the provision of the hardware and software to support what the users want to do." □

SaskComp boosts its processing power

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SaskComp survey, there was as yet little need for, say, redundancy equipment to assure reliability of service, this has now become of key importance. SaskComp now has formal change control and problem coordination procedures in place, and has reconfigured and rescheduled its equipment to make more resources available to on-line services.

In common with the computer services industry as a whole, SaskComp has had to contend with heavy increases in costs, particularly those of manpower and space facilities.

"Even though we are a very large processing site, the cost of our hardware and type of software required to run the system is less than 50% of our budget," says Poulin.

In 1980 the increases in non-equipment costs actually exceeded the decreases in equipment costs, necessitating a rate review to more accurately reflect the cost of providing services.

All the same, SaskComp services have remained more than competitive, according to Poulin.

"We have run bench marks of certain applications on our equipment, and on other suppliers that perhaps are not direct competitors, and in general our rates compare very favorably," Poulin says.

"There is a difference in the way we are managed. We have a strategy of sharing, which, while at times it may have some inefficiency in it, makes us more competitive in terms of rates."

Contracting out

With the pressure on for higher production, SaskComp has established an enviable track record. Even though the number of employees increased from 142 to 149 last year—a 5% increase—productivity increased by 24% (from $69,400 in 1979 to $86,000 in 1980 per employee.

"Software support is clearly a major function of the shared services we provide," Poulin maintains. "We have something like 200 software products installed in our Regina Regional Centre, and we have a significant number of staff dedicated to providing a high level of support on those products.

"Basically we are providing a high level of availability," says Poulin. "We clearly have a solid base of expertise and also have an idea of how to manage that function. So if an outside agency is involved in installing its own equipment, it's one thing to get application software expertise, that is, learn how to write Cobol, but it's quite another thing to try and hire people off the street who have operating systems expertise. We have been involved in contracting out our experts to go to other sites for six or eight months, or a year, to work at that site and ensure that the operation performs satisfactorily.

"Our business is to provide a computer service that the customer finds attractive."

Meanwhile, this year will see some major hardware additions. An IBM 3081 will be installed at the Regina Centre late this year, while a second 4341 is scheduled for installation at the Saskatoon site in November. □

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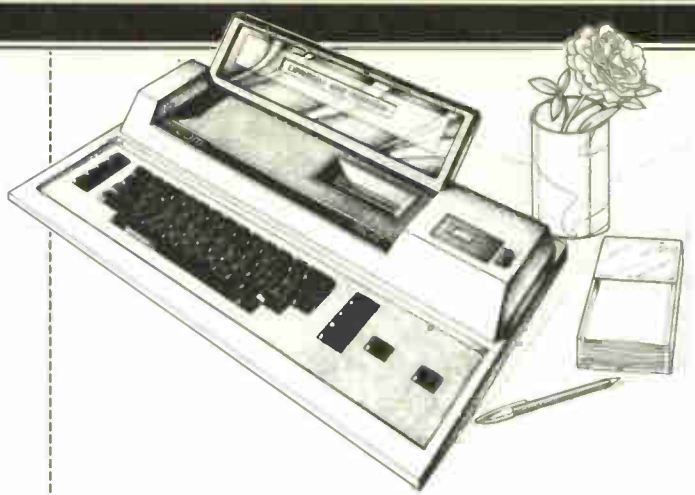

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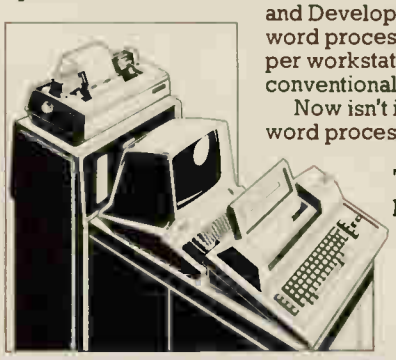

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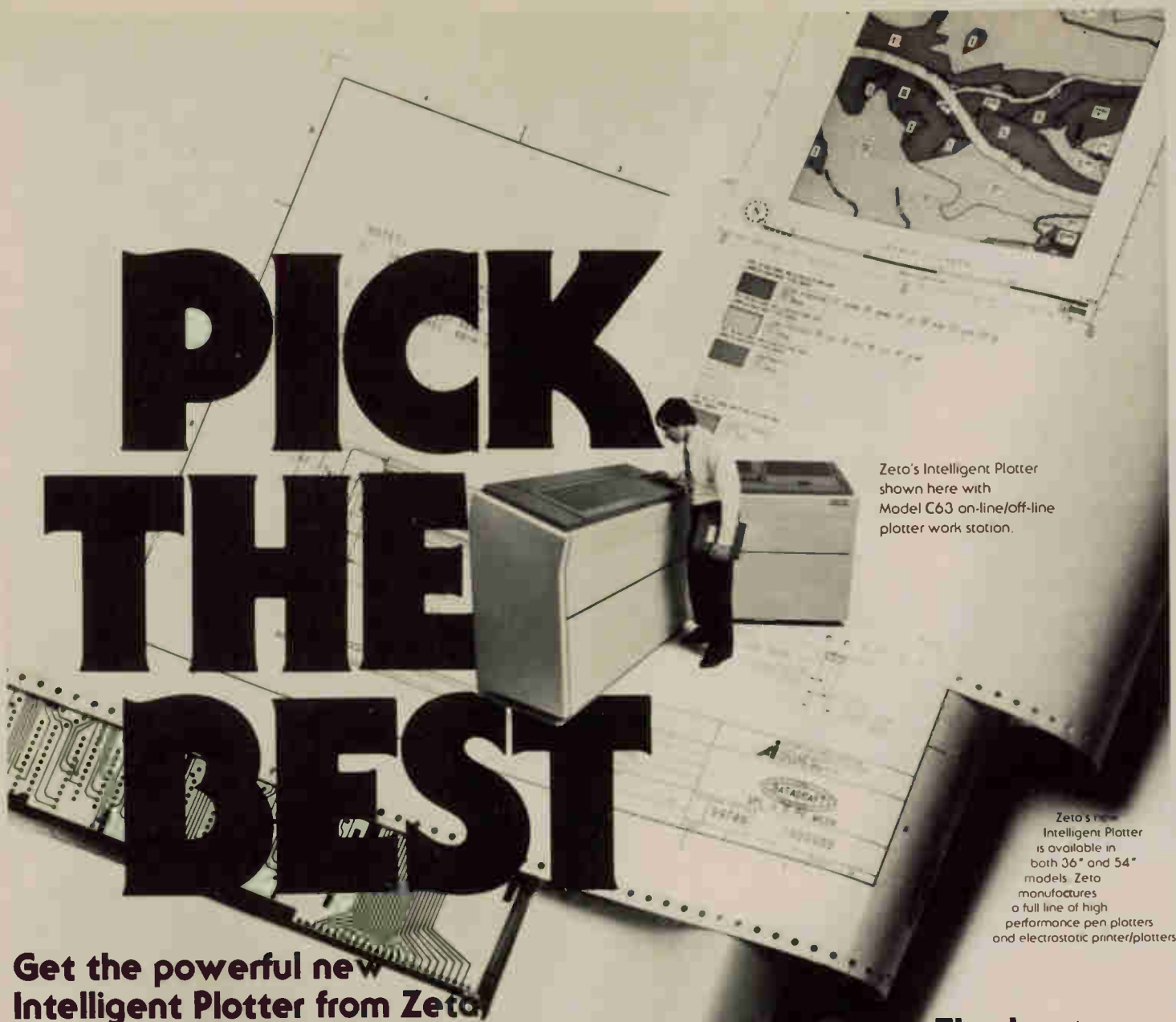

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Matching color graphics to MIS

From page 102

company with a computer information bottleneck. However, there is a key distinction to be made even within this technology that will help you distinguish among the many systems and will greatly affect how data can be displayed. It's the difference betweeen pixel-addressable and character graphics.

A *pixel-addressable* color graphics system can display each point on the screen—called a picture element or pixel—in a different color. Characters, graphs and pie charts can be positioned anywhere and in any orientation on the screen and colored at random, an extremely flexible approach. Many of the lower-priced systems, however, are based on *character graphics*. In such a system, color can only be addressed to a block of pixels or character matrix. This is fine for bar charts and block diagrams. But it reduces the color flexibility needed to compare overlaying graphs and trend lines in different colors on one display, severely limiting the system's usefulness in real day-to-day situations.

Sorting out the options

Beyond the fundamental elements of the technology, there are a few basic criteria common to all color graphics systems. How do you put these in perspective?

First, look at your own computer data base. How much information is in there? How many different reports does your system generate now and by whom are they used? Is all the data centralized or is it distributed among several locations? In general, there is a correlation between the size and complexity of your data base and needs and the performance you'll require from a color graphics display. With your information presentation needs as the guide and your computer's specifications—interface, software, communications protocols and the like—as bottom-line "musts", you can begin matching up each of the color graphics options.

How many colors

Most business systems start with eight displayable colors, which is adequate for most basic applications but the greatest color flexibility comes from the "palette" approach. Here, the user can *select* the displayable colors from a larger number, usually 64. With a given application—say, marketing—sales tracking information or competitive data can even be assigned a *specific* color, permanently. The net result is more impact and greater comprehension, immediately.

Resolution

This is a term that includes such factors as the number of pixels on the screen, total refresh memory size, viewable memory size and addressing range of the input commands. In practice, it usually describes the number of pixels on the screen. Resolution has a direct bearing on picture quality and the amount of information that can be displayed. Of the low, medium and high resolutions available, a medium-resolution display of, say 512 x 256 (the number of rows down by the number of pixels across) should be a starting place for all but the simplest graphics needs. A mid-range system, for example, with a general business color graphics terminal starts at 512 x 256 pixels. A more powerful color graphics computer terminal, or a color graphics computer are in the high resolution range: 640 x 480 or 640 x 512 pixels. By comparison, a graphics display can be purchased with as few as 128 x 128 pixels. The ultra-high end of the resolution scale, offers 1280 x 1024 pixels. Such a high-performance system is well-suited to the demands of computer-aided design, remote sensing, military and other sophisticated application, but could also be used for an MIS application.

Terminals or stand-alone

In most companies, color graphics will be implemented by the simple addition of interactive terminals to the host computer. One or more can

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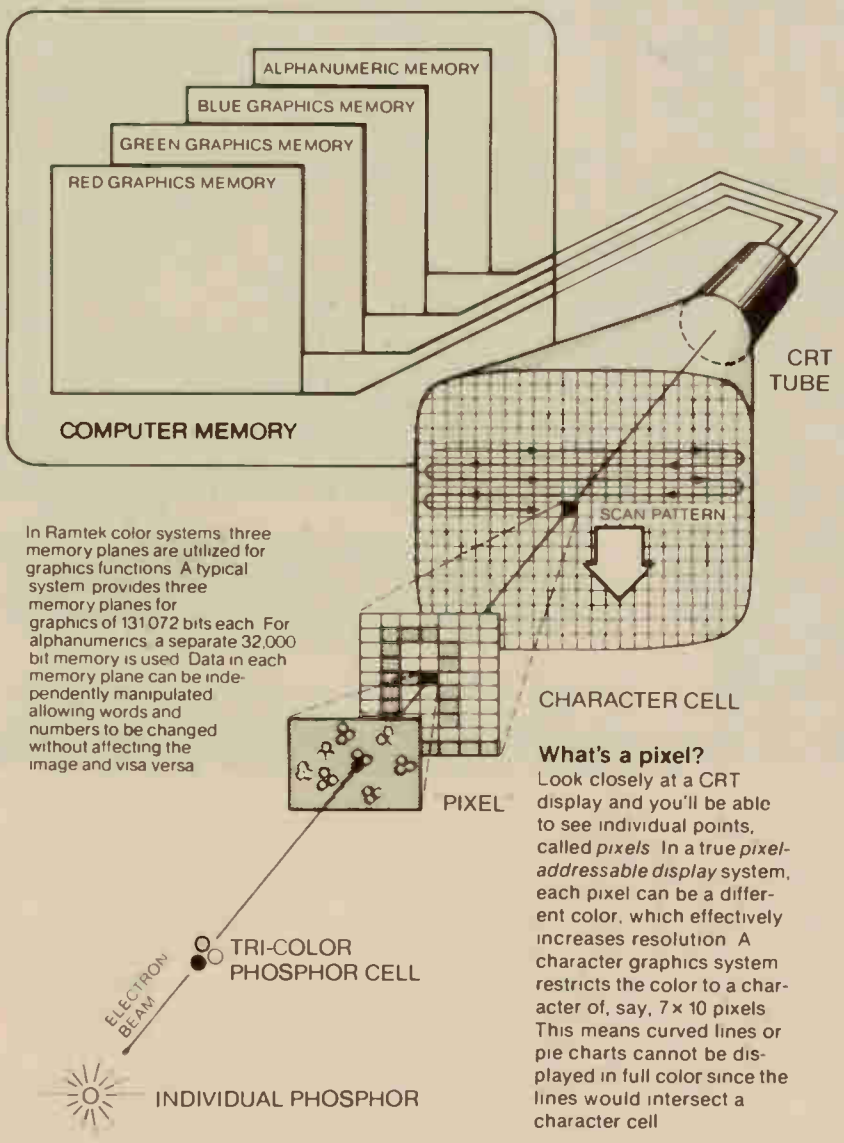

In Ramtek color systems, three memory planes are utilized for graphics functions. A typical system provides three memory planes for graphics of 131,072 bits each. For alphanumerics, a separate 32,000 bit memory is used. Data in each memory plane can be independently manipulated allowing words and numbers to be changed without affecting the image and visa versa

What's a pixel?

Look closely at a CRT display and you'll be able to see individual points, called *pixels*. In a true *pixel-addressable display* system, each pixel can be a different color, which effectively increases resolution. A character graphics system restricts the color to a character of, say, 7 x 10 pixels. This means curved lines or pie charts cannot be displayed in full color since the lines would intersect a character cell.

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Matching color graphics to MIS

From page 104

be interfaced. The other option—is a stand-alone color graphics computer system. It brings local computer display power into the hands of local users in a compact, streamlined, "office environment" package. Within a large company, it means department needs can be addressed right there, when and as needed. This local concept also makes it highly appropriate for the needs of smaller companies or branch locations.

Input devices

The most common device for entering data into the graphics system is the keyboard. When the information you want to enter already exists in pictorial form, you can enter it directly with the aid of a graphic tablet. Other types of cursor controllers such as joysticks, trackballs and light pens make it easier to enter and manipulate the data right on the screen.

Photo hardcopy output

Depending on whether the color graphic data is used as it appears on the screen or distributed as hard copy, there are a wide variety of choices. Varying screen sizes are available, including a 25-in. monitor, designed for small group viewing. For larger groups, large screen projectors are available. Hardcopy choices include photographic output from camera systems that provide 35mm slides, overhead transparencies, instant color prints in various sizes or 16mm film.

Printed output

Color graphic presentations can be inexpensively distributed to a large number of people by using an output device that prints on plain paper. Ramtek's 4100 Colorgraphic Printer for example, produces high quality, full color copies for pennies a page. It is a full color digital dot matrix printer with separate cartridge ribbons and print heads for each primary color plus black.

Software

Software directly influences the ease and speed with which a system can be put to work. Basically, it falls into two categories. The basic graphics software provides the graphic capabilities, i.e., routines for drawing circles, polygons, graphs and text.

The applications software needed to adapt the display system to specific company needs is often developed within the company. There is also a fast-increasing number and variety of applications programs available from independent vendors. □

Integration unit generates micro-based software

A new integration unit is being introduced by Tektronix Canada next month that allows users to use their present computer system to generate microcomputer-based software.

The new 8540 integration unit is said to offer a number of advantages.

"Host computer users have three major requirements after they generate executable object code," says Jack Woida, Marketing Support Manager. "They need to be able to execute and debug object code, they need to perform hardware/software integration, and they need to obtain performance analysis from the prototype in real time. The new device meets these needs by providing system memory, emulators and a Trigger Trace Analyser."

The 8540 joins the firm's 8550 single-user system and will be followed later this year by the 8560 multi-user system. The 8560, together with the 8540, provides a complete development system, notes the company.

According to the company, the 8540 can be interfaced to a host computer via an RS-232-C ASCII terminal port. Communications variables such as echo, parity and turnaround delay can be programmed from the keyboard, while data rates are selectable up to 9,600 baud. The unit can be connected to the host via data sets or with a hardwired connection for local configurations. Because the 8540 has a terminal-transparent interface, it can also be used with an existing host terminal. This configuration does not require additional host communications ports or new terminals, states Tektronix.

New integration unit is being introduced by Tektronix Canada for hardware/software integration in a host computer environment

Prototype software can be developed on the host and the object code downloaded to the unit program memory. Error-checking for downloading is provided so that the integrity of the program is maintained. Symbol tables can be downloaded also so that mnemonic labels can be used to reference important program locations during debugging sessions.

The 8540's program memory can accommodate up to 128K of program code that can then be substituted for prototype memory. The program memory can be mapped to reside at different logical addresses so that the emulator can be used to support the large address capabilities of 16-bit chips.

For both eight- and 16-bit applications, downloaded program code is executed on the 8540's emulator processor, a processor identical to the one that will be used in the target system. A prototype control probe links the emulator processor to the prototype hardware so the program is tested in its actual hardware environment. Because the emulators run in realtime, time-critical areas of program code can be tested and verified.

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TEXAS INSTRUMENTS
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Sales Assistants.

Sales Managers are sold on TI's Portable Data Terminals.

When it comes to reducing costs and improving sales productivity, TI's Portable Data Terminals can help fill the quotas. That's because TI's *Silent 700** Models 745, 765, 785 and 787 Portable Data Terminals are designed to help salesmen work smarter, not harder.

TI's family of portables are ideal for on-site sales demonstrations. Using the Model 745, 765 or 785's built-in acoustic coupler or the 787's direct-connect internal modem connected to a standard telephone line, salesmen can access information on the spot for more professional and innovative presentations. They can show their product selection, provide pricing information, analyze cost of ownership and even give competitive overviews. And virtually silent thermal printing at 30 or 120 characters-per-second keeps things quiet while closing the sale quickly.

For entering orders instantly, these lightweight traveling companions put the needed information close at hand. For instance, part number information can be entered into the host computer and within seconds salesmen can receive hardcopy printouts of inventory status. When salesmen use the 765 with its built-in nonvolatile bubble memory, order entry information can be retained for future reference even after the power is turned off. These compact portables can also double as electronic mail carriers to increase communications and response times between the sales force and the home office.

By using TI's Portable Data Terminals, sales managers across the country have found they can increase sales productivity levels and customer service, reduce order processing costs and improve turnaround time. That's why TI's reliable portables are the lightweight solution for all your sales application needs. TI is dedicated to producing quality, innovative products like the *Silent 700* Portable Data Terminals. And TI's hundreds of thousands of data terminals shipped worldwide are backed by the technology and reliability that come from 50 years of experience.

Supporting TI's data terminals is the technical expertise of our factory-trained sales and service representatives, and TI-CARE†, our nationwide automated service dispatching and field service management information system.

For more information on how TI's Family of Portable Data Terminals could improve your sales productivity, contact the TI sales office nearest you: Richmond Hill, Ontario, (416) 884-9181; Richmond, B.C. (604) 278-8474; or Ville Saint-Laurent, P.Q. (514) 334-3511.

We put computing within everyone's reach.

TEXAS INSTRUMENTS
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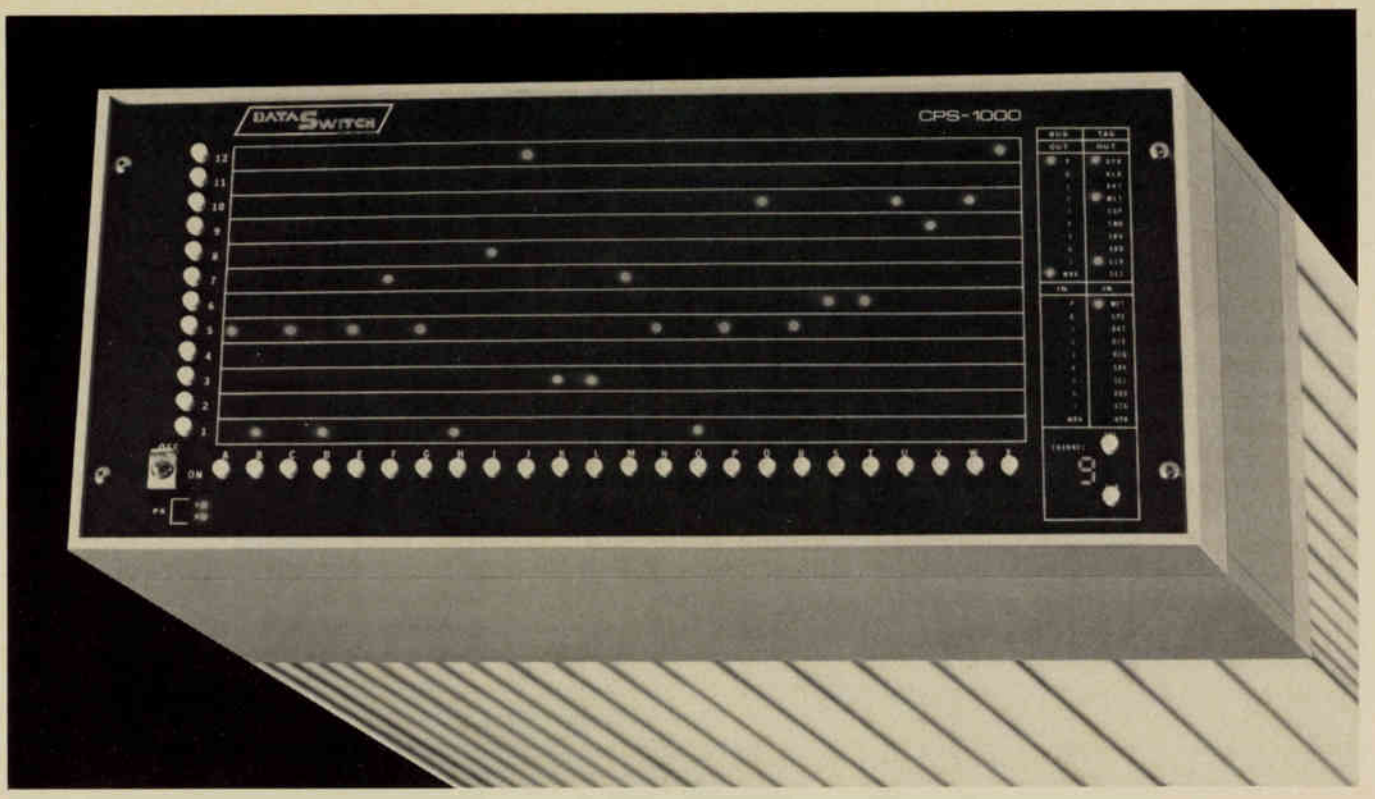

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If you are a large scale data processing user in the IBM or IBM compatible environment, you probably need us.

We're the exclusive Canadian distributor for Data/Switch. With Data/Switch, you can connect any peripheral to any port of any computer. Matrixes range from 2 x 2 to 16 x 24. Coax and EIA switches are also available. So, when you need switches, talk to us.

Only Data/Switch Systems have all these features:

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- Remote and extended controls
- Inter-active remote controls
- Continuous configuration display
- Key secured
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COMPUTER/PERIPHERAL SWITCH SYSTEM

- Matrix sizes from 2 x 2 to 16 x 24 (one system can replace several IBM 2914's)
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- Redundancy controls
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- The only remotely controlled switch system available that switches any control unit attached to IBM or IBM compatible CPU's.

FOR MORE INFORMATION CIRCLE NUMBER 102

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CONFIGURATION MANAGEMENT SYSTEM

Up to 16 CPS 1000's can be managed by the microprocessor-based system 1100.

FOR MORE INFORMATION CIRCLE NUMBER 103

DCS-2000
DATA COMMUNICATIONS SWITCH

- EIA or TELCO switching
- 2 x 16 and 4 x 16 matrix size
- Monitor patch panel (DCS-2000/M)
- Master and individual fallback selector
- Master crossover selector

FOR MORE INFORMATION CIRCLE NUMBER 101

CTS-3000
COAXIAL TERMINAL SWITCH

- CRT Terminal coaxial switch
- Matrix sizes–4 controllers x 16 CRT's
  –6 controllers x 16 CRT's
  –8 controllers x 16 CRT's
- Unique in the data processing industry
- Master and individual terminal/controller selector

FOR MORE INFORMATION CIRCLE NUMBER 104

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If you do financial planning and modeling,

tear out this page.

With more than 50 financial modeling systems on the market today, having to choose one can be confusing, at best. On the surface, many of the systems look alike. Looking deeper, only one stands out.

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As a comprehensive planning, modeling and information management software package; FCS-EPS brings the power of the computer into the hands of the financial planner. Over 100 pre-coded functions, with modules for forecasting and econometrics, sensitivity and risk analysis, color graphics; hierarchical consolidation automates currency conversion, inflation scenarios, cost allocation and cross-sectional reporting. It all adds up to a three-dimensional system which provides views of your financial future more detailed than any mere modeling tool ever could.

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FCS-EPS is a system limited only by your imagination. Beyond the pre-programmed functions is an entire financial programing language to take you as far as you want to go. You can begin to use the system after only two hours training.

But don't take our word for it. Get the facts. Send for our free publication, "Selecting and Evaluating Financial Modeling Systems," which includes a checklist of features you should look for in a state-of-the-art system. Use it to compare FCS-EPS with your company's requirements. We think the facts will speak for themselves.

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DATA PRODUCTS

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A Printer for Every Application

700 Series
The popular 700 Series offers printing speeds from 60 CPS to 150 CPS, most with bi-directional logic seeking capabilities. 701 with 9 x 7 Dot matrix, 702, 703, 704 with 9 x 9 Dot matrix full 96 character ASCII set. Models available with standard Centronics parallel interface or RS232C.

730 Dot Matrix Printer
730, 100CPS, 7 x 7 Dot matrix 80 column printer with standard capabilities of printing 132 columns at 16.7 CPI. Available with Centronics parallel or RS232C interface.

737 Dot Matrix Printer
737, 80CPS, N x 9 Dot matrix in proportional spacing mode, 3 paper handling systems, full 96 character ASCII set complete with Centronics parallel interface.

6081 Line Printer
6081 pedestal mounted band line printer. It offers field upgradability from 300 to 600 LPM with 100% parts commonality in full 132 column format using a mobius loop cartridge ribbon. The 6081 has the operator controls and options that are right for your application.
6080 has the same features as the 6081 and is also accoustically enclosed providing printing speeds up to 600 LPM at only 60dba.

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LA34 Family
LA34 family of receive only & KSR printers are members of the DECwriter IV 300 baud family. Their forms and paper handling flexibility combined with a true 30 CPS throughput and the well known DECwriter reliability make the LA34 printers ideal for a wide range of communication and computer console applications.

LA120 Family
LA120 family of receive only & KSR printers provide exceptional performance in high speed communication environments. The LA120 is a 1200 Baud bi-directional printer with improved operator convenience, reliability that you have been accustomed to with the Digital product line, not to mention the available options that make the LA120 the right printer for your 1200 Baud applications.

VT100
VT100 Digital's high performance video display terminal provides maximum video display flexibility and portability. Operator oriented features on the VT100 include double width/double size characters, 80 and 132 column lines, a detachable keyboard, smooth scrolling, a split screen and composite video output allows users to customize the video terminal to suit specific application needs.

VT132
VT132 Digital's high performance buffered video display terminal, offers for the first time Digital's proven VT100 functionality to block-mode applications. The VT132 is the extension of VT100 functionality into the smart, local editing terminal class. It is designed to fill the requirements of the block-mode environment by including local editing, protected fields, and protected field/space suppression in addition to all of the VT100 functions. It is human engineered to allow fast data entry, local data correction, and clean data transmission to the host.

Where Reliability is a Tradition

ADM3A
ADM3A, the ever popular "Dumb" terminal with a 14 month MTBF, direct cursor addressing, 11 selectable baud rates up to and including 19,200, complete with RS232C and 20Ma current loop interfaces.

ADM3AG
ADM3AG, with all the features of the ADM3A, including Tektronix* PLOT 10,* 4010 Software compatible, operates in point Vector, 4010 alpha or ADM3A alpha modes with a 512 x 250 plotting resolution, selective erase and displayable graphics Memory.

ADM5
ADM5, the newest addition to our CRT family features the reliability that you have been accustomed to with the ADM3A, with these added extras, 3 visual attributes, numeric keypad, upper & lower case, true 2 dot descenders, & gated printer port.

ADM31
ADM31, the intermediate terminal, with 2 pages of memory, full editing capabilities, visual attributes include protected fields, reverse video, half intensity, blink, underline with blank, tabbing and many more. The ADM31 has a personality that allows customer or Zentronics' application Engineering to modify CRT operation to customer specialized applications.

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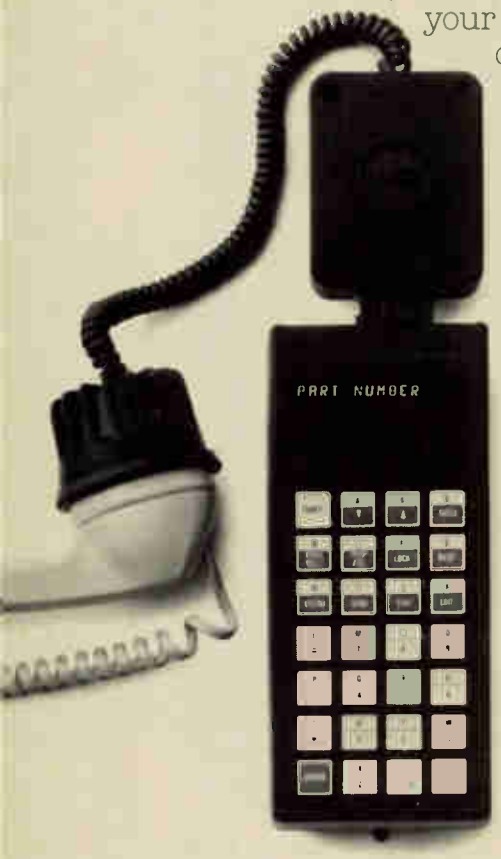
The fact is, MSI HandHeld Computers can mean a 30% to 60% reduction in your data collection time. They're portable, battery-powered data-entry computers that actually extend the power of your central computer—by allowing data to be keyed in where the action takes place.



You increase productivity, because the traditional, inefficient data gathering procedure (manual data collection which must be delivered to a central location, transcribed, and then keyed into your central computer) is completely bypassed.

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MSI HandHeld Computers save you time. And at MSI, we believe time is money.

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We put computing in the palm of your hand.

See us at the Canadian Computer Show, Booth 618.

Reader Service Card Number 202

IRON ORE COMPANY OF CANADA

The Iron Ore Company of Canada was formed in 1949 and has grown to be the largest iron ore producer on the North American Continent. While they employ approximately 6,500 people this is not indicative of their size being a highly sophisticated, mechanized operation with an annual production of 30 million tons.

Therefore, electronic data processing systems play a very intrical and diversified roll in their day-to-day operation creating an ONGOING need for LEADING EDGE TECHNOLOGY. Having managed a highly utilized D.P. facility for well over a decade they recognize the need for true "COMPUTER PROFESSIONALS" and are consequently very concerned with their career path movement, continuing education and cross training.

The present overall D.P. staff numbers about 100 and should rise to about 130 by the end of 1982, due to planned development projects. The prime immediate thrust in application development is a very large scale, complex, O/L, D/B Materials Management System through to the end of 1983. Three year plans include development of an integrated, O/L, D/B, Preventive Maintenance System. Development in other application areas will also be concurrent, as well as ongoing technological advancements.

ENVIRONMENT/FACILITIES

3033 4MB SYSTEM increasing to 8MB early in 1982
370/158 4MB SYSTEM for testing and development
10 3330 MOD 11's and **8 3350's** with 4 more on order
2 5280's running as RJE STATIONS
2 SYSTEM 7's, 1 for O/L ore grading, 1 stand alone for automated entry systems
1 SERIES ONE stand alone for process control applications with more on order
Over 100 CRT's of which 40 are under **TSO** and the balance supporting **O/L** production systems

OPERATING SYSTEMS

Currently running **MVS/SE** with **JES-2**
MVS/SP planned for early 1982

COMMUNICATIONS & D/B SOFTWARE

Currently using **IMS DB/DC, TSO, ACF/NCP** with **TCAM** and **VTAM** access facilities
Going to **SNA/SDLC** early in 1982

PROPRIETARY SOFTWARE

VIDEO/370, SPF, PANVALET, PMS, TMS, UCC-3, FDR,
DSF, COMPAKTOR, PLANCODE, GTF, SMP, AP-1, RACF, TSOMON,
SARA IV, STROBE and **ACT I**

LANGUAGES: PL-1, FORTRAN, APL, GIS/VS, SAS and ASSEMBLER

PROCESS CONTROL APPLICATIONS

MICON MICRO processors installed for plant control systems
with planned interface to mainframe through **SERIES ONE.**

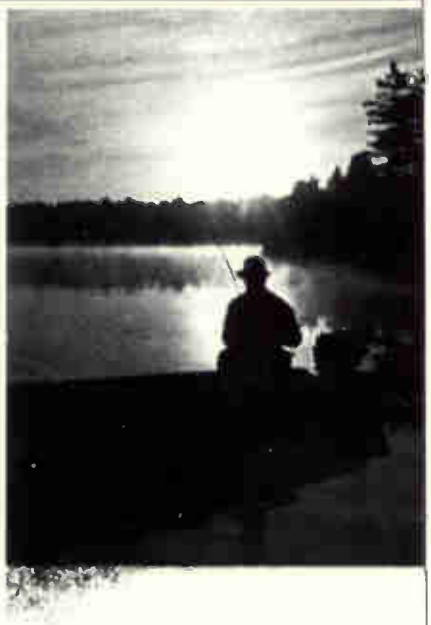
GENERAL APPLICATION SYSTEMS

Highly diversified mix of large scale business, financial and technical mining systems
plus a mix of various engineering applications and smaller systems.

OVER

LOCATION INFORMATION

The Iron Ore offices are situated in Hull, minutes from Ottawa via the Portage or Chaudier Bridges, thereby making it optional to live in Quebec or Ontario. Both Hull and Ottawa have many smaller nearby communities within easy commuting distances making a variety of living environments available. The approximate population of these cities is 65,000 and 306,000 respectively and they offer a wide range of hard core rental prices from $200.00 to $500.00 monthly while real estate can run from $40,000 to $80,000. Either area offers instant access to the joys and pleasures of nature at its best without the strain of unending traffic lines. It's a perfect playground for the sports minded whatever the interest and a great place to raise children.



TO ENQUIRE

1. Use the enclosed response card, or
2. Telephone Roy Harvey at (416) 593-1660
3. Send resume, attention Roy Harvey

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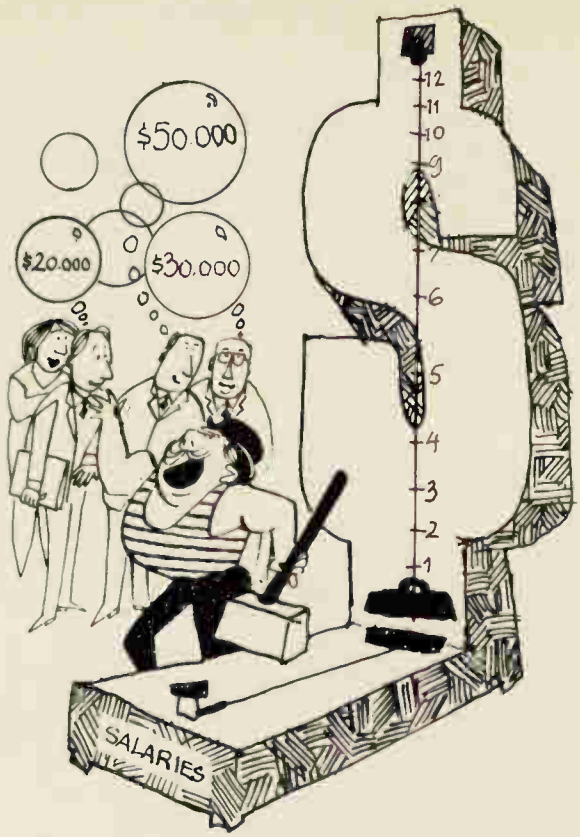

Dollars aren't the only measurement of happiness. If you're not careful, you may outsmart yourself, believes Abe Schwartz in this analysis.

Let's be realistic about DP salary expectations

By ABE SCHWARTZ

A fictitious scenario, but perhaps a familiar one:

David was stunned. Henry, a former classmate at the university's computer science program, had just said he was leaving for another job. Both had progressed evenly since the time they joined the bank's systems development department two years ago, and David knew he earned the same salary as Henry. Henry was now telling him that he had accepted an offer with another bank for $4,000 more than he currently earned.

David was both jealous and angry at the same time. He had wondered about it before; now he knew he was underpaid. David's boss when confronted was tolerant of his new-found "militancy" in demanding more money. He explained that the bank's salary scales were competitive and that he was due for a review in four months.

At first, David let the subject drop. However, the next time a recruiter phoned him, he hinted at possibly being interested in the "right situation." David outlined his expectations to the recruiter, who did not rule out the possibility of such an increase but did say it would not be easy. At first, the recruiter had no problems arranging interviews for David, and the employers seemed interested in his qualifications. However, the interviews seemed to end abruptly when he explained his salary expectations.

David's disenchantment began to show on the job; the choice assignments began to go elsewhere. He became more and more frustrated and now considered the possibility of lying with regards to his current salary. He doubted anyone would find out if he said he earned $2,000 more than he really did, and then a $2,000 increase wouldn't seem unreasonable. He was also beginning to accept interviews with companies he wasn't impressed with but who might be willing to pay his salary demands.

Eventually, David joined an insurance company for $3,000 more than he was earning at the bank, but he still felt cheated. He still scanned the morning papers for jobs and told the recruiter he would still be willing to go on any promising interviews, provided the "price was right". Within the span of a few months, David joined the growing number of data processing people who are disenchanted with their profession.

Professional disenchantment

What made David turn from a happy and contended professional to a bitter person in just a few months?

He fell into a familiar trap; he chose to listen to what he wanted to hear. From the time Henry told him he was going to be paid $4,000 more, David was only willing to accept evidence of his being underpaid. He was not prepared to test the validity of his assumption. So, for example, he didn't stop to think of the possibility of Henry lying about the amount of his increase.

Much publicity is given to the shortage of EDP professionals and

Turn to page 126

Abe Schwartz is president of Polaris Computer Systems Ltd., Toronto, a computer consulting firm which also markets and supports data base management systems.

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If old-fashioned methods are slowing your business down, automate. With Canon's CX-1 desktop computer system. Here's why.

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How to keep tabs on your business

The Canon M.B.A.™ (Modular Business Accounting) software program is a complete accounting package-thoroughly documented-designed to solve the problems of a small business. Written in ANSI COBOL, the M.B.A. allows even a first-time user to ease into the daily routine.

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Why the CX-1 belongs in your office

Quality. Reliability. Technological innovation. These are the attributes of every Canon product.

So whatever your accounting requirements, whatever your business, Canon's CX-1 system can give it a big, big boost.

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180 cps, bidirectional, Matrix Printer. Featuring condensed and expanded print, 6/8 lines per inch, a cartridge ribbon, self test and diagnostic display

3 Models B-300 and B-600
300 and 600 LPM, 132 column, rugged and reliable full font line printer. Featuring operator interchangeable steel print bands

4 D-50 KSR Terminal
A 50 cps Daisy Wheel Terminal combining exceptional print quality with communications capabilities

5 Model M-200
340 cps, bidirectional, high speed Matrix Printer. Having a unique dual column head which doubles head life and doubles throughput. The average speed is 200 LPM.

6 Model B-900
This 900 LPM Band Printer embodies the same design features as the B-300 and B-600. Includes a quietized cabinet with paper puller

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1 DAISY WHEEL PRINTER

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2 180 CPS MATRIX PRINTER

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3 300-600 LINES PER MIN. PRINTERS

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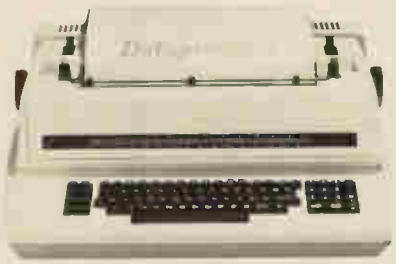
4 DAISY WHEEL TERMINAL



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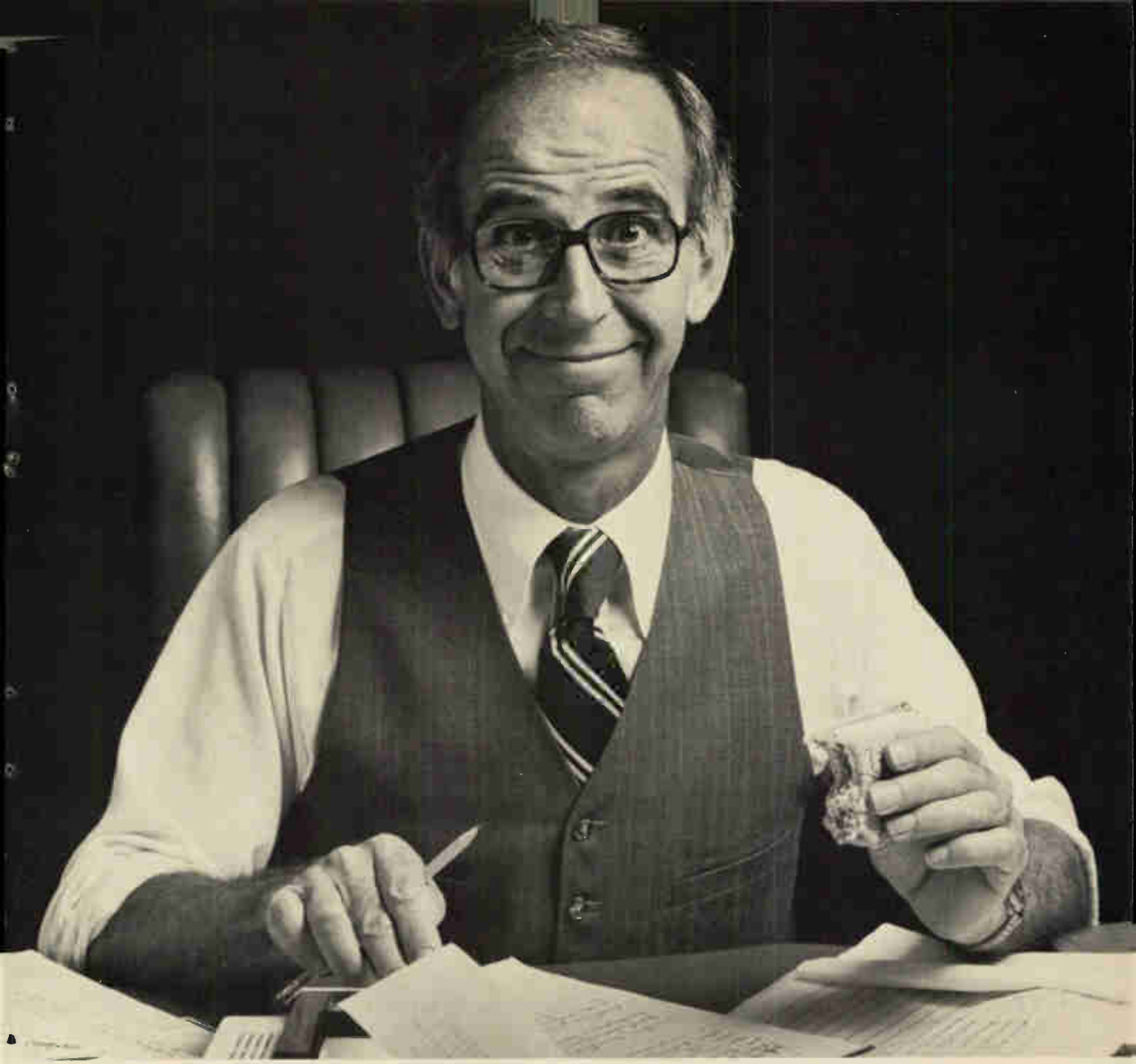
5 200 LPM MATRIX PRINTER

Reader Service Card Number 250

6 900 LPM LINE PRINTER

Reader Service Card Number 251

Reader Service Card Number 116



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The Information Management Company.

HOW TO INSTALL A DATA COMMUNICATIONS SYSTEM WITHOUT GETTING ALL 'WIRED-UP'!

INTRODUCING THE 3M INTERACTIVE SYSTEMS "VIDEODATA" NETWORK

Conventional Data Communications Systems

As data communications networks grow more complicated, it becomes less and less practical to rely on twisted wire pairs or dedicated cables - with their bulk, time-consuming installation, and difficulty of rewiring and service.

Interactive Systems

At Interactive Systems, we've developed a far simpler and more practical approach: THE "3M" 'VIDEODATA' NETWORK! Its benefits surpass those of any other data communications system!

Benefits of the "3M" 'Videodata' Network

1. **One cable replaces thousands of wires:** The "3M" 'Videodata' network uses a single, two-conductor broadband coaxial cable that can carry thousands of signals for hundreds of totally separate information systems.

2. **Ability to add on (easily expandable):** It's also much easier to add new systems and equipment. You simply connect each device to an Interactive Systems modem and run a drop cable from the modem to the nearest cable tap at significantly lower labour and cable costs.

3. **Accommodates internal moves easily:** Because the "Videodata" Network uses a single, two-conductor broadband coaxial cable, all of the information on the network is available at all of the cable taps. Internal moves simply involve moving each terminal with its modem to its new location and connecting the modem to the nearest cable tap. **No rewiring is required!**

4. **Quality of transmission:** Twisted wires can be highly susceptible to electrical 'noise' from nearby motors and other equipment. If the wires are used to carry digital data, the result can be computer error or loss of data. The "3M" 'Videodata' Network solves this problem by using coaxial cable which shields the data, voice and video signals from external interference.

5. **Video and voice applications:** In addition to two-way digital data for applications ranging from EDP to electronic mail and from energy management to manufacturing control; the "3M" 'Videodata' Network can also handle two-way video and two-way point-to-point voice.

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Reader Service Card Number 252

DP salary expectations

From page 119

the ever-increasing salaries being paid to attract them. Often this forces someone to exaggerate the salary they receive in order to keep their prestige intact and not let a friend think they "sold themselves short." This often happens in other volatile markets such as real estate.

David was further impressed by the high salaries advertised in the career section without stopping to think that the salaries might be inflated so as to attract responses. He was also impressed by salary surveys, without questioning the validity of their findings. The manner in which the information is collected; the low number of respondents (usually among the companies who are embarrassed from answering because they know they do not pay the highest salaries); and the manner in which the data is collaborated and presented should make an individual skeptical of its validity as the *sole* piece of evidence.

Listening to emotions

David chose not to listen to his boss, who tried to explain the bank's competitive salary scale. He chose not to listen to the personnel consultant, who tried very hard to explain the reality of the job market without offending him. He chose to disregard interviewers, who, one after another, cooled noticeably when he made his salary expectations clear. David even went so far as to lie when the facts seemed to go against him, a gamble that rarely works. More and more companies are checking references as a matter of procedure, and more and more applicants lose good offers because they lie in the interview. In short, he listened to his emotions and ignored his reason. He had unrealistic salary expectations.

How widespread is the problem? Personnel managers and consultants note that most of the people they interview have unrealistic salary expectations. Even if some of them are only demanding higher salaries as a negotiating strategy, a substantial number of EDP professionals end up feeling that they have been cheated.

What are you worth?

How do you objectively measure your worth in the market? This is not an easy task. Certainly, sources of information can include: trusted friends, personnel consultants, managers, newspapers, magazines, salary surveys, and job interviews.

However, you must objectively interpret the information from all of these sources. It is imperative to be skeptical of each individual source and come up with an objective appraisal only after all the information has been collaborated.

Most importantly, consider more than just your salary in evaluating the situation. Dollars are not the only measurement of job happiness. If you are not careful, you may outsmart yourself. Many people have regretted exchanging a comfortable position with a company they liked for a position they do not enjoy, but where they earn marginally more.

When the initial euphoria of the salary increase dissipates, one has to live with the job day in and day out.

Be realistic with yourself. it is natural for peers with the same professional backgrounds to be competitive, but people *are* different. Confront your weaknesses. Recognize that you may not possess the same technical skills as others in your peer group, but that your strengths lie in other areas. Concentrate on your strengths, but at the same time, improve your weaknesses.

Carefully scrutinize your expectations. Are you demanding too much? If you were a manager, would you hire yourself at that salary level? Going out for interviews is a free market exercise. Why should a manager hire you when he can get someone else with equivalent skills for a few thousand dollars less?

This does not mean that one should stop being ambitious. There is nothing wrong with taking steps to improve your career including, if necessary, switching jobs. However, in making your evaluation: try to be as objective as possible; question the validity of your information, and use more than just salary as a criteria.

Trying to balance one's desires with the reality of the situation can sometimes be difficult, as David found out all too well. □

Ottawa area on the way to becoming computer centre

OTTAWA—The development of high technology in the Ottawa area is one of those success stories of which Canadians can be justifiably proud.

In his keynote address to the Data Processing Institute's Professional Development '81 conference here earlier this year, Dr. Michael Caughey, vice-president CAD/CAM, Mitel Corp., Kanata, Ont. said: "The history of high technology in the Ottawa area is just one of those really lovely success stories that you can now reflect upon.

"Many of us in this group wondered at various times, like the bleak days of the early seventies, exactly where it was all going. In fact, many were convinced it wasn't going anywhere—that it was all but over. But now it's easier at this stage to look back on it and see what some of the steps of development were.

"I think we've got a lot to be proud of here in this area. In fact there is a major strength in the Ottawa Valley in computer systems—and for that matter the technology—that sometimes we have to pinch ourselves to really believe exists on a world-class scale.

"Communications—another whole world! What a fabulous area that is! And again what a strength in the Ottawa area!"

Caughey said that in operating systems they had seen primitive things—"that you would now have some difficulty calling an operating system"—move forward through batch and text manipulation to eventually full time-sharing.

"We have seen the evolution of the various time share networks. We have had some excellent examples in Canada, in fact in the Ottawa area, of how that industry has evolved.

"Think of the number of companies around this area who are contributing in an absolutely fundamental way to what's happening in the world on communications between machines and people to machines. What an exciting area here!"

Caughey said he had been fairly close to the development of graphics over the decade. He had watched graphics move from immaturity to maturity and do so very quickly, particularly in the area where they had been so heavily used and so rapidly accepted in the design of integrated circuits.

"There's quite a sprinkling of use of graphics over a tremendous range of areas but there's one big definable market for graphic systems and that happens to be in the design of integrated circuits and also in the design of printed circuit boards," he said. □

Tom Messer

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Tips for managing the marginal performer

The employee who's not pulling his or her weight in the department causes problems right down—and up—the line. The DP manager must know how to tackle such a situation, and that's the intent of this article.

By CLIFF BILYEA

"YOU can automate information processing, but you can't automate human communication!"

That's a statement that causes a lot of heads to nod in agreement when I discuss the subject of marginal personnel performance with an audience of DP managers. While the problems of employee under-production are by no means unique to this industry, the fact that it is often a *communications* failure that's responsible for it does add some irony in this particular line of work.

Marginal performance can be traced to many roots, but some causes are much more prevalent than others. There are three areas where these problems can originate: the employee's personal values, interests, skills and health; managerial or organizational shortcomings; and those circumstances that can be loosely called 'outside influences,' beyond the doors of the organization.

In the 'personal' category, the major shortcomings are: lack of motivation, dissatisfaction with job assignment, and failure to understand one's duties. The 'managerial/organizational' area often contains the mirror-image of those problems, namely lack of a proper motivational environment, inappropriate job assignment, improper supervision, lack of training and development, or failure to clearly establish the duties expected.

'Outside influences' show fewer preponderant categories, and can run the gamut from family problems to labor market conditions . . . union policies . . . or even the climate! But few if any root causes of marginal performance are found outside the organization. Most of the causes rest, to at least some degree, on the manager's shoulders.

Considering that about 80% of a firm's absenteeism generally comes from 20% of the employees, and the estimate that most clerical functions are handled at a rate at least 25% less productive than a fully acceptable standard of performance—not to mention the fact that improvements in office productivity over the last ten years have been minimal, despite major computer and technological changes—we can see that dealing with under-motivated employees is obviously something that can bring substantial economies to the company that tackles the problem intel-

Turn to page 134

Cliff Bilyea is personnel development officer with The Mutual Life Assurance Company of Canada, Waterloo, Ont. This article is based on a presentation to the annual conference of DPMA Canada.

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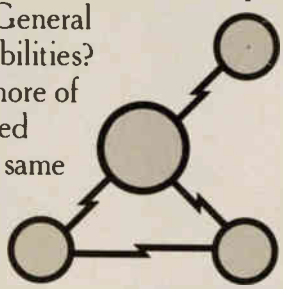

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Data General

Managing the marginal performer

From page 131

ligently.

(And, unfortunately, many managers tend to pay attention to the employee at the wrong time—only when they're substandard, ignoring them when they're 'up' and may only need some timely support and encouragement to *stay* 'up.')

What's the best way to evaluate the course of action that you, the manager, should take once you've identified a marginal performer on your staff?

One approach is to quantify the factors that pertain to the individual case, assign each one a positive or negative value, then compute the bottom-line value to arrive at a future direction. This particular system is one I've developed myself, and, while it of course requires subjective evaluations on the manager's part, does at least put a number of influencing factors into a decision-making framework.

The system works simply: put the marginal employee's name at the top of a sheet of paper, and under that write three headings across the page—'Factors,' 'Important,' and 'Value.'

Under Factors you will list these nine items: length of service; attitude toward job; special skills; overall performance; company action to date; belief in salvageability; option to transfer; critical incident(s); and absenteeism. Other factors can be added if you feel they are significant.

Each of these items will first be evaluated in the Important column by your placing a 'yes' if you consider it relevant to this person's circumstances and performance, or a 'no' if you feel it isn't. Only those factors with a 'yes' importance are dealt-with further, in the Value column.

Under Value, you assign a positive, negative, or zero number to each 'yes' factor, following the guidelines given in the box that accompanies this article. Then total up the points to see what overall action you should take.

The recommended actions and point values are: −5 to +10: retain and work on a regeneration action plan with the employee; +5 to +15 transfer within the firm, if the skills are better matched elsewhere; −5 to −10; 'dehire'; and −5 to −15: fire. 'Regenerate' means to renew the individual's commitment to their current employer, which will likely require behavior modification by both the marginal employee and yourself, while 'dehire' refers to the recent and growing practice of the employer accepting responsibility for helping the individual find an acceptable new job before terminating the present arrangement. It will be observed that the point-value ranges have overlapping areas, which reflects the discretionary nature of the decision, depending on the total circumstances of the individual. This is as it must be in an area such as personnel management, where there can be variables and unique conditions that no system could fairly handle.

Assuming a situation where the employee is 'salvageable' and wants to improve, you start by developing a mutual plan of action. The first step is to list the four or five key objectives or projects in the marginal performer's job, as per the job description, with emphasis on standards of performance for the results expected, rather than listing activities performed. Then ask the employee what he or she feels are the four or five key aspects of the job, and how they would measure successful performance. You might be amazed at how the two lists differ!

Remember to judge *performance*, not the person. You must direct your efforts toward improving that performance, not changing attitudes, since attitudes are a subjective, personal element. Start by identifying those areas where you and the employee already basically agree, and then work on developing mutually agreeable statements that outline the objectives in specific, measurable, and performance-related terms.

Along with clarifying objectives, you must also clarify the *priorities* of a job's various elements. Studies indicate that an average worker spends one-third of his time on trivial, non-essential tasks. If unaware of priorities, one can get caught in the 'trivia trap.' When a worker feels he is spending his efforts on important tasks, it improves his attitude by making him feel more important personally.

Of all the efforts to build a marginal performer's strengths, however, the most important is the action plan. This needs to be based on trust between the manager and employee. The employee needs to see that you want to help him/her and aren't out to 'get' them.

You and your employee should together establish performance plans that include objectives to be accomplished within a predetermined time frame. In laying out the plan, you should both establish performance standards regarding how well the job will be done—then performance review becomes meaningful.

The key to improving performance is first devoting the time and effort to understand why an employee is not performing up to par. Most people want to achieve and, if given the chance, will strive for excellence. After all, we all have self-esteem, but sometimes some members of our team just need a bit of help to bring it out. □

Values for key factor selection

1) Length of service:		2) Employee's attitude:		3) Special skills:	
Less than 1 year	−3	*Unsatisfactory*	−10	*None*	0
1-3 years	0	*Marginal*	−5	*Limited*	+2
3-8 years	+3	*Satisfactory*	+3	*Quite important*	+4
8-15 years	+5	*Very good*	+8	*In short supply*	+6
More than 15 years	+10	*Excellent*	+10	*Very difficult to replace*	+8
4) Performance:		**5) Company action to date:**		**6) Regenerate (on job):**	
Unsatisfactory	−10	*Inadequate*	+5	*No potential*	−10
Marginal	−5	*Marginally appropriate*	+3	*Low potential*	−3
Satisfactory	+3	*Appropriate*	−3	*Medium potential*	+3
Very good	+8	*Beyond that required*	−5	*High potential*	+8
Excellent	+10				
7) Transferability:		**8) Critical incident:**		**9) Absenteeism:**	
Not possible	−3	*No incident*	0	*One of the highest in the company*	−5
Limited possibility of success	+2	*# of small events*	−3	*Very noticeable*	−4
Good chance of success	+5	*Definite major incident*	−5	*Quite often*	−2
				Occasional	0
				Rarely	+2

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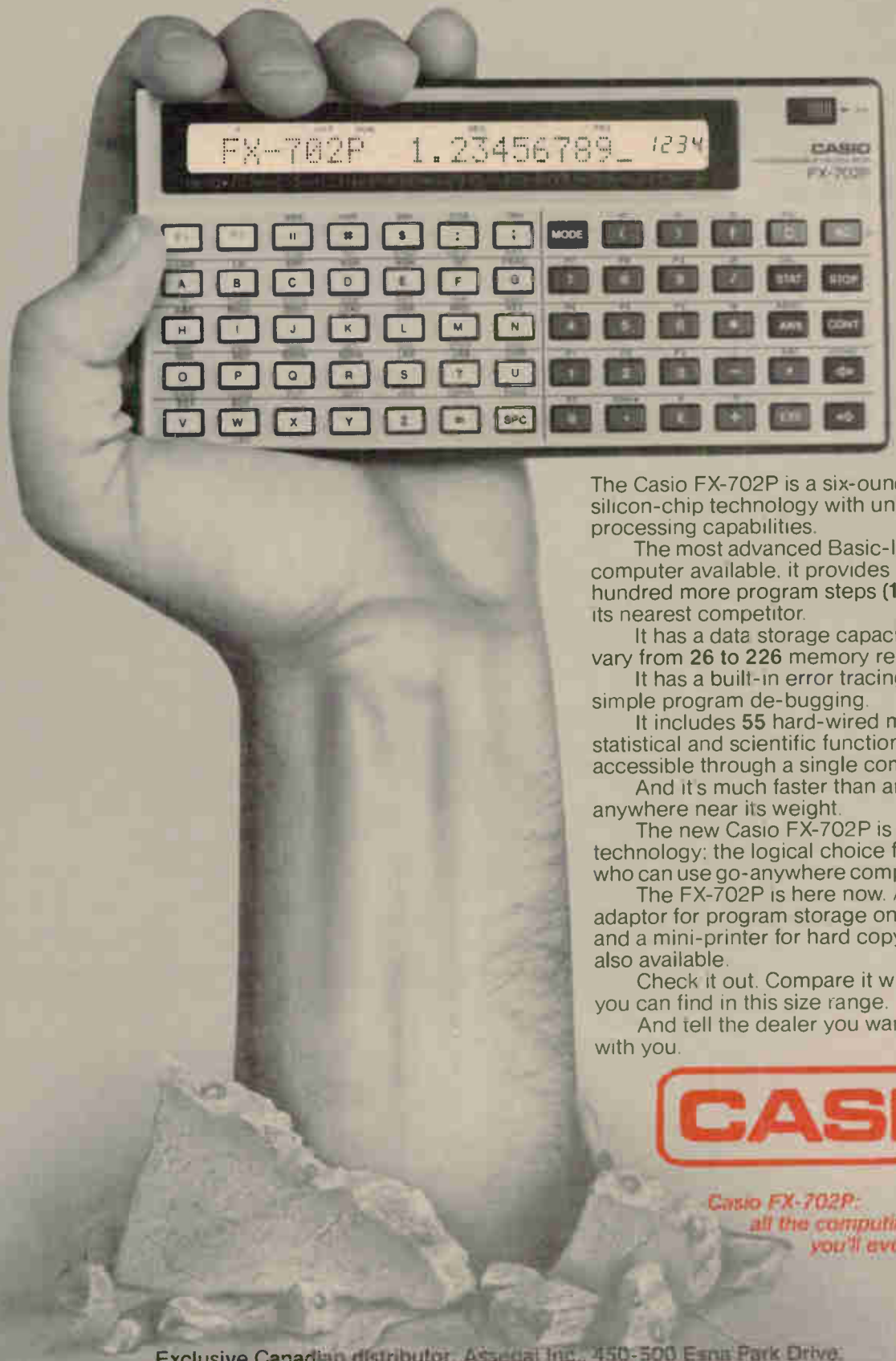

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'Voice mail' is getting ready for a big splash

The storage of voice messages in digital form for delivery at a later time, either as reconstituted speech or hard copy text, is evolving into a 'voice mail' concept. IBM is rumored to be ready for a move.

By WILLIAM A. SAXTON and MORRIS EDWARDS

IBM watchers believe the computer giant is about to make a big splash in communications waters with a Series/1-based "voice mail" system known as Speechfile. Reportedly, the system will operate with both IBM and non-IBM PBXs, allowing retrieval of disc-stored voice messages from standard telephones.

Industry observers believe that Speechfile will provide a major boost for voice mail by giving the concept IBM's stamp of approval. Potentially, voice mail could have even greater impact on business operations than the widely heralded electronic mail services.

Voice mail involves the storage of voice messages in digital form for convenient delivery at a later time, either as reconstituted speech, or, conceivably, as hard-copy text output. Ultimately, it could be part of an integrated office system involving telephones, computer terminals, facsimile machines and communicating word processors. For the immediate future, however, voice mail offers an alternative to text-oriented electronic mail systems for executives who prefer to talk rather than type. This could be quite an attraction. According to a study by SRI International of Palo Alto, Calif., the typical manager spends 75 per cent of his day talking to people and is reluctant to learn to use word processing equipment.

In a typical voice mail system, each user is assigned a "mailbox," which stores voice messages in digital form from other users. To retrieve their messages, users simply call the system from any keypad-equipped telephone. After hearing a message, a user can speak his answer into the phone immediately, and the system will automatically deliver the reply to the original caller.

Alternatively, a user can dictate a message and specify who is to receive it, and when, simply by punching keys on the phone pad. Further, the same message can be sent to a number of people, so that all participants can be notified of an upcoming meeting, for instance, with a single call.

Voice mail is not expected to replace normal telephone communications since many calls require a dialogue. However, it should minimize the disruption caused by trivial calls and eliminate the time-wasting practice of "telephone tag," where two people return calls to each other repeatedly without making direct contact. Also, voice mail offers a number of convenient features, such as delivering a voice message to groups of people, or sending it to a distant office overnight when rates are cheaper.

Interoffice voice memo

Several major firms are working on voice mail systems in addition to IBM. Wang Labs recently became the first major office automation company to add voice mail to its product arsenal with the introduction of its Digital Voice Exchange (DVX). Digital PBX suppliers, such as Datapoint and Exxon subsidiary, Inter-Com, Inc., are expected to offer voice mail capability soon as an upgrade to their systems.

As for AT&T, its advanced PBX, code-named Antelope, is still two or more years from the market. Last year, Pennsylvania Bell announced a voice mail offering developed by AT&T, but the service has been delayed by regulatory hassles. Meanwhile, AT&T's plans have been further hampered by the Federal Communications Commission's Second Computer Inquiry decision, which defined the voice mail offering as an "enhanced service" that can only be marketed through a fully separate Bell subsidiary.

For the moment, the leader in voice mail systems remains ECS Telecommunications, Inc., a small but well-financed company in Richardson, Texas, which installed its first Voice Message System (VMS) at the 3M Co. in St. Paul in early 1980. Since then, ECS has sold similar systems to about seven other firms, including Westinghouse and Atlantic Richfield Co.

With the 3M system, a user dials a special number to get on VMS and dictates his message into the phone. The system attempts to deliver the message immediately, but if the recipient is unavailable, it files the message in memory. Later, when the recipient dials his voice mailbox, the system reconstitutes the digital data back into the sender's voice and delivers the message.

Users can instruct the system to re-dial at regular intervals for urgent messages, or set specific delivery times or dates. Users can also dial their own extensions and dictate "tickler-type" memos to themselves as a reminder of future meetings or actions to be taken. In addition, voice messages may be circulated for voice comments, replacing the customary interoffice memo request-

Turn to page 140

Dr. William Saxton and Morris Edwards are independent data communications consultants and consultants to Canadian Datasystems. Dr. Saxton is the executive director of the Association of Data Communications Users (ADCU).

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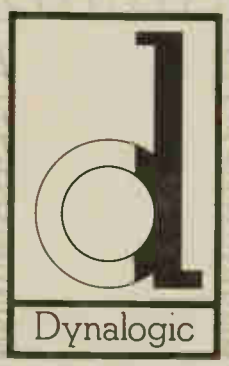

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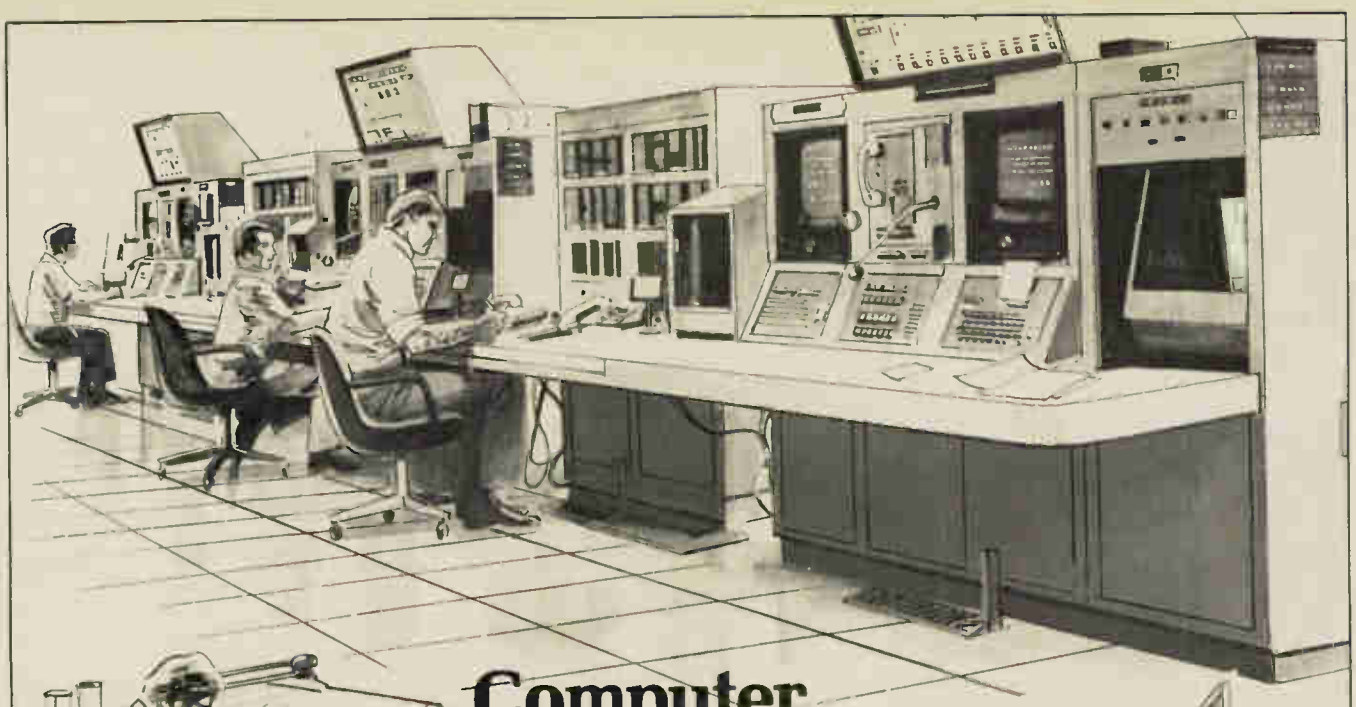

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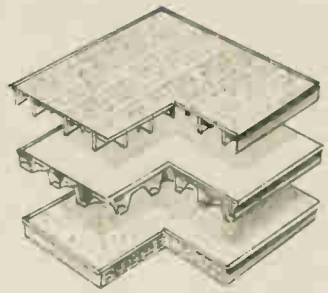

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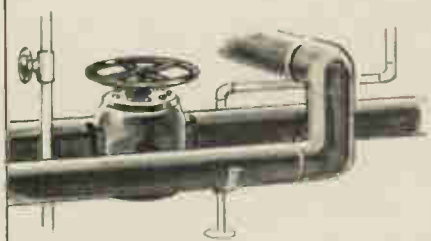

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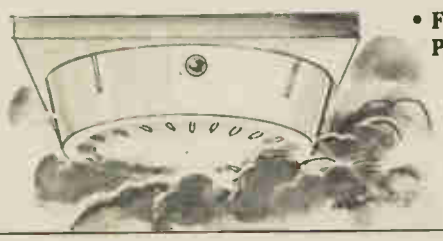

• FIRE PROTECTION

Reader Service Card Number 237

'Voice mail' is getting ready

From page 136

ing written comments. To provide organization-wide voice mail capability, VMS systems can be installed at several locations and interconnected by leased lines or the dial-up telephone network.

No more telephone tag

Wang's DVX also provides a voice mailbox service along with broadcast and other message distribution features. Users access the system via any keypad-type telephone and respond to unique voice prompts requesting user ID, optional password and destination telephone number(s). After creating a "voicegram," which can be 90 seconds long, the user may review, re-record, send or cancel it. There's a choice of immediate delivery, or subsequent delivery at a specified time within 31 days. Also, the message can be sent to 16 locations.

The DVX can deliver voicegrams to an audio mailbox or directly to any domestic telephone. Recipients may reply to voicegrams immediately without having to dial-up the original caller. An option to save voicegrams is available, as well as the capability of forwarding voicegrams with explanatory comments to other parties.

John Sawyer, Wang's product line director for voice communications, believes the DVX will help eliminate much of the time that principals and managers spend on non-productive tasks such as telephone tag and waiting for people to be available so tasks can be accomplished.

"About 70 per cent of all business calls do not reach the intended party on the first attempt," Sawyer claims. "And, as much as 50 per cent of these business calls involve one-way messaging—no interactive response is required." With the DVX, the time of day and time zone no longer control one's ability to communicate, he says. "Indeed, the DVX can be used at the airport during non-productive travel time."

"Potentially, voice mail could have even greater impact on business operations than electronic mail services"

Many users can access the DVX at the same time. The system may be configured in increments of four telephone lines, supporting 200 users, up to a current maximum of 16 lines supporting 800 users. Up to four 300M-byte disc drives may be used to store messages. The cost of a basic DVX configuration starts at $125,000, or about $600 per user. Shipments are scheduled to begin in the first quarter of 1982.

IBM's compound concept

Similar prices are being quoted by Chicago-based Voice and Data Systems, Inc., whose recently introduced Out-Voice system is the year-old firm's first product line. According to Donald Young, president, the microprocessor-based system can support up to 1,200 users. For a 100-user system, the price runs $900 per station, dropping to $440 for a 500-user system and $340 per station for a system handling 1,000 or more users. In its largest configuration, the Out-Voice system also employs four 300M-byte disks.

In anticipation of IBM's entry, rumors abound concerning its capabilities. According to the bi-weekly newsletter, *Electronic Mail and Message Systems*, (published by International Resource Development, Inc., of Norwalk, CT), Speechfile will differ from other voice mail systems in its ability to handle "compound" messages—part speech, part facsimile image and part ASCII text. Using a suitable terminal or communicating word processor, a manager would be able to enter a memo along with verbal comments or amplifications; the recipient would then be able to read the message and listen to the accompanying commentary. Similarly, with the appropriate facsimile transceiver, a user would be able to file and retrieve graphic images too.

In view of the keen user interest in voice mail services, and the involvement of so many industry leaders, it's hardly surprising that the market for such services has been projected as high as $1 billion by 1985. □

Data storage crisis predicted for near-term

The computer industry is facing a data storage crisis that, if not solved, will keep users from taking full advantage of future mainframe performance improvements.

"Inadequate 'storage-bound' data systems are already forcing medium-to-large-scale commercial systems into an under utilization of high performance CPU's," says Erik Salbu, president of Masstor Systems Corp., Sunnyvale, Calif.

"CPU performance is increasing by 20 per cent a year, while data storage capacity requirements continue to grow by 40 to 75 per cent annually—a pace which the industry is not meeting," he adds.

Masstor believes the current performance/capacity imbalance as well as increasing storage costs, growing space requirements, compounding energy consumption levels, costly staff requirements and the lack of competitive systems for linking like and unlike CPU's are the greatest challenge facing the large user today.

Performance imbalances are dramatically changing the traditional relationship between central processors and intelligent storage systems and equipment, notes this vendor.

"A strong argument can be made, that intelligent data. storage systems are becoming the hub of systems and that processors are becoming the peripheral devices," states Mr. Salbu. "Fifteen years ago the CPU represented 60 per cent of a system's total cost. Today it represents just 40 per cent or less, and peripheral equipment accounts for at least 60 per cent of the total cost."

The company is designing equipment and systems in which the entire range of storage equipment such as discs, tapes and mass storage systems can be interconnected to create a limitless-capacity storage facility, even under the control of mixed hosts.

"The demand for better data storage systems is most acute for multiple-computer, medium-to-large-scale installations. Some 3,000 installations represent an installed value of $29 billion," said Mr. Salbu. The total installed value of the systems in this market niche alone, he explains, is expected to grow to more than $45 billion by 1985, creating a $20 billion market for large capacity on-line storage products. Within five years, at the industry's historical growth rate, the company predicts there will be over 15,000 candidates for its current and planned products. □

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Dr. Kenneth E. Iverson

APL seeks wider user appeal

Novel language training method developed by APL inventor Dr. Iverson, aims to broaden its use in the business community.

An innovative approach to the problem of training programmers and others in the use of APL is being taken by I.P. Sharp Associates, Toronto, with a new training package that is being readied for introduction next month.

Dr. Kenneth Iverson, inventor of APL, says he recognized that despite the large-scale use of the language and its adoption by a large segment of computer users, there was a need for more and better ways for the business community to learn how to utilize the language. The new language education course is expected to make that possible, he says.

"I have long been aware of the contrast between the success with which the adventurous learn APL by simply using it, and the frequent failure of lecture courses to communicate the simplicty and applicability of the language," he said.

The new approach is not to train users by the conventional classroom studies but by a hands-on 'inductive' method, where APL is used on a terminal to solve business problems.

The software will run on any major APL system such as SHARP APL, IBM's APLSV and VSAPL, DEC's APLSF, and Burroughs' APL.

Students work in pairs, using a terminal as they learn how to define functions (programs) then how to use the functions to produce simple reports, charts and analyses of data. The main course exercises require three full days of work; supplementary exercises provide work for an additional three days.

A student, having learned the general APL language concepts from well-chosen examples, finds the answers to problems by experimenting with the system and by checking reference materials. There is no need for an instructor to present a lecture on formal rules. All answers to questions can be found by direct experimentation, notes Dr. Iverson.

"Most courses insist that you learn the entire language, regardless of whether you need all the symbols or not. I have found that symbols which are put to use immediately are much more easily assimilated by a student," said Dr. Iverson.

Part of the reason for adopting the inductive method is that the course has been developed for a wide audience. It is anticipated that some students may have had no prior computer experience.

The inductive method is the way children learn to speak their own language—by using it from the outset. Dr. Iverson says that it is also the best way to learn APL. The method, widely employed in the teaching of foreign languages, has proved highly successful. Just as it is not necessary to

Turn to page 144

Education kit for APL developed by I. P. Sharp Associates, Toronto.

APL training

From page 142

teach an entire foreign language before a pupil begins to make use of it, so in learning APL all that is necessary initially is to learn those parts which make it possible to put the language to practical use for a particular requirement. Thereafter, learning can progress at a rate within the capabilities of the individual, based on the groundwork that has been laid.

The new APL course is provided to users as a kit which consists of a teacher's module and six student modules. The teacher's module contains two reference manuals: the Sharp APL Reference Manual and the IBM Language Manual, teacher's notes, 35mm slides with notes and a binder cum easel. Each student's module contains the same two reference manuals, a binder cum easel and course sessions. A tape of the workspace can be purchased separately. Refill kits containing six student modules will be available to purchasers of the basic kit.

The course is designed for people who want to become APL applications programmers, those who need to use a computer and APL programs to do their job, as well as managers of applications programmers.

A renegade language

APL is something of a renegade language which has ignored the rules and procedures of other more conventional languages, notes I.P. Sharp in a press statement. You don't have to be a programmer to use it, you don't need the assistance of your data processing department and you don't have to learn the entire language before you can start using it to solve your business problems.

According to Maurice Elliott, Senior APL Development Advisor, Dome Petroleum, Calgary, "APL hides the nasty details of the computer from the user, leaving the user free to concentrate on solving the problem. It allows a geat deal of freedom of expression. You don't have to explain everything in detail which makes it a very concise and powerful language for expressing ideas. Because of its flexibility APL is strongest in the business planning area where you don't know what questions will be asked tomorrow."

APL uses about 70 graphic symbols, notes I.P. Sharp, but the average user uses only a fraction of that number. The key is that the user learns only the symbols he or she needs to solve their particular business problems. New symbols are assimilated only as needed.

Dr. Iverson deflates comments that symbols are hard to learn.

"There are about 170 symbols in normal use in the English language. Without the symbol for a period, for example, we would all be writing the word STOP at the end of every sentence as we once had to in early telegrams. We all recognize punctuation marks because we use them constantly. The same principle applies to APL. You learn only the symbols you need."

APL's simplicity and importance come from its emphasis on lists, tables, and lists of tables, all known as arrays.

"Everyone knows lists and tables. To the accountant a list of tables is a ledger, to the insurance actuary a list may represent mortality rates, to the salesman mortality sales figures," says Dr. Iverson. "When lists are presented in the terminology of the end user they are grasped very easily," he says. □

New VSS seen to benefit large system users

Following a three-year development effort, Storage Technology Corp. has introduced a new Virtual Storage System (VSS), for large-scale, sequential data processing environments. The new system is said to cut in half the cost of disc storage while accessing data significantly faster.

The company describes the new system as an intelligent data storage and management system that attaches to IBM and IBM-compatible computers using the Multiple Virtual Storage (MVS) operating system.

For data processors with one or more IBM 3033 or equivalent capacity, the new system is said to offer operational efficiencies and economies in data management, application programming, facilities management, and software conversions.

According to the designers, the system can process one megabyte data set twice as fast (about two seconds) as a disc, and twelve-times faster than IBM's mass storage subsystem.

System throughput is also improved through more data paths and multiple concurrent read access which eliminates contention and increases availability. The VSS control processor also takes housekeeping tasks out of the host CPU, states the company, allowing higher effective multi-programming level.

The VSS system includes two mainframe-power central processing units, each with two to eight megabytes of solid-state cache memory, two to eight microprocessor-based channel adapters, two to six backend channels, disc and tape control units, back-end disc and tape drives, and data management software.

One of the immediate tangible benefits of the VSS concept is the likelihood of doubling the utilization of existing disc drives, notes the company.

"Average disc utilization is typically as low as 45 to 50 per cent," said VSS Product Manager, Frank Walters.

"Disc pack fragmentation, poor blocking size and over allocation account for much of the wasted disc space today."

For the first time, data processors are being offered a tool that automatically allocates space for sequential data without regard to data set size, keeps track of deletions, and creates the possibility of 100 per cent disc utilization, he said.

A data compression algorithm within VSS reduces the size of stored data by 25 per cent, notes the company. Development of additional software is under way to further increase compression in future configurations. VSS also allocates data dynamically to the most effective medium.

The question of backup methods is answered by VSS in offering three complementary techniques to the user.

A standard method, called cyclic backup, copies changed data to tape at regular intervals. However, users may select tape journaling, which automatically writes data sets to magnetic tape concurrently with disc.

Shadow recording, which simultaneously writes each data set to both a primary and a secondary disc drive, is the third alternative. Users may select any or all backup methods depending on need.

Data managers have the option of establishing a value system that provides immediate on-line backup of the most critical files by using shadow recording, access to complete data sets of less-critical information from a cyclic backup tape, or reconstructing a lost data set by using transaction records from the data journal.

"Allocating disc space for dual recording of data has always been considered too expensive to be used as a backup method," Mr. Walters points out. "But now shadow recording can become more of a routine technique because of the space allocation and management controls VSS provides the user." □

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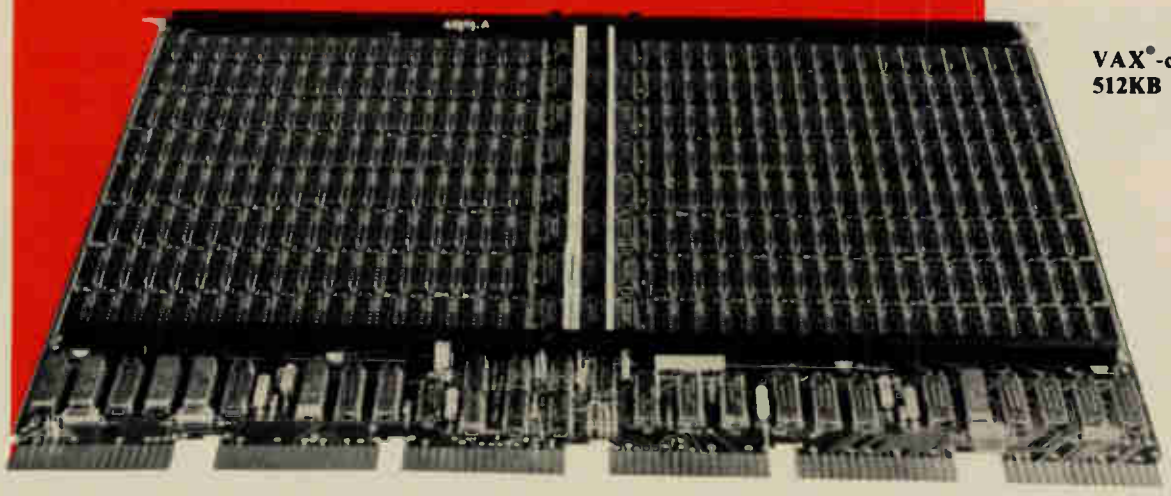

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Reader Service Card Number 111

By MIKE MINNICH, Associate Editor

Software development fuels growth at Quasar

"If our present performance continues, fiscal year '81 is going to give us a 75% sales growth over 1980, and annual revenues will break $10 million. Our goal in fiscal '82 will be $20 million."

—Mike Potter
President,
Quasar Systems

Software development is seen by many as one of the most crucial industries for Canada's future. This company profile looks at one of our most active firms in this area.

IN THE face of economic conditions across North America that are hurting businesses from automobile manufacturers to the corner fruit stand, the data processing industry is still, for the most part, enjoying solid growth. And Ottawa-based Quasar Systems, as a firm specializing in both custom software design and the marketing of more recently developed software products, is riding the crest of a powerful wave indeed.

"We formed Quasar in 1969," Mike Potter recalls, "and for the first nine years we specialized in DP consulting and custom software development projects. That's still a big part of our business, but in late 1979 we released our first commercial software package, called 'Quiz', and this past spring we added another, called 'Quick'. Both are for use on Hewlett-Packard HP-3000 minis, and are selling very well.

"This area of activity now brings in about 30% of our total revenues, and this proportion will continue to rise in the months ahead."

Quasar Systems Ltd. currently employs just over 300 persons, and that number is expected to double by the fall of 1982. In addition to the Ottawa headquarters, the firm has consulting/product sales offices in Victoria, Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Montreal and Halifax, as well as a U.S. office in San Francisco.

Director of research and development Bob Minns explains how the two Quasar software products work.

"Although they're really more sophisticated than these terms imply, you could describe Quiz as a report writer and Quick as a data-entry and file maintenance facility: one helps you get information *out* of the machine, and the other helps you put information *into* it. Both are intended to run on HP-3000s only, and are integrated with the operating system and database management system that come from the manufacturer.

Rapid reports

"Quiz, of which we now have about 400 systems installed worldwide, is very popular for users who want a 'paperless' environment," he says. "A simple report can be produced using three or four commands where before a programmer would have had to create a 2,000-or-more-line Cobol program. The HP-3000 is an online unit, and if you want fast data, with the reports just appearing on the terminal screen, it can easily do that for you. Of course, you can also output to a printer. Many of our customers use Quiz for preparing paycheques, membership forms, and so on, in addition to internal financial reports."

Quasar introduced the second product, Quick, at a Hewlett-Packard user group convention in Orlando, Fla., this past April. The data-entry/file maintenance package was reportedly very well received.

"Quick lets you generate a formatted data-entry screen just by describing what you want, using an inexpensive CRT terminal," Minns continues. "Quick will compile that description into, in effect, a program that can do inquiries against the data base, data entries against it, and selective retrievals from it, too. So, it's more than just data-entry—you can find, change, and update file data, too."

Both Quiz and Quick are based on 'Q-Schema', a kind of data dictionary that describes all files and data items that appear in the application, their interrelationships, etc. The intention is to shift a lot of the high coding that programmers have had to do over into the actual program design.

Quasar technicians say that their next project will be to create a 'transaction

processor' that will be able to automatically do month-end runs, year-end summaries, and so forth.

Future projects

As Mike Potter notes, "Quick and Quiz are not just neat little tools to do a bit faster what everybody else is doing anyway. We believe that the software development process is moving in a certain direction, and we feel Quasar is on the leading edge of that.

"We intend Quick and Quiz to be part of a larger family of products, to include other things now on the drawing board. Also, these products will be usable beyond just the HP-3000 base."

While the packaged software products have proved highly successful for Quasar, company officials are quick to point out that they still highly value their business in consulting and custom software design—which were the firm's sole products for many years, and continue to play a major role in company activity.

With the attainment of coast-to-coast branch representation recently, Quasar's nine-office network of consultants (ranging from senior consultants for information systems to programmers and documentation specialists) for its professional services division is not expected to add any more installations for several years (although a second U.S. office is planned). Its workload, however, remains high, with a current level of 200 clients divided almost equally between government and the private sector.

"Our clients run the gamut from the Government of British Columbia to Shell Canada to a hospital in the United States," Potter days.

"It's hard to give an example of a 'typical' job in this area, but a recent one that we're quite proud of was where we created a payroll/personnel system for the City of Edmonton—which has the largest municipal payroll in Canada. Our project team was made up of about 20 employees, and development costs ran into several hundred thousand dollars. We took the job right from the feasibility study stage straight through the programming implementation, and brought it in on-time and on-budget. The job was basically a big set of Cobol programs dealing with fairly standard applications, but the real success was to control such a large team effort with respect to timing and costs."

Marketing network

Quasar is working actively to expand its domestic and overseas sales of Quick and Quiz, plus the professional services, as director of marketing Ron Nelson explains:

"In Canada we deal through both distributors and our branch offices. In the U.S., we use both a third-party distribution network and a direct sales force. We have about 20 Quasar employees now who are marketing Quick and Quiz, with about half of these also selling the professional-services side," he notes.

"We have product sales offices established in California, Texas, and Alabama, and hope to have two 'full-service' locations for professional services set up in the States by the end of this year.

"Our third-parties are typically people who are developing vertical-type applications such as manufacturing or distribution systems, and want to provide flexibility to their users in terms of how to write reports, or do screen design. So, our product actually becomes part of *their* product. This activity now accounts for about 60% of our total product-sales volume, and we have more than 30 contracts in force with these organizations.

"For other areas of the world," he adds, "we mainly deal through distributors, but we have direct-sales people in the U.K. and Australia, and we're looking to develop a Quasar marketing presence in most of the Western European countries by mid-1982.

"Quick sells in Canada for $12,000, and Quiz for $7,500," Nelson sums up, "and we feel we're 10% to 15% lower in price and about 30% higher in performance than any competing product."

R&D commitment

Like any major software firm, Quasar Systems has a high commitment to development and expansion of its product line.

"We're making a major effort to expand the applicability of our packages to other manufacturers' hardware," Bob Minns says. "There's been no decision made yet as to specific brands, but they'll be minis of the same general type as the HP-3000."

Research and development spending is slated to run at something over 5% of gross revenues throughout the period 1980-85, with a total of more than $6 million to be spent on product development during this time. Quasar is currently giving serious consideration to acquiring expansion capital through either a public stock offering or a major private placement. All stock in the company is at present held by employees.

> *"We feel we're lower in price, higher in performance"*

"We've made some administrative changes," Mike Potter relates, "to better configure the company for the activities of the years to come. We recently created the positions of vice-president/finance and vice-president/international sales, as part of this plan."

When the Ottawa firm Data Logic changed hands recently, Quasar acquired the educational services division of that firm. This operation offers short courses on data processing to the business public (usually held in environments such as hotel conference rooms), as well as in-house classes at larger firms. Quasar also has a division within its Ottawa headquarters that offers hands-on training to customers in the use of Quasar products. The hope is to set up similar installations at some of the firm's branches, if demand is sufficient to justify the sizable hardware investment.

From their new home on the tenth floor of 275 Slater Street, Quasar's head-office employees can see little more than a forest of surrounding office buildings. As they work on their varied projects there, however, they're aiming to expand the vantage point of this vibrant company to the far horizons of the software world. □

Quasar software engineer runs a test program.

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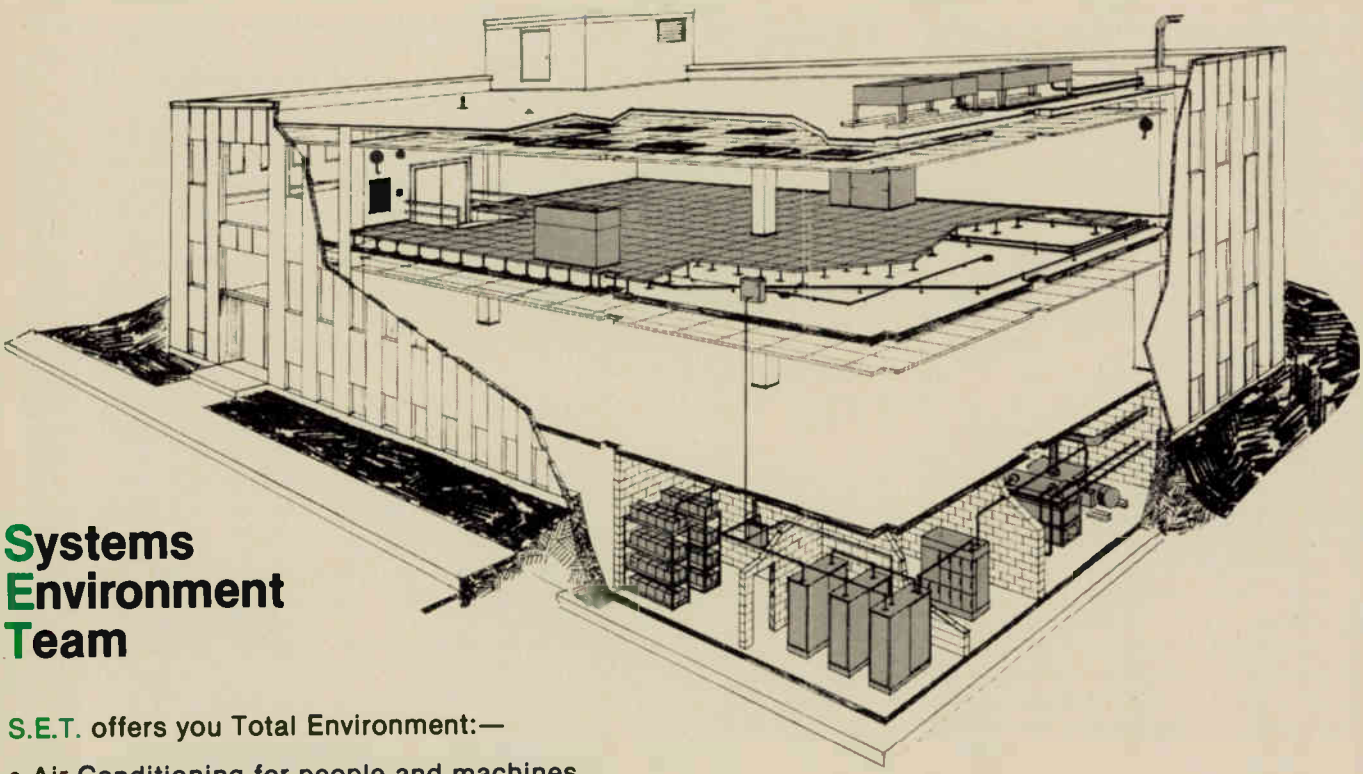

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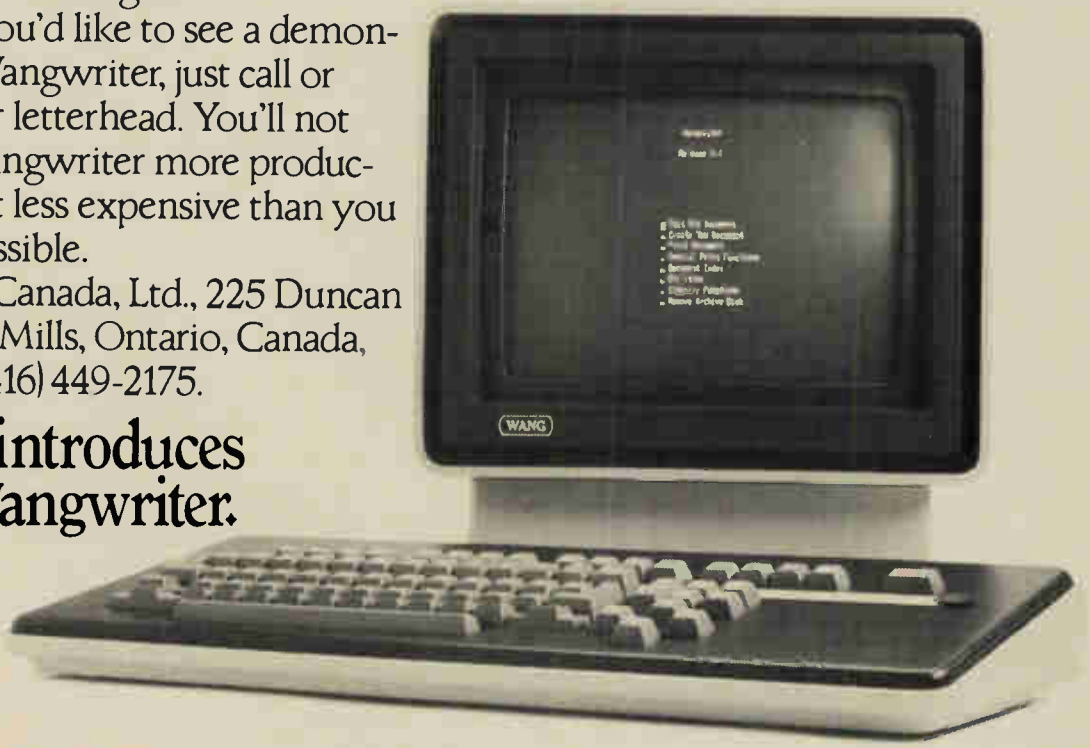

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Reader Service Card Number 240

The conference program in brief

Date: November 16, 17, 18 and 19, 1981
Place: Toronto International Centre, 6900 Airport Rd., Mississauga (Toronto)
Conference theme: "The profession in transition"
Conference chairman: Ken Arliss
Conference co-chairman: Hugh McGrory
Conference hours: Sessions start at 9 a.m. daily.

DAY ONE
Monday, November 16

Forces shaping the profession—Where are we going?

Chairman: Wayne H. Peters

MORNING SESSION
Keynote speaker: Dr. Arthur G. Anderson, Vice-President, IBM Corp., Armonk, N.Y. "The data processing profession in transition—Where are we going and why?"
Speaker: Don Tapscott, Manager, Office Information Communications Systems Group, Bell-Northern Research, Toronto. "Integrated office systems—The challenge to the systems professional."
Speaker: Jack Davies, President, Systemhouse Ltd., Ottawa. "Applications Software—The state of the art and the data processing professional."

AFTERNOON SESSION
Speaker: Frank Holst, Vice-President, Product Strategy and Management, Sperry Univac, Blue Bell, Pa. "EDP—An industry in transition."
Speaker: David S. Barrows, Director, Industry Sector Policy Branch, Ontario Ministry of Industry and Tourism, "Ontario's role in the microelectronics revolution."
Speaker: Alan Hutton, Amdahl Corp., "Large system leadership—Implications for the data processing professional."

DAY TWO
Tuesday, November 17

New technologies, methodologies and management

Chairman: John O. Haapala

MORNING SESSION
Speaker: Jim Butterfield, Associate Editor, Computer Magazine, "The microcomputer—Coming into focus."
Speaker: J. Mat Ardron, TIL Systems Ltd., Toronto, "Multi-protocol terminals."
Speaker: Martin Smith, Director National Accounts, Honeywell Information Systems Canada, "Security and privacy—How much should your management know?"

AFTERNOON SESSION
Speaker: Peter Webb, Vice-President and Data Processing Sales Manager, IBM Canada, "The mainframe—Part of the EDP resource."
Speaker: John D. Cameron, National Marketing Manager, Office Systems, Xerox Canada, "Office integration—A view for today."

DAY THREE
Wednesday, November 18

The computer, the profession and society

Chairman: Liz Forester
MORNING SESSION
Keynote speaker: Lydia Dotto, Science Writer, Toronto, "Society and the Computer."
Speaker: Dr. Ann Cameron, Associate Dean of the School of Graduate Studies and Research Professor of Psychology, University of New Brunswick, "Implications of Telidon on society and the individual."
Speaker: Harvey Strosberg, Lawyer, "Medical records and privacy."
AFTERNOON SESSION
Speaker: Dr. Ann Mellers, Consultant, "The impacts of office automation on employment."
Speaker: Dr. John Carroll, Professor of Computer Science, University of Western Ontario, "Computer crime."

DAY FOUR
Thursday, November 19

Computers for the professional practice—doctors, lawyers, engineers, accountants

Chairman: Peter D. Bergerson
Keynote speaker: Ted Nelson, author of "The home computer revolution", on "Computopia Now."

Accounting stream
Moderator: John M. Swinden
"Financial systems in the eighties" by Wally Reifschneider, McCormack and Dodge Canada Ltd.
"Business systems for the chartered accountant's practice," by Marc Ansell, Canadian General Electric Co.
"The AuditComputer—A new system for the auditor of the 1980's" by John H. Kearns, Clarkson Gordon Co.

Engineering stream
Moderator: Hugh McGrory
"Mini-mainframe installation and operation" by Charles S. Hodge, Boyle Engineering Corp.
"Computer-aided graphics—A potent communication and development medium" by Chuck Preston, TDC Graphics, Toronto.
"The robot revolution" by Dr. Graham D. Whitehead, Vadeko International Inc.

Legal stream
Moderator: Brian G. McKenna
"The computer—The lawyer's new electronic partner" by Lynne Verchere, Manac Systems International.
"Considerations in computerizing the small law firm" by Louis H. Milrad, Lawyer.
"When lawyers and computers meet" by Anne Foster, Canadian Law Information Council, Ottawa.

Medical stream
Moderator/speaker: H. Dominic Convey
"The real world of medical computing" by H. D. Covvey, Toronto General Hospital.
"A distributed patient information system—Philosophy and implementation" by George T. Horne, Director, Clinical Computer Systems, Hospital for Sick Children, Toronto.
"Modeling the 'art' of medical diagnosis" by Dr. H. Pople, Jr., University of Pittsburgh.
"The computer in a dental or medical practice" by Dr. Roel Wyman, Practicum Ltd.

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Expanded conference program extends over four days at this year's big computer industry event in Toronto. Shown is part of last year's conference audience.

Changing technology places EDP profession in transition

CANADA'S premier computer industry event, the Canadian Computer Show and Conference is being held on November 16-19, 1981 at Toronto's International Centre.

This year, the event has been expanded over four days, both for the conference and the exhibit segments.

As in previous years, this year's conference will be the meeting place for the country's information processing community and both the scope of exhibits and the conference program have been expanded to cater to the diverse needs and interests of EDP practitioners.

"The data processing profession is facing revolutionary advances in computer and telecommunications technology," notes conference chairman Ken Arliss. "As a result, this year's conference has adopted the theme "The profession in Transition." Conference co-chairman is Hugh McGrory.

Projections for show attendance are for 28-30,000 visitors, according to show manager, Reg Leckie. The expanded show is open daily from 10:00 am and will remain open on Tuesday and Wednesday evenings until 8:00 pm. It will close at 6:00 pm on Monday and Thursday.

The conference is sponsored by the Canadian Information Processing Society (CIPS) and is being held in conjunction with the show. The conference has been expanded to four days, with the fourth day devoted to special presentations to professionals in the engineering, health care, and legal fields. This year's event marks the 12th annual Canadian computing meet sponsored by CIPS. "The program is aimed at providing EDP professionals with insight into changing technology, user sophistication and social forces shaping computer use," says Ken Arliss.

K. Arliss | H. McGrory | A. Anderson | D. Barrows

"A highlight of this year's presentation is a fourth day, devoted to assisting professionals such as accountants, dentists, doctors, engineers and lawyers to understand computer systems relevant to their professions," he notes. "At the same time the sessions will help the computer industry understand the needs of such professionals."

On Days One, Two and Three (Nov. 16, 17 and 18) conference sessions are from 9 am to 12 noon, and from 1:30 pm to 4 pm, while on the fourth day (Nov. 19), sessions are scheduled from 9 am to 12 noon.

DAY ONE
November 16
Forces shaping the profession

The forces accelerating the changes faced by data processing professionals will be discussed in the opening session of the conference on Monday morning, Nov. 16. Dr. Arthur G. Anderson, Vice President of IBM and group executive of its Data Processing Product Group will provide his views of what people in the industry can expect to be doing and how they should be equipping themselves in the future.

Dr. Anderson will look at such factors as microcomputers, declining hardware costs, telecommunications, and staff scarcity.

The same session will hear a presentation by Don Tapscott on integrated office systems and the challenge they represent to the systems professional. He will discuss the ways in which people and organizations are being transformed by systems which are integrating data processing, word processing, management information systems, and communications.

Mr. Tapscott is Manager, Office Information Communications Systems Group, at Bell-Northern Research in Toronto. He manages a group of psychologists, training specialists, as well as computer science and communications experts, who are responsible for office system research, product planning and consulting.

The major area of applications software also gets attention in a presentation on the state of the art and trends in the packaged software market. Jack Davies, president, Systemhouse Ltd., Ottawa, will discuss such productivity aids as structured design, structured programming, code generators, application generators, system generators and others. Such aids are taking on increased importance because of the industry-wide backlog in the production of application software, which Mr. Davies calls the 'software crisis.'

The afternoon session on Day One will hear Frank Holst, Vice President, Product Strategy and Management, Sperry Univac, on 'EDP—An industry in transition'. He will outline how information processing, data orientation and distribution are becoming decentralized, and how the participants are changing as new competitors are entering an expanding market. He will also focus on how technology advances are allowing a broader segment of business and industry to computerize.

Ontario's role in the microelectronic revolution will receive attention in another presentation by David Barrows, Director, Industry Policy Sector, Ontario Ministry of Industry and Tourism. He will discuss the findings of a government task force on the status of the Canadian electronics industry and its impact on labor, education and society, and the possible role of the Ontario Government.

The final session on Day One looks at the implications for the DP professional of large systems. As the role of computers has expanded from simple data processing to a business asset, the reasons for the change and its effect will be discussed by Alan Hutton of Amdahl Corp. He will also look at how the role of the supplier is changing to the benefit of the users due to competition.

The first day session is chaired by Wayne H. Peters, principal in the Information Management Consulting Group, Woods Gordon Management Consultants, Toronto.

DAY TWO
November 17
New technologies, methodologies

The concepts of microprocessors will be discussed in the opening session on Tuesday morning Nov. 17 by Jim Butterfield, Toronto-based associate editor of Compute magazine, in a presentation on 'The microcomputer—coming into focus.' He will deal with the growing inroads of the micro into the sphere of activities of the DP professional.

How some unique Canadian terminal and packet switch offerings are opening new options in the management of on-line computer networks will receive attention in a presentation by J. Mat Ardron, consultant for TIL Systems Ltd., Toronto. He will cite Canadian case studies and look at what it takes to meet users' needs more quickly and economically.

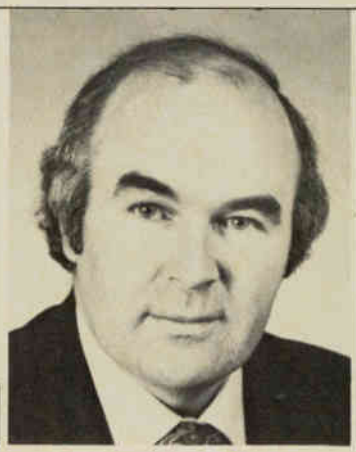
The third morning sessions will explore the issues of security and privacy with emphasis on senior management involvement. Martin Smith, Director of National Accounts, Honeywell Information Systems, Toronto, will discuss security aspects in a mainframe versus a distributed processing environment. He will deal with encryption and decryption and the challenges presented by the explosive growth of personal computing.

Tuesday's afternoon session will hear Peter Webb, Vice President and Data Processing Sales Manager, IBM Canada discuss the mainframe and its part of the EDP resource.

The integration of data and word processing and external communications equipment will be placed into focus by John D. Cameron, National Marketing Manager, Office Systems, Xerox Can-

Turn to page 154

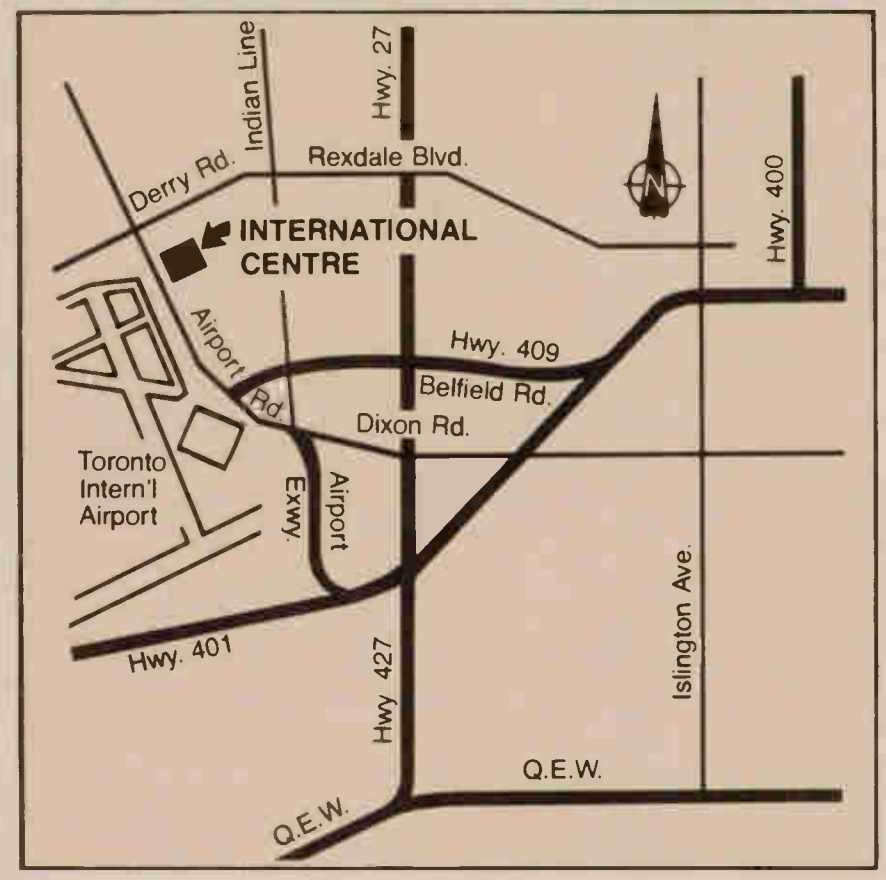

F. Holst


J. Davies


D. Tapscott


A. Hutton

How to get to the Canadian Computer Conference



ada. He will provide details of a product designed to link such computers within an office and explain how such systems relate to EDP professionals.

The Tuesday session is chaired by John O. Haapala, Manager, Management Services, Lake Ontario Cement Ltd., Toronto.

DAY THREE
November 18
The computer and society

The impact of computers, both large and small, on the general public will be assessed in Wednesday's morning keynote address by Toronto science writer Lydia Dotto under the theme of 'Society and the Computer'.

This is followed by a look at the implications of Telidon on society and the individual by Dr. Ann Cameron, Associate Dean of the School of Graduate Studies and Research, and Professor of Psychology, University of New Brunswick. Dr. Cameron will address questions dealing with the potential impact of Telidon on Canadians.

The third morning session on Tuesday will hear Harvey Strosberg on the subject of medical records and privacy. Mr. Strosberg is a lawyer who served on the Krever Commission which was established by the Ontario government to study the privacy of medical records.

The afternoon session will hear Dr. Anne Mellers, an organisational consultant based in Toronto, on the impact of office automation on employment. Dr. Mellers will explore how microelectronics are being implemented and their consequences in creating jobs, and in rendering others obsolete.

The topic of computer crime continues to create much interest and Dr. John Carrol, Professor of Computer Science, University of Western Ontario will deal with this subject in the final afternoon session on Wednesday.

With criminal access to computers and their data being one of the major concerns of EDP managers, Dr. Carrol will discuss advances in technology and the move away from traditional computing which are changing the nature of illegal access and which provide new means of entering computer files. The fact that the perpetrators are sometimes seeking intellectual challenges rather than material gain is a complicating factor; an aspect that will be discussed as well.

The Day Three program is chaired by Liz Foster, Senior Member, Systems Staff, Bell-Northern Research, Toronto.

DAY FOUR
November 19
Computers for the professional

The use of computers in professional practice is growing and the final day of the conference is devoted to four streams of interest to professionals in accounting, engineering, medical and legal practices.

The keynote presentation for these streams is by author Ted Nelson under theme of "Computopia Now".

"Computopia Now is not a description of the present," notes Mr. Nelson, "but a non-negotiable demand for a world in which things, information and ideas are accessible, clear and easy to use." Mr. Nelson will present a framework and a

J. Butterfield | J. Ardron | M. Smith | P. Webb | J. Cameron

J. Kearns C. Hodge C. Preston L. Verchere L. Milrad

philosophy of what a professional can expect to get and what should be demanded of a computer system.

Chairman for the fourth day program is Peter D. Bergerson, Systems Vice President, The National Life of Canada. Mr. Bergeron and four stream moderators are directing this portion of the conference program.

Accounting stream: will hear the state of the art in financial systems and in a presentation by Wally Reifschneider, Canadian Sales Manager, McCormack and Dodge Canada Ltd. He will provide a perspective on financial systems in the eighties.

Business systems for the chartered accountants' practice will be discussed by Marc Ansell, Technical Manager for the Business Systems Group, Canadian General Electric. He will survey several of the small business systems now available and discuss practical questions on how to select, acquire and operate the most appropriate system.

The final portion of the accounting stream will hear John H. Kearns of Clarkson Gordon, Toronto, discuss the AuditComputer, a new microcomputer system for computer-assisted auditing on client data files.

The accounting stream segment is moderated by John M. Swinden, Partner and National Director of Computer Audit, Clarkson Gordon Co.

Engineering stream:

The range of ways in which the computer affects the engineering profession is the theme for several presentations in the engineering stream, moderated by Hugh McGrory, Vice President, Proctor & Redfern Ltd., Toronto.

The implications of the cost reductions and the increasing power and flexibility of mini computers for the engineering community will be the focus of a presentation by Charles S. Hodge, Director, Computer Services, Boyle Engineering Corp.

In the same stream, the impact of computer-aided graphics as a communication and development medium will be delineated by Chuck Preston, General Manager, TDC Graphics, Toronto. Computer-aided graphics have become an explosive growth industry and Mr. Preston will highlight some current and expected computer graphics developments and how they will affect designers, managers and other professionals.

The robotics revolution will also get attention and a survey of the current Canadian robotics scene will be presented by Dr. Graham D. Whitehead, Vice President, Vadeko International Inc., a Canadian firm specializing in industrial robots. His presentation will emphasize the opportunities for computer hardware and software development in this area.

Legal stream:

The practical matters of obtaining

Computer Conference Fees

Computer Conference fees	any one session	any two sessions	any three sessions	any four sessions	any five sessions	any six sessions	any seven sessions
Before Nov. 6, 1981 (Non-CIPS member)	$70	130	185	235	270	295	310
CIPS members, pre-registered before Nov. 6	$60	115	165	210	240	260	270
At the door	$80	150	225	275	300	330	350

Conference fee includes admission to computer show. Advance registration for show only (before Oct. 31) is $3. Tickets for the show only at the door are $5. For conference registration phone 416/252-7791, ext. 158.

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Running concurrently with the computer conference is an extensive exhibit of data processing equipment and services. Shown is part of last year's show area. This year's show has been expanded to four days.

CANADIAN COMPUTER CONFERENCE

See also page 150 for conference program summary

From page 155

computer support for the legal profession will be addressed in Thursday's legal stream, moderated by Brian G. McKenna, solicitor with Day, Wilson, Campbell, Toronto.

The computer as the lawyer's new electronic partner is the topic of the presentation by Mrs. Lynne Verchere, President, Manac Systems International. She will cover the front and back office functions which computers can or will soon perform for every size of law firm at affordable prices.

The various application areas and their benefits in computerizing the small law firm will receive attention in an address by Louis H. Milrad. As a lawyer, Mr. Milrad will include an analysis of hardware and software selection, contracting, support and financing.

The final presentation in the legal stream is a discussion of the advantages to the legal profession through computerization by Anne Foster, Coordinator, Computers and the Law, Canadian Law Information Council, Ottawa. Ms. Foster will cover steps which the profession must take to ensure its need are met.

Medical/dental stream:

The use of computers in professional and dental professions will be discussed in a separate conference stream, chaired by H. Dominic Covvey. Mr. Covvey is also a speaker, discussing "The real world of medical computing." He will discuss the difficulties encountered in introducing computers into health care institutions.

"Enormous costs of computerizing are often coupled with a lack of battle-hardened experts with training in both health and computing spheres," notes Mr. Covvey. "Unless the medical profession overcomes the 'gee-whiz' phase and faces such problems, the dollar losses will be appalling."

The philosophy and implementation of a distributed patient information system is the subject of a presentation by George T. Horne, Director of Clinical Computer Systems, Hospital for Sick Children, Toronto. Mr. Horne will relate the experience gained at his hospital and touch upon the use of computers for administrative and clinical applications.

A medical diagnosis computer program, 'Caduceus,' will be explained by Dr. H. Pople, Jr., Co-Director, Decision Systems Laboratory, University of Pittsburgh. The program includes synthetic reasoning and clinical data and analytical evaluation.

The use of a Canadian-developed program for the small-to-medium size medical and dental practice will be described in the final segment in the medical stream in a presentation by Dr. Roel Wyman. For two years, Dr. Wyman's Malton Dental Group has used an on-site computer to assist with office and patient record functions.

As this preview indicates, the conference program is a diverse and a provocative one. It is designed to address the changing interest of many sections of the EDP profession and the needs of the many new users applying computing power to their own situations. □

H. Covvey

G. Horne

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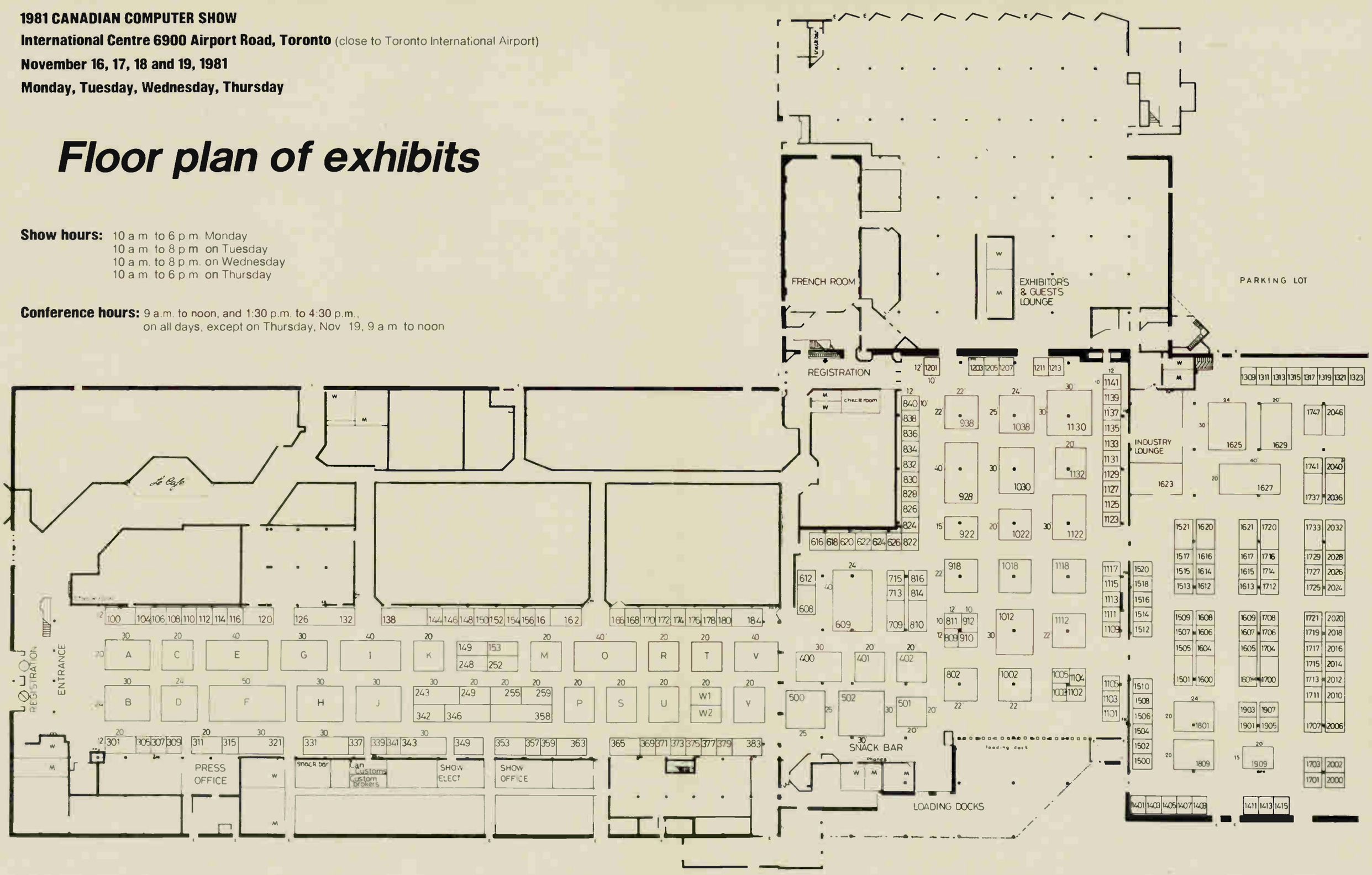
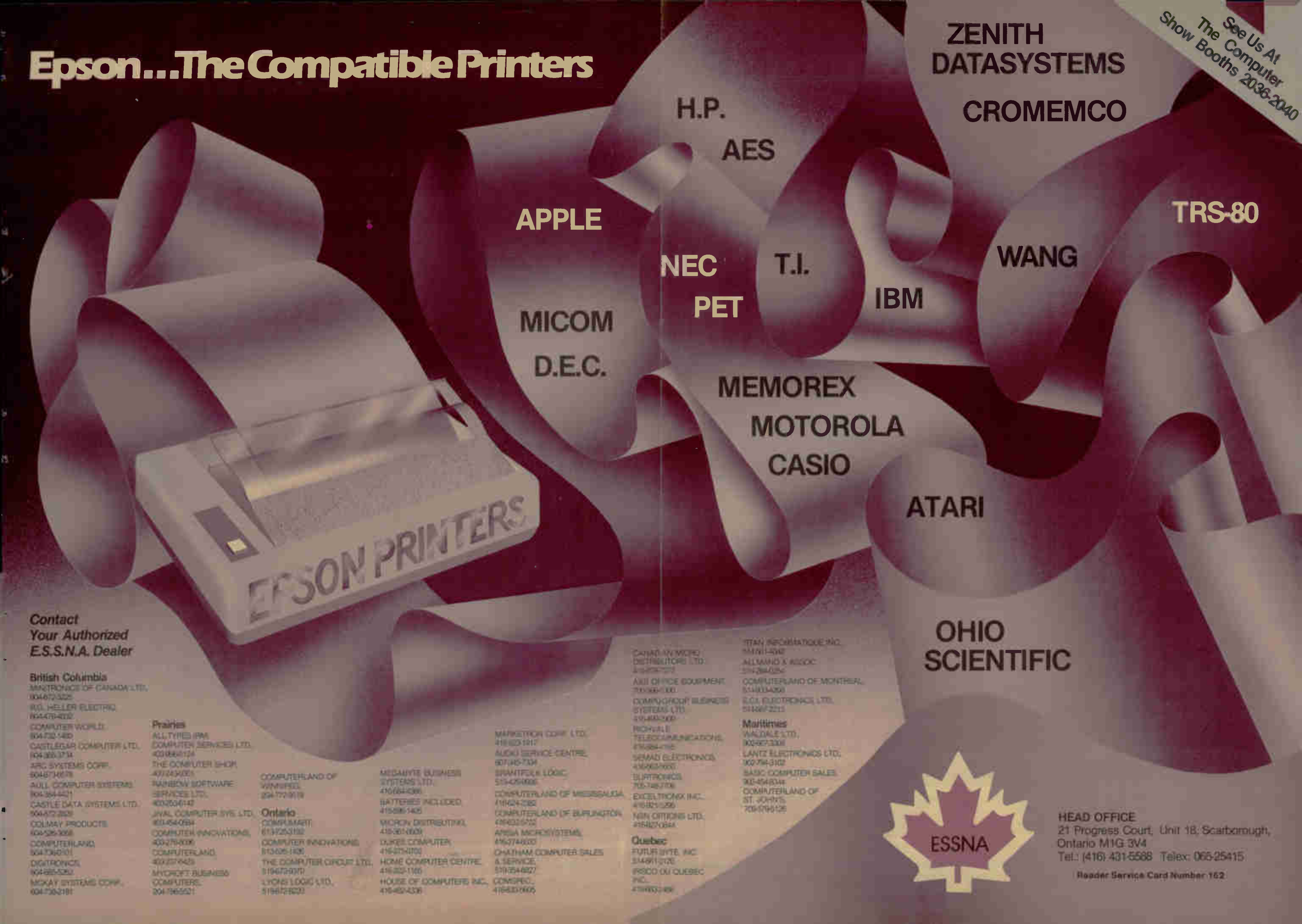
10 a m to 6 p m on Thursday

Conference hours: 9 a.m. to noon, and 1:30 p.m. to 4:30 p.m.,
on all days, except on Thursday, Nov 19, 9 a m to noon





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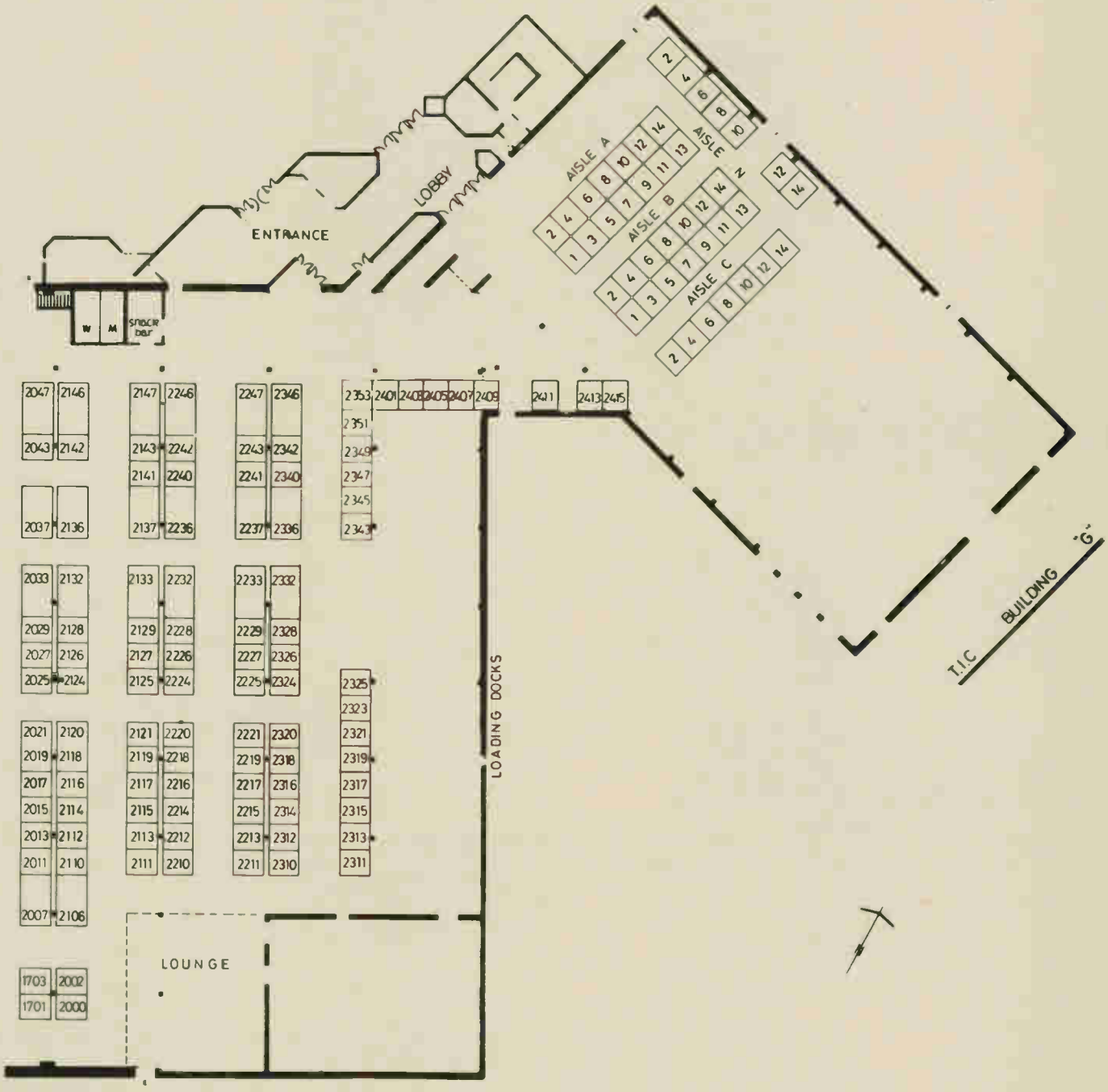

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It's a small price to pay for a big return when it comes to business efficiency in any organization. To find out, how small, call your nearest CGE office.

• Toronto (416) 530-5755 • Montreal (514) 849-9491 • Ottawa (613) 236-5519 • Calgary (403) 243-2202 • Edmonton (403) 420-0770 • Vancouver (604) 681-8136

Canadian General Electric

Data Communication Products

CANADIAN COMPUTER SHOW

PRODUCTS

"WE'RE enjoying an unprecedented response to this 12th annual Canadian Computer Show and Conference, and that's why we've extended it to a fourth day. We definitely expect to break all previous records for participants and visitors this year."

That's how the 1981 Canadian Computer Show has shaped up, in the words of coordinator Reg Leckie of Industrial Trade Shows of Canada. In order to accommodate the anticipated crowds, the show hours have been extended, too. The floor opens at 10 AM each day, and will remain open until 8 PM on Tuesday, Nov. 17 and Wednesday, Nov. 18, while closing at 6 PM on Monday the 16th and Thursday the 19th. This will give a total of 12 additional hours for viewing the exhibits.

A total of close to 30,000 attendees (including exhibitor personnel) is forecast for the show, and the number of firms exhibiting is expected to be just under 300—up 20% from last year. More than 90% of last year's participating firms had signed up for the '81 show by as long ago as the end of August.

"Virtually all major manufacturers are included this year," Leckie notes. "One inducement is the fact that our extra fourth day is being especially aimed at professional people and small-business owners; these kinds of people—including doctors, lawyers, accountants, dentists, and all types of entrepreneurs—are for the most part strong prospects to become first-time users of the smaller systems or services."

Many of the seminars in the conference portion of the Show have also been designed with these people in mind.

In addition to the broad representation of products on display, more good news for Show visitors comes in the announcement that, for the third year, the cost of entry has stayed unchanged at just $5 for a ticket that's good for all four days.

The following listings of Show exhibitors and their products are current as of presstime for this issue. All information was provided by the firms involved.

See page 205 for exhibitors index

Computer Show grand prize a 1982 Renault 18 automobile

A 1982 Renault 18 automobile, valued at approximately $12,000, will be the grand door prize at the Canadian Computer Show and Conference. The prize is courtesy of Toronto Executive Consultants, American Motors (Canada) Inc., and the Canadian Computer Show and Conference. All show registrants are eligible and entry forms are available at the prize display. Draw for the grand prize will be held Thursday, Nov. 19, 5:30 p.m. at Booth #1801.

Accu-Systems Co. Ltd.
Booth: 2146

101 Amber St , Unit 9,
Markham, Ont L3R 3B2
(416) 495-7520

Exhibiting: O.C.R. and proof machine balancing systems. Special packages for Utilities (with mark sense and O.C.R.) lock box and remittance processing and teller balancing systems for the banking industry.

All products will be on display in online and off-line configurations.

Personnel: John Marquis, John Angove, Bob Boose, Gil York, Bill Long, Jim Kennerman, John Siemens, Bob Henderson.

Reader Service Card Number 41

AES Data Ltd.
Booth: 1627

5755 Ferrier St.,
Montreal, Que. H4P 1N3
(514) 735-4481

Exhibiting: A complete line of standalone and multi-terminal text editors featuring the newest entry in the AES line-up of word processors, the Alphaplus. This is Canada's first self-contained word processor incorporating the keyboard, screen and printer into a single desk-top unit.

Reader Service Card Number 42

Ahearn & Soper Inc.
Booth: 'D', 311, 315

31 Enterprise Rd.
Rexdale, Ont M9W 1C4
(416) 245-4848

Exhibiting: Dataram memory and disc emulator systems; Documation card readers; Kennedy tape and disc products; Printronix line printers; a Trilog color plotter; Versatec electrostatic

ON REVIEW

printers/plotters and V-80 Plotter, and Western peripherals controllers.

Demonstrations will be given on the new Multiwriter IV word processing terminals. Also shown will be the IDS matrix line printers, WTI store and forward floppy discs, and Volker-Craig video terminals.

Personnel: Peter Fedak, Verne Campbell, John Paul, Al Cornish, Brian McKenna, Marc Schindler, Garry Beutler, Imrich Singer, Andy Wallenius, Don Campbell, Gerry Ferris, Glenn Beaton, Andy Larocque, Jacques Ledoux, Miller Houston.

Reader Service Card Number 43

A.S.P. Access Floors Inc.
Booth: 337

P.O. Box 94, Clarkson Post Office
Mississauga, Ont. L5J 3X9
(416) 822-6190

Reader Service Card Number 44

Alicom Data Ltd.
Booth: 1022

5A Caesar Ave.
Nepean, Ont. K2G 0A9
(613) 226-2340

Exhibiting: Statistical multiplexer with X-25 and co-axial star topology. IBM 3270 series compatible CRT's. Data test equipment, fibre-optic short-haul systems. Response time analyzers.

Personnel: Peter Craig, Bill Kimmo, Bryn Jones, Ben Kocur, Sam Stavro, Brian Kennell.

Reader Service Card Number 45

American Superior Electric Co.
Booth: 1727

38 Torlake Cres.
Toronto, Ont. M8Z 1B3
(416) 255-2318

Reader Service Card Number 46

Ampex Canada Inc.
Booth: 369, 371, 373

132 East Drive,
Bramalea, Ont. L6T 3A9
(416) 791-3100

Exhibiting: Interactive video terminal; 330/165-megabyte Winchester disc drive; 32/64/96-megabyte Winchester disc drives with cartridge back-up; 10-megabyte cartridge disc drives; disc controllers for DEC PDP series compu ers; disc controllers for DG Nova serie mini-computers; non-volatile memorie with Multibus compatibility.

Personnel: Mac Khan, M. Sev, D Crook, H. Diggens.

Reader Service Card Number 47

Anderson Jacobson Canada
Booth: 166, 168

321 Don Park Rd.,
Markham, Ont. L3R 1C2
(416) 495-5510

Exhibiting: 300; 12-baud acoustic and direct-connect modems, low cost high and low speed dot matrix printing terminals, letter quality printing and plotting daisy wheel terminals and off line floppy disc storage and editing units.

New product announcements: AJ520 CRT and AJ650 Ink Jet Printer.

Personnel: Alex Kosarow, Greg Richardson, Wes Hayden, Sheila Clachers.

Reader Service Card Number 48

Ashworth Automation Ltd.
Booth: 'S'

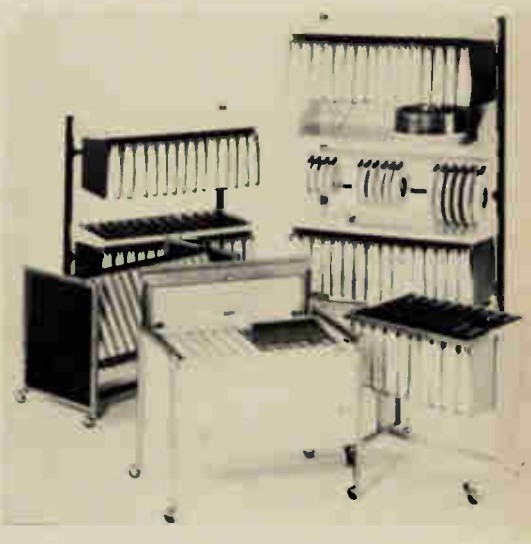
315 Steelcase Rd. E.,
Markham, Ont. L3R 2R5
(416) 495-0222

Exhibiting: Dataproducts line printers, Series B 300, 600, and 900; Series M 200 matrix printer; D50 receive-only and KSR daisy wheel printers.

Personnel: John Ashworth, Steve Chorny, Don Berger.

Reader Service Card Number 49

See Page 163 for Floor Plan



Acco Canadian Co. Ltd.
Booth: 2033

501 McNicoll Ave.,
Willowdale, Ont. M2H 2EZ
(416) 499-1000

Exhibiting: Accomedia filing and storage systems for diskette and microfiche. Products featured include rotaries, desk stands, indexes, binders, hanging files and bulk file trays.

Accodata retention system for storage of data binders, tape seals, disc drives and hanging files. Products featured include multiracks and accessories, mobile racks, mobile security cabinet and new products.

Personnel: Doug Large, Roger Yarnold, Jim Van Rossum, Linda Burrell, Bill Porteous.

Reader Service Card Number 50

CANADIAN COMPUTER SHOW

Advanced Business Computer systems Int'l.
Booth: 2233, 2332

1700 University Ave. W.
Windsor, Ont. N9B 1C4
(519) 255-9199

Reader Service Card Number 51

Applied Data Research Canada
Booth: 614, 616

505 Consumers Rd.
Willowdale, Ont. M2J 4V8
(416) 497-4424

Reader Service Card Number 52

Louis Albert Associates
Booth: 243

2264 Stevenage Dr.,
Ottawa, Ont. K1G 3H9
(613) 737-5941

Exhibiting: A complete range of both, sophisticated and more simple interactive and monitoring data test sets including the new INTERACTIVE INTERVIEW 4500 Series; subscriber-oriented data switching systems; data network management tech control systems; statistical multiplexers, Burroughs interface box; cassette recorders; EIA cables and our new powerful CPM microcomputer.

Personnel: Louis Albert, Michel Sabourin, Robert Boivin, Marc Aubin, Mike Rock.

Reader Service Card Number 53

Arthur Andersen & Co.
Booth: 1733

P.O. Box 29
Toronto Dominion Centre, 29th Floor
Toronto, Ont. M5K 1B9
(416) 366-6243

Reader Service Card Number 54

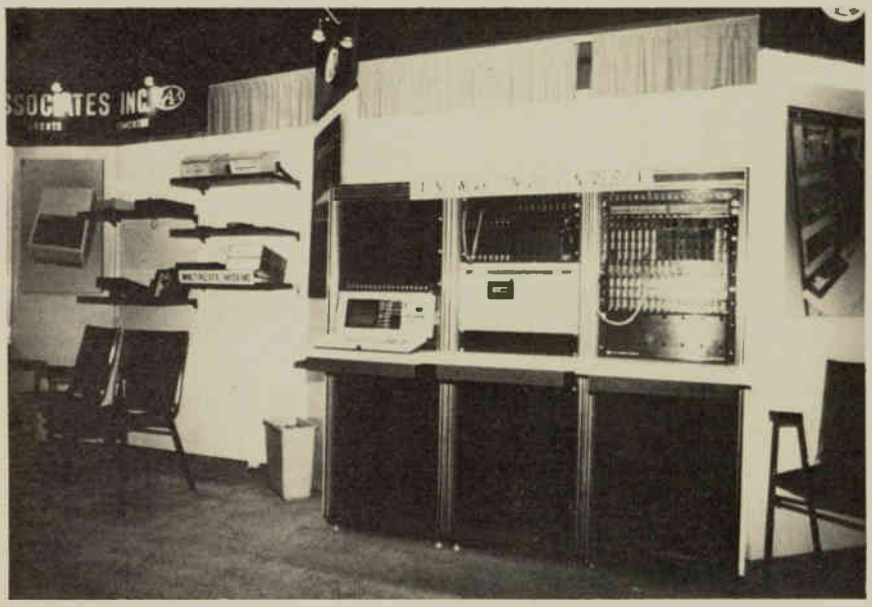
Apple Canada Inc.
Booth: 1112

875 Don Mills Rd.,
Don Mills, Ont. M3C 1V9
(416) 444-2531

Exhibiting: Apple-III: a more powerful personal computer—incorporates new Apple-designed operating system and central processor; up to 128 kilobytes of main memory, built-in disc drive, communications facilities, color graphics, a digital-to analog data converter, audio capability and new application software. It supports high-level programming languages (i.e. Basic, Pascal) and can accommodate a large range of peripherals, including three additional disc drives and a variety of printers.

Personnel: David Killins, Peter Jones, Peter Justiz, Dan Wojdylo, Lynn Schofield.

Reader Service Card Number 55



Louis Albert datacomm network control centre.

Arisia Microsystems
Booth: 1600

1455 Gregwood Rd.,
Mississauga, Ont. L5H 2T5
(416) 274-6033

Exhibiting: Arisia will introduce several new products: the System-IV, a multi-user hard-disc microcomputer for business, scientific, and industrial applications; the Osborne-1 Personal Business Computer; MicroAngelo B&W and color graphics from Scion Corp.; and our new integrated business software for G/L, A/P, A/R, Inven., and O/E.

We will also show our System-III CP/M computer, compatible terminals and printers, S-100 boards and CP/M and MP/M-based software.

Reader Service Card Number 56

Arkon Electronics Ltd.
Booth: 2043, 2047

409 Queen Street West
Toronto, Ont. M5V 2A5
(416) 868-1315

Reader Service Card Number 57

Associated Test Equipment Ltd.
Booth: 609

3530 Pharmacy Ave.
Scarborough, Ont. M1W 2S7
(416) 497-2208

Reader Service Card Number 58

Assn. for Systems Management
Booth: 2325

55 University Ave., Suite 600,
Toronto, Ont. M5J 2H7
(416) 364-4018

Exhibiting: ASM promotes the continuing education and recognition of administrative system specialists. On display will be ASM books, newsletters, journals and technical publications. Brochures describing our seminars, courses, annual conference, monthly meetings and career services will be available.

Personnel: Ilmar Talvila

Reader Service Card Number 59

Automatic Controls Systems
Booth: 1505

8 Melanie Dr.,
Brampton, Ont.
(416) 791-1020

Exhibiting: Dynabyte: Model BC2 single-board computer for Industrial Measurement and Control.

'Dynabyte': Multi-tasking micro-business computer for sales, accounting and inventory processing.

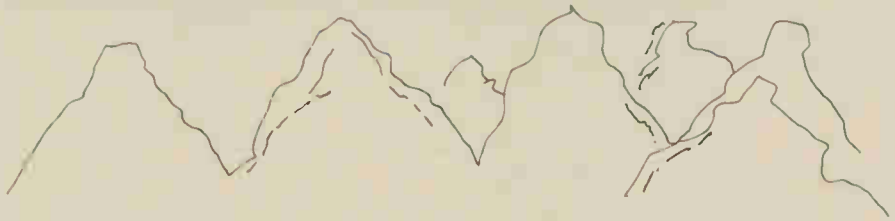
'Rios': Crydom remote input/output system for complete 'building block' interface system for computers.

'Dana': Taskmaster Model 8138; numerical control for industrial positioning.

Personnel: R. Stefanuk, A. Stefanuk, J. Bowles, P. R. Majeski.

Reader Service Card Number 60

KOMPRO GOES WEST



We're a total service computer supplies company and we're expanding rapidly. As of September 1st, we opened a sales office in Calgary to distribute our line of magnetic media supplies, computer ribbons, stock forms, data cards and media maintenance equipment. In the fourth quarter of 1981, we'll be opening a manufacturing plant in the West. This western operation will be under the direction of Tim Bracken, our Regional VP who brings to KOMPRO ten years experience in the computer supplies industry.

The western operation is an extension of our already existing national network of sales and distribution offices, and complements our plants in Ontario and Québec.

KOMPRO computer products are manufactured under strict quality control, our service is second to none, and our prices are most competitive.

For the KOMPRO office nearest you, call

Calgary	Toronto	Montreal	Ottawa
(403) 264-0129	(416) 663-1766	(514) 631-7022	(613) 225-5942

KOMPRO
Canadian Computer Products Limited

Reader Service Card Number 186

CANADIAN COMPUTER SHOW

Auerbach Reports
Booth: 146
1450 Don Mills Rd
Don Mills, Ont M3B 2X4
(416) 445-6641

Reader Service Card Number 61

Beautiline Systems Ltd.
Booth: 1518, 1520
420 Eddystone Ave.,
Downsview, Ont M3N 1H7
(416) 742-5360

Exhibiting: Beautiline systems will be exhibiting Datastation, an entirely new concept in the provision of maximum work comfort for computer operators. A variety of custom-designed layouts are offered with the Datastation system; careful attention is given to working heights, economical use of floor space, shared equipment use, hidden wiring and many options are available in the use of colored partitions (laminated, fabric, acoustical).
Personnel: Shelley Fox, Lutz Graunitz, Tony Vander Park, Fred Reilly, Barry Crews, Paul Altilia, Cathy Bobbie.

Reader Service Card Number 62

Black & McDonald
Booth: Island 'M'
101 Parliament St
Toronto, Ont. M5A 2Y7
(416) 366-2541

Reader Service Card Number 63

Bell & Howell
Booth: 2243, 2247
c/o Convex Systems
365 John St
Thornhill, Ont. L3T 2A1
(416) 899-5414

Reader Service Card Number 64

Borisko Bros. Ltd.
Booth: 1905, 1907
357 Kennedy Rd.
Scarborough, Ont. M1K 2A2
(416) 261-6181

Exhibiting: As one of the official Canadian movers to the Canadian Computer Show we offer a complete moving service for sensitive, high value and delicate products.

As members of United Van Lines, we offer Gold Banner Service, a guaranteed weekly service across Canada and the U.S.A.
Personnel: Fred Taphouse, Dave Fletcher, Max Haines, Dick Silverthorne, Susan Gorden.

Reader Service Card Number 65

C-E-S- Electronic Systems Group
Booth: 1607, 1609
528 Hood Rd.,
Markham, Ont. L3R 3K9
(416) 495-5555

Exhibiting: Virtual vector color graphics; Hazeltine's new low-cost Espirit CRT; ISI 387 IBM-compatible printer; Centronics high speed band printer; C.Itoh CIT101 CRT; IBM 3101 CRT; Digital Equipment VT100/101, LA120, LA34 and new VT125 Graphics CRT; Texas Instruments TI745 portable terminal: NEC letter-quality printers; Northstar Horizon micro computers; acoustic couplers, modems, and add-on memory.
Personnel: Colin Bayley, Roy Hood, Jim McGowan, Barbara Davis, Karen Spring, Bill Logan.

Reader Service Card Number 66

CNCP Telecommunications
Booth: 500
3300 Bloor St West
Suite 1800, West Tower
Toronto, Ont M8X 2W9
(416) 233-6359

Reader Service Card Number 67

Burroughs Inc.
Booth: 1625
801 York Mills Rd.,
Don Mills, Ont. M3B 1X8
(416) 445-4030

Exhibiting: OFIS 1—Burroughs Office Information System provides an integrated electronic base for such key functions as word processing, automatic filing and retrieval of business documents and information, resource sharing, personal records management, electronic mail and communication between departmental systems and host computers.

Burroughs B1955—demonstrating a distribution information system and a manufacturing system.

Burroughs B94—demonstrating Canadian order entry system.
Personnel: C.S. Thomas, D. Shaw, G. Piasentin, S. Ramzy, D. McNeill, C. Young, B. Croker.

Reader Service Card Number 68

CTS Computer Systems Inc.
Booth: 1012
204 Amber St.
Markham, Ont.
(416) 495-3450

Exhibiting: MDS Qantel business computers; QMRP—manufacturing software; 'Solohours'—general distributor software; 'Lexitron'—word processing systems.
Personnel: Karl Niemuller, G. Bushe, Paul Knecktel, Ting Lee, Howard J. Dean.

Reader Service Card Number 69

Cableshare Ltd.
Booth: 2211, 2213
P.O. Box 5880, 20 Enterprise Dr.,
London, Ont N6A 4L6
(519) 686-2900

Exhibiting: LSI-X.25 product line, Telidon business systems, TOLAS II business systems and local area networks.

Cableshare will also exhibit the Inter-Office Communications System, a communication concept including electronic mail, electronic filing, management information systems and word processing.
Personnel: Barry Walker, Roy Smith, Roger D'Hollander, Brian Liska.

Reader Service Card Number 70

Cail Systems Ltd.
Booth: 1507, 1509
67 Richmond St. W., Suite 505
Toronto, Ont. M5H 1Z5
(416) 362-1063

Exhibiting: Concept Communication Terminals demonstrating 8 pages of memory, forms, non-volatile memory, 80/132 column display, networking, etc.—both with ASCII and APL.

ISM interboard to upgrade the Concept terminal into a stand-alone microcomputer supporting CP/M-based application programs.

Sentinel Business Systems demonstrating accounting and various industry unique applications, utilizing advanced data base and menu facilities.
Personnel: R. Thompson, D. Evans, R. Pincus, L. Cole, N. Young.

Reader Service Card Number 71

Calcan Leasing Ltd.
Booth: 1118
1985 Leslie St., Don Mills, Ont. M3B 2M3
(416) 441-1262

Exhibiting: Minolta Photocopiers, Canon Calculators, and Olivetti Memory Typewriters.
Personnel:

Reader Service Card Number 72

Introducing The NEC Astra Business Systems in Canada

A Model For Every First-Time User.

THE MODEL 205

A desk-top system with the computer, memory, operator display and keyboard contained in a compact package. Two types of printers, a memory expandable to 256,000 words, and up to 4.8 million characters of diskette storage make the Model 205 ideal for low-volume applications, or as a remote computer linked by telephone to a larger Astra™ system.

THE MODEL 210

For multiple applications in a small office, the Model 210 supports up to four operator stations, 4.8 million characters of diskette storage, a serial or line printer, data communications capabilities, and a concurrency feature that allows up to four different applications to be run at the same time.

THE MODEL 230

As files and applications enlarge, the Model 210 can be easily expanded to the Model 230, which offers enhanced storage facilities. These include magnetic tape drives and 20-, 40-, or 80-million character disk drives. Up to four operator stations, data communications and multiple applications can be concurrently supported.

THE MODEL 250

Proof that the first-time user will not outgrow an Astra™ Business System, the Model 250 supports up to 16 operator stations and 160-million characters of disk storage. Memory can be expanded to 512,000 characters to support a large variety of concurrent applications.

See us at the
CANADIAN COMPUTER
SHOW

FERN COMPUTER SYSTEMS
242 Hood Rd., Markham,
Ont. L3R 3K8
(416) 499-6200

CANADIAN COMPUTER SHOW

California Computer Products of Canada Ltd.
Booth: Island 'G'

55 Westmore Dr.
Rexdale, Ont. M9V 3Y6
(416) 745-9610

Reader Service Card Number 73

Cal-Tek Supply Services
Booth: 1407

160 Gibson Dr., Unit # 9,
Markham, Ont L3R 3K1
(416) 495-2888

Exhibiting: Besides marketing various brands of new and used data processing and micrographic equipment, we offer direct and third-party maintenance on the same. These services are available in most major cities in Canada, some in the U.S. and some in the Middle East.
Personnel: Cal Westover, Gerry Burke, Dexter Desjardins.

Reader Service Card Number 74

Canadian Consulting Institute
Booth: 375

55 Queen St. E., Suite 409,
Toronto, Ont. M5C 1R6
(416) 364-3858

Exhibiting: Professional management consulting organization drawing on expertise dating back to 1963, specializing in the screening, testing, counselling and recruitment of personnel in all areas of data processing and technical services in junior up to senior management positions. Data processing services include all areas of programming, systems design, methods, operations and telecommunications, etc. Technical services include field service, project and design engineering, hardware specialties, quality assurance and control, testing etc.
Personnel: Don Sbrolla, Larry Foerster, Cathy Sbrolla, John Sbrolla, Rose Marie Sbrolla, Doreen O'Malley, Lores Smith.

Reader Service Card Number 75

Canadian General Electric
Booth: 'A'

396 Attwell Dr.,
Rexdale, Ont. M9W 5C3
(416) 675-7500

Exhibiting: TermiNet 2120 lightweight (24 lbs) 120-cps printer and the TermiNet 200 thick forms printer, ideal for airline tickets. The latest models of video display terminals with separate keyboards will be shown.

The new Panafax high-speed facsimile transceivers for electronic mail will be demonstrated. C.G.E. will also have its Racal-Vadic direct-connect modems on view.
Personnel: K. Leno, J. Seabrook, D. Roeder, M. Trievieri, S. Hughes, B. O'Heany, T. Bedford, T. Alexander, P. Daneau, S. Aboud, J-C. Carufel, T. Cooper.

Reader Service Card Number 76

Canon Optics & Business Machines
Booth: 2133, 2232

3245 American Dr.
Mississauga, Ont L4V 1N4
(416) 678-2730

Reader Service Card Number 77

Career Path Personnel
Booth: 1621

Royal Bank Plaza, Suite 730,
Toronto, Ont. M5J 2J4
(416) 865-7500

Exhibiting: Specialists in the field of career counseling and permanent placement of data-processing personnel.
Personnel: John Doucette, Charlie Green, Judy Adler, Beverly Powers, Eric Columbus, Brian Kennedy, Keith Nash, Henry Bakker.

Reader Service Card Number 78

Centronics Canada Inc.
Booth: "C"

5170 Timberlea Blvd., Unit B,
Mississauga, Ont. L4W 2S5
(416) 625-0770

Exhibiting: line printers, dot matrix printers, special OEM products and the 739 graphics series along with new products to be announced. Special emphasis will be put on Interface capabilities to I.B.M., DEC, Data General and Univac.
Personnel: R. Wilson, K. Thomas, M. Batholomew, J. McFee, P. LeBel, R. Huska, K. Marshall, R. Harjadi, T. Morrow, S. Collis.

Reader Service Card Number 79

Cesco Electronics Ltd.
Booth: 1203, 1205, 1207

4050 Jean-Talon St. W. Montreal, Que H4P-1W1
(514) 735-5511

Exhibiting: California Computer Systems—single and multiuser business systems, Intertec Data Systems—visual displays/stand alone and networking systems; Centronics-impact printers; Apple Computer—Personal/Business/Educational Computers; Texas Instrument—computers/terminals; Amdek—black/white, green, color monitors; Lobo—mass storage systems.
Personnel: Bernard Villiard, Jorge Olenewa, Byron Freeman, Benoit Ethier.

Reader Service Card Number 80

Centurion Computer Corp.
Booth: 1809

21 Progress Court, Suite # 15
Scarborough, Ont M1G 3V4
(416) 439-9472

Reader Service Card Number 81

Canadian Micronics Ltd.
Booth: 2316

606 Upper James St.,
Hamilton, Ont L9C 2Y9
(416) 823-1981

Exhibiting: The Micronics line of hand-held two-way data recording and transmitting terminals, along with our receiver processor with printer interface and keyboard.
Personnel: Bob Strain, Henry Orneus, Nils Larsson, Dale Bishop, Larry Chartier.

Reader Service Card Number 82

Cdn. Information Processing Society
Booth: 307, 309

243 College St.
Toronto, Ont. M5T 9Z9
(416) 593-4040

Reader Service Card Number 83

Canterm Communications Inc.
Booth: 1612, 1614

205 Torbay Rd.
Markham, Ont. L3R 1G7
(416) 495-5700

Reader Service Card Number 84

Compu-Group Business Systems
Booth: 2237, 2336

2255 Sheppard Ave. E., Suite 136,
Willowdale, Ont. M2J 4Y1
(416) 499-2900

Exhibiting: Apple II and Apple III computers exclusively. The introduction of newly announced hardware, peripherals and "professional" software, including electronic mail. Small and medium-sized business, professional and scientific applications.
Personnel: Howard Cracover, Michael Burns, Orin Roberts, John Hunter, Anthony Wright, Elaine Milrad, Mark Barook.

Reader Service Card Number 85

Computer Clearinghouse Ltd.
Booth: 174, 176

Box 28, 6900 Airport Rd.
Mississauga, Ont. L4V 1E8
(416) 671-2322

Reader Service Card Number 86

LSI quietly presents the Hummm Terminal.

From those wonderful folks who brought you the Dumb Terminal® video display, now there's the Hummm Terminal™ Printer.

Featuring quiet operation that's almost unheard of, outstanding reliability and print quality, impressive throughput and a long list of sensible features.

All at a hard-to-believe low price. So low, in fact, that you'll immediately know why we call it Hummm Economics.

A LOT OF IMPACT PRINTER WITHOUT A LOT OF NOISE.

Quite simply, the 310A Hummm Terminal is one of the quietest impact printers in its class. In fact, with its Acoustic Quieter it checks in at a soothing 56dBA. That's quieter than most typewriters. And than most copy machines.

Fine engineering is the quiet secret. The Hummm Terminal hums along bidirectionally at 180 cps.

BELLS AND WHISTLES STANDARD.

You won't find many options on the Hummm Terminal. Because we made most of them standard.

Its logic seeking capability finds the shortest path to the next character on a new line—thanks to space and blank character compression. And with an optionally expanded buffer of 2048 characters, a full terminal screen can be dumped instantly.

You get superior printing capability, including true lower case descenders and underlining—good for an original and five crisp copies on multipart forms. A 9x7 character field. Complete horizontal and vertical forms control. 14 switch selectable form lengths, and 14 perforation skip-over formats. And a 100% duty cycle.

HUMMMAN ENGINEERED.

The Hummm Terminal brings to computer printers the same high standards that made our Dumb Terminal video display the standard for an entire product category. It's rugged, durable, and stylish so it fits right into any office decor.

So call your nearest LSI Authorized Distributor and ask him for some Hummm Terminal information. And when you do, fill out the coupon completely and send it to us. We'll send you a free Hum^3 with over 3 billion combinations—and only one right one.

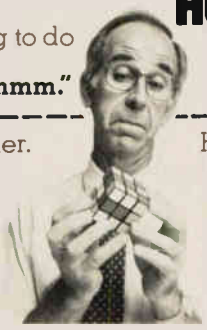
It'll give you something to do during those quiet moments when the Hummm Terminal is humming along.

Lear Siegler, Inc. Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803 714/774-1010. TWX: 910-591-1157. Telex: 65-5444. In Canada contact Zentronics: Calgary 403/230-1422 • Edmonton 403/463-3014 • Montreal 514/735-5361 Telex: 05-827535 • Ottawa 613/238-6411 Telex: 053-3636 • Vancouver 604/688-2533 Telex: 04-507789 • Waterloo 519/884-5700 • Winnipeg 204/775-8661 • Toronto 1355 Meyerside Drive, Mississauga, Ontario L5T 1C9, 416/676-9000 Telex: 06-983657.

THE 310A HUMMM TERMINAL.

LEAR SIEGLER INC
DATA PRODUCTS DIVISION

"Hummmm."



Hummm, Lear Siegler. You've certainly given me something to think about. I asked my distributor about the Hummm Terminal.

Here's his name along with my business card. (I realize that I can't get a Hum^3 if I don't include my card.)

CDS-10-81

Name_____

Distributor _____

Distributor Sales Rep_____

Distributor Location_____

Distributor Telephone_____

Lear Siegler, Inc., Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803. Attn: Adv. J

Reader Service Card Number 189

CANADIAN COMPUTER SHOW

Chubb Industries Limited
Booth: 1714, 1716

263 Queen St. E.,
Brampton, Ont L6W 2C1
(416) 451-3240

Exhibiting: Micro-processor based card operated access-control system specifically designed for the computer environment; allows determination of who has access to which areas when.

Halon 1301 automatic fire detection and extinguishing system with unique control features such as cross zoning, time delays, manual discharge and abort. Supervised detection and activation circuits.

Personnel: Bob Swanton, Bob Love, Hugh Sonnenberg, Al Hodgson, Walter Schultz.

Reader Service Card Number 87

Churchill LePage & Company
Booth: 2323

45 Charles St. E.
Toronto, Ont. M4Y 1S2
(416) 968-9088

Reader Service Card Number 88

Cincom Systems Inc.
Booth: 802

130 Dundas Street East, Suite 201,
Mississauga, Ont L5A 3V8
(416) 279-4220

Exhibiting: Complete line of integrated data base/data communications software, including application programming aids. Also, application software, including manufacturing systems and financial systems. Consulting and education services.

Personnel: Mike Farrell, Dick Collins, Jenny Tetzel.

Reader Service Card Number 89

Commodore Business Machines Ltd.
Booth: 1127, 1129, 1131, 1132

3370 Pharmacy Ave.,
Agincourt, Ont. M1W 2K4
(416) 499-4292

Exhibiting: SuperPET, developed jointly by Commodore Business Machines, University of Waterloo and BMB CompuScience, has a basic configuration of 96K RAM, 2K screen RAM and 36K ROM, utilizing Waterloo micro software such as microPASCAL, microAPL, microBASIC, microFORTRAN, including an editor, operate system and an assembly language development system.

VIC-20, a fully expandable personal computer with color graphics and sound, which interfaces with a standard B&W or color television or monitor. It has full peripheral support including floppy disc, printer, modem, joysticks and ROM cartridges.

Personnel: J.J. Dionne, D. Green, I. Kennedy, W.G. Twyman, J. Ferrari, P. Higginbottom, K. Hildon.

Reader Service Card Number 90

Computer Aid Accessories Ltd.
Booth: 1018

1645 Warden Ave.,
Scarborough, Ont M1R 5B3
(416) 298-6170

Exhibiting: Karl Gutmann ergonomically designed computer furniture for word processing, mini computer, programmer/terminal workstation environments. Entire line is completely modular to address today's systems and future needs. Terminal tables feature fixed heights, and airlift or hydraulic adjustability with separate adjustable keyboards, sliding tops, tilt base, swivel mounts, etc.

Personnel: Bruce Sage, Dan Dragone, Sonja Valleau, Greg Jones, Jim Currie.

Reader Service Card Number 91

Compucentre
Booth: 1517

9200 Claveau,
Ville d'Anjou, Que. H1J 1Z4
(514) 354-3810

Exhibiting: Complete demonstration systems from Apple Computer and Commodore Business Machines. We will also have information on our popular seminar program that is geared for professionals and small businessmen.

Personnel: Howard Dellar, Keith Ellis, John Stais, Howard Liberman, Jerry Tarasofsky, Joseph Patriarca, Andy Lewis, Yves Robert.

Reader Service Card Number 92

Communication Canfax
Booth: 2319

8180 Devonshire Rd., Suite 6
Montreal, P.Q.
(514) 737-8696

Reader Service Card Number 93

Compu-Globe Systems
Booth: 2310, 2312

85 Scarsdale Rd., Suite 201,
Don Mills, Ont. M3B 2R2
(416) 441-3077

Exhibiting: Point 4 minicomputer; a wide range of peripherals and software available to the sophisticated users or the newcomer. Applications are currently used in manufacturing, distributing, needletrade project control, hospital and word processing environments.

Personnel: Carl Joly, Viktor Pospodinis, Jonathan Levinger, Jerry Preziuso.

Reader Service Card Number 94

Computerland
Booth: 1613, 1615

5200 Dixie Rd.,
Mississauga, Ont.
(416) 624-2382

Exhibiting: The new IBM Personal Computer. Also the Apple II and III, the Xerox 820 small business system, and the Vector Graphic multi-user system. Capable of supporting 5 terminals and 2 printers, the Vector's chief attributes are reliability and cost-effectiveness with state-of-the-art technology.

Software on demo will include: Manufacturing inventory, wholesale distribution, accounting packages, word processing, medical billing and others.

Personnel: Jim Temerty, Lew Bercovitch, Ray Appleby, Brian Quan, Andy Hagan.

Reader Service Card Number 95

CCG TransCanada Telephone System
Booth: 1623

160 Elgin St., Room 1250
Ottawa, Ont. K1G 3J4
ZEnith 33000

Exhibiting: CCG's new public text-based messaging service, Envoy 100. This is the first TCTS offering in a family of advanced communications services which CCG will introduce to the Canadian business community in the 1980s.

Dataforce, a new field maintenance service. Through this service, CCG can supply any company, business or private enterprise with a single, centralized source of maintenance for the organization's data or text equipment.

Vutran, a micro-processor based transaction terminal designed for inquiry/response and data entry applications.

The Dataroute, CCG's national digital network and Datapac, the national packet switching network.

Personnel: Yolande Hachez, Louise Chauvet, Greg Boyle, Michel Joly, Mike Scrimgour, Bill Newman, Bob Dobro, Jacky Ellis.

Reader Service Card Number 96

Computer Markets
Booth: 622, 624

1 Scarsdale Rd.
Don Mills, Ont. M3B 2R2
(416) 445-1978

Reader Service Card Number 97

Computer Place
Booth: W-1

186 Queen St. West
Toronto, Ont. N5V 1Z1
(416) 598-0262

Reader Service Card Number 98

CANADIAN COMPUTER SHOW

Computer Scenographics Ltd.
Booth: 2351

85 Ellesmere Rd., Suite 214A,
Scarborough, Ont. M1R 4B9
(416) 444-2025

Exhibiting: Color computer graphics hardware (Ramtek), applications software and consulting. Featured products are the Ramtek 6211 high-resolution terminal with light pen; Ramtek 8540 CP/M and UCSD Pascal-based, 512k bytes RAM, IBM 3270-compatible computer; Ramtek 4100 3-minute colorgraphics printer.
Personnel: Stuart Pickard, Ray Demers.

Reader Service Card Number 99

Canadian Datasystems
Booth: 1909

481 University Ave.,
Toronto, Ont. M5W 1A7
(416) 596-5907

Exhibiting: Current issues and subscription information for Canada's biggest computer monthly; also copies of the Official Computer Show Guide.

Reader Service Card Number 260

Computer Warehouse Inc.
Booth: 2225, 2227, 2324, 2326

2255 Sheppard Ave. E., Suite A110,
Willowdale, Ont. M2J 4Y1
(416) 494-3600

Exhibiting: New and used DEC minicomputer systems (PDP-8's, PDP-11's and VAX's), peripherals and components available for immediate delivery from stock.
Personnel: Olivier DuPaul, John Goldsmith.

Reader Service Card Number 261

Computing Canada
Booth: 149

211 Consumers Rd., Ste. 302,
Willowdale, Ont. M2J 4G8
(416) 497-9562

Exhibiting: Copies of the Computing Canada Daily, published specially for the Canadian Computer Show, will be distributed at the booth. Other recent issues of Computing Canada will also be available, along with information on the publication.
Personnel: Paul Plesman, Vern Millward, George Soltys, David Smale, Shirley Armstrong.

Reader Service Card Number 262

Comterm Inc.
Booth: 1002

43 Eglinton Ave. E., Suite 402
Toronto, Ont. M4P 1A3
(416) 481-4467

Exhibiting: The new generation of terminals featuring color and software-switchable BSC, SNA/SDLC and APL using mini-diskettes.

Data communication terminals compatible with IBM 3274/3276/3278/-3287 in an SNA/SDLC environment and 3271/3275/3277/3286 under BSC. Up to 32 devices may be attached per controller, including light pens, and printers with a wide range of speeds.
Personnel: Guy Senecal, Ken Johnson, Michel Deschenes, Frank Fuser, Ernest Shipley, Claude Michel, Ron Vallee.

Reader Service Card Number 263

Consolidated Computer Inc.,
Booth: 838, 840

2421 Lancaster Rd.,
Ottawa, Ont.
(613) 731-7080

Exhibiting: CCI will show the latest in the Series 2 product line, the 2501.

The 2501 uses a high-speed minicomputer to control the collection, validation and intermediate storage of data from video keyboards for subsequent mainframe processing. The 2501 is a dual processor system designed to be cost effective and flexible equally at home in centralized or distributive multi application environment.
Personnel: D. Baycroft, T. O'Loane, B. Chamillard, G. Leng, I. Kerr, R. Kelly, B. Kong.

Reader Service Card Number 264

Control Data Canada
Booth: 'T'

1855 Minnesota, Ct.;
Mississauga, Ont. L5N 1K7
(416) 826-8640

Exhibiting: Peripherals' including Lark module drives; band printers; tension arm tape transports; flexible disc drives; Finch disc drives; various storage module drives.

Also, we are the major national supplier of magnetic media and manufacturer of supplies for computer operations, and we offer products such as: disc packs and disk cartridges, data processing cards, magnetic tapes, flexible discs, printer ribbons, stock tab forms.

Reader Service Card Number 265

Cybernex Ltd.
Booth: 'W-2'

2457 Dunwin Dr.,
Mississauga, Ont. L5L 1T1
(416) 828-2810

Exhibiting: Selected models from its broad range of video terminals, with a new 14-in. large-screen model being highlighted. Other new products will include a Basic Four emulator and a Hazeltine 1500-series emulator. Demonstration programs will be run on Cybernex's LC-3 OEM microcomputer system.

Personnel: Bruce Douglas, Dianne Cairns, Wayne Reid, Peter Wallbridge.

Reader Service Card Number 266

Corporate Consultants
Booth: 346

155 University Ave. Suite 500,
Toronto, Ont. M5H 3B7
(416) 862-1259

Exhibiting: Recruitment and placement for data processing personnel including E.D.P. management, hardware and software design, maxi/mini/and micro systems programming, marketing and marketing support, applications analysts and programmers, as well as financial personnel, engineering personnel and executive recruiting.

Reader Service Card Number 267

Allan Crawford Associates Ltd.
Booth: 1003, 1102

6503 Northam Dr.
Mississauga, Ont. L4V 1J2
(416) 678-1500

Reader Service Card Number 268

Cullinane Canada
Booth: 353

920 Yonge St., Ste. 410,
Toronto, Ont. M4W 3C7
(416) 928-0998

Exhibiting: Cullinane develops markets and supports computer software products worldwide that are designed to increase user productivity and the accessibility of stored information. Our product line is divided into three areas: database management systems; applications software; and audit-retrieval software.

Personnel: Steve Clayton

Reader Service Card Number 269

DGS Datagraphics
Booth: 2137

18H Enterprise Ave.,
Ottawa, Ont. K2G 0A8
(613) 225-0411

Exhibiting: A computer-aided drafting system and a computer-aided digitizing system comprised of a Digital Equip. Corp. PDP-11/23 microcomputer interfaced to a graphic screen, a G.T.C.O. 42" x 60" backlit digitizer, and a Logic Systems L-36, 4-pen, 36-inch digital plotter.

Personnel: G. Philliban, P.J. Philliban, F. Coillieaur.

Reader Service Card Number 270

Data Decisions Inc.
Booth: 2236

20 Brace Rd.
Cherry Hill, 08034
(609) 429-7100

Reader Service Card Number 271

Datacap Ltd.
Booth: 1105

77 Metcalfe St., #906
Ottawa, Ont. K1P 5L6
(613) 238-6363

Reader Service Card Number 272

CANADIAN COMPUTER SHOW

D.H.L. Int'l Express
Booth: 2311

P O. Box 23155,
Vancouver AMF, B.C. V7B 1V6
(604) 278-4221

Exhibiting: DHL provides document and small parcel courier service for the Canadian computer industry across Canada and to over 270 cities in more than 70 countries. We specialize in performing a quick and economical, all-inclusive service from pick-up to delivery with customs clearance included.
Personnel: Lise Greco, Susan Reveler, George Chalmers, Dave Seabourn, Dave Stewart, Donna Cheong, Brenda Tucker, Jim McMahon.

Reader Service Card Number 273

Dasco Data Products Ltd.
Booth: 126

421 Carlingview Dr.
Rexdale, Ont. M9W 5G7
(416) 675-7222

Reader Service Card Number 274

Data General (Canada)
Booth: 2001, 'B'

2155 Leanne Blvd ,
Mississauga, Ont L5K 2K8
(416) 823-7830

Exhibiting: A variety of software products for commercial and technical applications on some of the industry's newest 32-bit processors. These include the Advanced Operating System/Virtual Storage (AOS/VS) and 'Trendview' graphics display software for both business and technical users. Also on display will be the 'GENAP' financial package for small-business computers.
Personnel: Sam Donkoh

Reader Service Card Number 275

Datamex Ltd.
Booth: 'K'

14 Leswyn Rd ,
Toronto, Ont M6A 1K2
(416) 781-9135

Exhibiting: Complete range of video display terminals, including intelligent units, DEC emulators, graphics & color-graphics displays.

Portable printing terminals, & computers, including new 1200 baud silent printer ink-jet color graphic printer-terminal, letter-quality printers and printing terminals, including IBM interfaces, and dual-head Qume printer.

Intelligent floppy disc systems; word-processing systems.
Personnel: Dan Haruni, Sam Luks, Joe Tullo, Frank Squizzato, Phil Swan, Tony Katz, Norm Steinberg.

Reader Service Card Number 276

Dataplotting Services Inc.
Booth: 1321

160 Duncan Mill Rd.,
Don Mills, Ont. M3B 1Z5
(416) 447-8518

Exhibiting: Computer graphics and time-sharing services. Dataplotting's new virtual graphics software package will be demonstrated along with a business graphics package. A variety of graphics will be on display from Dataplotting's flatbed, drum, and color plotters. Time-sharing services from Dataplotting's two VAX 11/780 computers will also be demonstrated.
Personnel: Wilf Parker, Roger Smith, and Mike Holroyd.

Reader Service Card Number 277

Datapoint
Booth: 1703, 1701, 2000, 2002

3790 Victoria Park Ave ,
Willowdale, Ont. M2H 3H7
(416) 492-7400

Exhibiting: The Integrated Electronic Office: The functions of data processing, word processing, electronic message systems, telephone systems and graphics are managed in a single integrated system by the ARC (Attached Resource Computer) system, which allows processors to share a common data base by acting as a pathway for the movement of all information contained within the system.

Reader Service Card Number 278

Datascope of Canada Ltd.
Booth: 110, 112

491 Brimley Rd
Scarborough, Ont M1J 1A4
(416) 264-3221

Reader Service Card Number 279

Datatek
Booth: 377

P O. Box 83 Islington Stn B
Etobicoke, Ont M9C 4X9
(416) 625-5934

Exhibiting: Portable data-entry terminals Azurdata—MSI & Telxon. Sales & service for most models. Voice-response receiver systems. Programmable data entry systems for "route delivery", 3rd-party billing, etc.
Personnel: Les Crisp, Ron Jones, John Koerson, Mitch Sell, Gord Smith.

Reader Service Card Number 280

Data Product News
Booth: 108

481 University Ave.,
Toronto, Ont M5W 1A7
(416) 596-5906

Exhibiting: Current issues and subscription information for Canada's only EDP product-preview publication. Special extra manufacturer information will also be on hand.
Personnel: Vic Zellermeyer, Arvid Stonkus, Dan McKenzie.

Reader Service Card Number 281

Data Processing Mgt. Assn.
Booth: 612

55 Bloor St. W., Suite 1201
Toronto, Ont. M4W 3K2
(416) 967-6200

Reader Service Card Number 282

Datasphere Sales
Booth: 2341, 2343, 2345

1021 Rangerview Rd.
Mississauga, Ont. L5E 1H2
(416) 278-5501

Reader Service Card Number 283

Davlin Business Systems Inc.
Booth: 2032

486 Champagne Dr.
Downsview, Ont M3J 2T9
(416) 635-7200

Reader Service Card Number 284

Decision Data Computer (Canada)
Booth: 1319

287 Horner Ave.,
Toronto, Ont. M8Z 4Y4
(416) 252-5074

Exhibiting: Decision Data has more IBM compatible terminals and printers in service than anyone except IBM. Our customers have confidence in Decision Data as the number-one supplier of high-performance, low-cost, plug-compatible equipment.
Personnel: Gord Steele, Bob Chypchal, Joe Artibello, Frank Posavad, Michele Kehoe, Claude Stordeur, Walt Abrams.

Reader Service Card Number 285

Develcon Electronics Ltd.
Booth: 1737

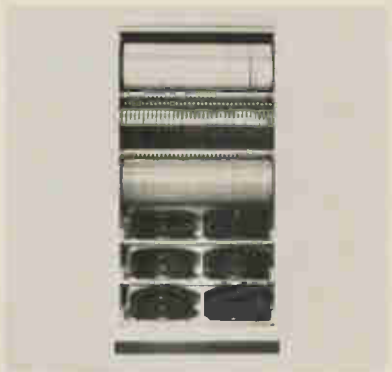
856-51st St E.,
Saskatoon, Sask S7K 5C7
(306) 664-3777

Exhibiting: Dataswitch, the intelligent switching system designed for the multi-user, multi-processor environment. Dataswitch links a network of data products to provide the operations manager total control and flexibility in the data centre. Optimization of installed equipment, together with ease in re-assignment, generates improved performance in resource management.

Short-haul data sets and various other communications products will also be on display.
Personnel: Hugh Elms, Terry Barratt, Richard Lindfield.

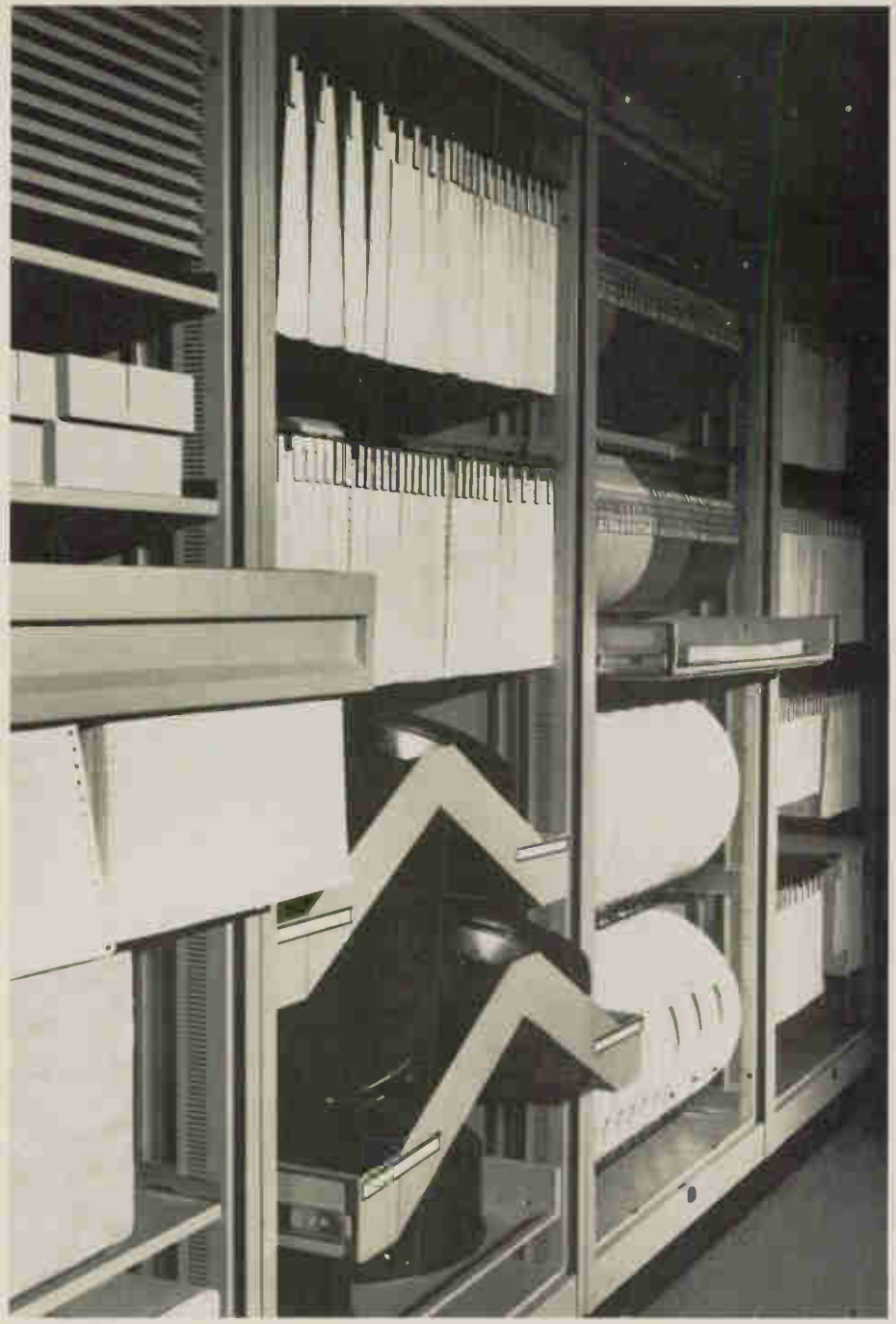
Reader Service Card Number 286

1972 Bought first Optimedia cabinets to file remaining punch cards, 1316 disc packs and reels of 1600 BPI tape.



1975 Media changed to include 3336 packs in addition to tape. Cabinets reconfigured, new cabinets added.

1978 New system required 3348 disks but no tape. Manuals and run books added. Cabinets again adapted to needs.



1981 Optimedia usage has grown to include a wide variety of computer room media, systems and programming documentation and printout reports in all departments of the company. As media has changed, the Optimedia cabinets have been reconfigured to meet each new filing need.

optimedia® cabinets

Because you don't know how your filing requirements may change in years ahead.

The days of single-purpose, soon-to-be-obsolete cabinets for D.P. records, documents and reports were struck a blow in 1972. That's the year Optimedia was introduced to computer rooms. Now these cabinets have become industry standards wherever D.P. media is filed. It's the filing cabinet with 99 lives. Find out why, circle the readers' service number or write today for our free brochure. The Wright Line, Marketing Department, P.O. No. 600, Agincourt, Ontario M1S 3C6.

Wright LINE

a unit of Barry Wright

Reader Service Card Number 233

DigiDyne Inc.
Booth: 1711

785 Lajoie Ave.,
Dorval, Que. H9P 1G7
(514) 631-1891

Exhibiting: Cipher Data Products Inc.—Microstreamer tape drives; Kepco Inc.—OEM open-frame switching power supplies; MPI—5¼ floppy disc drives & 8″ narrow-profile floppy disc drives.

Priam Inc.—8″ and 14″ Winchester disc drives; Solartron—logic testers; Hitachi—15 Meg to 100 Meg oscilloscopes.

Personnel: Nick Home, Ivan Berkovits, Tom Slodichak, Joel Duchoeny.

Reader Service Card Number 287

Digital Business Computers
Booth: 2217

133 Manitou Dr.
Kitchener, Ont. N2H 2T9
(519) 893-4200

Reader Service Card Number 288

Digital Equipment of Canada
Booth: 'F'

100 Herzberg Rd., P.O. Box 13000
Kanata, Ont. K2K 2A6
(613) 592-5111

Reader Service Card Number 289

Diskette House Inc.
Booth: 1712

147 Bentworth Ave.,
Toronto, Ont. M6A-1P6
(416) 781-5877

Exhibiting: Full range of computer media supply products. Distributors for Syncom "Ectype" diskettes, computer tape, and disk cartridges.

Personnel: Ed Marks, Paulette Marks, Bob Harrop.

Reader Service Card Number 290

Dispo-Tech (Toronto)
Booth: 822

2055 Ellesmere Rd., Unit # 8
Scarborough, Ont. M1H 2W6
(416) 438-3913

Reader Service Card Number 291

Dynalogic Corp. (Div. Kombi Corp.)
Booth: 170, 172

302 Leggett Dr., Ottawa, Ont. K2K 1Y6
(613) 592-3413

Exhibiting: Model 8092 Dynalogic Microcomputer System (DMS) incorporates 8.4-Mbyte Winchester hard disc and 1.2-Mbyte floppy diskette drives, supports flexible DynalLedger and DynaScript software for accounting and word processing needs.

DynaStor RS-232 floppy diskette subsystem provides direct IBM media compatibility for any ASCII computer.

DynaStor LSI-11 (Q-Bus) compatible floppy diskette subsystem.

Personnel: C. Murray Bell, Paul R.J. Matthews, Ranald L. Muir.

Reader Service Card Number 292

Dresser Controlled Power
Booth: 1729

877 Waler Road,
Windsor, Ont. N8Y 2N4
(519) 256-8254

Exhibiting: This booth will feature power systems for computers. The display will include the Series 500 power line regulator for use where line voltage varies above and below nominal levels and requires automatic correction. Also included is the Series 600 ultra-isolation transformer which provides low capacitive coupling between input and output circuits. The Series 800 power purification system is a resonant regulation and isolation transformer and the Series 900 electronic line voltage regulator is designed for regulating line voltage within a very narrow regulation band.

Personnel: John Mollon, Henry Tazzia.

Reader Service Card Number 293

Dynamedia Computer Products
Booth: 1616, 1620

170 The DonWay W., Suite 105
(416) 441-1595

Exhibiting: A wide range of data processing and word processing products, including the Verbatim line of diskettes, cassettes, and data cartridges. Also on display will be the Monarch line of multimedia storage cabinets, workstations, terminal and printer stands, tape racks, binder and document storage cabinets, tape and disc carrying cases.

Other products include magnetic computer tape, disc packs, disc cartridges, printer ribbons, acoustic covers, labels, diskette storage, stock tab and antistatic mats, as well as the CPS computer power distribution system.

Personnel: Harvey Beitchman, Ron Bourne, Louis Vachon, A. Santini, Syd Bernstein.

Reader Service Card Number 294

Dynamic Custom Equipment
Booth: 1901, 1903

1275 Britannia Rd. E.,
Mississauga, Ont. L4W 1C7
(416) 678-2360

Exhibiting: Adjustable-height computer tables and desks that can be attached together to make workstations that fit the needs of most mini and micro-computers. Stations can be constructed to adapt to space limitations.

Personnel: Jeff Plant, Sid Plant, Perry Plant, Bob Vitchell.

Reader Service Card Number 295

EKM Associates Inc.
Booth: 184

6 Lansing Sq.,
Toronto, Ont. M2J 1T5
(416) 497-0605

Exhibiting: EKM Associates will exhibit acoustical sound enclosures for all types of data processing printers, anti-glare filters to eliminate background reflections on CRT screens and an adjustable terminal table.

Personnel: Gordon McLean, Sigrid Di-Bella, Suzanne Doucette.

Reader Service Card Number 296

EMJ Data Systems Ltd.
Booth: 2114

79 Regal Rd., Unit # 5
Guelph, Ont. N1K 1B6
(416) 846-3233

Exhibiting: Intertec products: Superbrain and Compustar microcomputers. Letter quality Olivetti based printer—The TP121I.

Personnel: Jim Estill

Reader Service Card Number 297

ENA Datasystems Inc.
Booth: 379

268 Galaxy Blvd.
Rexdale, Ont. M9W 5R8
(416) 675-3304

Reader Service Card Number 298

E.P.M. (Disc-Media Services)
Booth: 2349

801 York Mills Rd.,
Suite 201,
Don Mills, Ont. M3B 1X7
(416) 444-7357

Exhibiting: Demonstration of inspection & cleaning methods for disc packs and cartridges. Care and handling tips will also be provided for disc media products.

Personnel: David Boerrichter, Jim Riess, Dave Rushton.

Reader Service Card Number 299

E.P.S. Consultants
Booth: 2240, 2242

2 Robert Speck Parkway, Ste. 1080
Mississauga, Ont. L4Z 1H8
(416) 279-8711

Reader Service Card Number 300

Efstonscience Inc.
Booth: 2215

3500 Bathurst St.,
Toronto, Ont. M6A2C6
(416) 787-4583

Exhibiting: This company is the Canadian distributor for Jensen Tools of Tempe, Arizona. We specialize in tool kits and testing instruments for the computer trade. Jensen Tools is a highly reputable firm among computer servicing and installation bureaus and we have been very successful in marketing their products in Canada.

Personnel: Evan Efston, Tom Gleason.

Reader Service Card Number 301

BOOKSHELF

Minicomputer Systems, by M. Vardell Lines and Boeing Computer Services Co., published by Winthrop Publishers Inc., Cambridge, Mass., 217 pp., hardbound.

This text is intended as an overview of minicomputer systems from history to system design and implementation. It covers the technology and use of small computers, and gives advice on the selection of different types of systems. The text surveys the range of computer hardware components and their interconnections, central processing units, memory, and input/output. Preliminary and detail design problems and implementation requirements are also presented. The text includes information guides for computer networks and system design, and more than 100 drawings, photographs and tables.

Microcomputers for Engineers and Scientists, by Glenn A. Gibson and Yu-cheng Liu, published by Prentice-Hall Inc., Englewood Cliffs, NJ, 479 pp., hardbound, $24.95.

This text is intended to close the gap between the expansion of microelectronic applications and user productivity. The book concentrates on the area of digital electronics applications that are complicated enough to justify the use of microprocessors, and is intended for scientists and engineers who wish to acquire an overall knowledge of microcomputers and program design.

The text covers: data formats; digital devices; integrated circuits; microcomputer architecture; programming; input/output; system bus and I/O control logic; I/O interfaces; solid state memory subsystems; development tools; single-chip 16-bit microprocessors; and bit-sliced microprocessors.

iSBX Bus Specification Manual, published by Intel Corp., Hillsboro, Ore., 32 pp.

Available to support new members of the Intel Multibus product family, this manual documents the iSBX Multimodule concept. The manual contains mechanical, electrical and functional descriptions to assist designers wishing to implement the bus into their system, or to evaluate the expansion facilities offered by the bus. The Multimodule board products to which the manual refers include the iSBC 80/24 single-board computer, compatible with the iSBC 80/20-4 8-bit computer, and the iSBC 301 4K byte memory expansion board.

Beginning Fortran, by Joe W. McKinley, published by Matrix Publishers Inc., Portland, Oregon, 242 pp., softbound, $9.95 US.

This text is intended for students at the high school, college and university level. Although written primarily about a batch processing mode of operation, the book can be useful for those learning Fortran in an interactive or time-sharing mode. The book is divided into four sections that include: a general overview, arithmetic operations, input/output, control statements, subscripted variables, subprograms, functions and subroutines, advanced programming, and example projects. Five appendices cover keypunching, flowcharting, deck set ups, an introduction to matrix algebra, and scientific subroutine packages.

Data Communications: An Introduction to Concepts and Design, by Robert Techno, published by Plenum Press, New York, N.Y., 293 pp., hardbound, $24.50 US.

This text is intended as an introduction for readers with no prior knowledge of data communications, while also serving as a comprehensive overview for the computer professional involved in the proposal, evaluation, or implementation of teleprocessing systems.

Readers are introduced to the basic concepts of data communications beginning with a historical background, and defining the essential functional components of synchronization, error control, line control, communications channels, modulation processes, and other terminology. Detailed information covering channel capacity in terms of signal speed derived from modulation, different types of channels, and telephone system is also included.

CANADIAN COMPUTER SHOW

ESE Ltd.
Booth: 342

1780 Albion Road,
Rexdale, Ont. M9V 1C1
(416) 749-2271

Exhibiting: A wide variety of data communications products, including a network management and control system, direct-connect modems, and the Universal Data Systems line-powered

modems.

New products on display will be the Codex 8250 LDSU, a synchronous line driver, and the Codex 6001 INP, a 4- or 8-channel statistical multiplexer. Both products were developed and are manufactured at ESE.

Personnel: R.C. Willcocks, Tom McGovern, Charles Murphy, Richard Dugal, Noel Lessard, Ernie Domshy, Sharron Elliott, Joe Farquhar.

Reader Service Card Number 302

ESSNA Ltd.
Booth: 2036, 2040

425 Steelcase Rd. E.,
Markham, Ont. L3R 1G3
(416) 823-3747

Exhibiting: Various types of Epson printers and printer mechanisms. The MX Series interfaces to most types of microcomputer, such as Apple, IBM,

Hewlett-Packard, Commodore PET, TRS 80 and others.

In addition, ESSNA will be offering a serial interface with buffering capabilities for data transmission over telephone lines that installs inside the MX printers.

Personnel: Ed Bruner, Terry Ibbetson, Mike Green, Craig Dickson.

Reader Service Card Number 303

Electralert Ltd.
Booth: 1513, 1515

160 Gibson Dr. Unit 6,
Markham, Ont. L3R 3K1
(416) 495-6730

Exhibiting: Winchester disc drives: 5¼ inch/8 inch/14 inch; capacities from 5 megabytes to 80 megabytes.

New from Digi-Data ¼-inch streaming cartridge tape drive for Winchester data back-up.

Color graphics hard-copy generator. Produces 35mm slides, or 4" x 5" or instant Polaroid copy from color video monitor.

Caldisk floppy drives, 5¼ and 8 inch.

Personnel: Ken Oag, Bob Fopeano.

Reader Service Card Number 304

Electro & Optical Systems
Booth: 1608

31 Progress Ct., Scarborough, Ont. M1G 3V5
(416) 439-9333

Exhibiting: Computer color graphics displays. High-resolution and wide bandwidth color displays suitable for CAD/CAM, and ultra-high resolution displays in sizes from 13" through 26" are also available. Models in either OEM chassis or standalone cabinets. Scanning frequencies up to 32KHz for 1024 x 1024 operation and video bandwidths to 40 MHZ.

Personnel: Michael L. Paull, A. Maurice Evans, D. Abbott.

Reader Service Card Number 305

Electrohome Ltd.
Booth: 400

809 Wellington Stn., Kitchener, Ont. N2G 4J6
(519) 744-7111

Exhibiting: Complete range of monochrome and color (medium to high-resolution) video displays, both enclosed and open-frame, in screen sizes of 9, 11, 12, 13, 15, 17, 19 and 23-inches. Also, a large-screen EDP-57 data/graphics projection video monitor that interfaces with most computers. Also Telidon videotex terminals and 'Contract' video displays especially designed for the computer/data industry.

Personnel: J. A. Pollock, S. MacLellan, H. H. LaPier, D. Wismer, D. Murray, D. Leach, T. Muffitt, G. Riggs, B. Parker, H. Maclean, L. Neilson, B. Bell, M. Bensusan, J. Stewart.

Reader Service Card Number 306

Elkay Electronics Ltd.
Booth: 2347

60 Nugget Ave., Unit 10,
Agincourt, Ont., M1S 3A9
(416) 293-8278

Exhibiting: Custom-designed and manufactured off-line switching power supplies for the OEM/EDP market.

Personnel: Leonard Klebanoff, Curtis Clarke, Richard Pikul, Norman Silberberg.

Reader Service Card Number 307

Epic Data
Booth: 2120

7280 River Rd.
Richmond, B.C. V6X 1X5
(604) 273-9146

Reader Service Card Number 308

Evans Research Corp.
Booth: 153

One Eva Rd., Suite 309,
Etobicoke, Ont. M9C 4Z5
(416) 621-8814

Exhibiting: Evans specializes in computer/communications industry market research, technical and educational publishing and seminars. Publications on display include recently-released "Planning For The Integrated Electronic Office" and "Corporate Strategies For The Canadian Computer Industry." Booth personnel will discuss public and custom-tailored in-house seminars and management briefings.

Personnel: Susan Bradley, Grant Higgins, Geraldine Moscato, Hugh O'Rourke, Andrew Toller.

Reader Service Card Number 309

Exceltronix Inc.
Booth: 2210, 2212

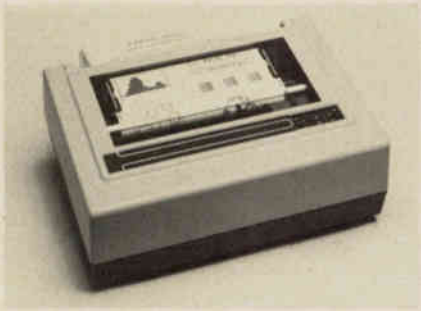
319 College St.
Toronto, Ont. M5T 1S2
(416) 921-5295

Reader Service Card Number 310

Facit Canada Inc.
Booth: 150, 152

161 Norfinch Dr.,
Downsview, Ont. M3N 1Y3
(416) 663-8360

Exhibiting: Facit will exhibit a full line of matric printers including the 4542 Graphics version of the 4540 along with the Dataroyal IPS 7000 and 5000 label,



bar code and text printers. The full range of Facit paper tape will also be shown including the new Facit 4042 Punch/Reader combination.

Personnel: Sid Singh, Wayne Holstenson, Warren Burgess, Ron Gostick.

Reader Service Card Number 311

Fern Computers
Booth: 2111, 2113

242 Hood Rd.
Markham, Ont. L3R 3K8
(416) 494-7799

Reader Service Card Number 312

Ferranti Packard Electronics
Booth: 2028

6030 Ambler Dr., Mississauga, Ont. L5N 2K9
(416) 624-3025

Exhibiting: Maintenance service for minicomputers, microcomputers, terminals, multiplexers and other peripherals. Available for on-call field service as needed or with comprehensive contract, depot repair service, preventative maintenance service in Canada and U.S.A.

Personnel: Michael Jones, Doug Greenwood, Colin McGregor, Dorothy McKinney, Gord Blayney.

Reader Service Card Number 313

Financial Times of Canada
Booth: 2221, 2219

920 Yonge St., Ste. 500
Toronto, Ont. M4W 3L5
(416) 922-1133

Exhibiting: A display of the ways in which you can use Canada's national weekly business newspaper to your best advantage: What's the most efficient way to reach high level decision makers who influence the purchase of computer hardware and software?

How do you find the best middle and senior management level job candidate for your personnel needs?

Personnel: Ron Anderson, Barbara Brayshaw, John Bryant, Mary Koven, Sarah Pennefather, Mick Reid, Mike Schoales.

Reader Service Card Number 314

First City Capital Ltd.
Booth: 2321

99 Avenue Rd.
Toronto, Ont. M5R 2G6
(416) 922-0088

Reader Service Card Number 315

Floating Point Systems, (Canada) Ltd.
Booth: 709, 810

P.O. Box 11328, Stn. 'H'
Ottawa, Ont. K2H 7V1
(613) 820-9608

Exhibiting: Floating Point Systems will exhibit its new FPS-164 high-speed (12 megaflop), extended-precision (64-bit), large-memory (2.5M words) array processor that interfaces to Digital VAX-11/780 and IBM mainframe computers. The multi-tasking FPS-100 and new AP-180V that attaches to the VAX high-speed DR-780 interface will also be shown.

Personnel: Paul Eckland, Jim Sherfey, Pierre Tremblay.

Reader Service Card Number 316

Florida Dept. of Commerce
Booth: 1311

107 W. Gaines Street
Collins Building, Room G-26
Tallahassee, Fla. 32312
(904) 488-9553

Reader Service Card Number 317

Four Phase Systems
Booth: 2214, 2216

560 Dennison St., Unit 9
Markham, Ont. L3R 2M8
(416) 495-1300

Reader Service Card Number 318

G.L. Industries
Booth: 2313

8315 Devonshire Rd.
Mount Royal, P.Q. H4P 2L1
(514) 733-8231

Reader Service Card Number 319

G.A. Computer Ltd.
Booth: P

351 Steelcase Rd. West
Markham, Ont. L3R 4H9
(416) 495-9434

Exhibiting: Data-Acquisition Test System: A real-time, multi-tasking system which handles various process inputs and outputs, providing a color graphic CRT display, plus logging printout and hardcopy reports.

NoCode System: An interactive applications generator, requiring no coding by the user, for a variety of data processing functions.

Display 8 Terminal: An intelligent, user-programmable, CRT terminal providing form-creation, data entry and RJE capabilities.

Personnel: Bob Pritchard, Jim Miller, Harry Leppington, Mac Shaw, Yvon Legault, Gilles Benoit, Maurice Emond, Mike Sterne, Bob Wynnyk, Gerry Suggitt, Tom Millar.

Reader Service Card Number 320

CANADIAN COMPUTER SHOW

Gandalf Data Ltd.
Booth: 331

Gandalf Plaza, 9 Slack Rd ,
Ottawa, Ont K2G 0B7
(613) 225-0565

Exhibiting: Complete line of local data sets, limited distance modems, super-Modem, the PIN Series and PACX IV.

PACX IV which is a microprocessor controlled terminal switching system is designed to automatically connect a number of computer terminals having various service requirements to a number of computer ports capable of supporting these requirements.

Also on display will be the PIN (Private Intelligent Networker) Series of products. The PIN 9102 is a microprocessor controlled interface for use with the Datapac network. PIN 9103 is an intelligent data concentrator that permits up to 32 asynchronous data links to be replaced economically by eliminating the multiple data links and modems, and concentrating data onto a single high-speed link.

Personnel: Chris McKenzie, Brian Heurter, Garry Barnett.

Reader Service Card Number 321

General Datacomm Industries (Canada)
Booth: 1501, 2342

2255 Sheppard Ave. E., Suite W410,
Willowdale, Ont. M2J 4Y3
(416) 498-5100

Exhibiting: At Booth 1501 we will show a full communications product line featuring networking configurations including the network diagnostic system, multiplexers, and a complete D.O.C.-certified line of modems including their new "datacomm family" (a unique new communications packaging concept) will be displayed.

GDC will also be exhibiting equipment dedicated to the home hobbyist and small business user, featuring the GDC 103J-L low speed, low cost modem at Booth 2342.

Personnel: George Best, John Savedra, Barry Walley, Robert Haskell, Elizabeth Thornton, Peppo Casalini, Andrew Brzozowicz, Warren Davies, Paul Zink, Maureen Crowley, Susanne Cavanagh, Anil Sharma.

Reader Service Card Number 322

Graphic Controls Canada Ltd.
Booth: 148

Herbert St ,
Gananoque, Ont K7G 2Y7
(613) 382-4733

Exhibiting: Sensitized paper supplies for non-impact printer/plotters, computer terminals and minicomputers.

One source for thermal, electrostatic and electrosensitive paper for use in dataloggers, chromatographs, spectrophotometers, calculators, recording equipment.

Personnel: John Shields, Glen Shields.

Reader Service Card Number 323

Gentian Electronics Ltd.
Booth: 2013

48 Main St. P.O Box 1240,
Stittsville, Ont. K0A 3G0
(613) 836-3987

Exhibiting: Hi-State Precision Coordinate Digitizer: high precision—Bonded grid; high resolution—.001" high accuracy to ± .003"; high stability—No moving parts; high speed—to 100 points/sec.; high-intensity backlighting.

Standard features include microprocessor versatility; full alphanumeric keyboard; X-Y display; RS232C output; point and stream digitizing modes; single-button cursor; Axis presets; Scaling; ±.005" accuracy; Fixed format; Floating origin

Personnel: Victor Popovich.

Reader Service Card Number 324

Hamilton Avnet
Booth: 1504, 1506, 1508, 1510

6845 Rexwood Rd
Mississauga, Ont L4V 1R2
(416) 677-7432

Reader Service Card Number 325

Hamilton Rentals
Booth: 824, 826, 828, 830

415 Horner Ave , Toronto, Ont M8W 4W3
(416) 251-1166

Exhibiting: Computer terminals from Digital, Texas Instruments, Hewlett-Packard, and others; desktop and graphic computers from Tektronix and H-P; minicomputers from Digital Equipment; and software for applications including word processing, system monitoring and control, and geological survey.

Personnel: Pat Nielson, Mike Fox, Will Jahnke, Clem DiPlacido, Irene Payne, Devon Coburn, Chris Christie, and Hubert LaFrance

Reader Service Card Number 326

Honeywell Information Systems
Booth: 928

2025 Sheppard Ave East, Suite 400
Willowdale, Ont M2J 1W5
(416) 491-0660

Reader Service Card Number 327

Harris Systems Ltd.
Booth: 132

19 Lesmill Rd.,
Don Mills, Ont. M3B 2T3
(416) 441-2400

Exhibiting: Equipment and systems to include the Harris 9200 SNA/SDLC interactive terminal, and the Harris 1670, with interactive Cobol, 'Keyplus', and 'Wordplus' word processing.

Personnel: Bill Miller, Fred Dietz, Gary Foley, John O'Connor, Joel Marois, Anne Singer, Diane Powell, Guido Haas, Fernando Conforti.

Reader Service Card Number 328

Heath/Zenith Data Systems
Booth: 1005, 1104

1480 Dundas St. E.,
Mississauga, Ont. L4X 2R7
(416) 273-3797

Exhibiting: The Z89 microcomputer line, featuring 64K of RAM. The Z47 two-megabyte 8-in. disc drive. The Z67 8-in. hard disc ten-megabyte drive with 8-in. floppy back-up. Z37 5¼-in. high-density soft-sectored disc drive with controller card. Also Zenith-produced utilities languages and applications software.

Personnel: Craig Oliver, Brian Winks, Bill Smith, Tom Goslin.

Reader Service Card Number 329

Hewlett-Packard (Canada) Ltd.
Booth: 114, 116, 120, 'E'

6877 Goreway Drive
Mississauga, Ont. L4V 1M8
(416) 678-9430

Exhibiting: A full range of Hewlett-Packard computers, terminals and peripherals for commercial and technical applications. Featuring: (Commercial) HP 3000 Series, HP 250; (Technical) HP 1000 Series computer; HP 9845 C desktop computer featuring color graphics capability; plotters and printers. New Products: HP 125.

Reader Service Card Number 330

Hill Security Van Lines
Booth: 144

40 Ridgetop Rd.,
Scarborough, Ont. M1R 4G3
(416) 291-5565

Exhibiting: Canada's most extensive transportation service for high-value sensitive products, trade and computer show materials. Official mover for the Canadian Computer Show. Scheduled service linking Canada and major American cities through Allied Van Lines Inc., special products division.

Personnel: Paul Guglietti, Sandy Hopkins, Doug Weir, Tom Burbank.

Reader Service Card Number 331

Human Computing Resources Corp.
Booth: 255

10 St. Mary St., Suite 401
Toronto, Ont. M4Y 1P9
(416) 922-1937

Exhibiting: Human Computing Re-

sources Corporation provides consulting and contract research and development services, markets and supports the Xenix (UNIX Version 7) timesharing operating system for the PDP-11 line as well as for microprocessor based systems (Zilog Z8000, Intel 8086, Motorola 68000), develops and markets Unix-based software products, and develops interactive graphics systems. We will be demonstrating Unix, stressing its systems-programming and document-processing capabilities. There will also be demonstrations of interactive computer graphics in operation.
Personnel: R. Baecker, E. Borkovsky, S. Crossey, S. Pozgaj, A. Rosen, C. Sturgess, M. Tilson.

Reader Service Card Number 332

IBM Canada Ltd.
Booth: 1030, 1038

101 Valleybrook Dr.,
Don Mills, Ont. M3B 3H1
(416) 443-6602
Exhibiting: System/38, System/34, Series/1, 5280 distributed data processing system, 5260 POS retail system, the System/23, 5520 administrative system, and the IBM Personal Computer. Also to be shown are the 6670 information distributor, the IBM Displaywriter, the 3101 display terminal, and 3279 color display terminals.
Personnel: Norm Vokey, Marcel Deurvorst, Bill Lane.

Reader Service Card Number 333

ICL Computers Canada
Booth: 'I'

1 Tippett Rd.,
Downsview, Ont. M3H 5T2
(416) 635-2870
Exhibiting: The System 10 small business computer; the 7700 Information Processor linked to an ME-29 mainframe; and also the 9512 point-of-sale and 9526 in-store data collection terminals. Software will include 'SAFES' manufacturing system and 'STARS' sales-order processing/financial accounting packages.
Personnel: Graham Bendell, Nigel Woolgrove, Jim Barnard, Ray Massey, Stu Moore.

Reader Service Card Number 334

IMSL Inc.
Booth: 2006

7500 Bellaire Blvd.
NBC Building, 6th Floor
Houston, Tex. 77036
(713) 772-1927

Reader Service Card Number 335

Induspac Ontario Inc.
Booth: 2142

951 Matheson Blvd
Mississauga, Ont. L4W 2R7
(416) 625-2913

Reader Service Card Number 336

Info Globe
Booth: 2143

444 Front St. West,
Toronto, Ont. M5V 2S9
(416) 598-5250
Exhibiting: Info Globe is an online database containing all of the articles published in *The Globe and Mail* since November 14th, 1977, and *Report on Business* since January 1st, 1978. The system can be accessed on most telephone compatible data terminals, word processors, and personal computers, and is available through the Datapac network. Info Globe will also be demonstrating Market Scan, a new database containing stock quotations from the Canadian and New York exchanges.
Personnel: Barbara Hyland, Dan Cook, Carol Marble, Ozy Camacho, Glenn Keeling, Diane Wood, Brian Cranley, Rick Noble

Reader Service Card Number 337

Input Canada Inc.
Booth: 2315, 2317

450 Sherbrooke St. East, Ste. 709
Montreal, Que. H2L 1Y7
(514) 282-3905

Reader Service Card Number 338

Innovative Computer Systems
Booth: 2315, 2317

3655 Weston Rd.
Weston, Ont. M9L 1V8
(416) 745-9670

Reader Service Card Number 339

Infotron Systems Corp.
Booth: 2318, 2320

Cherry Hill Industrial Center
Cherry Hill, N.J. 08003
(609) 424-9400

Exhibiting: Infotron's complete line of multiplexers, modems and portable test equipment are on display. Featured is the supermux 790 network concentrator. Designed primarily for multinode networks, the SM790 network concentrator offers centralized console control and monitoring, data protection, concentration and switching, alternate routing and load balancing. This device communicates with up to 8 remote SM790's or other INFOTRON SUPERMUX STATISTICAL MULTIPLEXERS (480's, 680's and 780's) at speeds to 72 kbps.

Personnel: Robert J. Bauer.

Reader Service Card Number 340

Interfax Systems Inc.
Booth: 2110

5955 Airport Rd., Suite 105,
Toronto, Ont. L4V 1R9
(416) 671-3920

Exhibiting: Electronic test equipment for field service, R&D and manufacturing; dynamic in-circuit IC tester from Thalamus Electronics Dolch Logic Analysers (16-19 channels); Quantec Systems PROM programmers and copiers; Kikusui oscilloscopes; Digital Multimeters from Data Precision.

Personnel: Kim Etherington, Howard Pakosh, Bryan Webb, Mark Lowman.

Reader Service Card Number 341

International Career Specialists
Booth: 2116

1430 Yonge St. Suite 225
Toronto, Ont. M4T 1Y6
(416) 964-7484

Exhibiting: Data processing specialists in the employment agency field.

Reader Service Card Number 342

Interplanetary Computer Systems Ltd.
Booth: 2126, 2128

950 Denison St., Unit 17
Markham, Ont. L3R 3K5
(416) 498-6836

Reader Service Card Number 343

Irwin Electronics
Booth: 1747, 2046

43 Hanna Ave., Floor 5
Toronto, Ont M6K 1X6
(416) 533-3521

Reader Service Card Number 344

Kent, Parke and Associates
Booth: 713, 715, 814, 816

2300 Yonge St., Suite 404
Toronto, Ont M4P 1E4
(416) 488-3336

Reader Service Card Number 345

SYSTEMS	33
MEMORIES	21
SUBSYSTEMS	31

RUN FASTER
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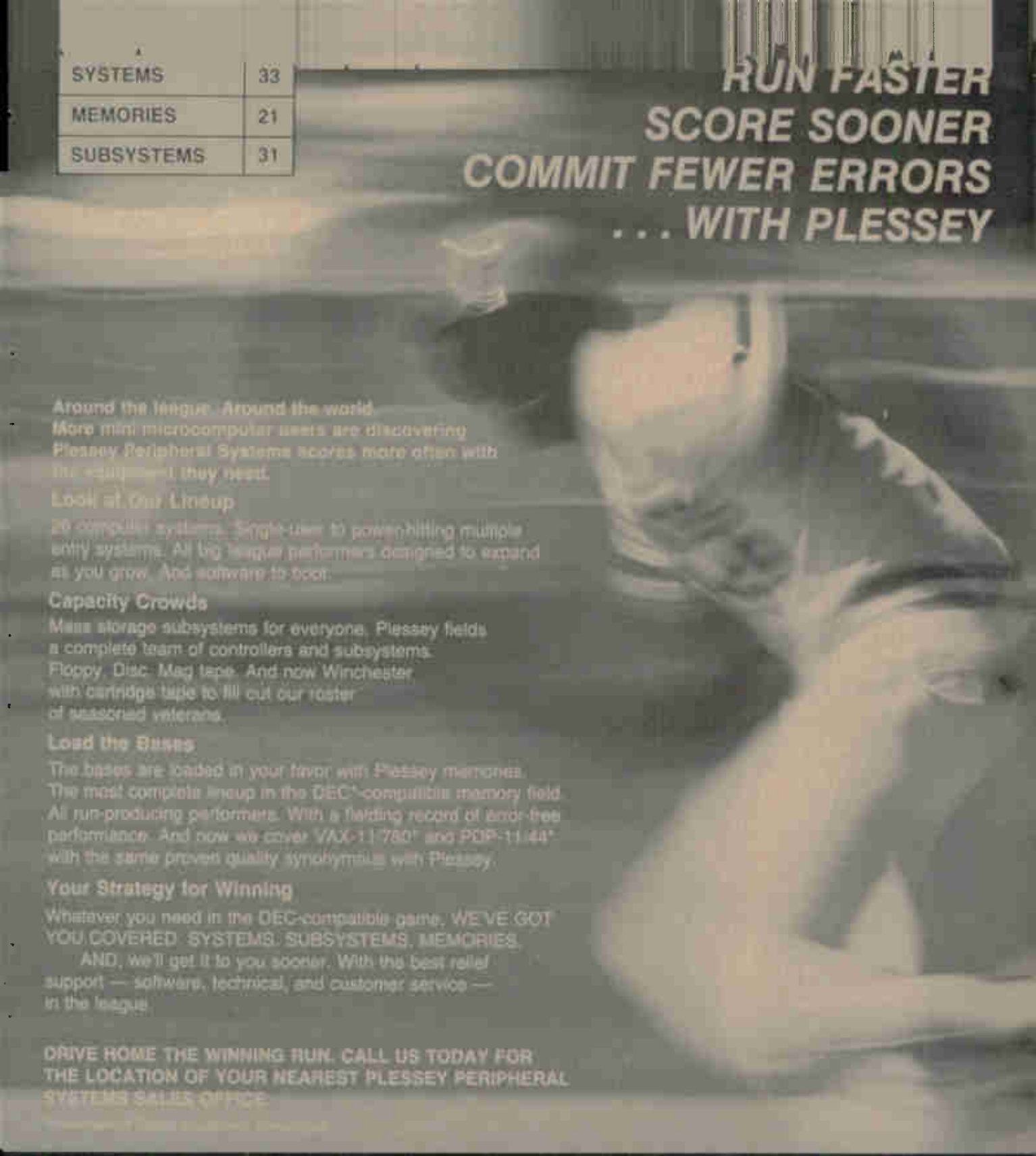

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CANADIAN COMPUTER SHOW

Kerr Norton (1977) Ltd.
Booth: 2106
11 Progress Ave., Unit 15
Scarborough, Ont. M1P 4S7
(416) 291-8836
Reader Service Card Number 346

Kodak Canada Inc.
Booth: 158, 162
3500 Eglinton Ave West
Toronto, Ont. M6M 1V3
(416) 766-8233
Reader Service Card Number 347

Kompro Canadian Computer Products Ltd.
Booth: 1409
315 Flint Rd
Downsview, Ont. M3J 2J2
(416) 663-1766
Reader Service Card Number 348

Lanpar Ltd.
Booth: Island 'J'
85 Torbay Rd.
Markham, Ont L3R 1G7
(416) 495-9123
Reader Service Card Number 349

Levitt-Safety Ltd.
Booth: 349
51 Laird Dr.,
Toronto, Ont. M4G 3T4
(416) 425-7230
Exhibiting: Levitt Systems will demonstrate the effectiveness of Dupont Halon 1301 to control and extinguish fires associated with computer facilities. Also on display will be the following: Justrite safety containers; Cease-Fire flame tamer containers; vacuum lifters and safety signs; hearing protection plus various escape breathing apparatus and portable fire extinguishers.
Personnel: Lorne Roberts, John Deline, Barry Rowswell, Mac Squires
Reader Service Card Number 350

Logic/One Ltd.
Booth: 1707
2755 Thamesgate Dr.
Mississauga, Ont. L4T 1G5
(416) 678-2345
Reader Service Card Number 351

Lumapower
Booth: 620
71 Finchdene Sq
Scarborough, Ont M1X 1A7
(416) 292-9782
Reader Service Card Number 352

MPS Management Consultants
Booth: 180
201 Consumers Rd., Suite 201,
Willowdale, Ont M2J 4G8
(416) 491-4231
Exhibiting: MPS-F financial modelling and planning system with colour graphics; Feedmix program for optimizing animal feed while considering costs and nutritional properties; PACS personalized airline crew scheduling; Oracle relational database products; electronic mail systems.
Personnel: Hiroo Thadaney, Victor Barwell, Ken Lythall, Ray Talwar, Prabir Dutt, Hans Ngo.
Reader Service Card Number 353

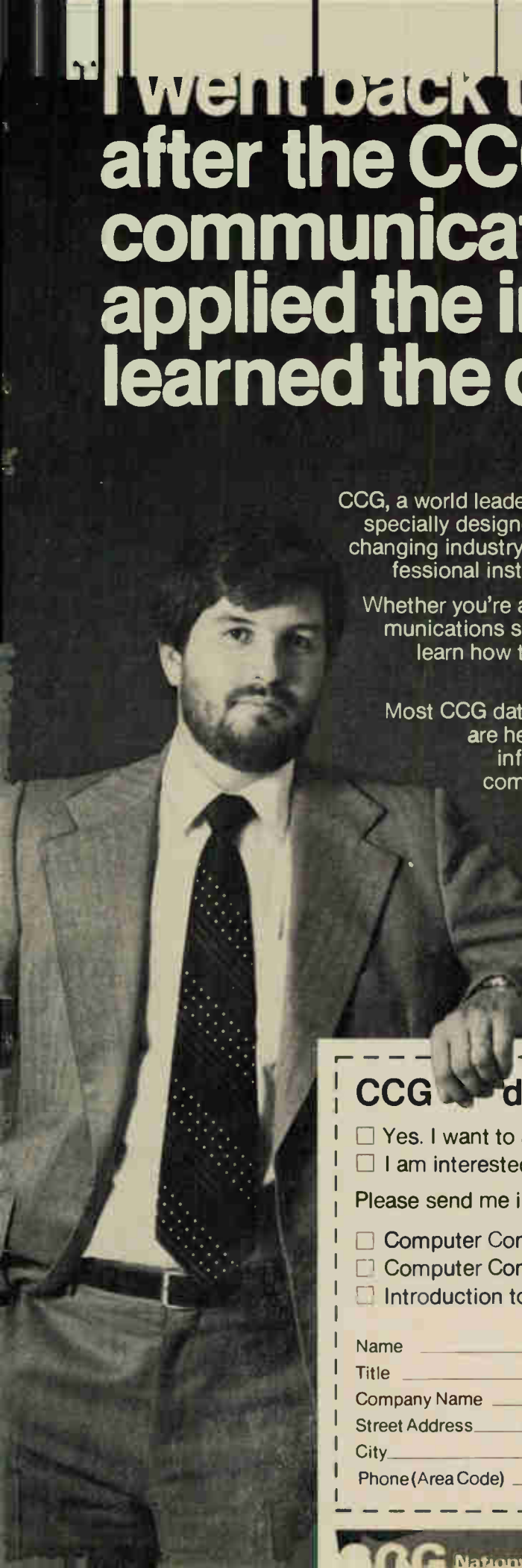
MCM Computers Ltd.
Booth: 321
6815 Rexwood Rd.,
Mississauga, Ont.
(416) 678-9170
Exhibiting: MCM power and micropower APL microcomputers.
Personnel: G. Jones, J. Aucoin, J. Woods, R. Mintz.
Reader Service Card Number 354

M & W Computers Inc.
Booth: 1721, 1719
2155 Leanne Blvd., Unit 3
Mississauga, Ont. L5K 2K8
(416) 822-8080
Reader Service Card Number 355

K.O Mair Associates
Booth: 383
145 Spruce St.
Ottawa, Ont.
(613) 238-7766
Exhibiting: DHK-11—8 line asynchronous port DMA Transmit programmable board for the LSI-11; full range of floppy and hard disk systems; we represent ADAC Dilog and Data products
Personnel: Dave Dexter, George Lambert, Barb Ward, Robert Gervais, Wayne Bradley
Reader Service Card Number 356

"I went back to work after the CCG data communications course and applied the information I had learned the day before."

Bryan Barrier
Senior Systems Analyst CIL Inc.



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The Computer Communications Group
TransCanada Telephone System

Reader Service Card Number 135

CCG data communications courses

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Ottawa, Ontario
K1P 6H5

CDS 1081

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CANADIAN COMPUTER SHOW

MSI Data Corp.
Booth: 618

2061 McCowan Rd., Unit 203,
Scarborough, Ont. M1S 3Y6
(416) 298-7332

Exhibiting: Exhibiting various products such as Series 66/77 and the programmable 88 "Omega Generation" portable handheld terminals, used for electronic ordering, salesman order entry and inventory tracking & replenishment.

Also on display will be the newly released MSI/fsr Terminal used in field service reporting, and the MSI Route Manager for route accounting systems.

Personnel: Jim Goodwin, Frank Williams, Ruth Sinclair, Ben Clark.

Reader Service Card Number 357

MSA Incorporated
Booth: 2314

3445 Peachtree Rd NE, Suite 1300
Atlanta, Ga. 30326
(404) 262-2376

Reader Service Card Number 358

Mannesmann Tally Canada
Booth: 1137, 1139, 1141

703 Petrolia Rd.
Downsview, Ont. M3J 2N6
(416) 661-9783

Reader Service Card Number 359

Matrox Electronic Systems Ltd.
Booth: 2141

5800 Andover Ave.
Montreal, P.Q. H4T 1H4
(514) 735-1182

Reader Service Card Number 360

Megatronix Inc.
Booth: 301, 305

100 Penn Dr.,
Weston, Ont. M9L 2A9
(416) 742-8015

Exhibiting: Megatronix will exhibit a range of graphics equipment including color graphics display terminals, digitizers, plotters, and graphics cameras. Also on display will be a variety of data acquisition equipment, data transmission test instruments, cable fault location equipment.

Personnel: Doug Aitken, Walter Ward, Les Bradford, Daniel Antz, Jim Elson, Alan Rosenthal.

Reader Service Card Number 361

Memorex
Booth: 809, 811, 910, 912

230 Lesmill Rd.
Don Mills, Ont. M3B 2T5
(416) 449-9940

Reader Service Card Number 362

Merit Personnel Consultants
Booth: 1713

27 Queen St. East, Suite 1001,
Toronto, Ont. M5C 2M6
(416) 364-1455

Reader Service Card Number 363

Micos Computer Systems
Booth: 'Y'

1295 Eglinton Ave. E.
Mississauga, Ont. L4W 3E6
(416) 624-0320

Exhibiting: The Micos family of business computer systems is a combination of compatible hardware and operating systems software. Micos will be demonstrating the Micos 100, 200 and newly announced 300 system. Micos peripherals which supplies plug compatible equipment in the DEC, Data General and Hewlett-Packard marketplace will be displaying the equipment of the following manufacturers: Systems Industries, Control Data, Storage Technology, Visual Technology.

Personnel: John Holliday, Wayne Thompson, Rudie Nagelmakers, Gilles Aucuit, Micos Distributors.

Reader Service Card Number 364

Micros Magazine
Booth: 2115

583 Ellice Ave.
Winnipeg, Manitoba, R3B 1Z7
(204) 783-7064

Reader Service Card Number 365

McCormack and Dodge Corp.
Booth: 1309

560 Hillside Avenue
Needham, MA 02194
(617) 449-4012

Exhibiting: A full line of accounting packages including G/L PLUS, general ledger/financial analysis system; A/P PLUS, accounts payable information system; F/A PLUS, fixed-asset accounting system; CPA PLUS, capital project accounting system; P/O PLUS, purchase order management system, and HiLite, an on-line query system.
Personnel: Wally Reifschneider, Ursula Bachli, Steve Bielawski, Kris Oberoi, Gail Walker, Clay Alexander, Carlo Maturo, Allen Katzoff.

Reader Service Card Number 366

McQueen Technology Corp.
Booth: 2029

93 Regal Rd., P.O. Box 1850,
Guelph, Ont. N1H 7A1
(519) 836-1010

Exhibiting: Sensalert production-line monitoring systems. Direct connection to machinery on plant floor gives minute-by-minute display of downtime, production counts, idle time and end of shift forecasts, at an economical system price.
Personnel: Bob McQueen, Scott Mitchell.

Reader Service Card Number 367

Maclean Hunter Business Publications
Booth: 365

481 University Ave
Toronto, Ont M5W 1A7
(416) 596-5000

Reader Service Card Number 368

NCR Canada Ltd.
Booth: 938, 1201

6865 Century Ave.,
Mississauga, Ont L5N 2E2
(416) 826-9000

Exhibiting: NCR Canada plans to feature some of the company's latest developments in hardware and software. Included will be the I-9020, one of the recent releases in the new I-9000 family of interactive systems. Also on display will be the NCR 2950 "terminal of the '80's".

Other products to be highlighted will include the 1770 and 1780 automated teller machines, the 5330 COM recorder/readers as well as a variety of retail P.O.S. terminals.

Software programs to be demonstrated will range from the Interactive Manufacturing Control System (IMCS), and Retail Manufacturing System (RMS III) on the I-9020 to the Medics and Remittance Control Systems on the 2950.
Personnel: V. Tremblay, J. Bennett, E. Hui, P. Furdyk, C. Ballantyne, J. Boks, S. Grosman.

Reader Service Card Number 369

NSN Options Ltd.
Booth: 2346

2102 Speers Rd.,
Oakville, Ont. L6L 2X8
(416) 827-0844

Exhibiting: Hewlett-Packard desktop computers; Cromemco microcomputers; Epson printers; GPIB and RS232C

peripheral devices; 5-megabyte disc drives; magnetic tape drives; data cartridge storage system.
Personnel: Neil Huddlestone, Stan Walker, Nicholas Brown, Ian Menzies.

Reader Service Card Number 370

Nabel Leasing (Citicorp Leasing)
Booth: 1715

P O Box 5050, South Service Rd
Burlington, Ont L7R 4C8
(416) 639-1144 Ext 146

Reader Service Card Number 371

Nabu Manufacturing Corp.
Booth: 1601, 1605

485 Richmond Rd.
Ottawa, Ont.
(613) 725-3300

Reader Service Card Number 372

Nakcomm Systems
Booth: 252

56 Bramsteele Rd.
Brampton, Ont. L6W 3M7
(416) 459-7617

Reader Service Card Number 373

Nashua Canada Ltd.
Booth: 1123, 1125

P.O. Box 299,
Peterborough, Ont.
(705) 743-1120

Exhibiting: Nashuas complete line of disc packs, disc cartridges & flexible disk (diskettes). We will also be exhibiting our line of xerographic toners and developers for various computer printers.
Personnel: Frank Cushing, Paul Wilson, John Filice, Dave Parry, Bob Armitage, John Claude.

Reader Service Card Number 374

Nelma Electronics Ltd.
Booth: 918

5170-A Timberlea Blvd.,
Mississauga, Ont. L4W 2S5
(416) 624-0334

Exhibiting: Word-50 and Word-70 series word processing systems; the OP-1 series of intelligent information systems; and a low-cost WP system called Word-15.
Personnel: Dan Dawson, Fred Horne, Leslie Aitken, Carol Deane.

Reader Service Card Number 375

Nicolet Instrument Canada
Booth: 1111, 1113

1—1200 Aerowood Dr.,
Mississauga, Ont. L4W 2S7
(416) 625-8302

Exhibiting: The Zeta 3620 intelligent digital drum plotter. This is the fastest 36″ drum plotter on the market, with 35″/sec. axial speed, 4G acceleration, 0.00049″ resolution. The plotter's intelligence is provided by two 16-bit microprocessors. Features include windowing and built-in diagnostics.

Models 1453SX and 1453B 12″ plotters will also be exhibited.
Personnel: Neil Lippiatt, Jim Courtney.

Reader Service Card Number 376

NIFE-Powertronic Corp.
Booth: 1604, 1606

125 Nantucket Blvd.,
Scarborough, Ont. M1P 2N8
(416) 757-5151

Exhibiting: NIFE-Powertronic Uninterruptible Power Supplies are used in modern high-performance industrial control, data processing and communications systems demanding high quality, transient free power. This year's exhibit features a UPS system with a brain, which detects input/output variations and equipment malfunctions, takes corrective action and provides a time-stamped printout.
Personnel: F. Spencer, M. Gallant, B. Hartland, N. Paton.

Reader Service Card Number 377

Nixdorf Canada Ltd.
Booth: 1122

505 Consumers Rd., Suite 102,
Willowdale, Ont. M2J 4V8
(416) 498-7200

Exhibiting: Equipment for data-entry, word processing, and distributed processing.
Personnel: Paul Kordish, Paul Pidcock, Linda Small, Mary Balla, Phil Frampton.

Reader Service Card Number 378

Norango Computer Systems
Booth: 358

801 York Mills Rd.
Don Mills, Ont. M3B 1X7
(416) 449-2761

Exhibiting: Durango 800XR dual-mode word processing and data processing computer.

Malibu dual-mode 200 printer flip-a-switch word data processing.

MPI graphic printer single sheet feed or tractor feed.

EXO computer—Z-80-based microprocessor business computer.

Reader Service Card Number 379

Norand Datasystems
Booth: 1117

525 Norfinch Dr.
Downsview, Ont. M3N 1Y7
(416) 663-5307

Reader Service Card Number 380

Norpak Ltd.
Booth: 343

Kanata, Ont. K2L 2P4
(613) 592-4164

Reader Service Card Number 381

Norris Computer Systems
Booth: 1725

45 Overlea Blvd., Suite 5
Toronto, Ont. M4H 1C3
(416) 421-6718

Exhibiting: A variety of "custom" business programs for the TRS-80, model 11 microcomputer, including: G/L, A/R, A/P, Inventory, Payroll, Bills of material, Invoicing, and Quality control.

NCS will feature a 10-megabyte hard disc drive allowing multiple computer access. Visit our booth to discuss your custom programming needs.
Personnel: Bonny Norris, Eric Norris, Chuck Norris, Dan Tomlinson.

Reader Service Card Number 382

North American Strong Box Corp.
Booth: 2112

43 Britain St.
Toronto, Ont. M5A 1R7
(416) 364-8447

Reader Service Card Number 383

Northern Telecom Canada Ltd.
Booth: 1130

304 The East Mall,
Toronto, Ont. M9B 6E4
(416) 236-2641

Exhibiting: Northern Telecom will be displaying its full range of electronic office systems, including Omniword, the new Displayphone, and the Repair and Overhaul Division's capabilities in instrument and data communications product repair.
Personnel: Robert H. Yuill, Robert Tatemichi, Don Crossland, Steve Pallavicini.

Reader Service Card Number 384

Olivetti Canada Ltd.
Booth: 2125, 2127, 2226, 2224

Don Mills, Ont. 1390 Don Mills Rd.
M3B 2X3
(416) 447-3351

Reader Service Card Number 385

Omega Science Inc.
Booth: 1109

342 Munster Ave.
Toronto, Ont. M8Z 3C5
(416) 239-3913

Exhibiting: Ohio Scientific microcomputers; Delta S-100 bus microcomputers; software for small business, lawyers; accountants, financial planners, engineers, construction and manufacturing.
Personnel: S. Jordan, W. Complak, D. Elliott.

Reader Service Card Number 386

Opportunities Unlimited
Booth: 1133, 1135

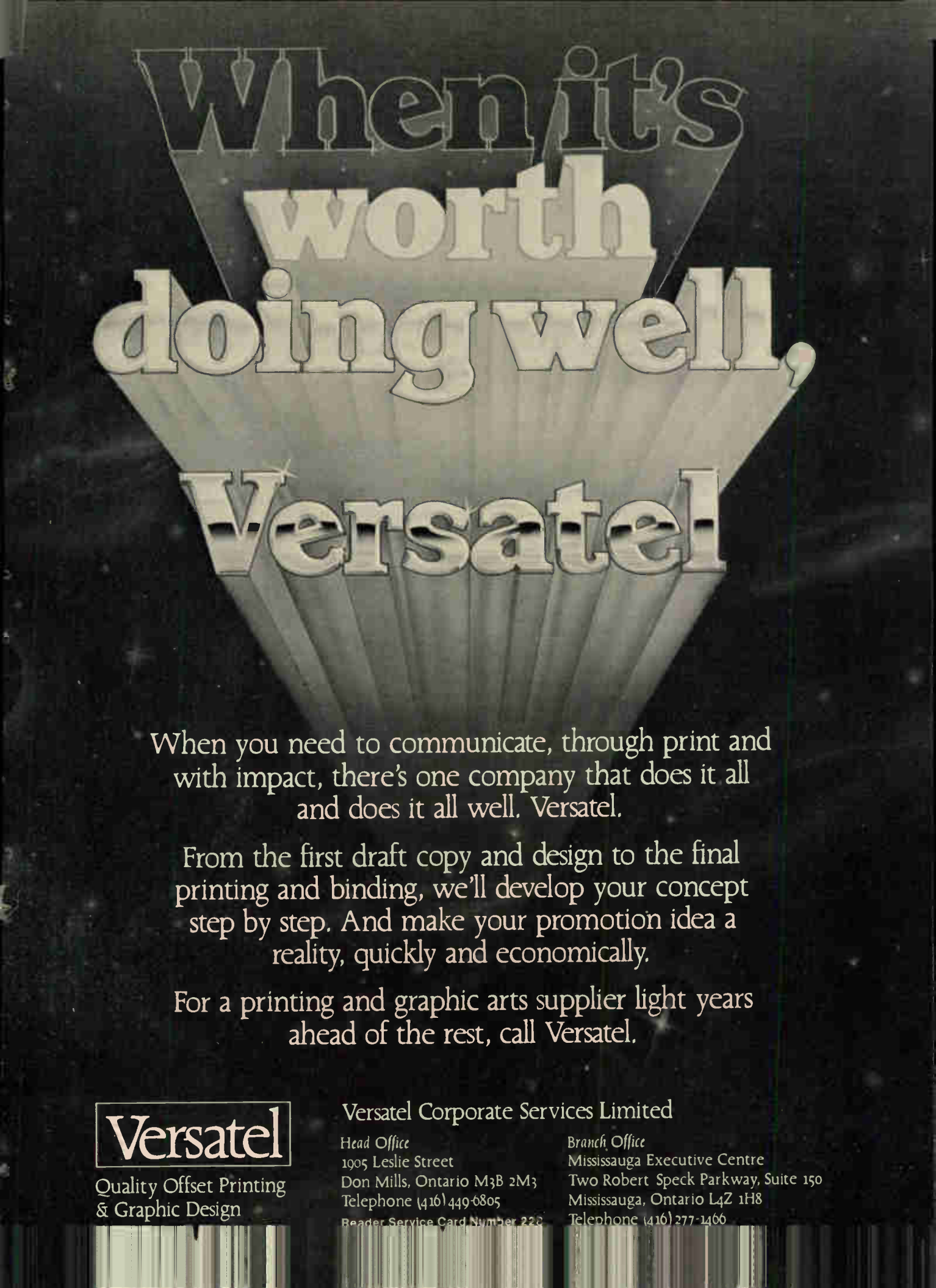
Commerce Court West, Suite 5201
Toronto, Ont. M5L 1A1
(416) 364-1445

Reader Service Card Number 387

Omni Tech—TDC Graphics
Booth: 2119, 2121

80 Royal Crest Rd.
Rexdale, Ont. M9V 4C1
(416) 749-3970

Reader Service Card Number 388



When you need to communicate, through print and with impact, there's one company that does it all and does it all well. Versatel.

From the first draft copy and design to the final printing and binding, we'll develop your concept step by step. And make your promotion idea a reality, quickly and economically.

For a printing and graphic arts supplier light years ahead of the rest, call Versatel.

Versatel

Quality Offset Printing
& Graphic Design

Versatel Corporate Services Limited

Head Office
1905 Leslie Street
Don Mills, Ontario M3B 2M3
Telephone (416) 449-6805

Branch Office
Mississauga Executive Centre
Two Robert Speck Parkway, Suite 150
Mississauga, Ontario L4Z 1H8
Telephone (416) 277-1466

Reader Service Card Number 228

Omni Data Systems Inc.
Booth: 1700

5 Denison St ,
Markham, Ont L3R 1B5
(416) 495-1855

Exhibiting: Canadian designed and manufactured EIA/Co-Ax communication interface switches (stand alone and rack mounted), accoustic couplers,

digital line drivers, modem eliminators, EIA cables and the latest product release—Atlas—a data communication hardware switch, monitoring and statistic gathering system controlled and operated by upgradeable software.

Personnel: Jose M. Gonzalez, Vince R. Catling, Betty Long, Paul Tang, Laszlo Varsanyi, John Russell, Carlos Figueiredo.

Reader Service Card Number 389

Pacemaker Data Ltd.
Booth: 2407

100 Main St E
Hamilton, Ont L8N 3R4
(416) 527-7701

Reader Service Card Number 390

Pansophic Systems of Canada
Booth: 832, 834

165 Dundas Street W , Suite 902
Mississauga, Ont L5B 2N6
(416) 272-0780

Exhibiting: Systems software products for IBM and plug compatible hardware that are utilized for increased management and control of the computer environment. Basic product line is Panvalet, Easytrieve, Panaudit, Panrisk and Panexec.

Personnel: David Penner, Bruce Durrant, Pat Batty.

Reader Service Card Number 391

Paradyne Canada Ltd.
Booth: 1629

200 Consumers Rd , Suite 504,
Willowdale, Ont M2J 4R4
(416) 494-0453

Exhibiting: Modems—A full line of modems including "intelligent" microprocessor based modems up to 9600 bps, and the first 14,400 bps and 16,000 bps modems;

Analysis—The automatic network management system;

Pixnet—An innovative approach to data communications offering the user the features of SNA today;

Response—A truly coordinated approach to distributed processing.

Personnel: R. G. MacPherson, H. A. Rowe, R. B. Johns, D. G. Wallace, W. P. Gibson, J. Gillen, R. Scaff, S. Outlaw, R. Price, W. H. Barlow.

Reader Service Card Number 392

Plessey Peripheral Systems
Booth: 154, 156

6291 Dorman Rd , Unit 20,
Mississauga, Ont L4V 1H2
(416) 677-5410

Exhibiting: Plessey Peripheral Systems will be demonstrating our newest offering for small business and distributed processing. The System—23VTJ is a desktop computer with 8", 28-MB Winchester and 15 MB tape cartridge backup. The system—23VTJ will demonstrate the PWS-1, a comprehensive word processing and records management package.

The Plessey staff will be pleased to discuss their complete DEC-compatible system and peripheral offering.

Personnel: Michael Conlin, Ron Avery, Andy Betterton, Richard Mantle.

Reader Service Card Number 393

PMI (Data Maintenance) Ltd.
Booth: 836

3440 Pharmacy Ave , Unit 10
Scarborough, Ont. M1W 2P8
(416) 889-8611

Exhibiting: PMI (Data Maintenance) Ltd. is a complete and independent data laboratory designed to give OEM commercial, industrial and government disc pack owners and users precise testing, rebuilding, converting, recertification, cleaning, troubleshooting and on-site preventive maintenance for disc packs and cartridges.

PMI's data laboratory is fully equipped with the latest and most precise

electronic testing equipment. Each of our technicians are fully trained to perform in all aspects of on-site preventive maintenance, repair overhaul, and recertification of disc packs and disc cartridges.
Personnel: A. Gamus, R. Dickin, B. Anderson, S. Kaizer

Reader Service Card Number 394

Prior Data Sciences Ltd.
Booth: 1514

16 Credit Union Way, Suite 301,
Ottawa, Ont. K2H 8R6
(613) 820-7235

Exhibiting: Prior Data Sciences Ltd. specializes in real time mini-computer systems development. Typical applications are: Supervisory Control and Data Acquisition (SCADA), computer-aided dispatch, process control and military systems development.
Personnel: Jack Prior, Suzanne Swan, David Webster, Leon Blum, Alen Schiller.

Reader Service Card Number 395

Prime Computer Canada
Booth: 'R'

130 Skyway Ave.,
Rexdale, Ont. M9W 4Y9
(416) 675-7870

Exhibiting: Prime-850 processor, the Prime Office Automation System (OAS), and the Medusa CAD package.

The 850 central processing system features multistreaming, and supports up to 128 connected terminals. It will be networked to a Prime 550-II processor at the booth, with both systems linked to our international packet-switching network.

OAS integrates word processing, management communications, and advanced text management with data processing on Prime systems. Medusa is a computer-aided design software package for complete two- and three-dimensional design, drafting and documentation.
Personnel: Roy Bond.

Reader Service Card Number 396

Qupro Data Systems Ltd.
Booth: 2246

1770 King St E.,
Kitchener, Ont N2G 2P1
(519) 576-4480

Exhibiting: A Pascal computer (Q-Engine) manufactured by Qupro. Q-Engine is a 16-bit, high-performance system executing compiled Pascal "P" codes. Also shown will be Qupro's Dataclock 100, a device capable of providing time and date to any computer system supporting asynchronous communications. Qupro will also show the new Rexon computer system.
Personnel: Roy Trivett, Sylvia Trivett, Scott MacKenzie, Paul Ahrens, John Hinton, Paul LaFlamme, Lorraine Hastings, Malcolm Meltz, Fraser Gunn, Jane Pyle, Barbara Lazarski, Gregg Kricorissian, Robin Davies.

Reader Service Card Number 397

CANADIAN COMPUTER SHOW

Quasar Systems Ltd.
Booth: 2132

275 Slater St.,
Ottawa, Ont. K1P 5H9
(613) 237-1440

Exhibiting: Quasar is one of the largest computer consulting firms in Canada, with branches in all major Canadian cities. Our reputation for high-quality software solutions is based on size, industry experience, fixed-price development, and internationally successful software products.
Personnel: Mike Potter, Jeremy Butler, Alan Stanley.

Reader Service Card Number 398

R-O-R Associates Ltd.
Booth: 138

21 Rolark Dr.
Scarborough, Ont. M1R 2S7
(416) 291-7121

Reader Service Card Number 399

CANADIAN COMPUTER SHOW

Radionics Ltd.
Booth: 1720
1240 Ellesmere Rd.
Scarborough, Ont. M1P 2X7
(416) 292-1575

Reader Service Card Number 400

Radio Shack (Div. Tandy Electronics)
Booth: 401
279 Bayview Dr.
Barrie, Ont. L4N 4W5
(705) 728-6242

Exhibiting: Radio Shack will be demonstrating its current solutions for its expanding TRS-80 microcomputer product line.

A wide variety of word processing, business and personal computing applications will be presented using the complete TRS-80 family of micro computers.

Featured will be the powerful color computer with discs along with many peripherals.

Personnel: T. Riordan, P. McCormick, P. Murray, D. Cumming, D. Cook, M. Burnstein, B. Leth.

Reader Service Card Number 401

Rexon Business Machines Cda.
Booth: 2021
55 Harbour Sq., Suite 915
Toronto, Ont.
(416) 363-9724

Reader Service Card Number 402

Sailor Micro Products Ltd.
Booth: 178
7502 Bath Rd.
Mississauga, Ont. L4T 1L2
(416) 677-4182

Reader Service Card Number 403

Sharp Electronics of Canada
Booth: 2010, 2012, 2014, 2016
116 Galaxy Blvd.
Rexdale, Ont. M9W 4Y6
(416) 675-7244

Exhibiting: The YX3200 small business computer system, including application software, A/P A/R general ledger etc. plus financial planning. The PC1211 Personal Computer.

Copier capable of up to 80,000 copies per month (SF770, SF811, SF820, 460, 450, 400, SF850) using competitively priced unique technology.

Personnel: Craig Hustadt, Keith Charlton, Neil Husband, Grahame Stap, Blair Munshaw, Ed Tymkow, Bill Hewitt, Les Friedman.

Reader Service Card Number 404

Signatel Ltd.
Booth: 339, 341
89 Telson Rd.
Markham, Ont. L3R 1E4
(416) 495-9229

Exhibiting: The Encore 100 data monitor/protocol analyzer system in emulation of several X.25 communication system test procedures. This display will show the capability of the ENCORE in interacting with various levels of packet switched communications network.

Also on display will be a new response time measurement system for IBM 3270 terminal systems. This equipment provides the terminal user an accurate means for measuring transaction time and response time at the terminal location. Several other products will be on display, including new modems from Intertel and Prentice Corporation.

Personnel: Gord Kenmir, Maurice Kulik, Wayne Pykari, Ron Dowdell, Fred Jensen and Bob Early.

Reader Service Card Number 405

Sheltech Canada
Booth: 2018, 2020
75 Wynford Dr.
Don Mills, Ont. M3C 2Z4
(416) 443-7489

Reader Service Card Number 406

Sola Canada
Booth: 1313, 1315, 1317
377 Evans Ave.,
Toronto, Ont. M8Z 1K8
(416) 252-6465

Exhibiting: Voltage regulating transformers and power conditioning equipment for microprocessors to large computer systems. Uninterruptible power supply "Sola Mini Ups" to larger size units. A variety of regulated open frame and rack type isolated power supplies for the O.E.M.'s.

Personnel: Bob Hurst, Ed Souza, Don Lake, Bill Madziarczyk, Ed Wrobel, Pam Samson, Jim Kimball.

Reader Service Card Number 407

Spacecom Ltd.
Booth: 1617
2200 Ave. Rd., Suite 103
Toronto, Ont. M5M 4B9
(416) 482-9410

Reader Service Card Number 408

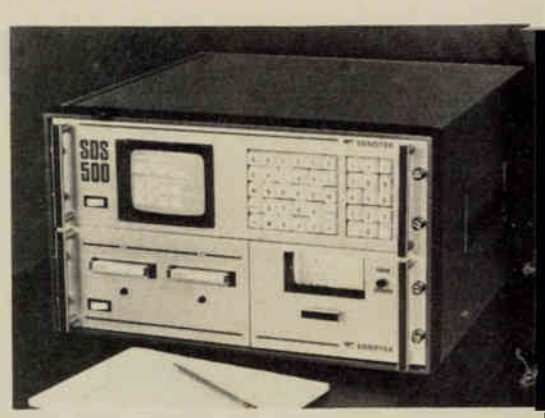
Source Edp
Booth: 104, 106
Royal Bank Plaza, P.O. Box 186
Toronto, Ont. M5J 2J4
(416) 865-1125

Exhibiting: Source Edp is North America's largest professional recruiting firm specializing exclusively in the computer field. We have two branch offices in the Toronto area, and 66 branches altogether across the continent.

Drop by our booth to pick up your free copy of: 1981 Toronto Computer Salary Survey; Computer Career Planning Guide; Computer Hiring Manager's Guide; Career Planning Guide for the Crucial Early Years.

Personnel: Peter Bates, Les Fenyves, Ed Johnson, Marcus Miller, Jerry Rumack, Chrystine Magraken, Gene Balfour, Rick Williams, Duncan Cheung, Dianne King, Mark Dooley.

Reader Service Card Number 409



Sonotek Ltd.
Booth: 1512
2410-5 Dunwin Dr.,
Mississauga, Ont. L5L 1J9
(416) 828-6810

Exhibiting: Industrial and airborne data systems for data logging, data acquisition, and process control. Rugged systems built to withstand harsh electrical and physical environments.

Also exhibited will be input and output scanners, multipoint and intelligent.

Color graphics displays will also be included.

Personnel: James Macrae, Bill Bates, Jiri Nor, Hugh Holley.

Reader Service Card Number 410

Sony of Canada Ltd.
Booth: 2024
411 Gordon Baker Rd.
Willowdale, Ont. M2H 2S6
(416) 499-1414

Reader Service Card Number 411

Spectra Colour Ltd.
Booth: 2147
4180 de Courtrai
Montreal, P.Q. H2S 1C3
(514) 739-2153

Reader Service Card Number 412

Sperry Univac
Booth: 502
55 City Centre Dr.,
Mississauga, Ont., L5B 1M4
(416) 270-3030

Exhibiting: System-80 small-to-medium scale interactive computer system. System 80 features an office environment design and demonstration of its ease of use tools and application software.

V77-800 Minicomputer geared at the Scientific, OEM, DDP and Commercial markets.

The new UTS-400 terminal family. MAPPER information management software tool.

Reader Service Card Number 413

Sun Computers Ltd.
Booth: 2037, 2136

15 Coldwater Rd.,
Willowdale, Ont.
(416) 495-9699

Exhibiting: Sun Computers has produced a 16-bit microprocessor based system running under Western Electric's Unix operating system. It allows up to eight users to run completely independent tasks simultaneously. Based on the Onyx C8002 computer with integral eight-inch Winchester hard-disc drive and 12Mb cartridge tape drive with main memory sizes from 256K bytes to one million bytes, the multiprocessor system is said to provide the power of a mid-scale computer at considerably lower costs.
Personnel: Ron Ellingson.

Reader Service Card Number 414

Sybex Inc.
Booth: 2026

2344 Sixth Street
Berkeley, Cal. 94710
(415) 848-8233

Reader Service Card Number 415

Sysdoc
Booth: 2015

213 Albany Ave.
Toronto, Ont. M5R 3C7
(416) 532-9143

Exhibiting: Sysdoc will announce its new product division. *The Do-It-Yourself Analysis and Documentation Kit* will be shown. This kit provides a no-nonsense approach for intelligent people who have never documented systems before. Representatives will also be available to describe Sysdoc's established contracting service.
Personnel: Diana Patterson, Francesca Lauro, Mark McAlister, Ellen Kert.

Reader Service Card Number 416

Systemhouse Ltd.
Booth: 402

99 Bank St., 3rd Floor
Ottawa, Ont. K1P 6B9
(613) 236-9734

Reader Service Card Number 417

Telxon Canada Corp.
Booth: 357

2651 John St., Unit 1A
Markham, Ont. L3R 2W5
(416) 498-1344

Exhibiting: Portable data-entry terminals for recording and transmitting via voice-grade lines orders, inventories, sales statistics, and other types of data; all hand-held, CMOS-technology equipment.

Telxon also manufactures and sells a complete line of receivers, including tape drives, floppy disc systems, and automatic polling devices.
Personnel: Dwain Kinsinger, Robert Moroz.

Reader Service Card Number 418

T.H.A. Technical Industries Ltd.
Booth: 2025, 2027

2500 Lawrence Ave. E., Unit # 12
Scarborough, Ont. M1P 2R8
(416) 752-1911

Exhibiting: Various computer and telecommunication sheet-metal items of custom manufacture such as enclosures, chassis, card cages, power supply mountings and front panels (demonstrating close tolerances and finishes).
Personnel: Joe Jackson, Ernie Waltman, John Dempster.

Reader Service Card Number 419

TIL Systems Ltd.
Booth: 1717

60 Yonge St., Suite 1100
Toronto, Ont. M5E 1H5
(416) 869-1157

Reader Service Card Number 420

Technical Service Council
Booth: 1704

1 St. Clair Ave. East
Toronto, Ont. M4T 2V7
(416) 960-5030

Reader Service Card Number 421

Topaz International
(see Webster Instruments)
Booth: 1706, 1708

CANADIAN COMPUTER SHOW

Teltone Ltd.
Booth: 2011

91 Telson Rd.,
Markham, Ont L3R 1E4
(416) 495-0837

Exhibiting: The Teltone Data Carrier System uses existing telephone pairs within a PABX service area to provide simultaneous telephone service and local area data communications. Normal telephone service is unaltered—personnel can transmit data and use the phone simultaneously.

The derived data link is capable of full duplex, asynchronous operation at speeds up to 9,600 bits per second.

Personnel: Jim Horsley, Mignonne Laroche, Denise Bogad, Don Fraser, Joe Nobrega.

Reader Service Card Number 422

Tektronix Canada Inc.
Booth: 'U'

P.O. Box 6500,
50 Alliance Boulevard,
Barrie, Ont. L4M 4V3
(705) 737-2700

Exhibiting: New to the Tektronix family of products is the 4110 series of computer display terminals. The 4110 series features the best of both storage and raster graphics including a new optional color enhanced refresh version of the Tektronix DVST storage tube.

Also on display will be Tek's lineup of sophisticated desktop computers and color graphics. Selected peripherals—plug-in compatible with many data communication systems, will be shown, including hard-copy units, interactive digital plotters, file managers, disc drives, etc.

Personnel: Dennis Kukulsky, Jack Woida, Asher Tamir, Fred Navi, Warren Clark, Everett McDermid and Bob Brown.

Reader Service Card Number 423

Texas Instruments
Booth: 'H'

41 Shelley Rd
Richmond Hill, Ont L4C 5G4
(416) 884-9181

Exhibiting: DS990/model 20 computer system with 50-MB drive, line printer, and Model 911 VDT. Will be demonstrating 'Tipe 990' word processing system; and non-impact data terminals: 780, 760, 740.

New products: 840 KSR/RO impact printers; operator-programmable 940 'smart'-editing VDT; and Series 10 personal information terminal.

Personnel: Dan Leavey, Jim Bolin, Neil Martin, Harold Hartman, Barry Armstrong.

Reader Service Card Number 424

3M Canada Inc.
Booth: 1521

P O Box 5757,
London, Ont. N6A 4T1
(519) 451-2500

Exhibiting: 3M will be displaying their complete line of magnetic media: computer tape, diskettes, drives, cartridges, office products supplies, velostat mats and CRT screens. In addition several new products will be featured: diskette storage boxes and binder systems, diskette cleaning kits, shockwatch cartridge clips, the HCD-75 drive, velostat conductive mats, velostat static control mats, colored, antiglare and security screens and heat print paper.

Personnel: P.G. Finlay, D.W. Fraser, D.M. Hepburn, T.M. Hepburn, E.B. Lawson, W.A. Rowcliffe, I. Price-Williams.

Reader Service Card Number 425

Toronto Business Magazine
Booth: 1101, 1103

105 Main St
Unionville, Ont L3R 2G1
(416) 297-2922

Reader Service Card Number 426

Toronto Career Centre
Booth: 1403, 1405

65 Queen St. W , Ste. 1020,
Toronto, Ont.
(416) 360-8050

Exhibiting: Professional Search Group, specializing in the recruitment and placement of personnel in data processing, engineering, accounting and financial industries.

Personnel: Mark Laine, Dan Saroff, Dan English, Chris Stoeckle, Barbara Emerson, Robin Heider, Zenobia Siddigui, George Thomas, Peter Makris, Simon Logan, Frank Sayers.

Reader Service Card Number 427

Tracan Electronics Corp.
Booth: 1211, 1213

1200 Aerowood Dr , Unit 46
Mississauga, Ont L4W 2S7
(416) 625-7752

Reader Service Card Number 428

Toronto Executive Consultants
Booth: 922

55 University Ave , Suite 1500,
Toronto, Ont M5J 2H7
(416) 364-0154

Exhibiting: For the past decade Toronto Executive Consultants has provided computer consulting and systems development services as well as career counselling, relocation and recruitment services to the Canadian E.D.P. industry.

Personnel: Tony French, Jim Slaven, Michael Klups, Bruce Cowan, Jerry Bennett, Roger Allinson, Wayne Goldsten, Monica Wells, Des Anthony, Larry MacIsaac, Sean King.

Reader Service Card Number 429

Total Computer Systems
Booth: 2353

P.O. Box 335,
Ajax, Ont. L1S 3C5
(416) 686-1106

Exhibiting: Software and hardware for Radio Shack's micro computers. Over 300 titles of software in the following areas: operating systems & aids, coordinated business systems, educational software, home management, simulations and games by over a dozen manufacturers.

As well, we will be showing printer, disk drives and a full line of hardware-related accessories.

Personnel: Gabriel Manda, Gary Cleland.

Reader Service Card Number 430

Transduction Ltd.
Booth: 608

1645 Sismet Road, Unit 12,
Mississauga, Ont. L4W 1Z3
(416) 625-1907

Exhibiting: DEC-compatible components and peripherals for LSI-11, PDP-11 and PDP-8 minicomputers. 11/Blue series enclosures for LSI-11. Model

VT103-QB DEC LSI 11/23-based minicomputer system. Data acquisition components. Data systems design floppy/Winchester-disc combo. Communications and disc controllers, specialized interface products.

Personnel: Stan Tyminski, William Johnson, Johanne Desena.

Reader Service Card Number 431

Tycor Electronic Products
Booth: 1516

9-6115 Third St SE
Calgary, Alta T2H 0T7
(403) 259-3200

Reader Service Card Number 432

Transtel Communications
Booth: 2405

151 Carlingview Dr.,
Rexdale, Ont. M9W 5S4
(416) 675-5522

Exhibiting: Business communication equipment including the Mitel SX100 and SX200, the Stronberg-Carlson Century 412, the Omega-III telephone system, and the Northern Telecom 1A2 key telephone system.
Personnel: Jim Corrigan

Reader Service Card Number 433

Ultec Computer Corp.
Booth: 2007

770 Browns Line,
Toronto, Ont. M8W 3W2
(416) 251-2887

Exhibiting: Microcomputers for professionals. The basic X-100 Microcomputer system has 64K memory, 1 MB flexible disk storage, CP/M operating system, terminal and printer. Some features of the system are: a heavy-duty power supply which provides protection against power fluctuations; the cooling and filtration assemblies make them suitable for industrial environment; solid customer support which includes a one year warranty on parts and labor.

Also on display, will be the recently released X-140 hard disk system which provides for increased speed and storage capabilities.
Personnel: M.J. Ulcar, V. Bissonette.

Reader Service Card Number 434

Instrument Rentals Canada (formerly U.S. Instrument Rentals Cda.)
Booth: 2017

Units # 6-7-8 6815 Rexwood Rd.,
Mississauga, Ont. L4V 1R2
(416) 678-7831

Exhibiting: Telcon—Ambassador Series I to VI Portable Crt Terminals with high quality 7" CRT. Selectric type keyboard and built-in acoustic coupler. Options include 40 or 80 column printer, text editing and 144K cassette memory. Packages in a lightweight carry-on case; you can take your office terminal with you. Available for short or long-term rental with purchase option.
Personnel: Vic Buffet, John Summach, John Small, Barb Metelka, Denis Keuninckx, Phil Champion.

Reader Service Card Number 435

A. Valeriote Computer Svcs.
Booth: 1741

47-1200 Aerowood Dr.,
Mississauga, Ont. L4W 2K7
(416) 624-3730

Exhibiting: As a distributor of microcomputer products, we will be featuring the Corvus line of hard-disc storage, in 5, 10 and 20-MB capacity, as well as the Constellation multi-user network. All systems are plug-compatible with TRS-80 and Apple computers. Also featured will be the 'Mirror' back-up system for videotape recorders.
Personnel: Mike Lehman.

Reader Service Card Number 436

L.A. Varah Ltd.
Booth: 501

505 Kenora Ave.
Hamilton, Ont. L8E 3P2
(416) 827-7035

Reader Service Card Number 437

VisiRecord Systems Canada
Booth: 2124

71 Wingold Ave.,
Toronto, Ont. M6B 1P8
(416) 781-5521

Exhibiting: VisiRecord will exhibit its new line of DataDesk Systems furniture. DataDesk features full wire management and wide slot cable access.
Personnel: W. Rachinsky, K. Marsh, J. Ford, I. Sirett, G. Kreitzer.

Reader Service Card Number 438

Voice Message Service
Booth: 1411, 1413, 1415
1200 Eglinton Ave. East, Suite 608
Toronto, Ontario

Reader Service Card Number 439

Volker-Craig Ltd.
Booth: 1500, 1502
266 Marsland Dr.
Waterloo, Ont. N2J 3Z1
(519) 884-9300

Reader Service Card Number 440

Wang Canada Ltd.
Booth: 'O'
225 Duncan Mill Rd.
Don Mills, Ont. M3B 3K9
(416) 449-2175

Exhibiting: Integrated Information Systems—Computers covering a broad spectrum from small to large scale systems;

Office Information Systems—Word Processing Systems to automate offices of small and large businesses, with optional data processing functions;

'Wangwriter'—A low cost system geared to first time users, and featuring many of the capabilities of the larger Wang W.P. systems.

Personnel: Paul Bergeron, Tom Pirner, Wendy Warden, Bernice Zuwala, Fred Fraser, Gorde Valde, Wayne Thrower, Sonja Gallagher, Lana Pottier, Art McCabe, Brenda Coleman.

Reader Service Card Number 441

Wabash Tape (Canada) Ltd.
Booth: 259
3135 Universal Dr., Unit 18
Mississauga, Ont. L4X 2E6
(416) 625-9533

Reader Service Card Number 442

P.J. Ward & Associates
Booth: 1323
214 King St. West, Suite 400
Toronto, Ont. M5H 1K4
(416) 593-1660

Reader Service Card Number 443

Waterloo Distance Education
Booth: 2117
P.O. Box 62
Waterloo, Ont. N2J 3Z6
(519) 884-4340

Reader Service Card Number 444

Webster Instruments Ltd., (Topaz Int'l Div.)
Booth: 1706, 1708
1134 Aerowood Dr
Mississauga, Ont. L4W 1Y5
(416) 625-0600

Exhibiting: Uninterruptable power systems, power distribution systems, power conditioners, line voltage regulators, Ultra-isolators, inverters, and frequency converters.

Personnel: Roger Webster, Brian Flippance, Richard DaCosta, Joe LaBonte, Larry Bushey, John Jeter, Nello Mehl.

Reader Service Card Number 445

Wright Line Canada Ltd.
Booth: 248
Suite 204, 1020 Denison St.,
Markham, Ont. L3R 3W5
(416) 495-5760

Exhibiting: Docu-mate: A system for filing and handling data processing documentation; documentation library units; documentation organizers built specifically for systems and programming personnel.

Optimedia: Cabinets designed to meet the specialized needs of computer rooms and computer-based information systems. Ergonomic terminal work stations; computer accessories.

Personnel: Allan Armstrong, Stan Brown, John Marchand, Amandio Contreiras, Randy Koster, David Irvine, Michael Campbell, Bruce Elliott, Peter Paleczny, Sal Bruni.

Reader Service Card Number 446

Xerox of Canada Ltd.
Booth: Island 'V'
703 Don Mills Rd.
Don Mills, Ont. M3C 3S2
(416) 429-6750

Reader Service Card Number 447

Zentronics (Div. of Westburne)
Booth: 359, 363
8 Tilbury Ct.,
Brampton, Ont. L6T 3T4
(416) 451-9600

Exhibiting: Zentronics Data Products, will be exhibiting the full line of Lear Siegler CRT's including the new ADM-32 and the recently cost reduced ADM-3A and ADM-5. Also, the Lear Siegler 310 180 CPS matrix printer. Also on display, will be the new 3500 and 7700 series of NEC Spinwriters and many of the form-handling options that are available.

The Centronics line of matrix and line printers will also be exhibited. As a Digital distributor, Zentronics will also exhibit the complete line of LSI-11 microcomputers and support modules and digital terminals. Also on display will be Memorex media, Livermore acoustic couplers and Qume floppy-disk drives.

Personnel: Steve Mosek, Bill Andreades, Frank Arseneault, Tom Winter, Voltaire Deleon, Reed Oldershaw.

Reader Service Card Number 448

Telidon too expensive for 'average' home?

According to a newspaper report concerning an undistributed three-year study commissioned by the federal Department of Communications, the in-home use of the Telidon interactive teletext system would be prohibitively expensive for the average Canadian family of the mid-1980s unless the costs were subsidized.

According to the Toronto *Globe and Mail*, the major study was prepared by the Ottawa firm of Roger Hough & Associates and handed in in late 1980. Among the findings were the forecast that even if a Telidon service were to cost just $25 a month in 1985, only 26,000 Canadian families would feel they could afford it, and of that number only 13,000 would actually subscribe. An acceptable market penetration of 150,000 homes could come only if the monthly fee were lowered to $6—far below the cost of the service.

Officials at the DOC apparently shelved the study with the comment that it failed to take into consideration Telidon prospects in overseas markets, and the business and institutional markets here in Canada.

Report speculates on Exxon office systems

International Resource Development Inc., Norwalk, Conn., has prepared a 39-page report on Exxon Corp. in which it is suggested that Exxon may be forced to drastic action if its money-losing office products division continues to drain resources from the firm.

The report observes that even with 1980 sales of $292 million (US) in automated office equipment, the division has never made a profit, and is forcing reallocation of financial resources from elsewhere in the corporation. The report analyzes the various courses of action open to Exxon, and speculates on future plans in the automated office field.

Details on ordering the report are available from IRD, 30 High St., Norwalk, CT 06851, tel.—(203) 866-6914.

Drummond McCall Inc. has ordered 15 Centronics Model 6081 line printers for its locations in Halifax, Montreal, Toronto, Hamilton, Winnipeg, and Richmond, B.C. The order for the 600 lpm printers is valued at $115,000. The units will be connected on-line to the firm's Univac data centre in Montreal.

The Zentronics Data Group, Brampton, Ont., is reducing the list price of its ADM 3A and ADM 5 Dumb Terminal video displays by over 20 per cent. The price reduction is part of a move to increase market share and to provide greater economics of scale with higher unit shipments.

The features of a personal computer, word processor, remote terminal, calculator, and a graphics workstation are combined in new HP-125 desktop system.

HP's personal computer can network with a 3000

Hewlett Packard (Canada) Ltd. has recently released a desktop system that it says combines the features of a personal computer, word processor, remote terminal, financial calculator, and a graphics workstation. The HP-125 is intended for primary use by business managers and professionals in financial decision-making, planning/analysis, word processing, and management communications.

The unit, entry-level priced at about $10,600 (Cdn)., uses the CP/M operating system, and can be quickly turned into a remote terminal to an HP-3000 network or a large mainframe through dual RS-232C datacomm ports. Transmission speeds of up to 9600 baud are offered.

Twin Z80A microprocessors are used in the HP-125, one of which serves as a system processor with 64K of RAM and handles program execution, while a separate terminal-processor Z80A offers the user many of the features of an intelligent terminal. These include use of eight 'soft' keys on the keyboard that can serve to handle a wide variety of operational commands through functions that are labelled on the CRT screen (with each key able to handle numerous commands, each from a different screen presentation).

The unit will store up to five pages of displayed information, with key-controlled scrolling. These features are all handled by the second Z80A, leaving the system processor free for program execution.

Five HP software packages are available (each sold separately). These are Visicalc/125, the widespread financial planning and analysis tool; Graphics/125, able to transform tabulated data into bar, pie and line charts on paper or overhead transparencies; Word/125, a word-processing package with complete formatting control, global search-and-replace editing, block text movement, and keystroke-interactive processing; Basic/125, an interpretive Basic language developed by Microsoft Inc. and running under CP/M; and Link/125, the facility by which the HP-125 can be connected to the HP-3000 family of distributed processing systems and transfer files to and from the larger unit as well as execute Image/3000 data base management inquiry procedures.

The HP-125 is available in two models: the Model 10 offers 500K of mass storage on two 5¼-in. mini-floppies, while the Model 20, with twin 8-in. discs, has 2.4 megabytes of capacity. Both models can accept further disc drives.

Each model can be used with either an integral thermal printer, a letter-quality WP printer, or a 180-cps serial dot-matrix printer for high-speed needs. Color graphics are available in a one-pen or eight-pen plotter that can be attached to the system.

A Model 10 is priced at $10,573 in Canada, and the software packages run from $175 to $699 extra. A two-month delivery cycle is anticipated. □

Computer model applied to skills resource planning

A computer-based human resource planning model that can be used to answer questions like, "how many people do we need to meet business goals?" has been developed by Comshare, Inc., Ann Arbor, Mich.

Called Prism, it is a model or mathematical representation of a company's personnel system. It produces reports that planners can use to:

□ forecast their organization's future needs for human resources based on historical data and "target" staffing levels.

□ forecast the supply of people who are promotable to potential vacancies.

□ highlight the shortages and surpluses of promotable employees at each level of the organization.

□ test the results of programs and policies that address those shortages and surpluses.

Prism is currently used by several firms to help correct over- and under-staffing and to analyze workforce mobility for problems like excessive turnover, lack of replacements for important positions, and blocked career paths. It is also useful for identifying training and development needs, guiding recruiting and selection and testing EEO goals and timetables. □

LSI logic arrays challenge custom circuit design

As computer makers produce more powerful devices, they run into cost and speed limitations. Logic arrays based on LSI are seen as the solution. Here's a look at current developments.

Logic array (LSI) is a technology whose time has come, says circuit designer W. J. Corrigan, president, LSI Logic, Santa Clara, Calif. following the signing of a cooperative program with Toshiba Corp. to develop an advanced HCMOS logic array family of large scale integrated circuits.

Corrigan, former president of Fairchild Camera and Instrument Corp., has formed LSI Logic to produce advanced logic arrays, which are complex integrated circuits that can be customized for individual applications. This provides the user with the advantages of both custom circuits and standard high volume circuits. Arrays are already in use in high-performance computers and are estimated to grow to more than a $1.4 billion business by 1985, as they find wide use in a broad range of information processing and communications products.

The two companies will cooperate on arrays of 1,000 to 10,000-gate complexity. According to the firm, the first products will be built in three micron technology, providing propagation delays of about 5 nano seconds. Plans are to subsequently introduce two-micron arrays with 2-3 nanosecond delays.

"For the first time this will provide HCMOS LSI, with its low power consumption, with speeds directly competitive with Schottky TTL, the present standard of the industry for demanding applications," says Mr. Corrigan.

The companies will introduce parts containing 1,000, 2,000, 4,000 and 6,000 gates during 1982.

Samples of the first products will be available in the first quarter of 1982. During 1983 the companies plan to develop arrays incorporating up to 10,000 gates.

In a backgrounder to logic array technology, LSI Logic Corp. makes these observations on this technology:

Logic arrays were developed in an attempt to meet the growing need for custom circuits for electronic equipment in the face of high costs for designing and producing the completely custom circuits desired by many electronic designers to meet their special requirements. Traditionally, the semiconductor industry has shunned custom circuits. Instead, it has attempted to define, design and manufacture integrated circuits that have wide application, so can be produced in high volume, thus accumulating the high total production experience that results in lowest costs.

In the past, the semiconductor industry dealt in relatively small building blocks that could be combined in many ways to create electronic equipment such as computers. Unfortunately, a conflict arose as these firms developed the capability to integrate much more circuitry on a single device or chip. It became harder and harder to find larger general purpose blocks usable by a variety of customers. A few have been defined and are in volume production, such as memories and standard telephone circuits, but the most creative answer to this need was the microprocessor. These standardized chip computers are able to perform a variety of functions which depend on a program designed by the customer.

These programmable microprocessors have revolutionized electronics, and are widely used in products as varied as inexpensive toys and exacting military cryptographic computers.

Enter the logic array

As computer firms push technology to produce more powerful computers, they run into two limitations—cost and speed. Both are satisfied by logic arrays.

The traditional computer central processing unit—is composed of vast numbers of individual integrated circuits mounted on a number of large printed circuit boards interconnected with cables. As the computer maker tries to increase the operating speed of his computer, however, he runs into physical limitations. Electrical signals travel about 1 inch in 0.1 nanosecond (one ten-billionth of a second). Very fast computer circuits now operate at less than 1 nanosecond; "lengthy" connections of a few inches could limit the operating speed of the whole computer.

The solution is to make the computer circuitry smaller by placing as much of the computer as possible on a relatively few chips, and packaging them so that they can be placed as close together as possible. This is possible with large scale integration and creative packaging.

The catch is that while the computer maker needs many different chips, he needs relatively few of each. A large computer might contain only a few dozen chips, most different. And each computer maker requires completely different chips.

This creates a need for relatively moderate volume, perhaps a few thousand individual devices per year of a number of varieties.

One approach to satisfying this need is with a custom chip design for each part. Unfortunately, this is expensive and time-consuming. A design might take a year to 18 months to produce. A bigger problem is the shortage of designers capable of designing such chips.

Logic arrays address these problems. There are two types, the gate array and cell array.

The gate array is a matrix of uncommitted gates, the lowest common denominator or fundamental building block in computer design. The cell array consists of larger, more complex blocks. Either type of array can be interconnected in many ways to form the custom large scale integrated circuits (LSI) required for high performance computers.

The big advantage of the logic array is that it can remain uncommitted

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Index of exhibitors

Here, in alphabetical order, are the firms exhibiting at this year's show and the number of their exhibit.

(All data as of press time)

Distributed data entry to reach $28 billion in '80s

With the advent of the distributed data concept made feasible by minicomputers and microcomputers, the relationship between man and his EDP machine is being redefined and the make-up of the computer industry, itself, is becoming altered.

So says a recent study on distributed data entry by Frost & Sullivan, Inc. That concept (distributed data entry) by 1984 will mature "as a viable information systems approach," adds Joseph Savino, F&S study director.

In business terms, the turn to distributed data entry—which may or may not be associated with distributed data processing—will give rise to a $28 billion dollar cumulative market during the 1980 decade, notes the study. Nearly 85 per cent of this market will be accounted for by shipments of intelligent terminals, alphanumeric displays, factory data collection systems, and key-to-disc equipment.

Two-thirds of the respondents to an F&S survey plan to incorporate distributed data processing functions as well. Already, data entry costs range between 10 and 25 per cent of an EDP budget, these users report.

Such users, it should be noted, welcome mixed vendor systems to achieve their goals. They seek data entry products that are aggressively priced, reliable and maintenance-free, offer compatibility, and are user-friendly.

The last item is especially important, F&S finds. Users want systems that can guide "less skilled data entry personnel," thus effectively shortening their training periods. "This is one of the user's unwavering requirements," F&S says.

As to hardware characteristics, users are keyboard oriented, with function menus and programmable keys offering significant appeal. Intelligent terminals interfaced with key-to-disc systems are viewed as a means to reduce communications costs. And, alphanumeric displays are proving to be indispensable, as on-line data entry is implemented in distributed environments.

In addition, optical readers are described as beginning to realize their full potential value. And portable data recorders will be used increasingly to capture source data in remote data entry applications, e.g. utility meter reading, survey recording, time keeping and inventory control.

Maintaining only a central data base, while preferred by a majority of users, is also giving way—in a significant number of cases—to remotely located data base organization, F&S notes.

But the big focus in the 1980s will be on software intensive products. The demand for applications software is gaining momentum.

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LSI logic arrays

From page 202

through most of its complex processing. Only in the last few steps is it programmed or customized. That means that the manufacturer can produce the chips in volume, yet end up with many different custom circuits.

This approach is much less expensive than purely custom circuits. It also can be automated, greatly reducing the need for skilled integrated circuit designers.

Technology of logic arrays

Logic array LSI can be fabricated in any type of integrated circuit technology, but two varieties have proven attractive to electronic equipment makers. One is complementary metal oxide semiconductor, better known as CMOS, technology. CMOS has not been able to operate at high speed in the past, but it requires little power, making CMOS logic arrays especially suitable for portable equipment operating from batteries. They have been used in instruments such as portable heart monitors, and much communications equipment such as pocket pagers and two-way radios.

The agreement between LSI Logic and Toshiba involves high performance CMOS, or HCMOS. This technology represents a major step forward in complexity and speed, opening the way for CMOS with its exceptionally low power requirements to operate at speeds as fast as the workhorse of present electronics equipment, Schottky transistor-transistor logic (STTL). STTL requires much more energy than CMOS, and also takes up more silicon chip area. These two factors limit the complexity of STTL.

The new logic arrays being developed will open whole new markets to CMOS arrays, including minicomputers, peripherals, communications, business equipment and instruments that formerly required less dense STTL with its greater power consumption. These two factors are very important because cost of electronic systems is highly dependent on size and packaging, and on power requirements since additional power requires more power conversion circuitry and complex cooling schemes.

The other logic array technology that has proven important is emitter-coupled logic (ECL). It provides even higher speeds than those projected for the new HCMOS arrays, meeting the most demanding requirements now considered practical.

The biggest market for bipolar logic arrays is large computers, including high-end minicomputers. Logic arrays became vital for these uses when IBM, which manufactures its own semiconductor devices, announced first that its then new 4300 and 3081 computers would be based on logic arrays. The only way for other computer makers to compete is to use similar technology. Some suppliers, who make equipment plug-compatible to IBM computers, were already using logic arrays while others are designing their new computers with logic arrays. High speed ECL is also needed in communications and instruments.

Other technologies such as HMOS, widely used for memories, can also be used for logic arrays, but have been little applied up to now and offer few advantages.

These basic LSI technologies are well known and understood at this point, though not at the density and complexity LSI Logic envisions. What is vital in producing arrays successfully is design automation and service. The design process must be based on the best computer aids.

LSI Logic is developing an advanced design automation system, which will offer integrated computer aided design, simulation, layout and test generation for complex logic arrays. It will allow users to develop masks and test programs in their own facilities, either by buying a system or by using a remote terminal within their own facility. □

On-line replaces batch, Cobol preferred, says survey

A recent study conducted by the Canadore College of Applied Arts and Technology, North Bay, Ont., has revealed that batch systems will be gradually replaced by real-time systems, data base concepts will replace more traditional applications, and the use of communications-oriented computer systems will increase. The survey polled 300 individuals in the northern Ontario and Toronto area DP Community.

Designed primarily to determine what qualifications the EDP industry is looking for in DP-trained college graduates, the survey indicates a wide range of factors that will influence the choice of graduates. According to Gord Malvern, placement career counselor, Canadore College, major findings show that the respondents believe on-line processing will replace batch mode and that Cobol will continue to be heavily used as a preferred programming language in spite of the proliferation of such other popular languages as Basic. Most DP installations use more than one language, either Cobol, RPG or Assembler, which is the most commonly used second language among the survey respondents.

Another finding indicates a substantial increase in the number of terminals since a survey conducted by Canadore in 1979, and points to a reduction in a predominance of batch processing in the future.

The majority of respondents also indicated that they are developing or supporting business systems as opposed to scientific or process control systems. Accounts receivable, general ledger and management reports are listed as the most common DP systems activities.

The survey respondents revealed the belief that DP and process control systems will gradually become more integrated, and that in-house programs are likely to be replaced by software packages. A considerable increase was also found in the opinion that service centres will be operating under a distributed processing mode within the next five years. Respondents felt it was unlikely that computer budgets will fall in terms of overall administrative expenses.

The survey also investigated the industry's projected demand for various data processing positions. After 1985, the survey indicates that there will be a greater decrease in demand for key operators, data control clerks and computer operators. An increase in demand will be maintained for terminal operators, applications programmers, maintenance programmers, software programmers, programmer analysts, and methods and procedures analysts. The strongest increase in demand is seen for systems analysts, computer auditors, data base specialists, and computer security analysts, says Mr. Malvern.

The survey reports that the industry would like to see 40 percent or more of a three-year DP program become more EDP-oriented and that one four-month semester be the minimum length of time students should have "hands-on" experience.

—Linde Fistell
Assistant Editor

Design of Massey Hall uses specialized software

The recent design and construction of the New Massey Hall cultural centre in Toronto was aided by a specialized computer program that analyzes the structural stress of unusually designed buildings. Carruthers and Wallace, a Toronto-based engineering firm, used the 'Stress 3.0' software program developed by Canada Systems Group, Mississauga, Ont., in its analysis of the load requirements for the building.

The software package is designed for structural and civil engineering problems and is an upgraded version of the original M.I.T. Stress program, claimed to be one of the most widely used programs of its type in Canada. The program's structural analysis, which involves checking factors affecting stability of the completed building, was used to test such load criteria as wind, temperature, snow and the combination of these factors that would produce critical load.

While Carruthers and Wallace has its own version of Stress, C & W engineer Marcus Aregawa, claims the unique circular design of Massey Hall required the use of Stress 3.0 for the more detailed analyses of variables and matrix operations, and to analyze member forces and distortions. The software package also interpreted complex deflection values for the glazing and circular shape of the structure.

The package can be used to make analyses of buildings during the preliminary design stage, final design, prestressing stages, the mixing of old and new buildings, construction simulation, and modelling.

Amdahl buys Cdn. Tran, boosts R&D effort here

Amdahl Corp. has received government approval to acquire control of Tran Communications Ltd., Mississauga, Ont., a manufacturer of electronic digital data communications equipment and networks.

Amdahl has agreed to add to the combined operations of the two firms by boosting R&D activities at Tran, including the establishment of a centralized hardware and software support facility within 12 months. This facility will have 12 additional staffers and will involve a capital expenditure of about $100,000. Its operating budget for the first two years is expected to be about $800,000 and $1 million respectively.

Tran will also assume a world product mandate for its M1100 and M2100 line of time division multiplexer products as well as for all other products designed and developed in Canada. It will also assume responsibility for the production and marketing worldwide of these products.

CBEMA plans conference to form international association

A two-part international business equipment conference aimed at forming an international industry association and discussing the industry's major concerns, is under preliminary planning, says outgoing CBEMA president Grant Murray.

Scheduled for May 30 to June 3, 1982, in Quebec City, the conference is designed to provide business equipment manufacturers with a forum to exchange ideas and address issues of international concern.

Present plans involve a two-part conference. For the first part, selected representatives from CBEMA and other business equipment manufacturer associations, will focus on the formation of an international association. The second part of the program, sponsored by CBEMA, will be open to the public and will include speakers from industry, the Canadian and other national governments, and the European common market, to discuss issues in international trade, telecommunications, ergonomics, and informatics.

CNCP seeks tariff changes for customer-owned Telex

CNCP Telecommunications has applied to the CRTC for tariff changes that would enable Telex subscribers to provide their own terminals if they wish, instead of leasing them from CNCP.

At the same time the firm is seeking to offer a maintenance service to those customers who provide their own terminals; the service would be provided by the firm's existing work force. Because of inventory and training aspects, the maintenance service would be offered on a selected list of terminals only, says CNCP.

Computer graphics meet issues call for papers

A computer graphics conference and exhibition being organized for May 17-21, 1982 in Toronto under the heading 'Graphics Interface 82,' is inviting technical papers describing research results and applications experience in computer graphics, hardware, languages, man-computer interaction, business graphics, image processing and related topics.

The conference is being organized by the Canadian National Computer Graphics Association, the Canadian Man-Computer Communications Society, the Canadian Image Processing and Pattern Recognition Society and other professional groups.

Authors interested in participating in the conference should contact Prof. Alain Fournier, Computer Systems Research Group, University of Toronto, Tel. 416/978-6983.

Ground has been broken for a new 30,400-sq-ft national head office for Ahearn & Soper Inc., Toronto (artist's sketch of the design is seen above). Construction of the facility at 100 Woodbine Downs Blvd. is expected to be completed in November 1981, with occupancy to follow before the end of the year.

The headquarters will consolidate the firm's administrative, marketing, production, and sales support servicing activities. Among the features of the building design is a special computer room that will house the company's central data communications system that links head office with A&S branches in Montreal, Ottawa, Waterloo (Ont.), Edmonton, Calgary, and Vancouver.

Kombi expands offices to meet increased growth

Kombi Corp., Kanata, Ont., has launched a major expansion of its head office and manufacturing facilities with the construction of a 66,000-sq.-ft. addition scheduled for completion October, 1981. The company will hire an additional 35 employees over the next two years.

According to Ed Morton, President, Kombi, the company is also considering integrating its facilities with those of Dynalogic Corp., Ottawa, which Kombi recently purchased.

CIPS calls for papers for 1982 conference

The Canadian Information Processing Society invites papers for the 1982 National Conference to be held May 19-21, 1982, in Saskatoon, Sask.

Under the theme "The Canadian Computer Industry: Bridges to Cross", topics under consideration include office automation, computer-aided systems analysis and design, word processing and typesetting systems, training and certification, distributed systems, new technologies, desk-top computing, operating systems, software engineering, database systems, computers and health, computers and education, and computers and the law.

In addition to regular paper submissions, CIPS invites papers from full-time undergraduate students attending any Canadian post-secondary institution.

Extended abstracts must be received by the program committee by November 1, 1981. Acceptance notification is January 1, 1982, and final papers are due March 1, 1982.

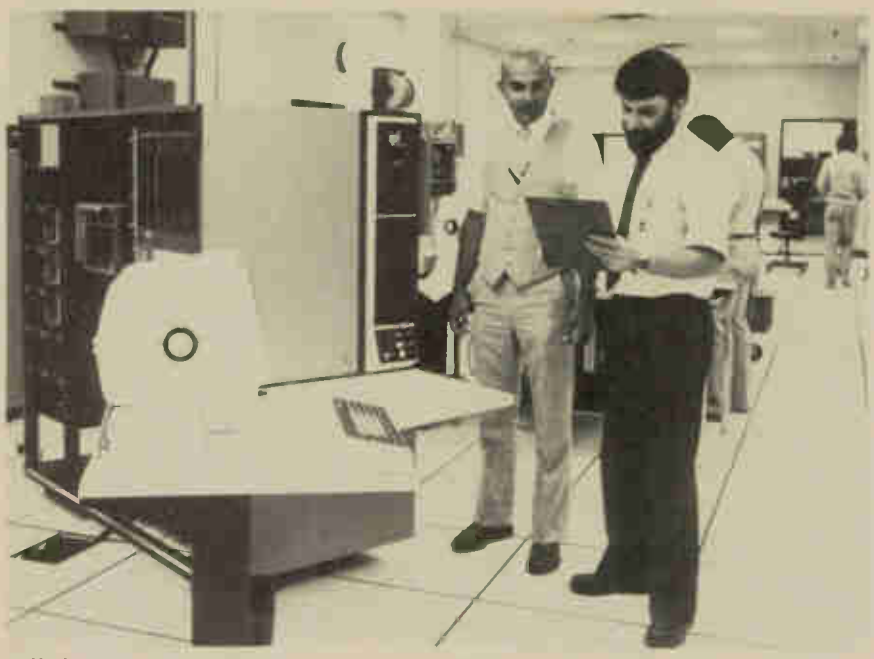
For more information, contact Dr. Rick Bunt, Dr. Paul Tremblay, Program Co-chairpersons, Department of Computational Science, University of Saskatchewan, Saskatoon, Sask. S7N 0W0. Tel. (306) 343-3783.

NEC data comm department supports U.S./Cdn. sales

NEC America Inc., Melville, NY, has formed a data communications department to handle sales, distribution and service of NEC data communications equipment throughout North America.

Included in the company's products is a new line of Bell-compatible modems, a series of high-speed fast-poll modems and auxiliary data communications equipment.

The new department, located at 3100 Central Expressway, Santa Clara, CA 95051 is headed by Shuzo Ikuta. Tel. (408) 980-1500.



Billed as the industry's first 4341-2 compatible processor to be shipped by a plug-compatible vendor, this unit is shown during final inspection at IPL Systems Inc. The unit is the IPL 4446, a 1.5 MIPS processor.

First 4341-2 plug compatible processor installed by IPL

Within two months of IBM's shipment of the first 4341 Group 2 system, US-based IPL Systems Inc., announced the installation of its first 4446 equivalent processor.

The IPL unit was installed August 21 at Business Systems Associates Inc., Framingham, Mass., a computer service bureau.

"Delivery of the 4446 so early in the life cycle of the 4341 Group 2 is significant," notes IPL president Stephen J. Ippoloto in a press statement.

"IPL now stands alone among vendors offering 4300-compatible processors in its ability to deliver a broad range of machines. In addition to the 4446, we can also deliver the 4443, which is equivalent to IBM's 4341 Group 1, and the 4436, which is about 50 per cent faster than IBM's 4331 Group 2," he states.

"The installation of the IPL 4446 was the smoothest I've ever seen," states Fred Cohen, president of Business Systems Associates. "It took only a few hours to begin running production jobs."

Robert Lavin, Business Systems Associates' vice-president, said the 4446 will allow the company to accommodate their growing number of on-line and remote job entry customers. "We were an early installation site for the IPL 4443 and were very pleased with its performance and reliability. Since we're handling more and more on-line manufacturing applications, we wanted the added power of the larger IPL 4446."

IPL's 4446 is said to be fully compatible with IBM 4300 software, including ECPS: VSE with single level addressing and virtual channel addressing, ECPS: VM370, ECPS: VSI and ECPS: MVS. The architecture of the 4400 Series permits users to add up to 8 megabytes of memory and add new features by plugging in circuit modules.

IPL Systems Inc. describes itself as the leading supplier of IBM 4300-compatible processors. The company began selling to end users last October, and sells its products in Europe on an OEM basis through Olivetti. IPL has installed base of over 225 machines, notes the company.

TTL macrocell array yields custom circuits quickly

The first TTL version of its Macrocell logic array for the development of LSI/VLSI custom circuits has been announced by Motorola's Bipolar IC Division.

Previously available only in two ECL versions, the new array is expected to greatly expand the penetration of array-type circuits into the computer market.

According to Motorola, the macrocell-array concept is a highly sophisticated outgrowth of the familiar gate-array philosophy. It couples a combination of on-chip SSI/MSI circuits and computer-aided design processes with an inventory of prediffused wafers that require only a metallization process for the completion of a proprietary LSI/VLSI circuit. The result is a cost effective custom design, notes the company, even in relatively low quantity use, which can be manufactured in as little as 13 weeks rather than the 12 months or more required with conventional custom circuits.

Basically, the MCA500ALS macrocell array consists of a chip with 77 precisely delineated areas. Within each area there is a number of unconnected discrete transistors and resistors. A computer-stored macrocell library contains instructions for converting the discrete parts in each area into one of a significant number of SSI/MSI circuits to form very large circuits (up to 533 gate equivalents for the MCA500ALS array). What the designer must do is to determine which functions from the library are to be used and how they are to be interconnected. The computer, after receiving the proper instructions, does the necessary placement and interconnect routing.

Bell Canada closes down IntelTerm sales unit

Bell Canada has decided to discontinue operations of IntelTerm Systems Ltd., the Toronto-based subsidiary that was set up in early 1980 to sell business computers and word processing equipment to the public.

According to Bell spokesmen, the decision comes as a result of a continued inability of IntelTerm to find a profitable niche in the market for the products it was carrying. Total losses on the order of $4.5 million for the past 18 months have been rumored.

IntelTerm carried word processing equipment by Vydec, electronic typewriters from Qyx, and small-business computers by Cado. All are US-based firms.

IntelTerm was originally controlled 100% by Bell, through its wholly owned subsidiaries Capital Telephone Co. Ltd. and Teledirect Ltd. Subsequent investment by New Brunswick Telephone, Maritime Telegraph and Telephone, Island Telephone and Manitoba Telephone System brought Bell's holdings down to 72%. Financial negotiations are now under way with these shareholders.

The wind-up of operations at the firm has already begun, and personnel strength at IntelTerm is expected to be down to less than 20 by year-end from a previous level of 70 persons.

Seismic contractor to use Perkin-Elmer computers

The Perkin-Elmer Model 3230 computers have been chosen for use by the Compagnie Generale de Geophysique (CGG), Massy, France, who will use them in their offices worldwide for use in processing and interpreting seismic data in the search for new energy sources.

Introduced in March, 1981, the computer is designed not only for seismic data processing, but also CAD/CAM, scientific research and computation, simulation and commercial transaction processing.

Besides standard peripherals, the com-

puter is equipped with tridensity 625 BPT high-speed magnetic tape drives with which CGG will demultiplex its field tapes. The company will also be using a P-E writable control store which speeds up job execution and provides the user with additional microcode space to implement heavily-used algorithms.

Project management system runs on micro computers

A project management system from North America MICA Inc., San Diego, is said to incorporate features formerly available only on large computer systems. Designated PMS II, it uses CPM, a critical path method of project scheduling and control.

The system is said to be ideal for the construction industry, or engineering firms, where projects with up to 500 activities are to be monitored.

PMS II calculates the critical paths based on a 3, 4, 5, 6, or 7-day work week. The network is easily updated with actual data about costs, starts, completions, changes in dependencies and/or duration.

Three levels of grouping are available for each activity notes the vendor, allowing the assignment of responsibility, for example, to a division, a department within the division, and a manager or engineer within the department.

PMS II's report writer allows sorting on multiple fields including late and early start. The activity reports show the status—critical, active, can start, must start, overdue—for each activity. The report writer also produces a Gantt chart in "late start/early start" order which makes it easy to visualize not only the activities in the network, but also which are critical, how much float time each has, and how long each should take.

In addition to these features, PMS II accepts budget dollars for material, labor, and overhead, and tracks actual against budgeted dollars. These figures appear on all activity reports.

Says Al Vanderpool, author of PMS II and president of N.A. MICA. Inc., "I estimate that controlling a project with a system like PMS II can save as much as 75 per cent of the administrative costs and can reduce overall project costs 25-30 per cent. The unique thing about PMS II is that its implementation on inexpensive microcomputers now allows easy access and control by individual managers within an organization." □

The University of Western Ontario, London, Ont., has acquired an educational-use license for Oracle, the relational data base management system developed by Relational Software Inc. Oracle is distributed in Canada by **MPS Management Consultants**, Willowdale, Ont.

Control Data offers new floppy disc units

An 8-in. flexible disc drive (9406-4) introduced by Control Data Canada, is a double-sided, single or double-density unit with 1.6 million bytes of unformatted storage capacity. It requires minimal power, says the company, through the use of Schottky LS circuitry and automatic power reduction. No negative voltage is required.

The new unit yields quiet operation, notes CDC, because it employs a 'centre of mass' driven actuator mechanism, soft head load and unload electronics and an optimized stepper motor circuit.

The company also introduced a double-capacity version of its double-sided 5¼-in. flexible disc drive (9409-T), which it introduced last year. The unit has a track density of 96 tracks/inch and provides 1 million bytes of unformatted data storage capacity. It is designed for such applications as key entry, point of sale and data collection and with word processing, small business and personal computer systems.

According to the company the unit requires no electrical adjustments or preventative maintenance during its estimated five-year service life. □

Computer stocks in perspective

Here's *Canadian Datasystems'* review of shares of some of the computer service companies. This monthly trading summary indicates centres of activity in the industry, but is not designed to provide a guideline for the purchase of these stocks.

STOCK	AUGUST				1981	
Company	High	Low	Close	Change	High	Low
Computel Systems	15.000	12.000	12.000	−3.000	18.000	3.300
Computrex Centres	0.350	0.300	0.320	+0.010	0.800	0.200
Comtech Group	5.000	4.500	4.750	−0.250	6.000	3.500
Comterm Inc.	4.750	3.850	4.300	—	4.750	0.000
Dataline Inc.	No trades				13.500	6.500
Digitech Limited	8.875	7.250	8.000	unch.	12.500	7.250
Greyhound Computer	2.500	2.000	2.280	+0.280	3.100	1.850
Patrick Computer	2,900	2.500	2.600	—	2.900	2.500
Riley's Datashare	2.500	2.250	2.250	−0.180	3.250	2.100
Sydney Devel. Corp.	2.650	2.250	2.450	−0.030	3.450	1.750
Systemhouse Ltd. 'A'	11.250	9.500	10.125	−0.625	13.000	7.250

*Closing prices are not available for unlisted stocks.

Source: The Financial Post Computer Services

Ottawa hospital installs materials management system

A computerized materials management system is being installed at the Ottawa Civic Hospital to keep track of all medical and non-medical supplies used by the hospital.

The system is part of the organization's Hospital Financial Management System (HFMS) and it will run on an HP 3000 computer. It is expected to be operational later this year.

"With the tremendous growth at Civic we are concerned about the ability of our present system to handle our inventory volume," said Peter C. Carruthers, Executive Director of the hospital.

"We are also concerned about the cost effectiveness of introducing a new system. The system is reliable, has a fixed cost and does not necessitate hiring more staff," he said.

The new system, including hardware, is valued at $400,000. It is being supplied by Systemhouse Ltd., Ottawa. □

Computer association represents industrial users

The newly formed Canadian Industrial Computer Society (CICS), Ottawa, has been formed to represent a growing group of professionals including engineers, scientists, technologists and other involved with the application and use of computer-based systems in industry.

CICS is an outgrowth of the National Research Council's Associate Committee on Automatic Control which was formed in 1959. CICS president Dick Gordon, of Dofasco Inc., will lead a group involved in steel plant automation. Backing-up the president is a small executive group and a board of directors representing industrial, academic and government organizations.

The Society is currently organizing its first major function, the Canadian Conference on Industrial Computer Systems, to be held at McMaster University, May 3 to 5, 1982. This conference will examine problems and solutions associated with industrial computer systems. A bimonthly newsletter, "CICS Bulletin ACII," will also be used to promote information exchange.

Membership is open to individuals professionally engaged in the field of industrial computers. For more information, contact the Canadian Industrial Computer Society, 12 Kindle Court, Ottawa, Ont. K1J 6E2.

Instant X-ray system checks ICs for defects

A compact, portable system that produces detailed 8 x 10-in. X-ray transparencies within 60 seconds in daylight, has been developed by Polaroid Corp. of Canada Ltd., Rexdale, Ont.

Introduced at a recent symposium in Quebec City, Que., the Instant Radiographic system is designed for both field and industrial site use and can be used for quality control and testing in the manufacture of small complex electronic devices such as integrated circuits.

The system is compatible with current X-ray generators and is said to use one quarter the amount of radiation exposure as other conventional systems, yet is able to produce X-ray transparencies of very high resolution.

The system includes the Model 85-06 film cassette, Model 85-12 film processor, Model 81-09 loading tray, and Polaroid transparent Type TPX radiographic Land film.

The film does not require wet chemicals for processing, and can be processed in the field or at the plant site immediately after exposure.

New system yields data on Canadian communities

To meet the needs of governments and businesses for more detailed data on Canadian communities, a new data service has been introduced by Canada Systems Group called SAIS, for Specific Area Intelligence System.

Data files compiled and maintained by the federal Dept. of Regional Economic Expansion (DREE) are the basis of the service and represent the most extensive single source of machine-readable community data compiled by the government.

The data base includes 1,133 communities and covers about 82 per cent of the Canadian population. The information includes census data and also draws on other public and private data sources.

One of the most significant capabilities of the new system is its 'fact sheet', a mini-version of the full data file which allows for detailed profiling at both the community and county level. Possible uses for the 'fact sheets' are cross tabulation, factor analysis and regression analysis related to target marketing, advertising and demographic studies.

Conversion unit changes floppy to mag formats

A new media conversion system from Applied Data Communications Tustin, Calif., translates floppy diskette formats to magnetic tape or magnetic tape formats to floppy diskettes.

The Trans/Media 500 system converts word processing diskettes to photocomposition diskettes, notes the company, and can be configured to handle a wide variety of diskette and magnetic tape formats. Input is accepted and output created from all IBM-formatted diskettes of other customer-specified units. The system uses 1,600 bpi PE tapes and/or 800 bpi NRZ tapes.

According to the designers, the system in a diskette-to-tape application can batch diskettes on computer-readable media for transfer to the computer system. It also converts diskettes prepared on multiple, non-compatible devices onto common media.

With the tape to diskette application multiple copies of diskettes can be produced for distribution when master data are prepared on a central computer system.

Northern Telecom chosen for Austrian comm net

The Austrian Post, Telephone and Telegraph Administration has announced that it will select the DMS-100 large local and DMS-200 long-distance digital telephone switching systems manufactured by Northern Telecom Ltd., Toronto, for the future expansion needs of telephone network service in that country.

The DMS switching technology will be used as the basis for digital switching to be developed and produced for Austria by major Austrian electronics and telecommunications systems manufacturers, under licensing arrangements with Northern Telecom.

Control Data reports revenue, export gains

Control Data Canada increased its revenues in the fiscal year ended November 30, 1980 by 29.2 per cent, reaching $162,558,000 according to the firm's annual report. Sales revenue in 1980 was $118,425,000 compared with $83,688,000 in the previous year. Rental and services revenue reached $44,133,000 in 1980, compared with $42,122,000 in 1979.

CDC reports R&D expenditures of $10,251,000 for 1980, up on the $8,978,000 expenditure in the previous year.

Earnings before taxes and extraordinary items also increased by 24.2 per cent over the previous year, making it three years in a row for the company to show growth with combined increased profitability.

The company's Systems & Services Division gained major new accounts with its Canadian-made Cyber 170 systems notes CDC, and also reports a sizeable growth in OEM products for other computer and systems companies. The firm's Cybernet services operation also reports continued growth, particularly in Western Canada.

Control Data reports that it is in its eighth straight year as a net exporter, with total exports of $72.1 million, compared with $53.5 million during the previous year, and $39.5 million in 1978.

"We see the decade of the eighties as a period of substantial export growth for Control Data Canada," notes George J. Hubbs, CDC president.

Basic/Pascal language offered to public domain

Commodore Business Machines Ltd., Agincourt, Ont., has released as public domain software the COMAL microcomputer programming language.

The algorithmic language is floppy-disc based and consists of 24 K of machine code. The language is said to combine the power and structured precision of Pascal with the learning ease of Basic.

The language includes such features as "if-then-else-end if", "repeat-until", long variable names to clarify their purpose, indented program lines, named procedures and true parameter passing. In addition, the language offers automatic identification that shows the structure of the program and is useful as a debugging aid.

Multi-branching, dimensional arrays, Boolean functions and file handling are also possible with the new language.

New consulting firm specializes in micros/minis

Keysoft International Ltd., a newly-formed Toronto-based consulting firm, supplies and maintains computer systems and associated software.

Specializing in micro- and minicomputer systems, terminals (both video and hard-copy), printers, graphics and interfacing to mainframes, the company also handles the programming of APL systems and offers consultation in a wide range of applications. These include: database design, database access and update, financial planning, forecasting, production scheduling, inventory control and order entry, mailing lists, accounts payable and receivable, general ledger, word processing, banking systems, and communications.

With the support of computer telecommunications equipment and electronic mail switching facilities, the company can communicate with associate companies worldwide.

Keysoft International is at 8111 Yonge St., Suite 1610, Thornhill, Ont. L3T 4V9. Tel. 889-2173.

Ticketmaster expands in UK to computerize box offices

Ticketmaster UK Ltd., a subsidiary of The Tickex Corp./Ticketmaster Canada, Vancouver, has signed an agreement with Wyndham Theatres Ltd., London, England, to computerize the box office operations of four major west end London theatres. Installation is scheduled for early 1982.

Negotiations are also under way for

three regional Ticketmaster systems to serve areas outside London, and other London theatres are expected to join with the four theatres in the West End system. Eventually, the system will be interlinked throughout the UK to provide a network of sales points and to remove the inconvenience of current booking methods, says Robert Dubberley, President, Ticketmaster Canada.

AES increases sales, expands facilities

Sales at AES Data Ltd., the Montreal-based manufacturer of word processing equipment, totalled $75 million in the first half of 1981, up 40 per cent from $53 million in the comparable period last year, says John Leng, president.

Leng also reports other growth within the company, including a doubling of plant and office space in the Montreal region to 300,000 sq. ft.; a new headquarters facility in St. Laurent, Que., with a product demonstration centre; the opening of an office communications products group in Mississauga, Ont.; and the establishment of a software systems group in Orlando, Fla., to develop an advanced software technology capability.

CCG's new Datapac service supports CPU/WP access

A new access service for Bell Canada's Datapac packet-switched data transmission network came into effect recently.

Called Datapac 3305, the new service is designed to support host computers, RJE terminals, and communicating word processors which emulate the IBM 2770/2780/3740/3770/3780 types of terminals.

Communicating word processors include such devices as the IBM Office System 6, Wang model WP5528, Xerox model 850 and Vydec models.

Communications may now be established between terminal-to-terminal, terminal-to-host or host-to-host configurations, says Bell's Computer Communications Group, providing application software exists to allow such interaction.

The terminals are connected to the Datapac network via a network interface machine (NIM), which supports the BSC point-to-point connection mode protocol. The interface machine translates user data into packets for transmission on the network.

Two methods of interface are provided to allow customer flexibility in interfacing the terminal and/or host with the network. In the first method, transparent communications may be established between terminals, or to a centralized host, without modifications to the customer's equipment, software or operation. A dedicated Datapac 3305 synchronous line accesses the Datapac network at the (destination) host end, while each (originating) remote terminal is connected to the network from a NIM-supported Datapac 3305 dedicated, public or private dial access.

In the second method—non-transparent communications, in which the hosts subscribe to Datapac 3000 access and the terminals subscribe to Datapac 3305—the host will connect to the Datapac network using X.25. An interface is being developed and will be incorporated in CCG's Datapac Access Software (DAS) package. This will complement the existing support for Datapac 3101 (asynchronous TTY devices) and Datapac 3303 (synchronous 3270 devices) into IBM systems.

In Brief:

□ **G.A. Computer Ltd.,** Toronto, has opened its Calgary office at 1935-30th Ave. N.E., Unit 13, Calgary, Alberta T2E 6Z5. Tel. (403) 277-6550.

□ **MICOS Computer Systems Inc.,** Mississauga, Ont., has launched its peripherals division, **MCSI Peripherals** at 1295 Eglinton Ave. E., Mississauga, Ont. L4W 3E6. Tel. (416) 624-0320.

□ **Memorex Canada Ltd.,** Don Mills, Ont., has appointed **Canadian Computer Products Ltd.** has a distributor of the company's magnetic media products, including computer tape, flexible discs and rigid discs. The products will be marketed throughout Canada under CCP's trade designation, Kompro. The vendor is located at 315 Flint Rd., Downsview, Ont. M3J 2J2. Tel. (416) 663-1766.

□ **Jacob Electronic Systems Ltd.** has become the authorized Canadian distributor for the Digilog line of desktop business systems. Jacob Electronic is at 328 Consumers Rd., Willowdale, Ont. M2J 1P8. Tel. (416) 496-0039.

□ **Comalco Ltd.,** Calgary, has opened a branch office at 801 York Mills Rd., Suite 201, Don Mills, Ont. M3B 1X7. Tel. (416) 449-8036. Telex: 06-966710 V1P T0R.

□ **MLPI Sysnet,** Toronto has been named exclusive Canadian distributor for Timeplex Inc., Rochelle Park, NJ. MLPI will sell and service the full line of Timeplex data communications products including the Series II Microplexer statistical multiplexer/data concentrator. MLPI is headquartered at 2255 Sheppard Ave. E., Willowdale, Ont. (416) 494-3600, and has branch offices in Montreal, Edmonton, and Vancouver.

□ **Future Electronics Inc.,** Pointe Claire, Que. and **Tansitor Electronics** have signed a distributor agreement allowing Future to inventory and market the Tansitor product line in Canada. Tansitor's products include tantalum electrolytic capacitors, and micro miniature solid encapsulated tantalum chips. Future Electronics has offices in Montreal, Ottawa, Toronto, Calgary and Vancouver.

□ **Memorex Canada Ltd.,** Don Mills, Ont., offers an 8-page booklet entitled "Critical Factors in Purchasing Rigid Media". For more information contact: Media Marketing Secretary, Memorex Canada Ltd., 230 Lesmill Rd., Don Mills, Ont. M3B 2T5.

□ **Atlas Electronics Ltd.,** Toronto, has been appointed Canadian distributor for the line of audio-visual and professional audio products from Telex Communications Inc., Minneapolis, Minn. Atlas has also been named Canadian representative for Polar Electronics Ltd., Guernsey, England. Polar manufactures electronic test equipment for printed circuit boards.

□ **Dy-4 Systems Inc.,** Ottawa, has appointed **Ahearn & Soper Ltd.,** Rexdale, Ont., as Canadian distributor for the company's line of graphics CRT terminals. With offices in Ottawa, Vancouver, Calgary and Montreal, Ahearn & Soper will provide technical assistance, delivery and maintenance. Dy-4 has also appointed **Tracan Electronics Corp.,** Toronto, as their eastern Canada stocking distributor. With branch offices in Montreal and Ottawa, Tracan will handle Dy-4's DSTD bus cards and the Orion business system.

□ **Comcheq Services Ltd.** has relocated its Vancouver and Toronto offices to larger quarters, at 1070 West Broadway St., Vancouver, B.C., and 1200 Eglinton Ave. E., Toronto, Ont.

□ **Interfax Systems Inc.,** has been named exclusive Canadian representative for **Quantec Systems Inc.,** Scarborough, Ont., which manufactures the Z-800 E-PROM programmer. Interfax has offices in Montreal, Ottawa, Toronto, and Vancouver.

□ **MLPI Sysnet,** Toronto, has been named Canadian distributor for all products from Alpine Datasystems Inc., Beaverton, Ore.

CIPS Calgary seminars held with Western Computer Show

"Challenges of the Eighties", a series of seminars sponsored by the Calgary section of the Canadian Information Processing Society, are slated to be held at the Calgary Convention Centre on October 28 and 29, 1981, in conjunction with the Western Computer Show.

A host of speakers will address specific topics of concern to managers and data processing professionals. Seminar topics include organizational implications of data base; dimensions of software testing; corporate data administration and data dictionary; and communications and the automated office.

To enroll for sessions contact: The Canadian Information Processing Society, P.O. Box 1197, Station "M", Calgary, Alberta T2P 2K9 or call Gord Mathezer at (403) 231-9442.

ABCS Inc. to distribute upgrade of relational DBMS software

Advanced Business Computer Systems International Inc., Windsor, Ont., has become the exclusive Canadian distributor of the Condor Series 20/DBMS relational database management system.

The system features powerful "business English" commands and advanced relational database structuring that lets both first time users and experienced computer programmers use DBMS to create custom programs for accounting functions, inventory control, record keeping, time and personnel reporting, and mailing list management.

The program is designed to let business owners and managers tailor applications to their business without help from a programming professional and is claimed to allow faster and more direct access to information than the hierarchical or network structures of other microcomputer software.

The system is compatible with Z-80 microcomputers and requires at least 48 K RAM memory and at least one floppy or hard disc drive. It runs on the CP/M operating system on most terminals.

New software produces computerized text

A new software system, called Scribe, for computerized text creation and management is being introduced by Digital Equipment. The system supports the firm's Gigi color graphics terminal and permits users to produce completely edited, composed and typeset documents.

Scribe was developed by Unilogic Ltd., Pittsburgh, and is available through Digital's External Application Software library.

Designed for use with VAX and Decsystem-20 computer system, the new software assists in preparation of books, documents, presentations. With it, users can produce camera-ready copy with a variety of typefaces and sizes. It also permits the inclusion of graphic illustrations with text developed at a Gigi terminal; automatically numbers figures and tables; and generates tables of contents, lists of figures and tables, and running page headers and numbers. The system also supports line printers, letter quality printers, phototypesetting systems and laser printers.

Single user license for Scribe, with documentation, is $12,560 for educational institutions and $31,400 for others. Maintenance services are available from Unilogic Ltd.

The University of Waterloo has recently added a new device to its computer communications network (CCNG) based on the Telidon system. The device, known as an input provider system, allows professors and students to develop their own electronic pages of graphs, illustrations, paragraphs, floor plans, maps, and displays.

Previously, UW's network received all of its information pages from the department of communications in Ottawa, but could not create its own because it did not have the input provider.

Other UW Telidon efforts include keyboard and data base organization designed to make it easier for users to find and retrieve material on a large system. Dr. Paul Beam, associate professor of English, has also been using the system for computer-aided learning and his students are creating programs which will eventually constitute lessons for part of a literary criticism course.

TI cuts prices on some electronic data terminals

Price reductions from 7-17 per cent on selected models of the Texas Instrument Omni 800 line of terminals went into effect August 1. The price changes affect the Omni 800 keyboard send-receive data terminal, the Model 840 receive-only printer and the Model 810 printer.

The price reductions on the Model 840 and 810 affect unshipped backlog, new orders and all existing purchase agreements, says TI. The price reductions are credited to innovations in manufacturing technology which have resulted in lower manufacturing costs.

The company also announced the addition of several new options that can be ordered on Model 940 KSR and RO units, and four new Model 840 option packages. The new options include a device forms control; adjustable tractor-drive only (replacing standard friction-feed); and an 18-key numeric keypad.

Band printers enhanced to boost maintainability

Control Data Canada is introducing enhanced versions of its 300 and 600 lpm OEM band printers to increase their reliability, and maintainability.

The new 9383 and 9386E models feature a 15-in. by 35-yard towel ribbon that is said to provide more than 1 million printed lines between ribbon changes in typical use. Towel ribbon life is estimated to be five to ten times that of a tabular ribbon, notes Control Data.

Design changes in the printer cabinet and electronic packaging have been made to reduce preventative maintenance. A dual access cabinet top allows the unit to be serviced from either the front or the rear without removing the top. Subsystem electronics are contained on a plug-in circuit board.

According to Control Data, microprocessor-controlled diagnostics are run from a new touch-sensitive operator control panel that displays 25 status conditions to the operator or maintenance engineer.

Interactive prompt aimed at TSO environments

An on-line interactive prompt facility for Easytrieve users operating in the TSO and TSO/SPF environments is being introduced by Pansophic Systems Canada Ltd., Mississauga, Ont.

Interactive Prompting Facility (IPF) 1.0, includes a question/answer terminal session for generating an Easytrieve program and subsequent report output. The IPF asks a series of questions relating to the library (field definitions), selection criteria, sort and control specifications, summary report indication, titles and list fields.

According to Pansophic, each response is validated for correct syntax, with descriptive diagnostic messages presented when an invalid response is entered. Once created, the report program may be saved on a standard operating system data set, checked on-line for correct Easytrieve syntax, or run on-line with the report output routed to the user terminal or system printer.

Digital adds $9-M office to Ottawa headquarters

The construction of a new $9-million, 108,000-sq.-ft. office building scheduled for occupancy in July, 1982 is under way following a recent ground-breaking ceremony by Digital Equipment of Canada Ltd., Kanata, Ont.

Situated near Digital's existing plant and headquarters in Kanata, the new plant will be occupied by 475 employees from the existing facility.

Necessitated by a business growth of 32 per cent in the last fiscal year and contined future growth, the three-storey building will accommodate most of Digital's front-office functions, the company management and the Management Information Service computer centre. Bringing the company's floor space in Kanata to approximately 400,000 sq.ft., the new facility will be designed so that 100,000 sq.ft. more space can be added in the future.

Portable facsimile unit accepts oversize documents

A portable facsimile system capable of transmitting or receiving documents as large as 9x14-in. is billed as the first such system to meet current technical standards for worldwide facsimile communications.

Developed by the Imaging Systems Div., Burroughs Corp., Office Systems Group, the new 'dex 1402' transceiver permits oversize forms and documents to be transmitted at a rate of one page in two minutes.

The desktop unit meets CCITT Group II requirements for AM/FM facsimile communication. The manually operated system has an internal data coupler and interfaces to telephone lines with a modular jack. The unit communicates in 2, 3, 4 or 6 minutes with other facsimile systems in the Burroughs line and with other vendors' equipment, notes the company.

The system's 9x14 in. format permits several smaller documents to be sent on the same telephone call.

The US list price is $3,500.

Gov't urges applications for Telidon-use program

Federal minister of communications Francis Fox has invited private firms, crown corporations, non-profit groups and educational institutions wishing to make use of Telidon interactive television technology to apply for financial assistance through the Telidon Industry Investment Stimulation Program.

Under the program, the federal government is purchasing 6,000 Telidon terminals from Canadian manufacturers, and will make them available for first-time users in the private sector. To qualify for this assistance, applicants must agree to purchase and install at least an equal number of terminals, and demonstrate the advantages of their proposals.

The federal support program will spend $10.5 million in 1981-82, and the government hopes this will generate private-sector investment of more than $100 million in Telidon equipment and services.

New Ottawa firm sets sights on CAD/CAM terminal market with new product. Orcatech Inc. was founded by David Pearson, president, (centre standing), Ian Carlisle, (right), VP Manufacturing and Development; and Girvan Patterson, (seated) VP Operations and Finance. First units will be shipped in December, says company.

Ottawa firm sets sights on CAD/CAM terminal market

A new Ottawa-based supplier of computer graphics terminals has started the manufacture and marketing throughout North America of a family of intelligent terminals for the CAD/CAM market. The product has been three years in development and the company expects to achieve $1 million in sales after the first year of operation. First terminal shipments will be made this coming December.

Orcatech Inc. states that it has signed a $500,000 two-year contract with Northern Telecom for the sale and service of terminals for CAD/CAM operations. A number of other computer companies are said to be evaluating the terminal with a view of adopting it as a CAD/CAM standard.

The company was formed by David Pearson, Ian Carlisle and Girvan Patterson. All three worked previously at Bell-Northern Research, where the system was initially developed to aid in the design of telecomm products for Northern Telecom.

"We believe that the formation of Orcatech is a significant milestone in Canadian high technology development," notes David Pearson, president, in a press statement.

"The use of computer aided design and manufacturing means Canada will be able to make higher quality, more complex products of all kinds, more cheaply and more rapidly than ever before," he said.

The new terminals are significantly less costly than present equipment on the market, states the company, yet they are claimed to have outstanding resolution and easy programming. Three basic terminal configurations will be marketed initially, ranging in price from $25,000 to $50,000.

The units comprise a CRT, an alphanumeric keyboard, a microprocessor computer, and various disc drives and associated memory units.

Other peripheral hardware, such as printers, graphic digitizer pads and monitors can be added to suit customer needs, states the company. The terminal components are packed in a workstation module.

The Orcatech terminal can function in a number of different modes, states the company. It can operate as an intelligent terminal to a main host computer. It can also become a stand-alone CAD/CAM minicomputer and graphics terminal, controlling a full set of discs and peripheral devices. It can also be configured in a local cluster of CAD/CAM terminals.

The company plans to initially concentrate on high-performance graphics terminals for the manufacturing industry, and plans to follow with a family of lower cost products for business and home applications.

Venture financing for the firm comes from various organizations which are holding equity positions. Northern Telecom will continue to be associated with the company through both an equity position as well as membership on the board of directors. Manufacturing facilities are located at 2680 Queensview Drive, Ottawa. Plans are to move to a new building in early 1983. □

PEOPLE

MORROW

Tom Morrow has been appointed operations manager for Centronics Canada Inc., Mississauga, Ont. He will be responsible for field engineering and logistics in Canada.

Phoenix Automation Inc., Ottawa, has elected **William M. Gilchrist** to the company's board of directors. He is a board member of several corporations in the resource industries field. Phoenix was established in 1980 and is a supplier of CADD turnkey systems.

HARVEY

ESE Ltd., Rexdale, Ont., has made three sales appointments. **Richard Dugal** is named district sales representative for Ottawa. He joins the company from Motorola Inc. **Joe Farquhar** has been named sales specialist. He will be responsible for the sale of ESE, Codex and Universal Data Systems data communications equipment. **Noel Lessard** has been named district sales representative for Quebec. He was formerly with TCTS in Montreal.

WILL

Vern Harvey has joined Atlas Electronics Ltd., Toronto, as field sales representative for Saskatchewan, Manitoba and northern Ontario. He will be based in Winnipeg. **John Will** has been named field sales representative for British Columbia, and will be based in Vancouver.

CROSSAN

Canada Systems Group, Mississauga, Ont., has made three appointments within the Multiple Access division. **Ronald C. Crossan** has been named eastern region director. He has been with the division for over 12 years. **Joseph M. Powers** has been named central region director with more than 21 years experience in data processing. **Arnold D. Barkoff** has been named western region director. He has more than 19 years experience in the data processing industry.

POWERS

Klaus Wilk, president, United Telephone Co. Ltd., Ottawa, has been elected president of the National Interconnect Association of Canada, Ottawa for the 1981/82 term. He has more than 20 years experience in the telecommunications industry. Other officers elected to the NIAC executive include **Glenn R. Gray,** president, Cantelco Canada Inc., Markham, Ont.; **Leo Lazar,** president, Tel-Com Communications Ltd., St. Laurent, Que.; **Neil A. McKellar,** president, Executive Communications Ltd., Mississauga, Ont.; and **Bob McGregor,** vice-president, Service and Installation, Tel-Efficient Communications Inc., Toronto.

BARKOFF

Software producer to spend $8 million on R & D

OTTAWA—Systemhouse, one of Canada's biggest computing consulting and product development companies, has officially opened its research and development centre here.

And at the opening ceremony Jack Davies, its president, took the opportunity to throw a few punches at governments for not putting any public money into R & D in the software industry.

Systemhouse, he said, will spend about $8 million on R & D over the next year on initiatives that include office automation, computer-assisted design and drafting, complete business systems and computer-based mapping systems. This amounts to a reinvestment of 7 per cent of the company's gross revenues.

In a brief address distributed to media representatives at the ceremony, Davies said that as a percentage of sales, his company's R & D investment has been substantially higher over the past two years as it undertook a major program to develop a range of software-based products for sale into selected vertical markets.

He went on: "I might add that this entire investment has been made by Systemhouse. To date we have not received a penny from any level of government to support our R & D program.

"I'm not particularly proud of that fact, and I believe that it derives from the fact that our corporate thrust is software-based, and software development has not been recognized in Canada as an initiative that can be supported by government funding programs.

"I believe that we are making progress in our negotiations with the government funding agencies, however."

The 22,145 square foot facility at 2827 Riverside Drive, Ottawa, accommodates the Advanced Technology and Product Development Divisions which employ over 100 people.

"A computer system may be considered great today, but it may be just adequate tomorrow and obsolete the day after," said Davies. "Research is critical to the success not only of this company, but Canadian high technology in general.

"We have always relied heavily on our own research and product development resources—for example, in developing our Hospital Financial Management System and our automated map and chart-making systems.

"Only now, however, have we been able to bring all our resources together in one place, and coordinate and direct them in support of our major product expansion program into the U.S. and Canada."

The centre was officially opened by Andy Haydon, chairman of the Regional Municipality of Ottawa-Carleton. Senior personnel from the National Research Council were there including Keith Glegg, vice-president, Industry, and Dr. W. Coderre; Dr. J. S. Riordon, Dean of Engineering, Carleton University; Dr. T. Oren, Professor of Computer Science at Ottawa University, and Dr. Roger Kaye, holder of the Systemhouse-Mitel Chair of Office Automation at Carleton U.

Haydon said they were witnessing a major change in the character of Ottawa-Carleton as more and more hi-tech companies expand or relocate to the region.

"The one-industry-town label doesn't fit anymore," he said. "We welcome this influx of new ideas, new people, new lifestyle.

"We're projecting that by 1990 the number of hi-tech employees in Ottawa-Carleton will equal that of the federal public service." (about 78,000).

Systemhouse R & D thrusts will be boosted by another 30 new employees at the year's end and 40 to 50 in succeeding years.

Expansion plans call for the company to move its head office to the Royal Bank Centre in 1982. There will then be four Systemhouse locations in Ottawa-Carleton—Head Office, Ottawa Branch at 99 Bank Street, the R & D Centre, and the Manufacturing and Integration Division in Nepean.

Tom Messer, Ottawa Editor

OCTOBER

22-25. Chicago
Common Fall '81: IBM Computer Users Group. Topics cover systems, applications and management. Contact: David G. Lister, Administrative Director, Common F81, 435 N. Michigan Ave., Chicago, IL 60611. Tel. (312) 644-0828.

29-30. Montreal
Montreal Office Exhibition. Contact: ECM Exhibition & Conference Management, 2 Robert Speck Parkway, Suite 750, Mississauga, Ont. L4Z 1H8. Tel. (416) 273-3910.

NOVEMBER

1-4. San Francisco
Data Processing Management Association 30th Anniversary International Conference & Business Exposition. Contact: Conference Coordinator, DPMA, 505 Busse Highway, Park Ridge, IL 60068. Tel. (312) 825-8124.

4-5. Toronto
Introductory seminars on UNIX. These seminars are designed to introduce the use of UNIX to software managers, consultants, analysts and programmers. Contact: Human Computing Resources Corp., 10 St. Mary St., Toronto, Ont. M4Y 1P9. Tel. (416) 922-1937.

4-6. Cologne, Germany
IFCOM Telecommunications Fair. More than 100 international telecommunications companies will present language, data, image and text communication technology including radio installations, telecommunications equipment, network management, wideband communication, individual components, and component assemblages. Contact: Messe- und Ausstellungs-Ges.m.b.H. Köln, Messeplatz, Postfach 21-07-60, D-5000, Köln 21, Germany. Tel. (0221) 821-1, Telex: 8-873-426 a-mua-d.

9-11. Los Angeles
ACM '81. Exhibits will include a range of computer-oriented products. Technical programs and seminars will cover: software, data base design, security, management, and graphics. Contact: ACM '81, P.O. Box 24059, Village Station, Los Angeles, CA 90024. Tel. (213) 536-9735.

12-14. Reno, Nev.
Accounting and Information Systems Expo '81. Contact: Leanne Stone, University of Nevada-Reno, Division of Continuing Education, College Inn, Reno, NV 89557. Tel. (702) 784-4046.

16-19. Toronto
Canadian Computer Show & Conference. The show has been expanded to a fourth day to include exhibits and topics of interest to doctors, lawyers, etc. Contact: The Canadian Computer Show & Conference, 36 Butterick Rd., Toronto, Ont. M8W 3Z8. Tel. (416) 252-7791.

16-19. San Antonio, TX
Computer Performance Evaluation Users Group Meeting. Sponsored by the U.S. National Bureau of Standards. Contact: Theodore F. Gonter, U.S. General Accounting Office, 441 G Street NW, Room 6011, Washington, DC 20548. Tel. (202) 275-5040.

17-19. Vancouver
British Columbia Business Show. Seminar topics will cover the business technology explosion, business communications, information processing, and business technology and people. Contact: Simon Roberts, Show Manager, Southex Exhibitions, #202-2695 Granville St., Vancouver, B.C. V6H 3H4. Tel. (604) 736-3331.

19-22. Las Vegas, Nev.
Comdex '81: The National Conference & Exposition for Computer Dealers, Distributors and Reps. Contact: (800) 225-4620.

DECEMBER

1-4. New Orleans
CMG XII International Conference on Computer Performance Evaluation. Contact: CMG, P.O. Box 26063, Phoenix, AZ 85068. Tel. (602) 995-0905.

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Full circle in software support?

By F. T. WHITE

The story of application software support has had two major eras so far: pre- and post-unbundling. In this article, the president of a major IBM competitor discusses what he foresees as the next development.

BACK in the early '60s, the data processing industry was dominated by a single vendor—one that clearly earned and nurtured its dominant position by providing leadership in the application of computer technology to solve business problems. IBM's strategy then was to be the catalyst and provide application solutions to encourage a wide range of businesses to accelerate computerization plans. Package solutions involving both hardware and application software resulted in IBM becoming the industry leader.

IBM's support personnel were far more familiar with the application than the hardware, and what the customers cared about was not described by machine model numbers but by acronyms like '62 CFO', 'ALIS', 'IMPACT', 'ACP', 'COLT', etc., for the insurance, distributing, airline, banking and other industries, along with a wide range of other application programs with related systems engineering expertise.

IBM's systems experts drew the respect of the user community and, combined with IBM's rich library of application packages, were responsible for the rapid development of computing in the '60s and also, for IBM's dominant market position.

During the late '60s, however, IBM commenced winding down its application development and support program and, by 1969, the final step came with the now-famous decision to unbundle support entirely. I believe history will show that the unbundling of 1969 was a major strategic error for IBM. My conviction remains: 'The vendor that owns the application, controls the market'.

Another important event happened during the 1960s—the announcement of the Model/360 and the development of a standard I/O interface, a standard instruction set, standard data formatting and encoding and—ultimately—communication protocols to simplify IBM's design, manufacturing, education and support activities. This also gave the double benefit of allowing the customer an upward growth path to larger and larger machines without reprogramming or conversion.

But not only did IBM simplify their own engineering design and manufacturing activities, the development of these standards sowed the seeds for other vendors to design and develop compatible products—terminals, tape units, main memory, disc drives and ultimately processors—to provide alternatives to each user who had chosen the Model/360 standard architecture as the base for his system development.

During the '60s, the user would buy a packaged solution of hardware and software much in the same way a music connoisseur bought his hi-fi set: in a single box with a fancy cover but no flexibility in choice of turntable, speakers, amplifiers or tuner.

As a result of IBM's decision to standardize on a single architecture and at the same time release its grip on its customer base by unbundling and de-emphasizing application support, individual specialty-product companies, much like the individual stereo component manufacturers, set out to produce more cost-effective replacement products for each component of the users' data processing system.

The '70s then saw the development of the component business. New companies, unheard-of ten years before, enjoyed unparalleled success in bringing more cost-effective and reliable system components to the marketplace.

Today in Canada, available intelligence suggests that STC ships more tape units than IBM, that competitive disc suppliers ship more discs than IBM, that plug-compatible processor suppliers have shipped almost $300 million worth of main frames, and that compatible terminal vendors ship more than half of the terminals used by 'IBM' installations. Like the stereo connoisseur who is really interested in quality and superior performance, the demanding data processing professional is likewise selecting the best vendor for each of his system component needs.

Now we have a very different competitive situation than we had even 10 years ago. During the '70s, fueled by growing competition, we saw important technology advances that resulted in dramatically lower prices and significant improvements in reliability and packaging.

There remains, however, one fly in the ointment. The hardware business has developed, especially recently, in a very positive direction with orders of magnitude of improvement in cost, performance and reliability over the past two decades.

Application software, however, remains in a sad state. I believe I would have no difficulty in gaining agreement that application development costs—as measured by executable instruction per man-day out of the development

F.T. 'Ted' WHITE is president of Amdahl Canada Ltd., Toronto.

shop—has not made significant gains since Cobol was adopted as an industry standard in the early Sixties. When you consider that the cost of a system developer today is three to four times the cost of 20 years ago, the contrast between hardware and software progress is shocking.

Many major systems currently in operation in many businesses are approaching their tenth anniversary. Each year the maintenance of these major systems requires more and more resources as the pressures of business change, demanding constant updating.

The backlog of new applications is growing and in many, if not most, large installations now ranges from three to five years. The lack of improvements in programming productivity has resulted in the central DP function being unresponsive to new and changing user requirements. This is providing the impetus for hardware vendors to make a wide range of stand-alone mini computer proposals to end-users to meet their apparently unique needs. Many of these proposals appear to be attractive, promising more responsiveness, more cost effectiveness, direct user control, etc.

But the facts are clear. The methodology supporting today's decentralized solutions is where the main-line data processing function was 10 years ago. It *looks* simple, but this simplicity stems from inflexibility and missing pieces. Real costs are hidden and future inflexibility is almost assured.

This brings us to the '80s. Conventional system development methodologies simply do not work, and there are few promising solutions to improve productivity on the horizon. The software technology of the minicomputer tends to be standalone and not compatible with the centralized information needs and demands of most corporations. The backlog is growing. What's the answer?

"The Eighties will be the decade of the application software industry"

For most installations I suggest it is to abandon the notion that only 'roll-your-own' solutions are appropriate. Instead, buy ready-made and readily adaptable solutions to application problems. Many large companies, for example life insurance companies, have major file maintenance systems that are 10 years old and no longer responsive to market needs. The cost for a rewrite probably exceeds $5 million, which in itself is almost prohibitive. But, more importantly, the resources required to write such a system simply are not available and the attendant risks of failure are extremely high. Large companies must look for packaged solutions to meet their major system needs.

Whereas the '60s were the decade of IBM dominance and the initial launching of most major information processing programs; and the '70s were the years of the users becoming vendor-independent, the '80s will see a full circle of evolution and will be the decade of the application software industry.

The vendor opportunities for the '80s obviously will lie in the application software companies. It is significant to note that even in 1981 the potential industry leaders have not been identified. Application software companies with revenues over $25 million can be counted on the fingers of one hand. The investment community is well aware of the potential that exists for those companies that have the promise of being leaders. The few companies that appear to be contenders, even though they are small in terms of their present size, are commanding unheard of market prices.

I believe both vendors and users will see the importance and significance of the potential for mutual success; it is my prediction that, in the next 20 years, the dominant suppliers in our industry will once again be those that own the applications. □

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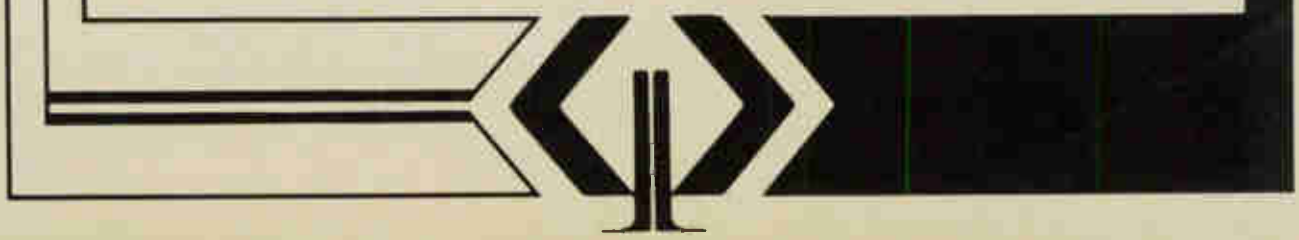

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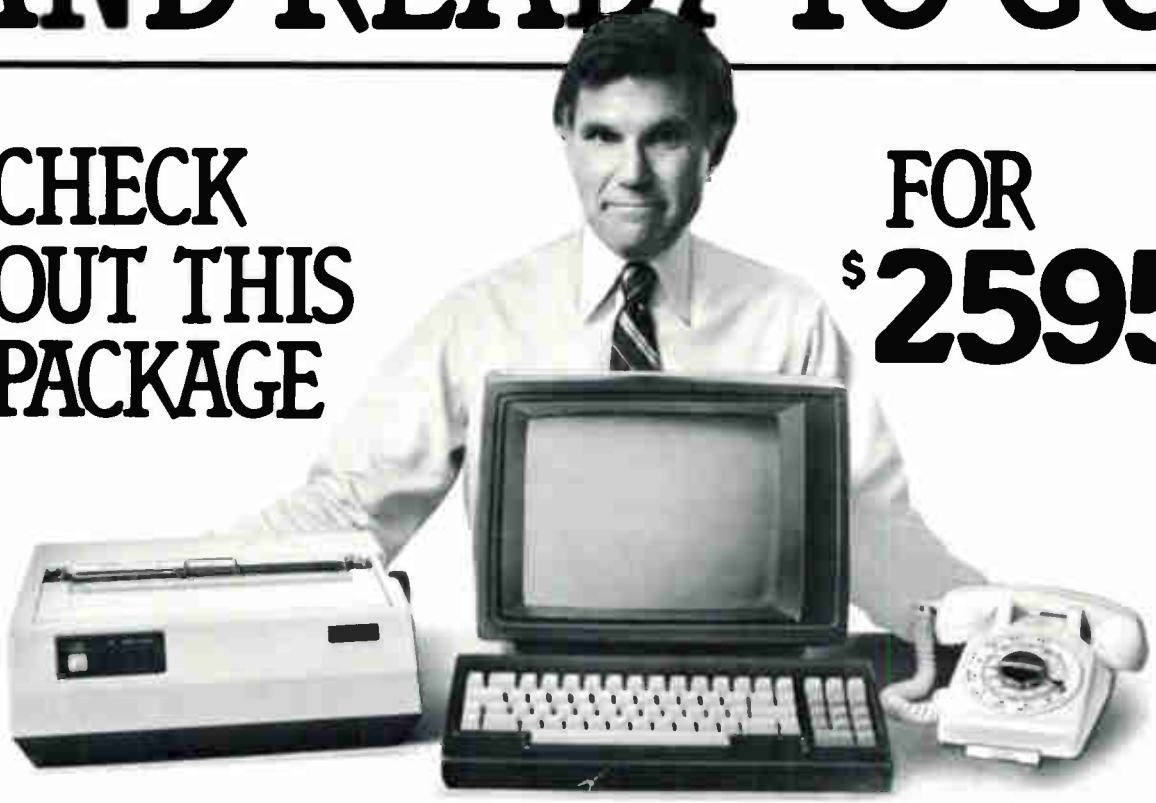

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