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ONTARIO EDITION    MAY 1993    VOLUME 6    NO. 5

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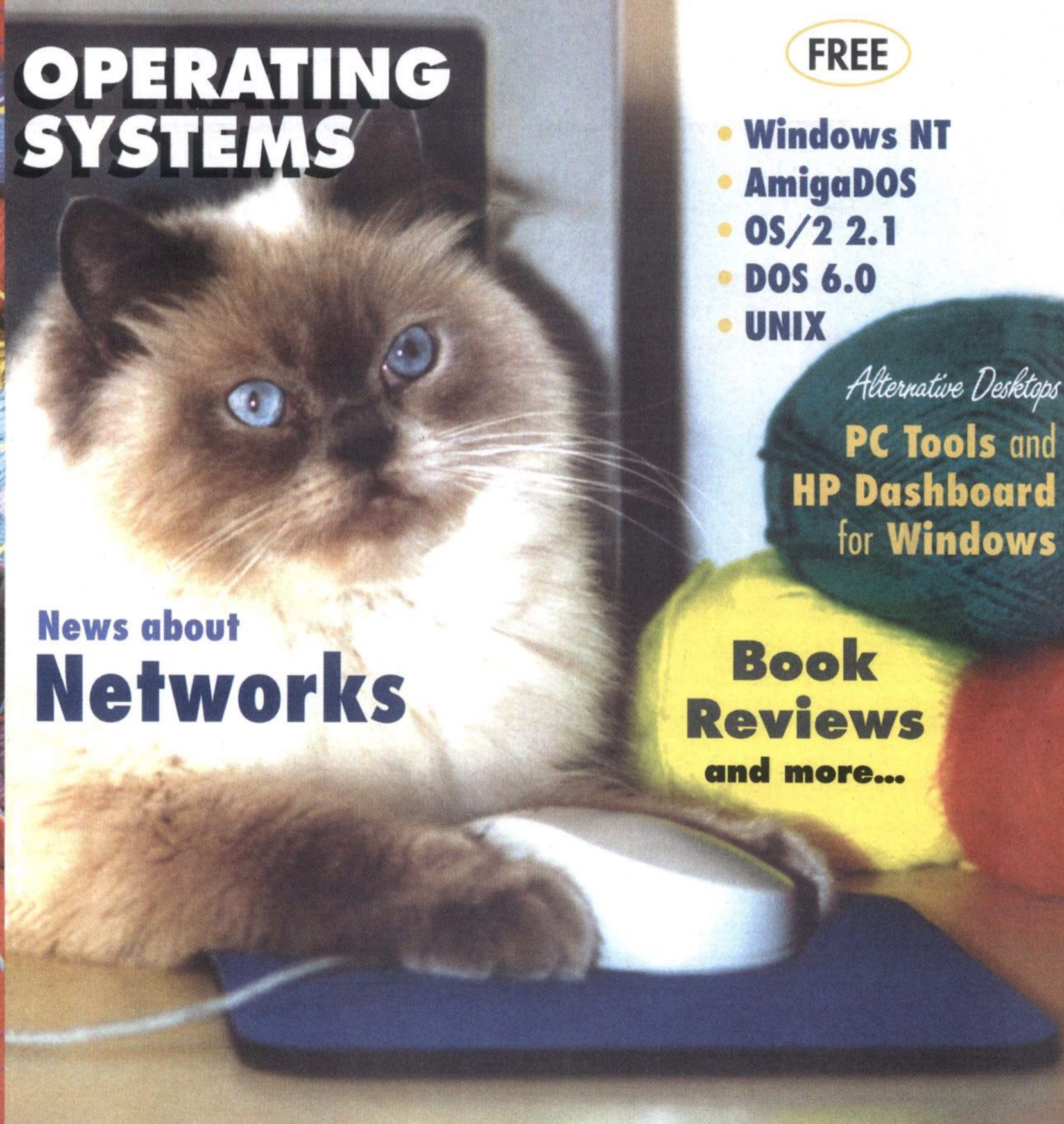
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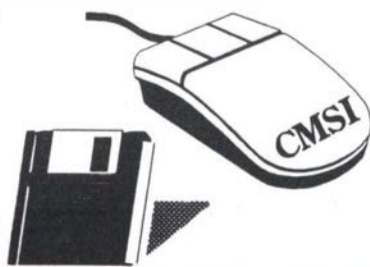


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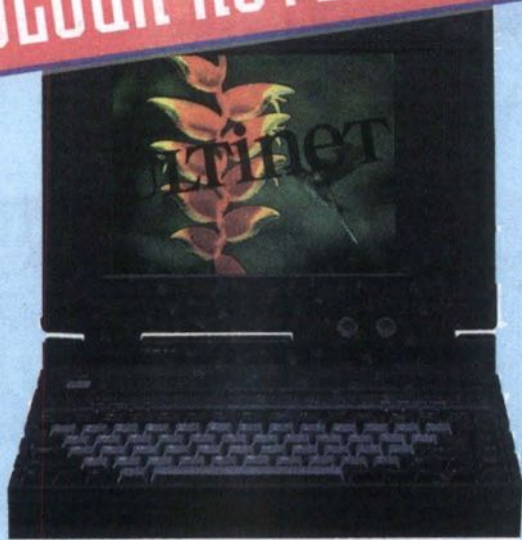
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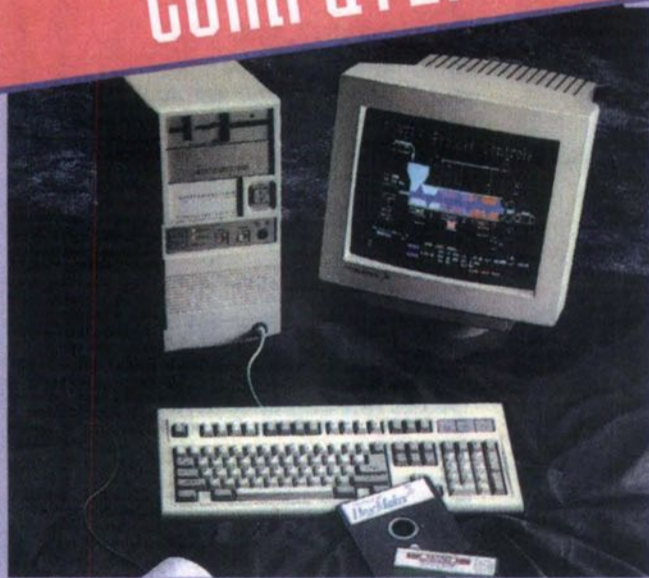
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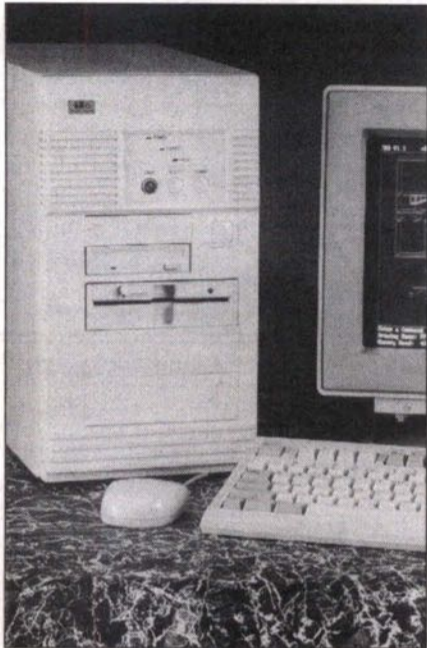
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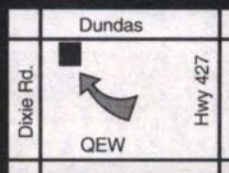
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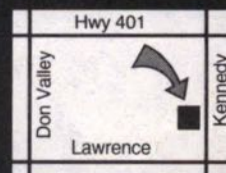
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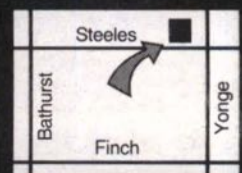
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## From the Editor



### Why everyone should become "computer literate"

The other day I was on a radio show. The host introduced me to his audience as an expert on computers and in the same breath, he admitted that he knew very little about computers. It occurs to me that the days of people admitting this kind of thing are numbered. When cars first came on the scene, people no doubt admitted readily that they knew nothing about driving these new-fangled beasts. As time passed and cars became more common, it became much more the norm to be a driver than to admit ignorance. When was the last time someone boastfully admitted to you "I don't know how to drive"? I believe that the time will soon be upon us when everyone, no matter what their profession, occupation or status in life will become computer literate.

### What do you mean by computer literate?

This is an important point, because as someone was quick to point out, most deep technical information about computers quickly goes out of date as programs and hardware change. Becoming too deeply ensconced in a particular realm destined your knowledge for the dustbin five years down the road. Talk to people who know how to program Apple IIs or VIC 20s for proof of this point. You don't want to dive too deeply into the depths of information, but you need to understand the trends and principles involved. Then pick the areas that are mission critical for your business or career and become an expert in these. Some of your information will no doubt become useless, but if you keep your eye on the ball and where the trends are going, you can keep updating your information. The principles in many cases will still apply.

### In business

The work environment is one of the most important fields in which to be computer literate. Everywhere you look jobs are being slashed. Many tasks are becoming obsolete because of computers. Automated Teller Machines have already reduced the need for a whole job category—bank tellers. The next phase of this kind of replacement is well under way. We carried reports recently in The Computer Paper about interactive video kiosks in Ontario that will dispense licenses for cars and people. Demand for secretaries is being reduced by managers learning to type and do their own typing at their own computer. The improvement in Optical Character Recognition (OCR)—software that allows computers to "read" and input vast quantities of text—means more typing jobs disappear. Receptionists get axed because the company buys a voice mail system. Think about your job. Can you be replaced by a computer?

And yet it is not all doom and gloom. At the same time that there are job cuts, opportunities are opening up for people who understand these new technologies and can make them work.

### In management

So much for jobs, what about the bosses? Same deal here. Thousands of middle-level management jobs are being restructured, "downsized" and "right-sized." Future-ready companies are restructuring themselves with very little management in the middle. Expertise is being contracted for on a "need-to-have" basis.

And bosses themselves have to get smart. I went to a meeting recently of newspaper and magazine publishers. Most forward thinking publishers at this group are preparing their companies for a transition to electronic media. It is not enough to delegate the task to some "techno-weenie". The understanding of this move has to be at the most basic level. God is in the details. That is the difference between a good choice and a bad choice of technology.

E-mail, interactive multi-media, business simulations, expert systems, object oriented programming, how do they affect your business? You need to know.

### In education

Regular readers of my columns will recognize this area as a recurring theme of mine. Information that used to be cloistered in the school system is now readily available outside of those hallowed halls. Computers, bulletin boards, CD-ROMs and desktop publishing (which has swollen the shelves of bookstores with interesting and innovative books for kids and adults alike) are providing the kind of interactive, learn-it-when-you-need-to-know-not-when-some-teacher-gets-around-to-teaching-it learning. A recent article in Wired magazine (415-904-0664) entitled "School's Out" asks the question: "Would you send your kid to a Soviet collective?" I reiterate the question: Are schools the best way to learn for your children? At the very least, I believe they need to be supplemented by a computer, a CD-ROM player and a modem at home.

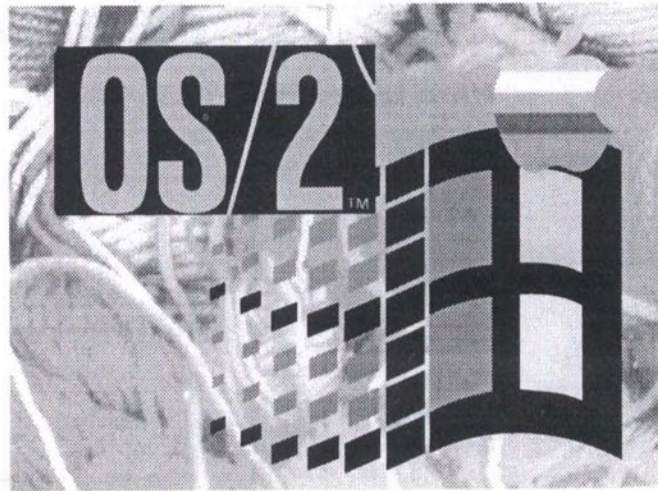
### Changes

My feeling is that the old expectation that the really important stuff that you need to know will be taught in a high school or university course is outmoded. By the time someone conceives of the area, designs a curriculum and starts teaching, it is possible to have passed by the relevance of the skill. Much of what was to be taught is readily available in magazines, vendor supplied courses (check out the offerings at Microsoft U.) online or on interactive CD-ROMs. According to the "School's Out" article, 99 per cent of all learning now takes place outside the school system. Where they came up with that figure, who knows, but look around you and judge for yourself. Where do you learn? How do you learn best? And ultimately, who is responsible for what you learn? Examine your life. Are there areas in which computers could help you do what you do? Why aren't you computer literate?

Kirtan Singh Khalsa  
Publisher/Editor

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## Features

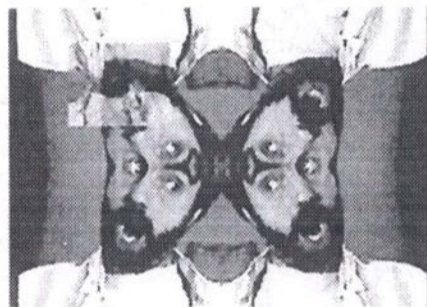


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## Editorial Schedule ONTARIO EDITION

### June '93

TOPICS • Multimedia  
• CD-ROM Roundup  
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COPY & CLASSIFIEDS Wed., Apr. 28  
CAMERA READY ADS Thurs., Apr. 29  
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### July '93

TOPICS • Mass Storage Options  
• Hard Drives & Optical Drives  
• Databases  
COPY & CLASSIFIEDS Wed., June 2  
CAMERA READY ADS Thurs., June 3  
DISTRIBUTION Fri., June 18

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TOPICS • Networking & LANS  
• The Home Office  
COPY & CLASSIFIEDS Tue., June 29  
CAMERA READY ADS Wed., June 30  
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## Mailbox

### LANtastic vs. NetWare Lite

I read your paper each month and enjoy it very much. One area I would like to ask you for an opinion and/or review materials on: LANtastic vs. NetWare Lite. Our company currently uses 10 individual PCs (DOS-based) and 1 Xenix-based PC. There are two PCs that can access the Xenix PC. We are looking at either LANtastic or NetWare Lite to join all of the PCs. Do you know of any in-depth comparisons? I don't recall seeing any in *The Computer Paper* recently.

J. Dopson  
Vancouver, B.C.

**Graeme Bennett replies:** I think most network experts would agree that while Novell Inc. is a leader in large-scale local-area networks, it lags behind Artisoft Inc. in peer-to-peer (serverless) networks, such as those provided by LANtastic. One disadvantage to NetWare Lite is that it is only available for DOS and Windows, while LANtastic is available for DOS, Windows, TCP/IP, and Macintosh.

However, Novell continues to update and add features to its NetWare Lite product. The latest version (1.1) includes a set of point-and-click utilities for setting up user accounts, shared drives and access permissions. Novell is also expected to release a product this summer called Personal NetWare that will include so-called universal client capabilities — the ability to attach to a NetWare Lite, 2.x, 3.x, or 4.x server with a single client requester.

Meanwhile, Artisoft has announced a new version (5.0) of its LANtastic peer-to-peer network operating system. The most notable enhancement is its ability to provide shared access to NetWare servers without requiring a separate network adaptor and NetBIOS software, as previous versions did.

Other new LANtastic 5.0 features allow users to access Unix NFS (network file system) resources, OS/2 disk drives and WORM (write-once/read-many) drives. The NFS and TCP/IP connectivity factors are probably enough to warrant a closer look at LANtastic. Windows-DOS Starter Kits are available for \$759, contact Artisoft, Inc. at (416) 828-2052.

We'll have more information on networking in the August issue of *The Computer Paper*.

As readers who have read this far can tell, the area of networking can be hideously complex at times. Users should seriously consider letting a network expert handle the job of putting all the pieces in place.

### Postal Code Software

I would like to find out if there is any postal code software out there that has a reverse search, i.e., enter the postal code and find out what addresses it belongs to. If anyone has some information, I would appreciate it.

G. Bates  
Vancouver, BC

**Graeme Bennett replies:** Toronto-based Sector Publications has a program called PoCo. It is a lookup program for the PC that promises to replace the paper version of the Canada Postal Code Directory. The package comes on

More Letters on page 8



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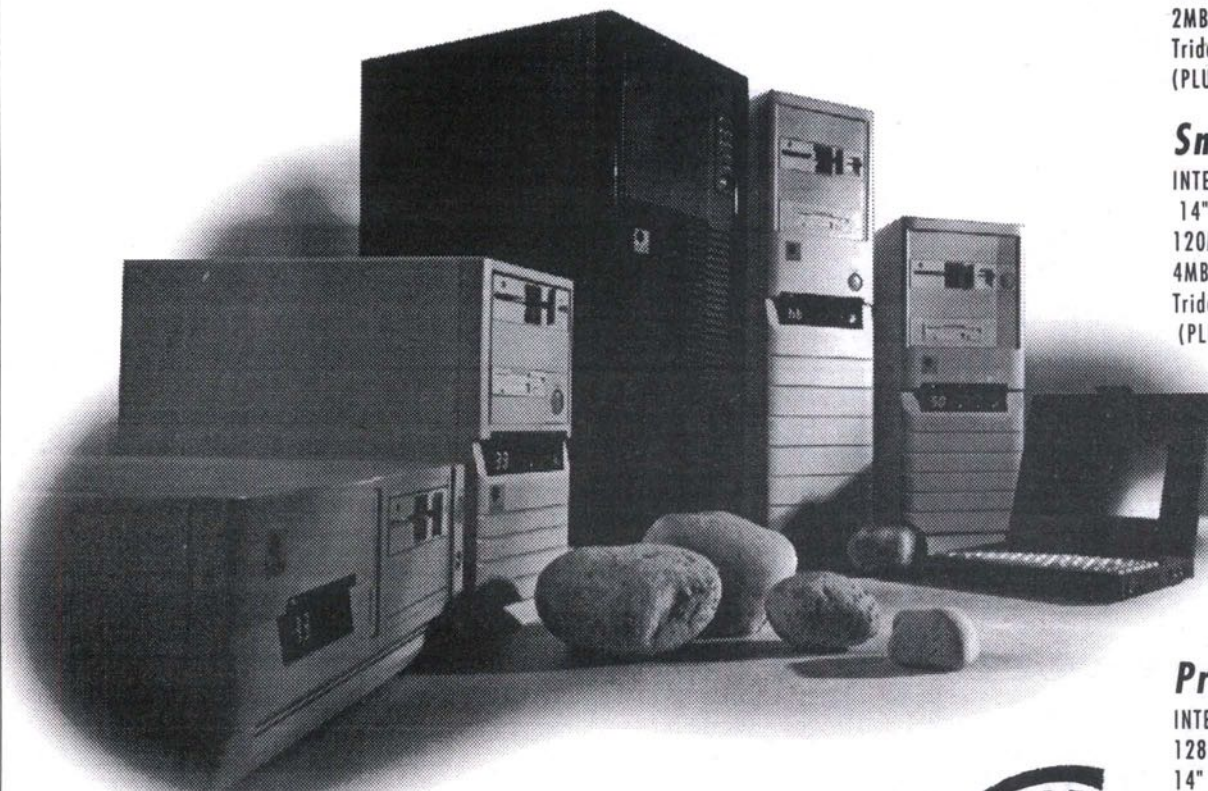
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## what's new

### Dell doubles revenues

TORONTO — While facing increasingly stiff competition in the personal computer market, Dell Computer Corporation reported over \$2 billion in sales in the past year, twice that of the previous year. According to Chief Executive Officer Michael Dell, his firm has more than doubled its market-share in the industry and is currently the third-largest PC manufacturer in the world.

Dell Computer Canada made a significant contribution to these figures. It surpasses the growth rate of the firm's average international sales, and in the past year it has doubled its total Canadian work force in order to keep pace with the demand for its products.

Contact: Dell Canada 1-800-387-5782.

### Bill Gates launches MS-DOS 6.0 via satellite

TORONTO — Bill Gates, chairman of Microsoft Corporation, officially launched MS-DOS 6.0 Upgrade at what was called "the world's largest PC user group meeting." Speaking from San Francisco, Mr. Gates addressed user groups simultaneously in over 20 cities in North America live via satellite. Total attendance was estimated to be more than 10,000 people.

Despite occasional problems with the satellite transmission, viewers watched as Bill Gates and Brad Chase — the International Manager for MS-DOS — put the new operating system through its paces. They demonstrated many of the features of

the new system, including its hard-drive doubler program, and fielded questions from the satellite "audience." In Toronto the event was hosted by the Personal Computer Club of Toronto, which asked people attending the event to make donations to a literacy charity. Donations were matched by an equal amount from Microsoft.

In Canada the package will be introduced at a list price of C\$59.99 until May 31, after which the package will list for \$155.95.

Contact: Microsoft Canada 1-800-563-9048.

### Macworld Report

### Apple WorkGroup Server announcement

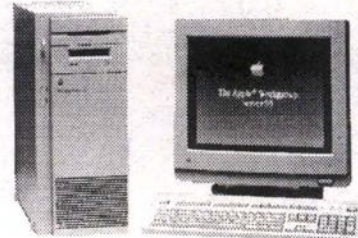
TORONTO — Apple Computers has announced its network computer strategy, and will soon to be releasing three new network servers aimed at the corporate market. Apple officials expect these machines to play a significant role in the future of Apple, and signals its intent to play a major role in the server market.

lion Macintosh users worldwide.

The new systems take into account the mobile user within the client-server system. This plan includes the Newton, Apple's much-publicized personal digital assistant.

The systems range from the low-end AWS60 (\$6,700), which can handle 20 active users, to the high-end AWS95 (\$18,000) which can handle up to 50 active users.

Contact: Apple Canada Inc. (416) 477-5800.



Targeted at current Macintosh workplaces using third-party servers, the new Apple servers offer a simple "plug-in-and-play" alternative for the base of the 10-mil-

### Letters

Continued from page 6

three diskettes and runs as a memory-resident application that takes up only 7K of conventional memory. It will also run as a DOS application under Windows or OS/2.

Searching and verification occur while you're entering the address, and alternatives are offered along the way. Once you've located the postal code you can copy it back to the application (a word processor or database, for example) that you were in before the search was initiated.

PoCo lists for \$59. (The company is offering PoCo for \$39 for a limited time as an introductory special.) A network version for up to twenty users is \$159. Contact Sector Publications at P.O. Box 738, Station C, Toronto ON M6J 3S1.

Another utility for searching postal codes is called ZipCode. This \$99.95 program (or \$49.95 with a Microsoft Word upgrade proof-of-purchase) promises to search 11.5 million addresses/900,000 postal codes in less than a second. Contact Zipcode at 1-800-461-1590. ■

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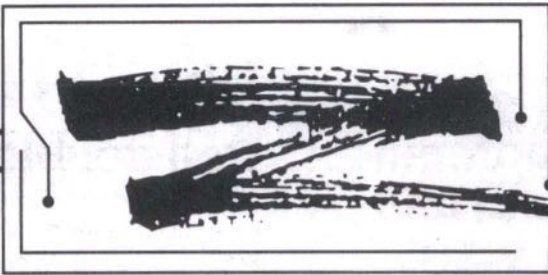
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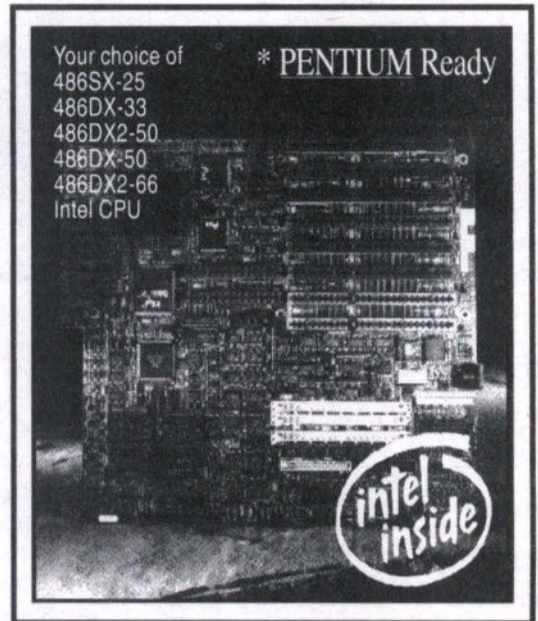
These advanced system boards are available today, from Zegna Electronic Inc.

In PC WORLD March 1993, in their "Fastest PC's In The Universe" article MICRONICS system

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PC Labs, October 27, 1992



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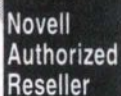
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# what's new

## Apple Canada reduces prices on selected Mac Products

MARKHAM, ON — Apple Canada Inc. has announced price reductions of up to 25 percent on selected models of Apple Macintosh products. Effective immediately, suggested retail prices will be decreased on all models of the Macintosh Classic II, Color Classic, Macintosh LC II, IIx, IIvx, PowerBook 145, PowerBook 160, Duo 210 and Duo 230, Apple Color Printer and Personal LaserWriter NTR.

Apple hopes lowering its suggested retail prices (SRPs) will enhance the company's competitive market position.

Here are some of the new prices:

	Old SRP	New SRP
Mac Classic II 4/80	\$1,439	\$1,269
Mac LC II 4/80	1,369	1,239
Mac IIvi 5/80CD	2,640	2,120
Mac IIvx 4/80	2,630	2,120
Powerbook 145 4.80	2,739	2,349
PowerBook Duo 210 4/80	3,140	2,340
Personal LaserWriter NTR	2,250	1,690
Apple Color Printer	3,440	2,820

## Video-conferencing system allows users to VISIT

The Gulf War did much to expand public awareness of video conferencing. Full-scale systems still sell in the \$50,000-\$100,000 range and take 3-5 telephone lines to move full-motion video from one end of the country to the other. They also feature zooming and panning controls at the users end, so that users can zoom in on a document, or pan back and forth between conference participants.



These systems are still out of the reach of many businesses, but video conferencing is becoming more affordable. Smaller units — without all the bells and whistles — that use only one line, send a picture every few seconds and cost under \$10,000 are becoming available. VISIT Video is a new video-conferencing system that uses a PC or Mac II as a host for a graphics card. A small black and white camera is mounted over each PC's monitor. The system requires an ISDN (about double the price of a regular business line, and not available in all locations) or 56 Kbps line.

Contact: Northern Telecom 1-800-NORTHERN.

## Multimedia without the CD-ROM?



For those of us not ready to buy a CD-ROM player for home, there is an option available to load multimedia titles from floppy disks. CD Source, in Scarborough, is distributing software from Knowledge Adventure. The company's Interactive Books titles include Isaac Asimov's *Chronology of Science and Discovery*, *Space Adventure* and *A Dinosaur Adventure*. Their newest title is a two-disk *The Tale of Peter Rabbit*. Minimum requirements are a 386 with 640K, VGA screen, DOS 3.1 or higher and a sound card.

Contact: CD Source, (416) 609-3155.

## Multimedia games bundles available from Advanced Gravis

Advanced Gravis, of Burnaby, B.C., is offering three new bundles for computer users wanting to get started in multimedia gaming. The company's UltraPaks feature the combination of the popular UltraSound 32-voice, 16-bit Sound Blaster-compatible audio card with a joystick and a choice of games that take advantage of the sound card's capabilities. Sample combination: Ultra Action Pak, Sound card, GamePad (a combination joystick and handheld controller) and two games — Test Drive (a driving simulation) and The Games: Winter Challenge. Regular price: \$345, bundle price: \$229.

## NEW PRODUCTS

## Jumbo briefcase solves carrying problems for laptop computers



Tired of trying to squish your laptop, printer, cables and manuals into your briefcase along with all the other things you used to store in there? The folks at ELMAR Development in Elliot Lake, ON, may have a solution for you — they call it the Eldura briefcase. It is made out of Du Pont Cordura, a tough soft-sided fabric.

Users claim they can fit both a laptop and a printer in the bag and if you don't load it too full, it will still fit under the seat on your flight.

Contact: ELMAR Company, 1 (705) 848-0094.

More What's New on page 32.

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386DX/40 ..... \$195	Maxtor 127MB IDE ..... \$270	Darius SVGA ..... \$360	Windows 3.1 ..... \$59	4 MB SIMMs ..... \$190
486DLC/33 ..... \$270	Connor 170MB IDE ..... \$300	Darius Multi-Sync .. \$429	Mouse ..... \$17	
486DX/33 ..... \$495	Maxtor 213MB IDE ..... \$365	Darius 17" ..... \$999	Local Bus VGA ..... \$170	<b>Modems</b>
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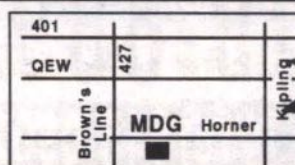
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# Comparing Operating Systems

BY GRAEME BENNETT

*First things first: People buy computers to run applications, not operating systems. As an industry was once put it, a computer's operating system is a lot like someone else's underwear. You can work with a person all day long; it doesn't matter much what kind of underwear they've got on — it might affect their comfort, or the way they run; we really don't notice it. But you might be surprised how many people have fetishes about it. You know how some folks have to have the fanciest, sexiest underwear? Same with operating systems.*

The operating system is the very personality of a computer. Mostly trustworthy, occasionally mysterious or downright ornery — it's no wonder some folks get so attached to computers. (To these people, I recommend a dog instead — it's a lot cheaper in the long run.)

Computers are easy to anthropomorphize. We grow accustomed to the way our computers behave.

It's the operating system that will have you evangelizing the gospel of computers to your friends — and an hour later, cursing at your machine.

The major 32-bit operating systems include: Windows NT, OS/2 2.x, SCO Open Desktop, Solaris, NeXTstep for Intel Processors, UnixWare and Interactive Unix. There are a handful of other Unix variants, including several low-cost products. All of these products run on IBM-compatible PCs.

For better or worse, I have lumped all of the Unix variants under a single heading in the chart. This is not to imply that they all share the same features. Rather, it is because virtually everybody who uses Unix does so because they need to, for one reason or another. As Ken Clark of Compusaurus says, "Unix is very vertical. It's the environment for developers."



Clark maintains that Unix is highly appropriate for distributed databases and other networked applications. "Anywhere you've got a room of ten dumb terminals..." he says, "...there's a Unix box behind them running the show."

You might say that DOS and Windows are only in this list so that the other 32-bit operating systems will have something to kick sand in the face of. They are here primarily because so many people think they are the "only" choice in PC operating systems.

Also listed in the chart are System 7.x, AmigaDOS and Atari MultiTOS operating systems, running on Apple, Commodore and Atari hardware, respectively. Apple and Commodore also offer proprietary Unix environments for their platforms, but as far as I can tell, almost nobody uses them.

The Amiga 1000 was the first computer to bring the power of a true multitasking operating system into the hands of "mere mortals" by providing a graphical user interface. The fact that it could run on a 256K machine with no hard disk was nothing short of amazing.

Here are the issues we deemed most important:

## Memory Management

One important consideration in any operating system is how it manages memory. DOS is the big loser here, hobbled with an archaic segmented memory design that forces software design limitations in everything from network drivers to games. To get around these limitations, DOS users resort to memory management utilities from Microsoft or several third parties.

The most intelligent design I've seen for a DOS memory manager is the one in Memory Commander. It differs from its competitors (notably, QEMM, 386MAX and the MemMaker command in MS-DOS 6.0) in that it "remembers" the optimal configuration for each application and adjusts itself automatically without rebooting. Amazingly, it provides up to 952K of contiguous memory for use by DOS applications. It is also compatible with Windows. It is available from Ultimate Fax Systems 604-642-7489.

No matter which memory manager you end up with, you may be baffled when programs ask you whether you want to configure RAM as Expanded or Extended memory. Do you need EMM386? Is DOS=HIGH? Are your UMBs properly configured? Augggh!

Windows 3.1 implements a shared memory design, in which all Windows processes reside in one global memory heap. Windows NT, OS/2, NeXTstep and all Unix systems, however, isolate processes into their own private virtual address space.

The memory management abilities of Macintosh, Amiga and Atari computers vary depending on their CPU, but even the low-end models powered by the Motorola 68000 chip can address several megabytes in one contiguous block. Computers equipped with a 68030 processor (or a 68020 with an optional paged memory management unit) can create "virtual address space" that, among other things, allows the use of virtual memory.

## OS services

### Virtual memory

Virtual memory (VM) is provided by all of

the operating systems listed in the accompanying chart below except DOS, AmigaDOS and MultiTOS. VM can allow you to run programs that require more RAM than you have physically installed, by using hard disk space as if it were memory. The trouble is, accessing "memory" from a hard disk is about a thousand times slower than from real RAM. As such, VM makes a pretty poor substitute for the real thing.

### E-mail

Disk formats are worth considering in two main areas: file-transfer and filename limitations. Earlier operating systems (such as the first few versions of MS-DOS and Atari TOS) had crippling limits on the maximum size of a disk partition (32MB probably seemed like a lot in those days) but today, all operating systems mentioned here support partitions of virtually unlimited sizes.

Because many people need to exchange data with DOS machines, every major computer platform now supports direct compatibility with DOS format disks. This format is sometimes called FAT for its File Allocation Table directory design. The main problem with DOS' FAT disk structure is that filenames are limited to eleven characters — typically an eight-character name and a three-character extension (e.g., FILE-NAM2.SML). Atari's operating system creates DOS-format disks and, as such, shares this FAT design limitation.

Being a DOS-based environment, Windows 3.1 also suffers from these limitations, although you can assign long names to Windows Program Manager icons, which partially alleviates the problem.

Windows NT and OS/2 can use FAT-format disks, with the same limitations, or optionally use their own proprietary hard-disk formats (NTFS and HPFS, respectively), which provide long file names and better performance on large volumes. Both systems use FAT exclusively for formatting floppy disks. This facilitates file transfers with other computers.

### Network services

Both Windows NT and Windows for Workgroups add file- and printer-sharing, E-mail, scheduling and other network services to the familiar Windows environment. NT additionally provides fairly extensive security measures to prevent the use of network facilities by unauthorized personnel.

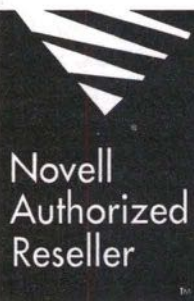
These network security measures are also available under IBM's OS/2 2.0, but they are packaged separately as LAN Server for OS/2.

Every Mac comes standard with all the hardware and software necessary to share files and printers in a peer-to-peer (serverless) network. Although security provisions

Continued on page 14

	MS-DOS 6.0	WINDOWS 3.1	WINDOWS NT	OS/2 2.1	NEXTSTEP	UNIX	MACINTOSH SYSTEM 7.1	AMIGADOS 3.0X	ATARI MULTITOS 4.0
<b>HARDWARE</b>									
SUPPORTED PLATFORM(S)	Intel <sup>1</sup>	Intel <sup>1</sup>	Intel <sup>1</sup> , MIPS R4000, Alpha	Intel <sup>1</sup> , future versions will support PowerPC	Intel <sup>1</sup> , NeXT	Intel <sup>1</sup> , Motorola, MIPS,	Macintosh	Amiga	Atari ST/TT, Falcon
MULTIPROCESSOR-CAPABLE RUNS PROGRAMS FOR...	No DOS	No DOS, Windows	Yes NT, DOS 5, Windows, POSIX.1	Requires add-on OS/2, DOS, Windows	Potentially NeXT, PC <sup>9</sup>	Yes Unix	No <sup>4</sup> Mac <sup>7</sup>	Potentially Amiga <sup>7</sup>	No Atari ST/TT <sup>7</sup>
THIRD-PARTY COMPATIBILITY OPTIONS	Windows, GeoWorks, GEM, Mac, Atari ST				PC, Mac	DOS	PC, Apple II	PC, Mac, C64, Atari ST, CP/M	PC, Mac, CP/M, 8-bit Atari
<b>MULTITASKING</b>									
TYPE OF MULTITASKING	task-swap	message-driven	preemptive	preemptive, multithreaded	preemptive, multithreaded	preemptive, multithreaded	time-slice	preemptive	preemptive <sup>2</sup>
KILL ERRANT TASKS	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
FREEZE REQUIRES REBOOT	Yes	No	No	Yes	No	No	Yes	Yes	No (OS/2 only), 68000 requires reboot
SET TASK PRIORITY	No	Yes	Yes	Yes	Unix only	Yes	No	Yes	No <sup>4</sup>
PRINT SPOOLING	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No <sup>4</sup>
COPY IN BACKGROUND	No	No	Yes	Yes	Yes	Yes	One only	Yes	Yes
FORMAT IN BACKGROUND	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
FIND FILES IN BACKGROUND	No	No	Yes	Yes	Yes	Yes	No <sup>4</sup>	Yes	Yes
MULTIPLE DEVICE REQUESTS	No	Fails, may hang task or machine	Subsequent requests fail	DOS sessions report device busy; OS/2 provides queuing	Yes <sup>4</sup>	Yes <sup>4</sup>	Subsequent requests fail	Yes <sup>4</sup>	Not tested
<b>USER INTERFACE</b>									
NAME OF GUI	CUI	Windows	Windows	Workplace Shell	NeXTstep	X Windows (Motif, Open Look, etc.)	Finder	Intuition	NewDesk (GEM)
MAX. # OF WINDOWS	n/a	Limited to memory	unlimited	Limited by memory, 16 full-screen sessions, 240 DOS sessions	unlimited	unlimited	unlimited	as chip RAM allows	4 or 7 (standard GEM), Unlimited (MULTITOS)
MAX. # OF FONTS		unlimited	unlimited	unlimited	unlimited	unlimited	128 suitcases <sup>4</sup>	unlimited	unlimited
MULTIPLE DISPLAYS	no	no <sup>4</sup>	no <sup>4</sup>	Yes (2), only one graphics display	Yes, on Cube (3)	Yes (unlimited)	Yes (6)	no	no <sup>4</sup>
MULTIPLE RESOLUTIONS	Graphics modes only	Yes	Yes	Yes	PC only	Yes	Depends on cable	Yes	Depends on system
MENU STYLE	Drop-down (Shell, QBasic, Editor only)	Drop-down	Drop-down	Pop-up (Workplace Shell)	Drop-down	Drop-down, Pop-up, etc.	Drag-down	Drop-down	Fail-down <sup>4</sup>
OTHER MENUS		Keyboard shortcuts		Context-sensitive, Drop-down	Tear-off, Pop-up	Configurable options	4	No <sup>4</sup>	Keyboard Commands
KEYBOARD SHORTCUTS		All	All	All	Customizable	Some	Some <sup>4</sup>	Most	All
ALTERNATE KEYMAPS		Yes	Yes	Yes	Yes, included	Yes	Yes, optional	Yes	No <sup>4</sup>
CHANGE SYSTEM FONT	Shell only	Yes	Yes	Yes	All	Yes	Yes, except menus	Yes	No <sup>4</sup>
SUPPORTED INPUT DEVICES	Keyboard	keyboard, pointing devices Pen and sound extensions optional	keyboard, pointing devices, pen	keyboard, mouse, voice, touch-screen, Pen extensions in, development	DISP, keyboard, ADB on new NeXTstations	keyboard, pointing devices, etc.	ADB, pointing devices, sound	keyboard, pointing devices, joystick	Keyboard, pointing devices, MIDI
SUPPORTED OUTPUT DEVICES	provided by applications	A variety of printers, serial, storage & display devices <sup>4</sup>	A variety of printers, serial, storage & display devices <sup>4</sup>	a variety of printers, serial, storage & display devices <sup>4</sup>	Fax, serial, several VGA & SVGA adapters PostScript printers	PostScript, other printers, storage & serial, multiport i/o boards	PostScript, Apple printers, SCSI, Apple & VGA displays.	a variety of printers, serial & display devices	Epson, IBM printers, Atari & VGA displays.
DELETING ICON REMOVES DOCUMENT, APPLICATION OR DIRECTORY	n/a	No. <sup>3</sup> Icons can easily be restored.	No. <sup>3</sup> Icons can easily be restored.	No. <sup>3</sup> Icons can easily be restored. Deleting icons from original Drives folder deletes file(s).	Yes, icons based on extension	No	Yes, does not update invisible "desktop" file	Yes.	Yes. Option on Desktop
CHANGE BG COLOR	limited	Not in DOS	Yes	Yes	Screen only <sup>4</sup>	Yes	Desktop only <sup>4</sup>	Yes	Yes
GRAPHICS PRIMITIVES		Windows GDI	extended Windows GDI	32-bit GPI	3-D Kit (RenderMan), Display PostScript	X Windows	QuickDraw	Amiga Graphics Library	GEM VDI
<b>OS SERVICES</b>									
STANDARD DISK FORMAT	FAT	FAT	NT file system (FAT on floppies)	FAT or HPFS	NeXT	UFS	HFS	Amiga 880k	FAT
LENGTH OF FILENAMES	8/3	8/3	256 (NTFS)	254 (HPFS)	very long	255	32	long	8/3
OPTIONAL DISK FORMATS	DOS: SD, DD, HD, ED	DOS: SD, DD, HD, ED	DOS: SD, DD, HD, ED, HPFS, POSIX	FAT: SD, DD, HD, ED, read-write optical	DOS: SD, DD, HD, ED, HFS	DOS, SS, DS, HD, ED	MFS, DOS SD, DD, HD	Proprietary 880K, (& HD on A4000), DOS,	SS, DS, (HD on TT & Falcon)
INTERPROCESS COMMUNICATION	None	via OLE, DDE	via OLE, DDE, Network DDE	DDE, pipes, queues, semaphores; OLE and DDE in Windows apps	Mach Services, Live Links	Pipes, sockets, IPC	Publish & Subscribe, AppleEvents	via ARexx	Clipboard
MACROS	Batch files	Yes	Yes	Windows Recorder (Windows only), Rexx	Unix scripting	Yes	No <sup>4</sup>	via Arrex	Function Keys <sup>4</sup>
VIRTUAL MEMORY	No	Yes	Yes	Yes	Yes	Yes	Yes	No <sup>4</sup>	No
E-MAIL	No <sup>4</sup>	WFW only <sup>4</sup>	Yes	No <sup>4</sup>	Yes	Yes	No <sup>4</sup>	No	No
BATCH FILES	Yes	Yes, via PIF	Yes, uses registration database	Yes	Unix scripts	Yes	On startup <sup>4</sup>	Yes	On startup
OUTLINE FONTS	n/a <sup>4</sup>	TrueType	TrueType	Type 1, (and TrueType in Windows apps)	Display PostScript (Type 1 and 3)	Type 1, PCF	TrueType (free ATM offered)	Compugraphic	Speedo GDOS
COLOR CALIBRATION	no	no <sup>4</sup>	no	no, colors are definable	Yes	No	Yes	no	no <sup>4</sup>
CD-ROM SUPPORT	ISO 9660, High Sierra	ISO 9660, High Sierra, audio	ISO 9660, High Sierra, audio	ISO 9660, High Sierra, audio, XA	ISO 9660, Mac HFS, NeXT, audio	ISO 9660, High Sierra, audio	ISO, High Sierra, HFS, audio, Photo CD	CDTV, ISO, High Sierra <sup>4</sup>	ISO, High Sierra Limited
HELP FUNCTION(S)	Yes	Context-sensitive	Context-sensitive	Hypertext, context-sensitive	On-line manual, context-sensitive	on-line manual	Balloon Help	CLI only	
LANGUAGE(S) SUPPLIED	CLI, QBasic	CLI (via DOS)	CLI	CLI (DOS & OS/2), Rexx	C, C++, Objective C, Unix shell	C, Unix shell	None	ARexx	Atari BASIC
VIRUS CONTROL	Yes	Yes	No	No <sup>4</sup>	No	No	No <sup>4</sup>	No	No <sup>4</sup>
BACKUP	Yes	Yes (DOS 6)	Yes	Yes	Yes	Yes	Yes	Yes	No <sup>4</sup>
DATA COMPRESSION	Yes	Yes (DOS 6)	No	No <sup>4</sup>	Yes	Yes(file)	No <sup>4</sup>	Backup only <sup>4</sup>	No <sup>4</sup>
DATA RECOVERY	Files & volumes	No	Files & volumes	Files & volumes	No <sup>4</sup>	Volumes	Volumes only <sup>4</sup>	Disk Doctor	No <sup>4</sup>
OTHER BUNDLED PROGRAMS	DOS Shell, misc. commands	File Manager, Paint, Network administration, Write, Terminal, similar tools as are and file, Calculator, found in Windows 3.1	MIDI Mapper, Solitaire, Too many to list, Minefield, others	Terminal, Chart, Fax, Seek & Scan, Editor & Chess are standouts	Mail, Digital Librarian, Oxford book of Quotations, Webster, PostScript Preview, Fax Reader, others	None	In-depth Tutorial, Text Editor, Notepad, Calculator, Alarm Clock, Puzzle, Scrapbook, HyperCard Player	CrossDOS, Clock, Calculator, Font Manager, Text Editor, others	Hard-disk setup, Terminal, Calculator, Control Panel <sup>6</sup>
SCREENSAVER	None	Yes	Yes	Requires password, third-party options	Yes	Yes	None <sup>4</sup>	Yes	Yes
<b>NETWORK SERVICES</b>									
MULTIUSER SUPPORT	No <sup>4</sup>	No <sup>4</sup>	Yes	No <sup>4</sup>	Yes	Yes	Some <sup>4</sup>	No <sup>4</sup>	No <sup>4</sup>
FILE-SHARING	none <sup>4</sup>	WFW only <sup>4</sup>	Yes	requires OS/2 LAN Server or other third-party app.	Yes, AppleShare & NFS	Yes	Yes	No <sup>4</sup>	No <sup>4</sup>
OTHER SECURITY FEATURES	none <sup>4</sup>	WFW only <sup>4</sup>	Yes, to Gov't standards	Screen saver password <sup>4</sup> restricted Workplace Shell	Yes	yes some <sup>4</sup> , restricted access	Shell available via optional AI Ease.	Keylock on A4000	No <sup>4</sup>


**NOTES:**  
 1 There are numerous Intel-compatible processors, including chips from AMD, Cyrix, Chips & Technologies, NEC and others.  
 2 Earlier non-multitasking Atari models can be upgraded to MultiTOS, but not all features are available on 68000-based models.  
 3 Deleting an icon from Windows' File Manager or OS/2's Drives window will remove associated files or directories.  
 4 Option(s) available through third-party add-ons.  
 5 Falcon also includes AtariWorks and SpeedoGDOS, Direct-to-disk Recorder.  
 6 Falcon also includes AtariWorks and SpeedoGDOS, Direct-to-disk Recorder.  
 7 Optional PC compatibility.  
 8 If opened in share mode, it will open two or more device requests. In exclusive mode, subsequent requests will return an error.  
 9 PC compatibility is standard on NeXTstep for Intel processors only. NeXT machines require Insignia's SolIPC.  
 MS-DOS and Windows 3.1 into courtesy of Tony Bauman of Anio Automation (604-874-0888).  
 NT into courtesy of Geol Wheelwright (604-689-8628).  
 OS/2 into courtesy of Mike Agerbo of Doppler Computer Centre (604-875-0261), Colin McClelland and Ron Sebastian of IBM Canada.  
 Macintosh into courtesy of Stefan Oetter of Simply Computing (604-594-5422).  
 NeXT into courtesy of Paolo Bertioia of Advantage Computers (604-231-5700).  
 Amiga into courtesy of Neil Wilson of Wizard Computer Systems (604-321-7144) and Coniah Chuang of VFX Video (604-451-0137).  
 Atari into courtesy of Graham Norton of Falcon Systems (604-522-2915).  
 Unix into courtesy of Ken Clark of Compuserius 879-7166.  
 Although officially unannounced, industry insiders also expect NT to be made available on Hewlett-Packard's PA-RISC range of workstations.  
 MS-DOS notes: DOS 6.0 offers several services not included in earlier releases, including data compression, data recovery, virus-control and backup applications. All of these are available via third parties for DOS 5.0 and earlier releases.  
 Sun has reportedly developed an application binary interface for Solaris that allows you to run shrink-wrapped Windows apps on Sun workstations.  
 OS/2 Notes: other security and network administration functions provided by IBM's LAN Manager for OS/2.



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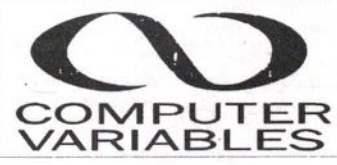
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		<b>MODEM</b>	<b>FLOPPY</b>
		<input type="checkbox"/> 2400 Baud <input type="checkbox"/> 9600 Baud <input type="checkbox"/> 14400 Baud <input type="checkbox"/> FaxModem	<input type="checkbox"/> 5.25" 1.2Mb <input type="checkbox"/> 3.5" 1.44Mb
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## Operating Systems

Continued from page 12

are not up to the level of server-based networks, Apple's Personal File Sharing is easier to set up and use than any other network.

Mac users requiring more complete security measures can purchase an optional server-based system called AppleShare. Novell's NetWare and Artisoft's LANtastic network environments also support the Mac.

Amiga users might do well to consider adding a PC-emulating "Bridgeboard" in order to use IBM-compatible network cards and software.

There are few network options available for network-ready Atari models, as no software is available that takes advantage of their built-in AppleTalk-compatible LAN ports.

## Printers

It is common for the operating system to provide system-level support for printers, fonts and other "global" services that all applications may make use of. As such, most systems include a large number of printer drivers for popular dot-matrix, ink-jet, laser and color printers. In the accompanying chart, you'll see that all operating systems but DOS and MultiTOS provide such printer support.

NeXT's initial release of NeXTstep for Intel processors will only support PostScript printers, but subsequent releases are promised to rectify this bizarre situation.

Only AmigaDOS 2.1 and 3.0 provide direct support for PostScript. Earlier releases relied upon application-specific drivers, or third-party system-level drivers.

In many cases, third-party drivers continue to provide features that improve upon those supplied by the OS. The Amiga and Mac have drivers (FinePrint and BetterWriters, respectively) that increase the number of grays that can be rendered. Other systems may have similar options. Dealers and user group members should be able to tell you more.

## Batch files

A batch file is usually a plain-text file that lists several program names or other commands to be executed. These can be automatically run at startup time, as in the case of DOS' AUTOEXEC.BAT or the Amiga's Startup-Sequence batch files.

Batch files are provided by all systems, although the Macintosh is the weakest here. A promised upgrade to the Mac's operating system called AppleScript will reportedly allow "real" batch files, but for now, Mac users' batch-file options are limited to launching one or more applications at startup time, or using a third-party system extension, such as Userland's Frontier. Atari users are similarly handicapped.

DOS — the weakest contender in many other areas of this survey, has strong batch-file capabilities, as do Amiga and Unix machines.

The Mac is also one of the few systems that provides no standard macro utility, although several third-party solutions are readily available.

Network services are standard on Unix and NeXT systems.

## User interface

There are several issues that cannot be properly described in a chart or a checklist.

One of the most important is the user interface.

How does each system handle multiple screens, multiple resolutions, long menus (font menus, for example), other input devices (pen input, for example), keyboard shortcuts, alternate keyboard mapping, foreign character sets (e.g., Arabic, Kanji)?

How, for example, does one add a device (e.g., fax driver that installs an application program, an icon and a set of fonts)? What are the steps to install and later remove these items completely? What happens if you move a program from one directory or disk to another and then click its icon? Does the standard environment allow you to change the system font, background and window color(s)? How?

There are many other important features to consider in your quest for the Ideal Operating System; unfortunately I haven't room to discuss them here. See the chart for a comparative analysis.

## Multitasking

There are different forms of multitasking, from the "true" preemptive type, to simpler and less capable cooperative time-slicing and task-swapping methods. Preemptive multitaskers are capable of copying files in the background, formatting disks, having two or more programs request the same serial port, etc. Here are a few other considerations: Can you set task priorities with standard system software? What happens if a print job is interrupted in mid-process? Can programs that were running at shutdown time be made to reopen automatically at next startup?

## Bundled applications

The chart lists only "important" applications, i.e., the ones people are actually likely to use.

## Security

Unix systems are traditionally used in multiuser environments, where security is a must. Windows NT promises to bring this security to the a wider audience than ever before.

## Optional Emulations

As is the case with DOS filesystem compatibility, virtually every system has one or more methods of running DOS programs.

This feature is said to be included with NeXTstep for Intel Processors, although it is not a standard feature on the Motorola-based NeXTstep. Those machines must resort to using Insignia Solutions' SoftPC. The latest release (finally) supports extended memory and VGA graphics.

Executor is a program available for the NeXT that emulates the Macintosh. It does not run all Mac programs, but runs the Mac versions of Microsoft Word and Excel without problems.

Mac emulators are available for the PC, Amiga and Atari, too. All work quite well, although none can successfully replace the real thing. One dealer I know calls people who rely upon these devices SHBAMS — they Should Have Bought A Mac.

Nevertheless, PC, Mac, or other emulators can help if you find you need to run a specific program that is only available for a computer you don't own — and don't want to buy.

Continued on page 15

Programs that offer DOS emulation are available from third-party vendors for some Unix systems; Sun Microsystems recently announced it is developing an "application binary interface" that will emulate Microsoft Windows on Sun systems. Unlike most competing products, it apparently will not require the user to purchase DOS or Windows. Microsoft, of course, maintains that this unlicensed emulation will infringe its rights.

Commodore has, over the years, offered several "Bridgeboard" IBM emulators for the Amiga, including models that emulate an XT, AT and, most recently, a 386SX. Because Amiga 2000-, 3000- and 4000-series computers include IBM slots as a standard feature, the Bridgeboard is a reasonably viable compatibility solution for Amiga owners who find they need PC compatibility. Although a Commodore-brand solution is not available for the Amiga 500, several manufacturers offer tiny PC- and AT-compatible cards for a few hundred dollars. Typically, they multitask with Amiga software, allowing the user to switch back and forth between the Amiga and DOS environment at will.

Atari computers have several DOS emulation options available. The most popular internal units are PC-Speed and AT-Speed (XT and AT emulators, respectively) from a company called Sack in Germany. For those users who don't cherish the idea of soldering things into their machines, an external XT-compatible emulator called SuperCharger is available from Rio Distribution in Las Vegas. SuperCharger lets you use the Atari's disk, monitor and printer while running IBM programs. It includes MS-DOS and works quite well, at about four times the speed of the original IBM-PC. Because it is emulating an XT, it cannot run Windows 3.1 applications, although it can run Windows 3.0, albeit in Real Mode only.

Windows 3.1, WFW, Windows NT and OS/2 2.0 come standard with an icon that, when double-clicked, brings up a familiar DOS prompt.

Windows 3.1 and WFW are, of course, running DOS, so emulation is not an issue. If a DOS program doesn't run from within Windows (and plenty don't!), the user needs only to exit Windows and drop back to DOS.

Windows NT is a different matter. It does not use DOS as its underlying operating system. As such, you cannot "exit" Windows NT. When you quit NT, it merely returns you to the logon screen that greets you when you first boot the program.

NT uses a clever trick to allow for the changes that some programs need to make to CONFIG.SYS and AUTOEXEC.BAT files. NT simulates these files with bogus entries that it takes into consideration when running DOS programs.

I did find a few programs that didn't run under NT's DOS emulation — at least, the beta version I tested. These programs are typically ones that attempt to directly access the floppy or hard disk. This, according to a dialog that pops up, "cannot be supported." Similarly, version 1.1 of the ubiquitous PKUNZIP causes NT's DOS box to report a System Error. Attempting to run a program that directly accesses a VGA display caused the whole system to lock up. Even Microsoft's own DOS 6 upgrade is incompatible (NT emulates DOS 5.0). I hope that Microsoft substantially improves NT's DOS emulation before the system's release.

OS/2 2.1, on the other hand, seems to have DOS and Windows emulation down pat. I have used the system for months now, with scarcely a crash or misbehavior. OS/2 2.0 only emulated Windows 3.0; version 2.1 of OS/2 adds Windows 3.1 emulation. Compatibility is excellent. It's especially pleasing to be able to run memory-hogging games (Microprose's World Circuit comes to mind) that fail under my TSR-laden DOS system. OS/2 invariably runs them without a hitch.

I must confess, I would have given up on OS/2 and gone back to Windows 3.1 if I had not received the update. OS/2 2.1 is a big improvement over the 2.0 release — even in its beta form.

However, not all users report similar success. OS/2 seems to be quite picky about its hardware requirements. I tried installing OS/2 on two systems. Both used the same BIOS (AMI) and the same type of hard disk (Fujitsu). One system worked, the other didn't. OS/2, apparently, is best installed by your dealer.

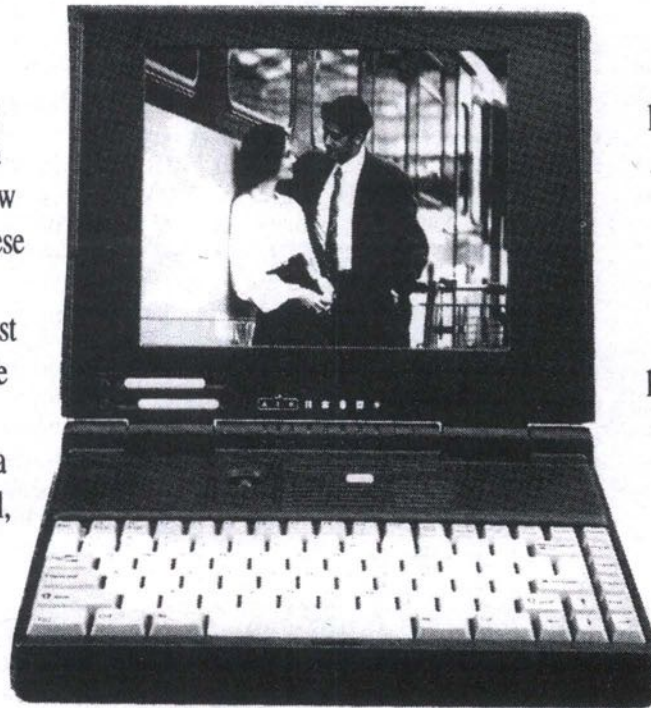
Device drivers are a sore spot for virtually all operating systems but DOS. You may want to upgrade to Windows NT, OS/2, Unix, etc., only to find that you may not be able to use your tape backup, CD-ROM, printer, graphics tablet, sound board, video card or other equipment. This is the Achilles Heel of any alternative to DOS. The best bet is to make a list of your needs and let a dealer configure a system that meets them.

At least OS/2 users have excellent SCSI

*Continued on page 19*

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# Looking into Windows

# All about OLE

BY GEOFF WHEELWRIGHT

*Object Linking and Embedding (OLE) is probably the most powerful function within Windows 3.1 — yet the one that most users know least about. In its current form, the most useful thing about OLE is that it allows users to “embed” items produced in one application as “objects” within another.*

A typical example is how a drawing or spreadsheet table might be embedded as an object within a Microsoft Word for Windows document. Under OLE, when you click on the object OLE automatically calls on the application that produced that object, opens it up and allows you to use it to edit the object in question. The changes you make will then automatically be reflected in the Microsoft Word document that the object is linked to.

Similarly, if the object cannot be ordinarily used directly from within Word — which is certainly true in the case of a voice message — OLE will enable you to click on the object and cause it to launch the Windows 3.1 applet responsible for playing audio messages.

To many, these may seem like merely useful tricks — but hardly the bedrock on which to build the future of an operating environment like Windows. But when you start to look at what Microsoft has in store for the upcoming release of OLE 2.0 — you really begin to understand why it is vital to the continued success of Windows.

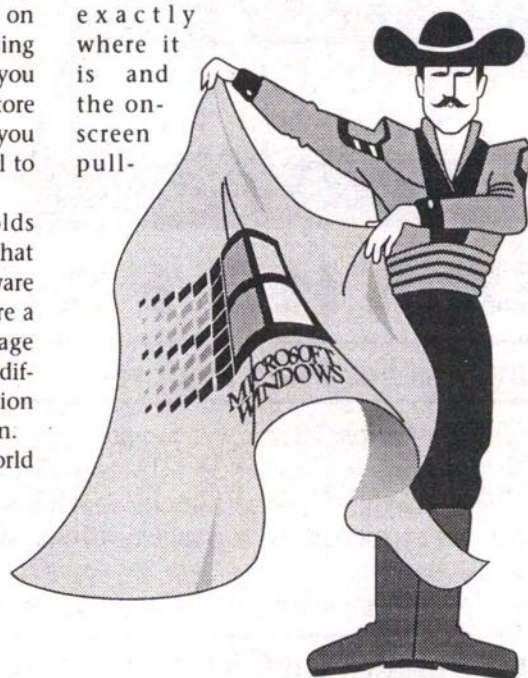
OLE 2.0 will be the glue that holds together a host of future applications that blur the boundaries of traditional software categories. It is already hard to say where a word-processor ends and a DTP package begins — where a presentation package differs from a professional drawing application and spreadsheets end and databases begin.

The future lies in a “data-centric” world — where the application is secondary. Users want to be able to work with their data in a whole variety of ways, without having to worry about switching between this package and that. They want to begin coloring outside the lines.

To this end, OLE 2.0 will include a feature that Microsoft calls “editing in place.” This means that when, for example, you establish an OLE link between an embedded table in a WordPerfect document and the Quattro Pro for Windows application that created the table, the business of updating and editing the table will become much easier.

At the moment, when you use OLE to edit the embedded table, Windows goes off and load up a copy of Quattro Pro for Windows in a separate window to your word-processed document, gets you to edit the table there and returns you to WordPerfect when you’re finished. Editing in place is much easier — when you click on the table that you want to edit, your working window stays

exactly where it is and the on-screen pull-



down menus and icons change to those used in Quattro Pro. As soon as you click on a text portion of the document, the menus and toolbar for WordPerfect automatically reappear.

Editing in place is a radically sensible idea, which should enable people to do what they’ve really always wanted to do in Windows — but never had the tools to accomplish. It also stands to change the way that software is designed. When can you establish OLE links from anything to anything — and those links make all kinds of functions appear as if they are part of your “native” application — then a lot of software companies are going to stop trying to re-invent the wheel all the time.

Why, for example, would you have three different spell-checking routines in your word-processor, spreadsheet and desktop publishing package? In the future, you probably won’t — you will pick one spell-checking routine that you can call via an OLE link from any application. And that spell-checker will be customized to use all of your personalized dictionaries, thus eliminating the need to have different copies of dictionaries for each application.

The same will likely become true for all kinds of basic functions — from drawing to table creation. In fact, it would not be surprising if Microsoft eventually built them into Windows itself. The company already takes this approach with the spell-checker and drawing routines used by Microsoft Word for Windows, Excel and Works for Windows.

In short, OLE 2.0 has the potential of changing the way that people look at applications — and the way that different pieces of data relate to one another. All data becomes an object,

with the potential for having one or more objects “nested” inside another.

OLE 2.0 allows, for example, links to refer to objects (or even parts of objects) that are embedded in other objects. Microsoft says that this “nested object linking” makes the OLE model more consistent and intuitive.

Another key improvement is direct access to nested objects. For multiple levels of nesting, you can now directly launch an application at the desired level of nesting rather than launching multiple applications to arrive at the object that must be edited.

This means that if you had a graphic within a spreadsheet model within a word-processed document, you wouldn’t first have to link to the spreadsheet in order to edit the graphic within. You could automatically “jump” to the appropriate level of nesting.

These features are particularly powerful because they offer the potential to manipulate objects in a wide variety of combinations and work with what the computer industry likes to call “compound documents” more productively.

### Drag and Drop

The most widely used method for transferring data between Windows applications has been to use the clipboard. With the traditional Windows clipboard, you “copy” your data to the clipboard, move to the destination application and then “paste” the data in place. Although effective, a more natural way to exchange data between applications is simply to click on an object, drag it to its destination, and drop it in place. OLE 2.0 supports this “drag-and-drop” idea for objects, providing a simpler yet more powerful user interface.

The OLE 2.0 drag-and-drop model supports the following capabilities.

- Inter-window dragging: Objects can be dragged from one application window and dropped into another application window. For example, an illustration can be dragged from a graphics application window and dropped into a word processing document.

- Inter-object dragging: Objects nested within other objects can be dragged out of their containing objects to another window or to another container object. Conversely, objects can be dragged to other objects and dropped inside them.

- Dropping over icons: Objects can be dragged over the desktop to system resource icons such as printers and mailboxes. The appropriate action will be taken with the

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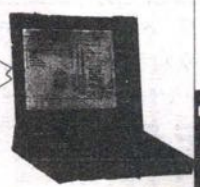
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object, depending on the resource the icon represents.

Drag and drop makes compound documents easier to create and manage because they can be manipulated as if they were physical entities. Additionally, OLE 2.0 offers a means to eliminate the traditional "barriers" between applications. Instead of perceiving window frames as walls surrounding data, Microsoft is hoping users will be able to freely drag information to and from a variety of applications.

**Storage-independent Links**

OLE 2.0 also supports an extended linking mechanism that enables greater flexibility when linking objects. An important feature of this new linking mechanism is that objects are now independent of the underlying storage system. Previously, a link could be established only to an object that was stored within the computer's local file system. Links can now be updated between objects within the same or different documents, without requiring that the objects exist on disk.

Storage-independent links also allow users to transfer documents with embedded objects to different computers without having to transfer another file containing the object. This means that you can therefore freely exchange compound documents with other users — without having to worry about the existence of the object on a disk.

**Adaptable Links**

In OLE 1.0, if a linked object was copied to a new location, the copied object correctly pointed to the source object, but links could not be maintained when both source object and linked object were copied simultaneously. With OLE 2.0, linked objects that are moved or copied to the same destination maintain their links correctly.

For example, suppose there are two documents README.DOC and INFO.DOC in the directory WORK\GEOF. Also suppose that README.DOC contains a link to an object in INFO.DOC. If the contents of the WORK\GEOF directory are moved or copied to a new directory named \TEXT, then the link in README.DOC now points to \TEXT\INFO.DOC. The link is updated automatically.

Adaptable links also allow a wider range of operations for objects within the same document. If a document containing linked objects is copied to a new location, the links in the copy point to the appropriate objects in the copy.

**Programmability**

OLE 2.0 also offers much greater interoperability and integration between applications. In many cases, this interoperability will be conducted interactively by the user. But OLE 2.0 offers another powerful way to integrate applications — through inter-application command operations.

With OLE 2.0, programmers can define a set of operations and make them accessible to other applications. These operations can even have argument lists, much like a function call in a programming language. The result of this capability is that applications call interact with one another without human intervention.

**Prospects for success**

It should be obvious that there is a great deal for users and developers alike to enjoy in OLE 2.0 — that was never really in question. The issue really is just how long developers will take to make their applications OLE 2.0-compliant.

There have already been reports that a number of developers are feeling somewhat short-changed in the OLE 2.0 development phase — and concern that Microsoft's own applications division might have a jump on the rest of the world in implementing the new standard.

Although the alpha version of Microsoft's OLE 2.0 Software Developers' Kit (SDK) has been available since last November, upgrading applications that are OLE 1.0-compliant so that they support the new OLE 2.0 standard is not a trivial task. Some commercial developers have expressed reservations about putting their resources into develop-

ing OLE 2.0 support until the specification is a little more firm — they are fed up with nailing jelly to the Microsoft wall.

But a company with the resources and drive of Microsoft is not likely to rest until OLE 2.0 is a success. Even if it takes significantly longer than the company expects (after all, it was only last year that a number of smaller developers started incorporating OLE 1.0 support into their applications), Microsoft is sure to put the necessary effort into making OLE 2.0 the object-linking standard of choice for Windows developers.

The challenge, however, lies in trying to exert so much pressure on the development community in so many directions all at once. Microsoft is already trying to get developers to buy into Windows NT, to adopt its Messaging API (MAPI) for Windows and to give up all notions of future OS/2 development in favor of Windows.

And, of course, all these discussions take place in an atmosphere where developers know that Microsoft may eventually just build a variation on their application into the OS and then leave them high and dry.

After all, DOS 6 will contain not only backup, undelete and file management functions — but also on-the-fly data compression utilities to rival the likes of Stacker and SuperStor. Windows for Workgroups 3.1, meanwhile, includes a peer-to-peer networking OS, electronic mail and scheduling.

What guarantee does the small software house have that by the time they develop a neat new Windows product that supports OLE 2.0 that Microsoft won't simply develop something similar and add it to the next version of Windows for free?

Of course Microsoft doesn't see it that way. Bill Gates will tell you he is just adding into the OS things that ought to be there — and will continue to do so as the power of entry-level PCs increases to make that possible and economically attractive.

However you slice it, OLE 2.0 could change the rules of the game yet again. If PCs do truly become "data-centric" around Windows 3.1 with OLE 2.0, then the whole notion of how people buy and use PC applications will change forever. ■

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E V E N T S

# PCWorld/Network World Expo

BY KEITH SCHENGILI-ROBERTS

TORONTO, March 10-12 — Over 10,500 people attended this year's PC World/Network World Conference at the Metro Toronto Convention Centre, up from last year's figures. The show was a success, with many of the computer industry's leading local and international hardware and software manufacturers appearing at the event.

**OS/2.0**

One of the largest single displays was put out by IBM, which is single-minded in its push of OS/2.0; up to twenty people could sit down and try out IBM's operating system for themselves, demonstrating various applications. It was a solid and effective presentation, judging from the comments of people trying out the system. After all,

the best way to convince people to buy something is to let them convince themselves that it is worth their while. The show went some way to dispel the disparagement OS/2.0 has often gotten from the computer press.

Contact: IBM Canada (416) 946-9000.

**Microsoft NT**

Microsoft was letting people have a look at Windows NT, and was constantly surrounded by people trying to get a look at the much-talked-about operating system. It was an impressive display, with the screen showing half-a-dozen computing-intensive applications running at once without any problem. Mind you, it's worth noting that it was running on a high-end server-like system, but after all, that's exactly the market Windows NT is (initially) aimed at.

Contact: Microsoft Canada 1-800-563-9048.

**WordPerfect for Windows 5.2**

WordPerfect Corporation was also out in force, putting on a show demonstrating its new WordPerfect for Windows 5.2. The new version features an impressive set of additions including built-in support for Grammatik 5 (the grammar-checking program), Object Linking and Embedding (OLE) support, Adobe Type Manager 1 fonts, button bars and several other useful features. Suggested pricing for the stand-alone version is \$595, and \$20 for an upgrade from WordPerfect for Windows 5.1.

Contact: WordPerfect Canada 1-800-321-2318.

**Multimedia Marketing**

A small display, but impressive in its implications was offered by a Toronto firm, which has put together a decent multimedia marketing tool. In the multimedia business for over 10 years now, Frank O'Hara Systems recently convinced the Toronto Dominion Bank to use multimedia as a marketing tool for the bank's financial products. These multimedia kiosks (using a computer, modem, a touch-sensitive television screen, laser-disc and printer) are one

of the first well-thought-out multimedia presentations I've seen. Expect one of these kiosks to appear in a mall or bank near you soon.

Contact: Frank O'Hara Systems Inc. (416) 425-5550.

**Anti-Virus and Anti-Disklock**

Though they don't get a lot of media attention these days, computer viruses are still out there. There is a constant battle between virus-makers and anti-virus program developers. The latest thing is a program called Anti-Virus, developed by Fink Enterprises. The company also has a program called Iris-Disklock which follows the latest trend in computer security in its ability to "lock out" access to a computer's drives and I/O ports to users without the proper access key.

The price for Anti-Virus is \$199 for a single station. No pricing is currently available for Iris-Disklock.

Contact: Fink Enterprises (416) 738-9400.

**Canon's Bubble-Jet 300**

The Canon display featured most of its computer printer line, including a Bubble-Jet 300. While no longer brand-new, it was the first time I had seen one of them. An impressive little printer that is quick and quiet, with 300 dpi resolution. Word is that we can expect an interesting combined notebook computer and bubblejet-printer from Canon in the near future. Suggested pricing for the BJ-300 is \$745.

Contact: Canon Canada 1-800-387-1241.

**A "Dynamic" Spreadsheet**

Lotus was unveiling a new spreadsheet program for Windows, called Improv. Its most impressive feature is its ability to allow users to move around user-defined categories and drop them into a new space, instantly rearranging the whole spreadsheet according to the new order. A handy feature for anyone who, for example, wants to take a standard spreadsheet and instantly rearrange things to show earnings for a firm by country, or by quarter, or by year.

Lotus is offering the package for \$129 until May 31, after which it will be listed for \$599.

Contact: Lotus Canada 1-800-465-6887. ■

The next PC World Expo for Toronto is currently scheduled for April 1994, and it will likely return to the Metro Toronto Convention Centre.



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**Operating Systems**

*Continued from page 15*

drivers available. I recently tested Trantor's SCSI host adaptor and software drivers for DOS and OS/2 with an AEC CD-ROM drive (distributed by Fastech, 604-279-9686). The drivers for this double-speed, Photo CD unit were installed easily and the unit worked well. Apparently, a Mac driver is also available.

**Conclusion**

Unlike the facts presented in the preceding chart, these conclusions are largely subjective, based on my observations of the industry at large and the relative significance from my perspective of each environmental factor. Therefore, I apologize in advance, for I am sure to offend some of you with any conclusion that appears unkind on your favorite operating system. As Ken Clark of Compusaurus said, "It's a very dangerous article to write. It's the kind of thing religious wars were started by."

For those who are currently using DOS (without Windows), the good news is: you have the most stable, lean-and-mean operating system available. System reliability is outstanding. After all, how much trouble can you get into running one task at a time? Thus, DOS is a great choice for business users running "mission-critical" applications where display speed is crucial, or hardware resources (hard disk space, memory, etc.) are limited. If you are using any version of MS-DOS prior to 5.0, I'd strongly recommend upgrading to at least that level. I've tested version 6.0 and am satisfied that it's the best version yet. With street prices less than \$50 for the DOS 6.0 upgrade, it's a great deal. Those using or considering Novell's DR DOS have a tough decision. Despite its numerous merits, I feel it's not the best choice. Microsoft's dominance is just too great. DR DOS users are likely to experience compatibility troubles and, unlike OS/2 users, they don't get a big payoff to justify the hassle.

If you want to run Windows, I recommend that you upgrade to DOS 6.0 and Windows 3.1. Because this combination is not capable of true preemptive multitasking, it is not ideal for use in network server or multimedia applications, but for most users, the print-spooling and message-driven multitasking provided are probably adequate.

Unlike Windows 3.0, version 3.1 is reasonably stable — especially if you limit your number of simultaneously open Windows applications. Most Windows users find that trouble starts when system memory or disk space runs low.

There are several alternatives to Windows' much-maligned Program Manager/File Manager duo, but be aware that some applications don't install properly under third-party Program Manager replacements like Norton Desktop for Windows and PC Tools for Windows. My enthusiasm for these improved shells is therefore tempered by the sobering realization that they sometimes add additional complexities and/or problems.

If you really want to multitask, and run DOS and Windows programs, I cautiously recommend OS/2 2.1, which should be released by the time you read this. Despite the paucity of OS/2 applications, it runs every DOS and Windows application I've

thrown at it — and it runs them well. I was not particularly happy with OS/2 version 2.0, but the latest beta of 2.1 is encouraging indeed. Based on beta versions, OS/2 appears to be much more successful than Windows NT at running DOS applications.

I'm sure to get letters from irate Desqview fans, who will correctly point out that it also provides multitasking for DOS and Windows applications. True, but like Novell/Digital Research's GEM, Desqview will ultimately be viewed as an also-ran. Life's not fair. I have a more favorable view

of Desqview/X. This version adds X-Window compatibility to the PC. If you need it, there it is.

Some users complain that OS/2's Workplace Shell (WS) is clumsy, but I rather like it — except for its nearly useless Find... command. WS is considerably more Mac-like than Windows is, yet Windows users can run a Windows 3.1 shell that looks and acts just like the real thing. As mentioned earlier, the biggest problem with OS/2 is the scarcity of device drivers for tape backup units, scanners, sound boards and other

hardware add-ons. If these were more widely available (and they are slowly starting to appear), I'd rate OS/2 as a good general-purpose operating system. It's As it is, I recommend it for power users with compatible hardware only.

Despite the relative merits of OS/2 2.1, all indications are that a lot of power users are going to be switching to Windows NT. It's hard to argue with the market presence of Microsoft. In a showdown between NT and OS/2, a lot of developers and network

*Continued on page 41*

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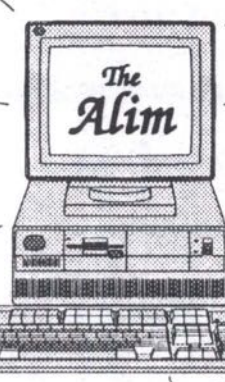
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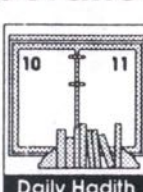
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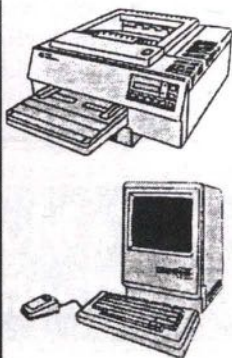
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# Follow the Bouncing Ball

## 3DO invents the next-generation video game

BY LARRY GUSSIN

### The New 3DO Company Plays the Graphics Card

Readers who have taught in elementary schools, or whose memories carry back to the fourth and fifth grades, will recall the medicine ball. Bigger than a second-grader, bulky and awkward, these canvas-skinned, air-filled spheres are the basis for a frenetic game in gym class. The children form in two parallel lines, lie on their backs with their legs in the air, and press calf to calf against one another. Then the teacher drops the medicine ball at one end of the row.

Las Vegas. At a jammed press conference, jammed exhibit booth and "place-to-be" reception they outlined a strategy to make 3DO the player/controller of choice for the digital home centers that consumers (so the partners hope or believe) will all be buying in the next few years.

This article reports on that announcement, exploring the 3DO progression of claims from technology to applications to markets. It adds a supporting interview with Bob Faber, 3DO's of marketing and sales, as well as critical reservations held by some industry observers.

### A Breakthrough Technology?

The 3DO (an acronym for Three-Dimensional Operating System) Interactive Multiplayer, as it is being called, will ship in October, 1993, and initially cost U.S.\$700. It will be a CD-ROM-based system that, like Sega and CD-I, among other platforms, uses a TV as a monitor.

However, 3DO's performance, particularly in regards to visualization, should far surpass the systems of these and other home market competitors. For starters, 3DO includes a



Cinematic software tools allow programmers to create movie type effects. Programmers may locate and define a light source on and off screen, and the software automatically illuminates other objects based on the light's location and brightness. Also shown above, 3DO's texture mapping capabilities allow programmers to wrap images onto 3-dimensional shapes.

If the children are agile and lucky enough (they rarely are) they are able to keep the ball airborne and above their feet as they push it to the other end of the row. But almost always, the ball falls off in a rush, amid much screaming, and bounces away. The teacher then retrieves it and begins the game again.

The medicine ball game comes to mind regarding the newly announced 3DO interactive home system for three reasons. For one thing, a ball like this — actually a 128-sided polygon inside a 3D box, bouncing around, spinning, landing softly and making a thudding, medicine-ball sound each time it bounces — is part of the marketing demo that shows 3DO's performance capabilities. Second, playing with a visually-rich 3DO title just might turn out to be, for all age groups, as much fun as playing with a medicine ball was in fourth grade. And finally, the medicine ball game with its slim chances for success may be an apt metaphor for the odds that 3DO or any other new, basically incompatible hardware platform faces.

These themes, of 3DO's technology, applications and business potential, were the central ones in the 3DO announcement, made by CEO Trip Hawkins and five powerful, diverse 3DO business partners at the Winter Consumer Electronics Show in

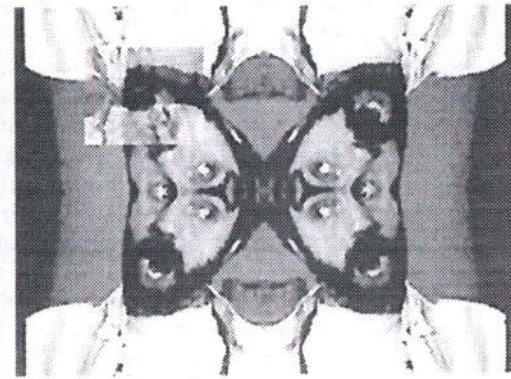
32-bit RISC CPU as a custom housekeeper, a multitasking operating system and a 650MB, double-speed (300K/sec.) CD-ROM drive. The bulk of its performance jump, though, comes from two custom, patent-pending animation chips, which can display or move between 36- and 64-million pixels/second — far more than the 6 million pixels/second of TV or the 1-million pixels/second of 16-bit game machines. It also displays up to 16-million colors, as compared to 2-million for TV or a mere 256 for 16-bit and 32-bit machines. These animation engines share data through 24 DMA (Direct Memory Access) chips and a memory management unit; the system also has specialized, high-caliber circuits for video processing and digital sound.

The goal of this added graphics performance, said Hawkins at the 3DO announcement, was "to create a more realistic and involving picture, something more like a movie experience." Current systems, he added, "provide such little animation performance that designers have to make the objects on their screen small, so that the consumer won't see the flaws." The systems currently shipping also make for "unrealistic images" and "herkyjerky" movement.

The way 3DO found to circumvent this (the actual developers were David Needle and RJ. Mical of the contract New

Technologies Group, both former Atari and Amiga designers) was to group graphics into animation cels — layered, high resolution, full-color images that the system can animate, scale, rotate and distort. These cel groups can be used to represent the textured "give" of a soft, heavy ball as it bounces against a hard surface, for instance — or to show the play of a large fire, reflected in the face of a character who is watching it.

To augment such hardware support for "movie-like" realism, 3DO added a set of programmed software effects — for warping images, making them transparent, defining lighting sources that illuminate other objects, smoothing rough bit-mapped edges, and texture-mapping images onto



A frame from a live video input, illustrating image warping, just one of 3DO's many graphics processing capabilities.

one another (so that, for example, the "sides" of a ball made of polygons can all have different images on them).

However much a breakthrough, cel animation may be in today's consumer electronics marketplace, there is disagreement about it being a revolutionary technology. One senior hardware engineer at the 3DO booth, who works on non-competing PDA (personal digital assistant) products, observed that 3DO's technology was not much different from hardware planing used by Silicon Graphics or Sega. And a Sega spokesman has said that, had Sega wanted to, it could have built an equivalent machine and sold it at a \$700 price point itself.

3DO Marketing-VP Bob Faber defends the claim of a technology lead. "I really doubt," he said, "that the competition has this performance. And, if they could have built this system, they'll see (by year's end) that they should have!"

**A Breakthrough in Applications?**

"People," observed Hawkins at the 3DO announcement, "obviously wish their TV was more interactive, because they spend all their time pressing the buttons on their remote."

3DO and its partners believe that people of all ages will want to interact with their home electronic centers, and that what is needed to spur the demand is realistic, dynamic 3D graphic imagery, to let users play with a title without losing hold of its powerful visual illusion. They claim that there is a missing \$17-billion market for interactive home entertainment; that system performance will be 3DO's wedge into exploiting this market, and that its multiplayer capabilities will carry 3DO into eventual market dominance.

(What existing markets [broadcast TV?] or habits [cruising malls? regular periods of sleep?] the huge new interactive market might replace, this reporter notes, is not

something Hawkins gets into.)

"Take sports and sports betting," continued Hawkins. "People cheer, wear the home team's merchandise, do the wave in stadiums. They clearly want to be involved. They also love their TVs. Yet they have never been able to interact with their TV in the convenience of their living room. 3DO will change how we use our TV, both when we are alone and when we entertain." And neither does it matter that many of the application types laid out by 3DO — interactive movies, life-like sports simulations, children's storybooks, reference materials, education and edutainment — look redundantly and suspiciously like the ones listed by CD-I, CDTV and MPC over the past few years. The issue is visual richness. "The point," says Bob Faber, "is that other platforms don't have the performance to offer users a satisfying experience. We do."

While Hawkins has a background as the charismatic founding CEO of Electronic Arts, the leading computer game publisher, he gets a lot of his inspiration today from the movies. Hollywood's breakthrough came, he says, "when directors lifted the camera and began moving around the actors...(as well as) using perspective and close-ups, and varying distances. Suddenly the experience was more real and intimate. With software, too, you would like to let users feel that they could get out of their 'fixed' theater seats and move around. That is what 3DO set out to support."

Assuming these capabilities, Hawkins sees a market for interactive products in the home extending far beyond the (mostly pre-teen) \$3 billion of today. In fact, he sees 3DO as the VHS of the '90s. Noting that movie revenues grew from \$3 billion in (pre-VHS) 1980 to \$21 billion in 1991, and that by '91 "spending for movie rentals was \$14 billion, nearly triple that of movie tickets," he suggests that, "with a similar improvement in home interactive media spending would go from \$3 billion to \$20 billion." The route to this future, he believes, is through an inexpensive, industry-standardized 3DO player.

Coming from computer games, Hawkins does know that the way into a new market is through the early adopters. "The first half-million customers," he says, "buy straight performance, the next five million buy value in relation to performance. Only after selling these upper tiers of the marketing pyramid can volume production bring prices down." What the top tiers want, says Faber, "is real interactivity. We will have it for them, and so unlike CD-I and CDTV we will be able to successfully market to them."

It is for the mass market, when prices fall to \$500 (by 1995, says Faber), that 3DO's multiplayer functionality becomes strategically important. As a CD-based platform, 3DO will play music and Photo CDs, but it won't be compatible with other interactive CD systems. Explains Faber: "Our performance leap means a PC or CD-I box will need a 3DO card for playback."

An area of compatibility that 3DO may be betting heavily on, though, is with MPEG-based CD movies. The idea of replacing VHS cartridges with less-expensive CDs has been around for a couple of years, as a way to build a mass base for CDs, and Hawkins said in 1992 that the CD format

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that Hollywood chose would be the one to win. However, while Faber acknowledged movies were an important part of 3DO's mass market strategy, he said that Hollywood's real intentions on moving movie rentals to CDs were not yet known.

Another, still murkier part of 3DO's long term strategy is using the Multiplayer as an intelligent cable controller, providing home viewer access to movies-on-demand, interactive shopping and game shows, and so forth. But, while interactive cable is clearly not far away, and while Hawkins

wife, Diana Gagnon, is a leading authority in the field, 3DO, for whatever reason, is promising much but being short on specifics. Says Faber, palms raised and with his gun in its holster, 'We have a high quality set-top box that will handle a network. Cable is a big opportunity — but that's all we are saying so far.'

**A Breakthrough Business Coalition?**  
With all the bases that 3DO is claiming to cover, it is not surprising that publishers are lining up. At the announcement there were

over 80 software licensees, from big players like Paramount and Warner Brothers, to hot small developers like Fathom Pictures (maker of the leading CD-I titles) and Maxis (developer of Sim City, etc.), to such less well-known players as HakuHodo, Psygnosis, Gray Matter (is this a great industry, or what!) and Radical Entertainment. But, noted analyst Richard Doherty, editor of *Envisioning*, "Developers only have to fork up a few grand to play. The real commitment, if there is one, will be in manufacturing."

To prod this commitment, 3DO has built a cross-industry coalition that includes AT&T, Matsushita, Time Warner, MCA, Electronic Arts and the venture firm Kleiner Perkins. Together these companies are leaders in manufacturing, communications, data compression, cable operations, publishing, multiple media creation and entertainment. It is also building a business model that will support developers by letting them use a Macintosh based development system, providing them with tools and a content library, and vowing never to compete with them as publishers. In turn, developers will pay a licensing fee for each unit they ship, as is customary in the video game business.

Who 3DO must truly romance, though, are the manufacturers. It is doing this by feeding them some of the developer royalties, and by promising to both pay their engineering costs and help support their marketing costs. These enticements may be working: both AT&T and Matsushita have committed to large scale manufacturing and, says Faber, "by October there will be at least half a dozen manufacturers in all."

Analyst Doherty is not so sure. "3DO has built a strong coalition, but it isn't clear what level of investment the partners have made. They have outlined what they see as a new marketing opportunity defined a platform and identified content providers. But the platform will have to be manufactured by several companies to succeed, and it is these companies that will be making the real commitment."

**Conclusion**

Whatever the current level of commitment of 3DO's partners, it is clear that a very big bet is now being laid down, a bet substantial enough to make a lot of people keep their hands near their wallets. The bet is that the key to the consumer market is visualization, and that the sophisticated graphics processing necessary to maintain an illusion of interactive reality has migrated down to consumer-level prices. It is a marketing bet, and if they are right 3DO will develop market share and be in place as the next wave of opportunities, such as interactive network communications begins to hit.

Where they have to be right, though, is in their notion that a mass consumer market for interactive products has been waiting only for better graphics and now will burst alive. It is a notion held firmly by the interactive community, hoped for fervently by the hardware community and approached more tentatively around Hollywood and in other content-generating communities. It is "the" question, and the interesting thing about the 3DO team is that it may begin to provide us all with an answer. ■

**Larry Gussin** is a veteran multimedia consultant and freelance journalist. He can be reached at 5019 Phinney Avenue North, #306, Seattle, Washington 98103, E-mail: LGUSSIN@MCI.com.

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# Free UNIX

BY TIM GUAY

Would you like to use Unix on your 386 or 486, but can't afford to spend a \$500 or more on an operating system? No problem — you can have your Unix and \$500 too. There are several freely distributable versions of Unix that you can download from Internet. The two that will be discussed here are 386BSD release 0.1 and Linux.

## 386 BSD release 0.1

386 BSD is a freely distributable Unix based on Berkeley 4.2 BSD that is fully POSIX compatible. It will run on a 386SX or better ISA bus machine. The practical requirements are 4MB of RAM and a 200MB hard drive. The hard drive controller can be any MFM, RLL, IDE, or ESDI controller. Currently, only the Adaptec SCSI controller is supported. Video support includes Hercules, MDA, CGA and VGA.

The source code is freely available if you want to poke around and see how an operating system is put together. You are free to modify the operating system to your heart's content, and is encouraged by the developers. 386 BSD can be used on a networked machine as it fully supports TCP/IP, NFS and FTP. There is a wide range of freely distributed applications software available for it, including the full collection of GNU software, and X Windows.

GNU software is a collection of Unix software that includes both clones of Unix utilities and two applications that are some of the best, if not the best, in their class. The two applications are GNU EMACS, which is a text editor, and the GNU C++ compiler. For those of you with

other implementations of Unix, chances are that there are versions of GNU software for your version of Unix.

## LINUX

LINUX is not as complete an implementation of Unix as 386 BSD, only implementing a subset of POSIX and System V. However, it is still of value to those who either may not need a full implementation of Unix, or do not have a large enough hard drive to hold 386 BSD. LINUX can reside comfortably on an 80MB hard drive. Some of the GNU software is available for it as well as X Windows, TCP/IP, NFS and FTP. Like 386 BSD it requires a 386SX or better ISA bus machine with 4MB of RAM. It only supports MFM, IDE and SCSI hard drive controllers, but supports the full range of video standards. LINUX is reputed to be slightly less stable than 386 BSD.

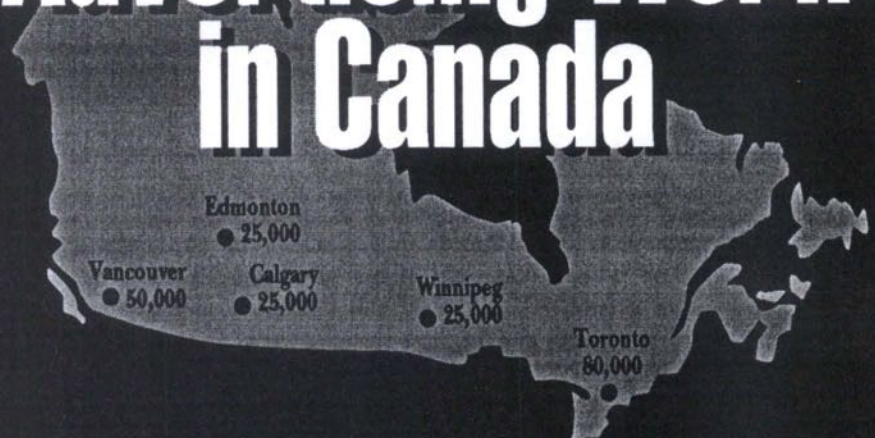
## Where to get 386 BSD and Linux

386 BSD can be downloaded via FTP from the following site: [agate.berkeley.edu](http://agate.berkeley.edu).

LINUX can be downloaded via FTP from the following site: [nic.funet.fi](http://nic.funet.fi).

Both these sites have the GNU software available. Enjoy! ■

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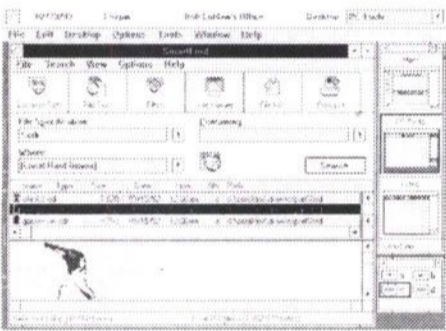
# PC Tools for Windows

BY GRAEME BENNETT

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You'd think somebody at Microsoft would notice how many "alternative desktops" are available for Windows.

Metz has its Task Manager, Symantec has its Norton Desktop for Windows, Hewlett-Packard has Dashboard (not to mention New Wave), Xerox has its own "Rooms" deskpace manager, and so on. And there are dozens of public-domain and shareware utilities available that all address the same fundamental issue: There are lots of folks who think Windows' Program Manager and (especially) File Manager could stand improvement.



PC Tools for Windows' SmartFind utility can display the contents of many types of files, including CorelDRAW graphics.

Moreover, if we look at the big picture, we find that of all the common graphical environments (GEOS, GEM, OS/2, Macintosh, AmigaDOS, et al), Windows is one of the few that adheres to the notion of a program manager that is separate from a file manager. Even Windows NT, touted as the next generation of Windows, maintains this separation, despite Microsoft's assertions that its products are refined in usability labs where Microsoft user-interface experts watch from behind one-way mirrors the way people interact with the company's products. I, for one, remain dubious that people in these labs actually prefer File

Manager over an integrated solution, or that they choose to use the right mouse button for nothing at all in the Windows shell.

I'll cut to the chase: Central Point Software's PC Tools addresses these two issues and other important considerations that face Windows users. Perhaps most importantly, it provides a real solution to the problem that every Windows user faces: there's never enough room on the screen to keep more than a few windows visible and organized. PC Tools for Windows (hereafter "WinTools") elegantly solves this problem by creating a palette of resizable "virtual screens" that you can drag items around in, or even from one mini-screen to another.

This feature, which CPS calls Multidesk, is perhaps the most compelling reason to use WinTools. It goes a long way toward quieting my biggest complaint about Windows: Multidesk makes it easy to have more than one display active at a time. That's one feature Macintosh users have long pointed to as proof of their platform's superiority.

WinTools has dramatically improved the Windows File Manager, too. (Hurray!) WinTools' File Manager sports much of the power of XTree's XTree for Windows. It is accessible by clicking on a small window containing drive icons that you can place anywhere on the desktop.

Some of the best features of WinTools are subtle. For example, it has the optional ability to delete associated programs and data files automatically when you delete a program icon. I've talked to many novice Windows users who don't understand the relationship (or lack thereof) between .EXE files and Windows icons. Beginning users often think they have lost their Windows applications if the icons or .GRP (group) files are deleted or misplaced.

The real value of WinTools is that, even if you never exploit all — or even half — of its capabilities, it has enough features that anyone can immediately start to use with virtually no training, that it can be recommended on that basis alone. Its disk-repair, optimization, backup, data-compression

and anti-virus utilities (to name a few) add more value if and when these functions are needed. And nearly everybody needs a disk-repair program sooner or later, I'm sorry to say.

## Computer Nerd-in-a-box

One feature that nearly everybody will want to check out is called System Consultant. Here, the program reports on your hardware and software configuration, much as Norton's System Information ("SI") does. However, System Consultant also makes intelligent suggestions about things you can do to improve your system's performance.

## Interface Value

Hallelujah! The right mouse button is implemented brilliantly. Much like OS/2's Workplace Shell, the right mouse button is context-sensitive. By this, I mean that when you click on a disk icon and press the right button, a menu pops up that lists disk-specific options (Copy Disk, Format Disk, Label Disk, etc.). Similarly, when you right-click on a document icon, the options are appropriate for it (Move, Copy, Rename, Print, Virus Scan, Compress, etc.). It's so convenient; it's the nicest implementation of this type of thing I've seen yet.

There are several other OS/2-like features in WinTools, too, like the way it remembers which applications you were running at shutdown time and restarts them the next time it launches. WinTools also has the useful ability to drag-and-drop documents on application icons to launch them, or on the Print File icon to print.

WinTools' features are comparable to Norton Desktop for Windows, which I suspect was its main inspiration. A few of the functions in WinTools are better implemented in NDW, notably the latter's ability to more easily find files when you are unsure of the name. For example, Norton's SuperFind allows you to type "\*FIND" and will proceed to locate files with names like KEYFIND.EXE, FIND.EXE, SFIND.HLP, etc. CPS' SmartFind utility has no comparable "wildcard-at-the-beginning-of-a-name" feature. On the other hand, SmartFind can view CorelDRAW's .CDR thumbnails directly (something NDW cannot do), which is a boon to Corel fans. Numerous other popular file formats are viewable, too, including Microsoft Word. Like NDW's SuperFind, WinTools' SmartFind can show the contents of ZIP-compressed archives. However, unlike Wintools, the Norton Desktop for Windows cannot create ZIP archives — even though the Norton Desktop for DOS can.

## Extra Goodies

Like NDW, Wintools adds a few frivolous goodies to sweeten the deal. Screensaver buffs will get a kick out of the Food Fight and Flying Beans, while naturalists might enjoy the Forest screensaver, which grows an endless variety of trees on randomly rolling hills. Each screensaver has a password security feature and both Food Fight and Beans include sound effects on machines capable of digitized audio playback.

## Problems

It is likely that more than a few PC veterans are leery of any new Central Point Software offering after the company's buggy PC Tools version 7.0 met with nearly universal disdain. While the version of PC Tools for Windows examined by *The Computer Paper* was only a beta version, it never crashed during testing. According to a Central Point Software spokesperson, the product is expected to be on store shelves by the time you read this.

The only significant problem occurred when I attempted to install Ventura Publisher 3.1 on my WinTools-enhanced system. To make a long story short, it didn't work. This is a problem that also plagues users of Norton Desktop for Windows and probably any other shell with a Program Manager replacement.

In my efforts to find a *real* problem, I deleted all the WinTools files manually instead of using the Uninstall option. Yep, that's a problem. My PC complained that files needed to run in 386 Enhanced mode couldn't be found and recommended that I run Windows' Setup program. After completely reinstalling Windows I was shocked to discover that Windows still wouldn't boot. Only after a careful reading of the READ ME file in the CPS directory did I discover the required steps to get Windows up and running again. So, use Uninstall, OK?

## Conclusion

WinTools offers a rich set of features that every PC user will find useful at one time or another, all wrapped in a user interface that is considerably more elegant than that of its primary competitor. However, I doubt that PC Tools for Windows offers enough compelling reasons for most NDW users to switch. Clearly, either package is vastly superior to the 'plain vanilla' Windows environment. WinTools is the best desktop manager for Windows so far. As a matter of fact, it makes Windows into my favorite GUI. And that is simply amazing. ■

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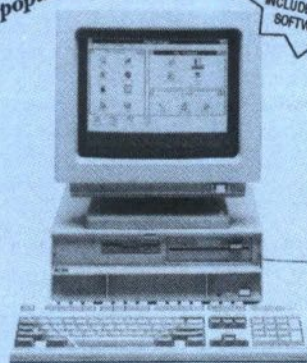
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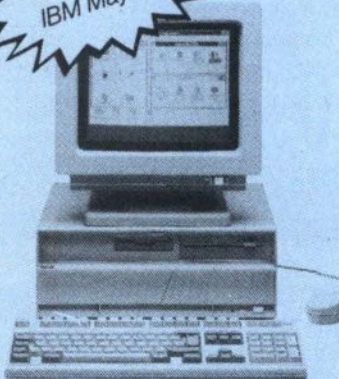
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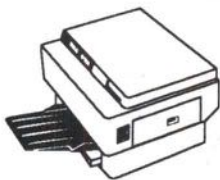
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# Dashboard for Windows

BY MARK WINDER

**Product:** Dashboard for Windows  
**Version:** 1.0  
**Requires:** 640K internal, 2MB extended RAM  
 1MB of hard disk  
 Microsoft Windows 3.x  
**Vendor:** Hewlett-Packard  
**Price:** \$99.51 (Cdn)  
**Phone:** 1-800-387-3154  
 Product # D1735A

*Rev up your IBM PC or compatible and get ready to cruise through Windows with Hewlett-Packard's new software, Dashboard.*

implies, resembles an automobile dashboard. It features a fuel gauge that reports system resource usage, an odometer that displays the amount of free memory, a printer manager, virtual desktops (called extended screens), a clock and quick-launch buttons for fast access to programs that you use frequently.

I found the installation straightforward and painless. Dashboard is installed in Windows and takes less than 1MB of hard disk space. A Windows group was automatically created that contained Dashboard, several README files and an uninstall program.

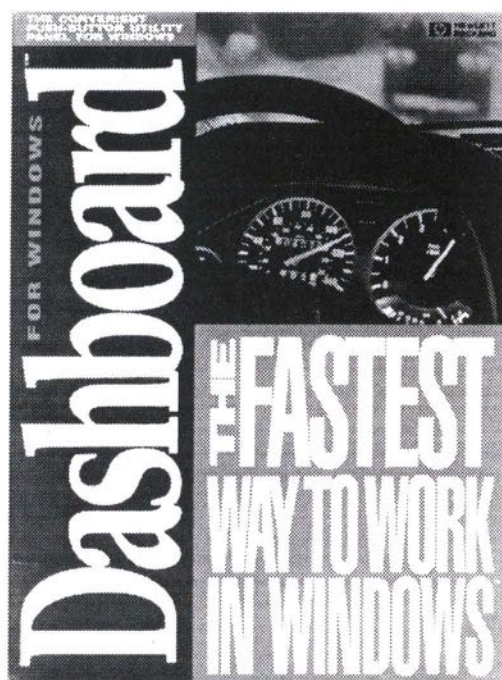
Shamefully, I admit that I then proceeded to run Dashboard and explore all the buttons before I even opened the manual.

In fifteen minutes I had completely customized the dashboard and added my own quick-launch buttons. The few times I ran into problems the context-sensitive help (the question mark icon on the far right of the dashboard) provided a quick solution.

From a system administrator's point of view, Dashboard is exceptionally easy to set up. Most of the configuration is automatic, as Dashboard uses the current Windows groups and printers. While Dashboard is a regular Windows application and can be run like any other program, it also can be used as a replacement for the Program Manager.

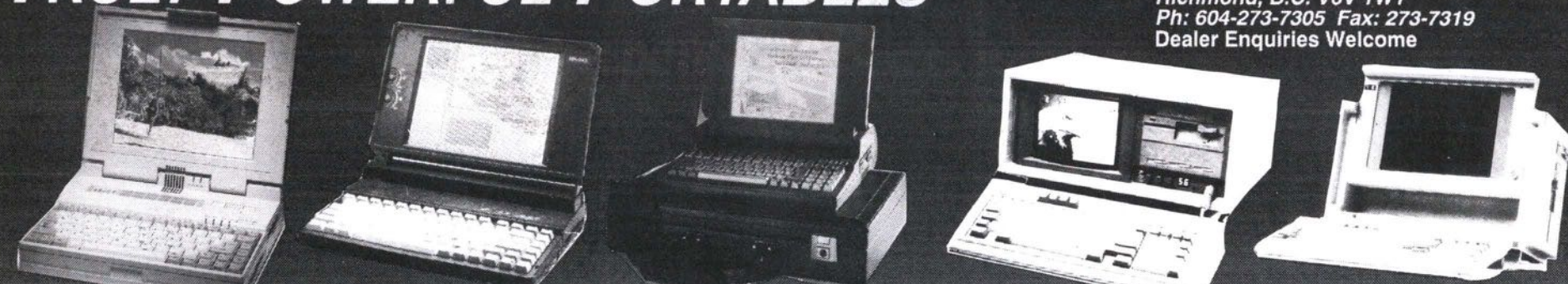
I would recommend using Dashboard as your Windows shell for two reasons. First, Dashboard does everything the Program Manager does but it is easier, faster and takes less space on the desktop.

Second, if you run both Dashboard and the



Dashboard is a Microsoft Windows 3.x desktop organizer which, as the name

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Program Manager you will not be able to move, edit, create, or delete groups in Dashboard. As the README.TXT file explains:

"After the handbook was printed, a flaw in Program Manager was discovered which limits Dashboard's ability to offer these functions [while the Program Manager is running]."

The dashboard is customized by selecting the wrench icon. The customization window is well laid out and gives you reasonable control over the appearance and contents of your dashboard. Each major item can be moved to a different location on the dashboard or removed (hidden). To make more room for extended screens and quick-launch buttons, I hid the clock and customized the title bar to display the time. I also added some humorous audio alarms (selected from nine new .WAV files) to warn me when Windows resources or memory become critically low. Incidentally, if you want sound through your PC speaker you must install a separate sound driver created by Microsoft. The driver is supplied with Dashboard, and detailed instructions on installing it are in the manual. If you are using a sound card and already have audio drivers installed, the PC speaker driver is not necessary.

Extended screens are miniature copies of the Windows desktop and are sometimes called "virtual desktops." While traditionally in Windows you have only one desktop to run all your programs, with extended screens you can create multiple desktops and run any number of programs in each. Used wisely, this keeps your desktop uncluttered and helps prevent the confusion of having many windows stacked on top of each other. For example, I have three extended screens; The first extended screen contains only the File Manager, the second I reserve for word processors and related utilities and in the third I run any other programs. To switch between the three, I select the dashboard extended screen that I want active, and the Windows desktop changes to match it. You can customize Dashboard to display from three to a maximum of nine extended screens, although the amount of room on your dashboard may dictate a smaller maximum. You can also save "layouts" so that each time you start Dashboard your applications are automatically started and placed in the correct extended screens.

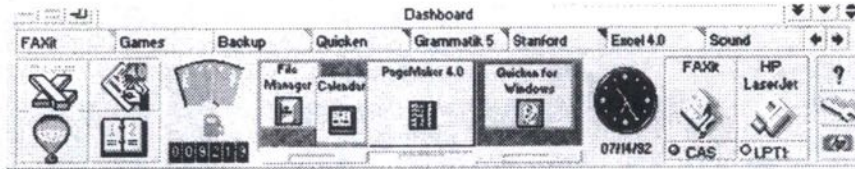
Quick-launch buttons are as easy to add as dragging an application icon from a group window to the dashboard's quick-launch area and dropping it. The icon is then displayed on the dashboard and a single pick will start the application.

Program groups are listed in a horizontal row of buttons (called the program menu) located under the title bar. A single click causes a "pop-up" menu to grow upwards to display the files in the group. Every menu also has an "Open Group" item to display the traditional group window. If you have more groups than will fit on the dashboard, scroll arrows are provided to view more group buttons. I found this annoying until I sorted the groups so that the ones I used most frequently were placed first. For added convenience, the Show Program Menu button is provided to toggle the program menu on or off to reduce the vertical size of the dashboard when groups are not needed.

Anyone who designs software-user interfaces should take a good look at this prod-

uct. Everything I commonly do in Windows is right there on the dashboard, visible and immediately accessible. Admittedly, this is not going to save me hours of labour, but it does make Windows extremely easy to use. If your job is to provide Windows support to novice windows users, Dashboard could make you and your clients happier people.

Ironically, Dashboard's greatest strength may also be one of its few weaknesses. While the user interface is intuitive and obvious, it is different than what you usually expect in a Windows application and not everyone may appreciate Hewlett-Packard's innovations. Of course, not everyone appreciated Windows when it was introduced.



Dashboard is a quality program and I am finding it an excellent shell replacement for the Program Manager. I finally got around to reading the manual and was as impressed with it as I was with the program. It was well written and well organized, and I was pleased to see that the design team members signed their names on the back cover. I would sign my name too; Dashboard is definitely a product to be proud of.

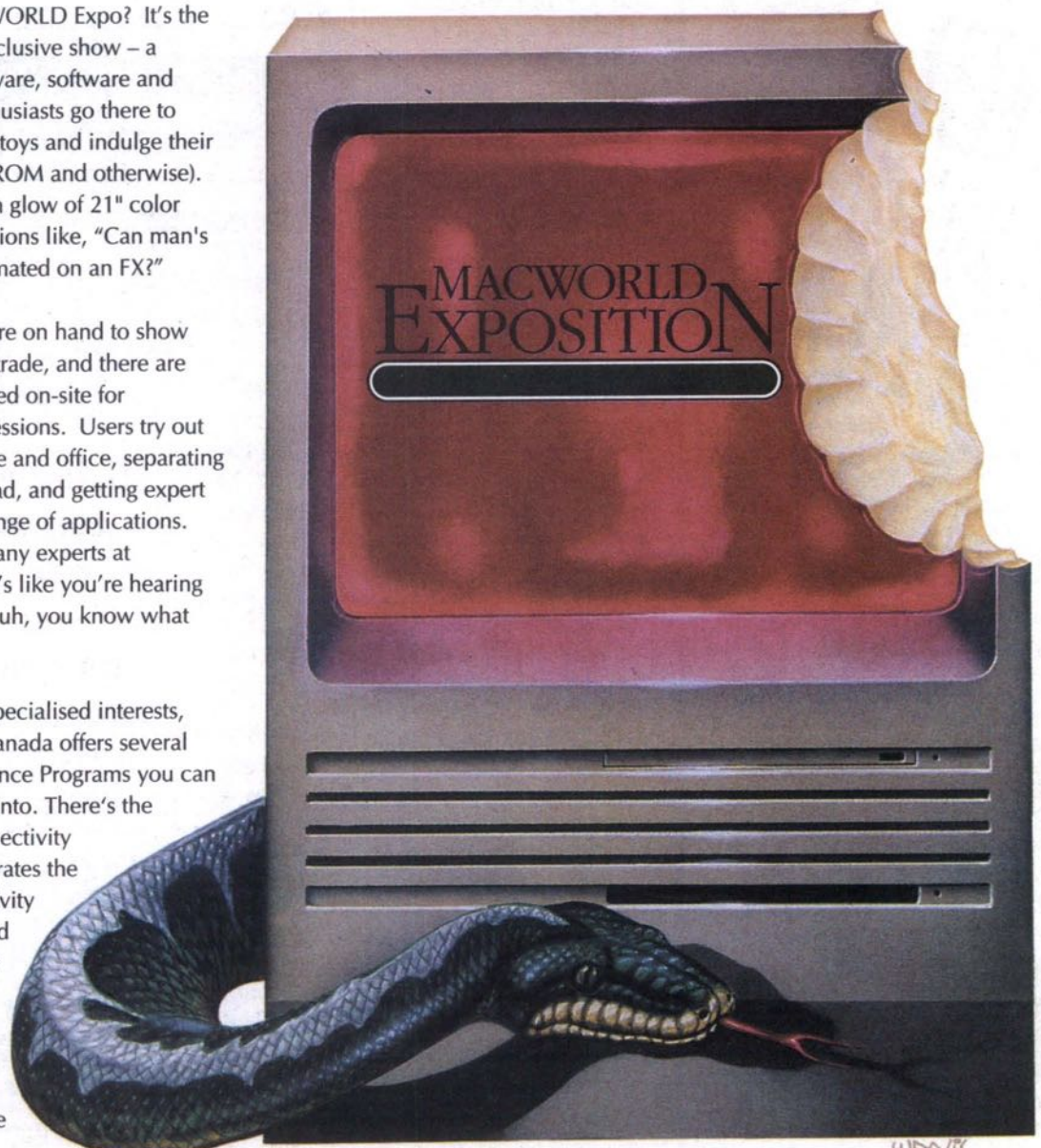
The suggested retail price of Dashboard for Windows is C\$125. ■

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Qualified Macheads are on hand to show users the tricks of the trade, and there are plenty of Macs provided on-site for impromptu practice sessions. Users try out new software for home and office, separating the quick from the dead, and getting expert critiques on a wide range of applications. In fact, there are so many experts at MACWORLD Expo, it's like you're hearing the word of G...(well, uh, you know what we mean).

For individuals with specialised interests, MACWORLD Expo/Canada offers several Pavilions and Conference Programs you can really sink your teeth into. There's the Networking and Connectivity Pavilion that demonstrates the latest in Mac connectivity solutions, an expanded Education Pavilion for K-12 and university educators, and an Electronic Prepress Pavilion showcasing innovations in creative



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and production processes. MACWORLD Expo also features plenty of information on the burning-hot combination of Multimedia and QuickTime technology, as well as a complete Multimedia Conference.

Who can resist the temptation? Take a bite out of MACWORLD Expo/Canada!



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NEW PRODUCT

# Lotus Improv

BY GEOFF WHEELWRIGHT

*A decade after it stunned the personal computer world with its pioneering Lotus 1-2-3 spreadsheet, Lotus Development is trying to reinvent the spreadsheet. Rather than tinkering with the still-popular 1-2-3, Lotus has instead developed an entirely new spreadsheet product.*

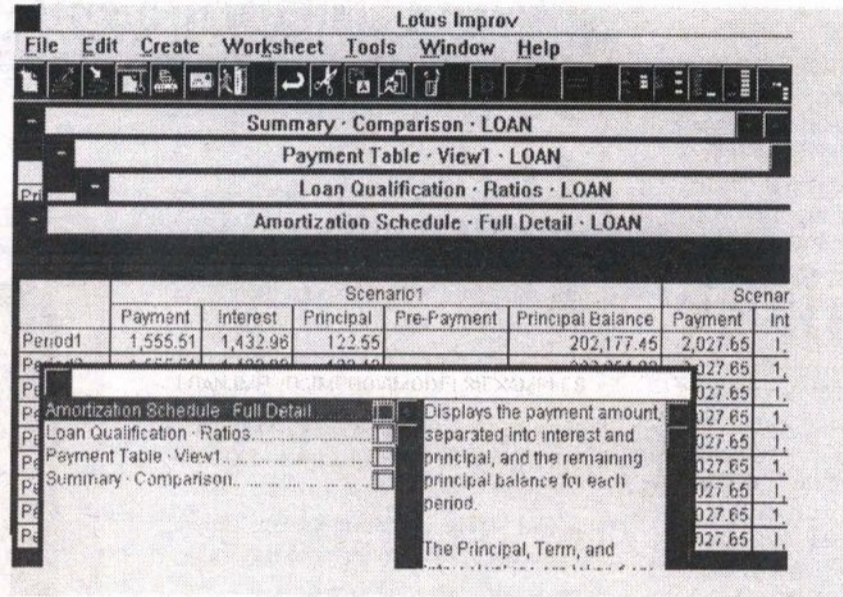
**K**nown as Improv, it is dedicated to the idea that what many corporate users want is ways of quickly building new "views" of their data — rather than having to completely rework that data in order to conduct "what-if?" analysis of the data. Improv is also supposed to help you get away from the idea of basing all your spreadsheet models on cell-related formulae and instead allows you to work with your data in a way that is easier to understand.

Rather than having to use formulae based on cell locations (ie. A1+B2+(C1\*C3)), you can simply just use English language expressions of formulae. If, for example, you want to express a formula for gross profit in manufacturing, you might express it as  $Gross\ Profit = (Unit\ Sales * Price) - Cost\ of\ Goods$ . As you can see, this way of expressing formulae for calculated data is a lot easier than anything offered in 1-2-3.

We are perhaps getting a little ahead of ourselves, however. Taking a few steps back to the basics about Improv — it is a Windows-based spreadsheet designed to allow you quick and easy access to multiple views of your spreadsheet data and both fast and flexible ways of producing graphs and charts based on that data.

It is not supposed to be a direct competitor to Lotus 1-2-3 for Windows or Microsoft Excel 4.0 for Windows — although it might well suit some users better than either of those products. You'll need a Windows-based PC with at least 4MB of RAM and some form of pointing device to use Improv. The recommended processor is a 33 Mhz 386 PC with 6 Mb of RAM.

One other important introductory note about Improv — in the short term, it is far cheaper than most of the competition. Lotus Development is selling Improv for a special introductory price of only, \$129 if you buy it before May 31 — after



**Using Improv, you can quickly and easily display, analyse and manipulate up to 12 categories of data within a worksheet at any one time.**

which it will sell for \$599.

You should by now have a rough idea of what Improv is — and how much you'll have to pay for it — so the real question is why would you want it? Probably the biggest attraction is the ease with which you can switch views. Imagine, for example,

that you have a national telemarketing operation that sells a range of products from a number of sites. In order to evaluate performance, you might want to look at corporate sales performance by region, by salesperson, by product and by month.

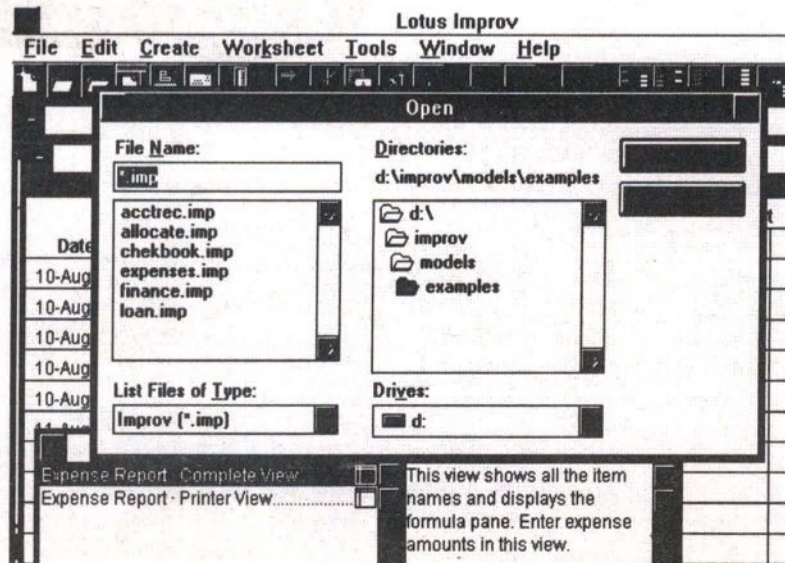
Using Improv, you can quickly and easily display, analyze and manipulate up to 12 categories of data within a worksheet at any one time. By creating multiple dynamic views on the same data, you can spot trends and pinpoint problems much more quickly than would otherwise have been the case. Creating these views is quite easy — as you can use the mouse to "drop and drag" categories — as well as quickly change the layout and organization of the Improv worksheet.

It should also be said that Improv also makes much better use of the Windows environment than did the company's first release of Lotus 1-2-3 for Windows. This may be due in part to the fact that Lotus had originally developed Improv for Steve Jobs' NeXTstep environment — which is a considerably more complex graphical environment than Windows.

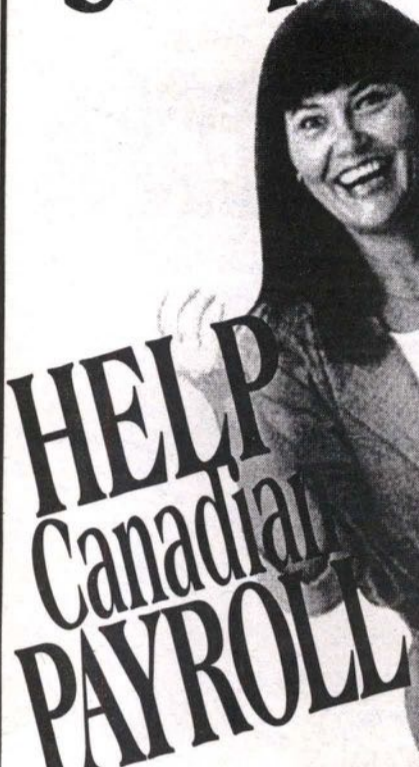
The charting options, for example, include 20 major chart and graph types — including the traditional 3D bar, line, bar, pie, scatter and area charts. As you would expect, the data in your Improv sheet and its associated graph are automatically linked so that changes in one are immediately reflected in the other.

As with the graphs in Lotus 1-2-3, you can change font types, background colors and fill-in patterns — as well as insert text, drawn images, lines, arrows, ellipses, clip art, logos, photos or OLE objects. Using the scripting facility in Lotus Improv — LotusScript — you can attach a script to a button or graph within Improv.

This scripting element is part of what



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Lotus calls its "Working Together" features — which include file compatibility, customizable SmartIcons, a live "status bar" and electronic mail enabling. The company reveals that this is the first Lotus product to introduce LotusScript and LotusChart. Improv will also exchange data, fonts and numeric formats with 1-2-3 for Windows and other versions of 1-2-3 — as well as Excel 4.0.

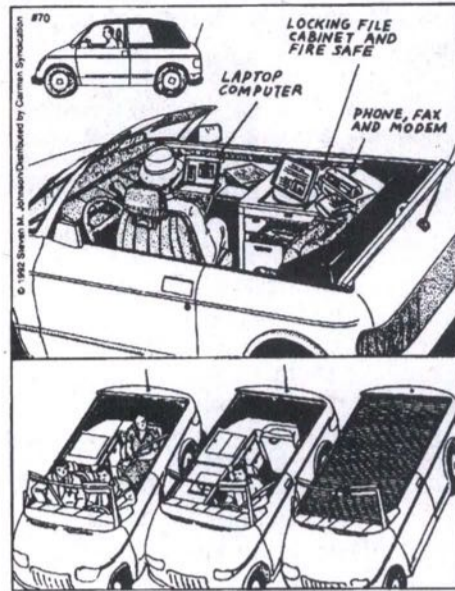
**Conclusion**

If you're looking for a different way to work with the data in your spreadsheets — or have never bothered to use spreadsheets because you found they never really did what you wanted — then Improv could well be the solution to your needs. It's innovative, comprehensive and at \$149 for the next month or so is a damn good deal.

**JAMES AT CeBIT**

Our regular column, CommTalk, is not featured in this month's issue of *The Computer Paper* as James MacFarlane is on assignment at CeBit in Germany. Be sure to look for CommTalk in next month's issue.

**Sightings BY STEVEN M. JOHNSON**



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## bookreview

# Peter Norton's Guide To Unix

FROM NEWSBYTES BY JOHN McCORMICK

*Unix is a true hacker's dream operating system, both because of its complexity and because, for the most part, it was actually written by hackers. Not hackers in the new computer vandal sense, but as the term was originally used, to describe amateurs or professionals who love computers so much that they tinker with them virtually non-stop.*

**Authors:** Peter Norton and Harley Hahn,  
ISBN: 0-553-35260-1.

**Publisher:** Bantam Computer Books,  
666 Fifth Ave.,  
New York, NY 10103.  
Phone 212-765-6500

**Price:** \$26.95 (\$33.95 Canada)

**Rating:** 4 on a scale  
1=lowest to 4=highest

**Summary:** A well-written, interesting and understandable introduction to what may well be the most versatile and important computer operating system.

Providing a decent introduction to Unix for non-hackers, or even the latest generation of computer enthusiasts who lack the culture that thrived at MIT, Berkeley and Carnegie Mellon back in the '60s, was a major challenge.

Unix grew over a period nearly twice as long as MS-DOS has existed; until now it can occupy as much as 140 megabytes of hard disk space; due to this underground growth Unix is extremely rich in commands and utilities.

While MS-DOS has about 60 commands, some with a few switches that can be used to modify the way they work, this book lists 538 commands for full-blown Unix, and that doesn't even count the commands for the built-in vi editor.

This book takes 72 pages to get to a chapter called "Preparing to Use Unix," and nearly every one page is both interesting and provides important background for those delving into this most complex of operating environments. Even an MS-DOS expert will want to read nearly every page to gain a feel for what the authors empha-

size is a culture as much as an operating system.

In some ways Unix is a dinosaur compared to MS-DOS. Just a quick example will show how different it is even at the most familiar enough with PCs to know that ASCII is a special binary code that represents 256 characters such as the alphabet, then you might be surprised to learn that Unix ASCII only has 128 characters. This is because Unix was a well-developed language by the time a "byte" was redefined by IBM as an 8-bit number — a byte was still only 7 bits long when Unix was born.

Unix also cares about whether your commands or file names have any capital letters — most current operating systems treat them all the same way.

This is just part of the introduction this book offers to the Unix culture. *Guide to UNIX* also provides an excellent introduction to what can be a very confusing aspect of Unix; the fact that, unlike MS-DOS, there are a number of command shells in Unix. While DOS's COMMAND.COM is the only command line shell users need to learn, Unix has the Bourne Shell, C-Shell, Restricted Bourne Shell, Korn Shell, Restricted Korn Shell, tcsh and even a Bourne Again Shell.

There is so much in this book that any review can only touch on what it contains, but most of all Peter Norton and Harley

Hahn provide a sense of how much fun computing used to be and still can be.

But, on a practical level, why would anyone want to learn such a complex and quirky operating system? Simple; while MS-DOS and local area networks struggle to provide multitasking and multi-user environments, these two major features are at the heart of Unix and they work well.

While it does provide a fine introduction to the basics of Unix, other books do that also; where this book really excels is in the way the authors offer a small glimpse into the culture

and fun of early computing and a look at how Unix still provides that fun to serious system-level users.

On the straight information side, the book also offers a good glossary, a brief explanation of all major Unix terms and a step-by-step tutorial that will lead beginners through their first few Unix sessions.

**Rating PERFORMANCE:** 4 Remember that this is an "introduction," and you won't be disappointed at the lack of advanced technical details.

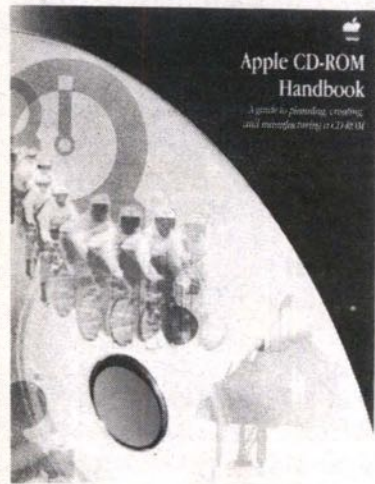
**USEFULNESS:** 4 Again, for Unix novices this provides a feel for the culture behind the operating system as well as a clear introduction to its actual use.

**AVAILABILITY:** 4 Bantam is a major book publisher and this book is not difficult to locate in larger computer-book resellers.

Contact: Kallman Communications, (914) 358-5153, or Bantam, (212) 492-9531.

**While MS-DOS and local area networks struggle to provide multitasking and multiuser environments, these two major features are at the heart of Unix and they work well.**

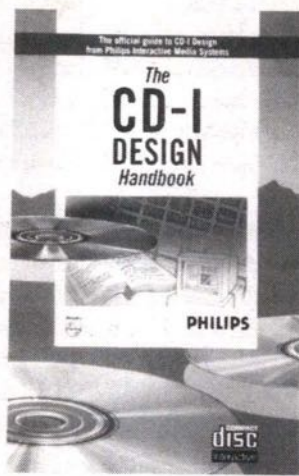
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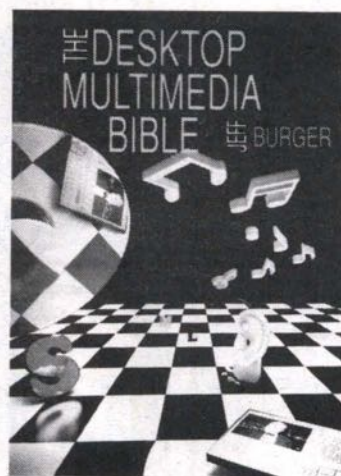
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**bookreview** BY KEITH SCHENGILI-ROBERTS

**The Internet Companion: A Beginner's Guide to Global Networking**



**Authors:** Tracy LaQuey and Jeanne C. Ryer.  
Foreword by American Vice-President Al Gore  
**Publisher:** Addison-Wesley Publishing Co. 1993; 192 p.  
**Price:** \$13.95 paperback

This friendly, easy-to-understand book is an excellent introduction to the often confusing world of the Internet.

It is highly recommended, perhaps even essential reading for anybody interested in accessing the many features available on "the Net."

It explains the basic terms used in data communications and provides instructions on how to use some of the basic tools of the Internet. The authors also guide the reader through to many of the Internet's features, from accessing the Glasnost archives to debating issues with people halfway around the world.

Besides listing the major resources available through the Internet, it also provides a guide to its etiquette, or as the authors call it: "netiquette".

The book itself is largely a product of the Internet, as its authors composed the book and sent each other draft copies through it. Add to this the fact that the Foreword by Vice-President (then Senator) Al Gore, is proof that communications services like the Internet have come of age. ■

**Silicon Mirage: The Art and Science of Virtual Reality**

**SILICON MIRAGE**

**Authors:** Steve Aukstakalnis and David Blatner  
**Publisher:** Peachpit Press, 199; 318 pages  
**Price:** \$20.00 paperback



This book is one of the first to offer readers a clear look into the field of virtual reality systems, an area which has recently become clouded and muddled by media hype.

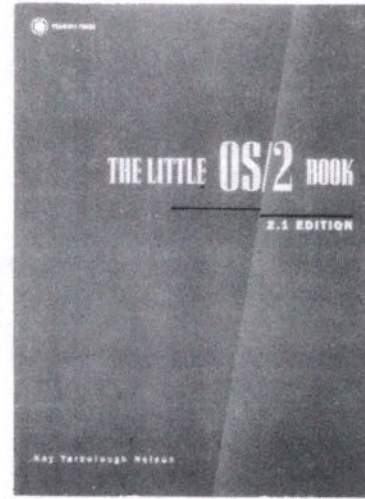
Silicon Mirage provides a complete overview of the science, mechanics and issues surrounding virtual reality, and does it in a very readable fashion. It looks at how people perceive the real world through their senses, and at how ingenious combinations of electromechanics and computers try to emulate the world of the senses for the virtual reality user. It also gives the reader a perspective on all of the current uses virtual reality systems are being put to, and ideas about their long-term implications.

The book is copiously illustrated, providing pictures for most of the equipment and systems described. This book is an excellent introduction to the potentials inherent in virtual reality systems. ■

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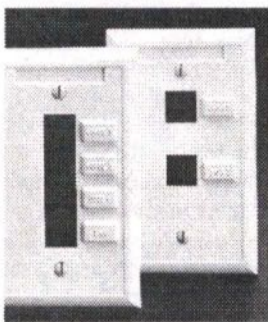
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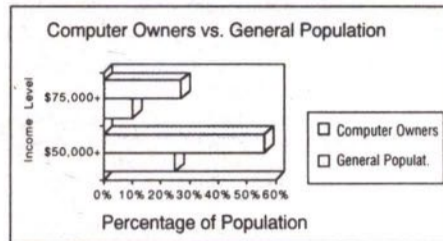
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Contact: Leviton, (514) 954-1840.

## Computers of the rich and educated

The rich are very different from you and one — they have more money and they are more likely to have computers. That is according to recent Statistics Canada numbers as well as a U.S. survey conducted for the Software Publishers Association (SPA). According to the SPA study, which surveyed 672 randomly selected households across the U.S., if there was a computer in your home, you were more likely to be better educated and make more money than the average American. (see Chart 1)



The Stats Canada numbers confirm these findings. According to them, the popularity of home computers has almost doubled in the last six years, increasing from 10.4% in 1986 to 18.6% in 1991 to 20.0% in 1992. Computer usage also varies by province. Home computers are most popular in B.C. and least popular in Prince Edward Island. Interestingly, Stats Canada excludes systems that can only play games, or which are used exclusively for business purposes. The U.S. study takes a more refined look at the way people use computers. It breaks computer usage down into five different areas: 1) brings work home; 2) home-based business; 3) personal productivity; 4) educational; 5) entertainment. This broader definition of computers probably goes along way to explaining the higher penetration level of computers in the U.S.

Contact: Statistics Canada 416-973-6586 Catalogue 64-202, Software Publishers Association 202-452-1600.

### A quiet dot-matrix printer?

Panasonic, a leading Canadian supplier of dot-matrix printers, has come out with a new twist for the declining market of dot



matrix printers — a quiet 24-pin dot matrix printer. Its new Quiet Series, claims to make it possible to carry on a phone conversation

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Contact: Stealth Computer Corporation, (416) 674-1375.

### Debut of AST's Premmia line

TORONTO — AST has announced its new Premmia line of computers — four 486-based machines with local bus architecture that are "Pentium ready."

The new machines incorporate video cards by Canadian video-card manufacturer ATI. Using the company's new mach32 technology, officials claim their process boosts Windows performance by 200 percent. The new machines will also accept the new Intel Pentium chip when it is released (expected sometime this summer), along with any new Intel Overdrive processors.

The Premmia's most distinctive features are its built-in security systems, including password protection upon start-up, and the capability of blocking access to the floppy drives and other input/output devices. This last feature is aimed at keeping unauthorized users from copying sensitive information.

Suggested pricing ranges between \$2,699 for the base Premmia 4/33s model to \$6,699 for the Premmia 4/66d model bundled with Windows.

As a further incentive, for a limited time AST is throwing in a copy of Lotus' new spreadsheet program, Improv for Windows.

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For example, my two children attend a small grade school in Metropolitan Toronto which is fortunate enough to have a modern computer lab as well as numerous computers which float between classrooms. This was due to the foresight of a former principal who lobbied hard to provide this school with the tools to educate its students for the twenty-first century.

Notwithstanding these good intentions, these computers now do very little. The staff and administration simply don't know how to make efficient use of them. These are not Amigas. They are not intuitive. It doesn't help that the software which is available in considerable quantity is "Flashcard Software". You know the kind: Add two numbers on the screen correctly and be rewarded by seeing a rocket take off.

Intuitive, multitasking software such as a paint program which produces real art and animation, wordprocessors which make children proud of their writing skills by presenting them with style, authoring programs which are simple yet powerful enough to put together an entire multimedia, interactive adventure. Only the Amiga has this kind of software (as well as "conventional" educational software) and the affordable hardware to run it.

In the instance of my children's school, for what was spent with the taxpayer's dollar, three times as many Amiga computers could have been purchased for the same money, a platform about ten times as powerful, and a computer environment which is neither intimidating, limited, frivolous nor overpriced.

## OPERATING SYSTEMS

Outside of those who are already Amiga users, very few people have an appreciation or even an understanding of the kind of operating system that the Amiga uses. This is unfortunate since in many ways AmigaDOS is superior to anything else that's available.

The most obvious advantage that most people can see right away is that the Amiga is the *only reliable* multitasking microcomputer on the market. While others are still trying to get their systems to perform this way, the Amiga has already been multitasking for 8 years. The benefits of this are enormous to user productivity and, once accustomed to it, you can never go back.

Another advantage is that the Amiga offers users a choice as to which way they're going to control their computers; the GUI (Graphical User Interface) is obvious and is very similar to the Mac interface. The CLI or command line interface however gives the user the kind of fine control over the system that a GUI can't always offer. Until the advent of Microsoft Windows, the IBM platform was strictly command line only.

A graphical interface was looked upon as frivolous or gimmicky and any computer using one was condemned as a "toy" rather than a serious business tool. In fairness, let's bear in mind that Windows is NOT an operating system as many assume. It is just like any other application that runs under MS-DOS. Apple, on the other hand, certainly recognized the advantages of a GUI but went entirely to the other extreme with the Mac! It offers no command line at all! The Commodore solution is to offer both options and let the user decide.



*The Amiga is the only reliable multitasking microcomputer on the market*

Other truly unique features of the Amiga abound, for example, shared system library routines that many diverse software programs can utilize. DOS commands be made resident in system memory for instant access but the entire ROM kernel routines can be mapped to 32 bit memory for truly amazing system performance.

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Since the release of AmigaDOS 2.0, the interprocess language AREXX has been a standard part of the operating system. This is an implementation of REXX that has been available on mainframe systems for several years now, but Amiga is the only micro that has it. This makes multitasking even more exciting and useful than ever before since it allows multiple programs to communicate with each other to form "super" applications that would otherwise not exist.

Something new to the latest versions of AmigaDOS is the capability to easily configure the system to use any of a dozen different languages at the system level; in other words, the menus, requestors, etc. are presented in the language of choice, such as French, German, Spanish, etc.

And consider this; the Amiga has the capacity to run not only its own operating system but also MS-DOS, MacIntosh, Atari, C64 and UNIX out of the same box. What other computer can claim to run even two operating systems?

## AMIGA COURSES AT AMSOFT

Our courses got underway on the 1st of April and they have proved to be both popular and well attended. Instructor Paul McCoy has designed these courses to be easy to understand yet very informative for the students, no matter what level of computer knowledge they have. No one needs to feel intimidated or embarrassed because he or she is new to the Amiga. The atmosphere is very relaxed and friendly and students can work at their own pace on individual computers.

The most popular courses seem to be Intro to Amiga, Intro to Graphics and Intro to Desktop Video. Each of these classes is 4 hours in length for a fee of \$60.00. Other courses cover specific topics and software programs more deeply. If you would like further information on any of these courses, or to register, please call or drop by the store anytime. Class space is limited so pre-register early to avoid disappointment.

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## WordPerfect 6.0 For DOS

OREM, UTAH (NB) — WordPerfect Corporation showed its WP 6.0 for DOS to North American, Australian and European industry analysts and the press this week, but the program isn't scheduled to ship until June. "It's well into beta now, and goes into beta 2 (testing) next week, WordPerfect spokesperson Jeff Larsen told Newsbytes.

Calling WP 6.0 for DOS "a product that goes beyond word processing," the company said the new version of the popular word processing program that first entered the marketplace in 1989 will include fax sending capabilities, sound support, electronic mail and spreadsheet capabilities, "allowing people to accomplish tasks never before possible with a word processor," in the words of WordPerfect president Alan Ashton.

A new spreadsheet capability allows users to including computing functions and cell formatting features as a part of the existing Tables feature. The spreadsheet feature, which is the company's own PlanPerfect incorporated into the word processor, supports up to 64 columns and over 32,000 rows. Users will also be able to fax directly from within Wordperfect, thanks to support for FaxBIOS technology and inclusion of drivers for Class 1, Class 2, and CAS-compliant fax devices.

Larsen said MIDI and digital sound are supported, allowing the user to incorporate voice notes. Clicking on the sound icon plays the sound, and buttons at the bottom of the screen allow fast-forward and rewind and speed adjustment.

A feature called Coach is designed to guide the user through selected functions, providing step-by-step instructions regarding how to execute that function. Three different editing modes — text, graphics and page — are user-selectable while editing. The text mode is what WordPerfect 5.1 provides. Graphics mode allows users to see a graphical representation of fonts, graphics and colors, while the page mode is similar, but also shows headers, footers, footnotes and page numbers. You can switch between modes as you create or edit a document.

Four types of scalable fonts are supported in version 6.0. You can select Type 1, Intellifont, TrueType and Bitstream Speedo. An included utility called WPMI installs additional scalable fonts if the user desires.

The program will also ship with a number of customized scalable fonts.

Selectable merge allows users to select the fields of the data records they want included in a merge, then set the selection criteria, such as everyone who lives in ZIP code 80901. Popular database file formats supported include Wordperfect's own DataPerfect, dBase, Foxpro, Lotus, Quattro and Excel. A feature called QuickFinder, which was introduced in WordPerfect 5.2 for Windows, allows the user to search local or network directories for a particular file, and indexes documents so the user can search for a document based on their own criteria.

The company says WordPerfect 6.0 for DOS will also support color printing, drag-and-drop graphics, wrapping text around graphic images, an Undo feature to cancel your last action, more powerful macro capabilities and better envelope creation. Grammatik 5, a grammar checking program acquired recently by WordPerfect Corporation, has been integrated into the program. The new version will take advantage of expanded or extended memory if your system has it.

WordPerfect 6.0 for DOS has a suggested retail price of US\$495 for new purchasers. Additional user licenses, with the manuals but without disks, will be available for \$349 or you can get a license without manuals or disks for \$295. A 20-pack user license without documentation or disks costs \$5,495. If you already use an earlier version you can upgrade for \$129. There's a huge market for upgrades, with an estimated 10-million WordPerfect users. Users of competitive programs like Microsoft Word can switch to the new program for \$149. The company says it will be announcing a free upgrade to the Windows 6.0 version when is released.

Minimum system requirements include an IBM-compatible PC powered by a 286 or higher chip, at least 450 kilobytes (K) of conventional memory, and 7 megabytes (MB) of free space on your hard disk for the program files. Monochrome, EGA, VGA or higher resolution displays are supported. For maximum performance, WordPerfect recommends a 386-based system, 520K of memory, 15MB of disk space and a VGA or better monitor.

Contact: Jeff Larsen, WordPerfect Corporation, (801) 228-5034.

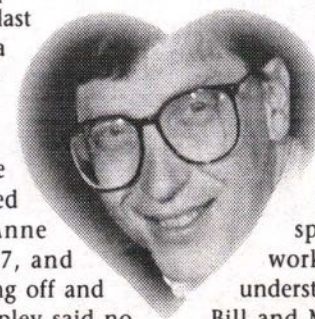
## Gates to marry Microsoft employee

Microsoft Corp. founder/chief Bill Gates is getting married. Reports from the publisher's Redmond, Wash., headquarters are that Gates was engaged last weekend to Melinda French, a product manager for the Microsoft Publisher desktop publishing program. Associated Press writer George Tibbits this morning quoted Microsoft spokeswoman Anne Rupley as saying Gates, 37, and French, 28, have been dating off and on for about five years. Rupley said no specific wedding date has yet been set. French, a Dallas native, holds a bachelor's

degree in computer science and a master's in business administration, both from Duke University. AP commented,

"Company observers long have speculated that Gates' single-minded dedication to Microsoft and his legendary long working hours might be tempered once he marries." On that, Rupley doesn't

speculate, but said, "Melinda works here as well and certainly understands our work ethic. I expect Bill and Melinda to continue to work very hard. I don't see any change forthcoming in the way we do business."



# Microsoft says Windows NT isn't for everyone

CARLSBAD, CALIFORNIA (NB) — Microsoft does not expect users to switch to Windows NT when it becomes available in the second quarter of this year, according to Dwayne Walker, director of Windows NT & Networking Products for Microsoft. Walker spoke concerning the future of Windows at the Windows Summit '93 held this week in Carlsbad, California.

According to Walker, Microsoft is aiming Windows NT at new markets unpenetrated by Microsoft operating systems and not at the average user. Windows NT is designed to move into new areas where PCs haven't been until now. "We have such a 'replacement' mentality in the software world, we assume any new product is aimed at replacing the product already on the market," Walker said.

**Microsoft sees NT as a complement and extension of the Windows family of products, rather than a replacement for the Windows operating systems currently available.**

Microsoft expects 20 percent of the current Windows 3.1 market to move to NT, Walker said. There are two versions of Windows NT planned — the Windows NT and the Windows NT Advanced Server. The difference is the Advanced Server product will have fault tolerance built in, such as mirroring and extra security features, Walker said.

Microsoft says NT will be "affordably" priced. Retail pricing is expected to be around US\$500 for NT; and upgrades from Windows 3.1, Windows for Workgroups and OS/2 users "who want to come home" will be in the \$300 range. The Windows NT Advanced Server is expected to be priced under US\$5,000.

While Windows NT will be announced at Spring COMDEX, it will not necessarily

be available then, Walker said. Responding to criticism loudly leveled by Borland President Philippe Kahn that Microsoft is big enough to ship buggy products because everyone assumes the company will fix the problems, Walker placed emphasis on Microsoft's aim to not ship Windows NT until it is ready. Walker strongly suggested

Windows NT might not ship in time for the semiannual show, which is scheduled this year for May 24-27 in Atlanta, Georgia.

In an effort to test Windows more thoroughly, Walker said the beta test program is moving into a second stage and the number of NT beta testers is expected to jump from 4,000 to 20,000. The beta II test is to be on 783 Intel platforms, 5 MIPS platforms and 13 Intel MPS systems. The beta I version couldn't print, but Walker said Microsoft is focusing heavily on printer support.

Applications are expected to be plentiful

for the new NT as Microsoft said it has sold three times as many Windows NT developers kits as it did for Windows 3.1. Walker said 5,000 applications for NT are expected, a number that is expected to double to 10,000 by the end of the first quarter of this year.

International versions of Windows NT are planned as well. Walker said 60 days after the release of Windows NT, international versions in German, French, Spanish, Swedish, Italian and Dutch would ship.

**Sightings BY STEVEN M. JOHNSON**

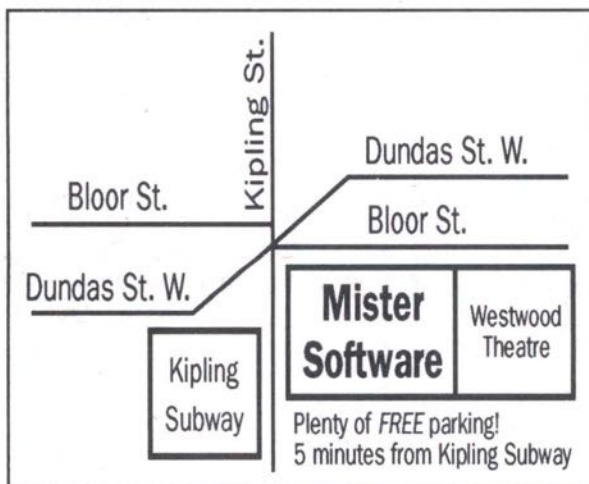


In Massachusetts, several forward-looking companies are merging office computer work stations with exercise room equipment.

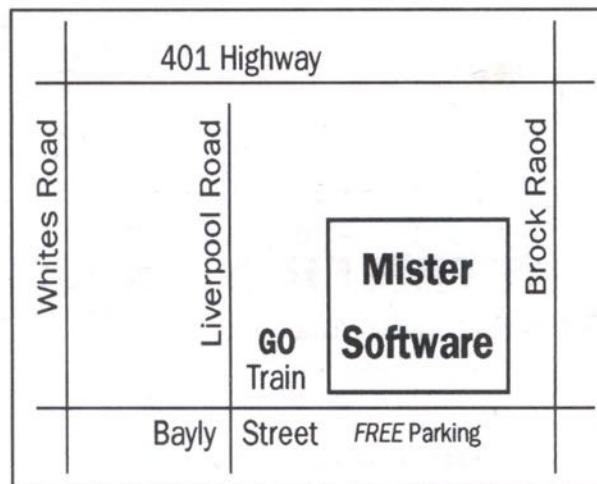
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## Symantec PC Cache Software speeds CD-ROM access 3000 percent

CUPERTINO, CALIFORNIA (NB) — Symantec has signed an exclusive agreement with Future Systems Solutions to market the Norton Speedcache+ 4.0, an all-in-one cache for hard-disk drives, CD-ROM drives, and removable media drives in both DOS and Windows.

The larger the size of the cache, the better Norton Speedcache+ performs, speeding up PC performance to provide lightning fast access to all data and programs, Symantec says. It reads only the data needed.

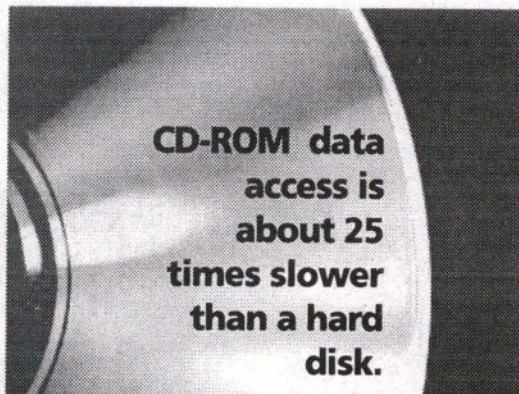
"Norton Speedcache+ is another example of Symantec's efforts to continuously enhance the operating environment with new utilities," said Rod Turner, Symantec's executive vice-president of the Peter Norton Group. "It also provides an opportunity to enter into new and expanding markets such as CD-ROM and multimedia."

Although CD-ROM drives store a lot of information, data access is about 25 times slower than with a hard disk. Norton Speedcache+ lets the user zip through CD-ROM programs such as Microsoft Bookshelf, Compton's Multimedia Encyclopedia

for Windows, Atlas, Corel Draw and other graphics and multimedia applications, Symantec says. Benchmark tests show that a typical information search through a Microsoft Bookshelf CD-ROM disk takes over three minutes compared to just nine seconds with Norton Speedcache+ installed, according to the company.

Norton Speedcache+ also allows the user to multitask and continue working while writing to disk. Norton Speedcache+ has also incorporated several advanced technologies, including dynamic read-ahead caching and intelligent write-back caching.

Contact: Ana Shannon of Symantec, (310) 449-4140.



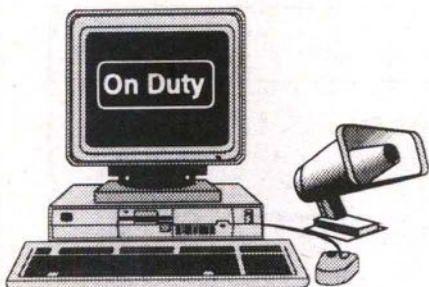
"This is a dedicated caching product," Symantec spokeswoman Ana Shannon tells Newsbytes, and adds that it operates independently of Norton Utilities and other Norton products and does not require those software packages for its operation.

Norton Speedcache+ speeds up Windows performance by up to 1,000%, CD-ROMs by up to 3,000%, DOS applications by up to 4,000%, and supports the largest cache size, up to 23MB, according to Shannon.

The product is 100-percent compatible with virtually all CD-ROM drives, Symantec guarantees, and is available now at a suggested retail price of US\$99.

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# Former Nabisco chairman tapped as IBM chief

NEW YORK, NEW YORK (NB) — Confirming rumors of the past several days, IBM has named Louis V. Gerstner, former chairman and chief executive of RJR Nabisco, Inc., to replace John Akers as IBM's chairman and CEO.

Gerstner's appointment marks the first time IBM has gone outside its own ranks to hire a new boss. That move reflects problems at the company over the past few years, which have led many observers to say new blood was needed.

Gerstner's background is outside the computer industry, although while at

American Express he gained attention by his use of information technology to help the company meet strategic goals. During his tenure there, American Express's First Data Resources unit grew to be the fifth largest provider of computer services in the United States.

More recently, he has helped take RJR Nabisco from a net loss of \$1.1 billion when he

joined the company in 1989 to net income of \$1.4 billion, while cutting debt more than in half.

Gerstner, who is 51, worked at American Express for 11 years before joining Nabisco in 1989. Before American Express, he was a consultant at McKinsey & Co., Inc., which he joined in 1965 after receiving a Master of Business Administration degree

from Harvard University. He will take over at IBM on April 1, the company said.

William Milton, an investment analyst who follows IBM for Brown Brothers Harriman in New York, wondered if Gerstner's appointment could make a difference, given that IBM is already in the midst of a reorganization and an ambitious cost-cutting effort. "There's no obvious action that a new CEO could take that's not already being taken," he said.

Contact: Rob Wilson, IBM, (914) 765-6565.

**Gerstner's appointment marks the first time IBM has gone outside its own ranks to hire a new boss. Observers say new blood was needed.**



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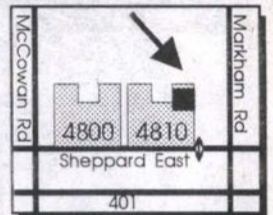
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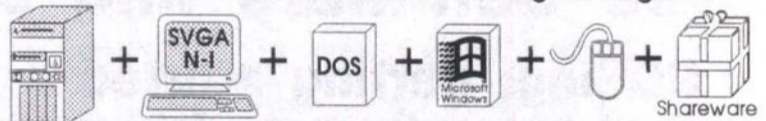
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## Sony pushing digital to broadcasters

NEW YORK, NEW YORK (NB) — Broadcasting's high quality and bandwidth requirements have made it a last bastion of analog production techniques. Most broadcast producers use expensive, customized devices for specific functions, and while some have gone digital — Qantel Paintboxes are now glorified Unix workstations — digital production has remained a far-off dream.

Now Sony, the largest factor in producing cameras and other broadcast equipment, is saying that digital is the way to go.

At the heart of its 47 new products for release at the coming National Association of Broadcasters' show in Las Vegas are new digital products aimed at broadcast post production.

Leading the list are new Digital Betacam videotape recorders. The format is compatible with its existing Betacam cassettes, which are a big standard for program producers if not consumers, and there's a migration path to coming widescreen picture formats. The launch is supported by a full line of switchers, editors, edit suite mix-

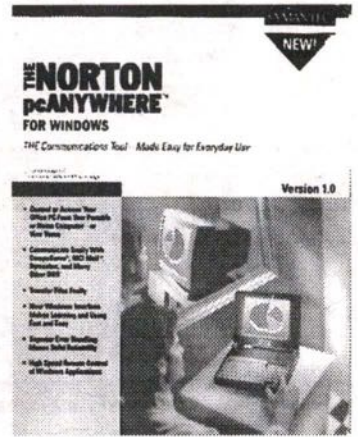
ers and monitors.

A big highlight of the new line-up is its first desktop editing system, the DES-500. It's based on a PC and combines many of the features of its existing DFX-500 effects device with a four-input video editor, audio processor and optional character and paint software.

Contact: Gerri Schmidt, Sony, (201) 930-7454.

## Remote Access PC communications Heats Up

CUPERTINO, CALIFORNIA (NB) — The battle in remote access products is heating up, with manufacturers lining up behind new standards like Novell NetWare and Microsoft Windows in order to get an edge.



Symantec has announced Norton pcAnywhere version 1.0 for Windows, which not only provides file transfers, but also claims to allow the control of a host computer from a remote location. It's aimed at workers traveling or working from home. It uses the Windows interface and offers a complete set of general communications functions, including popular terminal emulations and file transfer protocols.

Data compression and error correction facilities are also included, and installation on a local area network offers a software gateway for modem sharing, with drivers for over 90 modems. There's also a built-in script editor. The retail price is US\$199.

Microcom has responded with Carbon Copy for Windows 2.0. Launched in the UK last week, this package offers point-to-point connections across a LAN, dial-out connections to LAN, and PC-to-PC communication via modems. Super VGA is also supported, and the new product is compatible with the DOS Host program in Microcom's Carbon Copy for DOS. Its U.S. list price has been set at the same level as pcAnywhere (\$199) and free upgrades will be provided to buyers of Version 1.0 after February 1. Users of any brand of remote software can upgrade to the new version through June 30 for \$49.

Traveling Software's entry, which does not offer remote control but only file transfers, is LapLink V for NetWare, which it calls the "single most important step we have taken with our LapLink product," in the words of CEO Mark Eppley.

The new package includes SmartX-change, providing the ability to automate any file transfer over cables, modems, or a Novell network. File transfers can be scheduled to run unattended, and a "record" function, like that used to automate scripting on communications software products, is included. The software also features the Universal Communicating Object (UCO) technology allowing for links with computers that don't have the program. The current Canadian suggested list price for pcANYWHERE is \$179.

Contact: Symantec 1-800-NORTON-1.

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- 4 Use the password NEW
- 5 Explore the BBS for up to 20 minutes
- 6 Before leaving, enter "Chuck's Office" and purchase a membership.  
You can get a free demo account as well.
- 7 Call back after the next business day and your account should be active.

Turn on your modem and dial **538-9999**

**CALENDAR OF EVENTS**

**APRIL**

**ONTARIO COMPUTER FAIRS** April 18, 1993, in Kitchener, Ontario. Over 50 tables with a selection of computers, software, peripherals and games. Contact: James Creighton (416) 535-3761.

**THE SECOND INTERNATIONAL BEAM ROBOT OLYMPICS & MICROMOUSE COMPETITION** Thur. April 22 to Sun. April 25, 1993, at the Ontario Science Centre, Toronto. Robot judging will be based on sophistication of behavior, novelty of design, efficiency of power source and quality of hardware. Rules and guidelines are available. Please contact Mark Tilden (519) 885-1211, Ext. 2454.

**THE CANADIAN HIGH TECHNOLOGY SHOW** April 27 & 28, 1993, at Place Bonaventure, Montreal. An electronics showcase of exhibitors. Four show sections: Components & Microelectronics; Design Automation; Electronic Production & Packaging; and Test, Measurement & Instrumentation. For professionals from the high-technology industry or users of electronics. Trade only. The show and the Conference Program will be running concurrently. For more information call Reed Exhibition Companies (416) 479-3939.

**IMEC '93** April 28-30 at Exhibition Place, Toronto. Featuring Multimedia technology including: interactive video, CD-ROM, laserdisc technology, computer-based instruction, CDTV, DVI and CD-I. Seminars as well as an opportunity to see these technologies applied to the fields of Industry/Business, Medicine and Healthcare, Education in Training and Languages. For more information contact Tony Paul, in the east, at (416) 620-1078 and in the west, Vernon Samaroo at (403) 448-9181.

**ECOO - Educational Computing Organization of Ontario's 14th Annual Conference.** April 29 to May 1, 1993, at the Regal Constellation Hotel, Toronto, Ontario. Over 200 presenters in a multistranded conference. Pre-workshops and a large vendor area (including all the industry leaders) are available. For more information contact the ECOO office at (416) 773-3981 or fax (416) 773-6963.

**PC EXPO** April 30, May 1 & 2, 1993, at the Palais des Congres de Montreal. Estimated attendance 15,000. Contact: Industrial Trade & Consumer Shows Inc. 1-800-361-0329.

**MAY**

**SOFTWARE WORLD CONFERENCE & EXPOSITION** May 4-6 at the Metro Toronto Convention

Centre. The most extensive Canadian computing event returns to Toronto stronger than ever with Client/Server World at its side. Over 75 industry experts and more than 100 leading software companies. Contact: DCI (Digital Consulting Inc.) at (508) 470-3880.

**NETCON CARAVAN EXHIBITION & CONFERENCE** May 6-7, Ottawa Congress Centre. Focusing on Networking and Connectivity. For more info. call 416-497-9562 Ext 381.

**CANADIAN HIGH TECHNOLOGY SHOW.** May 5 & 6, 1993, Toronto, ON. Contact: Reed Exposition Companies. Tel: 203-964-0000.

**VARDEX '93** with an added Unix section, May 5 & 6 at Toronto's International Centre. Contact: Marina Perry, Reed Exhibitions (416) 479-3939.

**PROFESSIONAL AMIGA TECHNIQUES FOR VIDEO AND MULTIMEDIA** May 6 & 7, 1993, York University Instructional Technology Centre, North York, Ontario. \$321 (GST included) for both days. For more information, contact Amy Louzon, Commodore Business Machines, 3470 Pharmacy Avenue, Scarborough, Ontario M1W 3G3, (416) 499-4292 or Fax (416) 494-9755.

**RADIOCOMM '93** May 26-28, 1993, at the Metro Toronto Convention Centre. Canada's only trade show dedicated to mobile communications. Hours: Wed. May 26 10 a.m.-6 p.m., Thur. May 27 10 a.m.-6 p.m., Fri. May 28 10 a.m.-3 p.m. For more information, contact Harley Austin, Show Manager, or Carole Meyer, Assistant Show Manager (416) 252-7791 or Fax (416) 252-9848.

**MULTIMEDIA '93 EXPOSITION AND FORUM "The Merging of Technologies"** May 26-29, 1993, at the Metro Toronto Convention Centre, Toronto. Featuring: Multimedia Communications, Vicom, Electronic Design and Showcase on Production. Conference Trade Show May 27-29, 1993. Contact Susan Blair (416) 660-2491.

**JUNE**

**CONSUMER ELECTRONICS SHOW INT'L-SUMMER** June 2-9 1993. Chicago, IL. For more info contact: Sam Lippman at The Electronic Industries Association 202-457-8700.

**TORONTO FOXPRO DEVELOPERS CONFERENCE** June 11 & 12, 1993, at the Sheraton East Hotel in Toronto. This Conference will bring together some of North America's best known database developers for two days of seminars, workshops and panel discussions. To register call 1-800-268-2841 Ext.35.

**JULY**

**COMDEX/CANADA** July 13-15, 1993, at the Metro Toronto Convention Centre. The 1993, show is, in a sense, a continuation of the LAN Expo and Windows World. Contact: Kim Pappas, The Interface Group (617) 449-6600.

**WINDOWS WORLD-Canada.** July 13-15, '93. Toronto, ON. Contact: Interface Group: 617-449-6600.

**SEPTEMBER**

**THE ATLANTIC CANADA COMPUTER SHOW** September 15-16, 1993, at the Halifax Metro Centre, World Trade & Convention Centre. 10th show. Business, government and other organizations can find out how computer technology can help them become more productive and profitable. A showcase of the latest products and services. Contact: Fred West, Show Manager (416) 252-7791.

**MACWORLD EXPO** September 20-22, 1993, at the Metro Toronto Convention Centre. The newest innovations of interest to all MAC users, even bigger than the '92 show! Contact: Brukar International (416) 620-1078.

**NETCON '93** September 29-30, 1993, at the Automotive Building Exhibition Place, Toronto. The only show in Canada dedicated exclusively to networking and connectivity! Sponsored by Plesman Publications Ltd. Contact: Chuck Armitage, Show Manager (416) 497-9562.

**OTTAWA BUSINESS & GOVERNMENT COMPUTER SHOW** September 29 and 30, 1993, at Lansdowne Park. Contact: Industrial Trade & Consumer Shows Inc. (613) 232-0766.

**SEMINARS**

**CLIPPER DEVELOPERS ASSOCIATION OF TORONTO** Saturday, April 17/93 Clipper 5 Basics - The Preprocessor, arrays, code blocks, etc., by Rod Da Silva, full day session. To register call (416) 771-6675.

**ROYAL YORK HOTEL** April 20, 1993, in Toronto. The Toronto Chapter of the DPMA presents a talk on: "An Effective Approach to Job Searches for I.T. Professionals" by John Archer and Robert Half. Contact: John Hobbes (416) 738-2337.

**TELECOM SEMINAR "Managing the Meridian 1, The Next Generation."** An in-depth coverage of the technology, security and management of the Meridian 1 and Meridian Mail. April 26-27/93 Toronto, May 3-4/93 Ottawa, May 10-11/93 Vancouver, and May 17-18/93 Montreal. Contact: Gene Pellerin (613) 966-2721 or Fax: (613) 966-8038.

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tal of effective design using desktop publishing and develop a sense of "visual literacy" to go beyond the basics for dynamic results! Tues. April 27, 1993, Park Plaza Hotel, Four Avenue Road, Toronto, ON. 416-924-5471.

**DESKTOP PUBLISHING IN COLOUR.** May 12 '93, Holiday Inn, Mississauga, ON. May 14 '93, Embassy Suites, Markham, ON. To register call Michael Kieran at Desktop Publishing Associates 416-480-1376.

**CUTTING THE COST OF SOFTWARE DEVELOPMENT** This seminar will introduce you to the new practices and show you how to start by applying inspection now. Contact: Kathy Mahoney, Ottawa Carleton Research Institute 613-592-8160.

**INTERNATIONAL**

**WORLD COMPUTER LAW CONGRESS '93** April 25-28, 1993, at the Hotel Del Coronado, San Diego, California. Global Success in the Computer Industry: Putting the Business, Legal and Marketing Resources Together." For more information contact Michael D. Scott, World Computer Law Congress (213) 689-5186.

**ZIFF INSTITUTE'S INTERACTIVE CONFERENCE '93.** Addressing a broad range of emerging

applications in interactive technology. May 3-6, 1993. Anaheim Convention Center, Anaheim, CA. For more info call: 617-252-5009.

**LOTUS WORLD** May 3-6, 1993. Hynes Convention Center, Boston, MA. Workgroup Computing, Technology Management, Knowledge Working, application Development and Technology Trends. These are among the many topics to be addressed by top industry experts, writers, analysts and senior Lotus management. Call 508-443-3330.

**APPLE WORLDWIDE DEVELOPERS CONFERENCE** May 9-13, 1993. San Jose, CA. Contact: Danieli & O'Keefe 800-833-7751, fax 508-443-4715.

**MICRO FOCUS USERS CONFERENCE** May 10-12, 1993. Buena Vista Palace/Orlando, FL. \$745 U.S. before 4/1/93, \$845 U.S. after 4/1/93. Contact: Micro Focus Users Conference Headquarters, Palo Alto, CA. Tel: 415-496-7356.

**SUNWORLD '93.** May 11-13, Moscone Center, San Francisco, CA. Dedicated to Sun workstations, featuring a full conference program, including all-day technical tutorials. For more info call 1-800-545-EXPO or Fax: 508-872-8237.

**COREL DRAW-The Next Generation.** International User Conference. May 16-19, 1993. Grand Hyatt Washington, Washington, DC. To Register call 617-235-5560.

**VIRTUAL REALITY '93** MAY 19-21 1993. San Jose, CA. Focusing on VR in design, entertainment, military, medicine, networking and training. For more info contact: Meckler Conference Management 203-226-6947.

**COMDEX-Spring** May 24-27, 1993. Atlanta, GA. Contact: The Interface Group: 617-449-6600.

**WINDOWS WORLD** May 24-27, 1993. Atlanta, GA. Contact: The Interface Group: 617-449-6600.

**NEXTWORLD EXPO '93** May 25-27 Moscone Center, San Francisco, CA. NEXTWORLD Expo combines three events in one: A worldwide Developer's Conference; an end-user product show, with over 100 exhibitors. A User Conference program with topics ranging from object-oriented, client/server systems to enterprise-wide deployment. With the theme NEXTSTEP 486-The alternative to the Microsoft Monopoly. Call (800) 767-2336.

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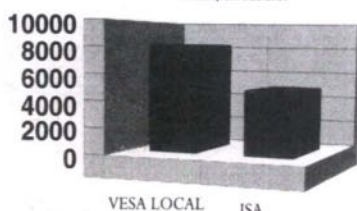
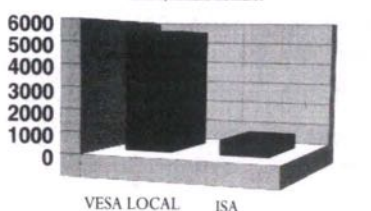


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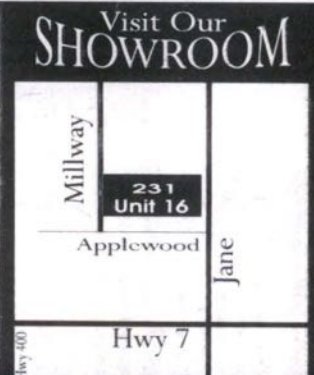
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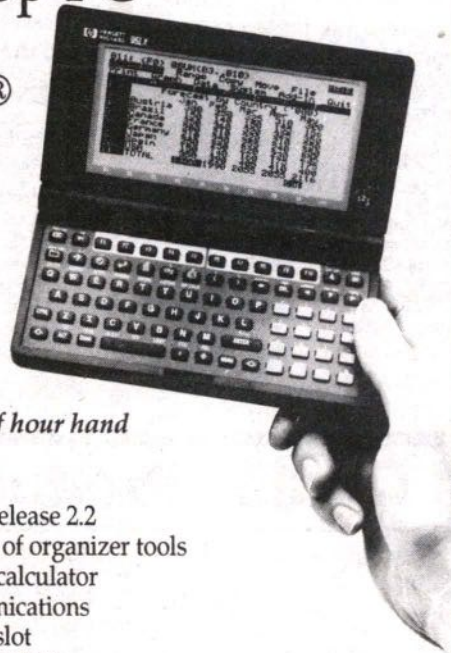
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**CANADIAN COMPUTER GRAPHICS ASSOCIATION** — CCGA's mission is "to provide education and information in computer graphics technology and its applications". At special events members are informed of developments in the industry, and provided a networking forum to develop career and business opportunities. Additional benefits include: insurance, newsletters, subscriptions, employment liaison office, and annual art & design competition. CCGA, 2175 Sheppard Ave. E., Suite 110, Willowdale, Ontario, M2J 1W8. Fax: 491-1670 Tel: 491-2886.

**CASE SPECIAL INTEREST GROUP** — A special interest group or SIG is currently being formed to help meet the needs of people interested in learning more about CASE. The purpose is to provide a forum where members may share their experiences. Experienced users or those contemplating introducing CASE to their organization are invited to call either Joe Da Silva at 252-1408, or Rob Beckman 928-2694.

**CASE** — Computer Aided Software Engineering is open to anyone interested in being tool independent, and technology independent. 1-1 1/2 hours, monthly scheduled meetings. Vendor presentations as well as individual. BBS 497-5263, (log on if MIS Affiliated messages, into Tech 2nd category called CASE). Contact Joe Da Silva at 252-1408 or Rob Beckman at 928-2694.

**CLUB CUBASE** — Toronto area users of Steinberg Software products, especially their powerhouse sequencer Cubase, now have a forum to share information and develop their skills. Club Cubase meets at 7:30 pm on the last Monday of every month, in Room C426 at the Casa Loma Campus of George Brown College - 160 Kendall Ave. For more information contact Club Cubase at 62 Hamworth Drive, Willowdale, ON, M2H 3C2 or call 496-9905.

**CLUB MAC COMPUTER GROUP OF ONTARIO** — All Mac users, Macintosh OS & related issues, meets 2nd Tuesday, Michener Institute, 222 St. Patrick St., Toronto, 7 pm to 10 pm, infoline 462-1702.

**COMPUTER TRAINERS' NETWORK** — A group of teachers, tutors and consultants who meet the first Thursday of every month, to discuss training or computer-related issues. Meeting format consists of refreshments, business portion, guest speaker and memberships available. Location: 121 King St. W., 24th Floor, Toronto, Ontario. For more information please call Veronica of Vision Computer at (416) 323-0406.

**CYBERPUNK RESEARCH LABORATORIES** — Merry hackers in search of picturesque; mountains, RAM and fairytales. For further data write c/o CyberPunk Research Labs. - Seneca College of Communication Arts, 1124 Finch Ave. West, North York ON M3J 3J3.

**ELECTRONIC GAMES PLAYERS' ASSOCIATION (EGPA)** — EGPA announces the start of their Canada-wide search for computer and video game players interested in swapping their used games. As a member of the EGPA, individuals will be able to exchange game software. Members will also be able to buy used games without a trade. Membership available for the first year with an annual renewal. If you are interested in joining or would like more information. Please send \$1 to cover postage and handling to: EGPA, 292 Patricia St., North Bay, Ont., P1B 7Z3. The one dollar is applied to your membership fee.

**FOXPRO TORONTO USERS GROUP**. Wednesday April 28 '93. Meeting Room #2, North York Public Library, 5150 Yonge St, North York. Meeting starts at 7:30p.m. to 9:30p.m.

**IRMAC** — Information Resource Management Association of Canada: dedicated to data management, IRM, data dictionaries, CASE, and strategic planning in the corporate environment. Monthly meeting in Toronto, Ottawa, and Victoria. (416) 960-6508.

**K.R.D.** — 1995 (The Kidstuff Reunion Drive Group For 1995) At 144 Gillard Ave., Riverdale. Tel: 461-1343. Call for meeting dates 11AM Saturdays. Group's focus is to collect 1975-6 Canadian pennies in order to

reassert interest by signing a petition to reinstate the 1975-76 CTV Show "Kidstuff". Computer Kidstuff 1995?? 2005??. Ask for Jeffrey Leitner (415) 461-1343.

**KW-MUG** — 376 Peel Street, New Hamburg, ON, N0B 2G0, (519) 662-2627. Focus: Public domain distribution; reviews of current software; meetings variable, no fees.

**LOGIC** — An Independent Apple User Group: Provides a support and information network to users at all levels. LOGIC accomplishes this by: holding monthly meetings, hosting Special Interest Group meetings, providing an electronic bulletin board, publishing the Maple Orchard magazine (free to members), and maintaining an extensive library of shareware and public domain software. Meetings 1st & 3rd Tuesday of the month, North York Centre, 5110 Yonge St., in the Memorial Hall at 7:30 pm. Messages (416) 323-0828 BBS (416) 487-9771.

**NEXT USERS GROUP** — Nextcomputer support, 2nd Thursday, Toronto Western Hospital, corner of Bathurst & Dundas, yellow elevator to 6th floor, 7:00 pm, Daniel O'Connell (416) 365-1899.

**PCCT (PERSONAL COMPUTER CLUB OF TORONTO)** — PC users, 3rd Tuesday, St. Gabriel's Community Centre, 672 Sheppard Ave. E. (2 blocks East of Bayview, North side), North York, 7:00 pm, membership includes shareware, BBS, special interest groups (SIG's) & workshops, information (416) 244-6786.

**STC** — Society for Technical Communication: Dedicated to the advancement of the theory and practice of technical communication in all media. The Toronto chapter has over 250 members. Meetings from Sept.-June, at Sun Life Assurance Company of Canada, 150 King St. W., on the 2nd Tuesday of each month. For more information contact Christine Mills at (416) 595-7690, or George Klima at (416) 448-3623.

**TAF (TORONTO ATARI FEDERATION)** — Atari users, 3rd Thursday, North York City Centre Library, 5110 Yonge St., (at Park Home) 7:00 pm, public domain library, regular demonstrations & guest speakers, infoline 425-5357, BBS 235-0318. Non-member admission \$2, membership \$30 (incl. newsletters).

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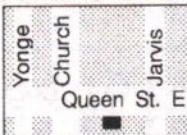
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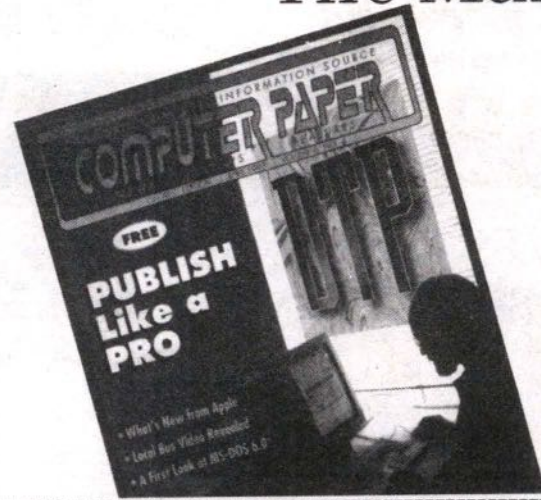
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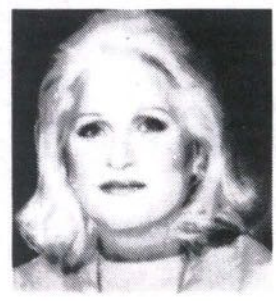
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