

B.C. EDITION

Vol.3 No.4 APRIL 90

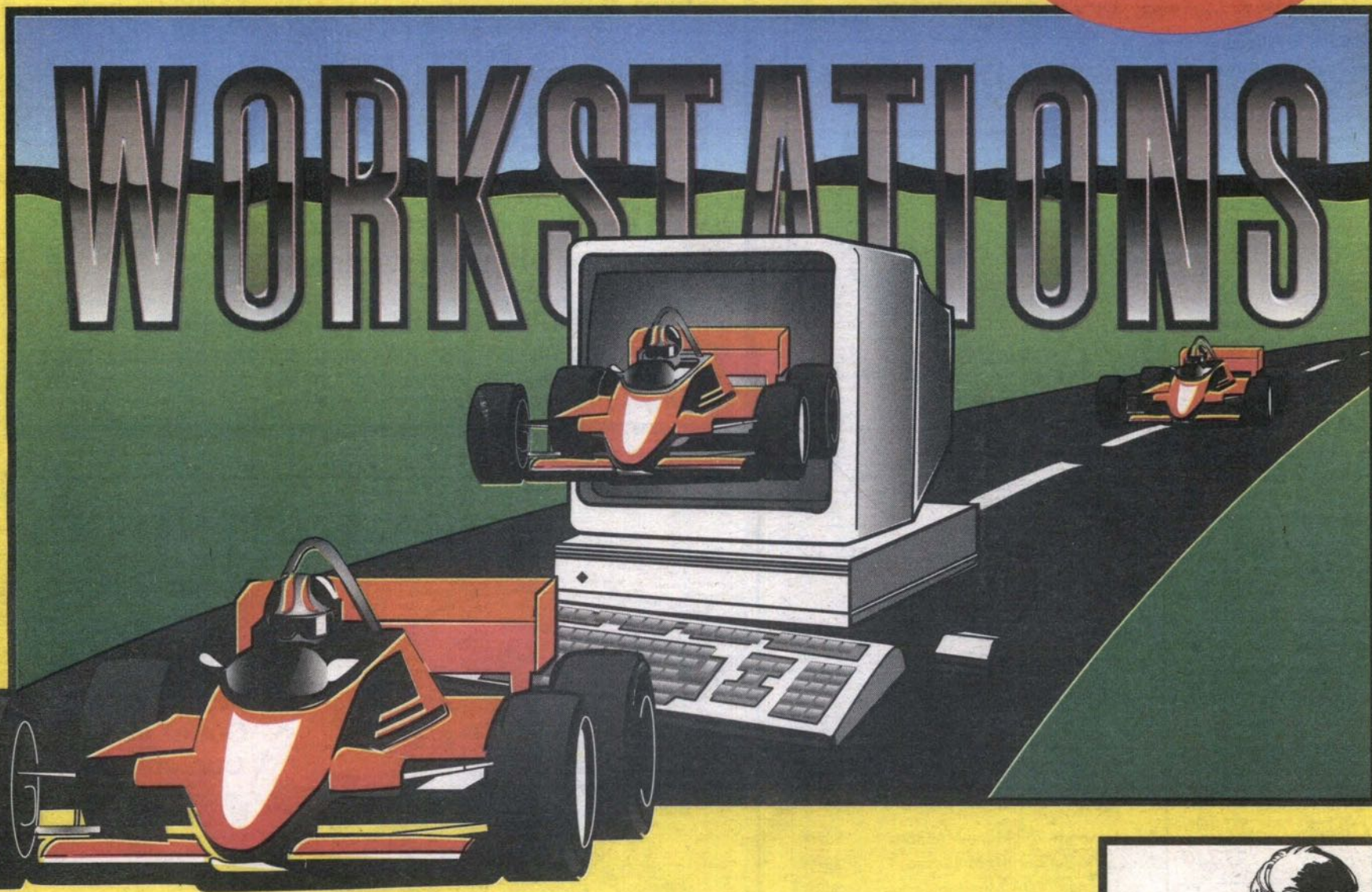
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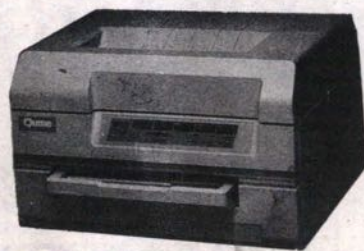
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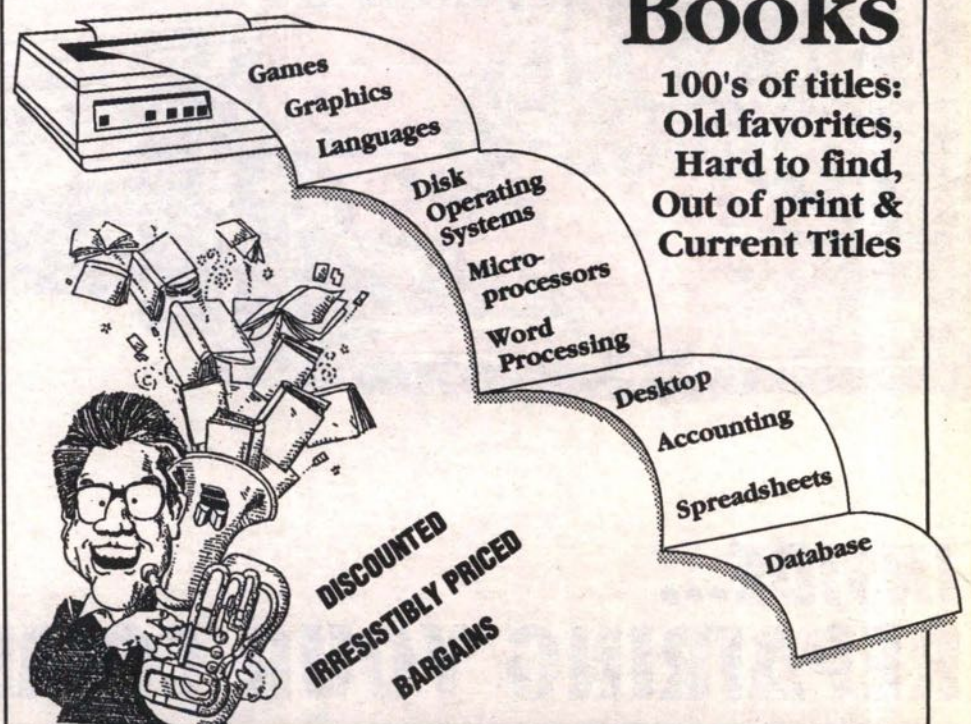
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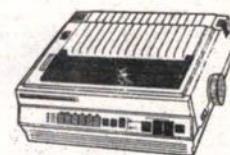
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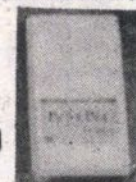
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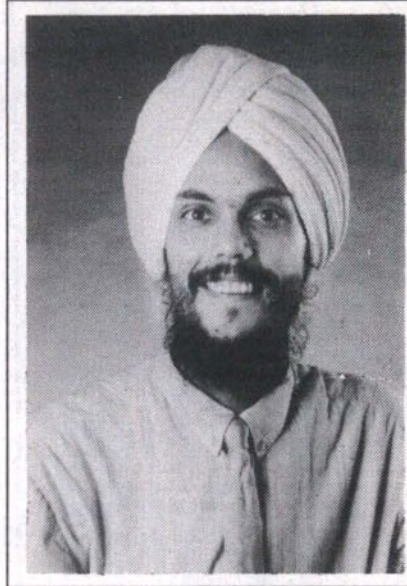
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FROM THE EDITOR



Spring is here, the sun is shining today as we paste up our April issue. It is tough to keep everyone inside, away from the beach, and working, but the evidence that we did it is in your hands. Gray-scale should be the name for a monitor, not a description of our complexion after too many hours at the keyboards. Hope you are getting out into the sun once in a while too.

This Month

Workstations were once the treasured preserve of engineers and academics. These powerful, multi-tasking, multi-user computers are starting to show up in a variety of business applications. They are still not cheap, but for the right "highly-leveraged" person, they can be a very worthwhile investment. Thanks to William Barr for this overview of what is available. Roedy Green is back with an "under the hood" look at how to maintain your own computer. He has some hot tips on how to keep that old box of chips functional.

Laptop computers are turning out to be the hit product of the 90's, offering computing power in a moveable package. Four models are reviewed this issue.

If laptops are the winners in computing, fax boards or fax modems are the peripherals to include with your computer. This month, we look at a range of fax products for the Macintosh and PC markets. Certainly for a business with a regular set of customers such as ours, they are an invaluable tool. At *The Computer Paper*, we send out a "broadcast fax" at the beginning of the month to let our advertisers know what will be in the next issue of the paper. (call me at 733-5596 if you want on or off our list). Because it is done from the computer, we can update the list from our database relatively easily. In an increasing number of cases, our fax-out is being received by a fax board at the other end of the phone. The file ends up on the customers hard drive, where he/she can read it and then have the option to delete the file or print it at that point — very useful technology.

Now if only E-mail were so accessible and universal. But that is another issue — next month's in fact. We will be focussing on telecommunications. Also featured will be an article on software for manufacturing.

Let our advertisers know that you saw their advertisement in *The Computer Paper*. It keeps them aware that their investment in advertising is paying off, and that allows us to bring you more coverage of the rapidly changing computer market. Thank you.

Enjoy the issue.

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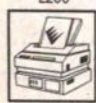
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Circulation: 50,000 ISSN 0840-3929
2nd Class Postage Reg. Number 7718
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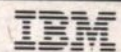
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I was reading an article called "Cyber Thrash" in SPIN magazine (Volume 5, Issue 12, March 1990), and they mentioned a magazine called "2600" which is dedicated to computer hacking/phreaking etc..., a subject which greatly fascinates me. I was wondering if you had heard of it, the author of the article was buying from newstands in New York, and if you do know of it, could you send me a mailing address and any other information you have pertaining to it, as I would like to take a look at a copy.

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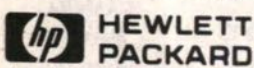
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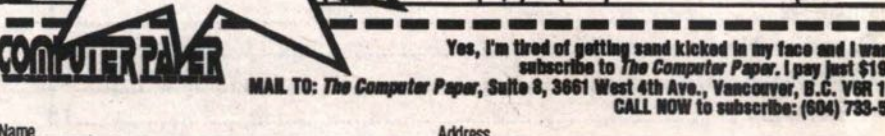
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How about it readers, anyone know where to get this magazine?

Re: VGA Monitors

I remember you as the chap who makes bold statements such as "there are many MS-DOS operating systems such as DesqView, etc." In this month's paper, I noticed another.

"I mention this card (CGA) mainly to warn you away from it."

I have always found the CGA card (with composite RCA jacks) very useful for video output to VCR's. There doesn't seem to be anything else that can easily send video signals from a PC to your average camcorder. I realize that it's tough to buy a CGA monochrome monitor in Canada (easily bought in the States though). Your readers should be advised of this useful side of CGA cards. If you know of any other video card that outputs to home VCR's, please tell us!

Reilly Burke
Vancouver International Airport

Grumbling Pays Off

We received this letter shortly after our publication went to press last month with the article ReadySetGrumble. Way to go Letraset, someone was listening to users, now just extend the deadline a bit and everyone will have a chance to upgrade.

**Canadian Ready, Set, Go!
Owners Upgrade to Design
Studio for \$149.**

Dear Ready, Set, Go Owner:
Letraset Canada Ltd. has met with an overwhelmingly positive response to the release of DesignStudio, the powerful new layout program for the creative professional. We've had hundreds of inquiries from leading software dealers, computer magazines, and designers. Many owners of Ready, Set, Go! have requested a trade-up to this product.

Although DesignStudio is a distinct product from Ready, Set, Go! the Letraset United States subsidiary has offered DesignStudio as a traditional upgrade to Ready, Set, Go! owners. Letraset Canada is offering a similarly priced trade-up offer to Canadian registered owners to ensure that they benefit from some unique benefits of the Canadian version of the software. In Canada, DesignStudio includes both English and French dictionary and hyphenation annexes. Letraset Canada Graphic Design Software is extending this time-limited trade-up offer.

Until April 30th, 1990, registered users of Ready, Set, Go! may trade up to Design Studio for \$149. (Limit one per registration, Ontario residents please add 8% pst = \$160.92).

To order simply send us a cheque or money order. Or order by telephone by dialing 1-416-475-TYPE and using your Visa, MasterCard, or American Express card. Please allow 4 to 6 weeks for delivery.

Letraset offers this time-limited special to registered users of Ready, Set, Go! to fulfill our commitment of offering the most innovative software programs for graphic design to our loyal product users.
Burton W. Robson
Manager, Graphic Design Software.
Letraset Canada Ltd.

SOFTWARE BC

The Coming 2 Years

by Kimberly Brooks

Attendance was down at the last Software BC meeting due to the snowstorm, but discussion was up because of the more informal group. Stewart Alsop, editor of PC Letter, gave his predictions for personal computers in the coming two years. According to Alsop, Unix will not affect the market, and Microsoft Windows will be the new standard for DOS-based machines. As the industry moves into 1991, OS/2 version 2.0 will emerge, Sybase's decentralized database structure will make it the new large-system database manager, large applications will be rewritten to fit on cheaper machines (i.e., Office Vision from IBM), and the new marketing policy for Apple will be "service comes first."

Next month's meeting will feature Ron Evans, President of Evans Research. The meeting will be held at The Hermitage Restaurant, 115-1025 Robson Street on April 19, 1990.

Contact: Software BC, 682-2034

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ACCPAC Easy		Generic Cadd Lvl II/III	129/229	StiBack (Automatic backup)	99	Midi Card (Adib Add on)	175	Panasonic/Roland Emv/Tray	129
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ACCPAC+ 5.1 IC		Grammar Estimator	219	SoftSafe (system security)	98	Microsoft Mouse W/Paint	129	Printer Buffer 64k / 256k	189/249
ACCPAC+ 5.1 LAN		Grammar (Grammar chk)	89	Software Bridge (wp Convert)	119	Microsoft Mouse W/Win/Paint	179	Switch Box 2-Way /4Way	69/99
Act (TOP SALES)		Graphic Organizer/Track	275	Software Carousel v3.0	79	NEC GS 2A White Monitor	369	Plotter in a Cartridge	399
Adobe Illust	489	LAN	349/1289	Spinrite II (increase HD spd)	98	Nec Multisync 3D (1024)	949	Headlines HP Cartridge	459
Agenda	319	LAN		SOZ Plus (NEW) (compress)	98	Samsung 20" Super VGA	1998		
Allways Tr	119/129	LAN		Statistics I (test/simulat)	98	Samsung 20" (mono 1280x)	2198		
Ami / Pro	189	LAN		Statistics II (model simulat)	98	Sota 286/386 Upgrade Board	459/689		
Amortiz	49	LAN		Stedmans MEDICAL Dictionary	79	SoundBlaster (Midi & Game)	359		
Animat	79	LAN		Super Base 2 / 4 windows	259/595	Summasketch 12x12 / 12x18	449/899		
Arts & Asksan	44	LAN		Supercalc 5.0 (super value)	349	Trackman (trackball)Logitech	149		
Autosk	79	LAN		Superproject Expert/Plus	539/329	UPS Battery Backup 450watt	689		
Bartend	19	LAN		Symphony 2.0	549	VGA Super Monitor	599		
Basic C	123	LAN		Timelime 3.0 / Graphics	449/159	Video Capture (color card)	499		
Battery	149	LAN		Timeslips III (time billing)	249	Wyse Terminal 30/50	439/629		
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Zucker 2400B int(3yr War.) 165
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WHAT'S NEW

LSD High Priest Now Into Cyberspace

Timothy Leary, the former Harvard professor described as the high priest of the '60's acid movement, is now achieving his altered states in Cyberspace from a computer. "Cyberspace" or "virtual reality" uses sophisticated computer hardware and software to create a new artificial reality inside the computer. Leary was the subject of a recent interview on Vancouver radio station ROCK 1040's *The Year 2000*.

The term "cyberspace" was coined by

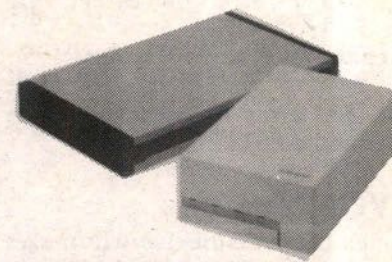
Vancouver author William Gibson in *Neuromancer*, a 1984 science-fiction novel that won the Hugo, Nebula and Philip K. Dick awards. The book describes a global computer/communications network supporting "consensual hallucinations" involving a billion people on a daily basis. (*Sounds a bit like Television!* — Ed.)

The computer industry likes to call this concept "virtual reality" and leading edge software is being developed by Autodesk, the makers of AutoCAD, and the largest manufacturer of computer-aided design software. Virtual reality-type programs are being used by architects to

get a better idea of the design of buildings by viewing them from inside a computer, by fighter pilots to gain experience in flight simulators, and by kids using the Nintendo "Data-glove" game controller. Eventually, according to Leary, there will be computer suits that allow users to "wear their computers."

According to the interview, Leary's motto for the 90's is "just say know," referring to his software company, Knoware (Suite 702-11288 Ventura Blvd., Studio City, California).

Leary spoke with Allan Earle, the host of ROCK 1040's *The Year 2000* program. The show can be heard Sunday mornings, on AM 1040 radio.



The Hissing of Office LAWNs

"Look Ma, no cables!" is the approach of a new cable-less local area network device. According to its distributors, the LAWN or Local Area Wireless Network marks a significant advance in the way computers communicate with each other. Devices on the LAWN network are not linked by the usual tangle of cables, but rather by high frequency "spread spectrum" radio. Each unit requires a Cdn \$679 LAWN unit and the LAWN software. The system works with up to 20 users who can be separated by a distance of up to 500 feet.

Distributed in Canada by Calcon Business Products (604) 261-6477.

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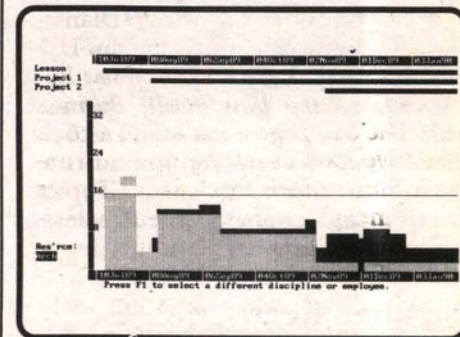
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SNA Gateway



Project Managers Flipped Upside Down

South Pointe Software of White Rock, B.C. have a new twist that they believe gives them an advantage over the 200-plus project management software programs on the market. Their recently announced software package, RPM/ Resources & Projects Manager, is a top-down, multi-projects, multi-resource program. Most other project management software consists of single-project, detailed task network programs that use Critical Path Method (CPM) or Program Evaluation and Review Technique (PERT). RPM does not require users to learn either of these techniques, instead it uses a familiar spreadsheet-like interface to view both total-company and individual-project resource allocation on a single Gantt/Histogram screen. Project and resource conflicts are immediately visible and quickly resolved by revising employee allocation or changing project or phase start or end dates.

Other features include separate resource-availability schedules, project percent complete, earned value, 100-year calendar, project notes facility with internal word processor. Demo version is \$85, full program is \$1785, with 90-day free software telephone support. Contact: South Pointe Software, 1-1812 Southmere Crescent, White Rock, BC, V4A 6W9 (604) 538-2326

Simon Fraser Beefs Up Computer Theft Security

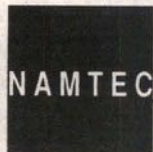
According to *Simon Fraser Week*, thefts worth over \$30,000 in the past nine months have prompted SFU to instal a new security system on campus. The system, active and monitored 24 hours a day, instantly alerts the security office

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when a computer is being tampered with and also triggers an alarm horn in the area where the tampering is occurring. According to Steve Mezaros, electrical superintendent of facilities management, the system can accommodate over 1000 sites.

Dynamix Launches Two New Accounting Packages

Dynamix General Accounting Software and Dynamix Joint Venture Accounting Software are two new accounting packages announced by Accounting Software Assistance of Calgary. Both packages run on IBM-PC and compatible computers. Both packages offer both single and multi-user accounting. The joint-venture accounting package features the ability to generate joint-venture billings for capital, revenue and operating costs. Contact ASA, 110-276 Midpark Way SE, Calgary, Alberta, T2X 1J6 (403) 253-3500.

New Canadian Book on The Home Office

Local authors Douglas and Dianna Gray, in association with McGraw-Hill Ryerson, have just published *Home Inc. — The Canadian Home-Based Business Guide*. The 316-page book offers a comprehensive look at setting up and running a home office in Canada. Topics covered include: self-assessment; selecting the right business; planning, legal, tax and financial considerations; low-cost advertising and promotion techniques; and time and stress management.

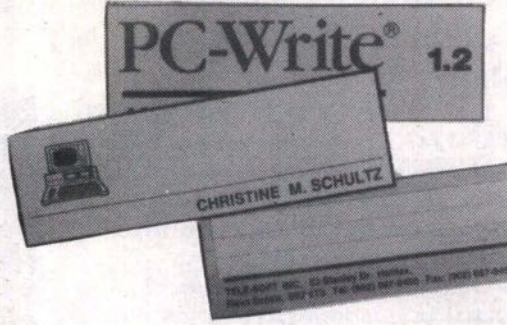
Some interesting statistics from their book:

- The home-based business is the most rapidly growing small business trend in Canada
- Over 50% of small businesses start out of the home
- Recent studies indicate that by the year 2000, up to 40% of the labor force will be working out of the home. Some of these people will be employees (telecommuting), but most will be self-employed
- Amway, Baskin-Robbins, Hallmark Cards, Hewlett-Packard, Nike and many other successful corporations in Canada and the USA started from home, in a basement, garage, den or spare bedroom
- Over 60% of home businesses are started by women
- Approximately 2/3 of home-business owners want to remain home-based as a personal, career or lifestyle choice. The other 1/3 want to start out of the home to save money, minimize risk and test the idea before expanding

QuickMail 2.2 Upgrade Improves Features, Speed

The race to dominate the Macintosh E-Mail market is heating up again with the release of CE Software's QuickMail version 2.2. The new version offers improved speed of access, better administration, and a variety of new features. Included is QM Menu, which allows users to attach a mail menu to any application, providing universal mail integration. CE Software has also included a number of utilities previously sold separately in the new package. QM-Bridge allows QuickMail sites to communicate with other QuickMail sites via a single MailCenter and a modem. By adding Farallon's MacRecorders, users can add voice mail

capabilities. With the new features, QuickMail appears to be the product to beat. Contact: CE Software Inc., 1854 Fuller Road, PO Box 65580, West Des Moines, Iowa 50265, 515/224-1995.



Your Own Diskette Labels

Ever wonder where you can get professional-looking labels for your company's diskettes? Photologic of Willowdale, Ontario, is offering multi-color labels starting at \$39 for 200 labels. They are an economical way for software developers to market their "private label" software, or for you to jazz up in-office disk labels. Contact: Photologic, 6 Lansing Square, Suite 141, Willowdale, Ontario, J2J 1T5 (416) 497-7001.

Omission

Last month in our survey of desktop publishing service bureaus, we left out a new Vancouver company called *Tomorrow's Graphics*. They offer PC and Macintosh support with station rentals starting at \$9.00/hour, a Microtek scanner with OCR and 256 levels of gray for \$12.50/scan, disk transfers from IBM to Mac and back for \$12.50 per disk up to 15 minutes, Laser printing on an Apple Laserwriter IINT from \$1.00/page, and a Montage slide processor from \$17.50/slide, faxes, Canon photocopying, Canon color laser copies, Kroy Kolor laminating, binding, desktop publishing services, and systems sales and software packages. They are located at 3615 Kingsway in Vancouver 604/433-8433. Fax 604/433-9887.

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First there were desktop computers. Then came the laptops. Each offered something that the other did not.

But now there's something that combines the best of both worlds. Because now there's a portable that's easy enough to take with you; yet powerful enough to double as your office computer.

You may say that sounds like a split personality. We say it sounds like the new Altima One.

Altima One can run MS-DOS and OS/2 with ease. Plus it features an impressive 80286 microprocessor that speeds to a full 16MHz, without ever gasping for breath.

What's more, Altima One comes with items that other manufacturers call options. Like a built-in 2400 baud modem. Or an optomechanical mouse with a compartment for storage. Or a PC compatible expansion slot.

Altima even remembered to give you more memory. Because with Altima One, you can expand from one megabyte to five.

Add to this the paper-white LCD backlit display; a full function 101-key detachable keyboard with numeric keypad; a 3 1/2", 1.44

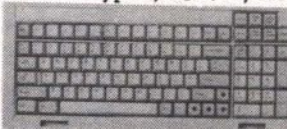
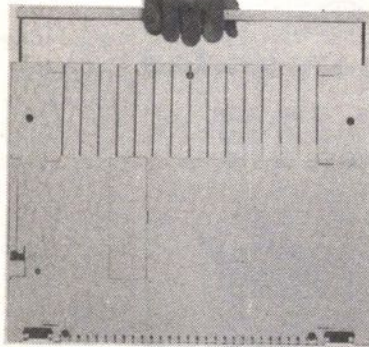
megabyte internal floppy disk drive; plus a 40 megabyte hard drive, and you'll realize why the Altima desktop/laptop is one heck of a computer. Or is it two?

Westcoast Computers

1915 Lonsdale, North Vancouver, B.C.

986-7680

Split personality.



NEWSBYTES

Amiga

Commodore, Atari Battle Continues At European Show

HANNOVER, WEST GERMANY, 1990 MAR 17 (NB) - All eyes at CEBIT '90 this week will be on the continuing struggle between Atari and Commodore for supremacy in the 32-bit game machine market.

Originally, industry watchers had expected Commodore to dominate Cebit with its much-publicised A3000 Amiga machines, leaving Atari to reshuffle its existing range of machines, including the Portfolio pocket PC and Lynx hand-held game console.

The official word from Commodore UK is that no new product will now be shown at CEBIT '90. According to informed sources, this is due to continuing delays in the system software for the A3000 Amiga, even though hardware was ready prior to Comdex Fall last November.

Atari, meanwhile, is putting together a big show centering around a revamped range of its TT and ATW series of 68000-based workstations and transputer machines, backed up by the Portfolio and the Lynx hand-held machines.

Commodore may have the last word, however, as Gigatron, the small West German systems specialist, will unveil its range of Amiga portables at CEBIT. The machines, although not actively endorsed by Commodore, are extremely innovative, featuring a choice of LCD and gas plasma screens, along with a redesigned Amiga motherboard.

Apple

Apple Gets Injunction In Canadian Gray-Market Case

MARKHAM, ONTARIO, CANADA, 1990 MAR 14 (NB) - Apple Canada has obtained an injunction preventing Megasoft, a Toronto computer dealer, from using Apple trademarks.

Apple filed suit against Megasoft in February and charged the dealer with infringing on Apple trademarks, passing off non-Apple products as Apple products, and masquerading as an authorized Apple dealer.

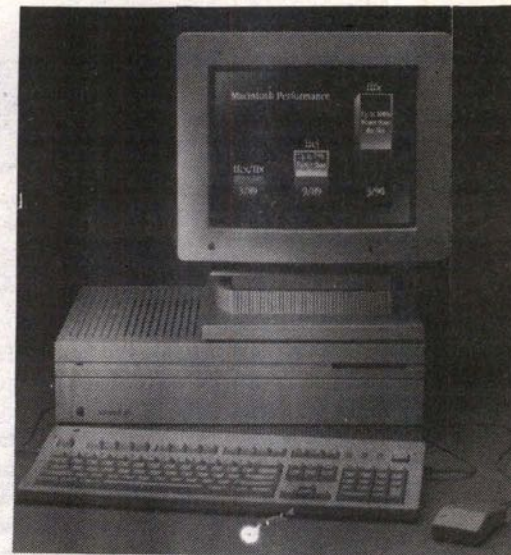
The injunction, granted by the Federal Court of Canada, prohibits Megasoft and its owner, Jacob Fine, from representing the company as an Apple dealer, and from using or displaying Apple trademarks or marks likely to be confused with Apple trademarks. It also stops Megasoft from acquiring Apple products from authorized dealers, and from passing off non-Apple products as Apple products. Megasoft must also post notices on its premises, and include notices in advertising and on invoices, stating it is not an Apple dealer.

Murray Vince, assistant legal counsel for Apple Canada, said Megasoft has displayed logos closely resembling Apple trademarks, such as a rainbow-striped Apple with a bite out of its left side (Apple's trademark has the bite on the right). "They were at least creating the impression in the minds of consumers that they were an authorized dealer," he said.

Earlier, Fine told Newsbytes Apple's

allegations were "completely without foundation and have no basis in truth or fact."

(Contact: Murray Vince or Norm Kirkpatrick, Apple Canada, 416-477-5800; Jacob Fine, MegaSoft, 416-785-8887)



New Macintosh Roll-out

CUPERTINO, CALIFORNIA, U.S.A., 1990 MAR 2 (NB) - Apple Computer has chosen the backdrop of the NCGA (National Computer Graphics Association) convention to unveil its most powerful Macintosh computer.

Apple has scheduled a news conference and luncheon for the press on March 19 at the Grand Ballroom, Anaheim Marriott Hotel, Anaheim, California, to unveil a Macintosh which has either been given the suffix IIFX, or IIXi. It's Apple's most powerful 68030-based workstation with a clock speed of 40 MHz, twice as fast as the Macintosh IIfx. A variety of add-on cards, including one for RISC (reduced instruction set computing) and 8- and 24-bit color, and a new version of A/UX, Apple's Unix operating system, are also expected to be unveiled.

Two I/O units are expected to be inside the powerful new Macintosh, units which will do some of the processing for the main CPU (central processing unit).

Atari

Atari Finances Recovering, New Lynx, Portfolio Due

SUNNYVALE, CALIFORNIA, U.S.A., 1990 MAR 9 (NB) - Atari's fortunes are brighter now than they were one year ago as it prepares to offer new versions of its laptop and hand-held game units, and it says supplies of the units are increasing.

Net income was \$5.7 million in the fourth quarter, compared to a loss of \$97 million during the same quarter last year. The company says income from continuing operations was \$5.8 million or 10 cents per share on sales of \$170.6 million for the quarter ended Dec. 31, 1989. This compares with income of \$9.3 million on sales of \$152.6 million for the

NEWSBYTES is written by Newsbytes Contributing Editors: Wendy Woods, Wayne Yacco, Dana Blankenhorn, Jon Pepper, Steve Gold, Peter Vekinis, Ken Takahashi, Naoyuki Yazawa, Paul Zucker, and Grant Buckler. Newsworthy Canadian press releases can be sent to Grant Buckler, CANADIAN BUREAU, 859 Kennedy Road, #203, Scarborough, Ontario, (416) 285-0644, Fax: (416) 285-5261

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fourth quarter ended Dec. 31, 1988.

During the year as a whole, sales amounted to \$423.6 million, slightly down from 1988's \$452.2 million. Net income was \$4 million for the year as compared to a loss of \$84.8 million or \$1.46 per share for the year ended Dec. 31, 1988.

The company says the results reflect growth in Atari ST and Atari PC4 MS-DOS-compatible product lines, and in initial shipments of the new hand-held Portfolio computer and Lynx hand-held color video game machine.

The company attributes the total sales decline to slower sales of the traditional video game line, not the Lynx. And European markets were said to outperform all other markets in both computers and video game sales.

Sam Tramiel, president and chief executive officer, said in the press announcement, "For Atari, 1989 was a transition year. It witnessed the introduction of a new generation of hand-held machines - the Lynx and Portfolio and, the disposition of an extraneous business segment. For 1990, Atari is fully committed to regaining market share in the video game sector with products like the Lynx, increasing our market share in the personal computer sector with products like the Atari STE, and maximizing our opportunity in the hand-held or palmtop computer business with Portfolio."

One obstacle in the way of maximizing opportunity in the video game arena is the slow production of Atari Lynx hand-held video game units. Greg Pratt, Atari spokesman, tells Newsbytes that supply is improving. "At this point we no longer have the same manufacturing constraints we had previously. We are confident that we will be able to have sufficient productive capacity in place to accommodate next fall's selling season," says Greg Pratt, Atari's chief financial officer.

Atari won't disclose exact figures on the numbers shipped versus numbers ordered, but Pratt says the company is expected to sell every Lynx it gets by the end of the quarter, March 31.

The problem is with the screens, which come from Japan's Citizen. While the unit was designed in the U.S., the Lynx screen is manufactured by the giant Citizen company in Japan. The complete Lynx units are then assembled in Japan and sold both there and in the U.S. The sluggish supply of the Lynx's unique screens are the reason for the trickling supply of the popular hand-held game units. Atari expects supply to increase sufficiently by the second quarter of this year and plans to announce that the Lynx will be shipped to Europe, as well as the U.S. and Japan.

Atari will exhibit at the CEBIT computer show in Hannover, West Germany, this month. The company is expected to introduce new versions of the Portfolio and the Lynx which have bigger screens and larger memories. The press conference is on the 21st of March.

Atari Lays Off 15 Per Cent Of U.S. Staff

SUNNYVALE, CALIFORNIA, 1990 MAR 17 (NB) - Newsbytes has learned that Atari has instituted a major reorganization of its Atari US division at its Sunnyvale, California, headquarters. Various sources tell Newsbytes that some 30 people, or 15 percent of the Atari US staff, were laid off on Friday. Programmers were not affected, nor was production, which takes place in Taiwan. The

cuts came among office, sales, and shipping workers.

August Ligouri, Atari's vice president for international finance, contacted at his home Saturday by Newsbytes, said that he had no exact numbers of people let go, but stated that the action was "more a realignment than a layoff," and that the move was designed to restructure the Atari US division to "put the right people in the right places," for the 1990s.

He could not confirm a report filed by the Z-Net news wire service on Genie, stating that the layoffs badly hit the company's accounts division, with up to 50 percent staff losses. Z-Net reports that none of the 'names' at Atari have been given marching orders.

"The fact that the upper level employees were spared gives some reason to expect that this is not a long-term reduction in overall operation, but more an immediate action for an immediate situation," reports the news wire.

The bulk of the US senior staff are currently en-route, Newsbytes understands, to Hannover in West Germany, for this week's CEBIT '90 show.

B.C. Bytes

Vancouver's Lehdar Offers MenuMaker

VANCOUVER, BRITISH COLUMBIA, CANADA, 1990 MAR 1 (NB) - Lehdar Systems has introduced MenuMaker, a C\$39.95 menu package for MS-DOS systems.

MenuMaker allows construction of menus so DOS users can execute programs, DOS commands and batch files by pressing a single key. It also includes a phone list and autodial capability. Raghu Lehdar, president of the firm, told Newsbytes the software will be distributed through retailers and bundled with hardware from several small PC vendors. The company is concentrating on the Canadian market at present, he added.

Lehdar also sells MiniText, a simple word processor, and the memory-resident Lehdar Calculator. The company offers a bundle of all three programs for C\$99, Lehdar said. Separately, Lehdar Calculator costs C\$39.95 and MiniText costs C\$49.95.

(Contact: Raghu Lehdar, Lehdar Systems, 604-879-5445)

Business

First Computerland Store Opens In Moscow

NEWYORK, NEWYORK, U.S.A., 1990 MAR 5 (NB) - The first western computer store in the USSR, a Computerland franchise, has opened in Moscow. Owned by Michael Tseytin, a Soviet emigre and president of a New Jersey-based Computerland franchise, the store, located near Moscow University, is stocked with equipment manufactured by IBM and other leading US companies.

The store has a policy of accepting only currency convertible to U.S. dollars. It is directing its attention to Soviet business and institutions. A printed source quoted Mr. Tseytin as saying: "We expect to do a \$10 million business in the first year."

Kaypro Files Chapter 11 - Says Move Is Strategic

SOLANA BEACH, CALIFORNIA, U.S.A., 1990, MAR 2. NB - Hard on the heels of the announcement of the latest round of executive changes, including the appointment of a new president and CEO and just two days after the introduction of a new 16-bit microcomputer, Kaypro has filed for creditor protection under Chapter 11 of the federal bankruptcy code.

In a statement issued by Kaypro, President and CEO Roy Salisbury is quoted as

saying: "My team and I have been on the job for 10 days. During this time we've implemented a number of cost-cutting measures and have made every effort to satisfy Kaypro's patient creditors."

In the same statement, Salisbury said: "We have devised a comprehensive strategic plan designed to put Kaypro back on track. We simply need more time to implement our course of action. We have chosen to exercise this option because it is a good business decision."

Salisbury has outlined several of the basic steps included in his strategic plan, including a change in the company's

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distribution channel, internal corporate restructuring, a careful analysis of Kaypro's current position and an open approach to future opportunities for growth. Salisbury's plan has been reviewed and endorsed by Andrew Kay, Kaypro's chairman of the board who commented that "this move will provide the environment necessary for Kaypro to flourish again."

The story behind Kaypro's rise and fall is a familiar one in the world of business, especially in young volatile businesses such as the computer industry. Large inventory purchases in anticipation of growth that didn't happen,

market softening, supply cost hikes as in the necessary dynamic random access (DRAM) chip, unfavorable financing arrangements, chips with intermittent defects and adverse publicity all contributed to the Chapter 11 decision.

Canadian News

Apricot Secures \$2.25 Million Contract With Canadian Government

BIRMINGHAM, ENGLAND, 1990
MAR 10 (NB) - Apricot has secured a UKP 1.5 million (\$2.25 million) contract

with the Canadian Ministry of Finance. The deal follows a 12-month evaluation of the UK company's products.

The contract is being administered locally in Canada by STM, the country's largest systems integration house. The first phase of the contract calls for STM to install 500 Apricot PS/2-compatible machines linked over Token Ring networks to an Amdahl mainframe.

According to Gerry Sumner, president of Apricot in Canada (AIC) which supplied the PCs, the Apricot Qi systems consistently out-performed the competition in the exhaustive trial programme. "Qi ran all the IBM operating systems

and applications without fault and faster than any other contender. This, plus its integral security facilities, made it the logical PS/2 micro platform for what is regarded as Ottawa's most significant information technology project for many years," he said.

(Contact: Jes Dorell, Apricot Computers (UK) - Tel: 021-456-1234)

CD-ROM

CD-ROM Expo: Trends

SAN FRANCISCO, CALIFORNIA, U.S.A., 1990 FEB 28 (NB) - The large audience for the Cahners Exposition Group's Fifth Annual CD-ROM Conference and Expo, held Feb 27-Mar 1 at the San Francisco Hilton, overwhelmed show organizers this year. They were forced to limit the numbers allowed in conference sessions and the number of free passes issued to members of the press.

The star of the show is CD-ROM, or compact disk, read-only memory, a disk that can hold an enormous amount of data compared to conventional floppy or hard disk media.

The new medium has long interested Microsoft, which hosts a show of its own and has a division dedicated to CD-ROM development. Keynote speaker Bill Gates, chief executive of Microsoft, told the crowd that CD-ROM is the secret to multimedia - the ability to tie together sources of video and audio and data into a single presentation. Such applications are memory hogs, and CD-ROM is the only way to store the information in an economical manner. One CD-ROM disk holds 600 megabytes of data. Gates predicted that once the cost of CD-ROM players for computers drops below the \$500 mark ("I feel confident we will do that in the next year," he said), more of the peripherals will be sold.

On display was a new mastering system for assembly of CD-ROM disks, from data preparation to data retrieval software, to finished disks. Priced as low as \$18,000, the Meridian Data VR Publisher (VR stands for Virtual ROM) has a 600 megabyte hard disk drive, as well as 1.2 gigabytes of digital audio tape drive and optimizer software.

Licenses were being swapped like baseball cards. The biggest winner appeared to be Knowledgeset, the Mountain View, California-based company started by Digital Research founder Gary Kildall. Knowledgeset has signed a license for IBM to use its Knowledge Retrieval System technology in an AIX (Unix) version, to be called InfoExplorer. This will be the retrieval engine for CD-ROM-based applications run on IBM's new RISC System/6000 family of workstations.

Knowledgeset also announced that Apple Computer has licensed HyperKRS, its full-text retrieval engine for Hypercard stacks. Apple will include HyperKRS in information products such as reference materials, product info, and technical documentation.

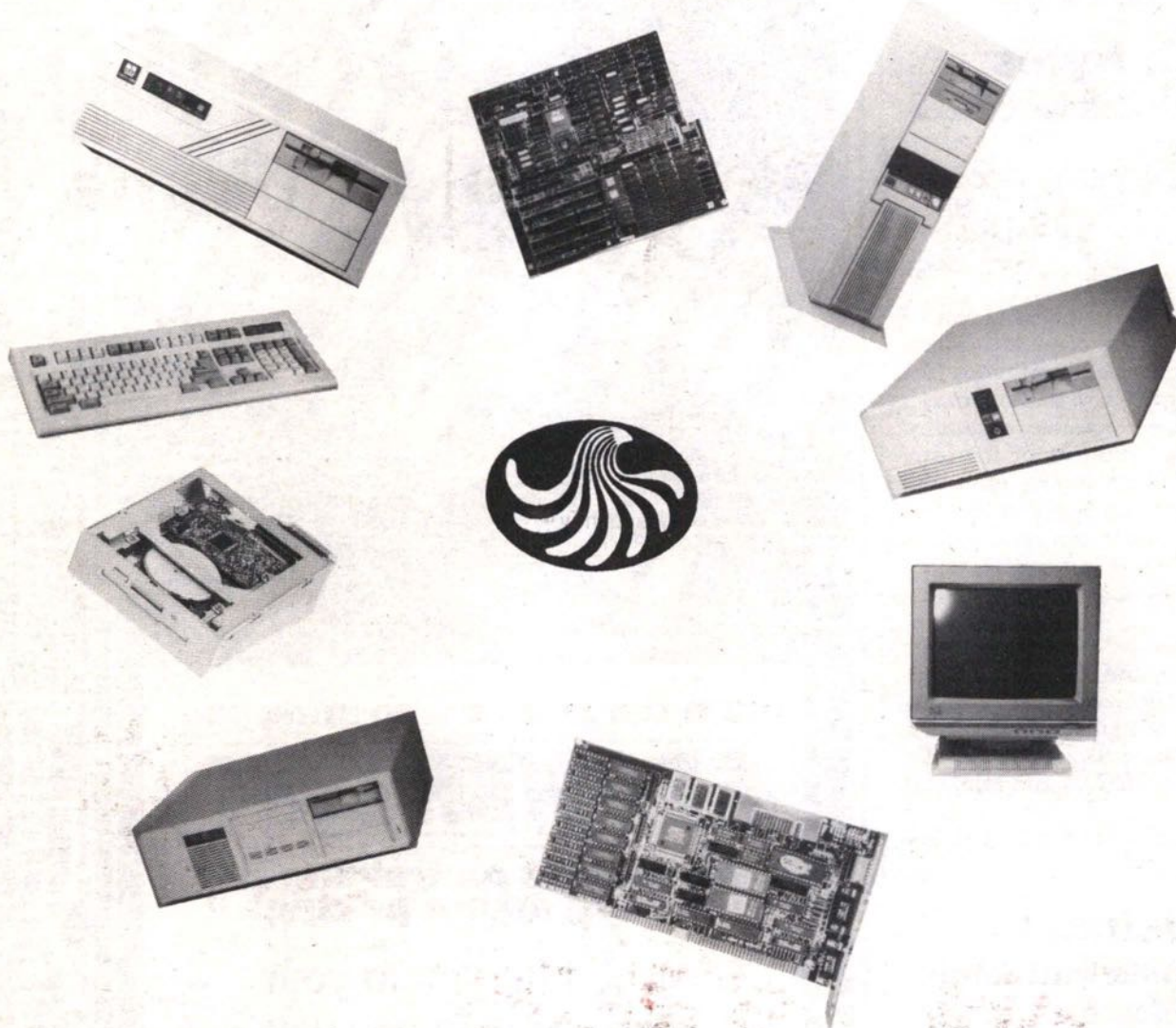
Apple Computer also announced it is licensing Personal Librarian, from Personal Library Software of Rockville, MD, for use in-house as Apple's full-text information management system.

Third-party applications, or software on CD-ROM disk, abounded. Among the highlights:

BRITANNICA SOFTWARE, Chicago, Illinois, announced that it will make its encyclopedia in CD-ROM format available exclusively for Radio Shack's Tandy

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2500 XL personal computer. The 2500XL comes with an internal CD-ROM drive. Compton's Multimedia Encyclopaedia has the complete text of the 26-volume print version of the encyclopedia plus 15,000 pictures, many in full color, animated sequences, 60 minutes of sound segments, and a custom interface for search and retrieval, all on one 5-inch CD-ROM disk. The Tandy 2500 XL features MS-DOS 3.3 operating system, an 80286 microprocessor, one megabyte of RAM, high fidelity sound, 16-bit VGA graphics, and mouse port. No price was available at deadline.

MEDIAGENIC'S ACTIVISION unveiled Cosmic Osmo for CD-ROM, a 100-megabyte version of the popular entertainment title, making it the largest entertainment product software ever. Cosmic Osmo's simulated 3-dimensional graphics and animated characters are interconnected by linking technology. An original music soundtrack runs simultaneously with gameplay, allowing music to play in the foreground of a scene, as opposed to an underscore. Such innovative technology represents a step toward interactive movies on computers. Cosmic Osmo is a non-linear, multidirectional program with seven animated worlds.

The CD-ROM version will be available in June at a suggested retail price of \$79.95. Cosmic Osmo™ for CD-ROM requires a Macintosh Plus, SE, or II with 1 megabyte of RAM, and AppleCD SC™ and a hard drive.

General

IBM Offers To Test Wells For Contamination

YORKTOWN HEIGHTS, NEW YORK, U.S.A. 1990 FEB 24 (NB) - IBM has offered to test the water in nine private wells near its Thomas J. Watson Research Center in Yorktown Heights, NY, after the contaminant Freon 113, a solvent used to clean electronic circuit boards, was found in a monitoring well on the grounds of the research center.

The Freon is believed to have been released into the ground when underground waste pipes broke in September 1987 and February 1988. Since those dates, IBM personnel have monitored the spread of the chemical, which is toxic in large doses, as it spread through 80 wells on the 219-acre Watson facility. The discovery of between 1.2 and 3 parts per billion of Freon 113 in late January in a well approximately 300 feet from the northeastern boundary of the IBM property was, according to IBM spokesman Fred Caplan, the first contamination of a well near the site's perimeter. This led to IBM's offer to test the surrounding wells.

New York State law allows up to 5 parts per billion of the chemical in public drinking-water supplies. Elizabeth Hendrick, Westchester County director of environmental health risk control, feels that there is no cause for alarm. "The data we have does not indicate any sort of health hazard to the neighboring residents. We're talking about very insignificant levels," she says.

The discovery of the chemical contamination comes at a particularly sensitive time for IBM in its relationship with the town of Yorktown. The firm is in the middle of an application process for a permanent state permit to store hazardous waste at the Watson Research Center, a facility located near Routes 134 and

the Taconic State Parkway about 50 miles north of the center of New York City. There is some local opposition to the granting of the permit.

The Gannett Westchester Newspapers on Saturday published mixed quotes from the neighboring homeowners. A

supportive Donald Cronemeyer, an IBM employee as well as a homeowner said: "We know IBM has found stuff on [its] property but nobody else's property. I know the outfit. I know they're trustworthy. There's no basis for concern." A skeptical John Wirth, lawyer for the

Southern Yorktown Homeowners Association commented: "I really think they respond only when they're required to respond. I'm not even sure they've told us everything that should be disclosed."

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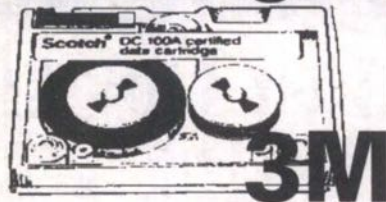
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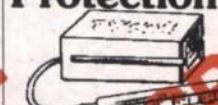
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Hughes Whistleblower Will Go It Alone Without Gov't. Support

LOS ANGELES, CALIFORNIA, U.S.A., 1990 FEB 28 (NB) - Apparently Michael Denlinger, the man who blew the whistle on an alleged cover-up of faulty circuit boards at Hughes Aircraft Ground Systems Group, will have to fight his fight alone.

Denlinger, a former senior engineer at Hughes Ground Systems, has accused the company of selling \$3.2 billion worth of potentially flawed components to the US Navy. He has alleged that quality control at Hughes revealed as many as six percent of the hermetically sealed circuit boards had cracks in their glass seals which could lead to corrosion and ultimate failure. He further has alleged that Hughes discovered the flaws in May 1985 and tried to cover up the problem.

Denlinger had been hoping for Justice Department backing in his efforts against Hughes. According to a report in the Orange County Register, after studying the case, on Feb. 28, the Justice Department declined to participate in Denlinger's suit at least for the present time.

IBM World

Xerox Buys Ventura

SAN DIEGO, CALIFORNIA, U.S.A., 1990 MAR 5 (NB) - Xerox Development Systems (XDS), longtime purveyor of Ventura Publisher desktop publishing software, has purchased Ventura Software, the company behind the program's

development. Financial details of the agreement have not been disclosed.

XDS President Larry Gerhard, in a published statement, said: "Building on the leadership position Xerox has established in the desktop publishing market with Ventura Publisher, it is natural that we continue this process by assuming development responsibility for the Ventura family of products." Gerhard noted that XDS has restructured its organization in order to handle in-house development of Ventura products.

XDS, which recently introduced a new upgrade to Ventura Publisher, has indicated that GEM, Windows and OS/2 Presentation Manager versions of the software will be available sometime in 1990. Former Ventura Software executives have temporarily joined XDS to complete the implementation of Ventura Publisher Gold Series, expected to be finished in June 1990.

(Contact: Ron Kuhl, Xerox Desktop Software, 619-695-7725)

HP'S New LaserJet III May Be Cheapest Postscript

MOUNTAIN VIEW, CALIFORNIA, FEB 25 1990 (NB) - Hewlett-Packard has rolled out a new version of its popular LaserJet printer, and promises to offer Macintosh-compatible laser printers that compete with Apple's own LaserWriter series.

The company says a cartridge which enables the LaserJet III to print PostScript documents will be \$695. The HP LaserJet III printer will be priced at \$2,395. Once discounting takes place at the retail level, customers may be able to

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buy this combination for little more than \$2,000 - that's \$1,000 less than most PostScript printers, and an aggressive entry into the PostScript laser printer market.

The new printer, says HP, offers clearer print quality and the ability to print fonts in any type size without "jaggies" or distortion, a technique called "font scaling."

The cartridge, containing a PostScript interpreter and 35 scalable Adobe fonts, will be available April 1, 1990, worldwide from HP authorized dealers and HP's direct-sales force.

PostScript is a computer language that describes the layout of a page to an output device, in this case, to HP LaserJet

printers. The industry-standard PostScript language is generally seen as dramatically improving the effectiveness and the appearance of printed documents.

Adobe Fonts Chosen For IBM SAA Standards

BOSTON, MASSACHUSETTS, U.S.A. 1990 MAR 5 (NB) - IBM has announced that it intends to provide Adobe Systems Incorporated font technology across the universe of its Systems Application Architecture (SAA) compliant operating systems. SAA compliant operating systems include Operating System/2 (OS/2), Operating System/400 (OS/400), Vir-

tual Machine (VM) and Multiple Virtual Storage (MVS).

Word of IBM's plans to ship the Adobe Font Technology with its OS/2 product came somewhat as a surprise to many industry watchers and is attributed by securities analysts as the reason for the increase in Adobe's stock price on Monday. Another report based on the IBM announcement claimed that Sheraton Lehman Hutton Inc. has raised its earnings estimates for Adobe.

Much of the surprise comes from the fact that IBM had previously announced plans to ship the Royal font technology, developed by Apple Computer and Microsoft, with its version of OS/2, a

move that appeared to close the door on Adobe's chances for inclusion with the product. The open font interface supported by OS/2 allows the support of multiple font technologies and will, therefore, provide users with their choice of font technologies.

IBM's implementation of Adobe font technology for SAA operating systems will be compatible with the previously announced implementation of Adobe's Display PostScript system for its Unix-based AIX operating system.

In a related development, Microsoft has announced that it will provide the Royal technology, which it has named TrueType, in subsequent releases of Microsoft Windows and OS/2 Presentation Manager. It also announced that its page-description language, announced in September 1989, will be called Microsoft TrueImage.

(Contact: Tracy O'Neill, IBM, 914-642-5412)

Local Area Networks

Network Courier for OS/2

Now Shipping

VANCOUVER, BRITISH COLUMBIA, 1990 FEB 22 (NB) - Consumers Software has begun shipping Network Courier for OS/2, demonstrated at the NetWorld show early in February.

The OS/2 version joins Consumers' DOS, Macintosh and Microsoft Windows versions of its electronic mail software. The OS/2 component is priced at US\$595 per network. It will run on any version of OS/2 and can support as many as 150 users on the same network.

Network Courier for OS/2 also allows access to gateways to outside mail systems, including MCI Mail, IBM's mainframe-based PROFS mail system, X.400 systems and facsimile transmission. Network Courier's addressing capabilities let users mix address types to send the same message to distribution lists including users of Network Courier and other mail systems, Consumers said.

The current OS/2 Network Courier does not support Presentation Manager, but company spokesman Michael Shandrick told Newsbytes earlier that the company plans PM support.

(Contact: Michael Shandrick, Consumers Software, 604-688-4548)

Telecomm

NSA Said To Oppose Soviet Fiber Optic Cable Plan

NEWYORK, NEWYORK, U.S.A., 1990 MAR 16 (NB) - Strong opposition is coming from the National Security Agency to a plan by a consortium of U.S. communications companies to aid the Soviet Union in installing a nationwide fiber optic communications system, according to an article in Thursday's *Washington Post*.

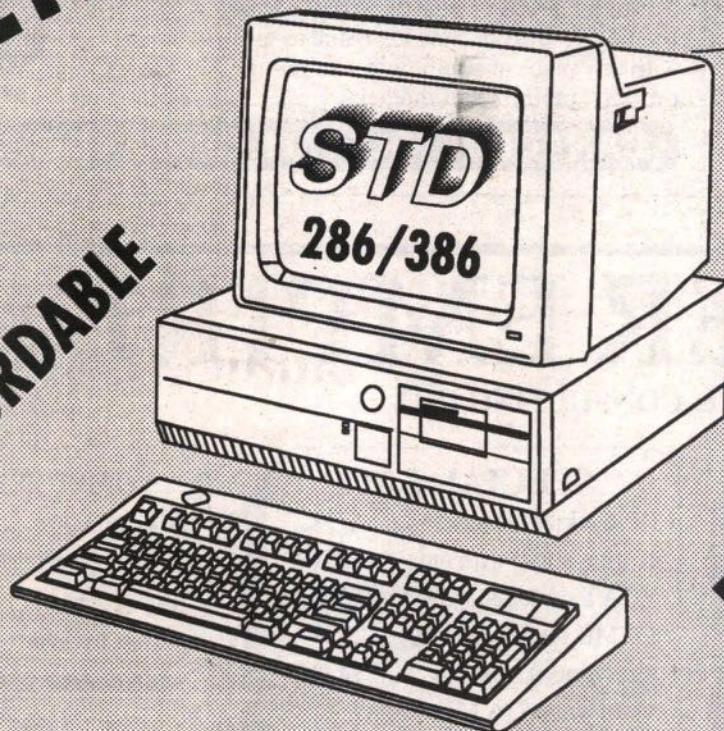
The dispute, viewed as a major test of the present loosening of U.S. restrictions on sales of high technology items to the Soviet Union, is said to center around an on-going intelligence eavesdropping activity by the United States intelligence services on Soviet radio and television circuits. It is felt that the introduction of fiber optic communications circuits by the U.S. consortium, led by the Denver-based US West Inc., will make the Soviet communications secure and, thus, ren-

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der a U.S. multi-billion dollar investment in sophisticated eavesdropping satellites obsolete.

The writer of the *Washington Post* piece, Mark Hosenball, also says that the dispute further points out the way in which technological innovation is rapidly outstripping the ability of the world's intelligence agencies to keep pace.

US West, one of the "Baby Bell" regional phone companies set up following the court-ordered breakup of American Telephone & Telegraph Co., requested government permission in January to build a fiber-optic telephone line across the Soviet Union and has arranged agreements with phone companies in Britain, Japan, Italy, Australia, Denmark and West Germany to participate in the project. It was this request that initiated the current controversy.

While spokespersons for the NSA and Defense Secretary Richard Cheney would not comment on the controversy, the *Post* article quotes a former Pentagon official, Frank Gaffney, who now runs the Center for Security Policy, a conservative think tank, as saying, "A Soviet fiber-optic network will ... make it infinitely more difficult for the West to monitor Soviet communications, a decisive factor assessing leadership intentions, status of forces and preparations for conflict."

Ed Mattix, US West's public relations director for international matters, told *Newsbytes* that while "there's no question that fiber is more difficult to tap into, most of the technology is available elsewhere in the world and is two or three generations old. It is certainly available to the Soviet Union from other sources."

He pointed out that the proposed link will benefit not only the Soviet Union but will also dramatically increase telephone and data transmission capacity between Western Europe and countries of the Pacific Rim, particularly Japan. "The advent of the European single market in 1992 and the greatly expanded world market presence of Pacific Rim countries require greatly improved communications systems and the proposed fiber optic system is a step in that direction." Mattix also told *Newsbytes* that, although *The Post* article states that US West acknowledges that parts of the U.S. government oppose the project, he is only aware of opposition expressed by Richard Pearle, a former government official, in his testimony before the House of Representatives Foreign Affairs Committee on January 25th of this year.

Stratford Delays Suzy Again

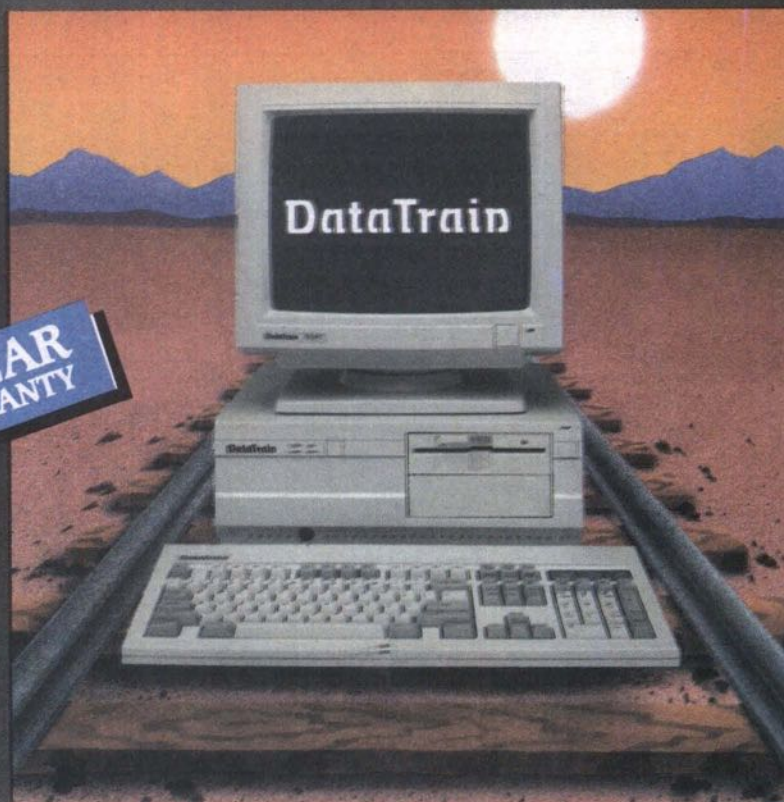
BURNABY, BRITISH COLUMBIA, CANADA, 1990 FEB 26 (NB) - Stratford Software plans at least four more weeks of testing before launching Suzy, its online information service.

The service, consisting of a dial-up system and accompanying software to run on users' personal computers, was originally to have been available in December of last year. That date was changed to February. Now the second date has slipped. Sharka Chobot, marketing manager, told *Newsbytes* the company is confident Suzy will be ready for early April.

The product is in final testing, Chobot said, and there are no serious problems. Having built a solid reputation for its accounting products such as Bedford Software, Stratford is "trying to maintain that sort of credibility in the marketplace

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by not releasing something that isn't perfect," she added. Stratford sold its accounting products, along with the Bedford name, to Computer Associates last July. That sale also means Stratford does not have to rush Suzy out the door for the sake of cash flow, Chobot said.

(Contact: Terry McDonald, Stratford Software, 604-439-1311)

Trends

Senior Execs Must Change How They Relate To Information, Says Drucker

RANCHO LAS PALMAS, CALIFOR-

NIA, U.S.A., 1990 MAR 15 (NB) - In the keynote speech at the Arthur D. Little Information-Based Organization Conference, noted business expert Peter Drucker told senior executives in information-based organizations that they will have to change the way they relate to "information."

Drucker did not say that such executives should become information specialists. Rather, he suggested they need to ask four questions and think through the answers carefully. The four questions are: What information do I need for my job and how do I get it? Who needs information from me and in what form? What does each member of the

organization need to know in order to be an effective team member? and, What do I need to know about the objectives and work of key people in the organization and how do I get them to accept responsibility for keeping me informed?

Drucker commented that today, most people use computers as number crunchers and information winds up being talked about more than actually used. In a true information-based organization (IBO), people must not only take responsibility for gathering the information they need but must also be cognizant of the information they must provide for others. Drucker defined information as "the right knowledge to take

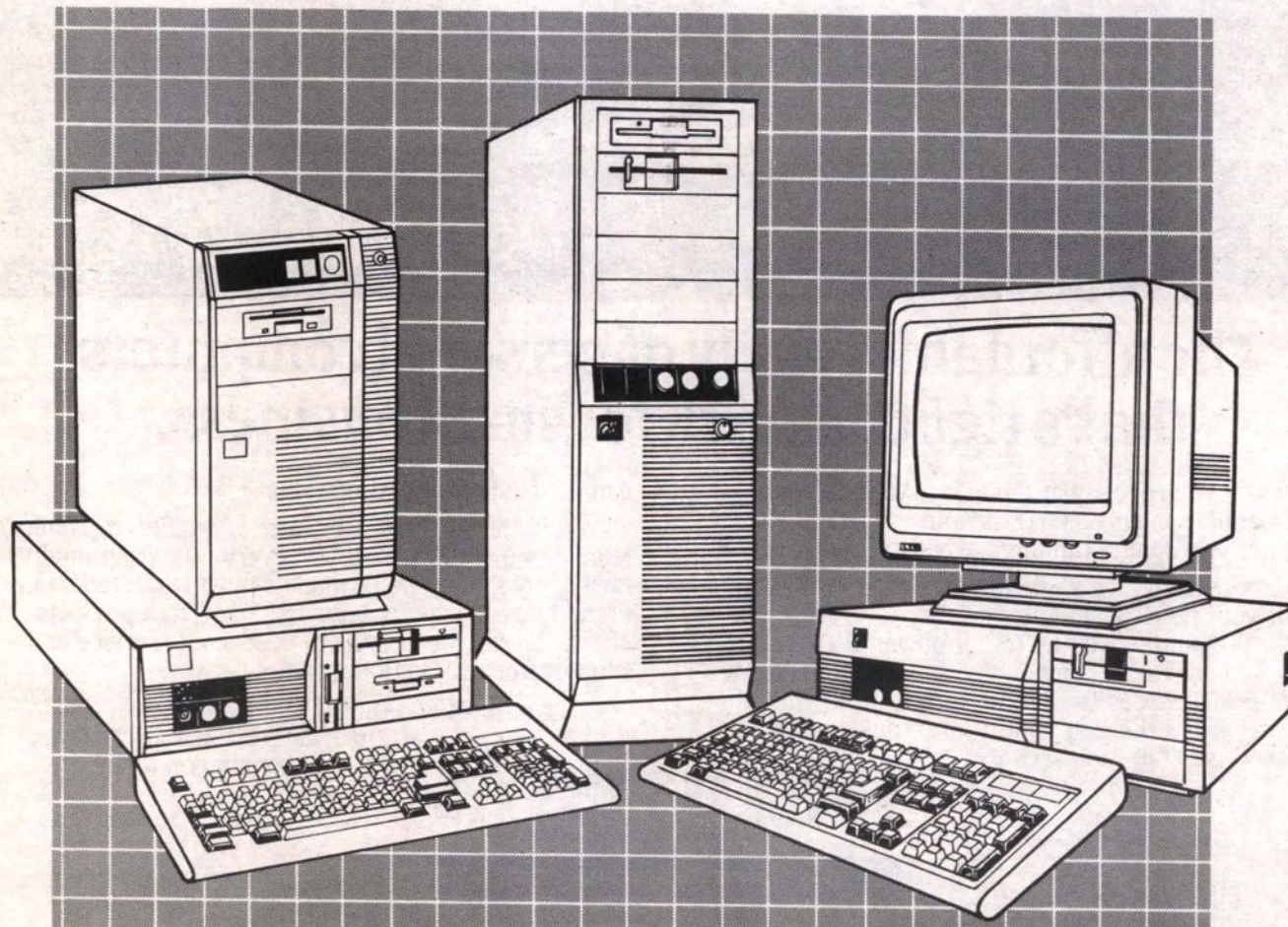
effective action" while he defined data as "one source of information." He added: "We are beginning to go into the information age instead of the data processing age" and pointed out that information can come from all levels: the shop floor, customer interface and data such as that found in spreadsheets.

Three factors to make the executive of the 1990's effective were stressed by Drucker. He noted that we are moving into the IBO with deliberate speed. People have to learn that information is important. The second factor he mentioned was that a great majority of institutions need to act in contemplation of global competition in a fast-changing world. His third factor was that people will have to take increasing responsibility for their own contributions—the business environment will not be static.

As a result, Drucker forecast that information executives in the IBOs of the 1990's will have to examine and refine their businesses and design systems to use information intelligently. They will need to train information specialists and above all, they will have to realize they are running a central "piece" of capital investment—not (capital) equipment.

(Contact: Jennifer Kammeyer, Polare/Fisher Communications, 213-478-0995)

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Intel Promises

Flash Notebook:

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SANTA CLARA, CALIFORNIA, U.S.A., 1990 MAR 9 (NB) - Intel's Dick Pashley, general manager of the firm's Flash Memory Operation, also the assistant general manager of the memory components division, shared his vision of the computer for the year 2000 with reporters and analysts this week.

During a press tour of the Intel's new "D2" site, also known as the Manufacturing Research and Development Site, Pashley said that by the year 2000, the most popular computer on the market would be what he's coined "The Flash Notebook," a half-pound, one-half-inch thick, 7 by 9-inch palmtop machine. The computer would have a built-in modem, fax machine, cellular telephone and television. Onboard would be 50 megabytes of "Flash" memory and a 200-hour rechargeable battery. All of this would be priced at the equivalent of \$200 in today's dollars.

Intel's Manufacturing Research and Development Site, where he made his comments, may be where the tiniest components of his vision could ultimately be made. The \$95 million facility, due to be completed in April, 1990, will be devoted to submicron manufacturing processes focused on non-volatile memory devices and minicontrollers.

Inside is a class-one clean room totalling 35,000 square feet. Intel says no more than .5 microns (eight one-hundred thousandths of an inch) of particles will contaminate a single cubic foot of air, a condition thousands of times cleaner than a hospital operating room.

The cleanliness is accomplished by having workers wear "bunny suits" that fully enclose their bodies, much as astronaut space suits do. The fabrication facility floor is raised to permit a laminar flow of air from the ceiling to the floor. The air itself is filtered and recycled ten times a minute.

Intel Chairman Gordon Moore says of the facility, "This will be one of the most

advanced semiconductor development facilities in the world."

(Contact: Pam Pollace, Intel, 408-987-6729)

Unix

RISC/6000 Faster Than Supercomputer

LIVERMORE, CALIFORNIA, U.S.A., 1990 MAR 15 (NB) - An independent study performed at the Lawrence Livermore National Laboratory in California has shown the new IBM RISC/6000 model 530 workstation capable of performing certain calculations faster than a Cray Model X/MP 4/16.

A study performed by researcher Eugene Brooks as part of a study called the Massively Parallel Computing Initiative, pitted the IBM workstation against the Cray in a standard nuclear reaction test called the Monte Carlo radiation transport benchmark test. Brooks' results showed that the RISC system ran the test 10 percent faster than the Cray, and a packet-switched network simulator ran 50 percent faster.

Lawrence Livermore spokesman Steve Wampler tells Newsbytes that the tests show that certain microprocessors in the IBM system run faster than those inside a Cray or other supercomputer. For instance, he said, some leading microprocessors can now run scalar code faster than supercomputer processors. Scalar codes are those codes for which low-level operations must be performed in sequence, in a manner similar to a craftsman producing one shoe at a time.

Supercomputers, however, are still five

times faster than microprocessors in running complex, lengthy calculations called vector processing, although the difference is expected to narrow in the next five years, according to Brooks.

Lawrence Livermore's Massively Parallel Computing Initiative (MPCI), in which 126 microprocessors will work in tandem on a BBN Advanced Computers TC 2000 computer, will examine the frontiers of parallel computing. The lab's decision to investigate massively parallel computing was fueled by revolutionary advances in the past four years putting more and more computing power into microprocessor chips for personal computers and workstations.

During that period, the compute power of microprocessors doubled nearly every year, allowing them to rapidly cut the computational gap with supercomputer processors.

(Contact: Steve Wampler, 415-422-4599)

Motorola Launches New Computer Line

NEWYORK, U.S.A., 1990 MAR 5 (NB) - Motorola has introduced a new line of RISC-based computers to directly challenge those recently introduced by IBM.

The computers, called the MultiPersonal Computer (or MPC) series, are based on Motorola's own 88000 reduced instruction set computing (RISC) microprocessor and are available in three models. The MPC-100, which contains a 20MHz processor is priced at \$23,985; the MPC-200, with a 25MHz processor costs \$35,985; and the MPC-300, which contains a dual processor, is priced at \$59,995.

Each model will be equipped with a minimum of three Motorola Network Display Stations, a configuration that Motorola representatives point out makes the cost of the MPC-100 come out to \$7,995 per user at its minimum configuration.

Motorola has adopted the Unix operating system and OSF/Motif, a window manager developed by the Open Software Foundation, as part of the standard software to be used with the system. Also provided with the system is X Windows, a graphical environment developed by the Massachusetts Institute of Technology, Looking Glass, a desktop manager from Visix Software of Reston, VA and Ethernet, a local area network standard.

The version of Unix used is System V/88, an implementation by Motorola of the industry standard Unix System V Release 3 operating system.

In announcing the new systems, Edward F. Staiano, president and general manager of Motorola's General Systems Sector, stressed the choice of industry standard software: "The Multi-Personal Computer is the most open computer system available today. We are offering a computer built with non-proprietary hardware and software that is extremely competitive in terms of performance, price and quality."

Motorola also includes with the package software called SoftPC, an emulator that allows applications written for the industry standard MS-DOS operating system to run without modification at speeds which Motorola states are comparable to an Intel 80286-based PC, running the same applications.

To illustrate its competitiveness in price and performance, Motorola stated

that its MPC-100 costs \$907 per MIP of processing power while the recently introduced IBM PowerServer 320 costs \$1,728 per MIP, the Sun SPARCserver One \$2,683 per MIP and the Digital Equipment DECSysTem 3100, \$2333.

The initial industry reaction to the Motorola announcement was generally positive. Brian Fernandez, managing director of Brean Murray, Foster Securities told Newsbytes: "Although it appears that Motorola has done a fine technical job, it's difficult in this market to get excited about new hardware announcements. The success of the product will be determined by Motorola's marketing ability."

David Boczar, an industry analyst with New Japan Securities-U.S., was quoted by United Press International as having similar sentiments, "I think it is a significant development to the extent that they are trying to highly advertise the fact that they do have a computer division, with low-cost, high-technology products, and how this can be exploited in the personal computer market. The competition is quite intense and it may be difficult for them at the beginning because it is a new area and the market is sluggish."

The MultiPersonal Computers are expected to be ready for shipment in May 1990 and will be marketed both by Motorola directly and through value-added resellers.



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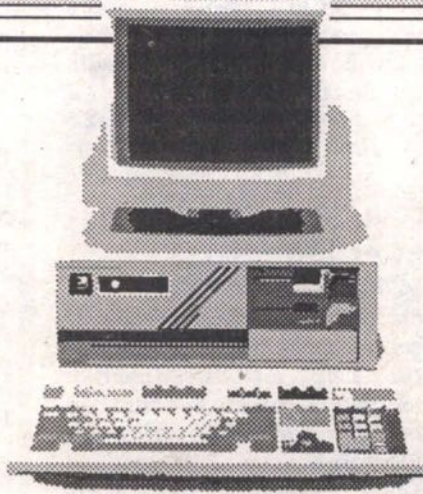
By William P. Barr

Once upon a time, in a faraway land called Academia, there lived a mystical group of people called Professors. They lived on a pair of isolated islands called Science and Engineering. Like modern Canada, they possessed tremendous natural resources, but lacked the processing technology to make use of their resources. One day, a group of these mystics underwent a strange ritual and wrote a research paper. Unable to process this paper, they went to the temple of Computing Services to seek guidance. After much deliberation, the High Priestess, chief artificer of the Dark Art of Computing, interpreted the paper. She determined that Academia needed a machine called the 3-M. A machine that possessed 1 MByte of RAM, 1 MIPS, and 1 MPixel would solve their processing problem, she predicted. With paper in hand, the high priestess, Athena, asked for divine guidance on the problem. After she had prayed for many days to the Big Blue god in the sky, a messenger arrived. In a shower of SPARCs, the SUN god Apollo answered the high priestess, telling her to look for an X in the stars as an omen. The priestess dutifully obeyed and waited. On that night, Apollo's wife,

...AViON, and her personal guard of Unix, rode down on mighty VAXen to deliver this 3-M machine. And lo, it was called a workstation. In an instant, a window opened and the goddess departed. This left Athena wondering what to do NeXT....

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Sun's SPARCstation is a leader of the workstation pack.

In this article, I want to give a broad outline of how workstations could fit into a corporate environment.

Defining A Workstation

As the name implies, a workstation does more than a personal computer. A PC was designed to do one thing at a time as a stand-alone machine. True, you can purchase all the components needed to make a PC seem like a workstation, but that would end up costing the same amount of money anyhow. Even so, a dressed-out PC still doesn't have the overall performance of a workstation, nor will the components be optimally integrated. By analogy, you are trying to shoehorn a dragster engine into a VW Bug so you can tow an RV; you really ought to buy a truck.

A workstation is designed to be more than a "power PC". Both the user interface and applications software for workstations are very graphically oriented. To handle the tremendous amount of video information, both CPU power and I/O throughput are key design features. They are also meant to be used on networks so that resources (laser printers, backup facilities, etc.) can be shared, or processing can be distributed to other machines. Finally, they must allow multiple programs to run simultaneously.

To accomplish these tasks, most workstations come with a set of standard equipment not found on a PC. This list includes: a multi-tasking operating system (usually Unix); built-in network support and an ethernet card; a powerful graphic user interface (GUI); a high-speed bus architecture to move data in and out of memory quickly; a math co-processor; big memory caches to speed up video, CPU and disk throughput; large, high-resolution monitors (usually 15" or larger); and lots of memory expandibility (some machines can hold 64 MBytes on board). All of these parts are integrated to work together smoothly. Very simply stated, a workstation is designed to be used by one person at a time to do several things at once while sharing resources on a network.

PCs Just Don't Cut It

Most of the manufacturers now regard the workstation as a commodity item and their marketing plans reflect this. Apollo and NeXT have boxes that

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sell for less than \$9,000. The grapevine has it that Data General and SUN are preparing something for that niche as well. That's a lot of CPU power for a good price. Anybody would be hard pressed to find an administrative assistant for the cost of a workstation.

Who benefits most from having a workstation? That is best summed up in the words of a Data General spokesman: "A workstation should sit on the desk of a highly leveraged person. His or her time is very expensive and it is in the company's best interest to make best use of it. This person may also have a lot of influence. The decisions this person makes must be supported by the most up-to-date and accurate information that is available." Such a person may be the engineer responsible for product design. Clearly, he can be more effective if he can create new designs and test them

all prior to prototyping the best one. Or, perhaps she is the financial wizard who has to monitor several exchanges (at the same time) to manage the company's cash flow. No matter, the system is designed to save time in the production of results.

Unix: Baskin-Robbins Style

There are many different flavors of Unix (about 200 at last count). However, the battle is beginning to take form, and there are two distinct sides. In very general terms, most Unix vendors reside in one of two camps. On one side is the SUN Microsystems/AT&T alliance who promote System V. Almost everybody else (IBM, DEC, HP/ Apollo, DG, etc.) belongs to the Open Software Foundation (OSF). Many major vendors are members of both. Put a zealot from either side into the same room and the

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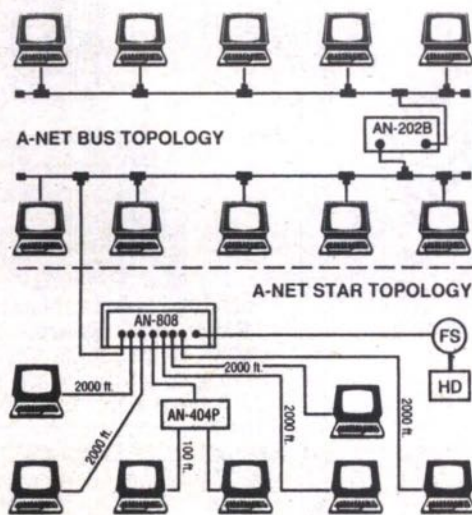
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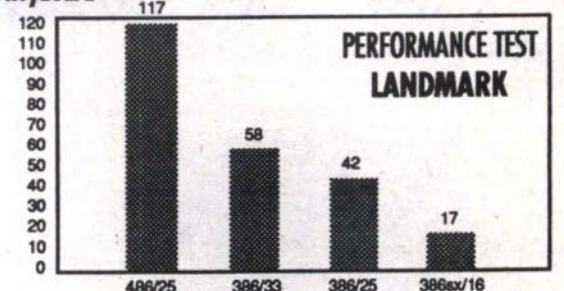
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discussion quickly deteriorates into that classic "Oh, Yeah?", "Yeah!" elementary schoolyard scene. As far as the user is concerned, there is no perceivable difference (except with the GUI). There are literally thousands of software packages available for each type of Unix. To make the standards debate seem even more absurd, most of the popular applications are available for both flavours of Unix. Islam and Christianity will probably reconcile their differences over Jerusalem before the Unix wars end. I advise my clients not to worry about which side to choose in the Unix debate. Find the software that does the job best, and buy the system that runs it. Besides, if software portability is a real concern, just ensure the software is written in a portable language like C or a fourth generation language.

Applications!

Since workstations come with powerful GUI's, the user doesn't have to navigate through the cypherspace of the ugly Unix command line. Good programmers agree that we mere mortals should be shielded from native Unix. The presence of a GUI means that you spend time learning the application instead of learning Unix. This is fortunate because there are oodles of applications software. Since workstations are popular in science and engineering, one would expect a myriad of CAD and imaging software. In this regard, you won't be disappointed. In business, the workstation is not a commonplace office fixture (yet) and little is known about what software is available. Of course, the standard databases, spreadsheets, accounting systems and word processors are available. Additionally, there are

numerous graphics, communications and vertical market applications on the market. In the interests of brevity, I will skim over the following areas of workstation software: publishing, financial management, and executive/decision support systems (E/DSS).

Publishing

To begin with, let me say that anything you can do on an Atari/IBM clone/Amiga/Mac can be done on a workstation. That's about where the similarity ends. Workstations can do the job a lot faster and the flexibility in the software packages is astounding. There are also a lot of programs on the market and they all do it bigger, better and faster than their PC cousins. Software packages vary in complexity and ease of use. On the one extreme is TeX, which requires one to be a programmer to use it effectively.

At the other extreme are packages like Interleaf (combining layout with word processing and spellchecker) or FrameMaker, which features user-defined interfaces.

Most publishing packages on workstations arose from the need for the academic/industrial community to publish technical documents in many arcane formats. As a result, most packages can manipulate technical illustrations and mathematical symbols easily. I can't go into depth with each package, but I will provide you with some highlights. I have used only four publishing packages (there must be over 50) on a workstation. These include Interleaf TPS (Interleaf, Inc.), The Publisher (Arbor Text, Inc.), Book Publisher (EastWest) and FrameMaker (Frame Technology Corp.). Interleaf is an overwhelming package; you can do everything but CAD in the



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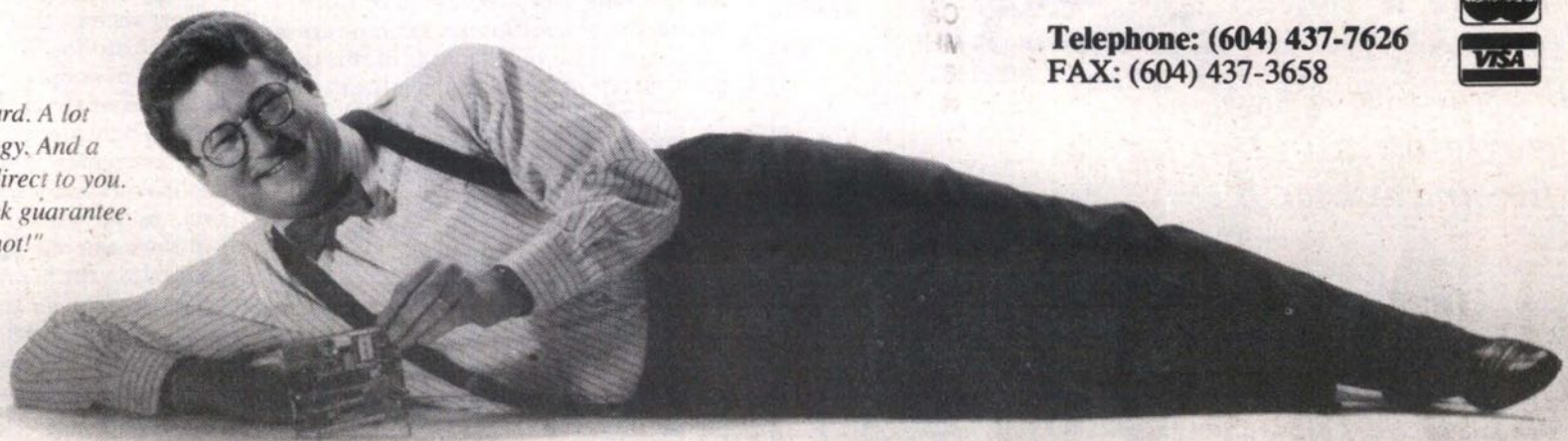
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Workstation Price Comparison

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Mac IICx Basic System: US\$7,552

Motorola 68030 processor, 4 MB RAM, 80 MB hard drive, Mouse, HyperCard, A/UX OS, 3 expansion slots. Priam 250 MB hard drive US\$3,495, 4 MB RAM US\$858, Ethernet card US\$699, 19" LaserView mono monitor & card US\$2,495, La Cie 600 MB optical drive US\$4,995, Keyboard US\$229.

IBM PS/2 80 Basic System: US\$9,227

Intel 80386 processor, 2 MB RAM, 314 MB hard drive, Keyboard, 4 expansion slots, AIX OS US\$595, 6 MB RAM US\$3,166 Ethernet card US\$595, 16" IBM 8514 monitor & card US\$2,975, Storage Dimensions 928/590 MB optical drive US\$8,925.

SUN SPARCstation 1 Basic System: US\$8,995

Basic system: SPARC RISC processor, 8 MB RAM, 17" mono monitor, Keyboard & Mouse, Ethernet Unix OS, 3 expansion slots. 327 MB SCSI hard drive US\$5,600, Delta Microsystems 800 MB optical drive US\$7,900.

Total system costs:

NeXT	US\$13,690
MacIICx	US\$20,393
IBM PS/2 80	US\$24,835
SUN SPARCstation 1	US\$22,495

N.B. I didn't include MIPS ratings because they are useless. Here is an example: UBC has an IBM 3081-K mainframe. It runs the VM, AIX and MTS operating systems simultaneously. It easily handles 40 users doing computational intensive tasks (lots of math). It runs at a mere 12 MIPS. A 27 MIPS workstation trying to do the same thing would die. MIPS are meaningless—throughput is what counts.

system. Their customer list is impressive, and so are the capabilities of the program.

There are three modules (basic, book management, and advanced graphics) so you only have to buy what you need. Book Publisher is great for a small publishing house. This package will allow revisions easily, manage design, and typeset. It also includes the business side of publishing: order processing, sales analysis, royalty statements and contact management. Revision pages can also be inserted without re-paginating. Frame-Maker is incredible! In addition to being easy to use, it's cheap. It has a great interface that you can customize, and because it uses Display PostScript, screen output is excellent on a NeXT cube (I understand something's in the works for SUN's, as well).

This is THE "shrink-wrap" publishing package for workstations. The Publisher is great for a technical environment, and it is also inexpensive. It uses the powerful TeX language, developed by Donald Knuth for typesetting and composition purposes. The nice feature of this program is its portability, and it is the easiest to learn of all the TeX-based publishing programs. I have also seen DocuPro Professional Publishing Software (DocuPro, Inc.) in action. The saleswoman took a window of raw text and graphics, opened a window containing a pre-formatted template, and the raw text was automatically formatted. I was impressed. I am also familiar with the capabilities of Ventura and Pagemaker on PC platforms. After using a workstation for electronic publishing, I wondered how people could work without them. For those of you who are dissatisfied with the lack of power or functionality of your PC-based desktop

publishing operation, a workstation-based solution may be worth looking into.

Playing The Stock Market

This may seem like a solicited plug for a Vancouver company, but it's not. Out of all the financial/stock analysis programs I have seen, OMEN III (Microstat Development Corporation) deserves an Academy Award. Any serious investor or stockbroker will want to give this program serious consideration. Like most packages, it can monitor a portfolio (with limit alarms) based on a ticker feed, track a news feed, perform technical analysis, chart, generate stats reports and manage a customer base simultaneously. What makes this program the cat's meow lies in the presentation of the package.

Securities analysts, investment bankers, brokers and portfolio managers have access to a lot of workstation-based applications. These packages range from foreign-exchange arbitrage analysis to expert systems that help manage risk in large portfolios. And you are the "highly leveraged" people (pardon the pun) who could benefit from a workstation on your desk. There are several real-time portfolio management systems, like OMEN III, for brokers and traders. With a workstation, unlike current terminals, several windows can be open at once, which eliminates the need for switching between screens all the time. For investment bankers and corporate treasury managers, there are software tools for foreign-exchange trading management, multicurrency portfolio management, risk management systems, and complete investment banking support packages.

For analysts, there are many statistical and charting tools available. There are

also knowledge-retrieval systems. These function just like research librarians; tell the program exactly what data relationships you are looking for, and it will search a news service to find them.

The financial industry is a natural home for a workstation. There are more than enough powerful software packages designed to make you more effective at your job. Invest some time investigating what is available and you just might find that edge you need.

Executive Support Systems

Executive/Decision Support Systems are something you are going to be hearing a lot about in the near future. Currently, they seem to be nothing more than an SQL database that puts data into a spreadsheet from which pretty pictures are made. That's nothing fancy. I prefer a description I overheard at the recent Unix show, "It's nothing but an electronic dog-and-pony show." Most of these products are still in their infancy, so I can't give any quasi-overviews.

But if you give me a minute, I'll just polish up my crystal ball.... The front end of an ESS would have a knowledge

retrieval system. You could type in something like, "find all articles about Exxon mergers between 1987-1990 with Canadian references" and the requested information would come from a data base. Next, you could put numerical information into a spreadsheet and do a couple of "what if" scenarios. If you wanted to, you could make a graph, and either play with the numbers and watch the graph change, or play with the graph and watch the numbers change. Once you were happy with a few different scenarios, you could send it to the experts for a review. Or, you could give the problem to an AI (artificial intelligence) application to figure out the technical analysis (breakevens, ROI, risk factor, etc.) in a few minutes. After seeing the results, you could go with your gut feeling and choose the option you feel comfortable with. That is how I see E/DSS evolving over the next few years. Rather, that is how I would like to see it evolve.

William Barr is a senior partner in the Vancouver-based management consulting firm of Barr, McCormick & Associates, which specializes in needs analysis and system selection.

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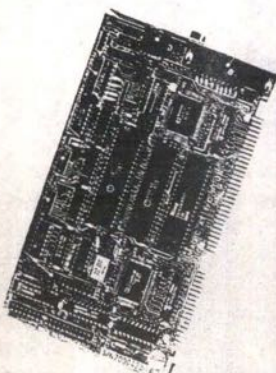
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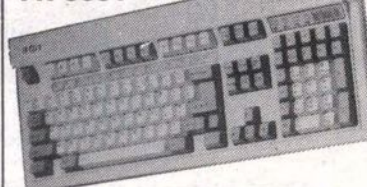
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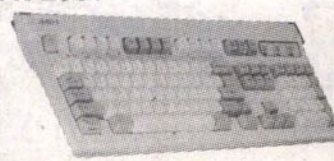
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5	8,736	9,087	25	35,909	38,301
6	9,910	10,408	26	37,089	39,620
7	11,107	11,733	27	38,331	40,943
8	12,297	13,060	28	39,521	42,264
9	16,155	17,135	29	40,712	43,585
10	17,387	18,450	30	41,892	44,906
11	18,567	19,794	31	43,082	46,225
12	19,809	21,104	32	44,262	47,548
13	21,010	22,425	33	45,504	48,869
14	22,242	23,757	34	46,747	50,190
15	23,422	25,078	35	47,937	51,511
16	24,674	26,400	36	49,117	52,832
17	25,854	27,731	37	50,359	54,145
18	27,106	29,062	38	51,549	55,470
19	28,287	30,374	39	52,740	56,795
20	29,519	31,695	40	53,972	58,116
21	30,727	33,375	41	55,162	59,435
22	32,296	34,338	42	56,352	60,758

FILE SERVER CONFIGURATION: MT286-12MHz O.W.S., 2MB, 1.2MB Floppy, 40MB 28ms Harddisk, Monochrome Display, Enhanced Keyboard, 2 Parallel & 1 Serial Ports, Arcnet Card. Novell Network Operating System, File Servers under 8 users are installed as NON-DEDICATED file servers.

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Scene Two. It is one year since you bought your Lemon computer. It has been in and out of the repair shop all year long, and today the warranty expired. What can you do now?

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by Roedy Green

Prevention

An ounce of prevention is worth a pound of cure. The best way to keep your computer from breaking down is to buy a good quality computer in the first place. Bargain-basement machines are no bargain. Besides the repair bills, you must contend with lost data, lost time, and lost use of your computer while it sits in the repair shop.

How do you shop for a good-quality computer? I suggest looking through back issues of the *The Computer Paper*. Almost every issue contains relevant articles. I have collected the unabridged versions of all my articles on two diskettes. For \$5 each, I will mail them to you anywhere in the world. Catch 22! You need access to a working computer to read them.

Hardware Tune-Up

Preventive maintenance is the fancy name for a hardware tune-up. You pay someone about \$100 to do what a good dealer would have done in the first place when you bought your machine.

A hardware tune-up includes such things as: testing all parts of the computer to make sure they are functioning normally, cleaning and treating all contacts, ensuring all DIP switches, terminating resistors and jumpers are set correctly; redoing the low level format with the proper formatting parameters, scouring the disk to search for tiny flaws; ensuring the floppy disk drives are properly aligned and adjusted correctly; labelling all cables and connectors inside and out. In addition, for older machines, a tune-up would include cleaning out all the dust and taking the keyboard apart and cleaning it.

Professional Repairs

While your computer is under warranty, you can take it back to the dealer who sold it to you. It is his problem to fix it, parts and labor. Once the warranty period is over, you can continue to take it back to him, but then you will have to pay.

There are companies that specialize in repairing computers. The two best-known Vancouver companies are the Xerox Service Center, 668-2380, and The Computer Clinic, 732-4414.

You can take your broken computer into Xerox and they will fix it for \$80 an hour labour, plus parts. They have 15 repairmen on staff and thus can usually repair your machine within eight hours. The Computer Clinic charges \$75 per hour. Other smaller companies charge

still less.

Steve Fairburn, the technical co-ordinator for Xerox, justifies Xerox's premium rates this way. Xerox trains its repairmen well and equips them with advanced diagnostic equipmentsuch the Factor machine which can automatically diagnose boards right down to the chip level. If they get stuck, they can immediately call on higher-level expert help. If a repairman in a small shop is stumped, he has no choice but to use trial-and-error, and charge you for the extra time it takes.

It makes sense to use these big guns for complex repairs (especially LANs), and smaller shops for simpler repairs (e.g., replacing a floppy drive).

Service Contract

Rumor has it that, in China, physicians only get paid if they keep their patients well. Here in Canada we have a similar system called Service Contracts. For example, The Computer Clinic will keep your SX machine running for one year if you give them \$300 at the start of the year. They will not charge you any labour, but they will charge you wholesale for any needed replacement parts. Walter Anderson of The Computer Clinic explained they come "on site" to your office to do the repairs seven days a week. They will also visit twice in the year to check out your computer and clean it.

Xerox, too, offers a Monday-to-Friday on-site contract — for \$450 a year — or a depot contract (where you must bring the computer in) for \$300. If you contract for ten machines, Xerox will give you a 20% discount.

The advantages of service contracts are:

1. It lets you relax, knowing your repair expenditures cannot get out of hand no matter how much of a lemon your machine was in past.

2. It gives added incentive to the repairman to do the repairs properly. If he were to do a sloppy job, he would just have to spend more of his time later doing it over. Without a service contract, you pay twice when the repairman does a shoddy job.

The disadvantages of service contracts are:

1. There is pressure to do the repairs as quickly as possible. Where the repairman has the option of taking an extra fifteen minutes to repair an expensive part or replace it with a new one, he might be tempted to replace it.

2. Computers suffer primarily from infant mortality. Most problems show up in the first few months of use. Once they get through that teething period, a good-quality computer will probably go four years without further trouble. Then in old age, mechanical parts such as floppy drives and hard disks start to fail. Most of the time, if you have a service contract on an "adolescent" computer, you will likely be wasting your money since it will probably not need many repairs.

Think of a service contract as an insurance policy. You may want one just to cover yourself on the off chance your adolescent computer needs costly repairs. Think of a service contract as your Medicare payments for your geriatric or lemon computer.

The Computer Probably Is Not Broken

When your computer is not working, first try turning it off, waiting ten sec-

onds, then turning it on again. This will usually clear software-caused problems.

Check all the on/off switches. You may be so used to leaving your computer on all the time, you may have forgotten that some switches even exist. Test the wall outlet with a lamp to make sure your computer is getting power.

A computer will appear to be broken when somebody has meddled with the monitor brightness or contrast knobs. The keyboard will not work if some child has flipped the switch on its underside. Screen saver software can make it look as if the monitor has died.

Emergency Repairs

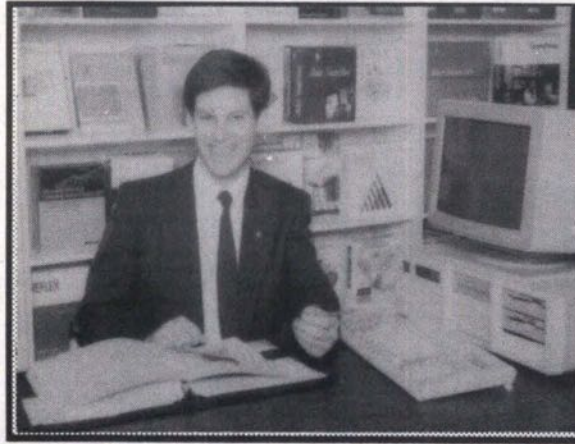
In 90% of all computer problems, NOTHING is broken. All the little electronic chips are humming away perfectly. The problem is simply loose or dirty contacts. Contacts are any places where electricity has to flow across a juncture where bare metal meets bare metal, such as where a cable plugs into a socket.

The main troublesome mechanical contacts are between the controller boards (video controller, hard disk controller, etc.) and the motherboard inside the computer. The contacts look like copper or gold fingers.

Do not worry if you don't yet know what a motherboard is. You don't need

to know anything at all about electronics. You don't even have to understand what a contact is to repair your own computer successfully.

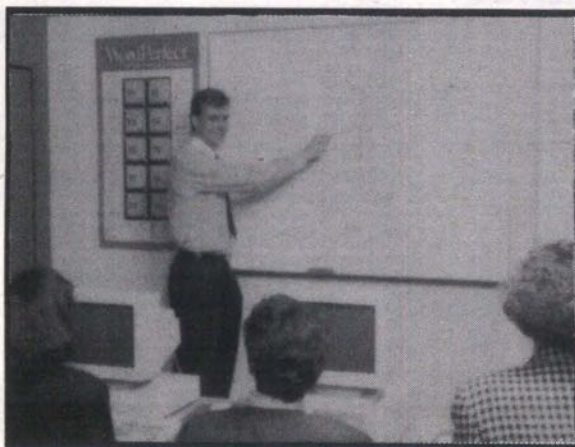
The connections between the ribbon cables and the controller cards also cause trouble. Also watch the connections between the ribbon cables and the floppies and hard disks. Both ends of cables joining your computer to the printer or modem also have pesky contacts. Even the place where the power cable plugs into your computer and into the wall socket are contacts. (You would be amazed at how many "broken" computers are simply a loose power cord!)



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Medical Receptionist

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		Wed. 7:00-10:00	J30507C...May 16 ... 5 wks	\$160

Graphics Series

Harvard Graphics	Vancouver Technical Secondary, 2600 E. Broadway	Tues. 7:00-10:00	V32007C...Apr. 10 ... 5 wks	\$160
Harvard Graphics: Level II	Vancouver Technical Secondary, 2600 E. Broadway	Tues. 7:00-10:00	V32107C...May 15 ... 5 wks	\$160

Database Management Series

d-BASE III+	Vancouver Technical Secondary, 2600 E. Broadway	Mon. 5:30-7:30	V29707C...Apr. 9 ... 5 wks	\$89
d-BASE III+: Level II	Vancouver Technical Secondary, 2600 E. Broadway	Mon. 8:00-10:00	V29907C...Apr. 9 ... 5 wks	\$89
d-BASE 4	Kitsilano Secondary, 2550 W. 10th Ave.	Tues. 5:30-7:30	K27707C...Apr. 10 ... 5 wks	\$89
		Tues. 8:00-10:00	K27807C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	K27907C...May 15 ... 5 wks	\$89
		Tues. 8:00-10:00	K28007C...May 15 ... 5 wks	\$89
d-BASE 4: Level II	Kitsilano Secondary, 2550 W. 10th Ave.	Wed. 8:00-10:00	K28207C...May 16 ... 5 wks	\$89
d-BASE 4: Programming	Kitsilano Secondary, 2550 W. 10th Ave.	Mon. 5:30-7:30	K28307C...Apr. 9 ... 5 wks	\$89

Accounting Series

ACCPAC BPI	Howe Centre, #801-549 Howe St.	Mon. 5:30-7:30	Y28207C...Apr. 9 ... 5 wks	\$89
ACCPAC Easy	Killarney Secondary School, 6454 Killarney St.	Thurs. 8:00-10:00	L30807C...Apr. 12 ... 5 wks	\$89
ACCPAC Plus: General Ledger 5.0	Killarney Secondary School, 6454 Killarney St.	Tues. 5:30-7:30	L27607C...Apr. 10 ... 5 wks	\$89
		Tues. 8:00-10:00	L27707C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	L27807C...May 15 ... 5 wks	\$89
		Tues. 8:00-10:00	L27907C...May 15 ... 5 wks	\$89
ACCPAC Plus: General Ledger 5.0 Financial Report Writer	Killarney Secondary School, 6454 Killarney St.	Thurs. 5:30-7:30	L28207C...May 17 ... 5 wks	\$89
ACCPAC Plus: Accounts Payable 5.0	Killarney Secondary School, 6454 Killarney St.	Mon. 8:00-10:00	L27007C...Apr. 9 ... 5 wks	\$89
ACCPAC Plus: Accounts Receivable 5.0	Killarney Secondary School, 6454 Killarney St.	Mon. 5:30-7:30	L27207C...Apr. 9 ... 5 wks	\$89
ACCPAC Plus: Canadian Payroll 5.0	Killarney Secondary School, 6454 Killarney St.	Wed. 8:00-10:00	L27507C...Apr. 11 ... 5 wks	\$89
		Wed. 5:30-7:30	L27407C...May 16 ... 5 wks	\$89
ACCPAC Plus: Inventory Control 5.0	Killarney Secondary School, 6454 Killarney St.	Wed. 5:30-7:30	L28007C...Apr. 11 ... 5 wks	\$89
Bedford Accounting 3.3	Vancouver Technical Secondary, 2600 E. Broadway	Mon. 5:30-7:30	V27807C...Apr. 9 ... 5 wks	\$89
		Mon. 8:00-10:00	V27907C...Apr. 9 ... 5 wks	\$89
		Sat. 9:00-11:00	V28407C...Apr. 21 ... 5 wks	\$89
Bedford Accounting 3.3: Level II	Vancouver Technical Secondary, 2600 E. Broadway	Thurs. 8:00-10:00	V28207C...May 17 ... 5 wks	\$89
Bedford Accounting 3.3: Business Applications	Vancouver Technical Secondary, 2600 E. Broadway	Thurs. 5:30-7:30	V28307C...May 17 ... 5 wks	\$89
Newviews Accounting	Howe Centre, #801-549 Howe St.	Wed. 5:30-7:30	Y28407C...Apr. 11 ... 5 wks	\$89
		Wed. 5:30-7:30	Y28507C...May 16 ... 5 wks	\$89
Computer Business Accounting (In Cantonese)	Britannia Secondary, 1001 Cotton Dr.	Sat. 11:30-1:30	B34507C...Apr. 21 ... 5 wks	\$89

Integrated Applications Software Series

Framework III	Britannia Secondary, 1001 Cotton Dr.	Mon. 5:30-7:30	B27707C...Apr. 9 ... 5 wks	\$89
MS Works	Kitsilano Secondary, 2550 W. 10th Ave.	Wed. 5:30-7:30	K28407C...Apr. 11 ... 5 wks	\$89
MS Works: Level II	Kitsilano Secondary, 2550 W. 10th Ave.	Wed. 5:30-7:30	K27507C...May 16 ... 5 wks	\$89
Symphony 2.0	Kitsilano Secondary, 2550 W. 10th Ave.	Mon. 8:00-10:00	K28407C...Apr. 9 ... 5 wks	\$89
Symphony 2.0: Level II	Kitsilano Secondary, 2550 W. 10th Ave.	Wed. 8:00-10:00	K28507C...Apr. 11 ... 5 wks	\$89

Lotus 1-2-3 Series

Lotus 1-2-3	King George Secondary, 1755 Barclay St.	Tues. 5:30-7:30	G27507C...Apr. 10 ... 5 wks	\$89
		Tues. 8:00-10:00	G27607C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	G27707C...May 15 ... 5 wks	\$89
		Tues. 8:00-10:00	G27807C...May 15 ... 5 wks	\$89
		Wed. 5:30-7:30	G27907C...Apr. 11 ... 5 wks	\$89
		Wed. 5:30-7:30	G28007C...May 16 ... 5 wks	\$89
Point Grey Secondary, 5350 E. Boulevard		Thurs. 5:30-7:30	P27807C...Apr. 12 ... 5 wks	\$89
		Thurs. 8:00-10:00	P27907C...Apr. 12 ... 5 wks	\$89
		Thurs. 5:30-7:30	P28007C...May 17 ... 5 wks	\$89
		Thurs. 8:00-10:00	P28107C...May 17 ... 5 wks	\$89
Lotus 1-2-3: Level II	King George Secondary, 1755 Barclay St.	Wed. 8:00-10:00	G28107C...Apr. 11 ... 5 wks	\$89
		Wed. 8:00-10:00	G28207C...May 16 ... 5 wks	\$89
Point Grey Secondary, 5350 E. Boulevard		Wed. 5:30-7:30	P27407C...Apr. 11 ... 5 wks	\$89
		Wed. 8:00-10:00	P27507C...May 16 ... 5 wks	\$89
Lotus 1-2-3: Accounting	King George Secondary, 1755 Barclay St.	Thurs. 5:30-7:30	G28307C...Apr. 12 ... 5 wks	\$89
Lotus 1-2-3: Business Applications	King George Secondary, 1755 Barclay St.	Thurs. 8:00-10:00	G28407C...May 17 ... 5 wks	\$89
Lotus 1-2-3: Macro Programming	King George Secondary, 1755 Barclay St.	Thurs. 8:00-10:00	G28507C...Apr. 12 ... 5 wks	\$89
Lotus 1-2-3 Release 3	King George Secondary, 1755 Barclay St.	Thurs. 5:30-7:30	G28607C...May 17 ... 5 wks	\$89
Lotus 1-2-3 (In Cantonese)	Hastings Learning Centre, 1909 Hastings St.	Tues. 6:30-8:30	Y33207C...Apr. 10 ... 5 wks	\$89

Spreadsheet Applications

VP Planner	Vancouver Technical Secondary, 2600 E. Broadway	Tues. 8:00-10:00	V29107C...May 15 ... 5 wks	\$89
Microsoft Excel	Vancouver Technical Secondary, 2600 E. Broadway	Tues. 5:30-7:30	V29207C...Apr. 10 ... 5 wks	\$89
SuperCalc 5	Vancouver Technical Secondary, 2600 E. Broadway	Tues. 5:30-7:30	V29307C...May 15 ... 5 wks	\$89

Programming Language Series

Assembly Language Programming	Britannia Secondary, 1001 Cotton Dr.	Wed. 5:30-7:30	B27907C...Apr. 11 ... 5 wks	\$89
Assembly Language Programming: Level II	Britannia Secondary, 1001 Cotton Dr.	Wed. 5:30-7:30	B28507C...May 16 ... 5 wks	\$89
Basic	Britannia Secondary, 1001 Cotton Dr.	Tues. 8:00-10:00	B28007C...Apr. 10 ... 5 wks	\$89
C Programming Language: Introduction	Britannia Secondary, 1001 Cotton Dr.	Mon. 8:00-10:00	B28107C...Apr. 9 ... 5 wks	\$89
Turbo Pascal: Introduction	Britannia Secondary, 1001 Cotton Dr.	Wed. 8:00-10:00	B28307C...Apr. 11 ... 5 wks	\$89
Turbo Pascal: Level II	Britannia Secondary, 1001 Cotton Dr.	Wed. 8:00-10:00	B28407C...May 16 ... 5 wks	\$89

Data Processing

Data Processing I:	Introduction to Computers & Data Processing - Part I	John Oliver Secondary, 530 E. 41st Ave.	Wed. 7:00-9:30	J26107C...Apr. 11 ... 10 wks	\$70
Data Processing II:	Introduction to Computers & Data Processing - Part II	John Oliver Secondary, 530 E. 41st Ave.	Tues. 7:00-9:30	J26207C...Apr. 10 ... 8 wks	\$60
Data Processing III:	Introduction to Application Programs				
	• Word Processing (e.g., Word Perfect, MS-Word)				
	• Spread Sheet Programs (e.g., Lotus 1-2-3, VP Planner)				
	• Data Base Management (e.g., d-Base 4)				

IBM Series

IBM PC: Introduction	King George Secondary, 1755 Barclay St.	Mon. 5:30-7:30	G27107C...Apr. 9 ... 5 wks	\$89
		Mon. 8:00-10:00	G27207C...Apr. 9 ... 5 wks	\$89
Point Grey Secondary, 5350 E. Boulevard		Mon. 5:30-7:30	P27007C...Apr. 9 ... 5 wks	\$89
		Mon. 8:00-10:00	P27107C...Apr. 9 ... 5 wks	\$89
Hastings Learning Centre, 1909 Hastings St.		Mon. 6:30-8:30	Y33007C...Apr. 9 ... 5 wks	\$89
		Wed. 6:30-8:30	Y33107C...Apr. 11 ... 5 wks	\$89
Tupper, Sir Charles Secondary, 419 East. 24th Ave.		Tues. 5:30-7:30	T28507C...Apr. 10 ... 5 wks	\$89
		Tues. 8:00-10:00	T28607C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	T28707C...May 15 ... 5 wks	\$89
		Tues. 8:00-10:00	T28807C...May 15 ... 5 wks	\$89
Vancouver Technical Secondary, 2600 E. Broadway		Tues. 5:30-7:30	V27007C...Apr. 10 ... 5 wks	\$89
		Tues. 8:00-10:00	V27107C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	V27207C...May 15 ... 5 wks	\$89
		Tues. 8:00-10:00	V27307C...May 15 ... 5 wks	\$89
Howe Centre, #801-549 Howe St.		Tues. 5:30-7:30	Y27007C...Apr. 10 ... 5 wks	\$89
		Tues. 8:00-10:00	Y27107C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	Y27207C...May 15 ... 5 wks	\$89
		Tues. 8:00-10:00	Y27307C...May 15 ... 5 wks	\$89
		Thurs. 5:30-7:30	Y27407C...Apr. 12 ... 5 wks	\$89
		Thurs. 8:00-10:00	Y27507C...Apr. 12 ... 5 wks	\$89
		Thurs. 5:30-8:30	Y27607C...May 17 ... 5 wks	\$89
		Thurs. 8:00-10:00	Y27707C...May 17 ... 5 wks	\$89
Magee Secondary, 1975 W. 49th Ave.		Tues. 5:30-7:30	A27007C...Apr. 10 ... 5 wks	\$89
		Tues. 8:00-10:00	A27107C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	A27207C...May 15 ... 5 wks	\$89
		Tues. 8:00-10:00	A27307C...May 15 ... 5 wks	\$89
		Wed. 5:30-7:30	A27407C...Apr. 11 ... 5 wks	\$89
		Wed. 8:00-10:00	A27507C...Apr. 11 ... 5 wks	\$89
		Wed. 5:30-7:30	A27607C...May 16 ... 5 wks	\$89
		Wed. 8:00-10:00	A27707C...May 16 ... 5 wks	\$89
Britannia Secondary, 1001 Cotton Dr.		Thurs. 5:30-7:30	B27007C...Apr. 12 ... 5 wks	\$89
		Thurs. 8:00-10:00	B27107C...Apr. 12 ... 5 wks	\$89
		Thurs. 5:30-7:30	B27207C...May 17 ... 5 wks	\$89
		Thurs. 8:00-10:00	B27307C...May 17 ... 5 wks	\$89
Killarney Secondary, 6454 Killarney St.		Mon. 5:30-7:30	L30407C...Apr. 9 ... 5 wks	\$89
		Mon. 8:00-10:00	L30507C...Apr. 9 ... 5 wks	\$89
		Wed. 5:30-7:30	L30607C...Apr. 11 ... 5 wks	\$89
		Wed. 8:00-10:00	L30707C...Apr. 11 ... 5 wks	\$89
		Wed. 5:30-7:30	L30807C...May 16 ... 5 wks	\$89
		Wed. 8:00-10:00	L30907C...May 16 ... 5 wks	\$89
Kitsilano Secondary, 2550 W. 10th Ave.		Thurs. 5:30-7:30	K27007C...Apr. 12 ... 5 wks	\$89
		Thurs. 8:00-10:00	K27107C...Apr. 12 ... 5 wks	\$89
		Thurs. 5:30-7:30	K27207C...May 17 ... 5 wks	\$89
		Thurs. 8:00-10:00	K27307C...May 17 ... 5 wks	\$89
John Oliver Secondary, 530 E. 41st Ave.		Wed. 5:30-7:30	J29707C...Apr. 11 ... 5 wks	\$89
		Wed. 8:00-10:00	J29807C...Apr. 11 ... 5 wks	\$89
		Wed. 5:30-7:30	J29907C...May 16 ... 5 wks	\$89
		Wed. 8:00-10:00	J29007C...May 16 ... 5 wks	\$89
Britannia Secondary, 1001 Cotton Dr.		Sat. 9:00-11:00	B30007C...Apr. 21 ... 5 wks	\$89
IBM PC: Introduction for Women	Britannia Secondary, 1001 Cotton Dr.	Tues. 5:30-7:30	B27507C...Apr. 10 ... 5 wks	\$89
		Tues. 5:30-7:30	B27607C...May 15 ... 5 wks	\$89
Managing Your Hard Disk	Howe Centre, #801-549 Howe St.	Wed. 8:00-10:00	Y27807C...Apr. 11 ... 5 wks	\$89
		Wed. 8:00-10:00	Y27907C...May 16 ... 5 wks	\$89
Novell Local Area Network 2.12	John Oliver Secondary, 530 E. 41st Ave.	Thurs. 5:30-7:30	J29407C...Apr. 12 ... 5 wks	\$89
		Thurs. 8:00-10:00	J29507C...Apr. 12 ... 5 wks	\$89
		Thurs. 5:30-7:30	J29607C...May 17 ... 5 wks	\$89
		Thurs. 8:00-10:00	J29707C...May 17 ... 5 wks	\$89
IBM PC: Introduction (In Cantonese)	Britannia Secondary, 1001 Cotton Dr.	Tues. 8:00-10:00	B34407C...May 15 ... 5 wks	\$89
Microsoft Windows: Introduction	Killarney Secondary, 6454 Killarney St.	Thurs. 5:30-7:30	L28307C...Apr. 12 ... 5 wks	\$89
		Thurs. 8:00-10:00	L28407C...Apr. 12 ... 5 wks	\$89
Understanding MS-DOS: IBM Level II	Magee Secondary, 1975 W. 49th Ave.	Mon. 5:30-7:30	A27807C...Apr. 9 ... 5 wks	\$89
		Mon. 8:00-10:00	A27907	

Computer Courses



Word Processing Series

MS-Word 5.0 (IBM)
 Vancouver Technical Secondary, 2600 E. Broadway
 Thurs. 5:30-7:30 V29407C...Apr. 12 ... 5 wks \$89
 Thurs. 8:00-10:00 V29507C...Apr. 12 ... 5 wks \$89
 Sat. 9:00-11:00 V28607C...Apr. 21 ... 5 wks \$89

MS-Word 5.0 (IBM): Level II
 Vancouver Technical Secondary, 2600 E. Broadway
 Thurs. 5:30-7:30 V29607C...May 17 ... 5 wks \$89

Multimate: Advantage II
 John Oliver Secondary, 530 E. 41st Ave.
 Mon. 8:00-10:00 J29007C...Apr. 9 ... 5 wks \$89

WordPerfect 5.0
 John Oliver Secondary, 530 E. 41st Ave.
 Wed. 5:30-7:30 J27007C...Apr. 11 ... 5 wks \$89
 Wed. 8:00-10:00 J27107C...Apr. 11 ... 5 wks \$89
 Wed. 5:30-7:30 J27207C...May 16 ... 5 wks \$89
 Wed. 8:00-10:00 J27307C...May 16 ... 5 wks \$89

Point Grey Secondary, 5350 E. Boulevard
 Tues. 5:30-7:30 P28207C...Apr. 10 ... 5 wks \$89
 Tues. 8:00-10:00 P28307C...Apr. 10 ... 5 wks \$89
 Tues. 5:30-7:30 P28407C...May 15 ... 5 wks \$89
 Tues. 8:00-10:00 P28507C...May 15 ... 5 wks \$89

Howe Centre, #801-549 Howe St.
 Mon. 8:00-10:00 Y28007C...Apr. 9 ... 5 wks \$89

Magee Secondary, 1975 W. 49th Ave.
 Thurs. 5:30-7:30 A28007C...Apr. 12 ... 5 wks \$89
 Thurs. 8:00-10:00 A28107C...Apr. 12 ... 5 wks \$89
 Thurs. 5:30-7:30 A28207C...May 17 ... 5 wks \$89
 Thurs. 8:00-10:00 A28307C...May 17 ... 5 wks \$89

Tupper Secondary, 419 E. 24th Ave.
 Thurs. 5:30-7:30 T28907C...Apr. 12 ... 5 wks \$89
 Thurs. 8:00-10:00 T29007C...Apr. 12 ... 5 wks \$89
 Thurs. 5:30-7:30 T29107C...May 17 ... 5 wks \$89
 Thurs. 8:00-10:00 T29207C...May 17 ... 5 wks \$89
 Sat. 12:00-2:00 T28007C...Apr. 21 ... 5 wks \$89

John Oliver Secondary, 530 E. 41st Ave.
 Mon. 5:30-7:30 J28207C...Apr. 9 ... 5 wks \$89
 Mon. 8:00-10:00 J28307C...Apr. 9 ... 5 wks \$89

Killarney Secondary, 6454 Killarney St.
 Tues. 5:30-7:30 L31007C...Apr. 10 ... 5 wks \$89
 Tues. 8:00-10:00 L31107C...Apr. 10 ... 5 wks \$89
 Tues. 5:30-7:30 L31207C...May 15 ... 5 wks \$89
 Tues. 8:00-10:00 L31307C...May 15 ... 5 wks \$89

WordPerfect 5.0: Level II
 John Oliver Secondary, 530 E. 41st Ave.
 Tues. 8:00-10:00 J27407C...Apr. 10 ... 5 wks \$89
 Tues. 8:00-10:00 J27507C...May 15 ... 5 wks \$89

Point Grey Secondary, 5350 E. Boulevard
 Wed. 8:00-10:00 P28607C...Apr. 11 ... 5 wks \$89
 Wed. 5:30-7:30 P28707C...May 16 ... 5 wks \$89

Tupper Secondary, 419 E. 24th Ave.
 Sat. 2:30-4:30 T28307C...Apr. 21 ... 5 wks \$89

WordPerfect 5.0: Tips, Tricks & Traps
 John Oliver Secondary, 530 E. 41st Ave.
 Tues. 5:30-7:30 J28607C...Apr. 10 ... 5 wks \$89
 Thurs. 8:00-10:00 J27607C...May 17 ... 5 wks \$89

Desktop Publishing with WordPerfect 5.0
 John Oliver Secondary, 530 E. 41st Ave.
 Thurs. 5:30-7:30 J28507C...Apr. 12 ... 5 wks \$89
 Thurs. 8:00-10:00 J28007C...Apr. 12 ... 5 wks \$89

WordPerfect 5.0: Macros
 John Oliver Secondary, 530 E. 41st Ave.
 Thurs. 5:30-7:30 J28107C...May 17 ... 5 wks \$89

WordPerfect 5.0: Graphics
 John Oliver Secondary, 530 E. 41st Ave.
 Tues. 5:30-7:30 J28217C...May 15 ... 5 wks \$89

IBM-PC Desktop Publishing Program

Desktop Publishing: Introduction
 John Oliver Secondary, 530 E. 41st Ave.
 Tues. 7:00-10:00 J26807C...Apr. 3 ... 1 wk \$25

Desktop Publishing: Page Layout & Design
 John Oliver Secondary, 530 E. 41st Ave.
 Thurs. 7:00-10:00 J26907C...Apr. 5 ... 1 wk \$25

Desktop Publishing: IBM - PageMaker 3.0
 Roberts Learning Centre, 1666 Comox St.
 Tues. 5:30-7:30 R32007C...Apr. 10 ... 5 wks \$120
 Tues. 8:00-10:00 R32107C...Apr. 10 ... 5 wks \$120
 Tues. 5:30-7:30 R32207C...May 15 ... 5 wks \$120
 Tues. 8:00-10:00 R32307C...May 15 ... 5 wks \$120

Desktop Publishing: PageMaker 3.0 - Level II
 Roberts Learning Centre, 1666 Comox St.
 Thurs. 8:00-10:00 R33307C...May 15 ... 5 wks \$120

Desktop Publishing: PageMaker 3.0 - Business Applications
 Roberts Learning Centre, 1666 Comox St.
 Thurs. 5:30-7:30 R32407C...May 17 ... 5 wks \$120

Desktop Publishing: Ventura 2.0
 Roberts Learning Centre, 1666 Comox St.
 Mon. 5:30-7:30 R32507C...Apr. 9 ... 5 wks \$120
 Mon. 8:00-10:00 R32607C...Apr. 9 ... 5 wks \$120

Desktop Publishing: Ventura 2.0 Level II
 Roberts Learning Centre, 1666 Comox St.
 Wed. 5:30-7:30 R32907C...Apr. 11 ... 5 wks \$120
 Wed. 8:00-10:00 R33007C...May 16 ... 5 wks \$120

See Macintosh for Additional Courses on Desktop Publishing

Fast Track Series - Weekdays

Roberts Learning Centre, 1666 Comox St.
IBM PC: Introduction (C)
 Thurs. 9:00-4:00 R30007C...Apr. 12 ... \$65
 Thurs. 9:00-4:00 R30107C...May 24 ... \$65
 Tues. 9:00-4:00 R28007C...Apr. 10 ... \$65
 Mon. 9:00-4:00 R28107C...May 14 ... \$65

Lotus 1-2-3 (C)
 Thurs. 9:00-4:00 R30207C...Apr. 19 ... \$65
 Thurs. 9:00-4:00 R30307C...May 31 ... \$65
 Tues. & Wed. 9:00-4:00 R28207C...Apr. 17 & 18 ... \$125
 Tues. & Wed. 9:00-4:00 R28907C...May 29 & 30 ... \$125

Lotus 1-2-3: Level II (C)
 Thurs. 9:00-4:00 R30407C...Apr. 26 ... \$65
 Tues. & Wed. 9:00-4:00 R28707C...Apr. 24 & 25 ... \$125

ACCPAC-GL 5.0 (C)
 Thurs. 9:00-4:00 R30507C...May 3 ... \$65
 Tues. & Wed. 9:00-4:00 R29407C...May 1 & 2 ... \$125

d-BASE 4 (C)
 Thurs. 9:00-4:00 R30607C...May 10 ... \$65
 Tues. & Wed. 9:00-4:00 R28507C...May 8 & 9 ... \$125

WordPerfect 5.0 (C)
 Thurs. 9:00-4:00 R30707C...May 17 ... \$65
 Thurs. 9:00-4:00 R30807C...June 7 ... \$65
 Tues. & Wed. 9:00-4:00 R28607C...May 15 & 16 ... \$125
 Tues. & Wed. 9:00-4:00 R28707C...June 5 & 6 ... \$125

WordPerfect 5.0: Level II (C)
 Thurs. 9:00-4:00 R30907C...June 14 ... \$65
 Tues. & Wed. 9:00-4:00 R28807C...May 22 & 23 ... \$125

Hastings Learning Centre, 1909 Hastings St.
WordPerfect 5.0 (C)
 Wed. Thurs. 9:00-4:00 Y34007C...Apr. 11 & 12 ... \$125
 Wed. Thurs. 9:00-4:00 Y34407C...May 9 & 10 ... \$125

WordPerfect 5.0: Level II (C)
 Wed. Thurs. 9:00-4:00 Y34107C...Apr. 18 & 19 ... \$125
 Wed. Thurs. 9:00-4:00 Y34507C...May 23 & 24 ... \$125

MS Word 5.0
 Wed. Thurs. 9:00-4:00 Y34200C...Apr. 25 & 26 ... \$125
 Wed. Thurs. 9:00-4:00 Y34600C...May 16 & 17 ... \$125

MS Word 5.0: Level II
 Wed. Thurs. 9:00-4:00 Y34300C...May 2 & 3 ... \$125
 Wed. Thurs. 9:00-4:00 Y34700C...May 30 & 31 ... \$125

Fast Track cost includes course materials - lunch not included.

Fast Track Series - Weekends

Roberts Learning Centre, 1666 Comox St.
Lotus 1-2-3
 Sat. Sun. 9:30-4:30 R31007C...Apr. 7 & 8 ... \$125
 Sat. Sun. 9:30-4:30 R31107C...June 2 & 3 ... \$125

ACCPAC-GL 5.0: Introduction
 Sat. Sun. 9:30-4:30 R31307C...Apr. 21 & 22 ... \$125

WordPerfect 5.0: Introduction
 Sat. Sun. 9:30-4:30 R31407C...Apr. 28 & 29 ... \$125
 Sat. Sun. 9:30-4:30 R31507C...June 9 & 10 ... \$125

d-BASE 4
 Sat. Sun. 9:30-4:30 R31707C...May 5 & 6 ... \$125

PageMaker: Introduction
 Sat. Sun. 9:30-4:30 R31807C...May 12 & 13 ... \$125

Ventura: Introduction
 Sat. Sun. 9:30-4:30 R31907C...May 26 & 27 ... \$125

Britannia Secondary, 1001 Cotton Dr.
IBM-PC: Introduction
 Sun. 9:30-4:30 B30207C...Apr. 8 ... 1 wk \$65
 Sun. 9:30-4:30 B30307C...Apr. 22 ... 1 wk \$65
 Sun. 9:30-4:30 B30407C...Apr. 29 ... 1 wk \$65
 Sun. 9:30-4:30 B30507C...May 6 ... 1 wk \$65
 Sun. 9:30-4:30 B30607C...May 13 ... 1 wk \$65
 Sun. 9:30-4:30 B30707C...May 27 ... 1 wk \$65
 Sun. 9:30-4:30 B30807C...June 3 ... 1 wk \$65

Fast Track cost includes course materials - Lunch not included.

Macintosh Series

Macintosh: Introduction
 Eric Hamber Secondary, 5025 Willow St.
 Mon. 5:30-7:30 H27007C...Apr. 9 ... 5 wks \$89
 Mon. 8:00-10:00 H27107C...Apr. 9 ... 5 wks \$89

Desktop Publishing: Mac-Pagemaker
 Eric Hamber Secondary, 5025 Willow St.
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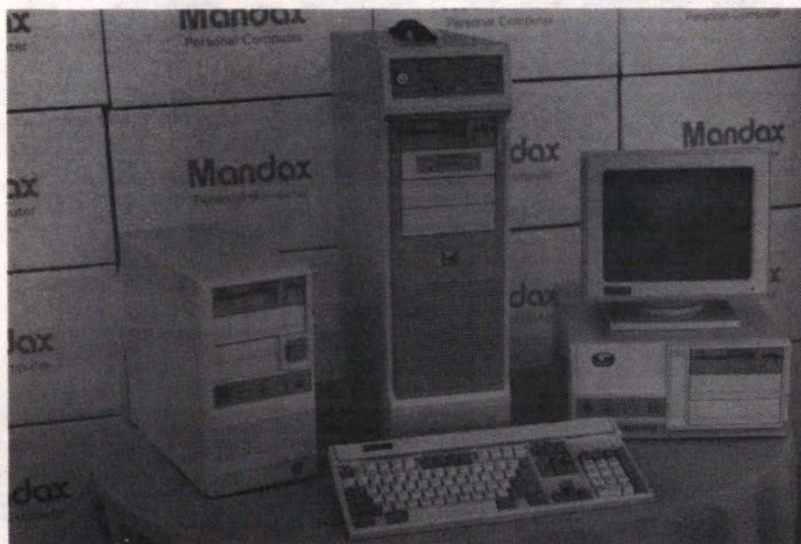
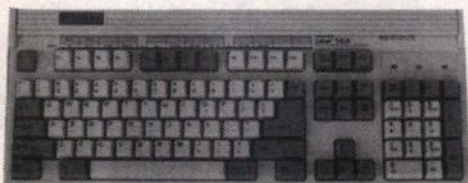
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The Tools

To repair your computer, you need only the simplest tools: two screwdrivers, some foam-tipped swabs, a bottle of isopropanol, and a bottle of contact cleaner.

I use a black MasterCraft 2x4" Phillips 57-3122-8 screwdriver from Canadian Tire. It has a distinctive black molybdenum chrome steel blade that does not turn to mush the way most screwdrivers do. I also use a blue MasterCraft 1/8 x 3" 57-3601-8 slothead screwdriver, again from Canadian Tire.

A foam-tipped swab looks like an oversized Q-Tip, except the foam leaves no cotton lint behind. You can get these at electronics supply stores.

You can get isopropanol in any drug store. It may be labelled as isopropyl alcohol or simply rubbing alcohol. Make sure you get the pure stuff, not something with massage oil added.

For contact cleaner, I use 100% *Cramolin R-100L Red* liquid from Caig Laboratories, 1175-0 Industrial Avenue, PO Box J, Escondido, CA 92025-0051 (619) 743-7143. You can buy a two-ounce bottle for about \$25 at radio or electronics supply stores. That tiny bottle is enough to treat thousands of computers.

A small nut driver and some needle-nose pliers may also prove helpful.

The Secret

To repair your computer you simply have to do two things:

1. Clean the contacts.
2. Tighten any loose contacts.

There is cleaning and there is **CLEANING**. I will tell you about the simple type of cleaning first. Once you have tried these measures and feel more confident, you can do the more daring types of cleaning. Ditto for tightening.

Turn Off The Power

The number one rule is: **TURN OFF THE POWER** before you do **ANYTHING**. This includes the power to your computer, monitor, printer — everything. This is not to protect you from shock. This is to protect the computer from damage. If you connect or disconnect anything while the power is applied, you stand a good chance of damaging the electronics. Leave the power cord plugged into the wall, however, since this will help drain away static.

Static

In Vancouver, static electricity is not a serious problem except for during a few February days. In Alberta and the BC Interior, static is a major problem all winter long. To avoid damaging your computer from static while you are repairing it, take these precautions:

1. Take off your shoes, especially rubber-soled shoes.
2. Touch the case of the computer before you touch anything else inside.
3. If you plan to do a lot of repair work, buy a grounding wrist strap to keep you grounded the whole time you work on the computer.

4. Any time you take cards out of the computer, immediately put them in an anti-static bag. Your computer dealer will probably be happy to give you a few bags.

Tightening

For electricity to flow, metal must touch metal. If for some reason there is an air, dirt or tarnish gap, the electricity cannot flow. Tightening a loose contact simply

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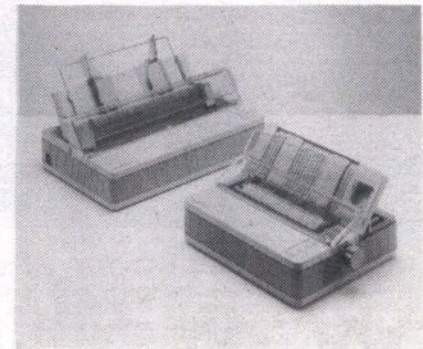


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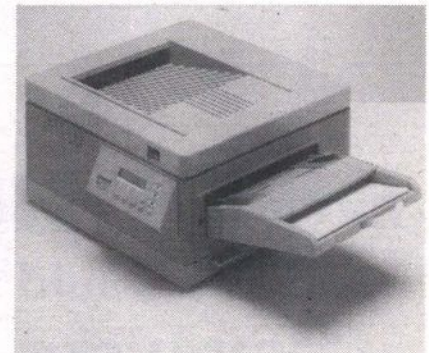
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presses the two metal parts together. This does not do much good if the surfaces are dirty, since then the dirt blocks the flow.

First, just look for something loose, such as a cable hanging half off. Then tighten that up, just pushing it on properly. If that does not work, then methodically clean everything and finally, systematically tighten everything up.

The screws used in computers are lightweight, so do not put much muscle into your tightening or you will soon strip the threads.

Tightening External Contacts

First turn off the power on everything. Then take a small slothead screwdriver and gently tighten up the screws that hold the cables onto the back of the computer. As I warned before, don't overdo this. These screws are delicate.

Then look at the other ends of the cables where they attach to the monitor, printer, modem, etc. Press these cables on firmly, and tighten any screws or clamps.

Turn the machine on and see if that makes the trouble go away.

Tightening Internal Contacts

If the computer still does not work, turn the computer off and open the covers. You may have to undo a few screws. Put them in a bowl where they will not get lost.

Look at all cables inside, and push both ends firmly onto the connectors. There will be cables from the hard/floppy controller to the floppies and hard disk. There will be some more from the multi-

I/O card to the rear serial connectors. There will be little D connectors supplying power from the metal power supply box to the hard and floppy drives.

You don't have to understand anything about what the cables are for. Just make sure both ends of each cable are firmly attached.

Put the case back on and turn the machine on and see if that makes the trouble go away.

Tightening Card Contacts

When you had the covers off, you may have noticed eight slots across the back of the computer. Most are empty, but some have cards sitting in them upright.

Power off, then you can open the covers again, and temporarily remove any cables coming out the rear or sides of the cards. Before you remove cables, label them with a Sharpie fine-point permanent marker to help you remember where they go and which way goes up.

There is a single screw that holds each card in the slot. Undo the screw. Lift the card out, and press the card back in again to reseal it firmly. The gold teeth on the bottom of the card will fit into the socket. Cards have little metal tails on the bottom rear that sometimes have to be bent slightly to get them to fit. Seat the card firmly. Make sure the right amount of "gum" is showing — that this card is as deeply seated as its brothers.

Make sure you put the card back into the same slot that it came from, and reattach all cables in exactly the same way they were attached before. Be careful. It is very easy to shift a ribbon cable over by one pin by mistake. You have to

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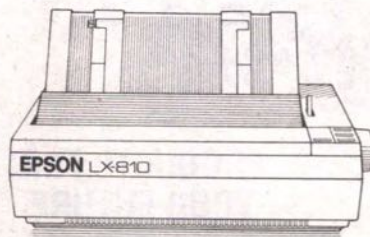
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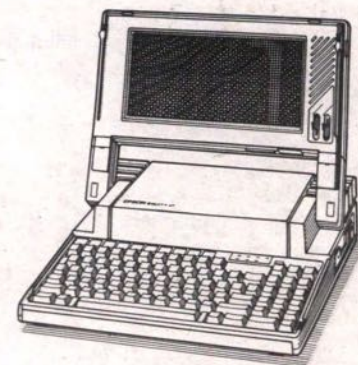
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be 100% accurate about putting cables back on correctly. If you hook a cable up incorrectly you may see a puff of smoke. This does not require great wisdom, just plodding methodical care.

If you suddenly find yourself not knowing how a cable goes, do not guess! Just find some similar machine, and peek inside for a hint.

Put the case back on and turn the machine on and see if that makes the trouble go away.

Vacuum Cleaning

Sometimes the inside of your machine may be so dusty it is pointless to clean contacts because they will get dirty again as fast as you can clean them. Also, mag tape drives and floppy drives have mechanical parts that will fail when they are clogged with lint.

Turn off the power to your computer. Open the covers. Get an ordinary vacuum cleaner and vacuum out the dust using the attachment for cleaning inside the cracks in chesterfields. Be gentle. Don't knock any of the delicate electronics. Instead, you could use a can of compressed air. I simply use my lungs to blow the dust out.

The fan at the back of your computer blows air out the back and sucks it in the various cracks of your computer — especially the slots in the floppy drives. If you have carpets in your computer room, when you open your computer, it will look as if sheep had been breeding inside.

Pay particular attention to the front slot in your floppy drives, and your mag tape drive. While you are at it, vacuum out your printer too, including its air filter.

Cleaning Floppy Drives

There are inexpensive cleaning kits for floppy drives that come with a diskette-like jacket containing a white fibre disk that you soak in alcohol. I have written a program called SCRUB that zig-zags the disk heads over the entire surface of the cleaning disk. Without SCRUB, the heads use only 1/80 of the cleaning surface. For \$5, I will mail you a copy of SCRUB, along with some other disk utilities. As with all my disks, you are free to make copies and pass them on to your friends.

Cleaning Mag Tape Drives

Use the special cleaning cartridge according to the instructions on the box.

Then take a foam-tipped swab and dip it in isopropanol. Poke around gently inside the tape drive, cleaning out any dust that the vacuuming and cleaning kit missed. In particular, clean the tiny light bulb and the sensor pillar on the left side used to detect the end of tape.

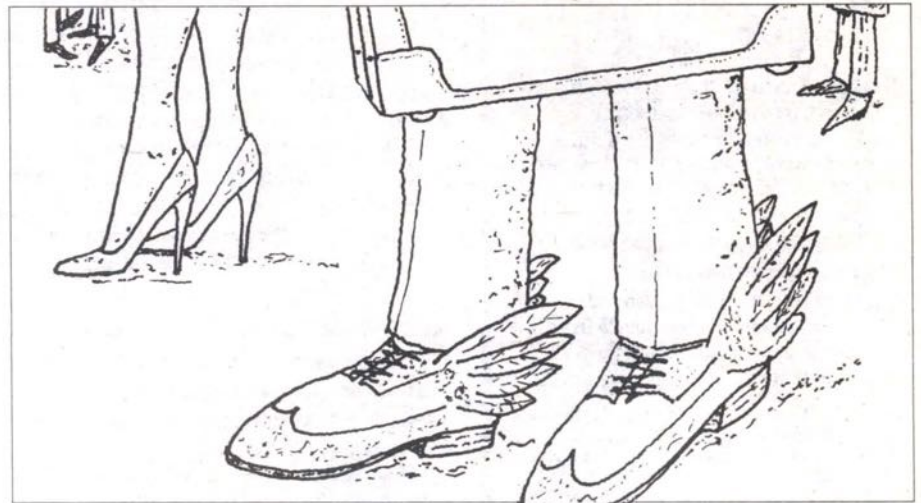
If that sensor gets too dirty, the tape drive will not be able to see the holes that mark the end of the tape, and will run the tapes off the end of their spools, chewing them to ribbons.

Cleaning Keyboards

Sometimes keyboards get so gummy with spilled drinks, hair or food, that some keys stop working. First vacuum to get the worst of the dust out. This may be all it takes.

Turn off the power. Try prying off a key. Do not pry off the space bar or any other large key. You may never get it on again! If it won't come easily, give up! Presum-

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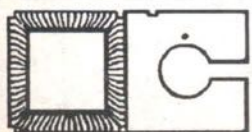
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ing you could get the key off, soak it in isopropanol, and wipe it with a paper towel until it is clean. Then take a foam-tipped swab dipped in isopropanol and clean out the congealed hair, dust and cookie crumbs surrounding the base of the key.

Put the key back on and see if all works.

If the keyboard is worse than before, sometimes taking the keycap off and just gently wiggling things or poking a toothpick in the keycap hole and gently jiggling will get it going again. Keyboard mechanisms are all quite different, so I cannot give precise instructions.

If you had success with one key, try a few more, then test. As you probably guessed, this is a very time consuming job. Most people just buy a new keyboard when the old one gets too dirty.

Cramolin Red Cleaning

Caig *Cramolin Red R-100L* 100% liquid is an anti-oxidizing solution that cleans, preserves and lubricates electrical contacts.

It works by first removing tarnish. Then it forms a monomolecular insulating layer to keep the metal contacts from oxidizing. When two contacts touch, the *Cramolin* slides out of the way. When you treat a pin with *Cramolin* and then insert it into a socket, the *Cramolin* will migrate to the socket's surface, cleaning and protecting it, too.

The crucial point to understand is that the *Cramolin* protective layer is only one molecule thick. You need only a minuscule amount of *Cramolin* to create this layer. Use it sparingly. To help you use it sparingly, you can dilute it with methyl hydrate (wood alcohol).

Slightly moisten a lint-free cloth or clean foam-tip swab with *Cramolin Red* liquid. Gently wipe the contact or connector surface, applying a small amount of *Cramolin Red* to the metal surface. Wipe the surface with a clean lint-free cloth to remove excess *Cramolin*. Repeat the procedure until the cloth shows no sign of residue.

Warnings

- Make sure there are no bits of tissue or lint stuck to your contacts.
- Don't touch the contacts with your fingers. If you do, start the cleaning process over from scratch.
- Be careful not to bend or stress the boards as you clean them or take them in and out. You might create minute cracks in the solder. Thereafter heat-sensitive intermittent failures will drive you crazy.

Cramolin vs Stabilant

Cramolin is not the only brand of contact cleaner. Audiophiles are familiar with *Stabilant*. I talked for an hour with Mike Wright, the Canadian inventor of *Stabilant*.

D. W. Electrochemicals, 9005 Leslie St., Unit 106, Richmond Hill, Ontario L4B 1G7, (416) 889-1522, manufactures it. *Stabilant 22* is the concentrate, and *Stabilant 22a* is a 4 to 1 isopropanol-diluted form. In the USA, they sell an 8 to 1 diluted form under the name *Tweek*. A kit of 15 ml of *Stabilant 22a* and 5 foam swabs sells for \$39. A liter of the concentrate costs \$4000.

Stabilant works by a different principle than *Cramolin*. *Stabilant* is a liquid polymer semiconductor. It behaves something like liquid solder. It reacts very

gradually to the presence of an electric field by conducting electricity. Where there is no field, it acts as an insulator. It fills in the air gaps between the mating surfaces, keeping contaminants out and conducting electricity.

Since *Stabilant* is not a cleaner, you should cleanse the contacts with something like isopropanol or the environmentally-hostile Freon TF first. *Stabilant* will also work quite well without pre-cleaning, however.

Stabilant and *Cramolin* are similar. Both are lubricants so you can use them safely on moving parts such as the hard disk spindle. Both migrate. You need only minuscule quantities of either.

Cheaper contact cleaners may remove grease, resins, cigarette tar and tarnish effectively, but they do not provide the protective film to prevent future contamination. Those outraged at the price of such a tiny bottle of liquid can join BIX, the Byte Information Exchange. Here, one man posted a recipe to make your own contact cleaner for pennies a bottle.

Which contact treatment should you use, *Cramolin* or *Stabilant*? *Cramolin* is less expensive, but a treatment lasts only about one or two years. *Stabilant* lasts about 16 years. *Stabilant* is so tough, NASA uses it on spacecraft flying in a vacuum.

Eraser/Alcohol Cleaning

Let us say you are in a cabin 1000 miles from the nearest civilization, and unbelievable as it sounds, you don't happen to have a bottle of *Cramolin* with you. Here is an EMERGENCY method only. If you do this more than a few times in the life of your computer, you might wear through the gold on the contacts and they will never work properly again.

Turn your machine off. Use a clean pink pencil eraser to clean visibly dirty or tarnished contacts. Do not use a vinyl eraser — get a plain vanilla "Pink Pearl." Pre-clean the eraser by rubbing it over a piece of clean white paper. Use a brand new eraser if possible.

Then carefully clean off the little bits of eraser with a tissue or lint-free cloth soaked in isopropanol.

Don't overdo this. If you are too vigorous or if you clean too often you might wear right through the gold plating. Wang recommends that you never erase gold contacts, only copper ones.

DIP Switches

Inside your computer, you will see little banks of switches resembling miniature pianos. Do not fiddle with these DIP switches! You will also see black plugs straddling pairs of tiny brass pins. Do not meddle with these jumpers, either!

However, if you are trying to install a modem or mouse and it does not work, the problem is almost certainly that some of those switches are set the wrong way.

Before you touch any of them, write down the current setting of all the switches. That way you can at least get back to where you started. I cannot overstate the importance of this advice.

Your documentation is probably wrong, so when you "correct" the settings, you will make things worse. Setting DIPs and jumpers correctly is an art. Get experienced help.

Component Swapping

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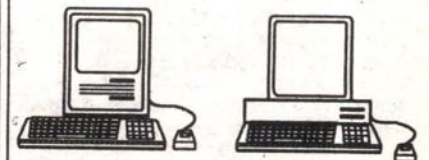
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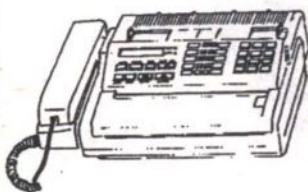


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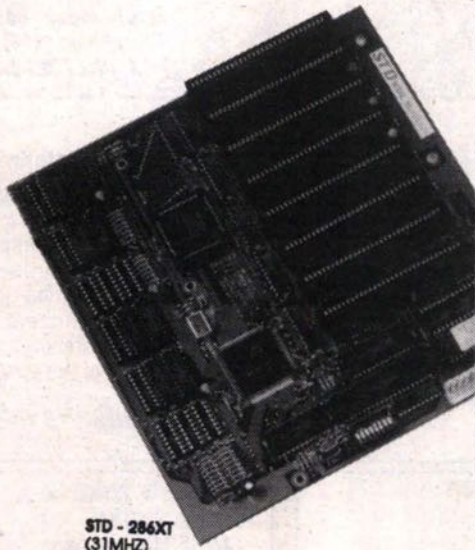
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Let us say that all this cleaning and tightening was to no avail. You should then take your machine to a professional repairman. However, if you are feeling adventurous, you could try some simple component swapping.

You need a second working computer very similar to the one that is not working. Let us call the working computer "A" and the defective computer "B."

Let us presume, for example, that B turns on, hums and whirs in the normal way, but there is no picture. We might guess that the problem is either with B's monitor, monitor cable or possibly the display adapter card inside the computer. These are the three parts most directly concerned with producing the picture.

We label all six components with a dymo gun either A or B, so we will not get confused whose parts are whose when we start swapping.

We turn off the power on both A and B. Then we swap monitors between the two computers. Then we power on and see what happens. If A stops working and B starts working, we can blame B's monitor as the culprit. If A continues to work and B continues to fail, this proves that B's monitor is innocent. We write down what we did in the log book and what the result was.

If you rule out the monitor as culprit, swap the monitors back the way they were. Then you can then try swapping the monitor cables. Continue until you find the failed component.

Sometimes you will get freak results, such as both A and B will fail or both A and B will work. Record this, too. Sometimes the failure is intermittent — it comes and goes. Sometimes there are two failed components. Tracking them down will bring out the Sherlock Holmes in you. This is why it is essential to keep the log book.

Once you have found the failed component, you might simply buy a new component and install it yourself, or you might take the failed piece in for repair. Since you have done so much of the detective work already, your repair bill will be less.

Hint — swap the ribbon cables first. These fail often, are easy to test and are cheap to replace.

The Zen of Computer Maintenance

Tracking down computer problems is fun, an art and an exercise in logic. There are many other techniques, such as diagnostic programs, I would like to discuss, but there is not space here.

Meticulously record everything that happens — especially when it is baffling! You are working away. Nothing is making any sense. Then suddenly, a blinding flash of inspiration hits you about the cause of all the strange behavior you have been seeing. You then need to go back over your notes to see if everything fits. Without records, you would have to do all the experiments all over.

The master repairmen I talked to gave me these bits of advice:

1. Record everything, including anything that happened to the computer just before the problem arose.
2. Work slowly and methodically. Change only one thing at a time.
3. Do not work when you are tired.
4. Do not panic. Random fiddling can turn a simple problem into a real mess.
5. Simplify by removing as much as possible from the computer that is not

related to the problem.

6. Make sure you have backups, including special backups of your CONFIG.SYS and AUTOEXEC.BAT files.

Acknowledgements

As usual, my friends on the BIX electronic conference, Harvey Fishman, Jay Vanderbilt, Dave Rifkind, Bob Brown and John Switzer and others, all helped me write this article.

Learning More

Scott Mueller wrote an excellent book, *Upgrading and Repairing PCs*, Que books

ISBN 0-88022-395-2. I am giving a series of courses called "Avoiding a Lemon" on prevention, "Repairing Your PC" on curing, and "Building your Own Computer" on assembly. Call 684-6529 for details.

Summary

Most computer problems are caused by dirty or loose contacts. All you have to do is clean and tighten all the contacts. If that does not work, swapping components with a twin machine will help you localize which piece of the computer is not working.

Parting Advice

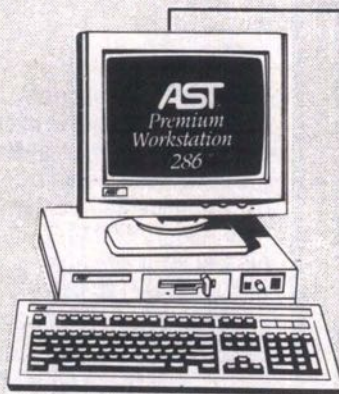
If you remember anything from this article, remember this. "TURN YOUR COMPUTER OFF BEFORE YOU TOUCH ANYTHING INSIDE OR OUTSIDE IT."

Roedy Green is President of Canadian Mind Products, a company that sells AT clones and accessories and does hardware tune-ups on old computers. Canadian Mind Products, #162 - 1020 Mainland, Vancouver BC, V6B 2T4, (604) 684-6529.

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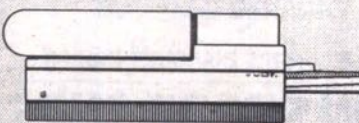
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by Daniel Wergler
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I am still in shock at the way fax machines have blasted their way into the office environment. No other device has had such an impact on running a business as the fax machine. You can order sushi by fax, pizza by fax, car parts by fax, computers by fax, fax machines by fax — and on and on. The only other device that rivals the fax machine is the photocopier. Can you imagine an office without a copier? Fax machines are almost, but not quite, up there with the copier. If your business card does not have a fax

number alongside your phone number, you are eyed suspiciously, and potential clients wonder about your business credentials! It's embarrassing to be faxless.

The fax machine is the great equalizer. Almost every fax machine will talk to every other fax machine. Anything that is flat and less than 8.5 by 11 inches can be transmitted by fax. Anything visual can travel the global telecommunications network. Hand drawings, charts, graphs, photographs, grocery lists, spreadsheets, menus — an image of any kind can travel instantly.

But, stand-alone fax machines are expensive. The reason is they perform several functions all in one small box. They are first an image scanner to convert the analog image into bit-mapped data. Then, they are a computer for the compression and storage of that bit-mapped image. Then, a high-speed modem for transmitting the compressed image over normal telephone lines. Finally, they are a printer for converting

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the digital image back to analog form.

Cheap and Cheerful

With this many functions in mind, it's easy to see how the Frecom FAX96 Fax Card came about. The FAX96 is a 9600 baud fax card. It takes up one 8-bit slot in a PC/XT, PC/AT, and PS/2 models 25 and 30. It requires at least 384K of memory, with 640K recommended. Also, a hard drive is almost a must (bit-mapped images can consume a lot of space, even when compressed). The FAX96 supports CGA, EGA, VGA and Hercules graphic adapters. There is a wide range of printer support, with what seems a sincere desire to accommodate printers not listed in this particular release. This includes laser printers as well. For graphic (bit-mapped) input, there is support for two models from one scanner manufacturer, the Chinon DS-2000 and DS-3000. Other scanners can be used, if they output a TIFF CCITT, TIFF uncompressed, TIFF packed or PCX file format.

For the purposes of this review, the FAX96 card was loaded into two systems: first, an Everex 286 with 1MB of ram, 40MB hard drive, Roland PR-1550 printer, Paradise 16 Plus graphics card and NEC Multisync II monitor; second another 286 system, with 640K ram, 65MB hard drive, Star NX1000 printer and generic graphics card and TTL monochrome monitor. It was very pleasant to have absolutely no problems loading the software and installing the card in either system. Setup was painless and everything ran well the first time.

The software is very easy to use, and even on a basic system, functions well. There are only a dozen or so command keys for full operation and they are all logically chosen. The layout of the menus is symmetrical and, on a color display, are colored to reflect the standards found on stand-alone fax machines. After each send or receive of a fax, successful or not, a log entry is made, and can be viewed from the program, sent to the printer, or renamed for archival purposes. There is a phone book function for fast access to names and numbers from within the program. Both the log and phone book are simple ASCII files and can be read and created by a basic editing program. This means that phone lists stored in spreadsheets or word processing programs can be easily converted for use with this product. Image files created or scanned can be in TIFF, PCX or FAX formats. A simple paint program would go a long way in creating and transmitting hand drawings if a scanner was unavailable.

Background Receive

FAX96 allows for a function called "background receive" to be on or off. This means that after either running the FAX96 software, or turning "background receive" on from the DOS level, it is running as a TSR (terminate and stay resident) program. When the phone rings, FAX96 puts a small display box in the corner of your current screen and informs you of the status as the fax is being received. This works well in most cases, although when in some programs, the display box appears blank (Microsoft Word, for example), although it still functions (a bug?). Also, other TSR programs will cause problems (Sidekick, for example).

Some Bugs

There is another small problem as well. When running FAX96 at a location

which required dialing out through a PBX phone system, the necessity of dialing "9" before the number to reach an outside line caused a problem. The manual instructs the user to type a "9,###" to get an outside dial tone. This did not function. I tried various combinations, but could not get FAX96 to send a "9" and then the number. In the Hayes command set used in standard modems, the ";" signifies a delay before dialing the seven-digit number. Perhaps that applies here, too, so one should be aware that until this problem is resolved or explained, caution should be applied when using this card with a PBX, Centrex or key phone system.

This reviewer sent and received test faxes to/from a Pitney Bowes 8050 fax machine with no problems at all. The FAX96 card and software is a good product overall, especially at a price of \$275 Cdn. It may not be suitable for a major office environment, but would be excellent for the budget-minded home or small-office user with existing equipment to complete the functions of a stand-alone fax machine.

In other words, with the right equipment, this card would deliver substantial savings over a stand-alone fax machine, because you would not be duplicating functions that can be performed with existing equipment. So, the FAX96 fax card appears to be a very good product for the money, keeping in mind its simple function.

Dan Werger provides image scanning services in Vancouver. Contact: 604/736-9624

Rock-Bottom Priced Audiotex/Fax Delivery Card Coming

FREMONT, CALIFORNIA, U.S.A., 1990 MAR 15 (NB) — Fremont Communications Company is cooking up a major challenge to the fledgling makers of audiotex/fax delivery systems, promising to offer a peripheral card for the PC which delivers the same features at a fraction of the cost. VP of Marketing John Houghton tells Newsbytes that his company is developing a fax bulletin board card, called the Fremont FAX96 Bulletin Board, for release this summer or this fall. It will be sold for several hundred dollars, compared to the \$10,000-\$20,000 that current audiotex/fax configurations cost from makers of competing systems. A beta version is already running, and callers can dial it up at 415-490-6593.

For callers, the fax bulletin board card currently works as follows. It answers the phone with a synthesized voice, provides the caller with several options, for example financial news, restaurant menus, or sports scores. The user punches in a number on their touch-tone phone corresponding to the feature for which they want a fax-based information. The user is then asked to enter their fax number, and they hang up. The fax card then calls their fax phone number and delivers the document.

The final version will incorporate the ability of a user to print out hard-copy print on their fax machine if they are calling from a fax/phone combination, while online, real-time. (Contact: John Houghton, 415-438-5016)

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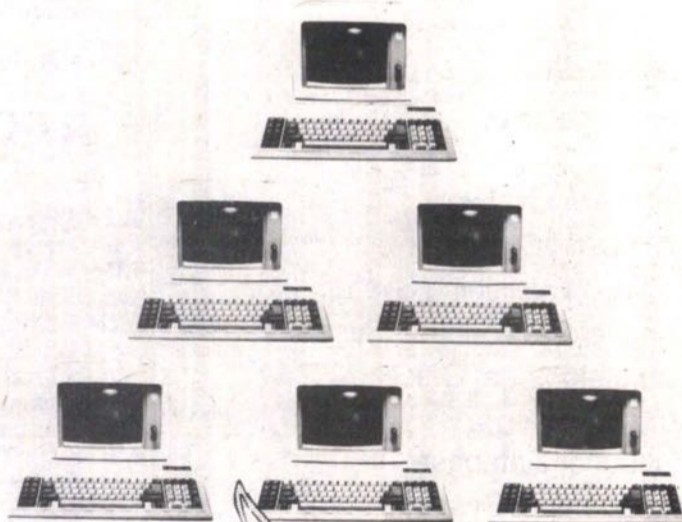
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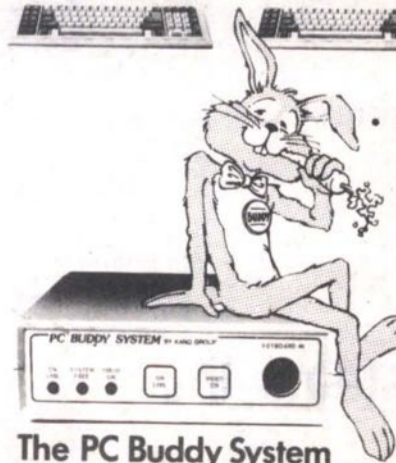
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Product: Lightspeed 9624
Manufacturer: Lightspeed Tech, distributed by Computer Friends, 14250 NW Science Park Drive, Portland, OR, USA, 97229, 503/626-2291
System Requirements: Mac Plus, System 6.0 or higher
Price: US \$499

CA, USA, 94538, 415/683-0300
System Requirements: MacPlus, System 6.03 or higher
Price: US \$599

Product: Abaton Interfax 24/96
Manufacturer: Abaton Technology Corporation, 500-1185 West Georgia, Vancouver, 604/685-7343
System Requirements: Mac Plus, System 6.0 or higher
Price: Cdn \$695

Product: Orchid Fax
Manufacturer: Orchid Technology, 45365 North Loop, West Fremont,

The Scene

The fax era is upon us, as any small businessman can attest. If you're ready to jump on board, there's a few new aspects to consider that may change the way you look at fax transmission.

Look around any office environment today and what do you see? Computers. And what other necessary office device do you see? Fax machines. Two different worlds, co-existing. But wait, something new is on the horizon — a hybrid promising to offer the best of both worlds. Enter the fax modem.

For the Macintosh, three manufacturers, Abaton, Orchid and Lightspeed, all offer units that represent the cutting edge in the fax modem arena. All are 9600 baud, Group 3 fax modems with 2400 baud data modems. All offer scheduled send-and-receive capabilities at the same relative speeds. The ability to create, manage and print faxes are included in all three. But the real difference is not what they offer but how they offer it. This is the criterion that either makes or breaks these units.

On The Surface

As far as the hardware is concerned, the Lightfax 9624 (Lightspeed) is the ugliest modem I have ever seen. It's big, bulky, and blue. It's cheaply constructed and the power supply is a huge monstrosity that sits on the floor. It does however offer a wide range of status lights that indicate transmission speeds and protocols, although they are puzzling at first glance. The speaker is adjusted by a volume control. It is the only unit that is configured by DIP switches.

The Orchid, on the other hand, looks like it's meant to be part of a Mac system. It's color matched, small and compact. It appears well-constructed but upon actual use it turns out to be less than MacStandard. The status lights have an annoying habit of breathing (faintly blinking) while the unit is on.

The InterFax 24/96 (Abaton) looks and acts like a Mac peripheral. It's well constructed and the ergonomics are pleasing. Like the Orchid, configuration is set by software.

The First Step

Each of the units comes with a stand-alone software program for the creation and manipulation of faxes as well as a host of files to control the fax modem itself. The first issue to deal with in the main program is the creation of fax number directories. Orchid comes with BackFax and is the simplest of the three main programs concerning directories. A name, number and note is recorded for each listing and the single numbers can be grouped. Unfortunately, the groups are listed along with the singles and tend to clutter up an already small display. The items can be edited but the lists are not properly updated and cause errors in the program. In some cases, entire groups were destroyed.

Lightfax provides far more options for storing data about each number. The groups and singles are displayed separately and groups can also be grouped to form larger distribution lists.

InterFax has similar features but the interface is far more unified. It also has the capability of importing text files from any tab delimited file (databases, word processors, etc.).

The Making of a Fax

Creation of a fax typically occurs outside of the main program itself. While in other applications, any active file can be "printed to disk" after selecting the modem driver (in the chooser) and using the "Print" command. The resolution (standard: 100 dpi, or best: 200 dpi) can also be controlled at this time. As the faxes are created they can be sent out (based on directories) or scheduled for later transmission.

Lightfax will allow for use of tempo-

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rery numbers but new numbers can't be added to the directories at this time and distribution lists can't be accessed. The faxes can be sent (without saving) or saved, but not both. When saving ("printing to disk"), the resolution can't be adjusted. Processing time at 1:07 minutes was the slowest of all three for a one-page document with text and graphics (a MacWrite II test page at fine resolution). Send time was 1:28. Lightfax was the only package to produce transmission errors throughout the testing. Unlike the other two packages, it does not support background transmission.

InterFax will allow access to distribution lists and temporary numbers, but new numbers are also restricted. Processing time was 0:55. Send time, at 1:12, was the fastest.

BackFax has the flexibility to add new numbers at this time. Unfortunately, no control of file names is available and all faxes are strangely named "Printout Abort." Processing was the fastest (0:47) but send time was slowest (1:44). BackFax will also handle straight file transfers to other Orchid or Apple fax modems.

A Wide World

While a single fax broadcast (one file sent to many numbers) can be set up in any program (InterFax does the best job at this), a multiple broadcast (different files sent to many numbers) can only be assembled in the main program itself. BackFax is the weakest here for it doesn't support file sets, so a series of single broadcasts must be created and then grouped together. Another alternative to this is to append to a single file when "saving" in a different program. Either way, these options are inflexible and proper broadcasting ability is lacking. On the bonus side, automatic cover pages are supported and at best-resolution, custom covers can be used.

Assembling a broadcast in Lightfax is a two-stage process. A file set is built and then sent to a distribution list. Automatic cover pages are also supported.

InterFax, by allowing distribution lists and file sets to be manipulated at the same time, was the most flexible. It was also the only program to offer a manual retry option if transmission failed. It did not, however, support cover pages, a sorely needed feature.

One of the advantages a fax modem has over a conventional fax machine is its ability to send higher-quality images. A fax modem sends an electronic image (as opposed to a paper image) and uses fonts that are three times the size of screen fonts. Lightfax and BackFax provided excellent quality (at best-resolution) with sharp, readable text even at 9 point. InterFax had problems here, most notably with large text sizes (24 pt. and up), where jaggies were apparent. It also created reproduction errors with 10 and 12 pt. text at standard resolution. Graphics were inferior, with distortions in pixel size, and in standard resolution, slight alignment problems were noticeable. This was not a big difference in quality, but a difference nevertheless.

Incoming Faxes

In the receiving department, Lightfax's lack of an unopened/opened mail metaphor (which the other two have) provides little indication that new faxes have been received. Reception occurs in the foreground only, and transmission errors were again encountered.

BackFax alerts the user by providing a

brief message in any application that fax has arrived. InterFax does it one better by adding a flashing icon in the menu bar that stays active until you "open" the fax. Receive times for all three units were approximately the same.

Once a fax is received it can be viewed or printed. BackFax offers limited view capabilities, with only an actual-size or best-resolution mode. Lightfax allows the image to be scaled from 50% to 300%. InterFax again offers the most flexible options by supporting scaling and resolution settings and four viewing orientations. These options can also be used in the actual printing of the fax.

Keeping Records

All this activity is recorded in journals that track certain elements of a fax. All the packages offer basic tracking but InterFax provides more info on error-reporting than the other two. Its displays are also far more readable and are saved as text files so they can easily be exported. BackFax has the weakest tracking because errors are not indicated in the send journal but only in a processing log.

Polling allows for requesting a fax be automatically sent back to the calling fax device. InterFax supports polling with a security I.D. option. Lightfax can additionally set up a fax to be polled by another machine (two-way polling). BackFax has no polling features.

The main program also facilitates conversion of foreign file formats into faxes and vice versa. Lightfax supports text, paint and TIFF formats. InterFax adds PICT to that list. BackFax is the most versatile, additionally handling EPS and Glue formats.

They Slice, They Dice, They Double As Modems

The units as data modems all performed well. The InterFax also supports the MNP.5 protocol for increased performance through advanced compression and error-detection.

How the units handle the switch between data and fax modem use is a critical issue. Switching of the Orchid can only be accomplished through BackFax itself. Also, when the modem is not on, the fax send/receive capabilities are turned off; they need to be reset when the modem is finally turned on.

A more civilized approach is taken by the Lightfax with its use of a DA to control the switching. The InterFax does this one better by automatically switching to data mode only in telecommunications programs. It also uses a control panel document for such functions as immediate fax reception and current transmission info.

The Fax Are In

All in all, there are more options than you can shake a stick at. Orchid and Lightspeed, while they have some innovative features, still have problems that make them awkward to use and in some cases unreliable. The InterFax is clearly the winner in software and interface design. It's also a better hardware product. Some areas still need to be addressed, but overall it's the best performer.

Roger Stafeck is president of MacSupport, a company specializing in support services for the Macintosh, including consulting, on-site instruction, and spreadsheet and database development. (604)681-9087.

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PRODUCT REVIEW: PC FAX BOARDS

Product: SpectraFAX Personal Link, a 9600 baud PC fax system

Manufacturer: SpectraFAX Corp., 209 S. Airport Road, Naples, Florida, 33942 813-643-5060

Price: US \$995

Rating: 3.5 on a scale of 1 (lowest) to 4 (highest)

by Dana Blankenhorn

SpectraFAX is the quiet leader in fax board technology. Besides this product,

the company also designed the Intel Connection Coprocessor and Panasonic Fax Partner, both excellent fax cards for PCs.

What you get with the SpectraFAX card is some no-nonsense hardware, a 9,600 baud fax modem which can send a full page of copy in 15 seconds, and software which allows you to translate ASCII documents into fax standards and review documents you receive as PC Paintbrush files. (A copy of Version 1.0 of the venerable Z-Soft drawing pro-

gram is included.)

More telling is the software. SpectraFAX included some tricks here it didn't give Intel or Matsushita. If you work directly with the company there are some wonders to be had, including the ability to combine full-size and half-size documents on the same send. The standard package, Personal Link, is easy to use and quick, with simple menus for choosing the files you'll send, creating a phonebook of fax addresses, and choosing which addresses to send files, and for

scheduling mailings for late at night. You can even add a cover sheet, either with your own favorite word processor or Paintbrush.

Our quibbles with the product are just that, quibbles, and will no doubt be solved with the next release of software. On the phone book form, you're asked for a phone number when it wants a fax number — there's another place for you to post a "voice" number. Where it asks for name it really wants the company, and vice-versa. Also, the board can get confused by simple print-control commands such as Alt-T for a new page. When we tried to send a page with this character included, the program hung up and decided what we were sending wasn't ASCII.

Ratings

PERFORMANCE/PRICE: 3.5. You'll get a better price buying this product from Panasonic or Intel, otherwise this would be a 4.

USEFULNESS: 3.75. A fax card is a must for PC owners who are sending faxes out. For receiving, you may still want a fax machine, which can be left on all the time.

MANUAL: 4.0. Documentation comes in the form of a well-written user manual, but you likely won't need it. The menus are self-explanatory.

AVAILABILITY: 3.0. You need to buy this directly from the company. If you're going to your local computer store, the same product can be seen in boxes from Intel or Panasonic, however.

Product: Connection Coprocessor, fax card for the PC

Requirements: PC, XT, AT, 80386, and 100% compatibles with graphics-capable dot matrix or laser printer

Manufacturer: Intel, 2402 West Beardsley Rd., Phoenix, AZ 85027, 602-629-7360

Price: U.S. \$695

Rating: 3.625 (on a scale of 1 to 4 lowest to highest)

by T. Bass

The controlling software that comes with Intel's Connection Coprocessor is simple and easily installed. If the user's computer is equipped with expanded memory or memory capable of being used as expanded memory, the programs are loaded into it. This lets the Connection Coprocessor be on alert in the background while the user is busy doing another task.

A nice addition to the software for fax transmissions is that the user does not have just a cover page, but can add a scanned or developed logo to that cover page. This provides an attractive ID to the critical information on the cover page.

It must be remembered that if the user has "call waiting" on the line to which the Connection Coprocessor is connected, that telephone feature can interfere with Connection Coprocessor operation. The call-waiting feature will bump-disconnect the fax or modem if another call comes in during use. While a user can disable the call-waiting phone feature for outgoing calls, nothing can be done for incoming communications.

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If sending multiple pages by fax to multiple sites unattended (i.e., broadcast faxes) is the user's desire, this may be the answer. And no thermal paper!!!

The graphics program that is packaged with the Connection Coprocessor is antiquated and does not function easily or well by today's standards. It is a serious short coming in an otherwise nice package.

The package provides a feature to compress a 132 column x 104 line page into a regular 8.5 x 11-inch page. The feature is great except that the user has to compress the entire document or nothing at all. In other words, the user cannot format compression on a per-page basis.

When the Connection Coprocessor is doing its job it works very efficiently and well. The software and the board make a lot of decisions about what is the best way to communicate with the other end of the loop based on information the user

gives it and the introductory information from the other end. However, when the user starts sending there is no visible way to keep up with the progress. Thus, the user doesn't know when the phone will be free to use for something else—no problem if the user has a dedicated phone line.

Its major short coming is the same one all fax receivers have—the files are not addressable by a word processor. The difference between bit maps and ASCII as a format is the problem. Connection Coprocessor does elect ASCII if the other end of the loop can send or receive it; it's an automated choice.

Intel's Connection Coprocessor Fax Board is mentioned as one of the "10 Most Important Hardware Introductions of 1989" in the *Personal Computing* October 1989 issue.

Rating

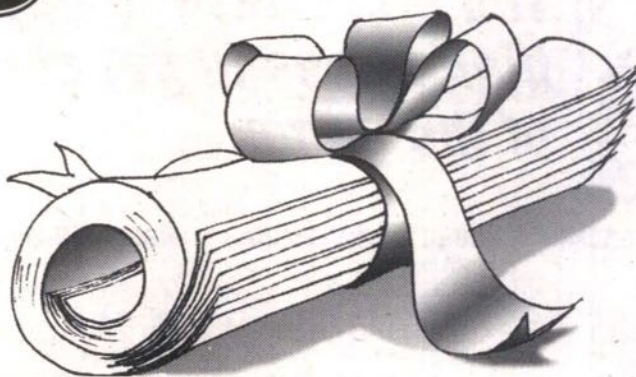
PERFORMANCE: 3. The efficient operation in the background is much improved over previous boards and software. However, the antiquated graphics package included is cumbersome. Also, the software does not let the user know when a fax transmission is in process or completed.

USEFULNESS: 3.5. Intel's Connection Coprocessor is quite useful if the user sends more than one communication a day to offices which are fax-based. It is faster, more convenient, and more private than a public fax machine. It also uses a regular dot matrix graphic printer for hard copy.

MANUALS: 4. well done & extensive.

AVAILABILITY: 4. The Connection Coprocessor can be purchased at numerous outlets.

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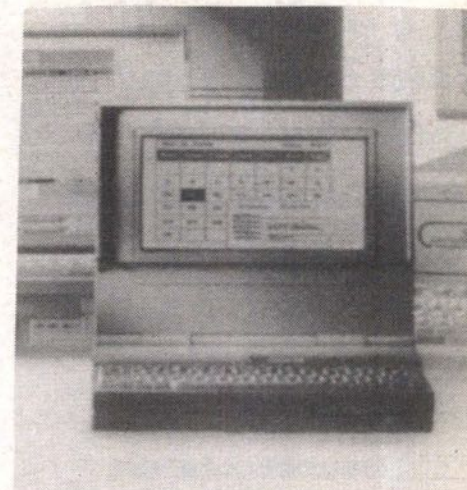
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Product: Compaq/LTE hard disk MS-DOS notebook computer
Manufacturer: Compaq Computer Corp., P.O. Box 69200, Houston, TX 77269-2000. 713-370-0670
Price: US \$2,999 (with hard disk)
Rating: 3.95 (on a scale of 1 to 4, lowest to highest)



by John McCormick

The LTE is a six-pound clamshell laptop/notebook computer with good display, excellent keyboard, and all the features needed to make it a useful traveling companion for those with light-duty computing chores to perform. Full VGA graphics and more power are available in the larger SLT and a 286-based version of the LTE (called the 286/LTE) is also available, with correspondingly higher price but similar battery life.

I was very impressed last year by the 286/SLT when I received one of the very first review units (still lacking FCC approval for sale at that time) but, as much as I admired its terrific graphics and power, it was just too big for my needs.

While I use a computer for almost everything imaginable at the Newsbytes bureau office, when I am on the road it is used almost exclusively for simple word processing/note-taking and for connecting with online services; therefore, a powerful and consequently rather heavy portable is not what I need.

This second generation of laptops from Compaq came with every feature I

ever wanted in a laptop: 640K (more RAM eats up battery power too quickly), 1.44 megabyte (MB) 3.5-inch floppy disk, 20 MB hard disk with good access time (29 milliseconds per specification but about 26ms on my tests), spare battery, built-in 2400 baud modem (with serial port also included), and the usual amenities such as printer and external monitor ports.

Despite all this, the LTE is the smallest laptop computer I have ever used that was actually big enough to do any reasonable amount of work on. Although battery life will undoubtedly improve over the years, and laptops will get even lighter, there is no way to make a laptop smaller than a certain size, which is limited by the size of a keyboard and a good, view-

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able screen. So this is likely to remain the smallest practical size for a real computer which is used by a touch typist.

This latest Compaq offering is packed with features but is still about as small as is commensurate with having a keyboard that is comfortable to work with, lacking only a separate number pad (those needing a separate numeric keypad can add one that plugs into the back).

Although the LTE came with both 3.3 and 4.0 versions of MS-DOS, I never did like 4.0, so I stayed with what for my money is the best version of MS-DOS. The Compaq disk formatting and setup program is fully automatic, so the fact that this computer arrived with nothing on the hard disk was absolutely no problem and would present even a novice user with little to do before the system was fully configured.

The quarter-inch-thick supertwist backlit display is only CGA (not VGA) grade, but I found it to be highly usable for most tasks.

As usual, you do pay a price for Compaq reliability and advanced technology, although at \$2,399 for the floppy disk version (all models come with a minimum of 640K RAM) and \$2,999 for the 20MB hard disk version tested, the basic computer is certainly reasonably priced considering what you get. My complaint would be with the overpriced (\$89) carrying case; an automobile adapter that costs \$129; an optional numeric keypad that at \$119 costs more than a good quality 101-key enhanced keyboard for any desktop; and nearly \$450 for a 2400 baud modem.

These prices seem out of line with the reasonable price of the base computers, despite their quality, but I guess you get

what you pay for and street prices are likely to make both the 286/LTE and the LTE very, very popular, especially with business users who can easily justify paying a few dollars more for the Compaq name and reputation.

Having a CMOS (complimentary metal oxide) 80C286 processor in the same size and weight package, the \$4,500 286/LTE is obviously a more sophisticated and powerful computer, but for my needs the 80C86-based LTE is just right.

These are the laptop/notebook computers that IBM should have designed and probably wishes they had.

Ratings:

PERFORMANCE: 4. The sophisticated power management and other utilities supplied by Compaq make this a dream to operate; just remember that it is only an 8-bit computer and not a speed demon.

USEFULNESS: 4. Again, the special Compaq-supplied utilities add to its utility, but, even without them, a notebook MS-DOS compatible computer this size and weight with a standard 1.44-megabyte 3.5-inch floppy drive is uniquely useful.

MANUAL: 3.8 Compaq's documentation is good, but a more elementary section designed for first-time business users might be appropriate since there is a likely audience for this sort of computer. Personally, I only looked at the documentation to see how good it was; an experienced PC user would never need to open it.

AVAILABILITY: 4. Compaq is an industry leader, and its machines are widely available.

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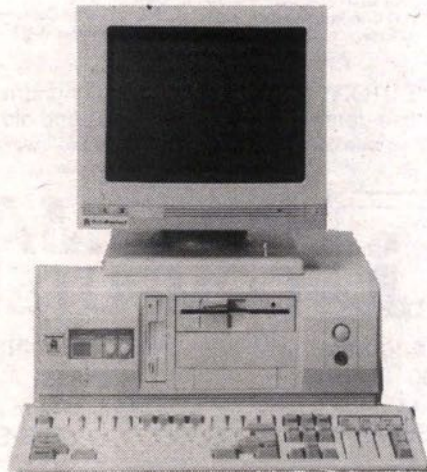
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 dBase III+ Intro \$75
LANGLEY COLLEGE, 530-8411
 Database 120 hrs \$300
LANGLEY SCHOOL, 533-4227.
 dBase III+ \$85
MICROAGE, 3601 W. 16th Ave. 222-1010.
 dBase III, IV, Pt. 1 Apr. 19, Pt 2 Apr. 30 \$175
ONCOURSE Suite 200-550 Burrard 640-7201
 Using dBase IV,
PBSC TRAIN 1350-1140 W. Pender 689-7272
 dBase III+ L.1-2-3 \$175
PCTI 520-6873 dBase IV \$100
PITMAN 1490 W. Broadway 738-7848
 dBase III+ Level I, \$170
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 dBase IV, L. 1, \$350; dBase III to IV, \$175
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 dBase III & Introduction \$175
UBC CONTINUING ED. 222-5276
 Intro to dBase IV, \$195 Inter. \$195
 Adv. dBase IV, Apr. 4-6, 9-4 pm 222-5251 \$395
VANCOUVER SCHOOL BD., 736-7241.
 dBASE III + Level 1 & 2 \$89
 dBase IV Level 1 & 2 \$89
VAN. COMM. COLL., 250 W. Pender St., Van.,
 682-5844 (call for dates)
 Intro to dBase III Plus \$150
 Intermed. dBase III Plus \$150
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 Update to dBase IV for dBase III Users \$75
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 PageMaker 1 Call for info \$450
PCTI 520-6873 PageMaker \$100
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 Intro to DTP \$45 DTP Workshop \$175
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 PageMaker, Ventura \$350
SELKIRK COLL., Castlegar 1-365-7292
 Electronic Publishing, Graphic Design
SIMON FRASER Downtown 687-4255
 Intro to Ventura Publisher, Apr. 3 \$160
STM SYSTEMS CORP. 684-7721
 PageMaker \$320
TLD COMPUTERS, #150-5851 No. 3 Rd., Richmond
 Pagemaker Basic \$250, Advanced \$300
UBC CONTINUING ED. 222-5276
 Improving Your Desktop Skills \$85
 PostScript Programming, Sat., Apr 21-May 5,
 10-3 pm, 222-5251 \$295
VAN DTP CTR 1150 Homer 681-9161
 Ventura, Pagemaker
VAN. SCHOOL BD 736-7241
 Mac-PageMaker \$89
 Ventura Level 1 & 2 \$120
 IBM PageMaker 3.0 Level 1 & 2 \$120
VAN. COM. COLL., 250 W. Pender St., Van., 682-
 5844 (call for dates)
 IBM/IBM Compatible \$75
 Graphic Design for DTP \$75
 Intermed. Design for DTP \$150
 Intro to PageMaker DTP \$150
 Intermed. PageMaker DTP \$375
 Desktop Pub. Workshop with PageMaker \$150
 Intro. to Ventura DTP \$150

EVENTS

CIRRUS ENTERPRISES *AEC — DIRECTIONS '90*
 for professionals in Architecture, Engineering, Sur-
 veying, Drafting and Construction, May 16&17,
 Ramada Inn, Victoria. Call Victoria 386-8844.
COMDEX/Europe at SICOB, Oct 4-8, Paris
COMPUTERLAND NATIONAL SEMINAR SERIES:
VISIONS, IDEAS, SOLUTIONS April 4&5 Vancou-
 ver, Call 640-6900.
COMDEX/Europe at SICOB April 23-28, Paris
COMDEX/Spring '90, June 3-6, Atlanta
COMDEX/Fall '90, Nov 12-16, Las Vegas.
HOME BASED BUSINESS SEMINARS: Vancouver,
 Apr. 21, 9-4 p.m., Apr 24 & 25, 7-10 pm, 736-7241
INTERNATIONAL TELEMARKETING CONSULT-
ANTS LTD., 734-6645
 Selling on the Telephone, Apr. 26 9-12 noon, \$65.00,
 Richmond
 An Introduction to Telemarketing, Apr. 26 1:30-
 4:30pm, \$65.00, Richmond
MacWORLD EXPOSITION/CANADA, Oct 23-25,
 1990, Toronto, Ontario Hundreds of exhibitors from
 Canada, US and overseas are expected to attend
 and demonstrate the latest innovations and tech-
 nologies available. Also, world renowned experts
 will be participating in a 3-day Mac conference.
 Other MacWorld Shows - San Francisco April 11-13,
 1990 and Boston August 9-11, 1990. For more info
 contact Mitch Hall Associates at (617) 361-8000.
NORTHEAST COMPUTER SHOW Oct 25-27, Boston
ONLINE '90, Computer Symposium for Business,
 Presentations & Exhibitions. 604/963-9275 Yellow-
 head Inn, Prince George, BC, April 27.
PERFORMANCE SEMINAR GROUP: Designing &
 Preparing Camera-Ready Artwork, A one-day semi-
 nar, Vancouver, April 10. Performance Seminar
 Group, 813-910 Mainland Street, Vancouver, V6B
 1A9.
PUBLIC LEGAL EDUCATION SOCIETY Free Law
 class on computers and the law for sellers, buyers
 and users. 438-4041.
SOFTWARE B.C. Speaker Ron Evans, President of
 Evans Research, at The Hermitage Restaurant 115-
 1025 Robson St. Vancouver, Call 689-3237
TANDEM COMPUTERS: SHARING THE VISION,
 April 4th, 1990, Westin Bayshore, Full-day event to
 discuss strategy, booths by InfoBuild, Oracle, Ingres
 and OSWARE 684-7141.
UBC CONTINUING ED., Microcomputer as a plan-
 ning tool, Apr. 26-27, 9-4pm, 222-5251, \$450.
 Expert Systems - Your Competitive Edge, May 4,
 222-5251 \$195
UBC CONTINUING ED. Personal Computer Week,
 May 14-18, 9-4 pm, 222-5251.
UNIX SOLUTIONS Oct 3-5, Anaheim.
VARDEX May 9-10, 1990 Trade & Convention Centre
 999 Canada Way, Vancouver, Call 416-479-3939

INTEGRATED SOFTWARE

CIRRUS ENTERPRISES Victoria, 386-8844.
 Framework II Intro, Advanced
DOUGLAS COLLEGE, New West.
 Getting to Know Your Computer, \$118
 Computer Use for Disabled, Sats. 4/21-6/2 \$40
 SuperCalc4 Intro June 23 \$105
DRAKE #601 889 West Pender 669-8789
 Smart, Symphony, MSWorks
GUILDFORD CONT. EDUC., 14577-106A Ave.,

DESKTOP PUBLISHING

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 Graphic Design, DTP (IBM & Mac);
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 Pagemaker, Ventura
CAPILANO COLL. N Van 984-4901
 Desktop Publisher \$70
CIRRUS ENTERPRISES, Victoria, 386-8844.
 PageMaker, Ventura
COASTWAY, 206-2501 Spruce St. 736-5039
 PageMaker, Ventura, CorelDraw
COMPUTERLAND 640-6900.
DOS & Mac PageMaker, Harvard Graphics DOS
 Pagemaker (2 days) April 26&27 — Vancouver Mac
 Pagemaker (2 days) April 19&20 — Vancouver Har-
 vard Graphics April 5, 25 — Vancouver
COMPUTER EMPIRE 879-4162.
 Ventura \$145
COQUITLAM CONT. ED. 936-4261
 Ventura or Pagemaker \$80
DOPPLER 101 W. 5th 875-0261
 Ventura or Pagemaker \$149
DOUGLAS COLL. New West. 520-5400.
 DTP - Hands-on Intro to Pagemaker, Apr. 21 \$95
 Hands-on Intro to Ventura, Apr. 28 \$95
GUILDFORD CONT. ED. Centre, 14577 - 106A Ave.,
 Surrey, 589-2221.
 Mac PageMaker, \$85
JUMP SOFTWARE Suite 450-650 W. 41st, Vancouver
 263-5867
 PageMaker, Ventura
KWANTLEN COLL. Surrey, 588-4411.
 Desktop Publ., Ventura DTP Intro
LANGLEY SEC. SCHOOL 533-4227.
 DTP With Pagemaker, \$70; Mac Intro \$65
McKAY 2151 Burrard 736-7221
 Desktop Publ, Graphic Arts 12 wks,
MICROAGE 3609 W 16th 222-1010.
 Pagemaker \$175
 Aldus Pagemaker Pt. 1, Apr. 23
 Aldus Pagemaker Pt. 2, Apr. 24

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STM SYSTEMS CORP. 684-7721
Symphony \$280
SURREY (Newton Cont. Ed.) 594-2000
Microsoft Works
TLD COMPUTERS, #150-5851 No. 3 Rd.
Microsoft Works, \$200
VAN SCHOOL BOARD 736-7241
Framework III, MS Works Level 1 & 2,
Symphony Level 1 & 2 \$89
VAN. COMM. COLL., 250 W. Pender, Van. 682-5844
Intro to Computers, call for dates
Word Proc., Spreadsheets & Database
Accounting

LOCAL AREA NETWORKS

BCIT, 3700 Willingdon, Burnaby, 434-1610
COMP 286, Novell Netware 286, \$100
Thursday, 12 April, 1990, 6 wks, Burnaby
CADENCE 300-1681 Chestnut, Van. 733-7638
3Com Network Administration
CENTRE FOR ADVANCED PROFESSIONAL ED.
(800)345-0240
Troubleshooting LANS May 3-4
CIRRUS ENTERPRISES, Victoria, 386-8844.
Intro. to Local Area Networks
COMPUTER EMPIRE 879-4162.
Networking Sys. Instal. \$245
COMPUTERLAND 640-6900. Novell
Novell System Manager (3 days)
April 10-12 — Vancouver
IBM PC LAN (2 days)
April 19&20 — Vancouver
Novell System Manager (3 days)
April 18-20 — Victoria
DRAKE #601 889 West Pender 669-8789
Netware System Manager for Novell
JUMP SOFTWARE Suite 450-650 W. 41st, Vancouver
263-5867
3Com Network Admin., Novell Netware
MICROAGE, 3601 W. 16th Ave., 222-1010.
Novell Syst. Mgr., Apr. 16, 17, 18 \$695
TLD COMPUTERS, #150-5851 No. 3 Rd.
Novell Sys Man., \$200

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COMP 190, Meet the Mac, \$200, 12 wks, Burnaby
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Bedford Acct. on Macintosh \$80
BYTE COMPUTERS 2151 Burrard St.,
Intro Macintosh \$85; MS Works \$149
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GUILDFORD CONT. ED. Surrey, 589-2221.
Intro. to Mac., \$85
LANGLEY SCHOOL, #88, 533-4227.
Macintosh Intro \$65
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On Site Instruction & Consultation
Intro. to Mac Word, Filemaker, Excel, etc.
NAVIGATOR TRAINING 879-5427.
Word Version 4.0, Excel 2.2, WordPerfect
SFU DOWNTOWN, 291-5100
Intro. to Pagemaker \$175
SURREY (Newton Cont. Ed.) 594-2000
Intro to Mac \$85
UBC CONTINUING. ED. 222-5276
Intro to Mac \$145, MS-Word Intro. \$185
MS Word 5: Int., \$185
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Macintosh Intro, PageMaker, Excel,
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Comp 160, COMP. SYSTEMS - Lev1, \$160
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Comp 245, BASIC
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Programming, Weds., April 11-May 9, \$185
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Lotus Apr 25 \$150
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BCIT, 3700 Willingdon, Burnaby, 434-1610
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Comp 115, SPREADSHEET CONCEPTS, \$70
Comp 169, LOTUS 1-2-3 - Level 1, \$196
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Lotus 1-2-3, Excel \$80
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Lotus 1-2-3, \$239
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Lotus 1-2-3, Man. Data & Macros, June 2 \$105
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IPC SYSTEMS, 228 W. 7th 873-5595
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Lotus 1-2-3, Pt. 1 Apr. 25 \$175
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Using Lotus 1-2-3, Macros
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Adv., private group lessons, 985-9408.
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Lotus 1-2-3 \$170
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Lotus 1-2-3 \$175, Excel Basics \$350
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CEPTS - Level 1, \$160
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CEPTS - Level 2, \$160
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APPLICATIONS, \$193
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FRASER VALLEY COLL. Abbotsford 853-7441.
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Using MS/DOS \$170
PRECEPT 735 Clark Dr 255-3198
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Intro to Computers \$140; DOS Intro \$175
SURREY (Newton Cont. Ed.) 594-2000
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Kaypro User Group/Vancouver Portable Computer Club, 3rd Mon., at Kwantlen College Richmond (DOS & CP/M) 271-1519.	
Mac User Group Meeting, BC Apple Society, Burnaby Lake Clubhouse 437-9935.	
MacWest Computer Society, 2 monthly meetings for members, plus PD copy session. General Meet- ings - 2nd Wednesday 7:30pm	
MacWest New User Meeting - 3rd Wednesday 8:00pm Guildford Public Library, Surrey. PD Copy ses- sions: with meeting. Bob Scales at 464-3645. Rolf Drommer: 941-3789.	
Microlog-128 SWL Users Group, c/o Robert Anderson, 1055 Moosejaw St., Pentlton, B.C.	
Mission Computer Users Group meets the last Tues- day of every month at 7:00 p.m. at Smitys Restau- rant in Mission.	
Maple Ridge Computer User Group, 2nd Tues of ev- ery month, M.R. Sr. Secondary 7:30, J. Brohman 463-9318.	
NEC APC Users Group, Lee 980-5825.	
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Pacific Information Exchange, P.O. Box 67366, Sta- tion O, Vancouver, V5W 3T1.	
Port Coq. Computer Club—Commodore, Amiga & IBM, 1st & 3rd Tues 7:30, 1379 Laurier, Hyde Creek Centre.	
Smart User Group, Brian Wiebe 669-8789.	
Software B.C., #400 - 1190 Melville St., Van., B.C. 684-7432. Next meeting Mon., Jan. 25, with Mike Miller, Executive Editor Infoworld.	
Sur-Tandy 1000+ Club Kwantlen College, Newton Campus, Rm. 201, 13468 - 77th Ave. Surrey. 3rd Tuesday.	
Tandy 1000+ Club, 2nd Mon. 7 pm, Kwantlen College, Newton Campus, Rm 209 or 211. Len Boscoe 574-5419.	
T.I. 99/4A Computer B.C. 99er Users Group, Every Thurs. 7-10 pm, Cameron Rec Cent., Bby. Ron: 522-2598. 1st Thurs Tutorials, 2nd Thurs General, 3rd Thurs Tutorials, 4th Thurs Copying Prog.	
TRACE (Richmond Atari Club), Thompson Comm. Centre, Richmond, 272-5789 1st & 3rd Mon. 7:30- 9:30.	

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Vancouver Color Computer Club, 3rd Tuesday, Dis- covery Park, 3700 Gilmore Way, Burnaby, Con- tacts: Jordan Dobrikin 420-6081; Steven La Favor 467-0923.	
Vancouver Electronic Publ. Assoc., 5th floor, 518 Beatty St, Van. V6B 2L3. 682-VEPA. Monthly meetings at 6pm at BC Club, Enterprise Ctr., 2nd floor, 750 Pacific Blvd. April 2, May 7.	
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Vancouver Netware Users Group, Les Lebrant 275- 8684. Meets 1st Mon.	
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USER GROUPS

Amiga User Group (PaNorAmA), BCIT, Rm 129-1A General Meets 2nd Wed 7:30; Programmers 4th Wed 7:30 President: Bill Wagstaff Tel: 597-1746	
Apple II User Group BC Apple Society Burnaby Rugby Club, Kiyo Masuda 437-9935	
Apple III Monthly Kiyo Masuda 437-9935	
Apple BC Computer Society, Pat Daley: 275-4973.	
Astute—Atari ST. 1st Tues. of month 7:30 Hastings Comm. Centre. Dave 942-8301.	
Beaver Valley Commodore Club First Tues every month at Montrose School Library. Call John Vink 367-6426	
B.C. Regional Users Group. Society of Hewlett-Pack- ard Users. Call Terry 420-1277	
B.C. Unix Users Group meets 4 times a year. George Pajari 925-2555, 2545 Queens Ave, West Van V7V 2Y9. Dinner meeting, 736-8394.	
Chilliwack Commodore Computer Club (C.C.C.C.) - 976, Supporting Commodore Amiga, P.O. BOX 413, Sardis, B.C. V2R 1A7.	
Computer Aided Ministry Society of Canada (Christian Computer Users Group) meets at Pacific Acad- emy, 516 Brookmore, Coquitlam. (Just behind the McDonald's on North Road near the Loughheed Mall.) First Thursday Monthly at 7:30 pm.	
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LAPTOPS

Altima One Laptop



Product: The Altima One
Manufacturer: Altima Systems Inc.,
Concord, California. Distributed in Can-
ada by Westcoast Computers, 1915
Lonsdale Ave., North Vancouver (604)
986-7680.

System: Comes with 1 MB RAM, 40 MB
hard disk, 1.44 MB 3.5-inch floppy disk
drive, CGA liquid crystal display, one
parallel port, one serial port, DOS 4.01,
2400-bps modem.

Price: Suggested List \$4,650 Cdn.

by Kirtan Singh Khalsa

This 16 MHz, 286-model laptop comes
fully loaded with a 40 megabyte hard
drive, 1 megabyte of RAM (up to 5 MB on
motherboard) and a 2400 bps modem. It
offers EMS 4.0 support, and 0/1 wait-
state performance. At 15 pounds and 4 x
12 x 16 inches, there is no mistaking it for
a palmtop, but it is still very manageable
if you are moving your work to and from
the office.

Altima One doesn't currently come
with a battery pack. It is rare that one
cannot find a wall socket to plug into,
and by leaving out the battery, Altima has
given the Altima One a full-sized power
supply, which means no clunky power
adapter. A standard AC power cord is all
you need to get functional. There are
rumors of a battery-powered Altima One
"real soon now."

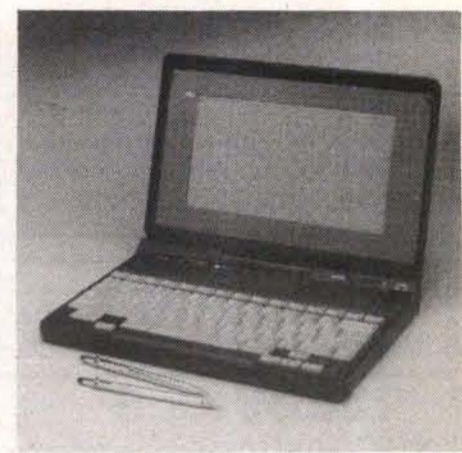
The screen, although only CGA level,
is very bright and readable in a variety of
lighting conditions. There is room to put
a half-size VGA card in the standard PC
8-bit slot.

The machine feels solidly built, and
well-designed. The full-sized keyboard is
detachable, and a Microsoft-compatible
two-button mouse is included as stan-
dard equipment. The mouse hides in a
little cubby hole off to the side of the
screen. The hard drive is shock-protected
and runs at 27 milliseconds.

Given the solid set of standard fea-
tures included, the price on this model is
probably the most interesting aspect. At
the suggested list of \$4,650 Cdn., it is
very competitive with similar models from
Zenith, Toshiba, NEC and Compaq.
Altima is a California start-up, with the
Altima One being their first product.
They have done a solid job on this new
unit, and if this is evidence of their capa-
bilities, future products should be inter-
esting.

LAPTOPS

NEC Ultralite Portable



Product: NEC Ultralite Portable
Manufacturer: NEC, 1255 Michael Dr.,
Wood Dale, Ill. 60191-1094 (NEC Can-
ada 416-858-3500)

Price: US \$2,499 to \$2,999

Rating: 3.25 on a scale of 1 to 4 (lowest
to highest)

by Grant Buckler

The NEC Ultralite is a sleek, light-
weight laptop computer with no disk
drives. Its principal weakness is its two-
hour battery life, a problem somewhat
alleviated by NEC's recent announce-
ment that replacement batteries will soon
be available.

NEC's Ultralite is a sports car of lap-
top computers. Small, sleek and black, it
goes nicely with an expensive suit and an
alligator-hide briefcase. But it's no econ-
omy model, and it's not as practical as it
might be.

The good news is that NEC has recog-
nized the Ultralite's two greatest short-
comings and tried to do something about
them. The improvements don't go as far
as they should, but they're at least a sign
that NEC has listened to user feedback.
If the company continues to do so, the
Ultralite could become a very nice ma-
chine.

The two key problems are price and
battery life. The Ultralite was originally
too expensive at about US\$3,500 with
one megabyte of battery-backed RAM
storage and nearly US\$4,000 with two.
That is just too much money for a laptop
with no disk drives, no matter how classy
it looks. So, late in October, NEC re-
duced the price to US\$2,499 for the one-
megabyte model, US\$2,999 for the two-
megabyte. That's more like it, though
still fairly steep for a machine without
disk drives.

The second problem is battery life. In
normal use, the Ultralite lasts about two
hours—without using the internal mo-
dem. If you really need a laptop, you
need it more than two hours a day. And
recharging the machine takes several
hours. Further, the Ultralite has no disk
drives and uses battery-powered RAM to
store data. Leave the computer un-
plugged for a long period, and you'll
lose your data too.

Because of experiences with early port-
able computers, the first question most
people ask about any portable is how
good the screen is. The Ultralite stands
up well here: the backlit LCD screen is
very readable from quite a range of
angles. You can tilt the screen however

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you like, and both brightness and contrast are easily adjusted.

If only the keyboard were as readable as the screen, though. Perhaps in the interest of style, the keys are lettered in white on a grey background. This is hard to read in any but the best light.

Still, the Ultralite is comfortable to type on, even though the keys travel very little when pressed.

Though the Ultralite has no internal disk drive, an external one is available. That allows easy data transfer between the Ultralite and a desktop computer. Or, if you prefer, you can use the serial cable and LapLink software provided

with the machine.

For software, the Ultralite has a slot that accepts a read-only memory (ROM) card. Several commercial software packages, including WordPerfect, XyWrite, Lotus 1-2-3 and Agenda, are available on these cards.

Rating

PERFORMANCE: 3. The Ultralite uses a NEC V30 processor—an 80286 work-alike—running at 9.83 megahertz. Don't expect the speed of a 386. But it's quite respectable, even without considering the size of the machine.

USEFULNESS: 2.5. The battery life

remains a major drawback. Software might be a problem if the popular packages now available on ROM cards don't happen to be the ones you want to use.

MANUALS: 3. There are three slim books: a Quick Start Guide, a Portable Guide and a Comprehensive User Manual. If you're an experienced computer user, the Quick Start Guide will tell you all you need to know to use the Ultralite. Much of the Comprehensive User Manual is devoted to MS-DOS Manager, a DOS shell provided with the computer, and to the Lap-Link software. The manuals are generally well written.

AVAILABILITY: 4. Widely available.

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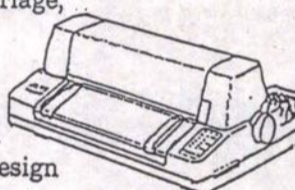
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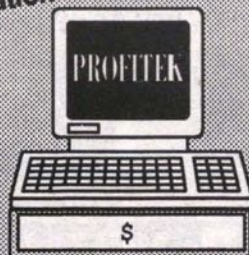
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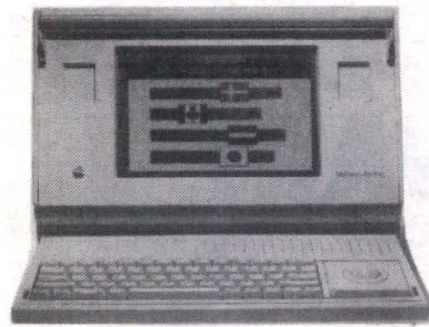
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LAPTOPS

Macintosh Portable Computer



Product: Macintosh Portable computer
Manufacturer: Apple Computer, 20525 Mariani Avenue, Cupertino, CA. 95014, 408-996-1010

Price: US \$5,799 for base model with 1 megabyte of RAM and one SuperDrive; an internal 40 megabyte hard drive costs another US \$1,199

Rating: 3.25 on a scale of 1 (lowest) to 4 (highest)

by Wendy Woods

I liked it. Sure it has its drawbacks, you've heard about them already and you'll read about them here. But nobody who previewed it put their finger on what I considered the most difficult hurdle in using this new machine. That was the jeers and taunts of the owners of featherweight MS-DOS laptops. They'd hoot and holler about my being forced to lug around this bulky unit, "Stuck on a Macintosh, eh? That's what you get!" they would laugh. Certainly made you feel like crawling under the nearest rock. There they were, striding away with laptops the size and weight of file folders under their arms.

Comdex may have been unfriendly to the Portable but it was the place where it was put to the test. Apple's newest machine was the workhorse for our daily filing of Comdex stories to Genie, CompuServe, Newsnet, and America Online—64 in all, consuming the talents of seven Newsbytes reporters. All these stories were uploaded to Genie, downloaded to my Portable in the Comdex press room, edited, and reuploaded to Genie and other networks.

The machine performed as advertised—a smaller, more portable Macintosh with a long battery life. The fact that it fit into a case the size of an overnight bag allowed it to fit neatly into the luggage compartments, but did not invite a ride on my knees. It was way too heavy for this.

Installed inside was a beta version of Megahertz Corporation's Easy-Talk Modem, the only one shipping at this time. This Hayes-compatible 2400 baud internal modem, which I installed in a snap inside the Portable, worked flawlessly, and is the only alternative to Apple's own modem for the Portable.

I also have high praise for the battery. The Portable rode with me on the train to and from the event. The 10-hour train ride to Las Vegas proved the lead-acid battery's long life. We kept it on most of the time, doing work on the table top of the dining car. It held up all the way, and when we arrived the battery wasn't even halfway drained.

The drawbacks of the machine were clearly, number one, its weight—20 pounds or so.

Now let's talk about the next hurdle—the screen. While the response time is clearly faster than your average liquid crystal display and nicely accommodates the quickest movements of the mouse, this active matrix LCD is just darn hard to see. Each evening, after having sat at this machine for over three hours filing

correspondents' reports, I was seeing double, the result of peering at the dark screen which poorly reflected light and exhibits double images when viewed from an angle.

Let's talk about that mouse substitute. The trackball idea is great. Lots of people like trackballs. But they do take some getting used to.

The only other problem was the frequent "kick in" of the power supply which serves the hard disk. As the machine is a masterpiece of power conservation, it powers up each time information must be retrieved from the 40 megabyte hard disk. This causes a delay of up to 10 seconds between entry of a command, and execution of it by the machine. In the interim the screen freezes up and one must wait ... wait ... wait. After a while this became rather annoying.

Okay, this appears to be a pan of the machine. Were it any other manufacturer's computer, it would be. But there is something to be said about Apple users which is untrue of virtually any other computer company's users. We are a patient lot. We can wait until the next improvement comes along, in the meantime savoring the idea of taking our Macintosh out in the field in a neat little case, using it on the road despite the drawbacks.

Would I buy it, though? No. It's still too expensive and too clumsy for me. But I can see it coming in handy for those corporate execs or researchers who must have a portable Macintosh. For them, price is no obstacle.

My local dealer says he's receiving supply of Macintosh Portables now, slowly, and that each one arriving is presold. I'll be interested to see how he's doing in about six months.

Rating

PERFORMANCE/PRICE: 2. This 68000-based unit is slow, has too little memory to use the addictive Multifinder (one megabyte). The screen, while state-of-the-art with a quick response time, is difficult to read. The big plus is the long battery life—6 to 12 hours.

USEFULNESS: 4.0. Let's face it, most of us Macintosh users could use one.

MANUAL: 4.0. Documentation comes in the form of various well-written user manuals, including a smaller abbreviated manual to take along on the road. I always found the answers to all my questions when reading them. As with all Macintosh products, however, the best part about the manuals is that you seldom need to use them.

AVAILABILITY: 3.0. Ample supply is expected by the spring.

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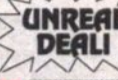
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