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GREATER TORONTO EDITION JANUARY 2003 VOLUME 16 NO. 01



Tablet PCs unveiled

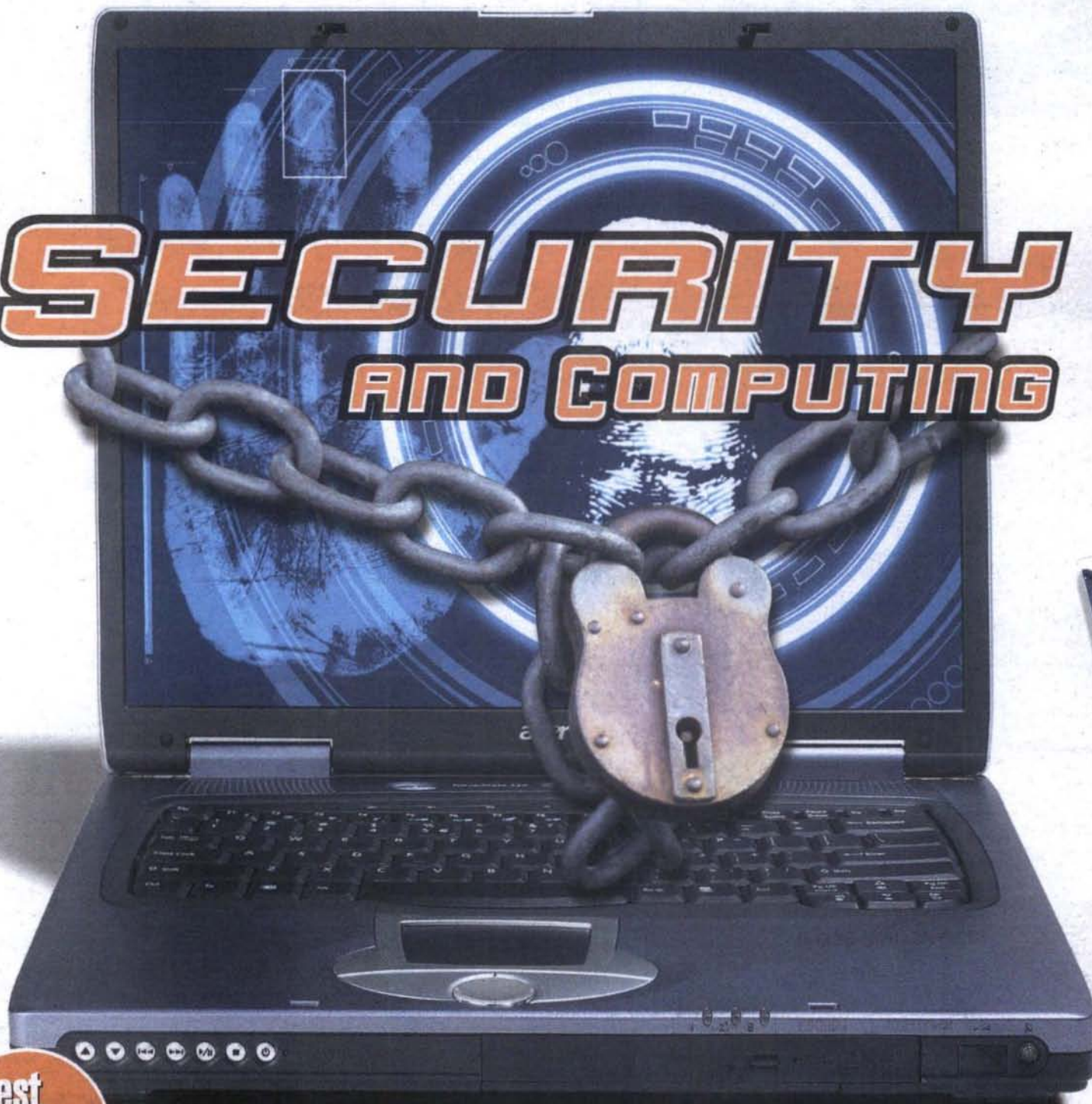


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Distribution begins.....Wednesday, Mar. 12, 2003

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# Resetting the bar



FROM THE EDITOR

In an office supply flyer that came in the morning newspaper, Palm's new Tungsten T (arguably the best Palm ever) is listed for a few cents shy of \$800. A page later, Compaq's mid-range iPaq 3850 Pocket PC is advertised for \$650.

In looking at these prices, I can't help but think back to a news conference I attended a couple of weeks earlier. Anthony Bonadero, Dell

Computer's director of worldwide mobile products, stood up and basically said handhelds are way overpriced. Bonadero was, of course, just setting us up for the punch line: Dell is getting into the Pocket PC handheld business and pricing will be a key strategy. When Dell talks about competitive pricing, other computer vendors get nervous, and a line in Bonadero's slide presentation that was written in bold red will surely make handheld vendors squirm: "significantly undercut current PPC Pricing."

He then passed around samples of the Axim X5 line. They didn't seem like bargain basement devices at all: TFT colour screens, the very current Intel XScale processor, and Windows Pocket PC 2002. So, what does "significantly undercut" mean to Dell? When I wrote this, Dell Canada's Web site listed the entry-level 300 MHz Axim for \$408 (\$379 if you forego the cradle for a plain USB sync cable) and \$549 for the 400 MHz unit. Plus Dell is offering an \$80 mail-in rebate, so the effective price is as low as \$299.

I admit my bias to the Palm OS, but when faced with a more than two-to-one price difference on the latest technology both platforms have to offer, I have to pause. And that's exactly what Dell wants anyone in the market for a new handheld computer to do. Palm fans may still go with Palm, but they'll be a dwindling lot if they have to pay twice as much—after all, Palms are typically cheaper

than Pocket PC devices. On the Pocket PC side, where models from various vendors are functionally similar, price differences will be a significant factor. I expect the next few quarters in the handheld sector will be bloody.

## Resetting the bar: Part 2

Going from little platforms to big, another development sure to shake up the personal computing landscape is the introduction by Intel of Hyper-Threading (HT) in its latest Pentium 4 processors. Intel has put an extra counter on the latest 3.06 GHz processor, which allows it to execute tasks in parallel. A threads-aware OS like Windows XP will think it now has two CPUs at its disposal and will distribute the work to account for that. The net result, according to Intel, is a performance boost of up to 25 percent.

However, it's not just a boost in straight-line performance; HT will also change the nature of how you do things on your computer. The catch phrase Doug Cooper, Intel of Canada country manager, used to describe it was "performance beyond megahertz." He said humans multi-thread naturally, and gave the example of cooking a meal, where a lot of sub activities need to be done simultaneously. But up to this point, desktop processors have executed instructions sequentially. The multitasking we enjoy is because the single processor is fast enough to time-share the tasks at hand. However, this breaks down when you have two processor-intensive tasks competing for CPU time; for example, burning a CD while playing a game.

At an event to announce the new processor, Intel of Canada demonstrated how this works by running the same application sets on two

identical systems, but with HT turned off on one. In the computer with HT disabled, CD writing was put on hold for as long as the game was played. On the system with HT enabled, the CD recording was completed without a break in the game play. Cooper ran through a few scenarios of the types of performance boost HT gives with a mix of business and recreational applications.

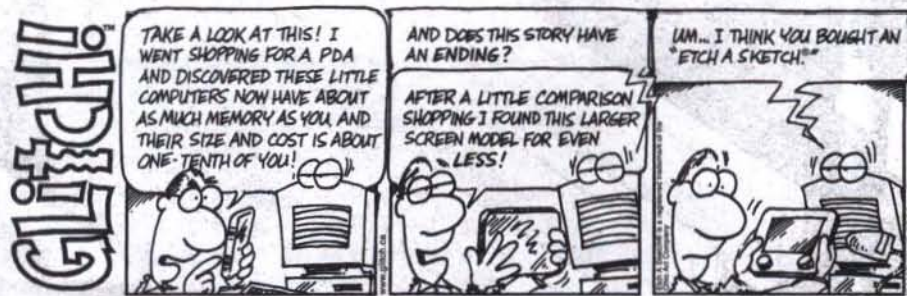
Intel sent us a sample of the processor prior to the official announcement, so we were able to test the performance ourselves. TCP Lab Editor, Sean Carruthers, notes that the performance increase is real, although our benchmark suite didn't show a 25 percent boost.

Still, the foundation for future desktop computing has been laid. Cooper said Moore's Law is still accurately predicting the CPU's advance, with 10 GHz processors likely by the end of the decade. He also said there was no theoretical reason why the number of counters on the CPU could not be increased. So, the real measure of performance will shift from how fast the CPU clock is, to how many processes it can handle in parallel.

## Best of the season

On behalf of everyone at *The Computer Paper*, thanks for the support you've given us during the year past. Best wishes for the holiday season, and may we all share in a prosperous, safe, and sane new year.

David Tanaka, Editor



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**I can see too**

Thanks for that article in the November issue called "I can see! I can see!" I have long felt that the needs of computer users have largely been ignored by the optometry profession. Why is it so difficult for an optometrist or ophthalmologist to adjust a prescription to meet a customer's specific needs? It's not rocket science!

Rob Mayhew

**Portfolio a movie star**

The portfolio was a great Atari product (see "Letter from the Editor," TCP December). I wish I had purchased one at the last Atari show in Toronto back in '92. Just a note of interest, the boy John in *Terminator 2* used an Atari Portfolio to break into the ATM machine and access the security card entrance in the lab where the Terminator arm and chip were stored.

Michael De Jong

**'Perfect' depends on point of view**

The "perfect handheld" (see "Letter from the Editor," TCP December) does not exist

because of politics, plain and simple. Besides the political issues, people may disagree as to what the perfect handheld is. I feel the most important part of a computer is memory and storage capacity.

Current high-capacity MP3 players have enough capacity to act as desktop replacements (for a 486 or 68040 anyway). For example, the Apple iPod has a least 5 GB of disk space, as well as 32 MB of RAM (calculated). The performance needed to decode MP3 files means the computer has the processing power to run most text-based (and some graphical) programs without difficulty. A PDA with comparable specifications costs twice as much.

There are two main obstacles to using an MP3 player as a computer: limited [input and output], which can be resolved by tweaking the USB port. But the fact is, the companies selling these high-capacity MP3 players refuse to release the specifications required to install your own OS. Products I specifically asked about include: Apple's iPod, Archos' Multimedia Jukebox, Diamond's Rio Riot, and Toshiba's MEG50AS Portable Digital Audio Player (Gigabeat in Japan). The answer was always "no."

With an MP3 player running Linux (possibly using morse-code input), you would be able to log in "remotely" through the USB port using a USB-parallel adapter and

PLIP. This would mean you can take advantage of the large screen offered by the Atari Portfolio you mention, or a legacy laptop; when needed. When all is said and done, I guess I'm really looking for the perfect sub-notebook.

James Phillips

**Fiddling for compatibility**

In his article, "Is true compatibility achievable?" (TCP, September), Marvin D. Silbert indicated that WordPerfect 7.0 will not operate under Windows XP. I decided to try anyway. With the help of the Windows XP compatibility wizard, I was able to run the installation program for the Corel WordPerfect Suite 7, and installed WordPerfect 7. However, every time I tried using WordPerfect 7, I saw an error message, and the program shut down.

On the other hand, I noticed no problems installing and running Corel WordPerfect 6.1 under Windows XP. I also installed the Novell version of WordPerfect 6.1 without problems, but to avoid error messages, I changed its properties so it ran in Windows 95 compatibility mode.

David Maroun

**Mea culpa**

In the December 2002 issue's Lab Test report, you failed to even mention that the

Toshiba e740 is the only Pocket PC with integrated 802.11b. This means that out of the box, a customer will have complete WiFi compliance and connectivity without purchasing any adapters or accessories. Moreover, you listed the price as a negative. The e740 is the most feature-rich Pocket PC in the market at \$949: 802.11b, dual CF and SD slots, removable battery all in a small form factor with no need for expansion packs.

Jason Laxamana

*TCP replies: Guilty as charged. We must have been sleeping when we edited that part. We've found that add-in WiFi cards in the CF format will cost a few hundred dollars, so adding that to the basic cost of a Pocket PC makes the Toshiba unit's prices considerably more competitive.*

**Correction**

A review of the XPSound XP-201 ("Holiday sounds: digital audio gifts," TCP December) incorrectly stated that the device comes with an AC power adapter. According to the Canadian distributor, Kaysound (www.kaysound.com), "the XP201 can be installed in the tower, connection wires are supplied. For exterior use a 9-Volt battery or a power adapter can be used, but neither is supplied." □

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# WHAT'S NEW

By TCP Staff

When a company says its new product is ideal for architects, designers, and engineers, certain details are immediately clear. First, it must have a lot of what design types can't get enough of—speed and storage. Second, it's expensive. Fujitsu's (www.fujitsu.ca) new Celsius Mobile H notebook follows this pattern faithfully.

The computer comes standard with a 1.9 GHz Intel Pentium 4 Processor-M, a 60 GB hard drive, up to 1GB of DDR-SDRAM, an Nvidia Quadro 4 500 Go GL graphics



accelerator, and a DVD/CD-RW drive, for a start.

But the eye-popping feature is the Bluetooth-enabled keyboard, which can

be removed from the unit and used from a distance.

Running with the power user crowd will set you back at least \$6,599, which includes a three-year limited warranty with round-the-clock tech support. While the data on the device is protected with encryption and an integrated fingerprint scanner, handcuffs to attach the case to the user's wrist are sold separately.

Those who always operate on a need-to-know (now) basis may be interested to learn that Copernic (www.copernic.com) is peddling its latest fix for information junkies. Copernic Agent 6.0, the company's integrated search software, is designed to help users manage, analyze, and track information on the Web.

The software comes in three versions: Basic, Personal, and Professional, all of which can be downloaded from the company's Web site. The Basic version is free, and allows users to search over 90 search engines and information sources simultaneously, with up to 3,000 possible results.



The Personal version (US\$29.95) increases the number of available information sources to over 1,000 and the number of results to 5,000, and includes tools to customize search categories and filter results, as well as the ability to integrate the software with Microsoft Office 2000 and XP applications.

The Professional version (US\$79.95) allows unlimited search results, and in addition to the Personal version features, includes Web page analysis tools that, for example, can extract and summarize key concepts from a page. The Professional version also allows users to monitor Web pages for changes or updates, according to Copernic.

Most people who have used hands-free headsets with their mobile phones have experience with the lesser-known meaning of the words "dropped call," which involves a failure of the earphone to remain in the user's ear for the duration of the conversation. Now

## Spotlight



### 9.2 megapixel LCD

For most people, attention to detail is important. For some people, it's critically important. For the portion of the latter whose critical details are on screen, Viewsonic (www.viewsonic.com) has come up with the VP2290b, a 22.2-inch LCD monitor with 3,840x2,400 QUXGA resolution. The display has a density of 204 pixels per inch—10 times that of typical LCD displays—and produces photo-like images, according to Viewsonic, which also boasts that this is the highest resolution currently available.

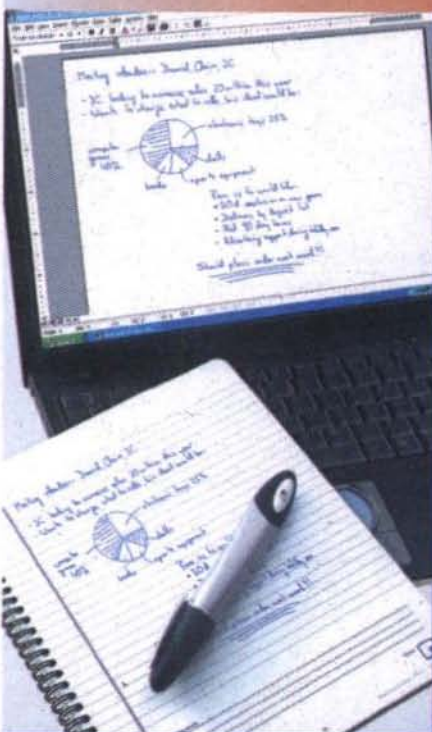
The monitor carries an estimated street price of \$12,798, but buyers should be aware that it's not for the faint of processor. Not just any video card will do—at press time, only three had been tested and approved by Viewsonic: the ATI Fire GL4 and the Nvidia 900XGL for PCs, and the ATI Radeon 8500 for Mac. Prices on these cards vary from around US\$200 for the Radeon, to close to US\$2,000 for the Fire GL4, so shop around and check for new compatible cards to be added to the Viewsonic site as they're tested.

## Spotlight

### Digital pen a tablet alternative

Finally, someone has provided a solution for all those unfortunate students who lose their homework to hungry dogs. The new io Personal Digital Pen from Logitech (www.logitech.com) captures and stores up to 40 pages of handwritten information, which users can download to their PCs via an included USB cradle, according to the company.

Logitech says the io Pen is based on technology from Anoto (www.anoto.com), and works by a combination of a small digital camera in the pen and specially designed "digital paper." The paper is printed with tiny dots in a special pattern that helps the pen keep track of where it is on the page. The pen records the dot pattern the camera travels over and is therefore able to reproduce the drawn image or handwriting on the computer screen, with



the help of accompanying software. In the end, users have both the paper and ink record, and the digital backup copy.

The package includes the io Pen, a USB cradle that also charges the pen's battery, Logitech io Software, an AC adapter, five ink refills, and a Mead Cambridge Limited Digital Notebook, as well as a pocketbook of Post-it Notes for Digital Pens and Post-it Software Notes-Lite. It's priced at US\$199.95 and is currently only available from select U.S. Web sites (see www.logitechio.com/wheretobuy). Of course, you'll eventually need more paper. Logitech is selling the Mead Cambridge notebooks for US\$9.99 and the Post-it notebooks for US\$5.89. The pen, and presumably the paper, is expected to hit Canadian retail stores in the spring. Meanwhile, perhaps some dog obedience classes will help keep your homework safe.

Logitech (www.logitech.com) has designed a line of headsets to address the problem. The colourful line comprises four different earbud headsets and two over-the-ear headsets, which range in price from US\$14.95 to US\$39.95.

The earbud sets use what Logitech calls a FlexLoop design, essentially soft rubber piece that fits into the outer ear to hold the earbud in place. The FlexLoops come in four sizes, so users can choose the most comfortable.

The headsets work with most popular mobile phones on the market, according to Logitech, including Nokia, Sony-Ericsson, and all standard 2.5-mm jack phones.



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# Sherlock Holmes meets data

## TCP takes a peek into the world of computer forensic examination

By Dave Chappelle

Volunteers tracked down an individual trading child pornography online and notified the FBI, who discovered it was a juvenile living in Pennsylvania. The case was turned over to state authorities, but not before an FBI agent had unsuccessfully attempted to contact the juvenile's parents, and left his business card in the door. The mother came home, found the card, called the FBI, and invited them and state police to talk with her son the next day.

That night the son deleted his hard drive partition and reinstalled the operating system. Short of sending the drive to a full-fledged data recovery lab, the evidence was gone. However, because of the timeline of the traded images, his IP address, and his partition deletion, a case could still have been made against him—especially for willfully destroying evidence. Formatting and partitioning a drive establishes a “consciousness of guilt” says Mike McTavish, supervisor of the Pennsylvania State Police computer crime unit.

The police decided not to go to the considerable expense of pursuing this particular case, but had they chosen to, they would have an arsenal of tools at their disposal. Welcome to the world of computer forensics.

In addition to law enforcement work, McTavish is an instructor with Guidance Software ([www.guidancesoftware.com](http://www.guidancesoftware.com)), which has developed a powerful Windows-based computer forensics application called EnCase. Guidance Software is a



*“You’re getting insights into someone’s true being. People do things on their computers they’d never do elsewhere.”*

classic “started in a garage” (by a police officer) success story that now has more than 100 employees. Along with selling the software, it trains forensic examiners, and many police officers, including some from Canadian policing agencies, have gone through the training.

Guidance Software defines computer forensics as the acquisition, preservation, and analysis of digital information that meets the requirements of evidence for court presentation. Digital evidence can come from many sources, including

a hard or floppy disk, USB drive, CompactFlash or SmartMedia cards, CD-ROMs, or any other data storage media.

The forensic process includes three stages: processing a case, obtaining evidence, and storing that evidence. In our legal system, rules of evidence are fairly strict, and it must meet a certain standard before it can be presented in court.

For example, it’s a lot more complicated than simply snooping around a suspect’s drive using Windows Explorer.

Simply booting a Windows computer alters date and time stamps and the content of the Recent and Temporary folders. In short, even the boot process and opening of Windows Explorer changes the contents of the drive, potentially undermining the integrity of evidence police may be trying to gather. If the data has been changed too much, it may not be admissible in court.

Preserving evidence for examination requires special software and techniques. DOS-based utilities used to be popular, but are limited in function and require a lot of time to be used effectively. This is where EnCase has established its following, being faster and more capable than the older tools.

Computers hold evidence better than filing cabinets, because while a paper document can be easily shredded, deleting a document from a computer disk merely deletes the file header. The file can still be located with the right tools.

“The data is there until it is overwritten,” says Terry Willis, a detective with the Los Angeles Police Department computer crime unit and part-time EnCase instructor. “A suspect can upgrade a computer, format his old drive, and give it to his kids. If the kids haven’t overwritten the original data, it’s still there.”

Willis says his jurisdiction includes Los Angeles International Airport, a hotbed of laptop theft, and EnCase is routinely used to recover them. Officers visit local pawnshops and run the software on laptops for sale. Unallocated clusters often reveal residue of an old OS

*Continued on page 14*



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**Sherlock Holmes meets data**

Continued from page 12  
(and previous ownership).

**Tales from the computer forensic front**

**The chatroom tip off**

An individual in Ontario was chatting online with someone in Pennsylvania during school lunch hour. Claims about a bomb in the Pennsylvania school were made during this chat. The Ontarian notified RCMP, who notified Pennsylvania State Police, who raced to the school before classes let out for the day. To determine who made the bomb threat, all students were detained while all library computers were forensically searched and the validity of the threat ascertained.

**Disgruntled employee**

Much computer crime involves disgruntled employees stealing trade secrets or customer contacts and erasing data from an employer's systems. Terry Willis, a detective with the Los Angeles Police Department, recounts a slightly different case in which an art gallery employee set up a Yahoo account in the name of the employer, then used the account from home to email all clients a notice that the gallery was going out of business and to ignore the invitation to the next show.

A gallery sys admin discovered evidence of the Yahoo account creation. Under a search warrant LAPD officers used EnCase in Preview Mode to see the incriminating email, in the suspect's home. She received 90 days in jail and three years probation, and her future

**Escalating cat and mouse**

Because courts around the world have accepted EnCase as a standard, commercially available forensic software applica-

wages were garnisheed to cover the loss of business to the gallery.

**Building an airtight case**

Evidence taken from computers often forms only a portion of that necessary for an arrest. Investigators liken the task of case-building to gathering enough threads to make cable strong enough to prosecute an offender.

Mike McTavish, supervisor of the Pennsylvania State Police computer crime unit, recounts the case of finding the body of a woman in her 20s, found wrapped in a carpet in a garbage dump. Regular investigation found that the woman's boyfriend had a company van and laptop. Matching carpet fibres were found in the van, but that wasn't enough.

Further investigation showed her to be a frequent visitor to numerous astrology sites, some of which required a password. Using EnCase to search the laptop, investigators found pages from astrology sites in the temp and cache folders, accessed within four hours of the estimated time of death. When the boyfriend couldn't provide the site passwords, the fibers and evidence that she had used his laptop so close to the time of her death helped convict him of first-degree murder.

**Email trail**

An individual's email is where police are

most likely to find an admission of guilt, or indication that a crime has been committed. Few people are aware of email encryption tools, and fewer still can be bothered using them.

LAPD established a motive for murder by searching a man's email after the bodies of his wife and daughter were found in Los Angeles Harbor. Investigators found an email from the man to another woman living outside the country, stating that a "new life" could be started once the "old life" was gone.

Timing is everything  
Windows' Recent and Temporary Internet folders are good places to look for the last actions performed on a system.

**Timing is everything**

A 4:30 a.m. call to a Pennsylvania 911 operator involved a juvenile who had been stabbed in the head at his home. He told police his father had done it, but both parents denied it. Responding officers noticed an active connection on the home PC, and called the computer crime unit. From an activity timeline, an examiner concluded someone had been using the computer to view child pornography until roughly 15 minutes before the 911 call. It turned out the son had refused his father's demands to mimic what he had been viewing online, so the father stabbed him.

—Dave Chappelle

makes training important—and is also the reason why Guidance Software has an extensive and busy training facility in California.

Instructors are full-time law enforcement officers who use their vacations to teach. They are also very experienced with EnCase, having used it to collect evidence and present testimony in court.

The opportunity to convict child pornographers and other criminals is a major motivation for forensic examiners. What else attracts people to the world of computer forensics?

"It sounds corny, but you're getting insights into someone's true being. People do things on their computers they'd never do elsewhere" says Mike Fowler, a senior enterprise instructor with Guidance Software. (Fowler also has 14 years experience in law enforcement, and several more in private-sector network security.) "It borders on voyeurism, because you're looking at a portion of someone's life they figure no one else will ever see."

Most investigations involve files that a user thinks no longer exist. Recycle bin unallocated clusters can still contain data, even after a drive has been reformatted. On confronting users with evidence of suspicious files, investigators say they are frequently told that someone else must have put the incriminating files on their system, or that the OS put them there.

However, those trained in forensics know better. "Stuff in the recycle bin is only put there by the user, not the OS,"

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**Sherlock Holmes meets data**

Continued from page 14

says Willis.

**What do they look for?**

Part of the investigation of a PC is a signature analysis, which determines if file headings and extensions match the file type. EnCase allows an examiner to match all three (Windows looks at file extensions, not the header).

Changing a file name or extension is a common method of hiding files—a step that can be incriminating evidence itself.

Date stamps can also be changed in an attempt to make it appear that the perpetrator was not aware of the crime, or that someone else added the file later. These attempts are easily found using EnCase.

Illegal images are also frequently inserted into document or text files. Software-savvy offenders have also been known to insert pornographic images of children into otherwise innocuous images, or to cover them with a white layer to make them appear blank. Signature analysis helps an examiner find these discrepancies.

EnCase can perform five file sorts simultaneously, looking for deleted and

overwritten files, unallocated clusters, and all other file types.

Once an investigator finds something that might be useful, a sweep is performed, saving the relevant data to the bookmark portion of the evidence file.

Keyword searches are a major function of EnCase, but searches based on individual keywords can be time consuming. "The electronic file cabinet can be overwhelming," says Willis. Also, suspects aren't necessarily good spellers, or may intentionally misspell file titles. So, EnCase allows unlimited searches, and groups of searches, flexible and fully customizable by the examiner.

Here's how it might work. Suppose the system being examined is believed to have been used to commit credit card fraud. The user may have tried to hide the credit card numbers by entering them as one long number, or as a single long string with spaces or hyphens in between. To shorten search time something called GREP expressions are used. When properly written, a GREP expression can turn up numerous relevant keyword hits in a single search.

EnScripts might also be used. These are scripts written to save time when

performing searches. The Guidance Software Web site has a members-only message board, where forensic examiners share information, EnScripts, GREP expressions, and other timesaving techniques.

This sharing of information has a Canadian twist too: instructors lavish high praise on Robert Gagnon, of the Ontario Provincial Police's e-crime section, who developed a network boot disk for EnCase investigations. Using one per machine, investigators can perform triage on multiple systems of a network without actually booting the individual computers into the native OS, thereby maintaining data integrity. No matter what network cards are installed, with this boot disk every computer in a room can be searched relatively quickly. Once evidence is uncovered, the suspect machine(s) can be removed without shutting down a business.

Police have been known to shut down all computers when executing a search warrant for digital evidence at a business. If only one employee is the culprit, shutting down the entire business leaves police open to heavy criticism, if not a lawsuit. The network boot disk avoids that problem.

**Beyond criminals**

Willis estimates that the LAPD uses EnCase in 95 percent of its computer-related investigations. Its use is not limited to law enforcement, though. Tim Margeson of data recovery firm CBL Technologies says its technicians frequently use it for a quick look at what's on the disk to be recovered.

This is particularly useful when a customer needs their data recovered in a hurry.

Margeson says the keyword search function in particular is very handy, because searches performed on email address or subject names allows them to retrieve individual email messages without having to go to the hexadecimal level.

Can EnCase recover any piece of data? No. While it will read data after a format, it can't recover data that's been overwritten or encrypted files. As well, files that have been run through a program like Shredder ([www.gale-force.com/shredder](http://www.gale-force.com/shredder)) will render data unreadable by EnCase. However, most criminals merely want the goods, and usually don't use these protection methods until after they've been visited by the law. □

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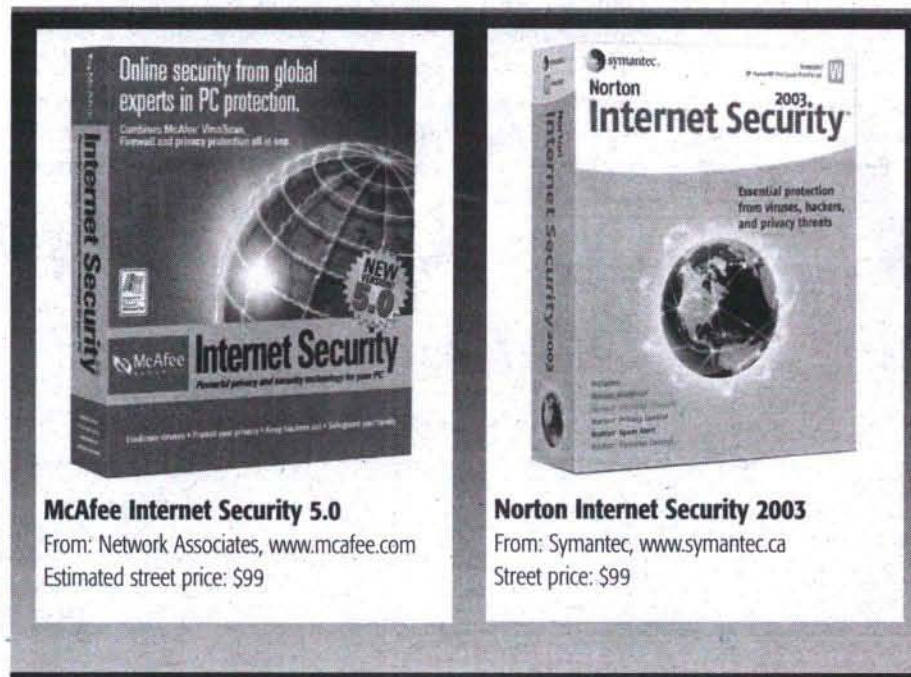
Corporate expert McAfee's new software shares retail shelves with Symantec solutions

By Emru Townsend

Once there were two programs I considered essential to anyone using a PC: Norton Disk Utilities and McAfee VirusScan. Anywhere I worked, I would push them on customers and co-workers. After all, who wouldn't consider Norton Disk Utilities a worthwhile investment after recovering an important deleted file, or feel likewise about VirusScan after a potentially hard-disk-killing virus was stopped dead in its tracks?

I confess that I lost track of VirusScan by the time I hit Windows 98. By then, Norton Utilities was part of Symantec's more comprehensive Norton SystemWorks package, which included, among other things, a virus scanner.

And there it was: Symantec quietly moved in on McAfee's territory by expanding its mission of keeping your



**McAfee Internet Security 5.0**  
From: Network Associates, www.mcafee.com  
Estimated street price: \$99

**Norton Internet Security 2003**  
From: Symantec, www.symantec.ca  
Street price: \$99

computer running smoothly to include security. The icing on the cake was an

easy-to-navigate interface, perfect for people who weren't technically savvy,

but knew they had to keep their computer safe.

With broadband access and wireless networks becoming ever more prevalent among home users and small offices, it's hardly surprising that both companies have renewed their efforts on the consumer battleground.

The result so far: both Symantec and Network Associates (McAfee's parent company) have released suites that bundle the best of their security product lines. Amusingly, both suites are named Internet Security.

Both programs are easy enough to install, with the usual options for typical, custom or complete installations. I have to give extra points to Symantec, which easily glided around an existing installation of the same version of Norton AntiVirus; McAfee Internet Security, confronted with an existing installation of VirusScan (a more current one, at

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that!) wouldn't let me deselect the VirusScan option. Since there was no reassurance that my current setup would remain unmolested, I backed out of the setup program, uninstalled VirusScan, reinstalled Internet Security (which now let me deselect the VirusScan option), then went back and installed the latest VirusScan. Difficult? Hardly. A pointless irritation? You betcha.

After installation, both suites collected everything into an easily accessible con-

trol panel. Another point for Symantec: on one system I was already running SystemWorks, and I ended up with one combined control panel that was complete without being overwhelming. (I admit that it's not really a fair test since I wasn't integrating two suites on the McAfee side, but I have to give Symantec credit for pulling together the two packages' nine titles and their assorted programs so well.)

Beyond that, there are quite a few sim-

ilarities between the two packages. Norton AntiVirus and McAfee VirusScan both run silently in the background, with icons in the system tray for easy access. Both catch virus-infected files while you work, including email menaces like Klez and malicious scripts. As an extra precaution, Norton AntiVirus also scans outgoing email.

The two firewall programs are also similar; both have basic presets (McAfee Firewall has three and Norton Personal

Firewall four) that work well enough on their own, but in either case you'd do well to spend a few extra minutes tweaking the settings to exactly what your system needs and how the program interacts with your software. For instance, if you're using an 802.11b network, you'll want to make sure the firewall won't block legitimate traffic from your other computers but keep unauthorized users out. Most importantly, you'll want to

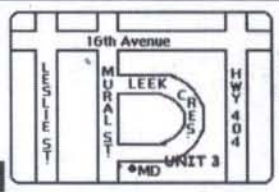
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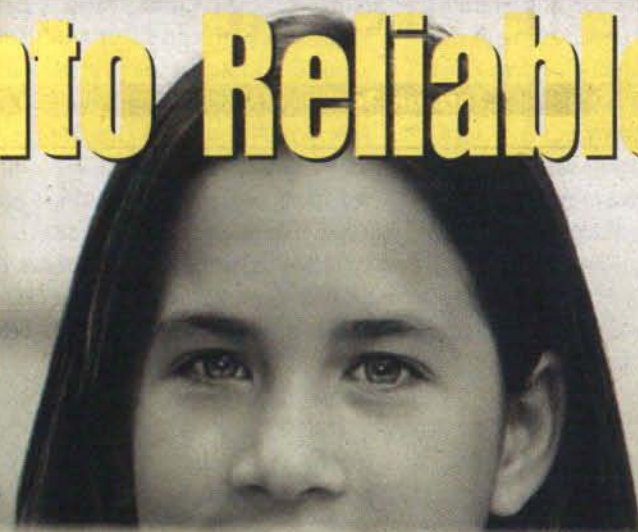
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# A week at forensics school

Much of the research and interviews for "Sherlock Holmes meets data" came during writer Dave Chappelle's week at Guidance Software's training facility in California. Following is a report about his classroom experience.

By Dave Chappelle

Our class was composed of 19 men and four women. The majority were from law enforcement agencies, but others worked in fields like private sector risk assessment, law firms, or network system administration. Some would admit only that they work for a national government. At least one California detective wore a holstered handgun, and admitted he had another in his pocket.

The Guidance Software classroom setup is pretty mundane: a whiteboard, instructors' desks and computers at the front, and three columns of student desks. Students sit two to a desk, and each student has a PC and flat-panel

Forensic Terms	
Term	Definition
Case file	EnCase file with ".cas" extension contains information specific to one case, with pointers to evidence, bookmarks, search results, hash, and signature analysis reports.
Checksum	A computed value, stored along with data, to detect corruption of that data.
CRC	Cyclical Redundancy Check: a variation of the checksum that is order sensitive. Data strings 1234 and 4321 will produce the same checksum, but not the same CRC.
EnScript	EnCase files with ".esc" extension: a high-level programming language cross between Java and C that works data from the drive.
Evidence file	Central component of EnCase methodology that contains a header, checksum, and data blocks that work together to provide a secure and self-checking description of the state of a computer disk at time of checking.
GREP	UNIX search utility expression syntax used to describe search terms to produce specific matches.
Hash	A value calculated by algorithm to verify data integrity.
Header	Provides information about the file.
MD5 Hash	Message Digest 5 Hash.
Partition	A portion of a hard drive. Drives must be partitioned before formatting and installing an operating system.
Signature	In EnCase, the combination of a file header, file extension, and file type. All three must match or a file may have been deliberately changed.
Temp or Trash file	Where temporary files used by EnCase during examination are stored.

monitor. In between the pairs of student monitors is another flat panel, which displays the instructor's computer.

Three instructors work the room simultaneously rotating roles: one gives the lesson, while the other two help stu-

dents. Since the introductory course was for people with no computer experience, I attended the intermediate class. Classes begin at 8:00 a.m. and run until 5:30 p.m., with an hour for lunch and 10-minute breaks every hour.

The intermediate course was fairly fast-paced. While the instructor talked, he demonstrated the technique, navigating around the program with the speed and efficiency of a practiced user. It was easy to miss a step by taking your eyes off what he was doing.

I was surrounded by experienced forensic law enforcement professionals and system administrators who appeared to readily absorb information that was completely new to me. By the afternoon of the second day some, including me were lost. Thankfully, the instructors helped us catch up. It was frustrating, as we're used to being the knowledgeable computer professionals.

Despite a tremendous amount of help and encouragement from instructors, it

Continued on page 33

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**Security blankets**

*Continued from page 21*

learn how each firewall deals with installed software accessing the Internet and blocking Trojan horses.

In fact, that approach neatly sums up the best way to approach both packages. They're designed to be user-friendly, and do a fairly good job of it (though I'm biased toward Symantec's products). To that end, both boast the ability to get everything up and running in short order, allowing you to work while the software does its thing and you forget about what's going on under the hood. While this is certainly possible, it's to your advantage to spend a little time going over each program's settings and adjusting everything to your liking.

One of the best examples of this is Norton Spam Alert. Like Personal Firewall, it has four default settings (Off, Low, Medium, and High) that you can adjust based on how much spam you usually get. Unlike what you'd think, Spam Alert doesn't delete spam; instead, it identifies it in your inbox by adding a

"Spam Alert" prefix to the message's subject line. It's a nice balance, because it makes it easier to filter, or at least spot, spam without running the risk of losing useful email. I ended up with a handful of legitimate messages (usually email newsletters) tagged as spam, so for the first few days I customized Spam Alert's filters to let certain subjects and senders pass through.

In just a few days, Spam Alert was correctly tagging about 75 percent of my incoming spam and making very few mistakes—no more than one or two a day, which is sure to drop as more exceptions are entered. (Network Associates has a similar application, SpamKiller, but it's not part of the Internet Security suite and I was unable to get my hands on it before press time.)

Continuing the trend of similar functionality, both suites can block popups, banner ads, and Web bugs. They also provide privacy protection. Most apparent is the cookie control. Like Spam Alert, it works best if you sacrifice a little time and convenience at first and train

the cookie-killer to ignore beneficial cookies (the most common being personalization and shopping-cart cookies) and kill invasive ones (advertisers' cookies that follow you around and report your surfing habits). Both also include personal information protection, which prevent you from transmitting selected information (such as credit card numbers, your address, or your email address) through email or the Web.

Symantec and Network Associates have succeeded in making two suites that are so similar you might wonder how you could ever choose between them. Using both extensively, I couldn't come up with a clear winner either. If you already have a Symantec or McAfee product you're happy with, you might consider sticking with the brand you know; if anything, the user interface integration makes things a bit easier.

But after spending some time looking for significant differences, I found quite a few that were subtle. I can't list them all here, but a few stood out.

True to its roots, McAfee VirusScan

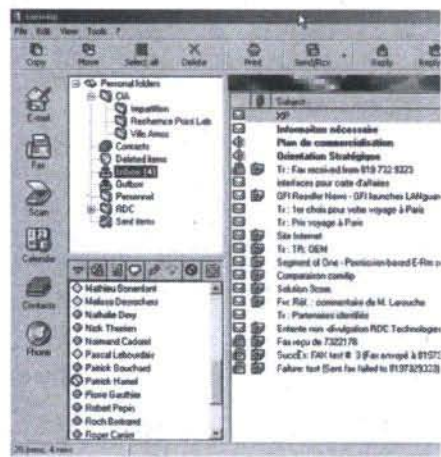
offers more comprehensive configuration options than Norton AntiVirus, but I found that Symantec's programs do a better job overall of explaining what different options do and how to set them. McAfee Internet Security provides for separate configurations for different users, whereas Symantec restricts such finessing to its Parental Control.

But there was one area where I was hoping to find a difference and didn't. There's no function for saving all your presets.

If you ever have to wipe your system clean and start all over again, you'll have to tweak every setting and retrain the programs all over again. If that's not enough to make you wince, consider that McAfee Internet Security has an option to store your Web passwords. How likely are you to use that when you can't easily back them up? Maybe there is a down side to both programs being so similar after all. □

Emru Townsend (emru@pobox.com) usually feels very secure.

**RDC secures branch office communications**



Where in the world is Amos? The answer to that—Northern Quebec—is particularly relevant to this story, because the town is home to RDC (www.com4ip.com).

RDC is a subsidiary of CIA Group, which wanted to develop software for secure communications between its various offices throughout Quebec. That development team was spun off as an independent company in 1999 to market the suite, Com4IP Version 3.0, to the world at large.

The product is aimed at small branch offices, but can be scaled up. The suite is

\$575 per user for up to 24 users, with per user rates dropping as the number of users increases.

According to RDC president, Jean-Claude Périgny, who dropped by TCP recently to demonstrate the product, Com4IP is an IP-based communications suite that offers high levels of security through 448-bit encryption. This allows people in various offices to communicate securely using the Internet. The suite allows encryption of documents, email, IP voice mail, and instant messaging.

Com4IP itself is an integrated commu-

nications product. It has group and individual calendars and contact managers, supports voice-over-IP telephony, and includes an instant messaging window.

It also includes an email fax gateway that routes faxes to the machine that can send it at the lowest cost. Using his company as an example, Périgny says when an employee in Amos emails a fax to a client in southern Quebec, the software can pick the fax server in the office that's closest to the customer, to reduce (or eliminate) the cost of a long-distance charge.

—David Tanaka

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# Orion simple, powerful firewall

By Dave Chappelle

Hardware maker Celestix understands that most computer users would rather not think about security. That's why it has engineered what is arguably one of the best firewall systems into a portable appliance with a simple browser management interface.



### Celestix Orion

From: Celestix (hardware), [www.celestix.com](http://www.celestix.com),  
SofaWare (software), [www.sofaware.com](http://www.sofaware.com)  
Suggested retail price: \$465

We tested the smallest of the line, the four-node Orion SOHO model SBX-133LHE-1 integrated firewall. Other models support up to 25 users, and offer site-to-site and remote access VPN

options (with prices ranging from \$465 to \$1,860).

Like most small network hubs, this blue box doesn't take up much room, measuring 20x12x3.1 cm and weighing 650 g. Stickers on the outside proclaim that the unit uses CheckPoint ([www.checkpoint.com](http://www.checkpoint.com)) Safe@Home software. This speaks something to the quality of the product, as CheckPoint is a major provider of firewall technology for large corporations.

Why would someone need firewall protection in the first place? To answer that, we need to look at a sketch of what happens when you make a request on the Internet, by clicking on a link or application, for example.

Data travels from your computer through other servers on the Internet, to the server from which you are requesting the information. Requests and the information travel around the Internet in the form of data packets. During transmission, packets can become fragmented and scrambled. The packets include packet headers (similar to the headers

you may have seen at the top of email messages) that are used to keep the information going to its final destination. Most firewalls are capable of performing packet filtering. Depending on the rules used to set the level of filtration, packet fragments will either be allowed to pass through the firewall or dropped. Sometimes dropped packets are resent (again depending on the hardware, software, and rules).

Malicious persons can perform sophisticated attacks by breaking down their software and attempting to pass it through a firewall by making it appear as legitimate fragmented packets.

The CheckPoint stateful inspection engine inside the Celestix Orion will gather together all fragments until an entire packet is assembled, then inspect it to see if it conforms to the rules set by the user. It won't allow packet fragments through based on limited criteria, which is how blended threat viruses, such as Code Red and Nimda, sneak past certain commercially available firewalls. It also prevents legitimate fragmented packets

from being dropped.

Even a reply from your computer saying, in effect, "I didn't request that" can contain enough information for a good cracker to determine your operating system, allowing the construction of a packet that looks like the answer to one of your legitimate requests. By performing stateful inspection, the second packet will be dropped.

Other firewalls offer stateful filtering, but stateful inspection was authored by CheckPoint back in 1993.

The rear panel of the Orion has five RJ-45 network jacks, four for network computers and one for either a broadband or WAN (wide area network) connection. The power jack and reset button are also on the rear panel. On the front are LED indicators.

A legend for understanding the various colours and flashing is in the Getting Started Guide.

In our version of the guide, the order of the setup instructions was misleading. The best practice is to first connect the

*Continued on page 30*

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# Sound the alarm

Dicota offers noisy protection for travellers

By Dave Chappelle

Cable locks are good protection against grab-and-run thieves when a notebook is parked on a desk, but most notebooks are stolen when they are in transit, and often by a team. One common technique is for one person to distract the notebook owner by asking for directions or time, while another grabs the case and slips away.

## Dicota Sentinel

From: Security Solutions of Canada Inc.,  
www.securitysolutions.ca Tel.: 888-410-9410s  
Price: \$89

That's where the Dicota Sentinel alarm system comes in. It's a two-piece system: an alarm that attaches by a thin cable to

your notebook case (or any object you want to protect) and a two-button remote control unit. Once the alarm is attached, it's armed using the remote. When armed, it emits a short beep and a red LED flashes intermittently.

The alarm is triggered by movement—if your bag is moved suddenly the 100 dB (decibels) siren sounds and both green and red LEDs flash. It can also be triggered by pressing the Panic button on the remote. This is handy if your bag disappears before you've armed it—or if you've forgotten where it is. The remote has a range of approximately 30 m. Pressing either button causes a red LED on the remote to flash, so you can see that the signal was sent.

How well does it work? We attached the

Dicota to different pieces of luggage, and were only able to take the bag if we moved extremely slowly and carefully. In a real world situation, the bag owner would have discovered it missing before we could have disappeared. Our slow movement may also have aroused suspicion.

The cable-mounted Dicota alarm can be attached to any number of objects, an advantage over notebook alarms that are fixed to the computer itself. Thus, the unit can also be used as a security alarm for someone nervous about staying overnight in an unfamiliar hotel or motel. When we tightened the unit around a doorknob, it sounded at the slightest touch every time, even when in full view of the person attempting to cautiously



twist the knob.

The Dicota Sentinel sells for about \$90, which is cheap protection for a notebook that costs several thousand dollars. It requires three AAA batteries for the alarm (not included). A watch battery for the remote is included. □

## Orion simple, powerful firewalls

Continued from page 28

power supply and power the unit. When the LED stops flashing and turns steady, plug in the WAN cable to your DSL or cable modem or LAN, then connect a cable to your computer.

A Web browser is all you need to set up the Orion. By entering <http://my.firewall> into your PC's browser address box, the Setup Wizard for the Orion appears. Select a password, and the wizard walks you through the entire setup process. Choose your method of connection: LAN, DSL, or cable.

Merely place a check in the box next to the services required: FTP, Telnet, POP3, SMTP, and others. The entire process is

very simple. Online help files are available.

Knowledgeable and experienced users desiring more control can use Advanced Setup, with the option of customizing protection by adding rules based on protocols, port numbers, and IP addresses.

By default the firewall blocks one way, allowing everything outward. This can be changed in the management console by manually blocking protocols or IP addresses.

A business could, for example, allow full or limited network, mail, and Internet access to some computers, while blocking all access to the systems in personnel and accounting.

The Orion will work with UNIX and

Mac systems, as well as Windows. Because the software is installed on a Linux version inside the box, the user doesn't need to be familiar with that OS. With an online interface providing protection, it's possible for travelers to have full protection when using a broadband connection. The diminutive size of the appliance allows it to be stuffed into a laptop case. This unit is easy to use and convenient.

While visiting the Mississauga, Ont. office of CheckPoint Software, we were treated to a demonstration of the back-end management system available for the Orion.

The level of control offered is astounding. If used on a business net-

work, management can track what machines are active and connected, and include in the activity log information such as IP address, computer name, time, source, destination, protocol, and port number.

Billing for connected time and service can be accomplished automatically. With such excellent central management capabilities, we're surprised ISPs and other managed service providers haven't bought these appliances by the truckload and distributed them to subscribers.

Celestix has engineered what is arguably the best available firewall software into a portable appliance with simple browser management interface. □

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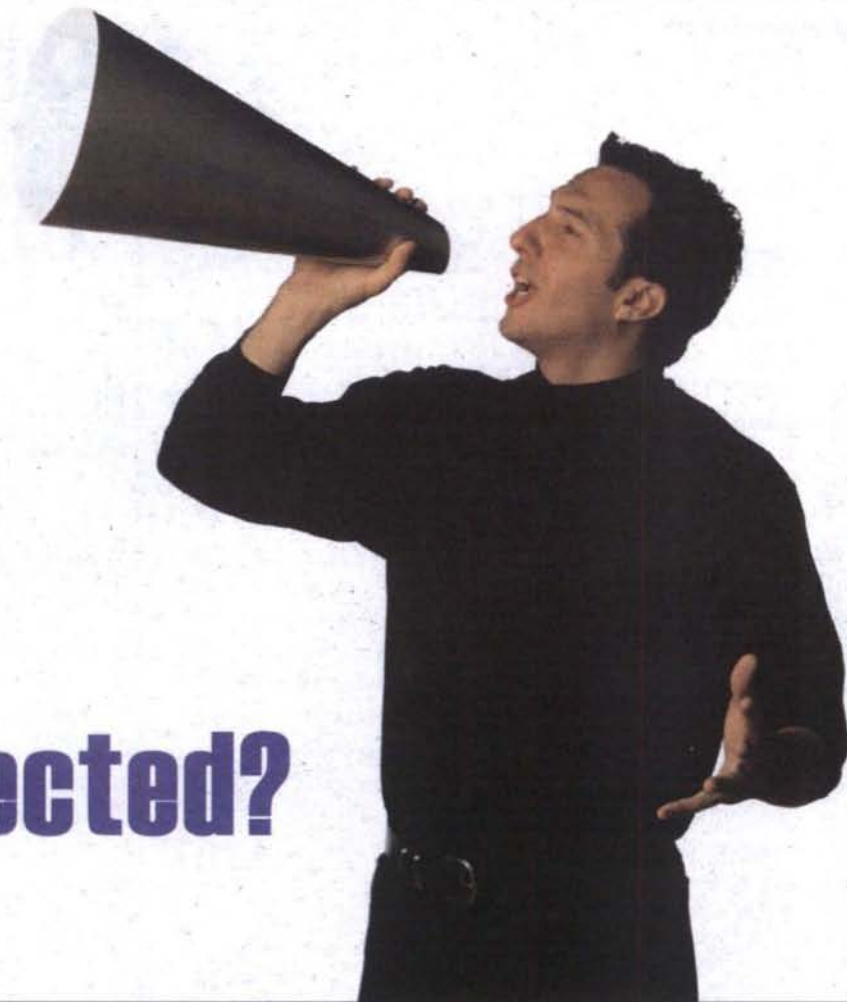
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**A week at forensics school**

*Continued from page 23*

was an extremely humbling experience; at times painfully reminiscent of days spent sitting in a college calculus class trying to figure out what was going on.

**What we learned (that we can tell)**

There's more to gathering evidence than one might first imagine. An investigator must decide how much surveillance to perform, and then decide between seizure and search, or search and seizure. The search warrant must be worded carefully.

Then comes questions of strategy: How many people are necessary to perform the search? Will outside specialists versed in a particular operating system or hardware be required? How will the connection between the suspect drive and the forensic drive be made?

Everything in the forensic investigation must be documented. If an investigator simply connects a forensic computer to a suspect computer, who is to say there is not another hard disk inside the suspect system that is only used for illegal activity?

We learned that for each case it's good practice to begin by creating new Case, Evidence, Temp or Trash, and Export files on a separate logical drive on your forensic computer.

We opened a new case file and imported the contents of the disk to be studied. Guidance Software's EnCase application archives this in the evidence file. To verify integrity, every 64-sector (32-bit) data block receives a CRC value.

When the software acquires a physical or logical volume it calculates an MD5 hash value, which is written into the evidence file and becomes part of the evidence documentation. The hash value can be compared every time an evidence file is added to a case, to verify the evidence file has not changed.

How to deal with erased media is included in the program, as is how to safeguard against inadvertently destroying potential evidence. To demonstrate the recovery power of EnCase, the class wiped floppy disks completely clean and then restored and verified the entire contents. The contents of USB drives, Compact Flash cards, and Palm PDAs were also analyzed. Deleted files can be

recovered and deleted partitions rebuilt, provided the data has not been overwritten.

The user interface of EnCase is a series of panes. The right pane includes Table, Gallery, Timeline, and Report views. By gathering and sorting, a Table is composed, images are viewed in Gallery, an evidence Timeline is established, and a Report of the findings generated. Reports are fully customizable. Filters in EnScripts also show up in the right pane. Filters manipulate the view when looking at files or folders.

Forensic investigators don't always have time to decide what is or isn't porn, so they bring up images on a drive into Gallery mode and let a vice-squad investigator decide. Once images are classed as illegal, the forensic technician can print them out and include header and file info.

The left-pane views offer Case, Bookmark, and Keyword. Different case files can be opened at the same time.

In the bottom pane are views for Text, Hex, Report, Picture, Disk, and Evidence. Here, various properties of the disk or subject media are displayed in

whatever view the operator decides.

EnCase is a thorough and deep program that requires a lot of study. As EnCase instructor Mike Fowler says, "Now that my focus is on instructing, it hurts me to think of what I missed as an investigator. The functionality was there, I just wasn't using it. I want to make sure every student who leaves this class knows how to use the product to its fullest potential." □

**WWW.**

TCP—TCP—The How Stuff Works Web site is a great resource year round, but just in time for the holidays, it includes a section on Christmas. Taking the form of explaining the traditions to someone from another planet, it answers questions like: Why is there a small evergreen tree in your living room? Why are there oversized socks hanging on your mantel? And, of course, What about these fruit cakes?

[www.howstuffworks.com/christmas.htm](http://www.howstuffworks.com/christmas.htm)



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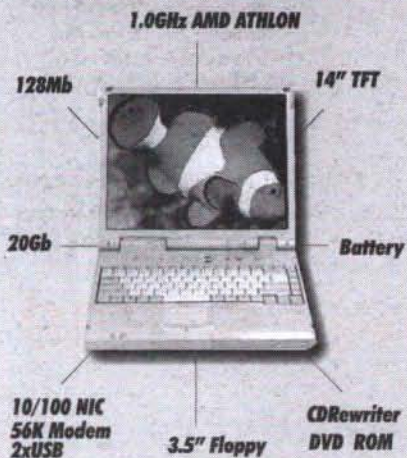
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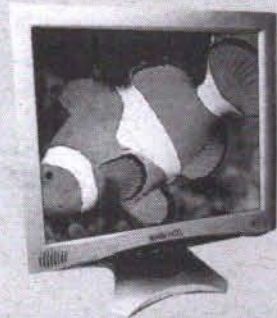
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## < LAST-MINUTE GIFT GUIDE >

### Power-line networking: Connectivity through your AC outlets

By Sean Carruthers

We've often said one of the benefits of wireless networking solutions like 802.11 or Bluetooth is that you don't need to install any cabling. Another no-new-wires technology uses the existing electrical wiring in your home as a networking conduit. We've seen companies talking about power-line networking at trade shows over the past few years, but haven't managed to get our hands on the products until now.

The theory of power-line networking is simple. Your house is already wired with standard electrical wiring, and you probably have several power outlets in every single room. So, why not tap all that pre-existing wiring and make it your home network cabling? Of course, figuring out a way to piggyback network signals on standard electrical current without losing the signal in the process was a challenge, but the technology has matured to the point where several manufacturers have brought out products.

The technology can achieve data transfer at up to 14 Mbps using any electrical outlet in your house. Depending on how your neigh-

bourhood is wired, your next door neighbors may be able to gain access to your network (we found we were able to connect to the network from the house next door). The way power is wired into the main grid, the signal shouldn't get too far—even if it makes it a few houses down, as soon as it hits the nearest transformer it should be disintegrated.

Because your data can leak outside of your house on the power grid, you should make sure to set a very unique network name and password when setting up, and if you're really worried about security (especially if you're dealing with sensitive information), you can protect your data with 54-bit DES encryption.

One note: while power-line networking products should work fine with most UPSes, any that remove noise and distortion from a power signal may strip out the data, so you'll want to use unprotected circuits for best data transfer.

#### Corinex PowerNet series

Corinex is a Canadian networking company based in Vancouver, but it has offices located in both the U.S. and Europe. PowerNet is Corinex power-line networking series, and there are several products in this line.

The most flexible of the products is the Ethernet version, which is a small metal box that resembles almost any other external networking component—in fact, it looks like a very tiny version of a rack-mounted switch, except it only has one 10/100 Ethernet port on

the front, instead of a row of them. Beside the port is a switch that easily flips you between PC and uplink mode, a nice touch for those of us who can't be bothered to keep a bunch of crossover cables handy.

The USB version of the product is a slightly smaller plastic box that connects to your desktop or notebook PC by a very short length of USB cable (about 60 cm, which means you'll have to find a place for it reasonably close to the PC). There's no indication that it's plugged in or connected to the power-line network until you hook it up via USB, at which point the LED lights go on. Apart from that one minor issue, it works fine.

There's also a PCI card version of the product, which requires one free slot inside your desktop machine, and connects to the power outlet by a cord slightly less than 2 m (5 ft.) long. The sample we received came with European-style prongs, and an adapter for plugging into a standard North American two-prong outlet.

#### Linksys PowerLine EtherFast series



Linksys was one of the companies showing off power-line networking products at Comdex Vegas 2001, but we only recently received some samples for review. The company is offering two products: one that hooks up to your PC via USB; and the other that hooks to either a PC or your network via Ethernet.

Of the two, the PowerLine EtherFast 10/100 Bridge is the more useful, because the Ethernet connection allows it to be hooked up to almost any part of your network, be it your PC, notebook, or router. Use a straight cable for computers, or a cross-over cable to hook it to the network (cables are sold separately).

We tried hooking up a pair of these in different locations in the house, and it worked well, even through a UPS. Because it connects to your equipment by a standard Ethernet cable, you don't need special drivers to make it work, though you do have to download the configuration software to make sure the adapters will talk to each other.

The USB product is another story, because it requires driver configuration in addition to the network configuration. After a bit of tweaking, we got the USB adapter up and running on our Windows 98 notebook, and it worked pretty much the same way as the bridge except it can't be used with routers. If your computers already have Ethernet onboard, we'd recommend the bridge, because of the flexibility, and the USB model mainly for machines without built-in Ethernet.

Linksys also has a router with power-line networking built in, for those who don't already have a router on their home network. The PowerLine EtherFast 10/100 Router, which we didn't have in the lab for testing, has one LAN port and one power-line connection. It comes with many of the same features as Linksys' other routers, including NAT security, DHCP server capability, and filtering. □

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# Hands On

Lab Test • Hardware Evaluations • Software & CD-ROM Reviews

## Outside the box

TCP Lab looks at external storage devices

By Sean Carruthers

One area of growth in the hard drive market is with external models—which is understandable as the idea of hard drive installation makes most computer users break into a cold sweat. Installing a new internal hard drive has a number of obstacles for even experienced users, including initial setup, formatting, and data migration. If your main hard drive is still in good shape, but is just too small, an external hard drive is a nice way around the problem: the drives are often plug-and-play, and even if you have to install a FireWire or USB 2.0 card to handle high-speed data transfer, it's a heck of a lot easier than installing and configuring an internal hard drive.

One other benefit of using an external drive with a high-speed interface is that it's exceptionally easy to move large amounts of data back and forth between computers. Instead of writing to a series of floppies or CDs, an external drive allows you to move many gigabytes of



data by copying it to the external drive, unplugging it, and moving it to the destination computer. Even better, most of the time it doesn't matter if one of the machines is a Mac and the other is a PC, because often these drives are compatible with both, as long as you format the drive for use with both OSes.

If you're running Windows 2000 or XP, your system should automatically recognize an external hard drive con-

nected via FireWire without additional drivers. In many cases, the same should be true of external USB drives, though sometimes they require drivers for the bridge interface. Previous versions of Windows may need a driver install before you can use the drives, or may require extra components from your Windows install CD.

Pricing note: \* Indicates prices con-  
Continued on page 37

## Mobo madness: the latest for AMD, Intel

By Sean Carruthers

If you're not quite ready for Intel's latest Pentium 4 with Hyper-Threading, don't worry. There are a number of recent motherboards for both Pentium 4 and Athlon XP that use the good ol' processors you may already have on hand.

For this series of tests, we have used three different metrics. AMD has recently made some industry-wide noise that our standard benchmarking suite, BAPCo's Sysmark 2002, is skewed to favour Intel; while we're not going to comment on this, it never hurts to get a second opinion, so we're also using Mad Onion's PC Mark 2002 and SiSoft's Sandra 2002 Professional for additional benchmarking numbers.

With all of these benchmarks, higher numbers indicate better performance. SysMark 2002 is designed to show overall system performance with a number of different (concurrently running) applications. PCMark 2002 is designed to stress-

Continued on page 43

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**Outside the box**

*Continued from page 36*

verted from US dollars. At time of writing, exchange rate was 1.57.

**Iomega HDD**

From: Iomega Corp., [www.iomega.com](http://www.iomega.com)

Estimated prices: \$315\* (20 GB), \$400\*/\$415\* (30 GB USB/FireWire)

**Pro:** Ultra-compact. Modularity means drives can be used with either FireWire or USB 2.0 if you have the adapters.

**Con:** Notebook-sized drives are lower-performance. Expensive!



- Available in 20 GB and 30 GB capacities.
- Drive speed 4,200 rpm.
- Available for either FireWire or USB 2.0 connections; port is added to the back of drive via an adapter. Users can purchase additional adapters to use with the other connection, if desired.
- Power cord included, but not required with FireWire connections with power on the bus (four-pin connectors require external power).
- Small window displays removable/user-changeable tag, to indicate what's on the drive. If you're using multiple drives for backup, you can label by day, for example.
- Compatible with Windows 98SE ((USB 1.1 transfer speed only), Me, 2000, XP, and Mac OS 8.6 and later.

Once upon a time, the Zip disk was the industry standard when it came to high-capacity removable storage. Then came recordable CDs, and Iomega's response was the Peerless, a 10 GB and 20 GB removable solution whose biggest selling point was its flexibility: the drive and base station were separate pieces and the FireWire or USB ports were on another piece that was interchangeable. The company has used some of the same smarts in the design of its new portable external hard drive, by keeping the ports on a separate adapter; if you buy the bundle with the FireWire adapter in the box, you can always purchase the USB 2.0 adapter separately, and vice versa.

We had a chance to look at the 30 GB FireWire version of the Iomega HDD, and when we plugged it into our FireWire port, the system instantly rec-

*Continued on page 38*



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**Outside the box**

*Continued from page 37*

ognized the drive. Because the drive contained in the compact plastic enclosure is notebook sized, running at 4,200 rpm, it's not exactly the swiftest drive out there (and not your first choice if you're planning to use the drive for streaming multimedia, like digital video), but gets the job done; for general data storage it's a great companion.

If you're looking for higher performance, Iomega offers desktop hard drives running at 5,400 rpm or 7,200 rpm, in USB 2.0 and FireWire versions, in capacities ranging from 40 GB to 120 GB.

**LaCie d2 FireWire Hard Drive**

From: Lacie Canada, [www.lacie.com](http://www.lacie.com)  
Estimated prices: \$499 (120 GB), \$769 (200 GB), and \$899 (250 GB)

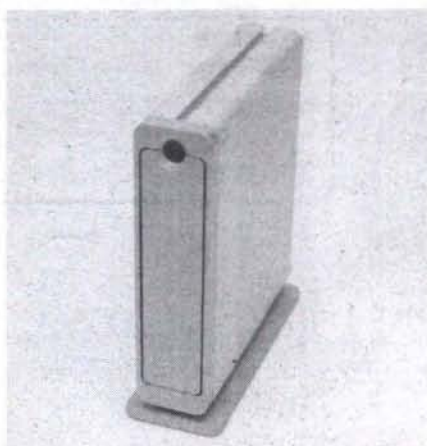
**Pro:** Rugged construction; rack-mountable; high capacity.

**Con:** Setup may be complicated for novices.

- Available in 120 GB (7,200 rpm drive inside), 200 GB (7,200 rpm), and 250 GB (5,400 rpm)
- FireWire connection to PC.
- Metal case protects drive, and has grooves along the sides to facilitate rack-mounting (can be mounted side-by-side in a rack, or adapters

available for putting single drive into 1U space-mounting brackets available separately for \$49).

- Compatible with Windows 98, 2000, Me, XP, and Mac OS 8.6 or later.



LaCie products have long been a favourite on the desktops of content creation professionals, thanks to the flexibility of its external storage products. Their new design is bound to make a lot of people happy: with a sturdy metal outer casing and slots along the side that can be used either for a vertical stand or to connect drives together for rack mounting.

The drive itself requires a slightly more complicated setup than most of the oth-

ers we looked at. Because LaCie is popular with both Mac and PC users, the drive comes unformatted and needs to be set up, and the install disk doesn't automate this. Instead, you'll need to get into the control panel's disk management section, if you're using Windows 2000 or XP, and manually set up a partition and start the format. Once you've completed that, you're on your way—the drive is easy to use and very speedy thanks to the fast interface and fast drive inside. (The 250 GB drive is an exception. With the slower 5,400 rpm spindle speed, it is better for applications that require storage more than lightning performance.)

**Maxtor Personal Storage 5000DV**

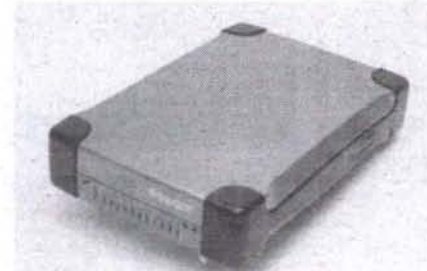
From: Maxtor Corp., [www.maxtor.com](http://www.maxtor.com)

Estimated price: \$475\*

**Pro:** Backup is ultra easy; both USB 2.0 and FireWire onboard; 250 GB version has highest storage capacity we've seen.

**Con:** 250 GB model has only 5,400 rpm drive.

- 120 GB capacity for the 5000DV model. Also available in 80 GB (5000LE for \$315\*) and 250 GB (5000XT for \$630\*) capacities.
- Both FireWire and USB 2.0 (compatible with USB 1.1) onboard.
- 7,200 rpm ATA/133 drive inside.
- Maxtor's OneTouch system makes backing up files easy—just press the button on the front of the drive to launch Dantz Retrospect.
- Compatible with Windows 98SE, Me, 2000, XP, Mac OS 9.1 and later (patch available for Jaguar compatibility).



Maxtor was the first of the major hard drive manufacturers to bring out an external version of its product with the earlier introduction of the 3000 series external hard drives. The 5000 series is more than a slight update to the line. Based on what a lot of people use external storage for—backing up important data—Maxtor made it easier than ever to do just that, simply by pushing a button on the front of the drive.

After you install the relevant software, the first time you press the button a configuration dialogue appears to help you specify what you would like backed up on your system: whether it's your docu-

ments, your applications, or both. The program, Dantz Retrospect, is quite configurable, allowing you to back up multiple drives with the press of one button. It's quite a nice addition to the product line, especially for those who would otherwise never bother to back up their data.

The 5000 series has three different models, each with a different capacity. We did our testing with the 120 GB 7,200 rpm 5000DV model (which is both USB 2.0 and FireWire compatible). You can also get the 80 GB 7,200 rpm 5000LE (USB 2.0 and 1.1 only), or the 250 GB 5000XT, which has both USB and FireWire compatibility, but only sports a 5,400 rpm drive, which is a better choice if your space requirements outweigh your need for drive responsiveness (like with multimedia apps).

**Western Digital FireWire External Hard Drive**

From: Western Digital Technologies, [www.westerndigital.com](http://www.westerndigital.com)

Estimated price: \$365\* (80 GB), \$445\* (120 GB), \$630\* (200 GB)

**Pro:** FireWire offers excellent transfer speed to the PC; 200 GB model offers tons of storage.

**Con:** Slightly more expensive than competition; setup program not fully Windows XP-compatible

- Available in capacities of 80 GB, 120 GB, and 200 GB capacities.
- Uses FireWire connection.
- 7,200 rpm drive inside.
- Compatible with Windows 98SE, Me, 2000, XP, and MacOS 8.6 and later.



Western Digital is the second drive manufacturer we've seen that has gone the external route. This one comes in a very sleek little container that's compact and quite attractive—and you don't have to worry about jumper configuration like you do with WD's internal drives.

The configuration program that comes on the CD doesn't seem to work with Windows XP (despite the logo stating XP compatibility on the outside of the box). Attempting to use it to set up your external drive could cause some problems—when we tried, the operating system reported afterwards that the disk was

*Continued on page 40*

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**AMD XP 2000+** Lease for \$50/m. **\$1333**

**AMD XP 2100+** Lease for \$51/m. **\$1351**

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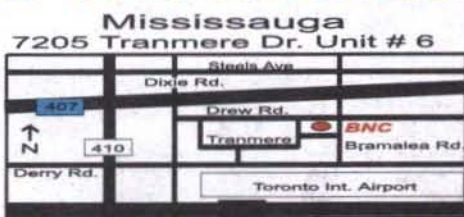
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< HANDS ON >

### Outside the box

Continued from page 38

only formatted at 2.52 GB. We had to reformat the drive using Windows XP (and thus a format in NTFS instead of Fat32) in order to get the full capacity out of the drive. After we did this, we were able to use the drive as expected, and sustained transfers went without a hitch.

Western Digital's product line also features USB 2.0-compatible external drives.

### Western Digital USB 2.0 External Hard Drive

From: Western Digital Technologies, www.westerndigital.com

Estimated price: \$239 (40 GB), \$315 (80 GB), \$399 (120 GB)

**Pro:** USB 2.0 offers fast transfer to PC; different capacities to suit different needs.

**Con:** Slightly more expensive than competition; Mac compatibility not as good as FireWire version.

- Comes in 40 GB, 80 GB, and 120 GB capacities.
- USB 2.0 connection, compatible with USB 1.1 (but slower, obviously).
- 7,200 rpm drive inside.
- Compatible with Windows 98SE, Me, 2000, XP, and Mac OS X and later.



For those with USB 2.0 onboard, here's your Western Digital external drive. This one features the same stylish design as the FireWire drive, but it bumps your burst performance from 400 Mbps up to 480 Mbps, which is handy for any applications that require speed on demand.

The drive worked beautifully with XP, right out of the box; in fact, the package doesn't even contain a driver disc. There are a few installation steps required for older operating systems, but they're pretty quick and easy. After we plugged it in, it was very easy to transfer data to and from the drive.

Though users who have serious multimedia needs may want to stick with the FireWire version, this one is still a great way to add a lot of storage to a USB-enabled system (even older ones, at the slower 12 Mbps transfer rate). The ease of installation with this drive makes it just that much nicer. □

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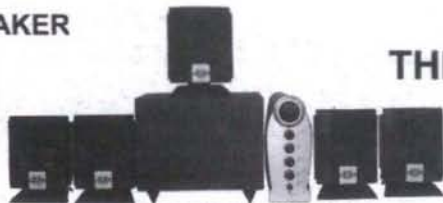


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**Mobo madness**

Continued from page 36

test three different components in the PC: CPU, memory, and hard drive. While the hard drive number may not be so relevant here (the drive is always the same from board to board) we have included it for the sake of completeness.

Lastly, the Sandra 2002 Professional benchmarks stress-test the CPU in two ways: the Dhrystone and Whetstone tests reflect its ability to handle arithmetic, while the multimedia component tests integer and floating point capability in a multimedia context. For both sets of Sandra tests, numbers are determined with all relevant CPU extensions turned on (MMX, SSE, SSE2, etc.).

Because all of the other components are the same apart from CPU and memory, any differences in scoring between boards are a function of that particular board's strengths and weaknesses.

**AMD Athlon XP**

A note about the testing: All motherboards have been tested this month using two 256 MB Kingston DDR333 modules (see www.kingston.com for Kingston's product line). We used the new ATI Radeon

9700 Pro card for graphics, running at AGP 8X when supported by the motherboard.

The boards were tested with the Athlon XP 2400+ processor. We were unable to get one of the newer Athlon XP processors in time for our deadline, and you can expect systems running the 2600+, 2700+, or 2800+ to turn in suitably better performance. As it stands, the Sandra CPU benchmarking test indicated that the 2400+ processor delivered a raw number-crunching ability around the same level, if not greater, than a 2.66 GHz Pentium 4 processor. Pretty impressive.

**Abit AT7-MAX2**

From: Abit Computer Corp., www.abit.com.tw

SysMark	PCMark	Sandra
ICC: 235	CPU: 5,852	Dhrystone ALU: 5,518 MIPS
OP: 153	Memory: 4,004	Whetstone FPU: 2,771 Mflops
Sys2002: 190	HDD: 537	Sandra multimedia: Integer 11,056 it/s
Floating Point 12,214 it/s		

- Designed for AMD's Athlon XP. Front-side bus up to 333 MHz.
- Via KT400 chipset.
- AGP 8X slot, five PCI slots.
- PS/2 connectors are back.
- Four slots for DDR.
- Requires ATX and 12-Volt power connectors.

- Two ATA, two RAID connectors, all ATA/133. Also two Serial ATA connectors on board, one Serial ATA cable, and a Serial adapter.
- Upgrades all USB connectors on the board to USB 2.0: six on rear, bracket included to add two more.
- Two FireWire connectors.
- Onboard 10/100 LAN.
- Norton AntiVirus 2002 included.

The first generation of the MAX board for the Athlon XP processor was problematic because it dropped only some of the legacy components.

The biggest issue was the half-hearted implementation of USB 2.0, with only some of the ports upgraded to the newer faster speed, making plugging in a high-speed USB device a potential crash—would you remember which USB plugs on the back of your PC were 2.0 and which were 1.1?

This new board rectifies the problem by bumping all USB ports up to 2.0, and goes one better by improving the AGP slot to AGP 8X (something the Pentium version of the board doesn't even do). As with the IT7-MAX2, this one also brings back the PS/2 ports for your mouse and keyboard.

Of course, the real news here is the implementation of Serial ATA onto the

motherboard, which is a new interface for connecting hard drives to your system. These new connectors use a skinnier, more flexible cable, which means less chance of damage while you're installing them (or other components). The Serial ATA interface also starts at 150 Mbps transfer rate (up from the 100 Mbps or 133 Mbps offered by ATA/100 and ATA/133) and has a theoretical speed of 600 Mbps down the road.

This board puts two Serial ATA connectors into the RAID connection area, and comes with one Serial-ATA-to-standard-ATA adapter so you can add one of your drives to the Serial ATA port right away (of course, you won't get the full speed, but at least you'll be able to make use of one of the ports right away).

**Gigabyte GA-7VXP**

From: Gigabyte Technology, www.gigabyte.com.tw

SysMark	PCMark	Sandra
ICC: 235	CPU: 5,880	Dhrystone ALU: 5,591 MIPS
OP: 152	Memory: 3,516	Whetstone FPU: 2,815 Mflops
Sys2002: 189	HDD: 509	Sandra multimedia: Integer 11,152 it/s
Floating Point 12,343 it/s		

- Designed for AMD Athlon XP. Front-side bus up to 333 MHz.

Continued on page 44

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<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">ECS LAPTOPS</th> </tr> </thead> <tbody> <tr> <td>INTEL P4 1.6G</td> <td>\$3,499</td> </tr> <tr> <td>INTEL P4 2.0G</td> <td>\$1,569</td> </tr> <tr> <td>15" TFT/20G HDD/LAN/256MB DDR MODEM/USB2/IEEE1394/DVD PLUS CDRW</td> <td>+580</td> </tr> <tr> <td>AMD XP1600</td> <td>\$1,339</td> </tr> <tr> <td>AMD XP2000</td> <td>\$1,409</td> </tr> <tr> <td>14" TFT/20G HDD/LAN/MODEM 256MB DDR, RAM/DVD PLUS CDRW</td> <td>+580</td> </tr> <tr> <td><b>A900</b></td> <td><b>\$1009</b></td> </tr> <tr> <td>1G CPU/14.1 TFT/10G HDD/USB 256MB RAM/LAN/MODEM/DVD</td> <td></td> </tr> <tr> <th colspan="2">UPGRADE PACKAGE</th> </tr> <tr> <td>INTEL P4 1.7/P4 MB 256MB PC-133 RAM/300W ATX CASE</td> <td>\$319</td> </tr> <tr> <td>AMD XP1800+/ECS MB 256MB PC-133 RAM/300W ATX CASE</td> <td>\$279</td> </tr> </tbody> </table>				ECS LAPTOPS		INTEL P4 1.6G	\$3,499	INTEL P4 2.0G	\$1,569	15" TFT/20G HDD/LAN/256MB DDR MODEM/USB2/IEEE1394/DVD PLUS CDRW	+580	AMD XP1600	\$1,339	AMD XP2000	\$1,409	14" TFT/20G HDD/LAN/MODEM 256MB DDR, RAM/DVD PLUS CDRW	+580	<b>A900</b>	<b>\$1009</b>	1G CPU/14.1 TFT/10G HDD/USB 256MB RAM/LAN/MODEM/DVD		UPGRADE PACKAGE		INTEL P4 1.7/P4 MB 256MB PC-133 RAM/300W ATX CASE	\$319	AMD XP1800+/ECS MB 256MB PC-133 RAM/300W ATX CASE	\$279																																																								
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### Mobo madness

Continued from page 43

- Via KT400 chipset.
  - AGP 8X/4X.
  - Three slots for DDR.
  - Six-channel audio integrated. Optical out on bracket.
  - Six USB 2.0, three FireWire connectors using included brackets.
  - ATA/133 IDE ports. Two RAID connectors.
  - Dual BIOS.
  - Norton AntiVirus and Personal Firewall bundled.
- While not quite as radical a departure as Abit's MAX series, Gigabyte's GA-7VXP is nonetheless a nice step forward, integrating both USB 2.0 and FireWire onto this very colourful motherboard. As before, the board features Gigabyte's Dual BIOS system, so flashing your BIOS is easier on your nerves—if something goes wrong, there's always a backup.

The board steps up to the AGP 8X and the new Via KT400 chipset, which means better performance all around when you have the newest compatible components. While this board's performance wasn't at the top of the heap, it was still quite good overall, especially considering it's priced a lot lower than much of the competition.

### Leadtek WinFast K7NCR18D-PRO

From: Leadtek Research, [www.leadtek.com](http://www.leadtek.com)

SysMark	PCMark	Sandra
ICC: 248	CPU: 5,996	Dhrystone ALU: 5,556 MIPS
OP: 168	Memory: 4,327	Whetstone FPU: 2,752 Mflops
Sys2002: 204	HDD: 711	Sandra multimedia: Integer 11,074 it/s
		Floating Point 12,253 it/s

- Nvidia nForce2-ST chipset. Supports up to 333 MHz front-side bus.
- 8X AGP slot, five PCI slots.
- Three slots for DDR, up to 400 MHz.
- Onboard Nvidia SandStorm 5.1 audio, SPDIF digital output.
- Two ATA/133 connectors.
- Three-port FireWire card included in box, inserts into PCI slot.
- Two serial and one parallel port.
- Onboard 10/100 LAN
- Two USB 2.0 on rear of board, header included to add four more, but bracket sold separately.

Over the past few years, we've looked at a few graphics products from Leadtek that used Nvidia graphics technology. When we heard Leadtek was coming out with a new motherboard (it has had a few already, though they've been lower profile than the graphics cards) that integrated the new Nvidia nForce2 chipset, we were anxious to see how the board would perform,

especially on the graphics side.

Well, silly us, the nForce2 chipset comes in two flavours: one with graphics and one without. While there's a Leadtek board shipping soon with the integrated graphics, this first entry is the version without onboard graphics. Rats! What we did find, however, is a motherboard with great integrated audio and good performance.

The one thing we were left scratching our heads about was the board's USB and FireWire configuration. While there's a header to add four more USB 2.0 ports on top of the two that are hardwired in, there's no bracket, which means a separate purchase. On the other hand, there's no FireWire integrated into the board, but the bundle comes with a full PCI card FireWire adapter. It's nice in that it adds both of the high-speed peripheral ports into your PC, but it still seems a bit strange.

### Intel Pentium 4

A note about the testing: all motherboards have been tested this month using two 256 MB Kingston memory modules, either DDR333 or PC1066 RDRAM, as

appropriate (see [www.Kingston.com](http://www.Kingston.com) for Kingston's product line). We used the new ATI Radeon 9700 Pro card for graphics, running at AGP 8X when supported by the motherboard. The boards were tested with the 2.8 GHz Pentium 4 processor onboard.

### Abit IT7-MAX2

From: Abit Computer Corp., [www.abit.com.tw](http://www.abit.com.tw)

SysMark	PCMark	Sandra
ICC: 352	CPU: 6,868	Dhrystone ALU: 5,261 MIPS
OP: 177	Memory: 5,681	Whetstone FPU: 1,510 Mflops
Sys2002: 250	HDD: 609	ISSE2: 3,496 Mflops
		Sandra multimedia: Integer 11,206 it/s
		Floating Point 13,825 it/s

- Designed for Socket 478 Pentium 4, running front-side bus up to 533 MHz.
- Brings back the PS/2 ports.
- One AGP 4X, four PCI.
- Six USB 2.0 on rear, bracket adds two more. Two FireWire connectors onboard.
- Two ATA/100 connectors, two ATA/133 RAID connectors, plus two Serial ATA connectors. Board ships with one Serial ATA connector and a Serillel adapter for connecting an older ATA drive to the Serial ATA bus.
- Three slots for DDR200/266/333.
- Onboard 10/100 LAN.
- Troubleshooting LED on board indicates errors

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<p><b>Super Value</b>  <b>Intel C1.1G \$349</b>  <b>Intel C1.3G \$369</b>          128MB Pc133 SDRam          MSI 6368 MB          20GB HDD/1.44FDD          52X IDE CDROM          10/100 Lan ON BOARD          3D Sound &amp; Spk.          ATX Case MID Tower Case          PS/2 KB &amp; MOUSE</p>	<p><b>Super AMD</b>  <b>DURON 1.3G \$389</b>  <b>XP 1700+ \$439</b>          ECS K7S5A MB          128MB Pc133 SD Ram          SIS 32M AGP VIDEO          20GB HDD/1.44FDD          52X IDE CDROM          10/100 Lan ON BOARD          3D Sound &amp; Spk.          ATX MID Tower Case          PS/2 KB &amp; MOUSE</p>	<p><b>Super Special</b>  <b>P4 1.6G \$549</b>  <b>P4 1.8G \$579</b>          ECS P4LXASD2+ USB2.0 FBS633          128M Pc133 SD RAM          ATI Radeon 7000 v 32M+DVI+TVO          20GB HDD/1.44 FDD          40X12X48 CDRW          3D SOUND &amp; 10/100 Lan &amp; Spk.          ATX P4 MID Tower Case          INTERNET KB &amp; WHEEL MOUSE</p>	<p><b>Super XP</b>  <b>XP 1700+ \$519</b>  <b>XP 2000+ \$569</b>          ASUS A7S333-A MB          128MB DDR Ram          Geforce2 Mx400 64M AGP          40GB HDD /1.44FDD          56X IDE CDROM          52X IDE CDROM          56K V.92 Fax Modem          3D SOUND &amp; Spk.          ATX MID Tower Case          Internet KB&amp;WHEEL MOUSE</p>	<p><b>Super P4</b>  <b>P4 1.7G \$609</b>  <b>P4 1.8G \$629</b>          ASUS P4S333 MB          128M DDR RAM          ATI Xpert 2000 Pro 32M          40GB HDD /1.44 FDD          52X IDE CDROM          56K V.92 Fax Modem          3D SOUND &amp; Spk.          ATXP4 MID Tower Case          INTERNET KB &amp; WHEEL MOUSE</p>	<p><b>Super Power</b>  <b>XP 2000 \$749</b>  <b>XP 2100 \$769</b>          Asus A7V333-WA MB          256MB DDR Ram          GF4 Mx440 64M DDR+TVO          60GB 7200RPM /1.44FDD          16X DVD ROM          56K V.92 Fax Modem          3D SOUND &amp; Spk.          ATX MID Tower TOWER          INTERNET KB &amp; WHEEL MOUSE</p>	<p><b>Super Dream</b>  <b>P4 1.8G \$829</b>  <b>P4 2.0G \$879</b>          ASUS P4S533 MB          256M DDR RAM          GF4 Mx440 64M DDR+TVO          60GB 7200RPM /1.44 FDD          16X DVD ROM          56K V.92 Fax Modem/Lan          3D SOUND &amp; Spk.          ATX P4 MID Tower Case          INTERNET KB &amp; WHEEL MOUSE</p>
<p><b>ECS</b>    <b>#928-14" \$1399</b>          P4 1.7GHZ/128M DDR/20G          MODELAN/DVD/TVO/14" TFT    <b>#928-15" C \$1469</b>          P4 1.7GHZ/128M DDR/20G/ MODE          LAN/DVD&amp;CDRW COMBO/TVO/15" TFT          UPGRADE TO 256M DDR -470</p>	<p><b>AIO LCD PC</b>    <b>\$1499</b>          P4 1.7GHZ/256M/ 40G HDD/1.44FDD          DVD&amp;CDRW COMBO/4 USB 2.0/IEE 1394          15 TFT A-Grade Panel          2.1 subwoofer SPK.          Wireless Multi KB+wheel mouse</p>	<p><b>Super Deluxe 1</b>  <b>P4 2.0G \$1139</b>  <b>P4 2.4G \$1189</b>          ASUS P4S8X &amp; 1394 &amp; serial ATA          256MB DDR Ram          Asus V9180 G4 Mx440-8x 64M DDR+TVO          80GB 7200RPM /1.44FDD          16X DVD ROM          48X16X48 CDRW          56K V.92 Fax Modem/LAN          3D SOUND On Board          Altec Lansing AVS500 spk.          ATX P4 MID Tower Case          Internet KB &amp; WHEEL MOUSE</p>	<p><b>SPECIAL!!!</b>  <b>MSI 40X12X48 CDRW</b>          \$62  <b>15" SAMSUNG 151S \$485</b>          Gef4 Mx440 64M DDR/TVO          \$89  <b>AMD Xp1800+ CPU (RETAIL) \$107</b>  <b>60G Maxtor 7200RPM.....\$129</b>  <b>4 PORT D-LINK ROUTER .74</b></p>	<p><b>Super Deluxe 2</b>  <b>P4 2.0G \$999</b>  <b>P4 2.4G \$1049</b>          ASUS P4B533 MB          256M DDR RAM          Geforce4 Mx440 64M DDR/TVO          80GB 7200RPM/1.44 FDD          16X IDE DVD ROM          48X16X48 CDRW          56K V.92 Fax Modem          3D SOUND &amp; Spk.          ATX P4 MID Tower Case          INTERNET KB &amp; WHEEL MOUSE</p>	<p><b>VIDEO CARD</b>          ATI TV Wonder PCU85B 96/108          ATI A-W/Radeon 7500 64M O/R 179/185          ATI A-W/Radeon 8500 64M O/R 259/289          ATI Radeon 9700 pro 128M 8X O/R 505/545          ATI Radeon 9000 pro 64M DDR V+D+T 175          ATI Rage 128 pro 32M AGP 36          ATI Xpert 2000 32M PRO AGP 42          ATI Radeon 7000 64M SDR/DDR 54/60          ATI Radeon 7600 64M DDR AGP 77          ATI Radeon 9800 64M DDR AGP4X V+D+T 104          Asus V7100 G2 Mx 32M AGP+TVO 62          Asus V8170M G4 Mx440-8x 64M DDR+TVO 91          Asus V8170 G4 Mx440-8x 64M DDR+TVO 110          Asus V8200 G4 Mx440-8x 64M DDR+TVO 181          Asus V9180 G4 Mx440-8x 64M DDR+TVO+DV 149          Asus V9180 G4 Mx440-8x 64M DDR+VVO 185</p>	<p><b>MONITOR</b>          SAMSUNG          LCD 15" 151S/171S 485/769          17" 760S/ 753DF 170/199          19" 950B/955DF 276/359          LG          LCD 15" 1511 S/17" 786LS 475/753          17" 700S/ EF700B 175/209          19" E900A/959FT . 339/395          NEC          LCD 1550V / 1700V 497/805          17" As70/AS75F 198/219          19" As90/AS95F 292/335          VIEWSONIC          LCD V5500 / VX700 489/835          17" A701 209</p>
<p><b>CDROM &amp; DVD &amp; CDRW</b>          52X LG/56X Aopen CDROM 30/33          MSI/LG / SONY 16X DVD 57/ 58/59          Toshiba 16X DVD 65          Pioneer DVD 16X/SLOT 62/72          LG 40X10X40/48x16x48 72/82          MSI 40x12x48/48x16x48 63/75          Sony 40x12x48/48x12x48 72/85          Plextor 40X12X48/48x24x48 168/185          Yamaha 44x24x44 176          Pioneer 104/A04 DVD-RW 405/439          Toshiba 5002 DVD-RW 425</p>	<p><b>HARD DRIVE</b>          Maxtor 5400RPM          20/30/40/60 89/94/109/124          80/120/160 139/212/369          Maxtor 7200RPM          20/30/40 99/99/125          60/80 129/157          WD 5400RPM          20/40/80 99/109/145          WD 7200RPM          20/40/60 102/123/139          80/100/120 159/185/248          IBM 7200RPM          40/60/80/120 125/145/163/235          REMOVABLE RACK 16</p>	<p><b>MAINBOARD</b>  <b>SOCKET 478 (P4)</b>          ASUS P4S333 101          ASUS P4S333-M 110          ASUS P4S533 149          ASUS P4B533 169          ASUS P4S8X 195  <b>SOCKET A</b>          ECS K7S5A 82          ASUS A7S333-WA 105          ASUS A7V333-WA 153          ASUS A7V8X-WL 172          ASUS A7V8X 216  <b>SOCKET 370</b> Msi 6368 85</p>	<p><b>Upgrade Corner</b>          ECS P4LXASD2+ USB2.0 FBS633          Intel Celeron 1.7Ghz          \$175  <b>Modem &amp; Networking</b>          56K V.92 FAX MODEM 18          56K Aopen PCI Modem 22          56K USR V.90 Win-Hardware 27/69          Logitech Quick Cam Express 33          Linksys USB LAN 19          D-Link 4 port Router 74          8 Port Hub 32</p>	<p><b>SOUND CARD</b>          32Bit S.C/128 S.B PCI 13/25          S.B. LIVE 5.1 Audigy 45/92          S.B. LIVE X-Gamer 5.1 92          S.B. Audigy Mp3+ 139          S.B. Audigy 2/Platinum 179/269  <b>SPEAKER</b>          Subwoofer 3Pcs spk 15          ALTEC LANSING AVS200 19          ALTEC LANSING AVS300 36          ALTEC LANSING AVS500 56          CAMBRIDGE INSPIRE4400 77          CAMBRIDGE INSPIRE2500 59          CAMBRIDGE INSPIRE5200 96          CAMBRIDGE INSPIRE6600 159</p>	<p><b>PRINTER</b>          CANON i320/i550 95/169          CANON S330/S520 114/125          EPSON C42UX 62          EPSON C62/C80 129/189          EPSON Photo 820/890 129/397          LEXMARK X25 75          LEXMARK X75/X85 199/239          SAMSUNG M11210 269          SAMSUNG M11440 339          HP 1000/1200 Laser 359/559</p>	

and status.  
 • Norton AntiVirus 2002 included.  
 Just as the Athlon version of the MAX series was refreshed, so has the Pentium version. The IT7-MAX2 is more similar to its predecessor than the AT7, but this one reintroduces the two PS/2 ports (so you can use your old keyboard and mouse). Unfortunately, it sticks with the AGP 4X slot, which means you won't be able to get the most out of the newest graphics cards. This one does, however, include the two Serial ATA connectors in the RAID

portion of the motherboard, and comes with one Serilite adapter for use with your old parallel ATA drive (essentially, the old ATA/100 and ATA/133 interface).

Despite the slight step backwards with the reintroduction of the PS/2 ports, it's doubtful that many will mind; the addition of Serial ATA is very welcome, and the overall performance of the board is still great. Admittedly, it would be nice to see a version of this board with the AGP 8X slot, but in the meantime this one does just fine.

### AOpen AX4B-533 Tube

From: AOpen Inc., www.aopen.com

SystemMark	PCMark	Sandra
ICC: 349	CPU: 6,824	Dhrystone ALU: 5,186 MIPS
OP: 168	Memory: 5,817	Whetstone FPU: 1,505 Mflops
Sys2002: 242	HDD: 612	5SE2: 3,487 Mflops
Sandra multimedia: Integer 11,174 it/s		
Floating Point 13,851 it/s		

- Designed for Socket 478 Pentium 4, front-side bus up to 533 MHz.
- Intel 845E chipset.
- One AGP 4X slot, three PCI slots.
- Tube-based audio is designed to provide

- warmer sound for those with sensitive ears.
  - Three slots for DDR 266/200.
  - Onboard 10/100 LAN.
  - Two serial ports, one parallel port, one game port.
  - AOpen bonus software pack includes Norton AntiVirus and various utilities.
  - Pull-down menus for driver install process a bit tedious if you have to install multiple components
- One of the biggest complaints audiophiles have about PC audio is that it just does-

Continued on page 58

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# The coming world of DVD recording

Rewritable DVDs offer multiple gigabytes of storage, but are they ready for prime time?

By Sean Carruthers

Recordable CDs have undoubtedly become the most popular format for transferring data between machines that aren't connected by a network, largely because writing a CD is now very quick and easy—and, more importantly, very inexpensive. (At less than \$1 per blank disc, the cost of writing the data once is almost negligible.) Rewritable CD media has also become reasonably popular, allowing the same media to be reused multiple times.

The biggest problem with CD-based media is capacity—a maximum of 650 MB or 700 MB, depending on your CDs. For users working with larger files (video, for example), that size limitation just won't do. Luckily, recordable and rewritable DVD media is becoming more prevalent and cheaper.

The newest generation of DVD typically stores 4.7 GB per side, which offers

an awful lot of space. While many of the first writeable DVD drives were cartridge-based, this was often more for the protection of the media rather than any real necessity. With the newest generation of DVD writers, however, many are strictly bare disc format. The bigger issue with recordable DVD at this point is the multiple competing standards, only some of which are compatible with the others (see chart).

As with hard drives, DVD writers are available as external or internal models. To add one internally, you'll need one full-size bay available on your IDE chain and a power connector.

### HP DVD Writer 200e

From: Hewlett-Packard, www.hp.ca

Estimated price: \$850

**Pro:** Both USB 2.0 and FireWire onboard; good software bundle.

**Con:** Incompatible with DVD-RW and DVD-RAM media; expensive!



- DVD speeds: 2.4X write (DVD+R), 2.4X rewrite (DVD+RW), 8X read
- CD speeds: 12X write, 10X rewrite, 32X read
- Handles up to 4.7 GB DVD media, up to 700 MB CD media, using a bare disc tray format (no cartridge required).
- 2 MB buffer, plus buffer underrun protection is built into drive to prevent wasting media.
- Either FireWire or USB 2.0 (switch covers one or the other, so you can't double-connect).
- Headphone jack on the front and audio out jack on the rear (for hooking up to your PC's audio component).
- Software bundle includes HP's DVD and CD writing program, Sonic's MyDVD, MusicMatch

Jukebox Cyberlink's PowerDVD, a backup program, and more

- FireWire, USB, and stereo audio cables included in the box.
  - Compatible with Windows 98SE, Me, 2000 Professional (with Service Pack 2), and XP.
- Hewlett-Packard's CD Writer line has surely been one of the more popular hardware lines, and its DVD Writer should be a crowd pleaser, too. Those who follow the rewriteable DVD media market will remember HP was slow to the field, while it refined the DVD+RW standard. In fact, HP even recalled the first version of the product before it hit the market in order to devote energy to providing a better second-generation version. That extra time certainly paid off. Even though the competing DVD-RAM standard managed to gain some ground, the DVD+RW product, when it was finally launched, was pretty solid.

Continued on page 48

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The coming world of DVD recording

Continued from page 46

The drive can burn both DVDs and CDs. It is incompatible with the DVD-RAM format but should read DVD-R discs just fine.

If you want to save a bit of money (and you have a spot free on your IDE chain), you can get the internal version of this product, the DVD Writer 200i (about \$575). The external version is an easy way to hook a DVD writer up to either your desktop or portable PC. (Note: if you're planning to use FireWire, you may have to get another cable if your notebook uses the smaller four-pin connector, as this package only comes with the six-pin-to-six-pin connector.) At any rate, you'll be able to choose between FireWire and USB depending on the machine you hook the drive up to; a simple flick of a switch on the rear of the machine covers the port you're not using, exposing the other.

The software bundle that comes with the DVD Writer 200e has pretty much everything you need to start burning both DVDs and CDs, whether you want to use the burner for straight data storage or multimedia discs.

LaCie d2 DVD-RW U&I

From: Lacie Canada, www.lacie.com

Estimated price: \$699

Pro: Slightly cheaper than HP external drive; rack-mountable; rugged construction; both FireWire and USB 2.0; both Mac and Windows compatible.

Con: Incompatible with DVD+RW and DVD-RAM media; Easy CD Creator may cause problems under Windows XP.



- DVD speeds: 4X write (DVD-R), 2X rewrite (DVD-RW), 12X read.
• CD speeds: 16X write, 8X rewrite, 32X read.
• Handles up to 4.7 GB DVD media and up to 700 MB CD media, using bare disc tray format (no cartridge required).
• Has both USB 2.0 and FireWire on rear.
• 2 MB buffer, plus buffer underrun protection built into drive.
• Metal casing protects drive and has grooves along the sides to facilitate rack-mounting (can be mounted side-by-side in rack, or adapters

Table with 3 columns: Standard, Supported by, Features. Rows include DVD-RAM, DVD-RW, DVD-R, DVD Multi, DVD+RW, DVD+R.

- available for putting single drive into 1U space-mounting brackets available separately for \$49).
• Comes with LaCie DVD Utilities for recording DVD and CD under both Windows and Mac. (Note: Ships with Easy CD Creator, which may cause problems during installation under Windows XP, thanks to Microsoft's inclusion of a version of the software within XP).
• Compatible with Mac OS 9.x and 10.x, Windows 98SE, Me, 2000, and XP.
When it comes to external storage products, LaCie has been a friend to many a

desktop in both the Mac and Windows worlds. The company has been releasing external CD burning products for quite some time, so the external DVD burner was the next logical step. LaCie has also updated its U&I technology (USB and IEEE 1394, or FireWire) to handle USB 2.0 connections—an absolute necessity when burning this amount of data to an external device. The physical installation of this drive is pretty easy: pick your
Continued on page 63

Promax Computer Systems Inc. advertisement featuring system listings (Beginner, Intermediate, Multimedia, Professional, P4 Starter), notebook listings (Fujitsu, Acer), video cards, sound cards, monitors, and various peripherals. Includes contact info for North Toronto and Richmond Hill.

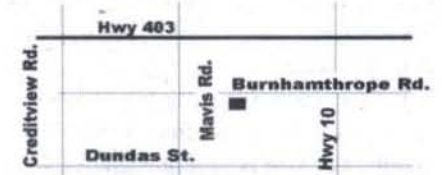
AOpen #1 Computing Solution Provider advertisement featuring product listings like SAMSUNG 15" LCD, LG 17" monitor, and AOpen Slim system with prices and descriptions.

\*Monitors with quantity limit. Some restrictions apply. See internet services and E&E for details. Prices are for in-stock items only. Not applicable to previous or existing @Home customers. Available only in @Home home areas. Properties of their respective owners. All prices are 2% cash discounted. Prices subject to change without notice. Items while quantities last. We reserve the right to limit quantities per customer. Some prices are final in case of discounts. 25% restocking policy to all returned items.



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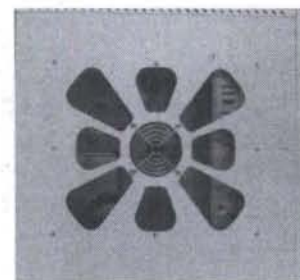
Perfect with neonlight!  
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CC-8076

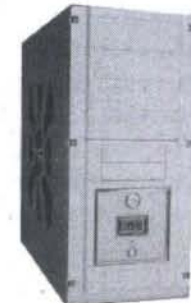
Seven Color!!!

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CC-8076 and CC-8079

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CC-8079

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# Small Office Technology

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## Year end for entrepreneurs

### Online banking, new software takes mystery out of accounting

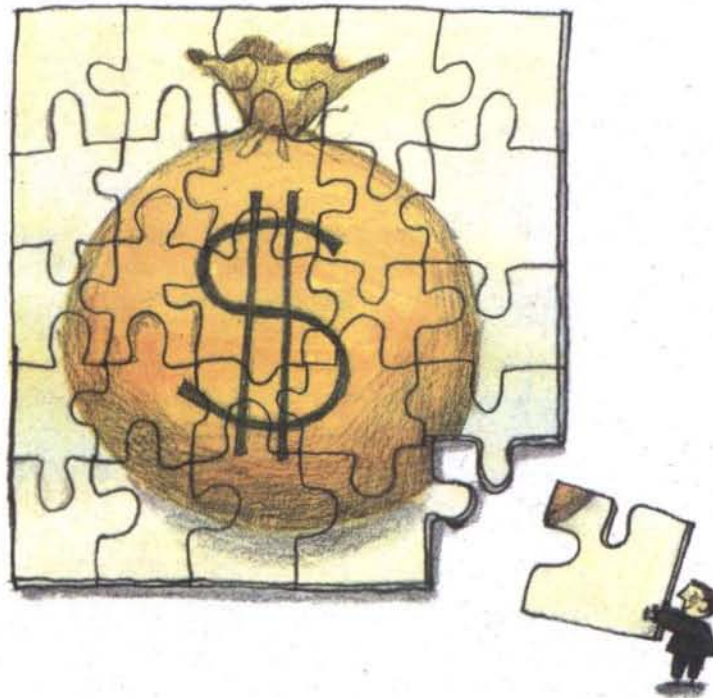
By Geof Wheelwright

The closing of one year and the beginning of another is often a time for personal renewal and contemplation of lessons learned from the 12 months that have just passed. It's often a time for recommitment, the making of resolutions, and a well-spring of good intent.

On the business front, there are also a number of key things you are going to want to reflect on about the year, starting with answers to the questions: how much money did my business bring in (from whom and when) and how much money did my business spend (with whom and when)?

The ease with which you can find the answers to those questions will depend a great deal on just how much work you have done ahead of time. If, for example, you have invested in a comprehensive accounting system—and have kept it up to date by making sure that all expenses and income are entered into that system and properly categorized—you should be able to start answering the most vital year-end accounting questions quite quickly.

By running a quick report you should be able to see all of that information in



glorious detail, and be able to organize and analyze it. You'll be able to create amazing charts showing analysis of expenses in all kinds of categories (perhaps revealing that crates of diet cola and take-out pizza are among the biggest "miscellaneous" expenses).

But let's say, for the sake of argument, you aren't quite that organized, and that

your small business is small enough that it's just you and a couple of other hard-working people keeping it afloat.

#### Let technology help you catch up

The good news is that even if your formal accounting is pretty poor, technology is in a position to help you get a lot of

*Continued on page 62*

## Using macros to simplify your life

By Kerry Dawson

There seems no end to the complexities of modern life. Though it would be impossible for many of us to live without our trusty PC, it has actually added to our range of activities. Many of us now spend a good part of the day sitting at our computers, searching for information, analyzing it, replying to email and even chatting with friends and work colleagues online.

#### QuicKeys 2.5

From: CESoftware, [www.cesoft.com](http://www.cesoft.com)

Price: \$99.95

#### Macro ToolsWorks 5.1

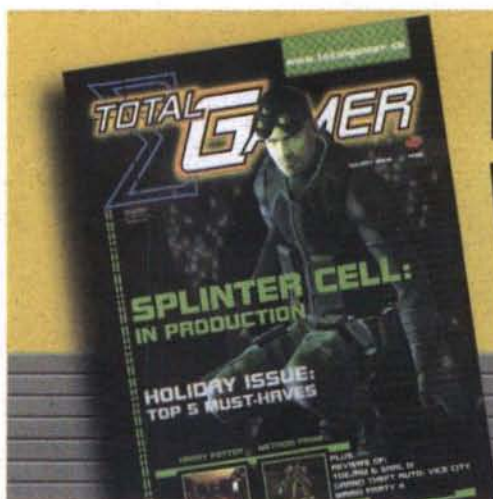
From: Pitrinec Software, [www.pitrinec.com](http://www.pitrinec.com)

Price: \$39.95

One utility group that is often overlooked and underused but can actually simplify computing life is the macro. A macro utility records keystrokes and plays them back at the stroke of a key sequence or press of a button, or can be used to produce more powerful custom written scripts.

The end result is that repeated tasks become easy through automation: for

*Continued on page 51*



# ENTER TO WIN!

## 1 of 2

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**Using macros to simplify your life**

*Continued from page 50*

example, you'll no longer need to retype frequently used word sequences, or look up email addresses, credit card numbers, or passwords. In fact, a macro program can also automatically log you on to all the Web sites you frequent and can even download information, such as your bank transactions, to a program like Money or Quicken.

There is one final but significant benefit to these programs: they work across all your application environments and allow you to output the same information anywhere or integrate functions from one application to another.

Although there are many macro utilities available, two that are worthy of special attention due to their powerful capabilities and ease of use are QuicKeys 2.5 and Macro ToolsWorks 5.1. I've used QuicKeys and Macro ToolsWorks extensively and can confidently say I could not do without them.

I first discovered QuicKeys many years ago when I used a Mac. I loved the program because I could not only record and playback keystrokes and scripts, I could also dramatically reduce my dependence on the mouse. When I switched back to

using a Windows-based PC in the late '90s, I was fortunate because CESoftware had migrated its program to Windows. Since my return to the Windows platform, I came across Macro ToolsWorks, which is the program I now rely on for the bulk of my macro and scripting requirements.

If you're using a Mac, you'll need to go with QuicKeys, as Macro ToolsWorks is not available for this environment.

For the PC, either program will prove a competent addition for improving and simplifying your interaction with your system. However, it is Macro ToolsWorks that I prefer, as its architecture and design are newer and more consistent with the Windows XP interface, especially with the release of version 5.1. QuicKeys is now looking a bit dated, and finding and replaying macros in QuicKeys can prove quite unwieldy, especially as you start to build up a stack of them. Finally, Macro ToolsWorks is simply the more powerful of the two systems and is substantially cheaper (\$39.95 for Macro ToolsWorks versus \$99.95 for QuicKeys).

In terms of functionality, both programs allow you to record your keystrokes and play them back by pressing a key sequence such as ctrl-alt-d to output, say,

today's date. They also both provide a toolbar capability that allows you to scan icons that invoke the macro. The one advantage to QuicKeys over Macro ToolsWorks here is that in QuicKeys 2.5, icons can include text to describe what the item is. In Macro ToolsWorks and previous versions of QuicKeys, you have to float your cursor over the icons to see what they are. As you can imagine, if you have to scan too many icons, it can slow your replay of an action significantly. Both programs also allow you to customize your macros or scripts and write them out manually.

However, where I find Macro ToolsWorks shines is in the variety of macros and scripts you can build and the various ways they can be played back.

In addition to the key combination and toolbar/button approach, you can replay key sequences and any script by entering any combination of characters as a short form of the script you want to activate. As an example, .ad can output my full address whereas .lmb can log me on to my bank account and download all current transactions.

Macro ToolsWorks will also create a menu of items when scripts have the same

key combination. As you build up macros, this becomes extremely valuable as you soon start to run out of potential key combinations. QuicKeys only allows one action per key assignment, so you need to start using the toolbars and icons as an alternative to activating actions.

There's much I haven't touched on about these two very capable programs, but you can't really go wrong choosing either. They'll both do much to improve your interaction with your PC. If you have a Mac, QuicKeys is definitely the granddaddy of macro programs, but for the PC, Macro ToolsWorks has become my preferred assistant. □

**WWW.**

TCF—Photographer Shaun O'Boyle's eerie collection of Modern Ruins Photographic Essays explores abandoned industrial sites, a deserted shipyard, and empty institutions, including several hospitals, an orphanage, and an insane asylum, where a poem etched into a wall remains as a sad reminder of its former occupants.

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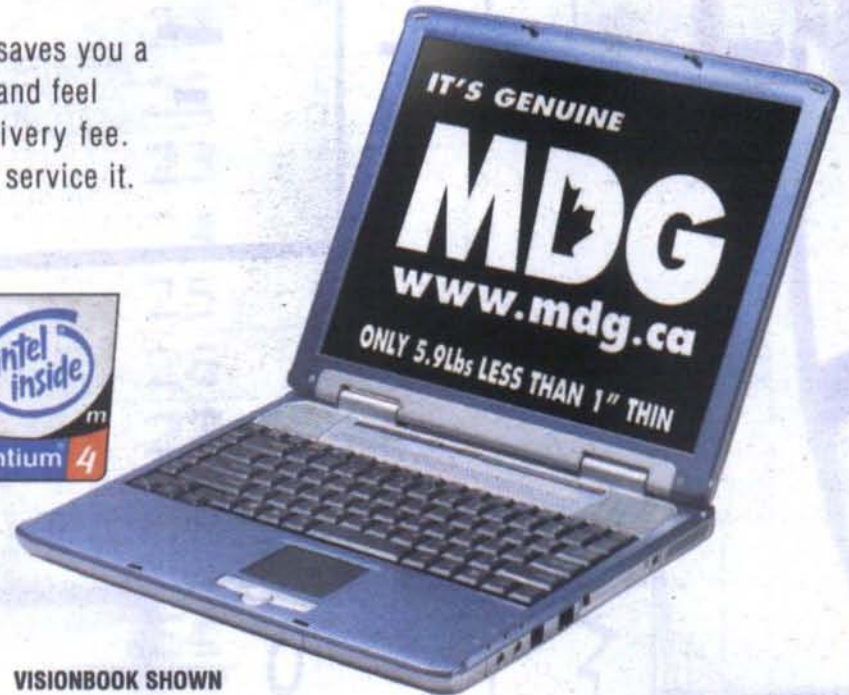
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# Share photos with PowerPoint



Helen Bradley  
OFFICE SUITE  
TRAINING

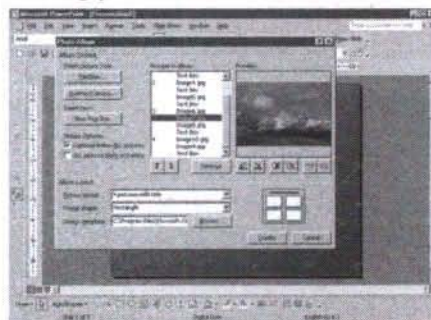
If you've thought of sharing photos with friends and family, you'll probably been considering some type of email delivery or Web site tool rather than PowerPoint. It may pay to give this presentation tool a

chance, though, as both PowerPoint 2000 and 2002 can be used to create photo albums from a series of images. You can add text to the page, and headings, and create wonderful presentations from your slides which anyone can view.

This month we'll look at how to use PowerPoint to create an album to share photos of the kids, vacations, and other family events. We'll also tell you how to add to the album over time. As a plus, like any PowerPoint presentation, you can post your album to the Web or email it to friends and family, who can view it using PowerPoint or free viewer software.

If you're using PowerPoint 2000, you'll need to download a wizard (in PowerPoint 2002 the album feature is built in and works a little differently). When you've downloaded the file album.exe (at [office.microsoft.com/downloads/2000/album.aspx](http://office.microsoft.com/downloads/2000/album.aspx)) simply double-click on it, and will install itself. If you're using PowerPoint 97, unfortunately, you can't use the wizard. However, with a bit of imagination and some PowerPoint skills you can create a similar result, using the images here as a guide.

## Starting your album



You can build a multi-page photo album with PowerPoint 2002's Photo Album tool.

If you're using PowerPoint 2002, start a new blank presentation and choose Insert, Picture, then New Photo Album.

If you're using PowerPoint 2000 with the wizard installed, choose File, New, select the General tab, click PhotoAlbum.pwz in the list, and click OK. You will see a Photo Album dialogue appear (it's basically the same in both versions).

The images you add to your album can come directly from your hard disk or you can scan or download them into the Photo Album tool from a scanner or camera. This latter method is not recommended, however, as PowerPoint doesn't offer you the ability to easily edit or crop images. So, plan to download or scan images into your graphics software first, edit and crop them there, save them to your hard disk, then select images from the disk in PowerPoint.

To add images, click the File/Disk button and locate the image files on your disk. Hold the Control key as you click each image in turn to select it, then click Insert to add the images to the dialogue. Once in the list, you can arrange the images in the order you want them to appear, using the up and down arrows.

## Choosing a layout

The default album layout displays one picture on a slide with the image sized to fit the slide and no fancy options—it's fairly plain and lacklustre. However, you can choose other options to include more photos per slide (one to four) and a page title. You can also add text blocks in place of one or more of the images on a page.

Select your preferred option from the Picture Layout dropdown list (notice that, when you do this, the small Preview window to the left of the list shows a thumbnail diagram of the slide as it will appear when created). We recommend you use one of the "with title" options—the one-photo and four-photo per page options will be best for images that have a landscape orientation, and the two-photos per slide option if images have a portrait orientation.

If any of your images have been scanned in or downloaded sideways, select them in the list, then use the Rotate Right or Rotate Left button to reorient them. If you're using PowerPoint 2002, you'll also note that there are buttons for increasing and decreasing image contrast and brightness.

Once you've chosen a layout (other than the Fit to slide option), the Frame Shape (Frame Style in PowerPoint 2000) option will be enabled. The options include bevelled and rounded rectangles, which are both rectangular but have different edges, and an oval shape that will crop part of your image. There are three other rectangle options that include small corner markers that look like photo corners used in a "real" photo albums. You can choose one of these options, or just use the default frame for a plainer look.

## Adding journaling boxes

To add some text to describe the contents of the pictures, both Album tools include an Insert Text Box button. Click it once to add a single text box, or multiple times to add multiple text boxes. Each text box will be the same size as the photos and it will take the space of one photo. You can add as many as you like and use the arrow buttons to move them into position in the photo list.

So, for example, if you have a two-photo per page layout, you could alternate photos with text boxes, so you'd effectively have one photo and one text box per page. Likewise, adding one text box for every three photos in a four-photo per page design will place three photos and one text box per page. You can also use a text box to force an empty space on a page.

For now, though, add only the text boxes you need (we suggest at least one per page) and move them into position so they'll appear on the correct pages.

Another option is the page background that you can add by choosing a design template for your album. Click the Browse button to the right of the Design Template option and browse the special Photo Album templates on your disk. If you don't see anything you like (and they're a pretty bland lot), you can use any other design template on your disk. The trick is to find the templates. You can use Start, Find, then Files or Folders to search for them (they're .POT files), or try Program Files\Microsoft Office\Templates\Presentation Designs folder. Click the template you want to use and click Select.

The Captions Below All Pictures option places the image's file name in a

box below each picture. This might not sound like an impressive option, but it does give you a predesigned and positioned box that you can edit later. If you plan to add a brief title for each image, select this option.

## Finishing touches

At this stage, you will be just about finished with the Photo Album dialogue and ready to create your album. Click Create to create the photo album. PowerPoint 2000 will display a warning stating that you won't be able to return to this dialogue to make changes later on. This isn't a huge problem as the photo album is a regular PowerPoint presentation anyway, so you can make changes to it using PowerPoint's tools. In any case, if you make any significant changes to a PowerPoint 2002 album, such as changing a photo size or removing an element, you'll lose these changes if you go back to edit the album. So, you're best advised to see the Photo Album tool as a starting point for creating the album but to plan never to return to it and use PowerPoint's own tools instead.

Before you make changes, browse through your album to become familiar with how it looks. Plan the changes and edits you'll want to make. If you've totally blundered in your layout (and if you're using PowerPoint 2002), choose Format, then Photo Album to return and make the required changes, then choose Update.

Once you've planned the changes you want, you can start to make them. Add a title for each image by clicking its caption box and typing in a short title. Click in each text box and add the descriptive text for the page—this will help you remember what is important about the photos and will help your viewers to understand that too.

Like any PowerPoint presentation, you can make changes to the page background by choosing Format, Slide Design, then selecting Color Schemes or Design Templates from the Task Pane options. If you're using PowerPoint 2000, choose Format and then either Slide Color Scheme or Background, or Apply Design Template depending on what you plan to change. You can choose to make

*Continued on page 56*

Internet Access

Website Hosting

Server Colocation

Managed Services

Website Development



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## Three Easy Steps to Colocation

### 1

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- 1/4 Cabinet
- 1/2 Cabinet
- Full Cabinet
- 6x9 Cage
- Custom Space

#### Select Location

- Toronto
- Ottawa

### 2

#### SELECT YOUR INTERNET

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### 3

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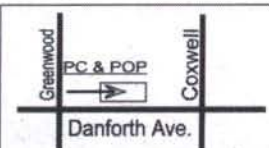
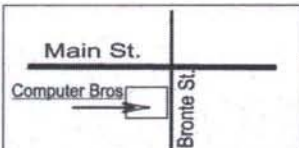
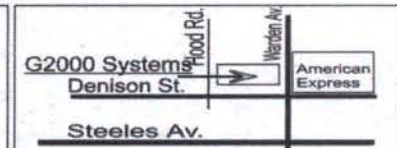
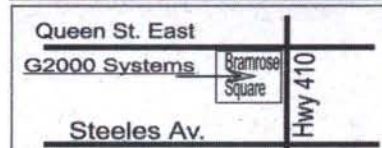
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**Share photos with PowerPoint**  
Continued from page 54  
the change for all the slides (album pages) or just the current page.

To decorate your pages, add images from your clip art collection. For example if your images are from a summer seaside vacation, use images of sea shells or fish to add interest. To do this, choose Insert, Picture, Clip Art, then select the image you want to use. It is also possible to add sound bites and video clips to your presentation—just keep them small if you plan to upload the presentation to the Web or email it.

**Adding to your album**  
If you want to add additional images to your album, resist the temptation to edit it using Format then Photo Album because you risk losing your changes. Instead, save your current album and start a second album with the additional images, taking care to set it up using the same frame and design template options.

To do this in PowerPoint 2002, choose Insert, Picture, and New Photo Album (in PowerPoint 2000, choose File, New, and choose the PWZ file). When your second album is created, choose View, Normal, and right-click the slides you want to copy to the original album. Choose Edit, Copy, Switch To The Original Album, right-click, and choose Paste to place the slide into your original presentation (in PowerPoint 2000, do this from the Slide Sorter view).

**Sharing the result**  
When you're done editing your album, save it to disk so you have a copy you can add to or edit in the future. You can now plan on how to distribute it. You can upload it to the Web using a Web browser, or you can simply zip the PPT file and email it to friends who have PowerPoint. If you know they don't have PowerPoint (or if you've used fancy fonts), you can use the Pack and Go wizard to pack the presentation into a file with the viewer. They can then run the executable file the Pack and Go wizard creates, then view the presentation on their computer using the enclosed viewer. □

Helen Bradley specializes in writing hands-on tutorials. Her columns appear regularly in a number of publications in Australia, the U.K., and the U.S. Contact Helen at helen@helenbradley.com.

Quick Tips

# Selections in PaintShop Pro

Making selections quickly and accurately is the first step in editing in PaintShop Pro. Here are some selection tips:

**Select to size** • When you need a 100x100-pixel selection from an image, don't read the size off the status bar, instead specify the size you want by clicking the Selection tool and choosing the




Rectangle selection. Now double-click the tool to open the Select Area dialogue. Type 100 as the Right and 100 as the Bottom values (leave Left and Top at 0), and click OK. A 100x100-pixel selection will appear in the top left of the image. Click the Mover tool and drag the selection into position with the right-mouse button.

**Save a selection** • You can save a selection inside an image's Alpha channel by first making the selection, then choosing Selections, Save to Alpha Channel, and clicking OK. Next, give the channel a name. Save the file in a format that saves channel data (PaintShop Pro's .PSP format, for example). You can then reload it anytime by choosing Selections, then

Load from Alpha Channel. Use the Selections, Save To File option to save selections for use in other images.

**Freehand selections** • The Freehand selection tool can be used to select an image that has very clear edges. Select the tool and, from the Tool Options palette,




*Continued on page 58*

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**Mobo madness**

Continued from page 45

n't sound the same as a good analogue stereo—all of those zeros and ones just don't have the same warmth as a good analogue signal, supposedly. AOpen's new motherboard aims to fix that by adding analogue back into the mix—at least as far as the audio component goes—by adding a socket on one corner of the board for a small vacuum tube that delivers the audio to your speakers.

The installation of the board adds a few more steps than standard motherboards because of the tube component. The tube and bracket come in a separate box (you can use the board without the bracket, but there's no audio without the tube). Because the tube assembly, complete with large capacitors, takes up so much space

on the bottom end of the board, there are only three PCI slots next to the AGP slot, and you will have to use the bracket beside the last PCI slot for mounting the tube audio bracket. It's a tight fit, but you should be able to get it into that bracket mounting spot with some careful work.

The addition of this audio component would be beside the point if the performance of the board wasn't very good, and as it turns out, the AOpen AX4B-533 Tube is quite competitive.

The big downsides, of course: it is more expensive than your typical board, and you'll occasionally have to replace the tube itself. For those who really love their audio quality, though, it certainly delivers. □

**A unique phone**

If you want to buy a mobile phone for someone who values style over anything else—and who is handy with a joystick—Microcell's new VTech A700 could be the right choice. Microcell, which operates the national Fido network, is selling the tiny, 57 g (2 oz.) phone for \$125, and offering a \$50 rebate, bringing the effective price down to \$75. Several features make this a unique handset, the most unusual of which is probably the joystick-operated interface, which makes heavy use of icons for navigation. It takes a little getting used to, but once you master it, it's seems pretty straightforward.

Built-in functions include a vibrating alert, calendar, alarm clock, calculator, scalable text and dynamic menu icons. The VTech A700 operates both on Fido's national GSM network across Canada, and in more 6,000 cities on the networks of Microcell's U.S. roaming partners, including T-Mobile USA/VoiceStream Wireless.

—Geof Wheelwright



From: VTech (for Microcell), www.fido.ca  
Price: \$125 (before \$50 rebate)

**Selections in PaintShop Pro**

Continued from page 57

choose the Smart Edge Selection Type. Now, click at various points around the object on its edge. The tool will select the edge as it goes. To undo a point, press the Delete key, then continue clicking again. Double-click to close the shape (do this over starting point).

**Adding and subtracting** • You can add (or subtract) an area to a selection by first making the selection, then holding the Shift key as you select another area to add to the first (hold Control to subtract an area). Use the same selection tool for the second selection or a different one, depending on what you need to select.

**Vector shapes into selections** • Create selections from a vector shape by first drawing the shape using the Preset Shapes tool and selecting the Create As Vector checkbox. Click the Object Selector tool, right-click the shape, and choose Create Raster Selection. Press the Delete key to remove the shape and you can now switch to the layer you want to work with and your selection will come with you.

**Use your magic wand** • The magic wand tool selects shapes by the colours in the image. From the Tool Options palette, set a tolerance: use 1 for clip art where the image includes solid colours and a higher setting for a photograph or complex image where there are variations of colours. You can then click on a colour to select it (and other adjacent colours within the current tolerance range). Hold Shift then click to add other areas. Use

Selections, Modify, and Select Similar to add other non-contiguous parts of the image with the same colour as the current selection.

**Working with selections** • To copy a selection from the image and move it at the same time, hold Control + Alt and use the arrow keys to move it into the new position. To crop to the selection, choose Image, then Crop To Selection. To move the selection to a new layer, choose Selections, then Promote to Layer.

**Use a type selection** • Create selections the shape of a letter or word using the Text tool. Click on the Text tool and on the image. From the Text Entry dialogue, click Selection, choose a font and size, and type the letter or word. Click OK to add it to the document. To move it into position, click the Mover tool and use the right-mouse button to drag it into place.

**Create from a mask** • Create a mask by choosing Masks, New, then Hide All. Choose Masks, View Mask, Masks, then Edit. Now paint on the image using White to remove the mask and black to add it (shades of grey cause it to be partly opaque). When you are done with the mask, choose Selections, then From Mask to create it. Remove the mask by choosing Masks, then View Mask. Stop it from being edited by choosing Masks, Edit, choose Masks, Delete, and click No to stop it from being permanently merged into the current layer.

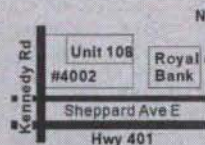
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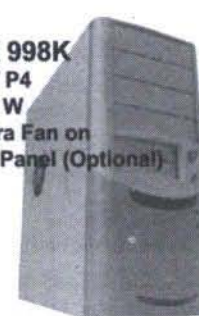



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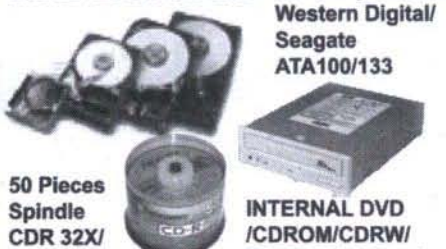
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# Microsoft launches Tablet PC

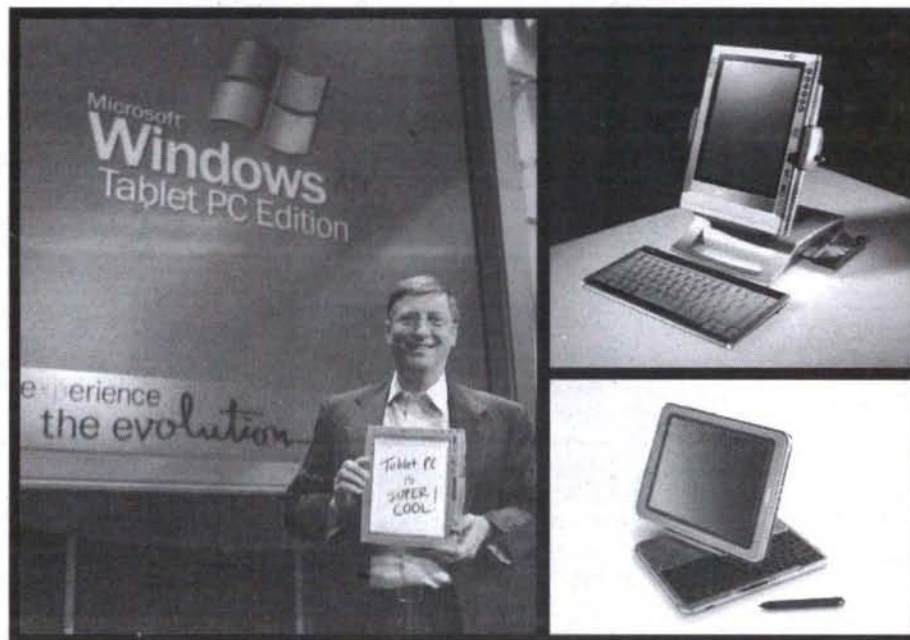
By Christine Walewski and TCP Staff

Microsoft (www.microsoft.com) seems confident its Tablet PC will revolutionize the workplace. At the product launch in Toronto in early November, the company said that, in five years, it expects most portable PCs will be tablets.

"This is both a business environment change and a technology change," said Microsoft Canada president Frank Clegg.

The Windows XP Tablet PC Edition combines a portable PC with a touch-sensitive screen that can be written on as if it were a notepad. Elliot Katz, product manager for the Tablet PC, referred to it as an evolution of the notebook PC.

The Input Panel gives users the option of entering information into their Tablet PC via an onscreen keyboard or with a digital pen using the Writing Pad. The digital Ink is treated as text using handwriting-recognition software. The user can format the text and conduct searches on handwritten text documents. Mistakes in handwriting can be erased by



Microsoft chairman, Bill Gates, at official U.S. launch of Tablet PC in New York. New devices using the platform include the Fujitsu Stylistic ST (top, right) and the Compaq Tablet PC TC1000 from Hewlett-Packard (bottom, right).

using the opposite end of the digital pen.

The Ink feature is compatible with all Windows XP applications, allowing users to insert Ink comments into Word documents, PowerPoint presentations

and be annotated, and handwritten Tablet notes can be emailed via Outlook.

However, if the email recipient doesn't use Ink-compatible platforms, the note file has to be sent as a compressed

TIFF or Web page. Microsoft says it expects a Journal Viewer will be released in December to rectify this. The application will be available as a free download from Microsoft's Web site.

The Tablet PC comes in two formats; all include a keyboard. A convertible format looks like a normal notebook PC, the key difference being that the screen can be rotated and laid flat to convert to tablet mode. The slate format consists of a notepad-like screen that a keyboard can be attached to. This type of Tablet PC needs to be docked to access a keyboard or mouse.

Deemed by Microsoft as "the first new device of the digital decade," the Tablet PC is the first in a line of products to be launched shortly. Microsoft has partnered with eight companies, including Toshiba and Compaq, to offer a variety of Tablet PCs and related applications.

## Hewlett-Packard

Hewlett-Packard's contribution to the new platform is the Compaq Tablet PC TC1000, which it previewed at  
*Continued on page 61*

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 Asus A7V333(DDR)/Rmd(DDR) 148/193  
 Asus A7V8X(Audio, Lan, 1594RAM, DDR-40) 215  
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**Microsoft launches Tablet PC**  
Continued from page 60

Microsoft's New York launch.

The slate-format device can be used alone or with a full-size keyboard. A flexible docking solution also allows users to place the Tablet PC in a natural, comfortable position to write on the screen while at a desk, according to HP. The dock can

also accommodate a second monitor, and the TC1000 screen itself can be viewed in portrait or landscape mode.

The tablet of the TC1000 is 2 cm (0.8 in.) thick and weighs in at 1.35 kg (3 lb.). It's powered by a 1 GHz Crusoe TM5800 processor, with a choice of hard drive size (up to 60 GB), Nvidia GeForce2 Go 100 graphics card, 10.4-inch TFT dis-

play, built-in 802.11b, and USB 2.0 connectivity. The device also incorporates user-programmable launch buttons and a jog dial. It has an estimated retail price US\$1,699 and up (depends on configuration). Price does not include dock.

**Fujitsu Stylistic ST series Tablet PC**

Being an old hand at developing pen-

based computers, Fujitsu Canada was natural hardware partner for Microsoft's Tablet PC platform. On the day of the OS launch, Fujitsu unveiled the Stylistic ST Series Tablet PC.

Like HP's device, the Stylistic ST it is a slate-format device that can be used alone, with a keyboard, or as a desktop computer with a docking station. It weighs 1.44 kg (3.2 lb.) and is 2.2 cm (0.88 in.) thick.

It uses an 800 MHz Mobile Intel Pentium III low-voltage processor, with 256 MB SDRAM (768 MB maximum) and 20 GB or 40 GB shock-mounted hard drive, and has a 10.4-inch XGA TFT display. It includes Ethernet, USB 1.1, infrared, and FireWire connectivity, built-in modem, PC Card slot, and lithium ion battery. Built-in 802.11b wireless connectivity is optional. The optional dock includes all of the peripheral connection ports, as well as a modular bay to accommodate an optical device, such as a DVD/CD-RW drive. It also has several one-touch application-launch buttons.

The Fujitsu Stylistic ST Series has suggested list price of \$3,899 or \$4,199 with the docking station bundle (includes CD drive, keyboard, and mouse. □

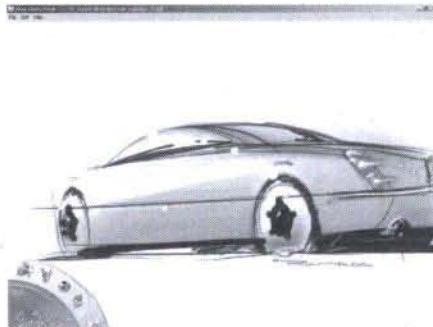
**Alias SketchBook Pro for tablet PCs**

Though not commercially available until early 2003, Toronto-based Alias Wavefront (www.aliaswavefront.com) has unveiled its first contribution to the Tablet PC platform, which was launched by Microsoft in early November.

The company says Alias SketchBook Pro will transform a Tablet PC device into a digital sketchbook, allowing users to sketch and annotate images.

With Alias SketchBook Pro a user can switch virtual brushes, quickly undo and redo, manipulate image layers, and integrate digital sketches into other Windows XP applications.

The company says the application is intended for both business users and graphics professionals, and draws on tech-



nology developed for Maya and StudioTools—its professional graphics applications.

Alias SketchBook Pro incorporates production quality tools, including: pencils, markers, brushes, and airbrushes that respond to pen pressure; a wide selection of primary and secondary colours, via an

easy-to-use colour wheel.

Images—from photographs to high-resolution technical drawings—can be annotated and emailed. Sketches can be easily managed and organized into a presentation with feedback instantly added to the annotation layer.

The application also includes the Marking Menu user-interface, which accommodates natural hand movements to select command options—without the need to hunt through traditional scroll-down menus.

A free introductory version of Alias SketchBook Pro can be downloaded at www.aliaswavefront.com/sketchbook or www.microsoft.com/tabletpc.

—Megan Johnston

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**Year end for entrepreneurs**

*Continued from page 50*

your year-end work done more quickly than ever before. In order for that to happen, however, you have to be prepared to do a little work up front.

If you haven't already done so, that work starts by picking an accounting system. For many small businesses, it could be something as modest as Microsoft Money, Intuit Quicken, or something a little more "professional" like Computer Associates' Simply Accounting or Intuit QuickBooks. These are inexpensive, easy to use, and broadly supported by the country's major banks.

Online banking is now a reality for many small businesses.

It offers a great way to extract the information you need to quickly build a comprehensive view of your finances.

The support of banks becomes important quite quickly when you sit down to the initially daunting task of entering your financial data for the year into your accounting system.

Online banking is now a reality for many small businesses. It offers a great way to extract the information you need to quickly build a comprehensive view of your finances. All of Canada's major banks (and most credit unions) let clients look up details of transactions on their accounts online going back a number of months.

If you bank with TD Canada Trust, for example, you can download any month-

ly statement in Money, Quicken, QuickBooks, or Simply Accounting data formats—or even as a comma-separated CSV file that can be imported into most spreadsheets.

You should be able to go back up to six months in retrieving these statements online and export the data contained within them to your chosen accounting application.

Likewise, most credit card companies in Canada also offer the ability to view past statements online and download details of those statements in a variety of data formats.

Of course, if you are starting from scratch, you will undoubtedly have a fair amount of work to do in setting up any computerized accounting system, as you work to ensure that you have all the necessary categories and enter the details of cash expenses and cash transactions. But that can't be helped. At least the availability of online statements can assist you in quickly bringing your books up-to-date.

Don't forget, however, that you'll need to ensure that your real-world filing keeps pace your increasingly organized electronic information. Whether you are submitting expenses to a client or claiming a tax rebate, you will still need to be able to show receipts and produce paperwork.

Having this in electronic form just means you will be able to calculate and analyze financial information more quickly.

**Moving forward**

In all your zeal to ensure that you have a comprehensive view of the past year, don't lose sight of your goal in doing so: to have an even better year in the next 12

months. And that should be a realistic goal, because you will discover a great deal about how your business spends and makes money by being able to analyze the information you enter into your accounting system.

But if you are smart about how you use that information, you'll have a chance to discover even more. And that's because you will be able to link pieces of information that you might not normally think to connect.

If you can quickly pinpoint the amount of revenue attributable to each customer in a given year it, could help you determine which are helping keep you afloat and which are holding you back.

Do you know, for example, who your most expensive customers are? Every small business has them. They typically require lots of time on the telephone or

in-person, yet may yield little in the way of revenue.

If you can quickly pinpoint the amount of revenue attributable to each customer in a given year—and the costs associated with servicing the needs of that customer—it could help you determine which are helping keep you afloat and which are holding you back.

Likewise, being able to quickly conduct analysis of bank charges, long-distance phone rates, mobile phone costs, office supply costs, and so on will help you make more informed decisions about how you manage your small business in the coming year than you did in the year past.

**A less taxing task**

Of course, the big advantage in all this will come at tax time. Not only will your accountant be overjoyed that you now have so much financial information at your fingertips, but the improved "real-world" filing you will have instituted alongside the development of this information should make his or her job much easier (and hopefully cost you less). □

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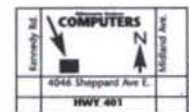
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### The coming world of DVD recording

Continued from page 48

connector and plug in the power. Some installations will require a driver install, but with newer OSes, the computer may see the drive immediately, which was our experience with XP.

Please note: because LaCie uses other manufacturers' drives inside its own casings, it's easy for the company to refresh the line with newer and better DVD recorders as they are made available. The specs we have listed above reflect the new Pioneer drive LaCie has just started to incorporate into its d2 line. Older versions of the d2 may well have the slower drive and slightly different specs.

#### AOpen DVRW2412 Pro

From: AOpen Inc., www.aopen.com

Estimated price: \$630

**Pro:** Compatibility with a lot of other manufacturers; good software bundle.

**Con:** Higher price; incompatibility with DVD-RAM/DVD-RW.

- DVD speeds: 2.4X write (DVD+R), 2.4X rewrite (DVD+RW), 8X read.
- CD speeds: 12X write, 10X rewrite, 32X read.
- 2 MB buffer and JustLink buffer underrun technology built into the drive.

- ATAPI connection (on the IDE chain).
- Software bundle includes Nero Burning ROM, neoDVD, Ulead VideoStudio 6 SE, Cyberlink PowerDVD.
- Blank media included: CD-R, CD-RW, DVD+R, DVD+RW (one of each format).



The DVD rewriteable space is a bit of a minefield because of the competing standards, and though DVD-RAM has been around longer, AOpen opted to stand behind HP's DVD+RW standard. As such, it will be fully compatible with any discs burned on an HP drive and incompatible with DVD-RAM. It should be able to read DVD-R media, though.

The installation of the drive is pretty much as quick and easy as any other internal optical drive: jumper it for master or slave as necessary, put it in an empty bay on your PC, then hook up the IDE cable and power connector. The drive comes with a ton of software to

help you burn both CD and DVD media, whether you want to do straight data or create multimedia discs.

#### Panasonic DVD Multi-Recorder LF-D521

From: Panasonic Canada Inc., www.panasonic.ca

Estimated price: \$499

**Pro:** Panasonic was a writeable DVD pioneer; multi-reader compatible with both DVD-RAM and DVD-RW formats; good price point.

**Con:** Incompatible with DVD+RW

- DVD speeds: 2X write (DVD-R), 2X rewrite (DVD-RAM), 1X rewrite (DVD-RW), 12X read.
- CD speeds: 12X write, 8X rewrite, 32X read.
- ATAPI interface (sits on IDE chain).
- 2 MB buffer, plus BURN-proof buffer underrun protection.
- Tray can handle either bare disc or cartridge-loaded DVD media.
- Comes with DVD-RAM driver, FileSafe, Sonic's MyDVD, WinDVD, B's Recorder Gold5 Basic, and more.
- Compatible with Windows 98SE, Me, 2000, and XP.

Long rumoured, Panasonic's Multi-Recorder is finally available. The nice thing about this model is that you don't have to worry so much about the divisions between formats in the DVD space. Not only does the drive write in



Panasonic's long-adopted format, DVD-RAM, but it will also handle the DVD-RW format. (Note: this is separate from HP's chosen format, DVD+RW, which this Panasonic drive does not support).

As the first DVD multi drive we've seen, we have to say it's pretty impressive, and it comes with a reasonably good bundle as well. While it's anyone's guess as to which rewriteable standard will shake out as the ultimate victor in the standards war, this one at least has two chances at the title! □

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# Wireless waxes and wanes but innovation still strong

By Sean Carruthers

**L**AS VEGAS—Over the three days in mid-November that we attended Comdex Las Vegas 2002, we picked on one particularly strong trend: that groups of people sitting around with notebooks and quietly cursing were probably trying and failing to connect to the Internet from one of the several "hot spots" located around the Las Vegas Convention Center.

Hot spots are publicly accessible areas containing open 802.11b wireless networks, designed for access by anyone with a wireless card on their notebook or PDA. The problem came down to one of resources: the company that set up the hot spots had a limited number of IP leases available, and there were far more people trying to connect than there were leases. So, large numbers of people couldn't get on the network, and those

who could saw very spotty performance.

I spent a fruitless half hour in the media room trying to connect, but finally gave up and started chatting with some other journalists who reported the same problems—signal strength was poor and connections fairly unreliable.

Oddly, I had far more luck accessing the Internet in the conference room area at the Venetian hotel. I walked down the hall with my wireless-enabled notebook until the card spotted an open network (the lights on the card would indicate a strong 802.11b signal). At one point I leaned against a wall outside a conference room and was able to piggyback on their wireless network and access my email back at the office.

My experiences here show that, despite the explosion of wireless networking, there's some work left to do: some networks that are supposed to be public are hard to get onto, and others

that are supposedly private can be used by anyone who passes by.

Of the show in general? Despite reports of fewer attendees and exhibitors, there was still plenty to see. Following are highlights.

### GeForce FX: next-gen graphics cards

Before the show floor even opened on the first day of the 2002 edition of Las Vegas Comdex, graphics giant Nvidia was showing off its new graphics card technology. The company, whose technology accounts for one out of every three graphics cards currently shipped in retail systems, pulled the wrapping off of what was codenamed NV30, and is now officially known as the GeForceFX. The card is designed to provide, in the words of Nvidia president and chief executive, Jen-Hsun Huang, "cinematic computing."

The GeForceFX name is derived from

the marriage of Nvidia's GeForce line with that of its former competitor in the graphics field, 3dfx, which it took over. The cards are built using the new 0.13-micron process, which is a step forward in several ways. It's the first card available commercially to make use of DDR2, the faster new memory standard. The graphics processing unit (GPU) has 125 million transistors and features 8-pixel pipelines, each running at a speed of 500 MHz, a definite bump up over the competition. Even more impressive is the speed of the memory. Because it uses DDR2, it's able to get the memory clock up to 1 GHz. The cards will also make use of the newer and faster AGP 8X bus.

One nice innovation with the new reference design is a cooling system known as FX Flow. It uses a combination of pipes, fins, and an enclosed fan to channel the heat directly out the rear of the

*Continued on page 66*

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**Wireless waxes and wanes**

*Continued from page 64*

card, outside your computer. While we've seen similar technology before on Abit's Siluro line of GeForce4 cards (known on the Siluro as OTEs), the new GeForceFX design also adjusts the speed of the fan depending on how hard the card is working: when you're using it full-tilt in a 3D game, it will be on; if you're doing something that doesn't require heavy use of the graphics component, it will scale back the fan speed, resulting in a lot less ambient noise. (Nvidia refers to it as "silent," though to be fair it's only silent when the fan is spun down.)

Many longtime Nvidia partners have already signed up to manufacture GeForceFX cards, including Asus, PNY, and Gainward, and the technology will be finding its way into high-performance gaming systems by companies like Alienware and Canada's own Voodoo PC.

**Voodoo goes mobile**

Speaking of Voodoo, the Calgary-based company has just announced that it will be joining the ranks of notebook manu-

facturers. The new Voodoo M-Class is designed as a mobile gaming machine,



featuring Pentium 4 processors at speeds up to 3 GHz (using desktop processors with a special cooling system that is a hybrid of liquid and air cooling). The graphics component in these new machines will be the GeForce 4 MX mobile GPU. As with other Voodoo products, the M Class will be user-customizable at the company Web site ([www.voodoo.com](http://www.voodoo.com)), including a choice of several different vibrant colours.

**BenQ speeds up the world of LCD**

While LCD flat-panel monitors are making huge inroads into both the office and home, most haven't been ideal for



motion video. With the release of the FP591, BenQ puts high-quality motion-video capabilities into a flat-panel design at an attractive price. The FP591 features a response time of 16 ms, which allows up to 62 frames per second without having to worry about the quality of the image. The screen also features 450:1 contrast, and a maximum 500 nits brightness, which can be adjusted to two dimmer choices when that level of brightness is not required.

The FP591 monitor is also designed with style in mind, with a bezel that incorporates a pair of 3-Watt speakers and SRS sound, soft-touch buttons, and slightly raised screen. The top of the bezel can accommodate an optional

photo card reader for CompactFlash, SmartMedia, and SD/MMC cards; when digital media is inserted, the monitor will display image thumbnails. There will also be an optional TV tuner available for the FP591.

While there will also be other monitors from BenQ featuring the 16 ms response time; the impressive thing with this one is that it will be available for about US\$500, even with the high-quality motion video and the built-in audio components.

**Storage is key**



Portable storage is a product category that seems to be growing exponentially, with the USB storage key sector exploding even faster. During the first day of

*Continued on page 69*

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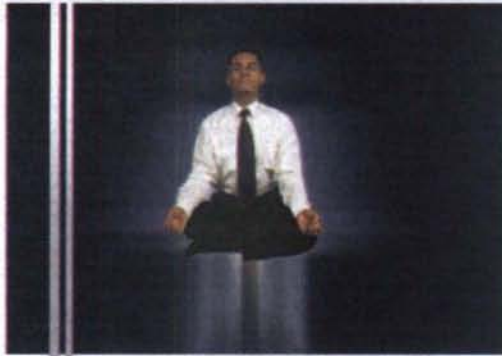
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**Wireless waxes and wanes**

*Continued from page 66*

the show, we saw a number of USB keys, including one of the biggest drivers of the technology, DiskOnKey, which has just introduced a smaller version of its popular key with the ARM7 processor onboard (allowing the key to be used as a boot device, and allowing applications to run directly from the key when it is inserted into a PC's USB slot).

Omega, famous for its Zip technology, has also gotten into the business, using DiskOnKey technology, but under the Omega Mini USB Drive brand name. DiskOnKey products will be available initially in 16 MB, 32 MB, 64 MB, and 128 MB capacities—with 256 MB and 512 MB capacities on the horizon. The Omega product is now available in 64 MB and 128 MB capacities.

Companies that have other flash-based products are also getting into the game. Lexar Media has just announced a USB key that is the first to use the 480 Mbps USB 2.0 bus instead of the 12 Mbps USB 1.1 interface used by other manufacturers' current models. This

boost in speed means the key can even be used for streaming multimedia.

Arch-rival SanDisk has its own take on the technology in the Cruzer (which we've previously seen), which is slightly larger than the others, but features a removable/upgradable SecureDigital card inside. This format allows the user to quickly convert their digital camera's SD card into a USB drive, for use on any compatible PC.

**GI Wireless gets a new standard**

For the last few months, when you talked about wireless networking, you had two main technologies to choose from: 802.11b, the choice for mainstream networking, with a top speed of 11 Mbps or 22 Mbps on a 2.4 GHz bandwidth; or the slightly upscale 802.11a, with a maximum throughput of 54 Mbps on the 5 GHz bandwidth, but which tends to have a degraded signal when there are walls in the way. The new standard is the long talked-about 802.11g, which manages to deliver 54 Mbps over the 2.4 GHz bandwidth, while maintaining backwards compatibility with older 802.11b

network components.

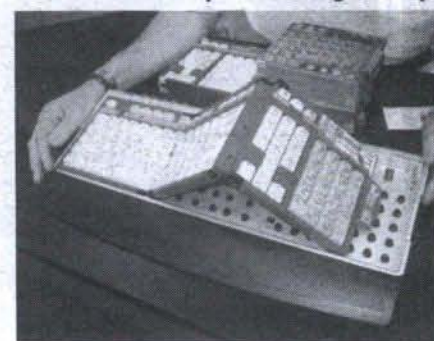
The advantages of 802.11g should be obvious to anyone who's deployed an 802.11b network: it allows for the potential of a faster network without making your old components obsolete. Obviously, any older components would only run at their maximum speed, but with an 802.11g access point, any 802.11g-enabled PC would be able to access the outside world five times faster than first-generation 802.11b networks and not be limited by walls (the shorter wavelength on 5 GHz equipment effectively shortens the range of the 802.11a hardware).

New 802.11g products from some manufacturers are expected to be available in the U.S. by the end of the year, so should be available for purchase in Canada by January of 2003.

While most of the usual networking companies are expected to participate, we saw early models from Linksys and Buffalo Technology. Products using 802.11g technology will feature a slight price premium over those using 802.11b, but only slight. Linksys esti-

mates that an 802.11g router will only cost \$10 more than a wireless router using 802.11b.

**Z Board makes keyboard change a snap**



While there were a number of Canadian companies in attendance all over the show floor this year, one of the more interesting new technologies appeared in the Canadian pavilion. Vaughan, Ont.-based Ideazon Inc. rented a booth to show off its new Z-board technology. The Z-board is a modular keyboard system consisting of a base unit that plugs into your PC through the usual PS/2 port, and modular fold-up keyboard components with application-specific

*Continued on page 78*

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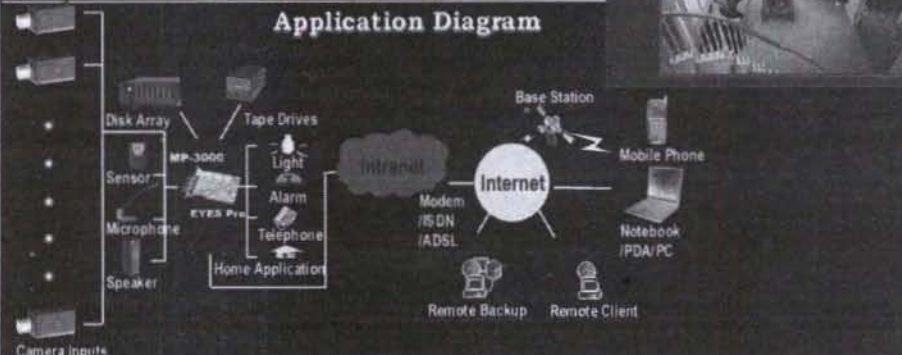
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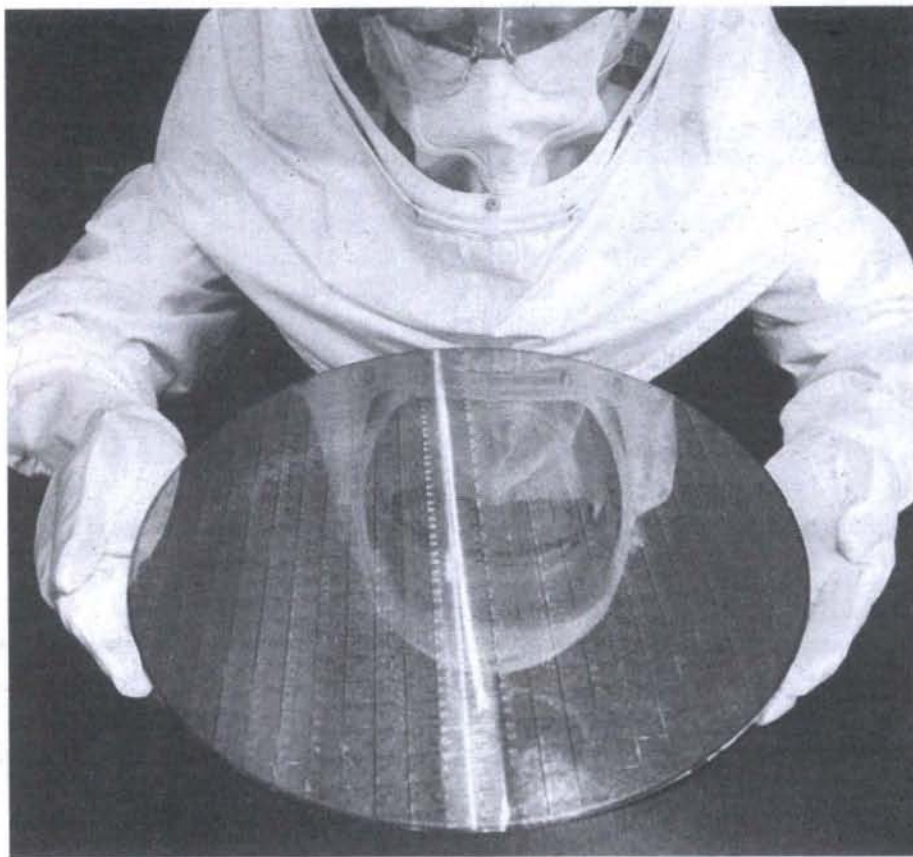
## Say hello to Hyper-Threading

By Sean Carruthers

Intel has been talking about introducing Hyper-Threading into its consumer line of processors for much of the past year. We initially heard about the technology during a briefing at Microsoft's 2002 WinHEC conference back in May. That technology has finally hit the streets, with Intel announcing the release of a 3.06 GHz version of the Pentium 4 processor with Hyper-Threading support built in.

The concept behind Hyper-Threading is pretty straightforward: before this development most desktop processors worked as a single unit, and multitasking was achieved by doling out tiny shares of the same processor to a number of different applications in rapid succession. Hyper-Threading divides a single processor into two discrete processing pathways, each of which then subdivides how it handles its tasks in the same way old processors used to.

*Continued on page 80*



## Seeking and supporting the elusive Linux desktop

Dee-Ann LeBlanc



USING  
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If you follow tech news, you've likely heard all of the complaints: Linux isn't ready for the desktop; not enough software; too confusing to use; and so on.

Well, in some ways Linux might not be ready for the average

desktop user, but that's not a debate I'm interested in at this point. If you want Linux to function as your only desktop environment, the key is knowing what software is available. The complaint that there isn't enough just doesn't hold water anymore.

### The major programs

Let's start with the big one, the office suite. There are an amazing number of office suites available in the Linux world these days, but one that's taken over by storm is available from OpenOffice.org ([www.openoffice.org](http://www.openoffice.org)). This suite is available in 27 languages and counting. It includes Writer (word processor), Calc (spreadsheets), Draw (art), and Impress (presentations).

When you need to work with images of any sort, and a draw program isn't enough for you, it's hard to find a feature that isn't in The GIMP ([www.gimp.org](http://www.gimp.org)).

If you need to trade documents with Microsoft Office users, OpenOffice.org may or may not fit the bill. Your best bet would be to experiment with some sample documents and make sure they convert back and forth from program to program. Heck, if you like OpenOffice.org, you can use the software under Windows, and soon even on a Mac, too.

*Continued on page 76*

## Apple updates notebook lines



Right before the start of the all important holiday shopping season, Apple has introduced new consumer portables in hopes of boosting sales in the sagging computer market.

Last month, Apple posted its first quarterly net loss in several years, so has introduced new models that are cheaper than their predecessors. In the past, Apple has kept the price steady but bumped up the processor speed. Unless new models included significant feature upgrades or redesigned exterior, the prices haven't usually



changed. The new iBooks have faster CPUs, better video cards, and are \$300 cheaper than the models they replace. The RAM configurations are unchanged at 128 MB in both 12-inch models and 256 MB in the 14-inch iBook. The hard drive changes from 20 GB to 30 GB on

the 12-inch combo model (the base model is still at 20 GB), and is 30 GB on the 14-inch book.

The video card and CPU are the biggest upgrades—a significant improvement for gamers. Previously, the iBooks had Radeon Mobility 7000 chips with 16 MB VRAM while the PowerBook Titanium had a Radeon Mobility 7500 with 32 MB VRAM. All three iBooks now contain the 7500 card, although the base model has only 16 MB VRAM. The 12-inch and 14-inch combo models both get 32 MB of VRAM—a significant boost. The 7500 with double the VRAM results in better OpenGL performance, which improves game frame rates and also speeds up Quartz Extreme

*Continued on page 72*

**Apple updates notebook line**

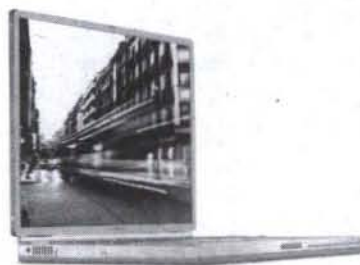
*Continued from page 71*

in Mac OS 10.2.

The CPU speed boost is a modest 100 MHz—to 700 MHz and 800 MHz. The processor is still a G3 though, so don't expect OS X to run as fast as it would on a G4 eMac or iMac. The Radeon Mobility 7500 is arguably a better card than the GeForce 2MX in the iMac and eMac line though, so the iBook should still hold its own against current Apple desktop consumer Macs for overall system performance.

For the first time, an Apple portable ducks under the US\$1,000 price point, making it cheaper than even the base eMac model. In Canadian funds, the iBook models now come in at \$1,599 \$2,599. At present, the cheapest desktop Mac you can buy is the eMac for \$1,690. Though it's \$100 less, the low-end iBook model is much more basic than the others, with a 20 GB hard drive, CD-ROM drive, 700 MHz G3, and only 16 MB of VRAM.

The higher end 12-inch and 14-inch models are more capable—with the larger hard drives, double the VRAM,



better graphics card and CD-RW/DVD-ROM drive. But, even with double the VRAM and a better graphics card, they are not capable of driving an independent external display, also known as spanning.

Any display plugged into the video out port on an iBook is limited to mirroring only, perfect for presentations but it doesn't allow you to extend your desktop. If you need monitor spanning in your Mac notebook, you still have to shell out for a G4 PowerBook.

All iBooks are still using a standard 100 MHz bus and the maximum amount of RAM remains 640 MB. If your needs are simple—email, Web

**New iBook and PowerBook specs**

Model	CPU	RAM	HD	Video card	VRAM	Screen	Optical drive	Price
iBook	700 MHz	128 MB	20 GB	Radeon 7500	16 MB	12.1-inch	CD-ROM	\$1,599
iBook	800 MHz	128 MB	30 GB	Radeon 7500	32 MB	12.1-inch	Combo	\$2,099
iBook	800 MHz	256 MB	30 GB	Radeon 7500	32 MB	14.1-inch	Combo	\$2,599
PowerBook	867 MHz	256 MB	40 GB	Radeon 9000	32 MB	15.2-inch	Combo	\$3,699
PowerBook	1 GHz	512 MB	60 GB	Radeon 9000	64 MB	15.2-inch	Combo	\$4,479
PowerBook	1 GHz	512 MB	60 GB	Radeon 9000	64 MB	15.2-inch	SuperDrive	\$4,799

browsing, and word processing—the base iBook is a steal, especially if you already have a desktop computer. For those who want to use an iBook as their only Mac and are interested in gaming, video editing, or more processor intensive tasks, the \$2,099 12-inch combo drive model is the way to go. For \$500 more you get double the VRAM, faster CPU, and an extra 10 GB of storage.

The 14-inch model gives you only another 128 MB of RAM, and of course extra screen space, but the resolution remains unchanged, at 1,024x768. On such a large panel, Apple should really consider a higher resolution. While 1,024x768 looks sharp and bright on a 12-inch screen, it can look a bit coarse on the 14-inch screen. Still, for those

upgrading from previous G3 PowerBooks and who are used to a larger screen, the top-of-the-line iBook is an attractive option, and its new price seems very reasonable. Another nice bonus of the 14-inch iBook is an extra hour of battery life—an estimated six hours, versus five hours for the smaller model.

Overall, if we had to pick a favourite, it would be the 12-inch iBook with combo drive. For just over \$2,000, it's a great machine that weighs in at less than 2.25 kg (5 lb.), can play DVDs, burn CDs, play games, edit video, and handle almost any home or office task.

We assumed the new iBooks would be cosmetically identical to the existing line, and the 800 MHz models are. The

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<b>1.2 Duron</b>	<b>\$389.00</b>	<b>1.2 Duron</b>	<b>\$399.00</b>	PIII 733	\$469.00	P4 1.9GHz	\$679.00	A7S333 \$119/ ECS K7SEM \$89/ L7VMM \$89 P4VMM \$89	
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128MB PC133		XP 1900	\$489.00	PIII 1.2GHz	\$509.00	P4 2.4GHz	\$719.00	ATI Rad 7500 64MB \$89/ Rad 9000 128MB \$149	
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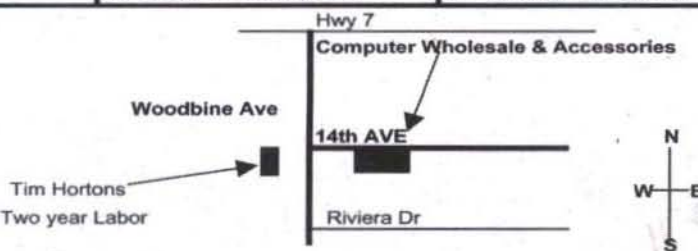
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\$1,599 700 MHz iBook, on the other hand, looks quite different. It's hard to pin down why exactly, but the grey plastics seem cheaper, and the white part is no longer clear plastic that has been painted white on the inside, it's just white plastic. It loses a lot of the sheen that gave it the "ice book" nickname.

Note that all iBooks are AirPort ready with a built-in antenna and have the following: two USB and one FireWire port, 56Kbps modem, 10/100 Ethernet, audio out, and video mirroring.

**PowerBooks get DVD burner**

The new Powerbook models include one feature that surprised us all, a built-in DVD-burning SuperDrive. In other respects, though, the upgrades to this line are pretty standard.

Instead of putting in more features, like built-in Bluetooth or a multi-button trackpad, Apple is choosing to refine the PowerBook with each new model, into the perfect productivity machine. Each revision fixes a few more bugs, adds a bit more speed, but generally doesn't take risks with its winning formula.

The new 867 MHz and 1 GHz PowerBook G4s retain everything that made their predecessors great. At 2.54 cm (one inch) thick when closed, and weighing in at 2.43 kg (5.4 lb.), they are slimmer and lighter than many desktop replacements in the PC world.

This upgrade primarily affects processor speed and graphics capability. Each model is 200 MHz faster and \$300 cheaper than its predecessor. The choices are now an 867 MHz G4 for \$3,699 or a 1 GHz G4 with SuperDrive for \$4,799. On the low end, you still get 256 MB of RAM but the base hard drive is now 40 GB. The higher end models include 512 MB RAM and a 60 GB hard drive, and AirPort cards are still included on the top PowerBooks and are optional on the cheaper models.

There are only two retail models, but Apple lists a third on its Web site that's sure to be popular. While these new PowerBooks are the first to include a SuperDrive, it does add to the weight of the machine, and not everyone needs to burn DVDs on the road. For this reason Apple is offering a CTO (configure-to-

order) 1 GHz PowerBook G4 without the SuperDrive for \$320 less.

The video cards on these new machines have been upgraded from a Radeon Mobility 7500 to the Radeon Mobility 9000—almost the same card as the one found in the newest dual-processor towers. The 9000 can handle much higher frame rates than the old card, and has new texturing features that are current with emerging 3D technologies.

For example, the 9000 features hardware transform and lighting, as well as the ability to render six textures in a single pass—which means these PowerBooks can handle the newest games, including the yet-to-be-released Doom III. This is the first time the video card in a PowerBook is as good as the one in Apple's top-of-the-line desktop.

The 1 GHz PowerBook has 64 MB VRAM, another first for Apple, while the 867 MHz model has to make do with 32 MB (the same as the previous generation). All PowerBooks retain the same complement of ports, with two USB, one FireWire, a 56Kbps modem,

10/100/1000 Ethernet, S-Video out, and DVI.

You can drive an Apple digital LCD using the Apple DVI to ADC adapter (available separately for about \$250). With 64 MB of VRAM and a Radeon Mobility 9000, the 1 GHz PowerBook could easily drive a 23-inch Cinema Display with enough VRAM to run Quartz Extreme on both screens.

Bus speed on these new books remains at 133 MHz, and the RAM is still regular PC133 SODIMMs. Apple could have made the switch to DDR as they did in the towers, but that would have generated more heat, drained more battery life, and added to the cost without a very noticeable performance benefit. In testing, the DDR-equipped G4 towers have not, thus far, shown much benefit from the newer, pricier RAM over the older PC133 models. The PowerBooks do gain 1 MB of DDR Level-3 cache though, which in addition to 256 KB of on-chip Level-2 cache should give a single-CPU G4 tower a run for its money.

*Continued on page 74*

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**Apple updates notebook line**

*Continued from page 73*

As far as bug fixes are concerned, Apple claims to be using a new paint process on the case that is more resistant to peeling and chipping, and AirPort reception is supposed to be improved by repositioning and fine tuning the dual antennae that run along the inside bottom of the case.

The SuperDrive model is a welcome addition for those who want to capture video footage in the field, then edit, and burn a demo DVD without having to return to the office. However, be aware that the SuperDrive in the laptop is limited to burning at a speed of 1X (as opposed to 2X in the current G4 Towers and iMacs, or 4X in the new Pioneer A05 SuperDrive unit).

The screen maintains the same 1,280x854 resolution and now has a brighter backlight unit. Otherwise, the new PowerBooks are cosmetically identical to their predecessors (the exception being that "PowerBook G4" from the bottom edge of the display is now written in the sans serif Myriad font, instead of Garamond Narrow).

As far as value, there is still an \$1,100 gap between the low and the high ends of the line. We think the best model in the range is probably the 1 GHz without the SuperDrive. Unless you need to burn DVDs on the road, the drive just adds to the weight and uses more battery life than the combo drive.

The difference between an 867 MHz and a 1 GHz (both with combo drives) is a more reasonable \$780. For that you get a larger hard drive, double the RAM, a built-in AirPort card (\$169), double the VRAM, and an extra 133 MHz of CPU speed. In the long run, the extra VRAM and CPU will keep your Mac feeling snappy a bit longer into the future.

If the 1 GHz is too rich for your blood consider this: the new 867 MHz Titanium costs only \$3,699, and last month an 800 MHz Titanium cost \$5,099, and you still benefit from the faster video card even with only 32 MB of VRAM. When Doom III comes out in the next few months it will require a GeForce 4 Ti or Radeon 9000 series for the best performance, so these new PowerBooks will be the only Apple laptops that can handle the full visual

splendor (and you can bet more games will follow suit). The SuperDrive model may not be available until mid December.

**Oxygen challenges Apple LCDs**

The cost of LCDs is dropping again, and though Apple has yet to release a revised display lineup, Formac ([www.formac.com/](http://www.formac.com/)) has stepped up with a new Oxygen line that it claims will beat Apple on quality and price.

Formac is the only company other than Apple that manufactures monitors with an ADC (Apple Display Connector)—ADC ports are built into almost all G4 Towers and can be used with the DVI PowerBooks. The advantage of ADC is that power, USB, and video all travel through one cable, thus eliminating clutter and saving a space on your power bar.

The newest Gallery model, the 1740 OX, is the first in the new lower cost Oxygen lineup. It boasts specs similar to Apple's 17-inch Studio Display, though it retails for hundreds of dollars less. The 1740 OX is available with either a DVI or ADC interface, but not both. The ADC

version draws power from the computer and also features two powered USB ports on the back.

It has a retail price of US\$699 (the 17-inch Apple display is US\$999). The DVI version will cost you US\$749, as it requires an external power adapter. As far as specs go, the Formac uses one of the latest LCD panels with increased brightness and contrast.

The Formac is brighter than the Apple (220 nits versus 200 nits), has a better contrast ratio (400:1 versus 350:1) and faster pixel refresh rate (10 to 25 ms versus 40 ms).

These improvements will result in more accurate and vibrant colour for design work, as well as less blur and ghosting in game playing and video. The Canadian price should be under \$1,099 which saves almost \$450 over the \$1,549 Studio Display, and puts it in line with 17-inch displays from Samsung, ViewSonic, and NEC.

Since it's also the only third-party monitor that will work natively with the ADC port on a G4 Tower, you save another \$50 by not having to buy an ADC to DVI adapter. □

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**Seeking and supporting Linux desktop**

*Continued from page 71*

However, if you can't give up some favorite Word feature, but still want to use a Linux desktop, there's hope. A number of products available today will allow you to use Windows software under Linux, with a varying degree of limitations, features, and success—some go much farther than just allowing you to work with Microsoft Office documents. Free programs of this type include WINE (www.winehq.org), Win4Lin (www.netraverse.com), CrossOver Office and CrossOver Plugin (www.codeweavers.com), and VMware (www.vmware.com).

And if you just can't give up your games, we'll keep your secret: try WINEX (www.transgaming.com).

For accounting there are Appgen (www.appgen.com) and GnuCash (www.gnu-cash.org). When it comes to email, calendars, and contact management, it's hard to beat Ximian's Evolution (www.ximian.org). For little things like instant messaging, Gaim (gaim.sourceforge.net) is a good choice, especially if you like to use more than one type of messaging service: for example,

AIM, ICQ, and MSN.

When it comes to Web browsers, there are Opera (www.opera.com), Netscape (www.netscape.com), and Mozilla (www.mozilla.org). Web page authors, on the other hand, often turn to Bluefish (bluefish.openoffice.nl).

Some of this software comes with the latest Linux distributions, and may even be installed by default.

**The major software repositories**

There's much more out there than I can list in a single article, especially since I can't guess everything you might want to do, so let me point you to the first places to look when you want to download new software.

I highly recommend you start right with your own installation CDs. On them you might find programs you'd have started using months ago if you'd only known they were there. From there, look to your distribution's Web site, where you'll find packages specifically tweaked for easy installation in your Linux distribution of choice.

The GNU project maintains a directory (www.gnu.org/directory) of the vast amount

of software it produces and maintains.

If you're a fan of the download site Tucows, you'll be happy to know it includes Linux-focused pages (linux.tucows.com).

ZDNet (www.zdnet.com) houses a wealth of Linux software, too. Look for it under the Downloads link.

Dig around on the Web and you'll never run out of resources. A quick Web search on, say, Google (www.google.com) with the following terms plus special keywords describing what you're looking for tends to turn up an endless list of choices:

- Linux software
- For example: Linux software equation editor
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**Help!**

So you have all of this software, and something goes wrong. What do you do, aside from try not to cry? The first thing I do is open up a search engine and type in some keywords.

If I have a specific error code, I type in its full text. Sometimes this isn't the most convenient option, however, especially if you're just getting started in the wonder-

ful world of Linux.

The first places I tend to send people are to the Linux Documentation Project (www.linuxdoc.org), and Linux Newbie (www.linuxnewbie.org). (Disclaimer: I often write for one of Linux Newbie's sister publications, but I was sending people there well before I became a contributor.)

Other good spots can be, depending on your problem, your distribution's site or the site for the software you're having trouble with.

Often these sites offer mailing lists for people to help each other out.

Linux Help (www.linuxhelp.org) is a great leaping-off spot if you don't know where else to turn, with links to newsgroups, Web sites, mailing lists, and more. If you prefer IRC, there are plenty of channels out there for Linux lovers. Check out LinPeople (www.linpeople.org) for one of the bigger IRC help projects.

Don't forget to check out print media too. Reading magazines and tech newspapers like this one, and the *Linux Journal* (www.linuxjournal.com), and *Linux Magazine* (www.linuxmagazine.com) can be a great way to learn about things you didn't even know you needed help with. □

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**CyberDeluxe P4 System**

**System Includes:**

- Asus PAPE, Intel 845PE Chipset ATX Motherboard or Intel 845PESVL, Intel Original Motherboard,
- Ultra-fast USB 2.0 Support,
- Intel Pentium 4 Processor 478 pins, 512K Cache,
- 256MB DDR Ram 184pins, 1.44MB Floppy Drive,
- Maxtor 60GB 7200rpm IDE Hard Drive,
- ATI Radeon 7500 64MB DDR (VGA+DM+TV out) AGP Video Card or GeForce 4 MX440 64MB DDR Video Card,
- On Board 10/100BT Ethernet Adapter,
- LG 48X CD-RW Drive,
- LG 16X DVD Rom Drive,
- Creative Sound Blaster Live 5.1 Sound Card,
- Alec Lansing AVS-500W Subwoofer Speakers System
- ATX Tower Case w/300w P4 Power Supply, (Equipped with 6 pins Aux & 4 pins +12v Power Connector)
- Internet PS/2 Keyboard,
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Upgrade to: Microsoft Multimedia Keyboard & Wheel Mouse Optical...\$20

**1.8 GHz \$1119**

**2.0 GHz \$1159**

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**CyberPro P4 System**

**System Includes:**

- Intel Pentium 4 Processor 478pins,
- Asus P4S 333 - M, ATX Motherboard,
- 256M DDR Ram 184pins,
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- GeForce MX 64MB AGP Video Card or ATI Radeon 7000 64MB w/TV out AGP Video Card,
- 1.44MB Floppy Drive,
- LG 40x12x40 CD-RW Drive,
- 10/100BT Ethernet Adapter,
- On Board AC97 Sound Audio,
- Subwoofer Speakers,
- ATX Tower Case w/300w P4 Power Supply, (Equipped with 6 pins Aux & 4 pins +12v Power Connector)
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- Logitech Wheel Mouse Optical.

Upgrade to: Asus P4S-533VML MB w/USB 2.0...\$25  
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**1.6 GHz w/556k cache \$779**

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**System Includes:**

- Intel Pentium 4 Processor, 478pins,
- Asus P4 Motherboard, DDR 128MB,
- Maxtor 30GB 7200rpm Hard Drive,
- 1.44M Floppy Drive, up to 64MB Video,
- 30GB 5400rpm Hard Drive,
- 10/100BT Ethernet Adapter,
- 52X CD-Rom Drive,
- Integrated 3D Sound,
- 120W Amplified Speakers,
- 17" SVGA 1280x1024 Monitor.
- ATX Tower Case w/300w P4 Power Supply, (Equipped with 6 pins Aux & 4 pins +12v Power Connector)
- A-Open PS/2 104 keys Keyboard,
- A-Open Wheel Mouse & Mouse Pad.

Upgrade to: 30GB ATA 100 7200rpm Hard Drive...\$10

**Celeron 1.7GHz w/128k cache \$645**

**P4 1.6GHz w/256k cache \$745**

**AMD Athlon K-7 System**

**System Includes:**

- Asus A7S333, SIS 745 Chipset, ATX Motherboard,
- CPU Heat Sink with Ball Bearing Cooling Fan,
- 256MB DDR Ram 184pins,
- Maxtor 30GB 7200rpm Hard Drive,
- 1.44M Floppy Drive,
- GeForce4 MX440 64M 4X AGP Video Card or ATI Radeon 7500 64MB w/TV out Video Card,
- 10/100BT Ethernet Card,
- 52X IDE CD-ROM Drive,
- On Board C-Media 6 Channel Audio Controller,
- 120w Amplified Speakers,
- ATX Tower Case w/300W P4 Power Supply, (Equipped with 6 pins Aux & 4 pins +12v Power Connector)
- A-Open 104 keys PS/2 Keyboard,
- A-Open Wheel Mouse & Mouse Pad,

Upgrade to: 60GB 7200rpm Hard Drive...\$40

**IP 1800+ \$629** **IP 2000+ \$649** **IP 2200+ \$769**

**Red Hot Deal !!**

**System Includes:**

- Intel CPU, w/CPU Heat Sink & Ball Bearing Cooling Fan,
- MSI/Gigabyte ATX Motherboard,
- 128MB PC133 SDRAM, 168pins, 133MHz,
- 30GB 5400rpm Hard Drive,
- 1.44MB Floppy Drive,
- up to 64MB Video,
- 17" SVGA 1280x1024 Monitor,
- Integrated Ethernet Adapter,
- 52X CD-Rom Drive,
- On Board 3D Sound Audio,
- 120W Amplified Speakers,
- ATX Tower Case w/300W P4 Power Supply, (Equipped with 6 pins Aux & 4 pins +12v Power Connector)
- A-Open PS/2 Keyboard,
- A-Open Wheel Mouse & Mouse Pad.

**Celeron 1.2GHz \$579**

**Upgrade P4 Celeron 1.7GHz DDR Ram + \$70**

**Christmas Holiday**

All stores will be closed from Dec 25 and resume on Jan 6

**Monitor Special: (With System Purchase Only)**

17" LG 700S .27 1280	\$ 175
17" LG E700B .25 1280	\$ 203
19" LG E900B .25 1600	\$ 325
15" LG 1511S LCD Monitor	\$ 479
15" LG 566LM Multimedia LCD Monitor	\$ 509
17" LG 782LE LCD Monitor	\$ 809
18" LG 1800P LCD Monitor	\$1019
17" NEC AS70 .27 1280	\$ 205
17" NEC AS75F .25 1280 *PF	\$ 229
19" NEC A995F .25 1600 *PF	\$ 355
21" NEC AS120 .22h 1600	\$ 717
17" NEC FE770 .25 1280 *PF	\$ 239
19" NEC FE991SB .25 1600 *PF	\$ 399
15" NEC 1550V LCD Monitor	\$ 515
17" Samsung 750S .23h 1280	\$ 192
17" Samsung 753DF .21h 1280	\$ 206
18" Samsung 955DF .20h 1600	\$ 348

\*\* Limited Quantities \*\* Dealer Welcome \*\*

**MOTHERBOARDS**

Asus: P4PE-Raid,1394 (Intel 845PE Chipset)	\$ 225
P4PE (Intel 845PE Chipset)	\$ 195
P4B533 (Intel 845E Chipset)	\$ 179
P4B533VML (Intel 845G Chipset)	\$ 149
P4B533GD (Intel 845E Chipset)	\$ 179
P4S533VML (SIS 651 Chipset)	\$ 129
P4S533 (SIS 645DX Chipset)	\$ 155
P4S8X (SIS 64E Chipset)	\$ 205
P4TE (Intel 850 Chipset)	\$ 219
P4T533 (Intel 850E Chipset)	\$ 259
P4T533-C (Intel 850E Chipset)	\$ 245
P4T533-CL (Intel 850E Chipset)	\$ 249
A7S333 (SIS 745 Chipset)	\$ 105
A7V333-GD (VIA KT333 Chipset)	\$ 199
A7V333-Raid (VIA KT333 Chipset)	\$ 199
A7V333 (VIA KT333 Chipset)	\$ 165

**MOTHERBOARDS**

Asus: A7V8X-L (VIA KT400 Chipset)	\$ 179
A7V8X-1394 (VIA KT400 Chipset)	\$ 199
A7N8X-1394 (nForce2 Chipset)	\$ 225

**Intel:**

P4D850EMVL (Intel 850E Chipset)	\$ 245
P4D845GEBV2 (Intel 845GE Chipset)	\$ 179
P4D845GERG2 (Intel 845GE Chipset)	\$ 179
P4D845GERG2L (Intel 845GE Chipset)	\$ 195
P4D845PEBT2 (Intel 845PE Chipset)	\$ 209
P4D845PESVL (Intel845PE Chipset)	\$ 185

**VIDEO CARDS**

ATI All-in-Wonder Radeon 7500 64MB	\$189
ATI All-in-Wonder Radeon 8500 64MB	\$275
ATI All-in-Wonder Radeon 8500 128MB	\$259

**VIDEO CARDS**

ATI Radeon 7000VE SDR 64MB DH	\$ 55
ATI Radeon 7500 DDR 64MB TV	\$ 89
ATI Radeon 7500 SDR 128MB TV	\$ 89
ATI Radeon 8500LE DDR 64MB VIVO	\$195
ATI Radeon 8500LE DDR 128MB S/H	\$149
ATI Radeon 8500 DDR 128MB Retail	\$249
ATI Radeon 9000 DDR 128MB TV	\$129
ATI Radeon 9000 Pro 128MB TV D/H	\$159
ATI Radeon 9700 Pro 128MB D/H	\$509
Asus V8170 MX420 64MB DDR TV	\$105
Asus V8170 MX440 64MB DDR TV	\$125
Asus V9180 MX440 64MB DDR TV	\$165
Asus V9280 T4200 128MB 8x	\$319

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LG 40x CD-RW Drive	\$ 76.00
LG 48x CD-RW Drive	\$ 83.50
Epson Stylus C42UX InkJet Printer	\$ 64.65
Samsung ML-1210 Laser Printer	\$ 259.55
Samsung ML-1430 Laser Printer	\$ 299.55
Mustek 48bit 600x1200 USB Scanner	\$ 68.43
30GB 7200rpm Hard Drive	\$ 99.00
60GB 7200rpm Hard Drive	\$ 139.00
Optimum 40x 80min/700MB CD-R Disk (50 Spindle)	\$ 22.00
16x 80min/700MB CD-R Disk (50 Spindle)	\$ 19.00
10x 80min/700MB CD-RW Disk	\$ 1.90
USR V.92 56K External Fax Modem (Retail)	\$ 139.00

\* Price ONLY effective between Dec.04 - Dec.17, 2002 \*

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**Value Station 3105**  
Intel® Pentium® 4 Processor 1.7 GHz  
(Retail version, 3 years warranty by Intel)  
ECS P4VMM2 All-In-One Board  
256MB SDRAM PC133 Memory  
30GB 5400rpm hard drive  
17" 1280, 27 monitor  
Integrated Savage 3D Video  
Mini Tower Case with Pentium® 4 Power Supply  
LG IDE 52X CD Drive, 1.44M Floppy drive  
Build-in 10/100BT LAN, 2 USB Ports  
AC97 Audio with Amplifier Speaker  
AOpen 104 keys keyboard,  
Logitech Wheel mouse

**CHRISTMAS SPECIAL**



**\$1329**

**e-Station 3104**  
Intel® Pentium® 4 Processor 1.8 GHz  
Intel® D845GLADL Desktop Board  
256MB DDR PC266 Memory  
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NEC AS75F 17" .25 monitor  
Intel® Extreme Graphics Video  
Med. Tower Case with Front USB & 300W Power Supply  
LG IDE 40X12X40 CD-Rewriter, 1.44M Floppy drive  
Build-in 10/100BT LAN, Maximum 4 USB2.0 Ports  
SoundMax 2.0 with Altec Lansing AVS200W Speaker  
Keytronic 104 keys keyboard  
Logitech Wheel mouse  
Microsoft Windows® XP Home

**CHRISTMAS SPECIAL**



**\$1749**

**Serious Station 3103**  
Intel® Pentium® 4 Processor 2.53 GHz  
Intel® D845PESVL Desktop Board  
256MB DDR PC333 Memory  
Seagate 40GB 7200rpm hard drive  
NEC AS75F 17" .25 Flat Screen monitor  
GeForce4 MX440SE 64M DDR Video Card  
Med. Tower Case with Front USB & 300W Power Supply  
LG 40X12X40 CD-Rewriter, 1.44M Floppy drive  
Build-in 10/100BT LAN, Maximum 4 USB2.0 Ports  
SB Live 5.1 sound with Altec Lansing AVS500W Speaker  
Microsoft Multimedia keyboard  
Microsoft Optical mouse  
Microsoft Windows® XP Home


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AOpen 56K Int V.90 w/Voice PCI modem	\$ 38
AOpen USB 10/100 BT Adapter	\$ 39
AOpen OP330 10/100 BT PCMCIA card	\$ 39
AOpen Wireless 11M PCMCIA card	\$ 88
AOpen Wireless 4 port Router	\$239
AOpen 56X CD-Drive	\$ 37
AOpen int. IDE 48 x 12 x 50 CD-Rewriter	\$ 85
AOpen KB-855, PS/2 keyboard	\$ 12
AOpen QF-50A P4 Chasis with 300W power	\$ 82
AOpen HX-08 P4 Chasis with 300W power	\$125

**Graphic Station 3102**  
Dual (2) Intel® Xeon® Processors 2.4 GHz  
With Intel® Hyper-Threading Technology  
Efficiency Multithreading and Multitasking  
Supermicro® P4DCE+ Workstation Board  
512MB RAMBUS Memory, Intel® 10/100 LAN  
Chenbro® SR10403 Chassis with 460W Power Supply  
WD 120GB 7200rpm ATA/100 8MB cache Hard Drive  
NEC AS95F 19" .25 Flat Screen monitor  
ATI® FireGL 8800 DDR 128MB 4X AGP Graphic card  
LG 16X DVD Drive and LG 40X12X40 CD-Rewriter  
1.44M Fl. drive, Microsoft Multimedia KB & Opt. Mouse  
Microsoft Windows® XP Professional



**\$4339**



**Real-Server 3109**  
Dual (2) Intel® Xeon® Processors 2.4 GHz  
With Intel® Hyper-Threading Technology supports  
Efficiency Multithreading and Multitasking  
Intel® SE7500C2 Server Board  
512MB DDR266 ECC with Register Memory  
Intel® SC5200 Server Chassis with 450W Power Supply  
WD 120GB 7200rpm ATA/100 8MB cache Hard Drive  
Build-in Promise® RAID Controller  
Dual (2) Intel® 10/100+ Server Ethernet Controller  
Integrated ATI® Graphic video with 8MB  
LG 52X CD-ROM, 1.44M Fl. drive, Keyboard & Mouse  
O/S and Monitor are not included



**\$3199** One Ultra160 SCSI channel Add \$208  
RAID 1, mirroring 120GB drives Add \$310



**Real-Server 3108**  
Intel® Pentium® 4 Processor 2.53 GHz  
With 533Mhz system bus and 512KB L2 cache  
Intel® S845WD1 Server Board at 533Mhz System Bus  
256MB DDR266 ECC Memory  
Intel® SC5100 Server Chassis with 300W Power Supply  
WD 80GB 7200rpm ATA/100 8MB cache Hard Drive  
Build-in Promise® RAID Controller  
Dual (2) Intel® 10/100+ Server Ethernet Controller  
Integrated ATI® Graphic video with 8MB  
LG 52X CD-ROM, 1.44M Floppy drive  
Keyboard & Mouse  
O/S and Monitor are not included



**\$1799** Total 512MB ECC Memory Add \$180  
RAID 1, mirroring 80GB drives Add \$200



**DRIVES & CONTROLLERS**

**IDE 7200 RPM, ATA/100:**

Maxtor (Quantum) 40 GB	\$ 132
Maxtor (Quantum) 60 GB	\$ 159
Maxtor (Quantum) 80 GB	\$ 192
Seagate 40GB Barracuda Super Quiet!	\$ 134
Seagate 60GB Barracuda Super Quiet!	\$ 165
Seagate 80GB Barracuda Super Quiet!	\$ 189

**WD 40 GB (400BB)** \$ 132  
**WD 80 GB (800BB)** \$ 186  
**WD 80 GB, 8M cache (800JB)** \$ 199  
**WD 120 GB, 8M cache (1200JB)** \$ 299  
**WD 180 GB, 8M cache (1800JB)** \$ 550  
**WD 200 GB, 8M cache (2000JB)** \$ 609

**LAVA Firewire IDE Enclosure** \$ 122  
**LAVA USB 2.0 IDE Enclosure** \$ 122

**SCSI 10000 RPM:**

Seagate ST-318406LW U160 18G	\$ 279
Seagate ST-336607LW U320 36G	\$ 435
Seagate ST-373307LW U320 73G	\$ 878

**PROCESSORS** (Please call for the current price, or refer to our WEB site. All retail boxes include heat sink fan & 3 yr. warranty)

Intel® Celeron® Processor 1.7 GHz	\$ 109
Intel® Celeron® Processor 1.8 GHz	\$ 129
Intel® Celeron® Processor 2.0 GHz	\$ 158
Intel® Celeron® Processor 2.1 GHz	\$ 185
Intel® Celeron® Processor 2.2 GHz	\$ 215

**Intel® Pentium® 4 Processor**

1.7 GHz	\$ 222
1.8 GHz	\$ 252
2A GHz	\$ 289
2.4 GHz	\$ 339
2.53 GHz	\$ 409
2.66 GHz	\$ 539
2.8 GHz	\$ 699
3.06 GHz	\$1150

**Intel® Xeon® Processor**

2.0 GHz	\$ 415
2.4 GHz	\$ 505
2.6 GHz	\$ 795
2.8 GHz	\$ 966

**MOTHERBOARDS**

**Intel® Server Boards**

SAI2, support ATA	\$ 630
SDS2, support SCSI U160	\$ 985
S845WD1, support ATA RAID 0,1	\$ 370
SE7500C2, support ATA RAID 0,1	\$ 720
SE7500C2SCSI, ATA RAID 0, 1 & SCSI	\$ 958
SHG2, support Dual SCSI U160 channels	\$1290

**All Desktop Boards has built-in audio:**

**Intel® Desktop Boards**

D845WNL 5PCI AGP LAN	SDRAM \$ 185
D845GLLY 4PCI Video LAN	SDRAM \$ 154
D845GLLYL 4PCI Video LAN	SDRAM \$ 169

**D845EPT2L 3PCI AGP LAN** DDR \$ 189  
**D845EBG2L 6PCI AGP LAN** DDR \$ 195  
**D845GLADL 4PCI Video LAN** DDR \$ 174  
**D845GBVL 6PCI Video AGP LAN** DDR \$ 205

**D845PESVL 5PCI AGP LAN** DDR333 \$ 195  
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**D845GEBV2L 6PCI Video AGP LAN** DDR333 \$ 218

**D850EMV2 5PCI AGP** Rambus \$ 250  
**D850EMV2L 5PCI AGP LAN** Rambus \$ 265

**MEMORY** (Please call for the current price, or refer to our WEB site)

**Good for most boards include Intel®:**

SDRAM 128M, 133MHz	\$ 39
SDRAM 256M, 133MHz	\$ 57
SDRAM 512M, 133MHz	\$ 99

**DDR 128M, PC266** \$ 65  
**DDR 256M, PC266** \$ 118  
**DDR 512M, PC266** \$ 232  
**DDR 256M, PC333** \$ 128  
**DDR 512M, PC333** \$ 245

**RAMBUS 128M 800MHz-40** \$ 95  
**RAMBUS 256M 800MHz-40** \$ 170  
**RAMBUS 512M 800MHz-40** \$ 405

**VIDEO CARDS**

D-Link DSC-C300 Webcam 30 fps	\$ 69
MSI 8878-170 MX440SE 64M	\$ 119
MSI 8880-010 MX440 64M	\$ 153
MSI 8870-040 T4200 64M	\$ 228
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**ATI TV Wonder (add-on PCI)** Retail \$ 99  
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**ATI Radeon 7500LE DDR v/o** 64M \$ 88  
**ATI Radeon 9000 DDR v/o** 128M \$ 148  
**ATI Radeon 9000PRO DDR v/o** 64M \$ 149  
**ATI Radeon 9000PRO DDR v/o** 128M \$ 180  
**ATI Radeon 9700PRO DDR** 128M Retail \$ 565  
**ATI All-in-Wonder 7500** 64M Retail \$ 212  
**ATI All-in-Wonder 8500DV** 64M Retail \$ 295  
**ATI FireGL 8700** 64M Retail \$ 255  
**ATI FireGL 8800** 128M Retail \$ 545

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3Com 3C905 10/100BT	Bulk \$ 53
3Com 3C996B-7 1000BT Server Adapter	\$ 225
3Com 3C16470 16 ports Switch	\$ 472
3Com 3C16471 24 ports Switch	\$ 655

**AOpen USB 10/100BT Adapter** \$ 39  
**AOpen OP330 10/100BT PCMCIA card** \$ 45  
**D-Link PCI 10/100BT Adapter** \$ 20  
**Intel® Pro/100+ SEC Adapter** Bulk \$ 55  
**Intel® Pro/1000T Desktop Adapter** \$ 155  
**Intel® PCMCIA 10/100BT RealPort** \$ 119

**Linksys BEFSR41 4 ports Switch** \$ 104  
**Linksys BEFSX41 4 ports VPN/Firewall** \$ 126  
**Linksys Wireless BEFW11S4** \$ 175  
**Linksys Wireless 11M PCI Adapter** \$ 105  
**Linksys Wireless 11M PCMCIA** \$ 105  
**Linksys Wireless 11M USB Adapter** \$ 105

**Netgear FS108 8 ports Switch** \$ 99  
**Netgear FS116 16 ports Switch** \$ 229  
**Netgear JFS524 24 ports Switch** \$ 369  
**Netgear 10BT Mini Print Server** \$ 128  
**Netgear 10/100BT 2 ports Print Server** \$ 165  
**USR 4 ports Router + Print Server** \$ 99

**10/100 BaseT (RJ45, 8 wire) Connector** \$ 1.5  
**RJ45 key jack module for wall plate** \$ 4.5  
**Wall plate (1/2/4/6 holes)** \$ 2.0  
**Ethernet Cable 10/100BT FT4** \$ 0.22 / feet  
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**Uninterruptible Power Supply**

APC Backup-UPS 350	\$ 122
APC Backup-UPS 500	\$ 183
APC Backup-UPS Pro 500UC	\$ 215
APC Smart-UPS 700Net w/ Software	\$ 518

**CASES with Power Supply**

Med Tower 6 bays ATX 250W	\$ 55
P4 Mini Tower 4 bays ATX 200W	\$ 57
P4 Med Tower 6 bays ATX 300W	\$ 69
P4 Med Tower ATX 300W with USB	\$ 72
AOpen Full Tower 10 bays 300W	\$ 129
In-Win P4 Micro ATX Case 180W	\$ 90
In-Win P4 Case 300W with USB	\$ 110
ATX Power 250W / 300W / 400W	\$ 35 / 46 / 89

**SOUND CARDS/ SPEAKERS**

SB Live Dolby Digital 5.1	Bulk \$ 47
SB Audigy w/1394	Bulk \$ 93
SB Audigy Platinum II	Retail \$ 282
Altec Lansing AVS200W	\$ 22
Altec Lansing AVS300W 3pcs	\$ 42
Altec Lansing AVS500W 5pcs	\$ 62

**CDs / DVDS / REWRITERS**

LG int IDE 52X CD-Drive	Bulk \$ 31
LG int IDE 16X DVD Drive	Bulk \$ 65
LG int IDE 40 x 12 x 40 w/ software	Bulk \$ 77
LG int IDE 48 x 16 x 48 w/ software	Bulk \$ 89
LG int IDE 32 x 10 x 40 + 16X DVD	Bulk \$ 133
Pioneer A05 int IDE DVD-R/RW writer	Retail \$ 529
HP 200i int IDE DVD-R/RW writer	Retail \$ 535
Roxio EZ-CD Creator V5.0	Bulk \$ 15
PowerDVD / WinDVD software	\$ 25
Blank CD-R 80 min. 100pcs (Spindle)	\$ 38
Blank CD-R / CD-RW Sony	Retail \$1.3 / 2.9
Blank DVD-R / DVD-RW Sony	Retail \$ 20 / 33

**FAX MODEMS**

AOpen 56K Int V.90 w/Voice PCI	\$ 38
USR 56K Int V.90 w/Voice PCI HW	bulk \$ 78
USR 56K Ext V.92	\$ 138

**PRINTERS**

HP LaserJet 1000 10 ppm 1M	\$ 360
HP LaserJet 1200 15 ppm 8M	\$ 589
HP LaserJet 2200 19 ppm 8M	\$1035
HP LaserJet 4100 25 ppm 16M	\$1679

**HP ColorLaserJet 2500L 16/4 ppm 64M** \$1490  
**HP ColorLaserJet 2500 16/4 ppm 64M** \$1799

**MONITORS**

Acer / BENQ V551	15" 1024 .27	\$ 175
NEC AS70	17" 1280 .27	\$ 215
NEC AS75F	17" 1280 .25	\$ 240
NEC AS95F	19" 1600 .25	\$ 365
NEC AS125F	22" 1600 .24	\$ 715
NEC LCD 1550V	15" 1024 .30	\$ 525
NEC LCD 1700V	17" 1280 .26	\$ 839
NEC LCD 1850E	18" 1280 .28	\$1105
NEC LCD 1920NX	19" 1280 .29	\$1435
NEC LCD 2010X	20" 1280 .31	\$2155

**Viewsonic E70F** 17" 1280 .25 \$ 249  
**Viewsonic E90F** 19" 1600 .25 \$ 389  
**Viewsonic G90F** 19" 1600 .25 \$ 415  
**Viewsonic G810** 21" 1600 .25 \$ 769  
**Viewsonic P220F** 22" 1600 .25 \$ 925

**Software** (Microsoft OEM must be purchased with major hardware)

MS Office XP Small Business Full Ver.	OEM \$ 305
MS Office XP Professional Full Ver.	OEM \$ 505
MS Office XP Professional Full Ver.	Retail \$ 779
Norton Antivirus 2002	OEM \$ 35
Windows XP Professional Full Version	OEM \$ 265
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**Wireless waxes and wanes**

*Continued from page 69*

layouts. The concept is simple: if you have a computer in your home or office that is used by multiple users or for multiple tasks, you simply replace the keyboard with one optimized for the application at hand by pulling it out and replacing with a new module.

The base module has a number of rubberized posts that send a signal to the PC when depressed.

This module also features a small contact panel that automatically adjusts your keyboard layout when it connects with the companion panel on the back of the keyboard module. When you click in the keyboard module, your layout will automatically be reconfigured, so long as you have the driver software pre-installed.

While the Z-board is due to be launched in January, expect the base model to cost about US\$25. The keyboard modules will range in price depending on the level of complexity involved in the programming at Ideazon's end: keyboards for some basic

applications will run about US\$10, games will be around US\$15, and keyboards for heavy-duty applications like Photoshop will probably run about US\$20.

**Heads up!**



Heads-up displays are all over movie screens lately, but they're not quite so common in everyday life. Microvision Inc. is taking small steps towards changing that with the release of the Nomad Personal Display System. The Nomad consists of a special see-through eyepiece that is mounted on an adjustable

headpiece. A cable runs back to a control unit held in a belt-pack. Users look straight through the eyepiece module to whatever is in front of them, overlaying a bright high-definition red display over whatever you're seeing—all you have to do is refocus your eye to see the display. You don't have to move your whole head towards a monitor located away from the action. The eyepiece display is designed to simulate a 17-inch monitor screen, and can be used with any computer's VGA or SVGA 15-pin output. The display is in red because that's the monochrome colour that best matches the majority of daylight applications for potential Nomad customers.

While it is designed with specific users in mind (for precision tasks like surgery, or for outdoor work, for example), anyone can use the product with a standard computer. It's going to cost you, though: this version of the Nomad Personal Display System will cost \$6,995.

**ViewSonic brings Mira home**

Earlier this year, Microsoft gave us a sneak preview of its Mira technology,

which allows users to control a central computer from a wireless screen anywhere in your home: undock the screen from your PC and carry it to the next room, and it will maintain contact with your computer via the Remote Desktop Protocol. Products using Mira were expected in time for this year's



Christmas season, but so far that hasn't come to pass. Instead, ViewSonic announced that its Smart Display-based product (Mira's new name), the airpanel series, will be available as of Jan. 8.

The airpanel will be available in two different models: the V110, a 10-inch portable LCD (800x600 resolution) with

*Continued on page 82*

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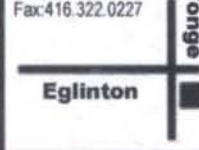
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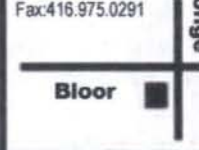
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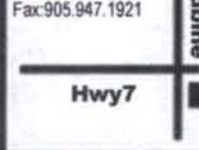
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**Say hello to Hyper-Threading**

*Continued from page 71*

If it sounds like a subtle difference, it isn't. The upshot is that what happens on one side of the processor doesn't affect what's happening on the other side—in effect, it's like having a dual-CPU system even though you only have one processor on your motherboard. Practically speaking, you'll be able to do two processor-intensive tasks at the same time without forcing both of them to suffer.

During the WinHEC conference we saw a demonstration of the technology in action; the test machine ran a heavy-duty number-crunching task using one "half" of the CPU, while the other portion flawlessly decoded and played back a high-resolution video file.

Of course, there's a catch: you won't be able to drop a Hyper-Threading capable processor into just any machine—you need a motherboard and operating system that are Hyper-Threading-enabled in order to make use of the technology (right now Windows XP and Linux are the only ones that qualify).

If you use an operating system with Hyper-Threading awareness you'll get better performance right out of the chute (Intel estimates a boost of as much as 25 percent), as the processor will take over part of the functionality that used to eat up operating system resources; you achieve even better performance levels if you have applications that are

optimized for Hyper-Threading or dual-processor configurations.

There are four new Intel chipsets that will support Hyper-Threading, including the Intel 845PE, the 845GE, the 845GV, and the 850E.

While Hyper-Threading is available in only the 3.06 GHz Pentium 4 processor at present, all new Pentium 4 processors are expected to have Hyper-Threading as a matter of course. It is unclear at this point whether the technology will migrate back through the line to processors with slower clock speeds, or into the Celeron line. Also, the introduction of Hyper-Threading is not expected to have much impact on the higher-end Xeon processor line, which already featured hyperthreading, as those processors already have other technology advantages for server applications that a consumer level processor still can't match. (The one potential for change here is that the use of the new Pentium 4 with Hyper-Threading will provide a more modestly priced solution for business users who don't need the raw horsepower that a full Xeon solution would provide.)

The 3.06 GHz Pentium 4 processor is expected to cost US\$637 in 1,000-unit quantities.

We managed to get our hands on the new 3.06 GHz Pentium 4 processor, and put it through a few different benchmarks. The processor was installed on an

Intel D850EMV2 motherboard, with 512 MB of PC1066 RDRAM installed. The graphics card was Crucial's new Radeon 9700 Pro model with 128 MB of onboard video memory (running at 4X in this testing).

We used a 30 GB IBM Deskstar hard drive on an ATA/100 interface. The operating system was Windows XP Professional.

We ran all of our tests two times: first with the Hyper-Threading turned off, and then with it turned on (this was accomplished at the BIOS level). The first number in our benchmarking scores below represents the performance with Hyper-Threading enabled, and the bracketed score indicates performance with Hyper-Threading disabled.

**SysMark 2002**

Internet Content Creation:	408 (394)
Office Productivity:	197 (188)
Sysmark 2002 (overall rating):	284 (272)

**PCMark 2002**

CPU:	7,486 (7,475)
Memory:	7,299 (6,907)
HDD:	626 (560)

**SiSoft Sandra 2002 Professional**

CPU Arithmetic: Dhrystone ALU:	7,035 (5,532) MIPS
CPU Arithmetic: Whetstone FPU:	2,467 (1,642) Mflops
Whetstone iSSE2:	6,035 (3,809) Mflops
CPU Multimedia: Integer	14,265 (12,140) it/s
Floating Point	21,484 (15,127) it/s

With the raw benchmarking, it's obvi-

ous that the Hyper-Threading technology has a real effect on the system's performance.

While the overall system performance increase (indicated by the SysMark 2002 benchmark numbers) isn't anywhere near 25 percent when using Hyper-Threading, there's still definitely an improvement.

The real boost appears in raw calculation, either arithmetic or multimedia-based, which is good news for any application that requires encoding/decoding (MP3 or DVD, for example).

**VIP Award**

**Intel Pentium 4 with Hyper-Threading**

We think Hyper-Threading is a major development for the consumer desktop. It brings multi-threading power usually found in high-end servers down to regular users like us. Just for the ability to rip a CD to MP3 while simultaneously playing a graphics-intensive game, this one would deserve the VIP, but the technology has so many other added benefits that it's doubly worth the award. □



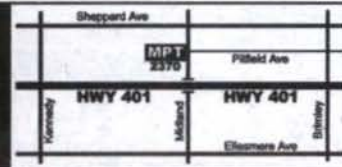
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**Wireless waxes and wanes**

*Continued from page 78*

a 400 MHz Intel Xscale processor, and 64 MB SDRAM; and the V150, with the same processor and a 15-inch LCD (1,024x768 resolution). Both run Windows CE for Smart Displays and feature integrated 802.11b wireless networking for connecting back to a Windows XP machine. The airpanels come with a rechargeable lithium ion battery designed to provide five hours of runtime. The V110 and V150 will be available for US\$999 and \$1,299 respectively.

**Western Digital shows off concept drives**

While we're waiting for Serial ATA drives

to hit the market, Western Digital has found another way to spice up the world of hard drives. The company, which has recently introduced external drives using USB 2.0 or FireWire connections, was showing a number of customized external drives.

The drives inside were pretty standard, but the casing was changed, with clear top panels designed to show off special stamped metal top panels, circuitry, and coloured lights.

While these are mere aesthetic changes, they do transform what are typically just metal boxes into a lifestyle product. While the designs haven't been finalized, they are expected to hit retail shelves early to mid 2003.

out for dominance.

TDK has just added to the list of technologies to keep straight with the introduction of the Indi DVD writer, which teams up DVD-RW/DVD-R with DVD+RW/DVD+R capability. This is especially interesting because of the fact that the plus-RW camp and the minus-RW camps (as they've come to be nicknamed by people in the industry) are theoretically on opposing sides.

It's a cagey move for TDK, because it brings the two best DVD burning technologies into a single product, a nice bonus if you're working in an office where both technologies have already been deployed. (Sony also has announced a drive that's capable of handling both rewriteable formats.)

The Indi DVD MultiFormat (model AID+040212N) will burn DVD+R at 4X, DVD+RW at 2.4X, DVD-R and DVD-RW at 2X, CD-R at 16X and CD-RW at 10X. It will be available in January. Price to be announced.

**That's the Tigit!**

While Microsoft is busy pushing the Tablet PC, there are computers out there

with a still smaller form factor. While it was originally introduced in February, Tigit's eightythree is still worth remembering in all the hype over the Tablet PC. It runs a full Windows XP installation in a form factor that's barely larger than your hand.

The eightythree uses a 300 MHz Geode processor from National Semiconductor, and features 256 MB of RAM and a 10 GB hard drive. It has a 4-inch colour TFT display with 640x480 resolution and touch-screen input. In addition to the stylus that's included, it has miniature keyboard below the screen, and a nub-style pointing device. For external connectivity, you can plug devices in via USB, SD slot, or the PC Card slot located along the top (which will handle removable storage as well as any standard PCMCIA devices, like wireless networking cards

Because the eightythree runs Windows XP, it can do pretty much anything a full-sized desktop can do. Because it's running a 300 MHz process, though, it will obviously do most of those things far more slowly, but it will also be far more portable. □

**WWW.**

TCP—You don't have to live near the San Andreas Fault or the Marianas Trrench to be worried about earthquakes. This site is a one-stop resource, including offers earthquake-related news, information, preparedness supplies, and a comprehensive guide to online resources about earthquakes.

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**TDK DVD drive goes Indi route**



The world of writeable DVD can be a tad confusing to the beginner, as there have been at least three standards fighting it

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# Input systems

Whether its a matter of improved ergonomics, clearing desktop clutter, or being a slave to the cool factor, there are plenty of reasons to upgrade input peripherals. Here are a few new devices we think would be welcome additions to a loved one's desktop this holiday season.

## Cymouse

This a mouse you wear on your head—that's right, on your head. We first saw this about a year ago at Comdex Las Vegas, and it now appears to be ready for prime-time. Cymouse consists of two sensors: one that is placed on top of your monitor, and the other on your forehead. The way you line up the sensors determines what happens on screen when playing a 3D game.





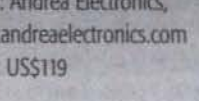

If you turn your head to the right, the view on the screen will move appropriately. If you move the two sensors further apart, you'll back up. While it's disorienting at first, once you get used to it it's a nice way to free up at least one hand for other tasks while gaming.

As with most game controllers, you have to set up profiles to use it with specific games (it comes with a handful of profiles already set up). The price may be steep, but for hardcore gamers, freeing up a hand may well justify the cost.

—Sean Carruthers

## Cordless Optical TrackMan

When it comes to mice, trying *not* to think of Logitech is hard. This company has built its entire business around better peripherals, including a number of innovative mouse and trackball solutions. Most recently, it has been focusing on a

 <p><b>Cymouse</b></p> <p>From: Maui Innovative Peripherals Inc., <a href="http://www.cymouse.com">www.cymouse.com</a> Estimated price: US\$179</p>	 <p><b>Cordless Optical TrackMan</b></p> <p>From: Logitech Inc., <a href="http://www.logitech.com">www.logitech.com</a> Estimated price: \$120</p>	 <p><b>PocketMouse Pro</b></p> <p>From: Kensington, <a href="http://www.kensington.com">www.kensington.com</a> Estimated price: \$70</p>
 <p><b>Optical Keypad Mouse</b></p> <p>From: Genovation Inc., <a href="http://www.genovation.com">www.genovation.com</a> Estimated price: \$129 (from US\$79)</p>	 <p><b>DA-400 Desktop Array Mic</b></p> <p>From: Andrea Electronics, <a href="http://www.andreaelectronics.com">www.andreaelectronics.com</a> Price: US\$119</p>	 <p><b>Wireless Optical Desktop Pro</b></p> <p>From: Microsoft Canada, <a href="http://www.microsoft.ca">www.microsoft.ca</a> Estimated price: \$169</p>

couple of controller technologies—optical and cordless—and has finally brought both into the world of the trackball, a controller loved by a small but very dedicated group of computer users (myself included). The trackball is a great addition to any computer system if you're a fan of 3D gaming. It allows for very intuitive, quick scrolling in all directions without having to worry about running off the edge of the mousepad.

The Cordless Optical Trackman is designed for use in the right hand, put-

ting both the trackball and a scroll wheel at your fingertips. While the button layout takes some getting used to, it should be pretty easy to pick up. Even better, all Logitech controllers are user-programmable, allowing you to set up the third and fourth button for commands you use often (cut and paste, for example).

The Cordless Optical Trackman's receiver hooks into your USB or PS/2 port. The unit itself is powered by a pair of AA batteries. It's fully compatible with Windows 95 through XP (basic functionality under

Windows 3.1 and DOS) and Mac OS 8.6 through 9.x.

—Sean Carruthers

## Wireless Optical Desktop Pro

If you're like most people, you probably fight with your mouse every so often as its cord gets caught on the edge of your PC, wrapped around your coffee cup, or tangled up with the keyboard cord and the other cables nesting around your desktop. If you regularly find yourself in this situation, it's probably time to go wireless.

The Wireless Optical Desktop Pro has a radio frequency (RF) connector that hooks to your computer via PS/2 or both PS/2 and USB ports (the mouse connector has an adapter but the keyboard is hard wired for PS/2 ports only). The keyboard has an ergonomic design that splits the keys into two main sections so you can hold your hands in a more natural position. It also sports a number of quick-launch keys and multimedia-specific buttons along the top (who says a pro can't have fun, too?).

The wireless mouse has a scrollwheel and an optical sensor so it can be used on almost any surface without a mousepad. It's also ambidextrous, so it can be used comfortably in either hand. Both the keyboard and mouse require two AA batteries each (included). The whole shebang is compatible with both Windows (98, Me, NT, 2000, and XP) and Mac (8.6 through OS X 10.1 and later).

If you don't want the split keyboard, you can save a bit of money with the standard Wireless Optical Desktop (it's only \$139). On the other end of the spectrum, early adopters can try out the

Continued on page 93

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# Online memorial explores brother's life

By Peter Tupper

What happens when we die? Usually that question leads to a discussion of the soul and the possibility of an afterlife, but it can have a different meaning: how are we remembered by the living, and does that memory change?

Those were some of the many questions plaguing artist Paul Levine in the aftermath of the death of his brother Richard, killed in a car crash on B.C.'s Sea to Sky highway in 1999. Levine struggled to make sense of this event, even going so far as to photograph his brother's remains in the morgue. "It was blurry, that period," he says by way of explanation.

The result of two years of gathering and assembling material is Raising the Dead ([www.raisingthedead.ca](http://www.raisingthedead.ca)), an unsettling memorial Web site that explores his brother's life and death. Not being a commercial project, the site can push the limits of Flash animation without having to cater to users with slow connec-



"At death people stop analyzing you and come to a conclusion. Those conclusions generate the myth."

tions or computers. The main interface shows a video clip of Richard welcoming the audience, played out on his gravestone.

Instead of the usual stages of grief, the site offers four different areas to explore: Protest, Ruminantion, Nostalgia, and Myth. Each offers a different perspective on Richard's life, death, and what happens after, not so much in the sense of an

afterlife but his presence in our society. You can hear his outgoing phone messages, study his autopsy report, screen video of the funeral, view Flash animations based on dreams Levine had about Richard, and more.

One goal of Levine's project was to avoid the idealizing the deceased. He specifically asked people to remember moments of conflict with his brother, whom he describes as a "cantankerous" person who "sought out conflicts."

Having this much access to another person's life, especially after they're dead, can be discomfiting. It feels like attending the funeral of a person you hardly knew and having to talk to the teary relatives.

One of the most compelling pieces is a Flash animation recreating the fatal car accident, narrated in a matter-of-fact tone by Richard's four-year-old son. The boy was two at the time of the accident, and only knows his father through stories told by other people.

"To him, really, his father is a myth," Levine suggests. "At death people stop

analyzing you and come to a conclusion. Those conclusions generate the myth."

That myth comes to supplant the person who is lost to the living. Levine seems to be as uncomfortable with his own creation as anyone. He isn't certain that his brother would appreciate how he has been memorialized.

"I think I have kind of abused my brother in making this memorial. It's disquieting to my family," Levine says. "I think [Richard] would be flattered, but he would also be disturbed."

Levine plans to take Raising the Dead offline in October 2003, one year after its launch, the period of mourning prescribed by Jewish custom. It will also be a reminder of how ephemeral Internet art is.

However, the site has already been archived by the Rhizome ([www.rhizome.org](http://www.rhizome.org)) project—a New York-based non-profit organization that supports the creation, presentation, discussion, and preservation of new media arts—giving it life even after Levine shuts it down. □

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Weaving your own Web site

# CSS selectors: Part 1

By Keith Schengili-Roberts

Anybody familiar with Cascading Style Sheets (CSS) ought to know the principles behind them. At its most basic, "cascading" means that a CSS property applied after another one is given more "weight," overruling any previous CSS properties that may ordinarily apply to a given Web element.

So if you have a CSS rule set to the <body> tag, and then specifically format paragraphs with a different CSS rule, the formatting to the paragraph wins out, because it is more specific.

Another related concept is that of selectors, which allow you to selectively apply CSS formatting rules based on the context in which a particular CSS property is applied.

In this article, we'll take a look at some CSS selectors and how they can be used.

## Contextual selectors

Selectors are meant to be applied in certain situations or when combinations of HTML tags appear on a Web page.

An example of when you might use them would be if you have a couple of nested, unordered lists on a Web page and you want them to be displayed differently when they appear, in order to make each type of list element stand out more.

Using contextual selectors, you can arrange things so list elements appearing in the "main" list appear larger and in a different colour than those that appear in a sub-list.

For an example of this, take a look at the two rules held within the <style> tags at the top of the following Web code:

```
<html>
<head>
<title>Contextual Selectors #1</title>
<style>
ul li {font-size: x-large; color: black;}
ul ul li {font-size: large; color: gray;}
</style>
</head>
<body>
<ul>
```

<li>An extra-large list item in a black font.

<ul>

<li>A large sub-list in a gray font

<li>Another large sub-list item in a gray font

</ul>

<li>Another extra-large list item in a black font

</ul>

</body>

</html>

What you see is a selector acting in only a specific situation—the smaller, gray text is only used for the sub-list, and the larger, black text is used on the main list elements—both before and after the sub-list.

This CSS concept can be applied to many other useful situations. For example, you can set nested, ordered lists to display different numeral types (so "outer" list elements are preceded by decimals and the "inner" nested list is preceded by roman numerals, for example) using the list-item CSS property.

It can also be handy when you want to distinguish between elements that would ordinarily be rendered in the same way. For example, if you set all of your <i> and <em> tags to the colour value "green" and use both tags within a single sentence you will lose any distinction between these two elements. The contextual selector rule means you can apply a special CSS rule that allows you to set a different set of display properties whenever these two tags appear together. The following example code shows both of these examples:

```
<html>
<head>
<title>Contextual Selectors #2</title>
<style>
```

ol {list-style: decimal}

ol ol {list-style: lower-roman}

i {color: green}

em {color: green}

i em {color: lime}

body {font-size: large}

</style>

</head>

<body>

<ol>

<li>This list item should be preceded by a decimal number

<li>As should this one

<ol>

<li>This nested sub-list is preceded by a roman numeral

<li>As is this one

</ol>

Continued on page 90

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**CSS selectors: Part 1**

*Continued from page 88*

<li>Back to decimal numbers as we return to the "outside" list.

</ol>

The words in this sentence that <i>are italicized</i> should be in green.

<p>

The words in this sentence that <em>are emphasized</em> should also be in green.

<p>

<i>This sentence is all in italics, and the

<em>emphasized words</em> should appear differently.</i>

</body>

</html>

When you view this code in your browser, you'll see that nested list elements are rendered in lower-case roman numbers.

You'll also see how the special contextual CSS rule applies a different colour value ("lime") when <i> and <em> tags are applied within the same sentence, overriding the value when either appears separately.

**Child and adjacent sibling selectors**

Contextual selectors are only one of

many CSS selectors available. Another type are known as "child" selectors. They are applied when an element is considered to be the child of some "parent" element. It uses a less-than (>) symbol between at least two Web elements.

List elements can be considered children of the parent ordered or unordered list tags. In a similar way, all displayed content on a Web page can be considered the child of the body tag. The child selector enables the Web author to specify that when a given child element appears after a certain parent element, it should be formatted in the way described. The following code sample provides two examples of this:

```
<html>
<head>
<title>Child Selector #1</title>
<style>
ol > li {font-size: 14pt; font-family: serif}
ul > li {font-size: 12pt; font-family: sans-serif}
</style>
</head>
<body>
<ol>
<li>This ordered list item is rendered
<li>using a 14pt serif font
```

```
</ol>
<ul>
<li>This unordered list item uses a
<li>slightly smaller, 12pt sans-serif font
</ul>
</body>
</html>
```

In this case, all of the list items displayed in an ordered list will be rendered in a 14-point serif font, and those in an unordered list will be rendered in a 14-point sans-serif font.

Adjacent sibling selectors allow Web authors to decide how one Web element should display if it appears immediately after another element that shares the same parent.

In such a case, you could define how different header tags should interact with each other (because their immediate parent is the body tag), but not, say, a header and a cell in a table, which fall under different parent elements (the header to the body tag; the cell to the table tag).

Adjacent sibling selectors use the plus (+) symbol between two or more elements, and specify that if a certain condition occurs between these two ele-

ments, formatting should occur according to the rule stated by the selector. In the following case, whenever a second-level header immediately follows a top-level header, the second-level header will be indented by 1 in.:

```
<html>
<head>
<title>Adjacent Sibling Selector #1</title>
<style>
h1 + h2 {text-indent: 1in}
</style>
</head>
<body>
<h1>Here's a Header</h1>
<h2>This Header Should Be Indented</h2>
<h1>Here's Another Header</h1>
<p>Some text in a paragraph</p>
<h2>This Header Should <em>Not</em> Be Indented</h2>
</body>
</html>
```

So, when you look at this example within a compliant browser, you'll see that the indenting rule only applies to the first of the two <h2> headers that appear on the page. This is because, in the second case, a short paragraph sits

*Continued on page 92*

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# Best of computer books 2002

**Keith Schengili-Roberts**

Every year I get several large boxes-worth of computer books to review. Some years it is easy to come up with a list of the top books, but there have been times this year when I wondered whether or not I would have enough outstanding books to recommend by the end of the year. This year there seemed to be more and more by-the-numbers books that provided the basics and not much else, so my annual list includes only five recommendations, instead of the usual 10.

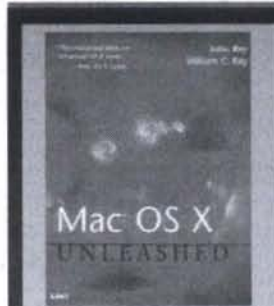
I certainly can't claim to have read every computer book published this year, and this list reflects my biases and interests, but the following titles represent books I've picked up repeatedly. Any book that manages to stay on my bookshelf has got to be good—and these titles have all been "keepers."

Here, in no real order, are my picks for the best computer books of 2002.

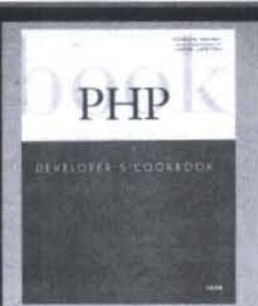
## Mac OS X Unleashed

At almost 1,500 pages, this behemoth includes all the material you expect in a guide to Mac OS X and plenty more. It is aimed squarely at the more experienced user who is not afraid of getting under the hood of this new operating system.

The first 400 pages are devoted to relatively basic material, which is arguably better covered in other, beginner-level OS X titles. But the authors really get down



**Mac OS X Unleashed**  
 Authors: John Ray and William C. Ray  
 Publisher: Sams, www.sams.com  
 ISBN: 0-672-32229-3  
 Softcover 1,464 pages 2002  
 Price: \$74.95



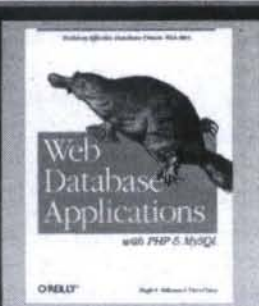
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**Homepage Usability: 50 Websites Deconstructed**  
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 Softcover 315 pages 2002  
 Price: \$59.95



**PC Hardware in a Nutshell, 2nd Edition**  
 Authors: Robert Bruce Thompson and Barbara Fritchman Thompson  
 Publisher: O'Reilly & Associates, www.oreilly.com  
 ISBN: 0-596-00353-6  
 Softcover 780 pages 2002  
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**Web Database Applications with PHP and MySQL**  
 Authors: Hugh E. Williams and David Lane  
 Publisher: O'Reilly & Associates, www.oreilly.com  
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 Softcover 563 pages 2002  
 Price: \$69.95

and dirty when turn their attention to the BSD Unix core. If you're a hard-core Mac user who wants to get the most out of OS X, this tome has what you need.

I would have preferred that the basic material be dropped completely if only to keep the weight of the book down, but it will serve the beginner with ambition.

## PHP Developer's Cookbook, 2nd Edition

As I pored through this book, I couldn't get over the childlike feeling of finding new toys. The book structure is, essentially: here's a PHP function, a description of how to use it, and some good example code to work with. Sounds simple, yet it

has a lot of useful code, written by people who obviously know how to get the most out of this scripting language, which is used to create dynamic Web pages.

About half of the book is devoted to basic language constructs and useful code suitable for beginners, such as how to manipulate strings of text, work with dates, deal with arrays and files, create classes, and use cookies. It then goes beyond the basics, looking at topics like interfacing with other programs and languages, working with LDAP and XML, and a whole section it devotes to the Zend API, which allows users to create custom functions and extensions to PHP.

The "cookbook" approach works well, making it fairly simple for readers to take a basic code recipe and "cook" it for their own ends.

## Homepage Usability: 50 Websites Deconstructed

This book assesses Web sites of 50 organizations, including large companies, government and non-profit institutions, and news and Web portals.

The basic approach of the critiques is a couple of pages that introduce the homepage, and a rough breakdown a very general critique of how the page's "real

*Continued on page 92*

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**Best of computer books 2002**

*Continued from page 91*

estate" is being used (or, in some cases, not used well). The critiques are each followed by another page or two that looks in detail at individual items and functions of the home page.

While I have some qualms about the sometimes overly-picky nature of the Web page reviews (and the fact that many of Web sites reviewed favourably tend to look the same), I have returned to this book several times over the past year because I've found it serves as a good reference to understanding what are becoming

the "best practices" for designing a Web site interface. If you have appreciated Jakob Nielsen's other books on Web interfaces and usability, you'll like this one too.

**PC Hardware in a Nutshell, 2nd Edition**

One of the things that separates true techies from the rest of the pack is the willingness to dive into the physical guts of a machine in order to add new components: hard drives, video cards, and motherboards. Given the ever-changing nature of computer technology, however, retaining ongoing expertise in the area of PC

**CSS selectors: Part 1**

*Continued from page 90*

between the <h1> and <h2> headers, so the adjacent sibling selector rule does not apply to it.

At the moment selectors are relatively poorly implemented in the latest edition of Internet Explorer, but are well supported in Netscape Navigator and Opera browsers.

The contextual selector examples will work within Internet Explorer, but only

recent versions of Netscape Navigator and Opera will render the child and adjacent sibling examples properly. □

**Next time:** More CSS selectors.

Keith Schengili-Roberts welcomes any comments, questions, suggestions, or HTML tips you may have. Email Keith at: robertsk@rogers.com. He teaches a course on CSS and Dynamic HTML at the University of Toronto's Faculty of Information Science (www.fis.utoronto.ca). His latest book on CSS (*Core CSS, 2nd Edition*) is due out in 2003.

hardware means keeping up with the latest specs on a bunch of different technologies—or you can buy this book instead.

What I think most readers of this book will appreciate is that the authors are "hands on" with their subject matter. It goes beyond the relatively simple matter of how to do such things as adding new memory cards, hard drives, or video cards, by providing a solid grounding in the wide variety of such devices available, their strengths and weaknesses detailed.

If you are planning to do PC upgrades in the near future, you can expect to save a lot of time and hassle by getting yourself a copy of this book first. Highly recommended.

**Web Database Applications with PHP and MySQL**

MySQL is to PHP like wind is to a powered sailboat—you don't have to have it, but it can really power your Web site easily and economically.

While there are many books on PHP and some on MySQL, few bring the two topics together as well as or extensively as this

O'Reilly title. If you are looking for a good introduction to using PHP with MySQL, this is the book you have been looking for.

Both PHP and MySQL are open source development environments: the first designed for creating dynamic Web pages, the second for building powerful but simple-to-create databases. Each works naturally with the other.

The book starts out with a basic introduction to PHP and then MySQL. The concepts are simple, and anyone who is familiar with basic programming concepts will "get it" quite easily.

Throughout the course of the book readers are walked through the creation of a virtual wine store, learning how to build such things as sortable lists of stock, creating a simple search engine, making a shopping cart application, and more.

This book is a great way for getting some "real-world" experience of how PHP and MySQL are used.

I only wish I could buy the Australian wines from their fictional store at the prices they list. □

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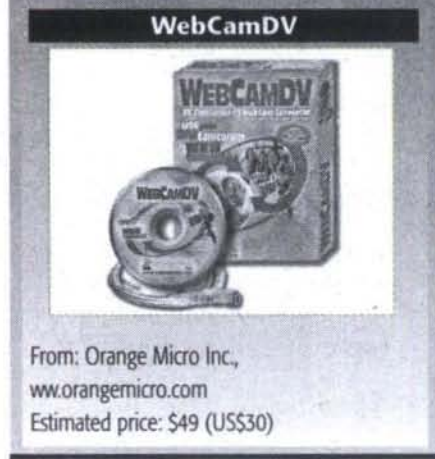
For those who do a lot of video chatting, having a video capture device of some sort is an absolute must, and a Webcam is almost always the device of choice. Here are a couple of solutions for the online socialite on your gift list.

### ADS USB Turbo 2.0 Webcam

The problem with most Webcams comes when you want to capture higher quality clips, like a video greeting to send to family back home. Sometimes the limitations of your camera and its connection to your PC offer only grainy or jerky video.

ADS offers a solution with its new USB Turbo 2.0 Webcam. The camera features a USB 2.0 connection, so video bandwidth should never be a problem, and capture should be as smooth as your computer itself will allow. The camera captures video at resolutions of up to 640x480 at a maximum of 30 frames per second, and can simultaneous capture audio. The camera has a tripod mount and even comes with a mini telescoping tripod attached, which is also adjustable.

The software bundle includes NetMeeting, iVisit, iSpQ VideoChat,



Messenger, Yahoo, Teveo Live, and Quicktime, so you'll have a lot of programs to help you get started. As a bonus, a five-port USB 2.0 card is included in the box in case you don't have USB 2.0 in your computer. The hitch: it is compatible with Windows 2000 and XP only.

—Sean Carruthers

### WebCamDV

If you have already invested in a digital camcorder but want a Webcam for your PC, consider Orange Micro's WebCamDV bundle, which allows you to use your DV camcorder as a Webcam. The bundle is essentially a 6-to-4-pin FireWire cable, audio cable, and software.

But with Webcams available for peanuts, why would you bother? Because this kit allows you to make use of all of that camera's built-in features, like high-quality audio, auto focus, zoom, and even the remote control.

If you don't already have the DV cable to hook your camera to your PC, this is a great deal...for a few dollars extra, you'll get the software too!

—Sean Carruthers

### Input systems

Continued from page 84

Wireless Optical Desktop for Bluetooth, which features the non-split keyboard and a Bluetooth connection to the PC. It's so new it doesn't have a price yet, but a recent Microsoft press release estimates it will retail for about \$250 (from US\$159).

—Sean Carruthers

### PocketMouse Pro

Notebook computers have built-in touchpads or trackpads, but many people would just as soon use a mouse—if they could just find one that didn't take up too much space in their already stuffed bags.

The answer to this problem just might be the PocketMouse Pro, which has two noteworthy features: it's optical, so no roller ball means less maintenance and that it can be used on non-flat surfaces, including your pant leg if you happen to be pinned in seat 23B; and its cord is retractable, eliminating the potential for tangles in tight places. The cord caddy mechanism winds the USB cable back into the body of the mouse for storage. The USB plug is housed in a small compartment with a flap when the cord's fully retracted.

When you want to use it, just open the flap, tug on the USB plug and out it comes as the cable unwinds.

The PocketMouse Pro is about 11x3.8x5.8 cm (4.4x1.5x2.25 in.) or about 25 percent smaller than a standard mouse, but is quite comfortable to use and even has a scrollwheel.

—David Tanaka

### Optical Keypad Mouse

If your work involves inputting a lot of

numbers, having to hit the road for extended stretches with a notebook can be a pain if you have no keypad. Since a lot of mobile users already tuck a mouse into their computer bag for long trips anyway, Genovation came up with an elegant solution: adding a standard numeric keypad to a scrollwheel mouse. The Optical Keypad Mouse is an extra-wide mouse with a palmrest that lifts up to expose a the keypad.

Continued on page 101

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## Wireless networking basics

In keeping with the holiday spirit, why not share your high-speed Internet access? The following products make that even easier by offering both wireless and cable connections—a great solution for home or small office environments.

### Wireless Broadband Router, Wireless LAN Card



From: Gigabyte Tech., [networking.gigabyte.com.tw](http://networking.gigabyte.com.tw)  
Estimated price: not available at press time

### 22 Mbps Wireless Cable/DSL Router, PC Card



From: US Robotics, [www.usr.com](http://www.usr.com)  
Estimated price: \$299 (router), \$129 (card)  
Price: approx \$30

### Gigabyte

With so many people heading to broadband Internet connections, it's no surprise that a lot of companies are coming out with broadband router products. They make it easy to connect multiple computers to the Internet using a single connection to the outside world.

Gigabyte's new Wireless Broadband Router (GN-BR402W) is a stylish little device, in a metallic blue plastic housing that can be mounted on the wall to eliminate clutter and for better data transfer and reception. The router has four 10/100 Ethernet ports on the rear for wired connections, as well as integrated 802.11b wireless networking, which will allow you to send and receive data at up to 11 Mbps almost anywhere in your house—unless it's made of solid concrete or something similarly dense. A parallel port on the back of the router allows you to share a printer among locally connected devices

(either wired or wireless). The router ships with two Ethernet cables.

Of course, if you're going to have a wireless router, you'll need at least one wireless adapter. Gigabyte's LAN Card (GN-WLM01) is pretty much what you'd expect: load the driver onto your notebook, stick the card into the PC Card slot, configure your network, and away you go.

—Sean Carruthers

#### US Robotics

A lot of users, myself included, have a soft

spot for US Robotics because it was the technology we first used to connect to the Internet—remember 2,400 and 9,600 bps? With the switch to broadband, telephone-based modems haven't been on most people's minds of late, but USR is still a name to keep in mind, thanks to its networking products.

One of the company's newest lines is its 802.11b-based wireless broadband sharing routers, which can be used with either cable or DSL broadband connections. This particular model (USR8022) has two

10/100 Ethernet ports for connecting wired devices, and it can handle many more wireless connections at up to 22 Mbps under ideal circumstances. There are two adjustable antennae on the rear of the device, as well as a parallel port, so you can share a printer between multiple connected machines, wired or wireless. It also features a reset switch on the front of the box, just in case you have to reboot the router. It ships with one Ethernet cable.

The card (USR322210) itself is a pretty basic 802.11b PC Card capable of 22 Mbps

connections. Just load your drivers, slot the card in, set up your network ID, and away you go. Both the router and card are backwards compatible with 11 Mbps technology (though, obviously, they'll only connect with 11 Mbps cards or routers at 11 Mbps).

Note: if you already have a broadband sharing device on your home network, US Robotics offers an access point, also at 22 Mbps, that will add 802.11b networking to your current network.

—Sean Carruthers

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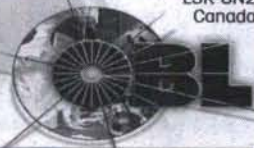
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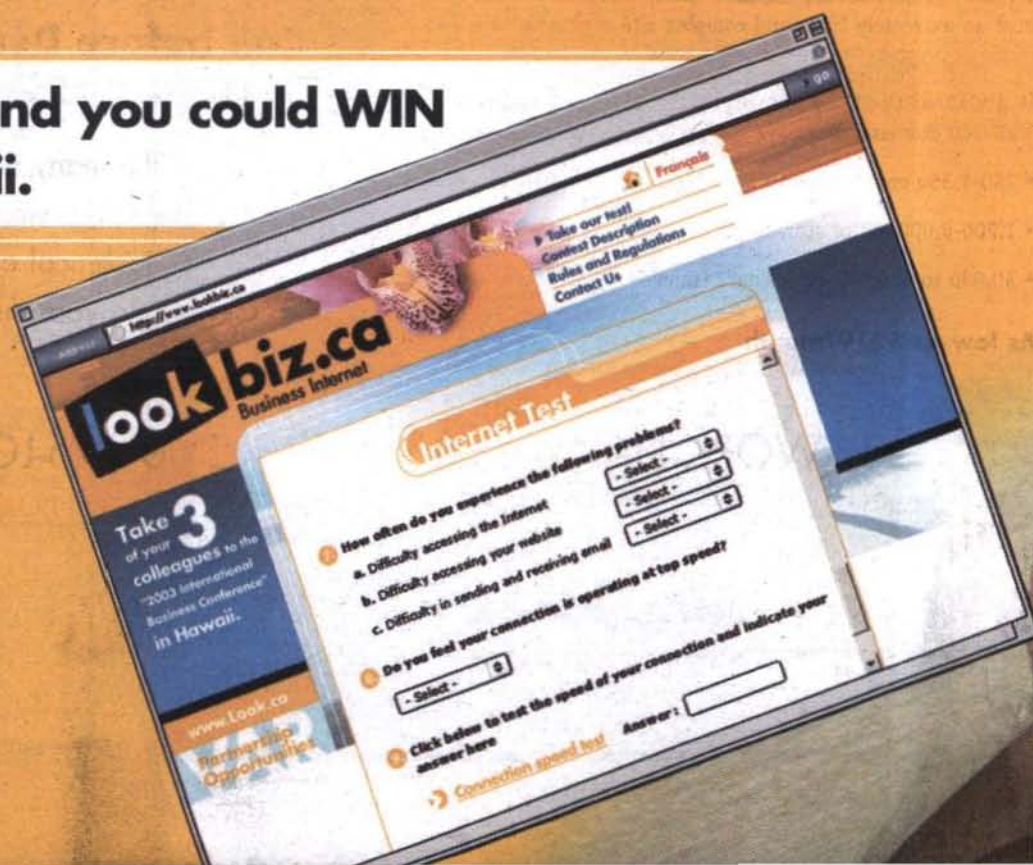
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- 1<sup>st</sup> Year New Domain registration dotca, dotcom, dotorg, dotnet
- 50 you@yourdomain.ca email addresses: POP3, SMTP, IMAP, Webmail, spam filtering, self-administration and virus protection (optional)
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- 16,000 MB of transfer
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### Managed Web Server

This high-end hosting service offers the customer a powerful solution to host several domains under one account and/or host an extremely large and complex site requiring high-end traffic, disc space and email capacity.

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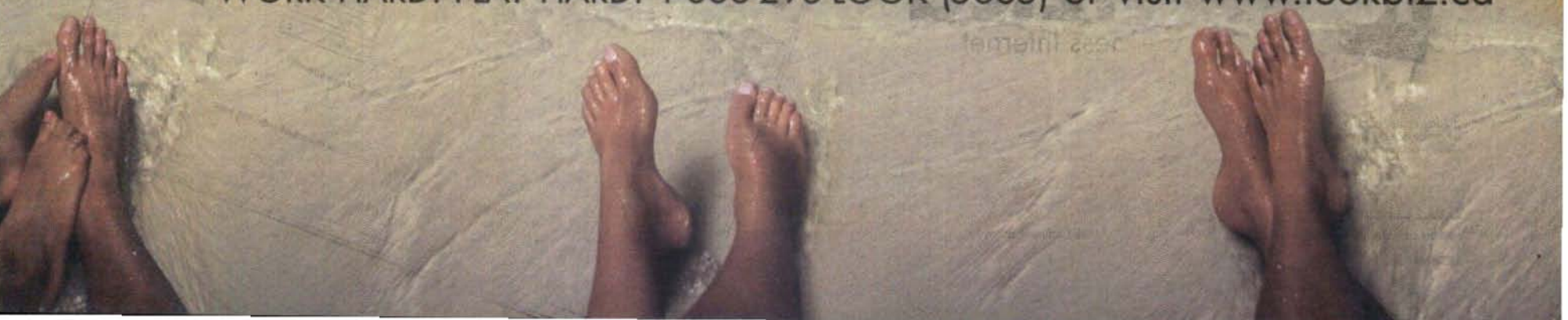
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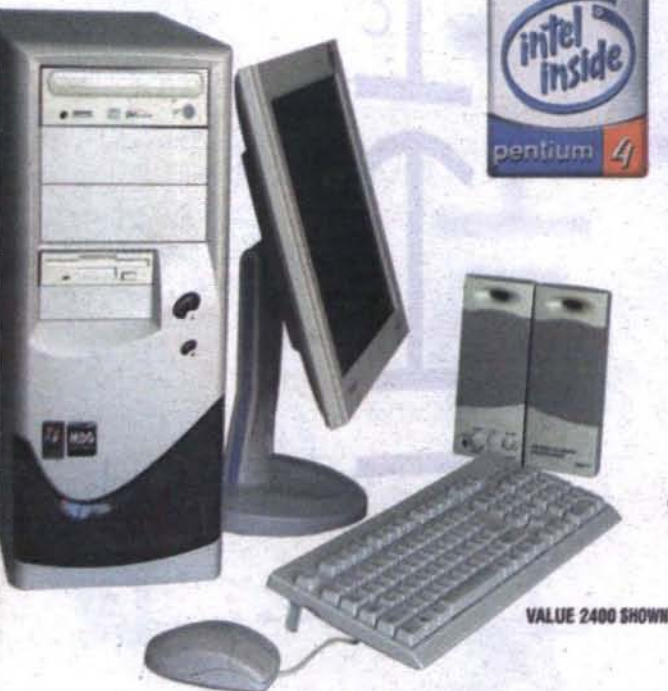
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- 3D Audio PRO Sound
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