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VP151	15.0	COMPOSITE VIDEO	1280 x 1024	DIGITAL/ANALOG	YES
VP181	18.1	COMPOSITE VIDEO	1600 x 1200	DIGITAL/ANALOG	YES
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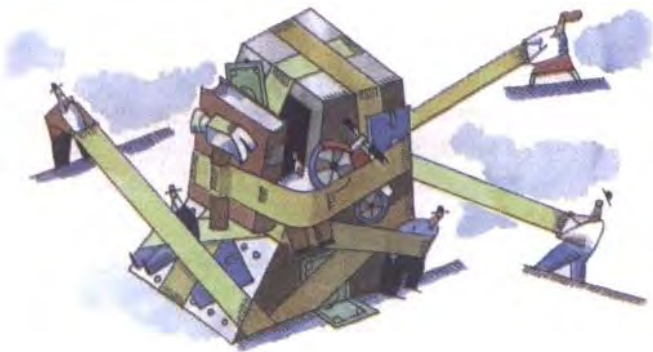
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How much power do you really need?



David Tanaka

FROM THE EDITOR

In the fall of 2000, we seem to be on one of those plateaus that the PC industry regularly hits, where hardware, software and the tasks we want to accomplish seem well matched.

There will always be power users for whom the latest is never enough, but for most of us, using our computers at home or at work, there are few tasks that even a mid-range computer can't handle.

TCP's Test Lab editor, Sean Carruthers and I have an ongoing discussion about what kind of PC user really needs the latest products that show up in the lab, from 1 GHz processors to 15,000 rpm hard drives.

We've wondered what kind of user would actually generate enough data to fill a 20 GB or 40 GB hard drive, or would take full advantage of the audio capabilities contained in a Sound Blaster Live card, or would need the blistering polygon processing counts that the latest generations of video graphics cards are capable of delivering.

Our conclusion, invariably, is that in a computer that's going to be used primarily to surf the Web, play a few games, check email, maybe balance a personal bank account, and write the occasional letter or term paper, these leading edge subsystems aren't really necessary.

We figure that extreme game players make up one of the few PC user profiles that still consider the speeds and feeds truly important. Plus, there are professionals working in engineering or medical research who also demand all that the modern PC can deliver, and more. But that in itself is an interesting development—the humble PC is being used for the kinds of tasks that were the exclusive domain of specialized (and expensive) workstations just a half a decade ago.

However, it would be folly to think that enough is forever enough. The annals of computer history are littered with pronouncements that now seem silly: that the world market for computers is about five (attributed to Thomas Watson, chairman of IBM in 1943), or that 640 KB of RAM was sufficient for anybody (attributed to Bill Gates in 1981). So, while we may think that few users really need the power that can be delivered by today's personal computer, we're not about to conclude that this is a steady state.

Here's a case in point. I'm presently using two notebook computers, an 18-month old model powered by a 400 MHz

Pentium II processor with 128 MB of RAM, and a brand-new unit powered by a 700 MHz Pentium III with 256 MB of RAM. There's no doubt that the newer one is the performance champ. On our Test Lab benchmark suite, it achieved one of the highest scores to date for a notebook.

But after sitting in front of one or the other of these machines least four hours a day since the new unit came into service in early July, I've come to a conclusion that surprises me: either of these machines will do everything I need or want to accomplish today.

There are a couple of applications I regularly use—voice processing and image editing—where the Pentium III model clearly outshines the other machine. And I suspect that if I were to upgrade both machines to Windows 2000, the newer machine would handle the transition better. So, looking ahead, yes, the faster machine has more capacity for what may be expected of it a year from now.

Redefining performance

Where I find both machines lacking—and equally so—is in areas that are outside what's normally been defined as the computer. Primarily, it has to do with how I gain access to the information residing beyond the box.

I'd wager that for most PC users, sporadic email delivery and intermittent Internet access are far more frustrating today than the amount of time it takes to recalculate a spreadsheet. Sure, I'll always want a faster computer, but that measure of system performance is no longer enough—I also want one that connects me to the digital information flow whenever and wherever I please.

Last month, I wrote about the RIM BlackBerry and Rogers AT&T Mobitex wireless data network, which together form a glimmering of computing to come.

If you take a modernist perspective, you might find it hard to understand how anyone could get excited about a decade-old datacomm network, or a device that uses a 386 processor. But what this solution delivers today that a 700 MHz Pentium III notebook cannot is switch-it-on-and-go access to that huge data repository called the Internet.

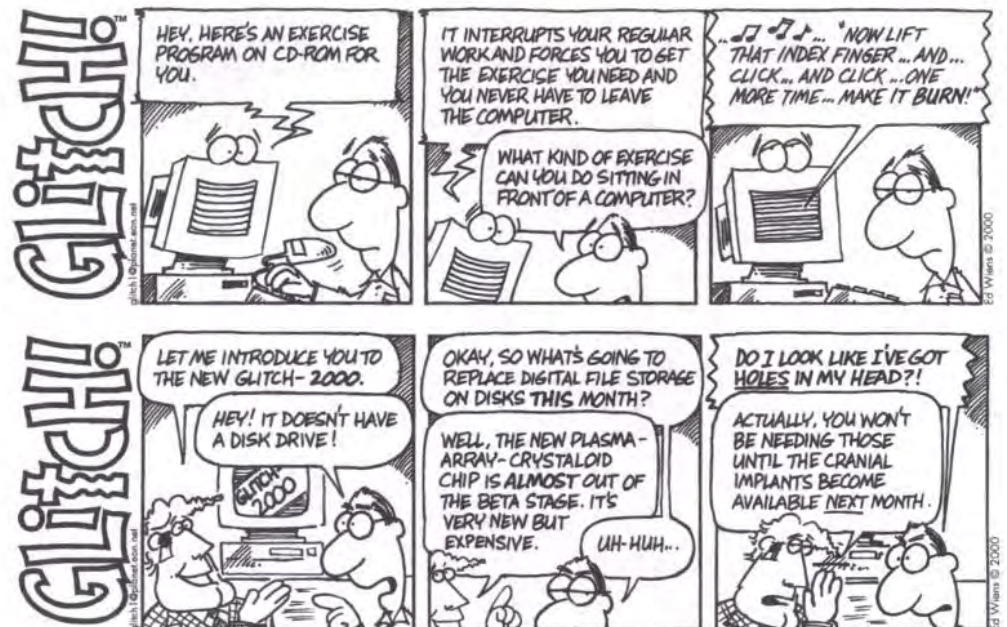
Sun Microsystems chief executive officer Scott McNealy preaches that the network is the computer. The value of that sermon is not the political subtext declaring the end of the PC era, but an illumination of what has to be done next to advance personal computing so that it continues to match our evolving needs.

Fast CPUs and capacious hard drives are now baseline measures. Manufacturers have to deliver a high level of performance in those subsystems just to get on the playing field. Tomorrow we'll want to compute even if we're not at a desk, or near a power outlet.

Building in features that fulfill those needs is where the real competitive action will be.

Interesting times ahead,

David Tanaka
Editor



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Gloomy cast on Sun article

The Sun Ray article detailing the latest and greatest in thin-client (see "Sun's Rays hit Saskatchewan," September issue) is by no means earthshaking. Been there, done that! It's called dumb terminals.

I have had some experience with the Citrix MetaFrame server brand of the same solution. It all depends on the connection. If you have a big fat pipe and are mostly working with text, by all means research the cost benefits (a really central server, one-stop LAN administration, easy software and hardware upgrades) and move to the Sun solution. It is slick

and the roving profile is definitely a "cool" feature. However, if you are doing development or working in graphics intensive environments, you would be hard pressed to beat a dedicated fat-client workstation.

Kevin DesRues

TCP replies: So, kiddies in Room 22b, there'll be no C++ today, and keep your paint boxes down to 256 colours!

Fast line for small business

I have recently become a reader of your paper and the article "Revisiting the fam-

ily network" in the April 2000 issue resonated with me. I too have a "small network headache, sending me searching for a beer (actually several) and aspirin," but rather than a home situation, mine is from a small business perspective.

We are a small business (two people), peer-to-peer networked (Ethernet cable already installed) in an office building currently using a dedicated phone line as our fax/data line. You can see the problem that will arise should we try to add two more computers. Do we add more phone lines or DSL or stay with our current solution, where we just holler to each

other to "get off the phone line." We need to find a networking/Internet solution at a home office price.

I was intrigued by another article in the April 2000 issue called "ISB gives LAN high-speed Internet". It appears to be a very affordable solution for the home situation but when trying to apply it to an office setting, the DSL or cable price is astronomical because you are a business.

Would TCP consider an article geared towards small businesses with an Ethernet network that want to connect to the Internet through something less than \$500 a month?

Deborah Binda

TCP replies: If you read LAN Line in the Tech Enterprise section of the September issue and this issue, columnist Issie Rabinovitch talks about a couple of modem-sharing solutions that are under \$500. (Both LAN Line columns dealing with Internet sharing solutions can also be read online at <http://www.canadacomputes.com>.) These are similar to the ISB2Lan product you refer to, but are cheaper.

As you've pointed out, getting high-speed service in an office tower might be the real challenge because of the higher cost of DSL for business, but if your needs are primarily for email and short sessions on the Web, a device that allows your multiple PCs to share a single phone line for Internet access might be sufficient. Some service providers offer DSL business services for under \$500 a month, and we expect that the number of ISPs offering high-speed services to business will increase this fall and next year. We've also seen high-speed cable service packages geared to business being offered in some parts of Canada, but you'd have to check to see whether this is offered in your area.

There are a number of developments occurring in this area, and we will most certainly be covering them.

BX forever, dude!

This is just a quick note to point out that the author of "Adventures in CPU Land" (see TCP, September issue) needs to go do some homework on the 440BX chipset!

I am absolutely astounded that the author stated many completely unfounded mistruths about this chipset, especially since its popularity far rivals that of other historic chipsets, like the VIA MVP3! It was stated was that "the BX chipset only supports Slot 1" and another was that it will not support UDMA/66.

Facts: The Abit BX-133 RAID can do UDMA33/66/100 at 133 MHz FSB, using a RAID array, with CPUSOFT-III to boot!

Rob Bassett

SC replies: It's true that the BX chipset has recently undergone a bit of a renaissance. In addition to the Abit board you mentioned, many other manufacturers have introduced new boards built around the BX chipset, and many of them have updated the boards to include UDMA/66 and UDMA/100, as well as other modern amenities.

It's worth noting, however, that the majority of existing BX boards are the older models, with the UDMA/33 limit and the slower AGP slot. We hope to get the new souped-up BX boards in for testing, as they certainly seem to promise excellent performance all around.



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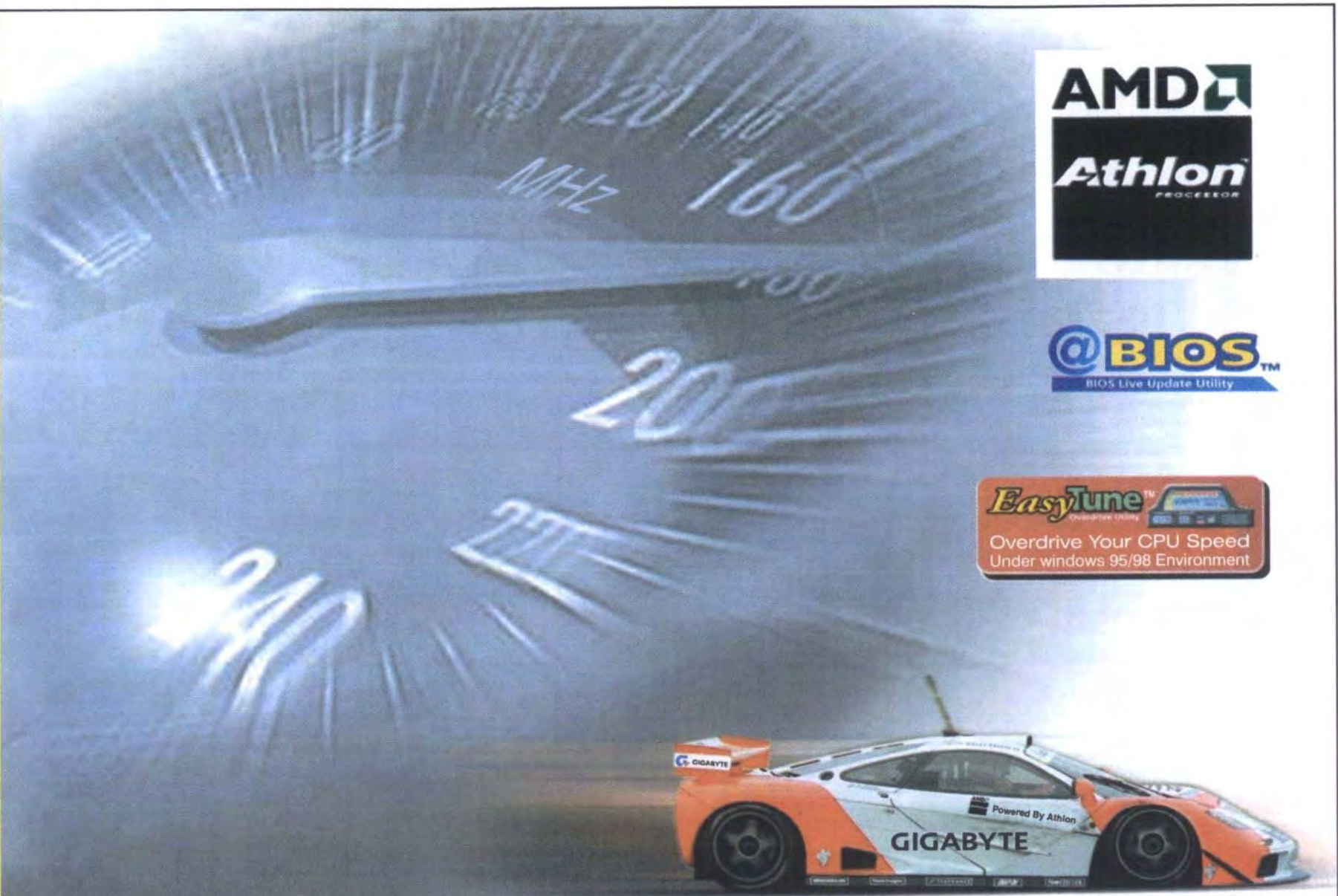
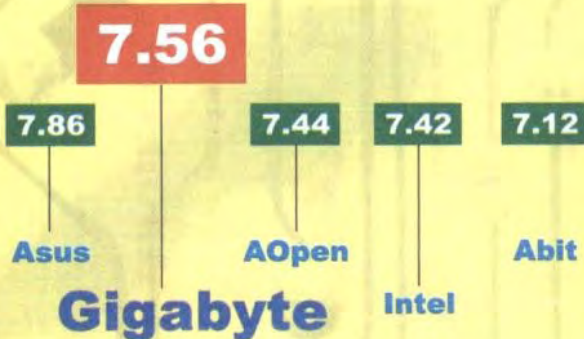
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The domain in Spain stays mainly with those who complain

GENEVA, Switzerland—In a ruling that should cause concern for many Web site operating travel companies and city “portals” around the world, an arbitrator officiating over rights to the Internet address Barcelona.com has decided it should be taken away from its current owners and handed to the Spanish city with the sound-alike name.

The decision, issued under a dispute resolution procedure adopted by the Internet

Corporation for Assigned Names and Numbers (ICANN), could be seen as a boon for local governments eager to cash in on the dot-com frenzy and a headache for owners of numerous Web sites—many multi-million-dollar productions—that have been named after well-known locations.

The ruling came in August from arbitrator Marino Porzio, who was assigned by the United Nation’s World Intellectual Property Organization (WIPO) to settle the dispute

over Barcelona.com using the rules of ICANN’s Uniform Domain Name Dispute Resolution Policy (UDRP). WIPO’s Arbitration and Mediation Center is one of four organizations around the world authorized to sort out complaints under the UDRP.

According to Porzio’s written decision, Barcelona.com was originally registered in early 1996 by Concepcio Riera of Barcelona. In May of this year, at about the same time

the city filed to claim the address under the UDRP, the domain was transferred to a company operated by Riera and her husband, Juan Nogueras Cobo, which they called Barcelona Inc.

Currently, the address points to a Web site that serves as a source of news and tourism information related to Barcelona.

In order for a complainant to succeed in a domain-nabbing attempt under the UDRP, the rules say the current holder must have no legitimate claim to the address and that they must have registered the address—or are using it—in “bad faith.”

The surprise for many operators of Web sites with geographic names was that Porzio didn’t consider the operation of a Barcelona “portal” to constitute evidence of a legitimate right to the address.

In addition, he ruled the domain is currently being used in a way that meets at least one of the UDRP’s “bad faith” definitions, including to “attract, for commercial gain, Internet users... by creating a likelihood of confusion with complainant’s mark as to the source, sponsorship, affiliation or endorsement of your Web site or location or product or service on your Web site or location.”

Wrote Porzio: “According to [Barcelona Inc.’s] business plan... it is obvious that the main and only purpose of such plan is to commercially exploit information about the city of Barcelona in Spain and its province, particularly, using the information prepared and provided by [the city] as part of its public service.”

The arbitrator suggested that it is reasonable to assume that anyone using the address Barcelona.com “would normally expect to reach some official body or representative of the city of Barcelona itself.”

The problem with that point of view, said Internet law expert Michael Geist, is that it could easily be applied to a variety of popular Internet destinations, including many operated by large media companies.

Geist, a professor at the University of Ottawa School of Law, said that if Porzio’s ruling turns out to be an anomaly, it will be good news for companies such as the *Boston Globe* newspaper, the owner of Boston.com; Boulevards New Media, which owns LosAngeles.com, Seattle.com, Albuquerque.com, and others U.S. destination domains; TorStar/BCE, which owns Toronto.com; and Southam Inc., which currently owns the domain Canada.com.

“I think it’s an absolutely awful decision,” he said. “Based on the fact that we’ve already seen WIPO make clear that they’d like to move quite explicitly in this direction [protecting geographic names], there’s clearly the potential that this will become a precedent-setter.”

Geist said the notion that Internet users would mistake a dot-com address for the official site of a government organization was “nonsense.”

“If there would be any official site, one would have thought—particularly outside the United States—that it’s going to be the country-code domain,” Geist said. “So, it would be Barcelona.es, not Barcelona.com.”

Barcelona Inc.’s site is at: <http://www.barcelona.com/>. The full text of the WIPO’s UDRP decision can be found at: <http://arbitr.wipo.int/domains/decisions/html/d2000-0505.html>.

—Newsbytes

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WHAT'S NEW

Intel's PC camera does double duty



Intel Corp. has unveiled a new digital camera that can be used to take Internet-ready photos and record video at, and away from, the PC.

Attached to a computer, the Intel Pocket PC Camera can be used for video phone calls, to send email postcards, create PC movies, and play PC Camera games using the included software. Removed from its stand, it can be used to capture digital stills and video clips at events taking place far from the computer. It has 8 MB of memory, which can store a combination of 128 VGA quality (640x480) images or two minutes of video when untethered from a PC.

Intel says the 227 g (8 oz.) camera is a high-quality VGA camera with a CCD sensor for enhanced low-light performance, and a four-element lens with a 50-degree field of view. An auto setting lets users capture five shots in two seconds, and a self-timer lets everyone get in the picture, says Intel.

The camera includes batteries, a carrying case, and wrist strap, as well as a software bundle that includes Microsoft Windows Netmeeting for video calls, Intel E-mail Postcard, Video E-mail, Auto Snapshot, Movie Builder, Home Page Builder, Picture Manager, games developed by Reality Fusion, and MGI Photosuite SE.

It has minimum system requirements of a 166 MHz Pentium processor with MMX, USB connectivity, Windows 98, 98SE, or Millennium Edition, a Windows-compatible sound card with speakers and microphone, 32 MB RAM, and Internet access.

Now available in Canada, the Intel Pocket PC Camera has a suggested retail price of \$249.

—TCP Staff

Reducing cable confusion

London, Ont.-based cable manufacturer, StarTech.com has launched a Web site to help computer users select the right cable. Visitors to <http://www.computercablefinder.com> will find listings of StarTech's SCSI, USB, printer, networking, keyboard, video, and other cables.

Once on the site, the user selects the purpose for which the cable will be used, such as connecting a printer or monitor, then matches the cable ends. With this information, the Cable Finder produces a list of compatible cables. Users can choose the length, and in some cases the colour, they prefer.

They are then shown detailed technical specifications, a photo of the cable, suggested retail pricing and information on where they can purchase the product. If a user requires a unique cable designed for a specific application, they have the option of ordering custom cables using

an online form.

Also available on the site are reference charts that identify and explain the applications for common computer port connectors.

—TCP Staff

Compaq intros new iPaq devices

NEW YORK—Compaq Computer Corp. (<http://www.compaq.com/products/ipaq>) has introduced a four-product extension to its iPaq line of easy-to-use personal Internet devices that compliment the PC, including a Net appliance billed as a "Web in a box" and a pager-sized wireless email device.

Mike Larson, vice-president of consumer products for Compaq, says the new products meet the demand for new ways to access the Internet. "Eventually, we'll see every home networked with wireless broadband," Larson says. "We want to offer customers a complete suite of PCs and iPaq devices to use in every room of the house."

Larson cited a Forrester Research report predicting that 45 percent of all Internet users will go online using more than one device.

The iPaq Home Internet Appliance is a plug-it-in, turn-it-on device that can be used anywhere in the home, running on Microsoft's MSN Companion Service. "It's very non-threatening,"



says Larson, "it's very simple to use, and is for people that are using CPUs (central processing units) for just email communication or for people who don't have a computer today because they're concerned about using it." The cost is US\$199, including a US\$400 rebate for buying a three-year Internet service provider (ISP) subscription to MSN at US\$21.95 per month.

Equipped with Research In Motion Ltd. (RIM) software, the BlackBerry Wireless email device allows users to read, compose, forward, reply, delete or file email using one corporate email address. The device—priced at US\$399 with a minimum one-year airtime service fee of US\$39.99—is small enough to clip onto a belt or waistband.

The plug-and-play PA-1 audio player, available late this month at \$249.99, allows users to download music files from their PCs through a USB port and without a memory stick. Its one-button access to the PC links the user to the iCAST music and entertainment Web site, the company said.

Compaq, as an extension of its partnership with Watchguard Technologies Inc., also introduced the iPaq Connection Point, a home and small office gateway that provides firewall security, wireless Internet and flexible home networking. It will go on sale in about 60 days at US\$499.

"Every one of these products comes with associated services as well," said Larson, "so clearly, the objective would be to build those lifetime relationships with the customers but also to drive above-the-box revenue streams as well."

Larson declined to give Compaq's specific market share goals and would not reveal details of financial aspects of alliances involving iPaq products and services.

The new devices join the previously-rolled out iPaq Desktop PC and iPaq Pocket PC.

—Newsbytes

Publisher sets full season of ebooks

Following its success in March, with ebook-only release of Stephen King's *Riding the Bullet*—which was downloaded more than 500,000 times—Simon & Schuster (<http://www.simonsays.com/ebooks>) has announced that this fall will be its first full season of publishing original ebooks, with electronic versions of new releases hitting the Web at the same time print versions hit the bookstores.

The simultaneous original ebook/print releases will include business, personal finance, fiction, popular culture, health, children's nonfiction, games, and educational reference titles. Works by bestselling authors—including V.C. Andrews, Mary Higgins Clark, Stephen King, Colleen McCullough, Hunter S. Thompson, Bob Woodward, and Jesse Ventura—will be among the new releases, according to a Simon & Schuster press release.

Simon & Schuster says its eBooks will be available in several formats, including Microsoft Reader, Glassbook, Rocket eBook, Softbook, Peanut Press, and Softlock.com.

To highlight its ebook offerings, Simon & Schuster says it will release an "instant" biography of the next U.S. president at 12:01 a.m., Nov. 8 (election day is Nov. 7), which will include a chronicle of the successful candidate's life and times, from childhood through to his acceptance speech.

The company also announced it will be publishing the new *Star Trek S.C.E.* (Starfleet Corps of Engineers) series of books in electronic form exclusively. The first book in the series will be offered initially in Microsoft Reader format as part of a special promotional program, but will later become available in other ebook formats.

Corel Linux OS Second Edition debuts

Corel Corp. has unveiled Corel Linux OS Second Edition and CorelDraw Graphics Suite for Linux, which are both currently available online or from retailers.

Corel Linux OS Second Edition has a suggested retail price of US\$29.99 for the standard edition and US\$89.99 for a deluxe version. A free download is also available at <http://linux.corel.com/download/>. Corel says the edition adds to the functionality of the OS's existing tools and utilities, providing a graphic front end and focusing on the PC environment, while maintaining its utility as a Web server, file server, or print server for experienced Linux users. The new release adds USB support, broader hardware support, improved ease-of-use, and an updated kernel, according to the company.

The CorelDraw Graphics Suite for Linux has a suggested retail price of US\$249. Corel says its suite of drawing and painting tools for the Linux platform supports Internet publishing, and includes productivity-enhancing features designed specifically for the Linux environment.

—TCP Staff

Be to port BeIA to Compaq appliances

Compaq Computer Corp. has plans to begin marketing Internet appliances equipped with BeIA—Be Inc.'s Internet appliance OS—to a variety of industries, according to a Be press release.

The combination of Compaq's hardware and Be's software platform will enable Internet service providers, financial services firms, e-commerce companies, and other affinity partners to

extend their customer relationships through dedicated, branded devices, according to Be.

BeIA features a Web browser from Opera Software, support of streaming media, such as RealNetworks, RealPlayer, personalJava from Sun Microsystems, and plug-ins such as Macromedia Flash, yet remains a lightweight solution taking up only 7 MB of space.

—TCP Staff

Microsoft debuts Train Simulator



Attendees to the recent National Model Railroad Association's National Train Show meeting in San Jose, Calif., recently, were treated to a preview of Microsoft Train Simulator, a program designed to simulate running a railroad on a PC.

Designed to be the train counterpart to Microsoft's highly successful Flight Simulator, Microsoft Train Simulator provides a true-to-life train experience to the computer. Microsoft is currently working with six of the world's leading railroads, recreating hundreds of miles of routes with realistic scenery, equipment and operations. Using multiple camera angles, players can take on the role of an engineer, passenger or bystander. The game will feature realistic engineer's control panels, scenery and weather, and players will be able to operate up to nine different trains, ranging from old steam locomotives and the most-modern high-speed "bullet trains." They will also be able to take their train along any of six famous rail routes, and in either historical or contemporary settings.

"Microsoft's 18-year commitment to simulations continues with Train Simulator," said Ryan Mugford, business manager for Microsoft games in Canada. "We are looking forward to a product that brings the thrill of trains and railroading to the general public and allows train enthusiasts and modellers to extend their hobby onto their personal computers."



The program is expected for launch in Spring of 2001, and is being developed in conjunction with British-based Kuju Entertainment. More information about the sim can be found at <http://www.microsoft.com/games/trainssim>.

—Keith Schengili-Roberts

Continued on page 14

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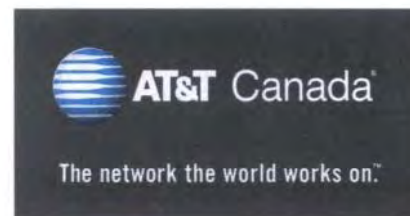
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What's New

Continued from page 12

Nomad Jukebox offers 6 GB for MP3s

Looking very much like a stylish portable CD player, the Nomad Jukebox—the latest addition to Creative Lab's successful line of portable MP3 players—differs from a simple CD player in its storage capacity. This unit can hold up to 150 CDs. While the vast majority of portable MP3 players offer a maximum 64 MB RAM of memory, Creative Labs is planning to offer customers a quantum leap in memory for playing back what could be their entire music collection with the Nomad Jukebox, which will boast a whopping 6

GB of storage in the form of a compact hard drive. It also comes with an additional 8 MB of DRAM, which provides five minutes of shock protection, ensuring virtually skip-free playback. It comes with rechargeable NiMH batteries, capable of four hours of playback, and the whole thing weighs in at 400 g (14 oz.).

The Nomad Jukebox also comes with several other impressive features, such as being able to record on-the-fly via an in-line jack, an adjustable playback speed function and EAX environmental effects, enabling the user to add dimension to their music. It also sports a speedy USB connection, offering a speedy and no-fuss way of transferring music files to the device. In

addition to MP3 files, the device will play other formats such as Microsoft's WMA.

Pricing information is not yet available for the Nomad Jukebox. It will require a basic PC running either Windows 98 or 2000, with a USB port, and at least 12 MB free hard drive space. Creative Labs says it will be available in late summer 2000.

—Keith Schengili-Roberts

ACD upgrades image database tool

Victoria, B.C.-based ACD Systems International Inc. has released version 3.1 of ACDSee, its all-in-one image viewer, browser, database, file management, and image manipulation tool for

managing digital images.

ACDSee 3.1 allows users to generate Web pages from photos, send images by email directly from ACDSee, generate and print thumbnail contact sheets, play embedded audio in Exif JPEG files, customize toolbars, and try out LuraWave and LuraDoc extreme compression technology plug-ins for 30 days.

The company says that in addition to its new features, users can now opt for an advertising-enabled version of the software. A full-featured version of ACDSee 3.1 can be downloaded from the company's Web site (<http://www.acdsystems.com>) and used free for 90 days. At the end of the trial period, users can choose to run the software in "sponsored" mode, which requires them to view ads when using the software. Or, for US\$49.95, users can purchase a registered version of the program, which is ad free.

ACDSee 3.1 is suitable for both high-end graphics professionals and home users, according to an ACD press release. The company says registered users of ACDSee 3.0 can upgrade to the new version for free.

—TCP Staff

Microsoft MechWarrior 4 offers

If the idea of battling in a futuristic, heavily armed 40-foot tall, 80-ton, 90-mile per hour war machine that strides across alien landscapes appeals to you, you might take an interest in the downloadable preview trailer for MechWarrior 4: Vengeance, the highly anticipated sequel set in the BattleTech gaming universe.

Made to hype the launch of the game expected by the end of this year, the MechWarrior 4 trailer is shot very much like a sci-fi feature film, with lots of intense, action-packed sequences featuring mechanical warriors of a dark future set on far-off worlds. The basic storyline sets the player as a fighter trying to reclaim a stolen inheritance from oppressive masters. While the story is not exactly original, it is obvious from the trailer that MechWarrior 4 will be set in a visually compelling environment.

Currently under development by Microsoft's FASA Interactive group, MechWarrior 4: Vengeance, promises to player a selection of up to 21 different MechWarrior machines—seven of which are entirely new—bristling with a variety of hi-tech weaponry and attributes. Each Mech offers unique strengths and weaknesses, so gamers must carefully evaluate each mission and plan accordingly. Players can customize their Mechs by adding armour, weapons, and sensors to gain strategic advantage over enemy Mechs. The game will also boast a variety of day missions, night missions, plus fog, rain, snow blizzards and lightning effects to provide atmosphere and add to the intensity and realism. The new game will also greatly expand multiplayer features, and for the first time players will also be able to create their own missions, host their own MechWarrior servers, and participate in missions cooperatively.

The preview trailer is available in AVI and MPEG formats at: <http://www.microsoft.com/games/mechwarrior4>. MechWarrior 4 is set for release by "holidays 2000."

—Keith Schengili-Roberts

Deep Blue a celeb

IBM's chess-playing supercomputer, Deep Blue is better known than Oracle chief executive officer Larry Ellison or Sun Microsystems boss Scott McNealy. This, according to a news release from IBM announcing the famous computer's scores on the Q Score celebrity rankings.

If you follow the stars you may already know about the Q Score, a measure by Marketing Evaluations Tv/Q Inc. of a person's or character's

Continued on page 21



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128MB 168 Pin SDRAM (PC 133MHz)
1.44MB Floppy Drive
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Creative Labs Sound Blaster Live! Value Card
52x Speed UDMA CD-ROM
MLI-747 5 pcs. Sub-Woofers Speaker System
Samsung 750S 17" .27mm DP NI SVGA Monitor
ATX Mid-Tower Case with CSA 300W Power Supply
107-keys Windows 98 Keyboard, PS/2 Mouse
2 Year Parts & Service Warranty



Athlon K7-750MHz	\$ 1,690
Athlon K7-800MHz	\$ 1,720
Athlon K7-850MHz	\$ 1,820
Athlon K7-900MHz	\$ 1,870
Athlon K7-950MHz	\$ 2,015
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Pentium III 440BX AGP/PCI/ISA Main Board
Internal L2 Cache
64MB 168 Pin SDRAM (PC100MHz)
1.44MB Floppy Drive
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Ultra DMA33 Cont. w/2x16550 Serial,
1xBI-Directional Parallel, 2xUSB Port
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Creative Labs Sound Blaster Ensoniq Card
52x Speed UDMA CD-ROM, Speakers
15" Non-Int Low Rad. SVGA Monitor PnP
ATX Mid-Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard, PS/2 Mouse
2 Year Parts & Service Warranty



PIII 500MHz 512KB L2 ..	\$ 9 6 5
PIII 550MHz 512KB L2 ..	\$ 9 8 5
PIII 650MHz 256KB L2 ..	\$ 1,055
PIII 700MHz 256KB L2 ..	\$ 1,085

Pentium III ~ MediaMax Pro

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1.44MB Floppy Drive
20GB Ultra DMA-66 IDE Hard Drive
Ultra DMA66 Cont. w/2x16550 Serial
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Creative Labs Sound Blaster Live! Value Card
52x Speed UDMA CD-ROM
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ATX Mid-Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard, PS/2 Mouse
2 Year Parts & Service Warranty



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IDE Hard Drive Special!! **20GB \$144**

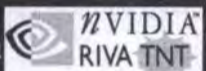
UDMA 66 7.5GB	\$108
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Promise UDMA66 Controller **\$32.00**

Promise UDMA100 Controller **\$54.00**

Power Station

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15" Non-Int Low Rad. SVGA Monitor PnP
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1 Year Parts & Service Warranty



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566MHz w/128KB L2	\$ 8 8 0
600MHz w/128KB L2	\$ 8 9 0
633MHz w/128KB L2	\$ 9 1 0
667MHz w/128KB L2	\$ 9 4 0
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Celeron ~ BookPC

PC Partner i810 Flex ATX Main Board (upgrade to P3 CPU)
64MB 168 Pin High Performance SDRAM
1.44MB Floppy Drive
15GB Ultra DMA-66 IDE Hard Drive
1xBI-Directional Parallel, 2xUSB & 1xSerial Port
On Board 64 Bit 3D Graphics Accelerator
On Board AC-97 Sound Card
On Board 10/100BaseT LAN Card
52x Speed UDMA CD-ROM, Speakers
15" Non-Int Low Rad. SVGA Monitor
AOpen H300C Slim Desktop/Tower Case
107-keys Win98 Keyboard, PS/2 Mouse
1 Year Parts & Service Warranty



CELERON

566MHz w/128KB L2	\$ 8 5 5
600MHz w/128KB L2	\$ 8 6 5
633MHz w/128KB L2	\$ 8 8 5
667MHz w/128KB L2	\$ 9 1 5
700MHz w/128KB L2	\$ 9 5 5

AMD SuperStation

MicroStar K7T Pro Athlon/Duron VIA 133 Main Board
128MB 168 Pin High Performance SDRAM (PC100MHz)
1.44MB Floppy Drive
15GB Ultra DMA-66 IDE Hard Drive
Ultra DMA-66 IDE Controller
2 x 16550 Serial, 1 Parallel & 2xUSB Port
AGP TNT Vanta 3D Card w/16MB
On Board AC-97 2.0 3D Audio Sound
52x Speed UDMA CD-ROM, Speakers
15" Non-Int SVGA Monitor .28mm dp PnP
ATX Mid-Tower Case with CSA Power Supply
107-keys Win98 Keyboard, PS/2 Mouse
1 Year Parts & Service Warranty



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ASUS V6800 nVIDIA GeForce 256 64MB DDR Pure ...	\$420.00
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Adaptec 2910C/2930U PCI SCSI Controller	\$115/133
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Adaptec AAA-131U2 RAID SCSI Card	\$535.00
Promise Ultra66/Fastrak 66 PCI Controller	\$32/128
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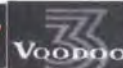
Canon BJC-1000SE/2000SE (\$20 rebate) ..	\$ 8 0 / 1 1 8
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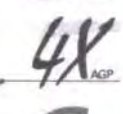
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Pentium III~Game Blaster



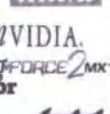
Intel Pentium III Processor/133MHz Bus
 Asus P3V4X/CUV4X VIA Apollo Pro 133A ATX Board
 128MB 168 Pin SDRAM (PC133MHz)
 1.44MB Floppy Drive
 20GB Ultra DMA-66 5400RPM IDE Hard Drive
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 52x Speed UDMA CD-ROM
 MLI-480 Sub-woofer Speaker
 Samsung 750S 17" .27mm DP NI SVGA Monitor
 ATX Mid-Tower Case with CSA Power Supply
 107-keys Windows 98 Keyboard,PS/2 Mouse
 2 Year Parts & Service Warranty



- PIII 533MHz 256KB L2 ... \$1,405
- PIII 733MHz 256KB L2 ... \$1,530
- PIII 800MHz 256KB L2 ... \$1,635
- PIII 866MHz 256KB L2 ... \$1,795
- PIII 933MHz 256KB L2 ... \$2,030

Ultimate Power Station

Intel Pentium III Processor/133MHz Bus
 Asus CUV4X VIA Apollo Pro 133A ATX Board
 128MB 168 Pin SDRAM (PC133MHz)
 1.44MB Floppy Drive
 20GB Ultra DMA-66 7200RPM IDE Hard Drive
 Ultra DMA66 Cont. w/2x16550 Serial,1xBI-Direc
 tional Parallel,4xUSB Port
 AGP nVidia GeForce 2 MX w/32MB TV Out
 Aureal Vortex 2 SuperQuad A3D 2.0 Sound Card
 52x Speed UDMA CD-ROM
 Altec Lansing 45.2 Sub-woofer Speaker
 Samsung 753DF 17" .20mmDP DynalFlat Monitor
 ATX Mid-Tower Case with CSA Power Supply
 107-keys Windows 98 Keyboard,PS/2 Mouse
 2 Year Parts & Service Warranty



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- SONY CDR - \$1.45
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Hewlett Packard SureStore 40GB Int/Ext DDS-4 DAT ..	\$1630/1890
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Seagate Scorpion 24GB DAT Int/Ext Drive	\$1040/1215
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HP JetDirect J3258B 170X 10BaseT Ext Print Server ..	\$ 205
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HP JetDirect J3263A 300X 10/100BaseT Ext Print Server ..	\$ 360
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Intel NetPortExpress Pro Ext. Printer Server PCL2151B ..	\$ 368
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Xircor Realport RM56V1 56K v.90 Modem	\$ 182
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Xircor Realport 2 R2WD Wireless Data (Ericsson/Nokia) ..	\$205
Xircor Realport 2 R2BM56WG 56K WinGlobal Modem	\$ 225
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AOpen SOHO-5+ 5 Port/528 8 Port Hub	\$34/48
D-Link DE-809TC 5 Port Hub	\$ 53
D-Link DE-809TC 8 Port/DE-812TP+ 12 Port Hub	\$66/203
D-Link DE-816TP 16 Port/DE-824TP 24 Port Hub	\$180/294
Intel InBusiness SH10T5 5 Port/SH10T8US 8 Port Hub ..	\$ 64/77
Intel InBusiness SH10T8B 8 Port Hub (with coax)	\$ 115
Intel InBusiness SR10TPSUS Internet Station	\$ 186
Netgear EN104TPNA/EN104NA 4 Port Hub	\$41/53
Netgear EN106TP 6 Port Hub	\$ 52
Netgear EN108TPNA/EN108NA 8 Port Hub	\$63/74
Netgear EN116NA 16 Port Hub	\$ 128
SMC 3605T-EZ 5 Port/SMC 3608T-EZ 8 Port Hub	\$53/80
SMC 3616TC-EZ 16 Port Hub (with coax)	\$ 195

Switches	
3Com 3C16733 OfficeConnect Switch 10/100BT 4 Port ..	\$ 255
3Com 3C16734 OfficeConnect Switch 10/100BT 8 Port ..	\$ 295
3Com 3C16951 SuperStack II 10 Switch 1100 12 Port ..	\$ 865
3Com 3C16950 SuperStack II 10 Switch 1100 24 Port ..	\$1370
3Com 3C16981 SuperStack II 100 Switch 3300 12 Port ..	\$1700
3Com 3C16980 SuperStack II 100 Switch 3300 24 Port ..	\$2620
3Com 3C39024 SuperStack II 100 Switch 3900 24 Port ..	\$4110
CISCO Catalyst 2912-XL-A 10/100 Switch 12 Port	\$1690
CISCO Catalyst 2924-XL-A 10/100 Switch 24 Port	\$2250
D-Link DSS-5+ 10/100 5 NWay Desktop Switch	\$ 120
D-Link DSS-8+ 10/100 8 NWay Desktop Switch	\$ 135
D-Link DSS-16+ 10/100 16 NWay Rackmount Switch	\$ 465
D-Link DSS-24 10/100 24 Port Switch	\$1060
HP J4120A ProCurve 1600M 16 Port 10/100 Switch	\$1540
HP J4121A ProCurve 4000M 40 Port 10/100 Switch	\$3175
Intel InBusiness SS101TX8 Port/SS101TX16 Port Switch ..	\$203/530
Intel Express 410T 10/100 Standalone Switch 16 Port ..	\$ 800
Intel Express 410T 10/100 Standalone Switch 24 Port ..	\$1150
Intel Express 460T 10/100 Standalone Switch 16 Port ..	\$1350
Intel Express 460T 10/100 Standalone Switch 24 Port ..	\$1650
Intel Express 520T 10/100 Scalable Switch 12 Port	\$1915
Intel NetStructure 470T Switch 6 1000BaseT Port	\$4140
Intel NetStructure 480T Routing Switch 12 1000BaseT Port	\$10800
Netgear FS105 5 10/100BaseT Port Switch (Slimline)	\$ 143
Netgear FS108NA 8 10/100BaseT Port Switch	\$ 180
100/1000 Mbps Systems	
3Com 3C905C-TX-M FastEtherLink PC Management	\$ 122
3Com 3C905B-COMBO Fast EtherLink 10/100 Combo	\$ 200
3Com 3CR990-TX-95 EtherLink 3XP 56 Bit Encryption ..	\$ 143
3Com 3CR990-TX-97 EtherLink 3XP 168 Bit Encryption ..	\$ 143
3Com 3C980C-TX Fast EtherLink Server Card	\$ 139
3Com 3C985B-SX Gigabit EtherLink Server Card	\$1045
3Com 3C16722 OfficeConnectFastEthernet 8 Port Hub ..	\$ 230
3Com 3C16721 OfficeConnect FastEthernet 12 Port Hub ..	\$ 395
3Com 3C16750B OfficeConnect 10/100 8 Port Hub	\$ 203
3Com 3C16751B OfficeConnect 10/100 16 Port Hub	\$ 332
D-Link DFE-530TX 10/100 PCI FastEthernet Adapter	\$ 22
D-Link DFE-570TX 10/100 4 Port PCI Server Adapter	\$ 380
D-Link DFE-904 10/100 Dual Speed 4 Port Hub	\$ 118
D-Link DFE-908DX10/100 8 Port NWay Hub	\$ 245
D-Link DFE-2624 Dual Speed 10/100 24 Port Hub	\$1250
D-Link DSH-5 Dual Speed 10/100 5 Port Hub w/Switch ..	\$ 98
D-Link DSH-8 Dual Speed 10/100 8 Port Hub w/Switch ..	\$ 150
D-Link DSH-16 Dual Speed 10/100 16 Port Hub/Switch ..	\$ 284
HP J3294A ProCurve 10/100BaseT 12 Port Hub	\$ 490
Intel PCLAB460 Pro 100+ PCI Fast Ethernet Adapter	\$ 638
Intel PCLAB470 EtherExpress Pro/100+ Server Adapter ..	\$ 135
Intel PCLAB472 Pro 100+ Dual Port Server Adapter	\$ 359
Intel PCLAB490 Pro/1000 Gigabit Server Adapter	\$ 930
Intel InBusiness SH100TX4 FastEthernet 4 Port Hub	\$ 115
Intel InBusiness SH101TX8 FastEthernet 8 10/100 Hub ..	\$ 160
Intel InBusiness SH101TX16 FastEthernet 16 10/100 Hub ..	\$ 300
Intel Express 330T Stackable Hub 10/100 16 Port	\$ 765
Intel Express 330T Stackable Hub 10/100 24 Port	\$1135
Netgear FA310TX 100 PCI FastEthernet	\$ 28
Netgear GA620NA Gigabit Ethernet Card	\$ 490
Netgear FE104NA/FE108NA 100 4 Port/8 Port Hub	\$95/159
Netgear DS104NA 10/100 Dual Speed 4 Port Hub	\$ 105
Netgear DS106NA 10/100 Dual Speed 6 Port Hub	\$ 127
Netgear DS108NA 10/100 Dual Speed 8 Port Hub	\$ 150
Netgear DS516NA Dual Speed 16 Port Stackable Hub	\$ 316
Netgear DS524NA Dual Speed 24 Port Stackable Hub	\$ 454
SMC 1211TX EzCard 10/100BaseT PCI	\$ 26
SMC 5208TX EZStack 10/100BaseT 8 Port Hub	\$ 350

Network Printers	
HP 4050 Laserjet,1200dpi,17ppm	\$1695
HP 4050N Laserjet,1200dpi,17ppm,16MB,Network	\$2190
HP 4050TN Laserjet,1200 dpi,17ppm,16MB,Network	\$2385
HP 5000 Laserjet,1200dpi,16ppm,11x17"	\$2230
HP 5000N Laserjet,1200dpi,16ppm,11x17",Network	\$3150
HP 5000GN Laserjet,1200dpi,Graphics intensive	\$3980
HP 8100 Laserjet,1200dpi,32ppm	\$3995
HP 8100N Laserjet,1200dpi,32ppm,Network	\$4450
HP 8100DN Laserjet,1200dpi,32ppm,Duplexer	\$5170
HP 4500 Color Laserjet,600dpi,(Ret2400),32MB	\$3780
HP 4500N Color Laserjet,600dpi,64MB,Network	\$4430
HP 8550 Color Laserjet,600dpi,12x18",32MB	\$7040
HP8550N ColorLaserjet,600dpi,32MB,Network	\$8600
Lexmark Optra E310,8ppm,2MB	\$525
Lexmark Optra E312,10ppm,4MB,USB	\$585
Lexmark Optra M410n,12ppm,4MB,USB	\$1250
Lexmark Optra M412,17ppm,4MB,USB	\$1170
Lexmark Optra M412n,17ppm,8MB,10/100BaseTx	\$1585
Lexmark Optra T610,15ppm,4MB,Parallel	\$1465
Lexmark Optra T610n,15ppm,8MB,10/100BaseTx	\$1930
Lexmark Optra T612,20ppm,8MB,Parallel & Serial	\$1580
Lexmark Optra T612n,20ppm,16MB,10/100BaseTx	\$2030
Lexmark Optra T614,25ppm,8MB,Parallel	\$1700
Lexmark Optra T614n,25ppm,16MB,10/100BaseTx	\$2580
Lexmark Optra T616,35ppm,16MB,Parallel	\$2850
Lexmark Optra T616n,35ppm,16MB,10/100BaseTx	\$3330
Lexmark Optra W810n,35ppm,16MB,11x17",Parallel	\$3840
Lexmark Optra W810n,35ppm,16MB,11x17",Network	\$4080
Lexmark Optra C710,3ppm,32MB,1200dpi	\$2915
Lexmark Optra C710N,3ppm,32MB,1200dpi,Network	\$3310
Lexmark Optra Color 1200,12ppm,1200dpi,11x17"	\$5350
Lexmark Optra Color 1200N,12ppm,1200dpi,11x17"	\$6450

Power Protection	
APC BackUPS 300	
\$126.00	
American Power	
BackUPS 300/500M/650M	\$ 126/183/250
BackUPS Pro 280S/350/420S	\$ 180/210/288
BackUPS Pro 500/650S	\$235/385
BackUPS Pro 1000/1400	\$550/700
SmartUPS SU420/SU620NET	\$320/410
SmartUPS SU700/SU1000/SU1400NET	\$ 499/730/930
SmartUPS SU2200/SU3000/SU5000NET	\$1350/2060/3590
Back UPS Office BF350/BF500	\$116/145
Matrix 3000VA/5000VA (Modular UPS)	\$3600/6140
SmartCELL for Matrix 3000/5000	\$ 70
Line Conditioner LR800/LR1250	\$128/173
Personal SurgeArrest 7/7 Outlets with Tel	\$ 25/33
Professional SurgeArrest 7/7 Outlets with Tel	\$ 40/52
Professional SurgeArrest 8/8 Outlets with Tel	\$ 44/56
Network SurgeArrest 7/7 Outlets with Tel	\$ 48/60
Notebook Surge Protector	\$ 18
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Cable Tester \$80.00	
Twisted Pair	
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- 10/100BT

\$765

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Okipage 6w

Model	PPM	Res	Price
Okipage 6w	6	600dpi	\$ 305
Okipage 8z	8	600x600	\$ 365
Okipage 10e	10	600dpi	\$ 475
Okipage 12i	12	600x600	\$ 955
Okipage 24dx	24	600dpi	\$1995
Okipage 8c	8	600dpi	\$3740

Microline DOT-MATRIX OKIDATA Printer

Model N/W	CPS	Pin	Price
ML184	300	9	\$365
ML320/321	435	9	\$510/715
ML520/521	435	9	\$625/830
ML390/391	390	24	\$540/730
ML395/Color	607	24	\$1640/1750
ML590/591	360	24	\$725/985

Golden Orb For Intel PC-PGA 370 Coppermine CPU **\$18**

Thermaltake Aircooler For AMD Duron Socket A Processor **\$20**

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Capacity	Model	Access	Cache	RPM	Interface	Price
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9.2GB	ST39204LW	5.2ms	4MB	10000	ULTRA 160	\$ 400
18GB	ST318436LW	5.9ms	2MB	7200	ULTRA 2 SCSI	\$ 505
18.4GB	ST318404LW	5.2ms	4MB	10000	ULTRA 160	\$ 585
18.4GB	ST318451LW	3.9ms	4MB	15000	ULTRA 160	\$ 790
36.7GB	ST336704LW	5.2ms	4MB	10000	ULTRA 160	\$ 935
73.4GB	ST173404LW	5.2ms	4MB	10000	ULTRA 160	\$1725
9.1GB	DNES-309170	7ms	2MB	7200	ULTRA 2 SCSI	\$ 350
9.1GB	07N3220	4.9ms	4MB	10000	ULTRA 160	\$ 400
18.3GB	DNES-318350	7ms	2MB	7200	ULTRA 2 SCSI	\$ 525
18.2GB	09L3905	5.4ms	2MB	10000	ULTRA 2 SCSI	\$ 740
18.3GB	07N3210	4.9ms	4MB	10000	ULTRA 160	\$ 605
36.4GB	07N3100	6.8ms	4MB	7200	ULTRA 160	\$ 895
36.9GB	07N3200	4.9ms	4MB	10000	ULTRA 160	\$ 965
9.1GB	QM309100XC	6.3ms	4MB	7200	ULTRA 160	\$ 310
9.2GB	QM309200TY	5ms	8MB	10000	ULTRA 160	\$ 530
18.4GB	QM318300XC	6.3ms	4MB	7200	ULTRA 160	\$ 515
18.4GB	QM318400TY	5ms	8MB	10000	ULTRA 160	\$ 790
36.7GB	QM336700XC	6.3ms	4MB	7200	ULTRA 160	\$ 935
36.7GB	QM336700TY	5.5ms	8MB	10000	ULTRA 160	\$1380
73.4GB	QM373400TY	5ms	8MB	10000	ULTRA 160	\$2570
9.1GB	MAH3091MP	6.8ms	4MB	7200	ULTRA 160	\$ 320
9.1GB	MAJ3091MP	4.7ms	4MB	10000	ULTRA 160	\$ 410
18.2GB	MAH3182MP	6.8ms	4MB	7200	ULTRA 160	\$ 495
18.2GB	MAJ3182MP	4.7ms	4MB	10000	ULTRA 160	\$ 630
36.4GB	MAJ3364MP	4.7ms	4MB	10000	ULTRA 160	\$ 965

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HP9210i 8x4x32x SCSI Internal CDRW \$400

HP9210e 8x4x32x SCSI External CDRW \$530

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HP9600se 12x8x32 SCSI External CDRW \$540

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SyncMaster 700NF

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- 0.25mm AG Pitch
- 1600x1200@76Hz

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SyncMaster 955DF

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- 0.20mm (H) Pitch
- 1600x1200@68Hz

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SyncMaster 900NF

- 19" (18" V) Natural Flat Tube
- 0.25mm AG Pitch
- 1600x1200@76Hz

\$660

SyncMaster 170MP

- 1280x1024 @75Hz
- Built-in TV Tuner
- Resizable PIP / Remote Control

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ACS66 iMac 3 pcs. Speaker System (6 color options) \$116.00

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YST-M8 5 Watts/ch Multimedia Speaker (2 pcs) \$40.00

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PC Works Desktop Speaker \$63.00

PC Works Four Point Surround Speaker FPS1000 \$102.00

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PCGA-BP52 Double Cap. Battery	\$489
PCGA-BP51 Standard Battery	\$249
PCGA-SP51 Stereo Speaker	\$164
PCGA-AC51 AC Adapter	\$164
PCGA-BP252 Triple Cap. Bat.(Z505R)	\$639
PCGA-BP251 Standard Battery (Z505R)	\$319
PCGA-BP54 Quad Cap. Battery	\$788
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PCGA-PSX1 XG Dock	\$559
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PCGA-UM51A USB Mice(7xx/505)	\$81
PCGA-UFD5 Ext. USB Floppy(Z505)	\$123
PCGA-PRS Port Replicator(505,C1X)	\$164
PCGA-CDRW51 PC Card CD-RW Drive	\$789

Memory Stick

MSA-4A 4MB Memory Stick	\$49
MSA-8A 8MB Memory Stick	\$69
MSA-16A 16MB Memory Stick	\$109
MSA-32A 32MB Memory Stick	\$179
MSA-64A 64MB Memory Stick	\$299
MSAC-PC2 PC Card Adapter	\$119



IBM ThinkPad

Model	CPU	RAM	HDD	CD	Display	Ethernet	Price
i1210	Cel500	32MB	6GB	24X	12.1 HPA	56K	\$1,555
i1230	Cel500	64MB	6GB	24X	13.3 HPA	56K	\$1,815
i1250	Cel500	64MB	6GB	24X	12.1 TFT	56K	\$1,955
i1260	Cel550	64MB	6GB	24X	13.3 TFT	56K	\$2,140
i1330	Cel500	64MB	6.0GB	24X	12.1 TFT	Combo	\$2,050
i1370	Cel550	64MB	12GB	24X	13.3 TFT	Combo	\$2,560
240	P3-500	64MB	10.4GB		10.4 TFT	56K	\$3,125
600X	P3-500	64MB	12GB	DVD	13.3 TFT	56K	\$4,050
600X	P3-650	64MB	12GB	DVD	13.3 TFT	56K	\$4,425
600X	P3-700	128MB	18GB	DVD	13.3 TFT	56K	\$5,735
A20m	Cel550	64MB	12GB	24X	15 TFT	56K	\$3,350
A20m	Cel550	64MB	12GB	24X	15 TFT	Combo	\$3,450
A20m	P3-500	64MB	6.0GB	24X	12.1 TFT	56K	\$2,885
A20m	P3-500	64MB	6.0GB	24X	12.1 TFT	Combo	\$2,985
A20m	P3-600	64MB	12GB	DVD	14.1 TFT	56K	\$3,770
A20m	P3-600	64MB	12GB	DVD	14.1 TFT	Combo	\$3,870
A20m	P3-700	64MB	12GB	24X	14.1 TFT	56K	\$3,865
A20m	P3-700	64MB	12GB	24X	14.1 TFT	Combo	\$3,965
A20p	P3-700	128MB	18GB	DVD	15 TFT	56K	\$5,120
A20p	P3-700	128MB	18GB	DVD	15 TFT	Combo	\$5,220
A20p	P3-750	128MB	20GB	DVD	15 TFT	56K	\$5,445
A20p	P3-750	128MB	20GB	DVD	15 TFT	Combo	\$5,545
T20	P3-650	128MB	6.0GB	24X	13.3 TFT	56K	\$4,050
T20	P3-650	128MB	6.0GB	24X	13.3 TFT	Combo	\$4,150
T20	P3-700	128MB	12GB	DVD	14.1 TFT	56K	\$4,885
T20	P3-700	128MB	12GB	DVD	14.1 TFT	Combo	\$4,985
T20	P3-750	128MB	20GB	DVD	14.1 TFT	56K	\$5,400
T20	P3-750	128MB	20GB	DVD	14.1 TFT	Combo	\$5,500

Acer TravelMate 600TER

Intel Pentium III 600MHz
 64MB Memory
 12GB Hard Drive
 13.3" TFT Display
 56KBps Modem
 4x4x20 CDRW/built-in sound
 10/100BaseT Ethernet

Best Buy \$3,200

Model	CPU	RAM	HDD	CD	Display	Price
341TV	P3-500	64MB	6GB	DVD	12.1 TFT	\$2,765
343TV	P3-500	128MB	12GB	DVD	12.1 TFT	\$3,235
508T	Cel500	64MB	4.8GB	24X	12.1 TFT	\$1,875
521TE	P3-600	64MB	6GB	24X	13.3 TFT	\$2,600
521TXV	P3-600	64MB	6GB	DVD	14.1 TFT	\$3,100
524TXV	P3-650	64MB	12GB	DVD	14.1 TFT	\$3,375
602TER	P3-650	128MB	12GB	CDR	13.3 TFT	\$3,485
603TER	P3-700	128MB	12GB	CDR	13.3 TFT	\$4,185
732TLV	P3-500	128MB	12GB	DVD	15 TFT	\$3,615
734TXV	P3-600	64MB	9GB	DVD	14.1 TFT	\$3,385
734TL	P3-600	64MB	12GB	24X	15 TFT	\$3,575
735TLV	P3-650	128MB	12GB	DVD	15 TFT	\$3,650
737TLV	P3-700	128MB	18GB	DVD	15 TFT	\$4,075
738TLV	P3-750	128MB	18GB	DVD	15 TFT	\$4,635

TOSHIBA Satellite Pro 4330

Intel Celeron 650MHz
 64MB Memory/10GB Hard Drive
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17"	OPTIQUEST Q71	0.27mm	1280x1024	16.0"	30-70KHz	\$ 310
	OPTIQUEST Q75	0.23mm	1600x1200	16.0"	30-85KHz	\$ 400
	ViewSonic E771	0.27mm	1280x1024	16.0"	30-70KHz	\$ 330
	ViewSonic E773	0.25mm	1280x1024	16.0"	30-70KHz	\$ 380
	ViewSonic G773	0.26mm	1280x1024	16.0"	30-70KHz	\$ 430
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	ViewSonic PF790	0.25mm	1600x1200	18.0"	30-97KHz	\$ 705
	ViewSonic PF795	0.25mm	1920x1440	18.0"	30-110KHz	\$ 840
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What's New

Continued from page 14

celebrity status. According to the IBM release, its RS/6000 Deep Blue supercomputer—the one that beat chess grandmaster Garry Kasparov, in 1997—has achieved star status, with a Q Score on par with CNN host Larry King, or radio bad boy, Howard Stern.

IBM says Deep Blue has been mentioned more than 5,000 times in print media during the last three years and has been material for late night talk show hosts David Letterman and Jay Leno.

Deep Blue's Q Score was derived from results of a questionnaire that went out to a random sample of the U.S. population in June. It listed 80 well-known people, characters, and—apparently—computers.

—TCP Staff

TAXi—IBM completes TP line refresh

IBM has introduced a new line of ThinkPads called the X-series, completing a line refresh that saw the introduction of A and T models earlier this year.

The X model will replace IBM's thin-and-wide ThinkPad 570 series and subnotebook 240 series. Models of the X20 will be available with 500 MHz Celeron or 600 MHz Pentium III processors. The units have a 12.1-inch TFT display and will weigh 1.4 kg (3.1 lb.) with the standard battery or 1.57 kg (3.5 lb.) with the optional long-life battery.

A clip-on slice, similar to the one introduced with the ThinkPad 570 that blends visually with the computer to make it look like a single unit, will be optional. As part of IBM's strategy to simplify parts inventory for itself as well as its customers, the X models will accept the same docking station or port replicator that the A and T series use, and the extensional all use a common UltraBay 2000 slot.

Along with the existing i-Series, the T, A and X series form the acronym TAXi, which IBM says will help customers and dealers identify the differences among the models (the 2.25 kg T thin-and-light for travellers; the A as a desktop alternative; the 1.35 kg X for extreme road warriors; and the I for individuals at home or in small offices).

—TCP Staff

Amazon.com picks Microsoft Reader

SAN FRANCISCO—Amazon.com will use a souped-up Microsoft Reader for its new e-book store, Microsoft announced in late August.

The software giant will develop a custom version of Microsoft Reader for Amazon.com so the dot-com's customers can begin downloading ebooks to read on their computers or PDAs by early winter, said Microsoft marketing and public relations manager Mario Juarez.

"They'll expand their online book store to begin selling ebooks as quickly as they're able to establish the technology and put it up," Juarez said.

Amazon.com books general manager Lyn Blake said the ebook store would launch "soon," but did not say when the likely date would be. Titles ranging from general fiction to reference will be available in ebook form, she said. Amazon, a pioneer of Internet bookselling, hopes it can stretch its online retail success to ebook sales.

The market for ebooks has a future nearly as bright as its digital media counterparts—music and video, according to a study by Andersen Consulting released in June. Predicting that the consumer ebook market would reach US\$2.3 billion by 2005, Anderson noted that, "content availability is the premier critical feature for consumer adoption" of the three areas. Twenty-eight-million people are likely to adopt devices

to read e-books by 2005, the study said.

Microsoft previously announced a partnership with Amazon.com competitor BarnesandNoble.com for its entry into the ebook fray, and expects to make similar agreements with other book e-tailers and online publishers. "We don't view Amazon and Barnes and Noble as the full extent of the kinds of alliances that we anticipate being able to build," said Juarez.

—Newsbytes

First colour LEP display unveiled

U.K.-based Seiko-Epson (<http://www.epson.com>) and Cambridge Display Technology (CDT, <http://www.cdtd.co.uk>) say they have developed a 2.5-square-inch full colour display using CDT's light emitting polymer (LEP) technology, an innovative display science that paves the way for the creation of ultra-small, paper-thin consumer electronic displays.

The prototype colour display has been made using CDT's red, green and blue polymer materials and an industry-first ink-jet printing process developed for the project. The colour display achieves colour quality equal to current liquid crystal display (LCD) technology and is comparable to displays found in many portable computer products.

This latest development follows an initial announcement in 1998 when CDT and Seiko-Epson demonstrated a monochrome plastic television display based on LEP technology and announced their intention to develop a colour LEP display.

The prototype colour display measures 2.5 square inches, has a resolution of 200 by 150 pixels, with 16 gray scaling at system level, and will be targeted at initial market entry points for LEP displays products such as mobile phones and personal digital assistants (PDAs). Beyond this, CDT and Seiko-Epson expect this technology eventually to penetrate all other display mar-

kets.

Based on an innovative manufacturing technique which uses ink-jet printing to deposit

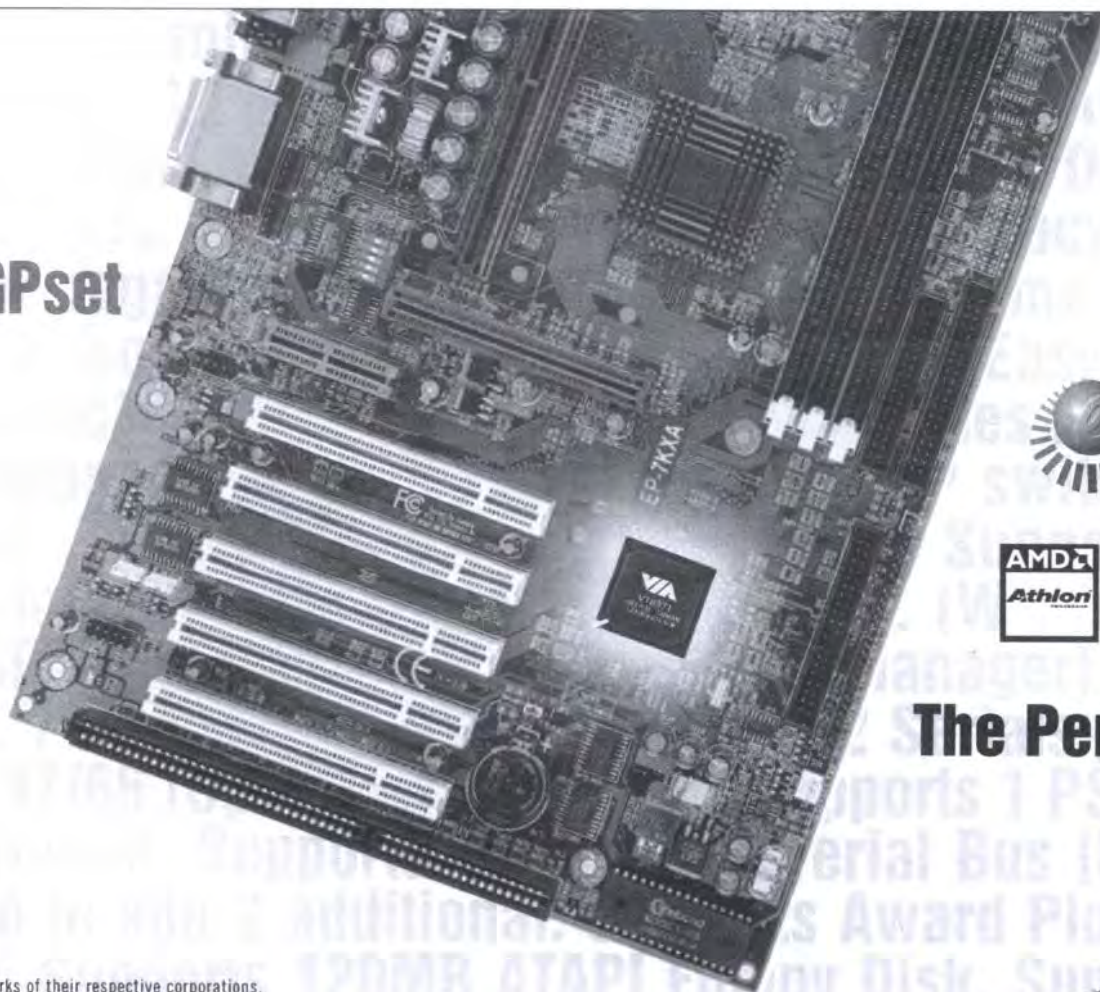


individual pixels made up of the red, green and blue LEP materials directly onto the substrate, potential display size is limited only by the size of the available wafer with no impact on the overall throughput when deployed in existing manufacturing lines.

"The pre-production colour light emitting polymer display being shown by CDT and Seiko-Epson has a colour density similar to current LCDs. The techniques being jointly developed by the two companies means that the manufacturing cost of an LEP display will be significantly less than the cost of producing conventional LCD or cathode ray tube displays," said Dr. Shimoda, general manager of basic research, Seiko-Epson.

—TCP Staff

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L&H team talks up speech technology

By David Tanaka

Imagine a person in Vancouver who speaks only English having a productive telephone conversation with someone in Beijing who speaks only Chinese. This will be a reality within just a few years, according to Alan Forsey, senior vice-president of finance and planning for speech technology developer Lernout & Hauspie (L&H). Forsey and

other L&H executives presented the company's technology road map in Toronto in mid-August. In L&H's vision of the future, on-the-fly machine language translation, natural sounding text-to-speech and voice-controlled devices will all be commonplace.

Ieper, Belgium-based L&H (whose North American headquarters are in Burlington, Mass.) predicts that speech technology will become a central technology integral to many

industries, and it is already making inroads to call centres and telephony-related services. The company focused part of its presentation on the medical sector, where it expects speech technology will save the medical records industry about \$1.2 billion in transcription costs alone.

Rob Schwager, president of L&H's health-care solutions group said it takes about 27 minutes to process a patient record through the various steps, from the physician dictat-

ing the report into a tape recorder, to someone transcribing and proofing the transcript, which is then coded onto data forms. On average, it costs about \$18 to process a single record, and with about one billion patient records being processed in North America each year, the simple math shows its value to be about \$18 billion.

Using speech recognition can reduce transcription costs by about 20 percent: "that's about \$1.2 billion worth of efficiency," said Schwager. L&H has developed voice-processing systems that improve efficiencies all along the health record collecting chain. "Our strategy is to apply technology to these various steps to squeeze our cost," said Schwager.

The company has also developed a similar service based on an application service provider (ASP) model. Called iChart Portal Services, it is aimed at smaller hospitals and clinics that can't afford the server-based system, and uses a pay-per-use cost model.

In terms of its consumer-oriented software products, L&H announced a new version of Dragon NaturallySpeaking 5, the first update to that product since L&H acquired Dragon Systems earlier this year. This follows the May release of VoiceXpress 5, along with a new version of Power Translator Pro.

Power Translator offers a glimpse of things to come in the world of simultaneous machine-based language translation. It includes a Web utility that will take a foreign language Web page and translate it into English. The results are far from perfect, but the translation gives you a sense of what the content is about. For example, when we used the Web translator on a French site, we read the following translation of an excerpt from a review of a clip-art collection: *In spite of a big simplicity of use and hold in hand, 3Space ClipArtist disappoints by his/her/its stripped interface and a catalogue of clip-arts disappointing.* Not grammatically correct, but we at least got the idea.

There is also a main two-window application, where you type in one language in the upper window and the machine translated text appears in the lower window.

One of the ongoing challenges with software-based translation, says L&H, is that all the regional variations of dialects and idiomatic expressions need to be registered with the speech-recognition engine. A related factor is that modern languages are living languages, and so ensuring that the translation dictionaries always reflect current language style and usage is an ongoing project.

At this point no one would argue that software translation could be used without human intervention. It allows one to get a sense of the message in another language. While some of the translated sentences may be constructed awkwardly, and their grammar may not be entirely correct, a person still gets an overall sense of the intended message.

Many of the technology themes presented by L&H are similar to those presented by IBM's Speech Technology Group earlier this year. For example, IBM also touched on telephony as being a main beneficiary of speech technology, demonstrating a dial-in movie theatre locator whose voice responses to customer queries were entirely synthesized. Both companies also mentioned audio Web sites, where content could be read back to a surfer—who had perhaps accessed the site using a Web-enabled cell phone. □

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Breaking the gigahertz barrier

There's probably a big difference between the system you really want and the system you really need

By Sean Carruthers

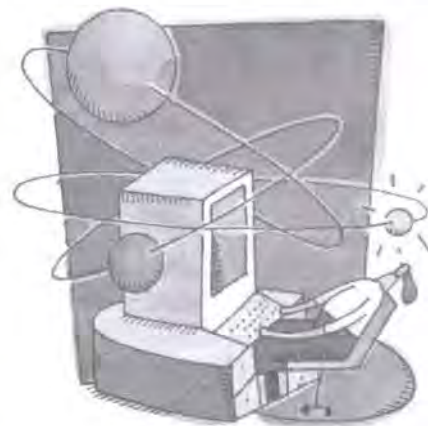
We've reached a point in the evolution of the personal computer where even mid-range systems are more than capable of meeting a typical user's needs. It's no longer necessary to spend top dollar to get a PC that does everything you demand, and then some. Don't worry, though... if you're a performance fiend, the gigahertz processor has arrived.

Pushing past the gigahertz barrier

Gigahertz processors are still very expensive and, for most users, don't offer enough of a performance boost over slightly slower but less expensive chips. If your main uses for a PC are surfing the Web, reading email and word processing, you won't come close to using the full potential of a gigahertz processor.

There are those, however, who will be able to make use of the chip's power. If you're working with any processor-intensive applications, a gigahertz chip can speed things up. Processor-intensive operations include complex transformations of images in a program like Adobe Photoshop, 3D calculation and rendering, or any extended encrypting or decrypting (using Zip, PGP, or even software decoding of MP3 and DVD, for example).

It is worth noting, however, that even with such tasks, a gigahertz processor isn't the answer to all your needs, especially if you're already running a fast processor. Once you reach a certain level, per-



formance gains are fairly minimal, and the value of the faster chips becomes questionable. Those looking for a level of performance that's close to the top end may find it far more worthwhile to aim for the 900 to 950 MHz level, where performance is so close to 1 GHz that it makes barely any difference, yet the pricing is far more attractive.

Gigahertz performance

We spent some time with a 1 GHz Pentium III processor lately, dropping it into a system that previously used a 600 MHz Pentium III. Here's what we have to report:

- MP3 files encrypted slightly faster, but you can get a similar performance boost by adding one

of the new audio cards with MP3 hardware-assist built in (like the Soundblaster Live! MP3+).

- DVD playback was unfailingly smooth in software mode, but this wasn't really much different than with the 600 MHz processor, where we saw only occasional glitches.
- Zip and PGP encrypting and decrypting was faster.
- There was no discernable effect on surfing the Web, word processing, and other basic programs.
- There was an improvement in programs like Photoshop... though maybe not enough to justify the much higher cost of the 1 GHz processor.
- Gameplay was smoother on 3D-intensive games, but the improvements were not as much as we hoped for. A graphics card with better specs is far more important.

What is of greater interest is the difference between the 1 GHz processors from both AMD and Intel. We recently had an opportunity to benchmark 1 GHz processors from both companies in two roughly comparable systems we built in TCP's Test Lab. Because the motherboards are necessarily different (AMD uses the Socket A instead of the Socket 370), we swapped motherboards and processors, but all other components inside the system remained exactly the same. The motherboards we used were both built by Asus, and had similar specs, with the major difference

being the chipset used (the Athlon-based A7V used VIA's KT133 chipset, compared to the Intel 815 chipset used in the Pentium III-oriented CUSL2).

We found that Intel's Pentium III scored slightly higher than the Athlon, but in some cases the difference was small, and only in certain areas. For example, when combined with an ATI Rage 128 graphics card and 128 MB of CAS3 SDRAM, the Athlon turned in an overall Sysmark 2000 score of 177 to the Pentium III's score of 178. Not much of a difference on the surface, but look at some of the specifics:

1 GHz Athlon vs. Pentium, ATI Rage 128

Test	Athlon	Pentium III
Bryce 4	235	210
CorelDraw 9	217	204
Excel 2000	181	188
Naturally Speaking	150	166
Photoshop 5.5	106	126
Windows Media Encoder	176	175
Overall	177	178

While the Photoshop portion of the test suite showed the weakest scores on both processors, the Athlon was far worse than the Pentium III. The Pentium III flexed its muscles with the Excel 2000 spreadsheet and Naturally Speaking speech recognition portions. The surprising thing was that the Athlon actually sprinted ahead with some of the applications, like Bryce and CorelDraw.

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The component connection

Few of us have the means to run out and buy every new processor or subsystem that promises to boost our computing to the next level. Swapping components is a time-honoured method for bringing new sparkle to aging systems.

By Sean Carruthers

We've often written that there comes a point in the life of every computer system where it's just simpler—and probably cheaper—to replace the whole thing with a new one. But if you haven't reached that point, and you still want to squeeze a bit more life or performance out of your PC, there are a few things you can do, and not all of them are expensive

The CPU and the motherboard

Although it's not the only element that affects system performance, the most obvious thing most people point to is the central processing unit (CPU). Over the last few years, CPU speeds have shot up dramatically. When I finally made the switch from an Amiga to the world of the IBM PC, I had a system with a 75 MHz processor, and I felt like I was the king of the hill. As this is being written, CPU speeds are now closing in on 15 times that speed, with about half of the speed gain accounted for in the last year or so. The question is, how much processing power do you really need?

Both Intel and AMD have introduced 1 GHz processors. Most programs will run comfortably with a processor running at half that speed—which, thankfully, is about the

speed of today's entry-level CPU. If it's time for you to replace your CPU, you can probably find a 533 MHz Intel Pentium III for between \$300 and \$400, and a 650 MHz AMD Athlon for under \$300 (August 2000 street prices). If you want to go the budget route, you can get Intel Celeron or AMD Duron chips with a similar rated speed, but for less money (though at the cost of some of the performance).

For those of you who are upgrading from an older machine, there's a good chance you'll have to change your motherboard as well. However, the task of matching up a processor and a motherboard is a bit of a minefield these days for a few reasons. When Intel announced the Pentium II in the spring of 1997, it shifted the design from the trusty Socket 7 interface to the new Slot 1 single-edge connector design. Although some of the new Pentium III chips still use the edge connector interface, Intel has also introduced the Socket 370 interface for its new Celeron processors, and is moving much of the Pentium III line over to that same socket which is, incidentally, incompatible with the earlier Socket 7.

Here's the biggest problem, though: not all Socket 370 motherboards are compatible with all Socket 370 processors. Indeed, Socket 370 motherboards using Intel's 820 chipset

run at a bus speed that is too fast to accommodate the Celeron. The newer 815 chipset is more forgiving when it comes to the bus speed and what processors you can use, but boards are only now appearing in stores. When you are buying parts, it's extremely important to make sure your board and processor are compatible. (See "Adventures in CPU Land" in the September issue of TCP for an analysis of the processor/motherboard compatibility problems. It is also archived on our Web site at <http://www.canadacomputes.com>.)

If you decide to upgrade both CPU and motherboard, there are two other things you should keep in mind if your current machine uses an AT-style motherboard instead of the ATX design that is most common today. The biggest giveaway of the older AT system is that the keyboard connector is about the same diameter as a dime and is attached to the case, with wires from the connector to the motherboard. ATX designs integrate the connector directly on the motherboard. If you're unsure, you should check with someone who knows because there are two additional things you'll have to replace if you have an AT-style system: your case (along with the power supply) and your RAM.

AT and ATX cases have different connectors to the power supply. Even if you were able to somehow miraculously cram a new

motherboard into the old case and make the slots all line up (which is unlikely), you'd still have to replace the power supply. When you get to that point, it's probably just easier to get a new case.

As far as the RAM is concerned, AT-style motherboards used 72-pin memory, which gave way to 168-pin SDRAM with the jump to ATX. Further, most new motherboards require at least PC100 memory (100 MHz) for compatibility with the bus speed, and the memory from older systems (even older ATX systems) was rated for 66 MHz or slower. The good news is that SDRAM continues to be relatively inexpensive, despite the price spike last year. Below, we'll look at the effects of RAM on your system performance.

Get enough memory!

One of the quickest ways to hobble your system's performance is to shortchange your system on memory. If you don't have enough, your system will swap data to and from the hard drive to make up for the difference, which slows down the system performance substantially and can lead to system freezes. But how much is enough?

An older Windows 95 system may work A-OK with 32 MB of RAM, but if you're making the step up to a Windows 98 system, you

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Breaking the gigahertz barrier

Continued from page 24

Changing the video card to the higher-performance GeForce2 didn't seem affect the Athlon much, which turned in a slightly higher score (oddly, boosting up some suites and losing some performance on others). The Pentium III, however, showed a definite improvement:

1 GHz Athlon vs. Pentium, GeForce2

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CorelDraw 9	217	208
Excel 2000	186	193

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NOTEBOOK SPECIALS

The component connection

Continued from page 24

want to start with at least 64 MB. We'd go one step further: if you can afford 128 MB, get 128 MB. On a Windows 98 system, there are very few circumstances where 128 MB isn't enough, and anything more than that seems to have very little effect on system performance, as we've discovered on our benchmark tests.

If you're planning a move to Windows 2000, you have to immediately bump up to 128 MB, because 64 MB just isn't enough, and 96 MB isn't quite enough to make all applications run comfortably. If you can afford to, it certainly doesn't hurt to go with 256 MB.

Although some motherboards actually give you the choice between PC100 or PC133 memory, it always pays to go with the higher rating if it's compatible with your system. Most new Pentium III systems use a 133 MHz front-side bus, and having memory that performs at the same level boosts system performance—sometimes substantially. If you're buying new memory, the price difference between PC100 and PC133 is very minimal,

so it's better to get PC133 and reap the performance reward. It's worth noting that many boards will force you to use PC133 RAM with a CPU that runs at 133 MHz, so you may not even have the option.

The latency of your RAM can also make a performance difference, once the speed of other system components starts to rise. Latency, basically, is the amount of time it takes for your RAM to respond to a command from the system, and get the data flowing. Most new RAM is rated at CL3, which means it takes three clock cycles to get the data flowing. By switching to memory rated at CL2, it shaves one cycle off the response time. This really affects performance for tasks that send data in numerous bursts, but is less effective when longer continuous data streams are used. There tends to be little, if any, price difference between CL3 and CL2 RAM, so if your system can take either, it might pay to get CL2-rated memory right off the bat and give yourself a bit of breathing room, even if you don't see any of the benefits at your current performance level.

Some of you are undoubtedly wondering about RAMBUS, and the claims of superior

performance with the use of RIMMs. There have been a lot of extravagant claims made about the overwhelming performance boost that you can get by stepping up to PC400, PC600, or PC800 RAMBUS memory, but we have to be honest and say that we have seen very little in the way of improved performance with RIMMs. In fact, some of the RAMBUS-based systems we've had a chance to look at in the Test Lab have actually been outperformed by PC133-based systems with otherwise similar specs.

What makes RAMBUS memory such a difficult technology to swallow is the inflated price: for a 128 MB stick of RAMBUS memory, you can expect to pay at least twice as much. For a performance gain that is negligible or non-existent, it doesn't make any sense to pay the extra, until RAMBUS can show across-the-board, real-world performance gains.

Better performance takes drive... hard drive, that is

With the increased speed of all of the components in your system, you're most likely to encounter a performance bottleneck at your hard drive. During testing with a 1 GHz processor, we often found that the hard drive was holding up the rest of the system. It really doesn't matter how fast your processor or RAM is if it takes forever to get data to and from the hard drive.

This is especially true if you're currently using a hard drive running at UDMA/33 (a data transfer rate of 33 Mbps) or slower. Unfortunately, this describes most of the hard drives currently in PCs. If you have such a drive, you've probably noticed it chugging away while you're waiting for your program or data to appear on the screen. What's happening is that your system is demanding the data from the hard drive faster than the drive can supply it. While it will always take time to pull the information from the hard drive, you can certainly speed up the process substantially by upgrading your hard drive.

Most PCs use the IDE interface for hard drives. While this interface has traditionally been much slower than the high-performance SCSI interface, IDE has actually gone a long way recently towards narrowing the performance gap. The previously mentioned UDMA/33 was improved to UDMA/66 last year, and now companies are beginning to introduce UDMA/100 technology (we have seen the interface on motherboards, but no drives as of yet). Both of these technologies improve the speed of transfers greatly, even to the point where they are becoming a serious threat to SCSI.

Up until now, SCSI has been the undisputed champ when it came to drive size and performance. Currently, SCSI data transfer speeds top out at 160 Mbps, which offers exceptional performance for certain applications. The biggest downside to SCSI is the cost, which is often twice that of an IDE drive of a similar size. This doesn't even take into account the extra cost for the SCSI host adapter. For specific applications, like hard disk recording (either music or video), the extra cost of SCSI is well worth it, however.

The good news is that most of us can make do just fine with a UDMA/66 IDE drive at half the price. Benchmark tests of a number of real-world applications showed next to no difference in scores between IDE- and SCSI-based systems. In fact, certain applications showed slightly better performance on the IDE side.

Another way to boost performance of your hard drive is by upping your spindle speed.

Most current hard drives spin at 5,400 rpm, though older drives often spin more slowly. Systems that can't handle UDMA/66 can nonetheless get a bit of a performance boost with a UDMA/33 drive that bumps the spindle speed up to 7,200 rpm. Essentially, the faster the drive spins, the more quickly it spins the proper data into place and the faster your PC can access it. Combining a UDMA/66 transfer with 7,200 rpm spindle speed offers even better performance. The only downside of making the step up to 7,200 rpm is that a hard drive spinning at that speed generates a lot more heat. If you make the move to 7,200 rpm, make sure the cooling inside your system is sufficient by installing an additional fan, because too much heat inside your PC will shorten the life of your entire system, especially components that already run hot.

The bottom line on drives is that you can get a definite performance boost by moving to a drive with a faster interface, but you don't have to sink money into a SCSI solution. The one thing you have to remember, though: your motherboard has to be able to handle the faster transfer rate. Motherboards that can handle UDMA/66 drives generally have a blue socket on the board, and come with a special 80-pin shielded cable for use with the drives. If you're unsure, check the specs on your board. You can still use UDMA/66 drives with the slower interface, but you won't see any performance boost.

(Nearly) free drive boost!

One thing you can do to boost your system performance somewhat is to make sure your cable configuration is optimal. If your system has one hard drive and one optical (CD/DVD) drive, you can get the best performance by separating the two onto different IDE channels—if they're not set that way already.

Your system should have two IDE channels: one marked primary and the other secondary. Each channel can handle two devices, known (unfortunately) as master and slave. Typically, your hard drive is set up as the primary channel master. In a system with only two IDE devices, the optical drive can be set as the master on the secondary channel, though many system builders set it up as the slave on the primary channel, forcing both devices to share the bandwidth of a single cable.

If you're comfortable tinkering around inside your computer's case, you can check to see what your configuration is. If both of your drives are on the same cable, you may be able to move the optical drive to the secondary channel just by changing the optical drive's jumper from slave to master, then plugging it into the other IDE socket. If you don't have the extra IDE cable, you can generally get one fairly inexpensively. By splitting the two drives onto different channels, you can give yourself a bit of a performance boost in any application—such as a game—that makes extensive use of both of the devices simultaneously.

For systems that have more than the two devices, this becomes more tricky, because you might end up changing drive letters unpredictably. If you've got more than one hard drive or optical drive and you're not sure what you're doing, you may want to consult with someone before trying cable switches.

Incidentally, this cable-switch can actually be helpful if you have two optical drives, too, if one of is a CD-RW drive (also called a CD burner). If you've got both of your drives on

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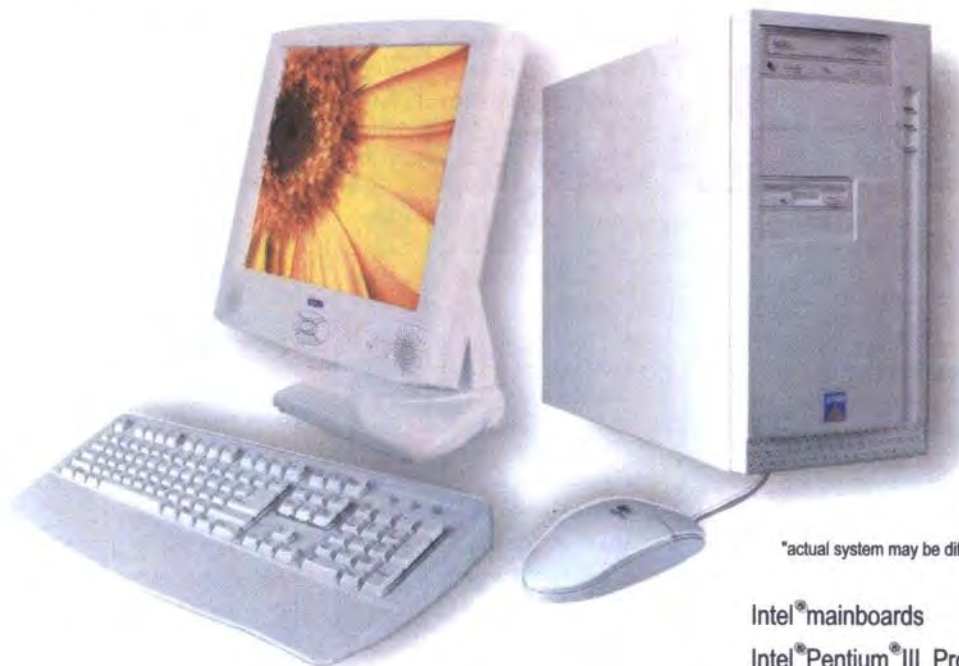


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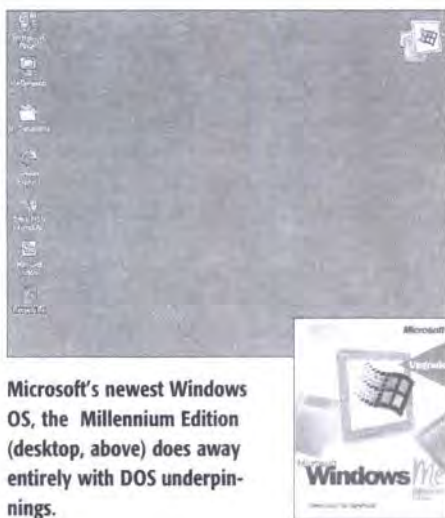
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Windows or another OS flavour?

By Sean Carruthers

If you've purchased a PC in the last two years, you're probably using Windows 98, which balances an entertainment focus with the ability to run heavy-duty office applications. While it crashes more frequently than Windows NT or 2000, most game fans will probably still find it is the best solution.

The replacement for Windows 98 is now announced and shipping, and is known as Windows Millennium Edition (or, if you prefer, Windows Me). This is the first time a



Microsoft's newest Windows OS, the Millennium Edition (desktop, above) does away entirely with DOS underpinnings.

consumer-oriented version of Windows has done away entirely with the DOS underpinning that has caused so many stability problems (DOS now resides in what Microsoft calls Protect mode). In most ways, however, Windows Me resembles Windows 98, though you may have some problems running old software with the new operating system.

We recently did some quick benchmarking tests using a standard install of Windows Me and found that the system was actually slower than with Windows 98. Windows Me scores were between five and 10 percent lower on our benchmark tests using the same hardware platform.

Those seeking stability have often looked towards the more expensive business-oriented NT-based operating systems. The newest version of NT is known as Windows 2000, and despite a problematic start (security holes were discovered almost immediately after the product shipped), a service pack has been released that deals with many of the initial issues. It's still not perfect, by any means; despite assurances from Microsoft that "you may never see a blue screen again", (I manage to regularly crash my machine with things as seemingly benign as a click-and-drag operation).

For business users, however, it is still far

Continued on page 38

The component connection

Continued from page 28

the secondary cable, it may actually be helpful to switch one back to the primary IDE channel, if you're running into problems copying from one CD to another. The data from one CD has to travel all the way to the motherboard for processing, then back to the CD burner. If they're both on the same cable, bandwidth again becomes a problem. Incidentally, if you're not having any problem burning CDs, it's probably best not to monkey with your cables. As they say, if it ain't broke...

A rather graphic performance boost

If you live for PC games, the number one upgrade should be obvious to you: a shiny new graphics card. You can have a ripping-fast processor and tons of RAM, but newer games pretty much demand one of the newest and best 3D graphics cards in order to achieve best performance.

Last month we had the opportunity to look at a number of new graphics cards, including a few different cards that make use of NVIDIA's new GeForce2 graphics processing unit. For games that need to do a lot of on-the-fly 3D rendering, the GeForce2 is currently unsurpassed in terms of raw frames per second. This comes at the expense of a bit of picture quality in some instances, although in games that stress frames over textures,

that's not so much of an issue. Also new to the market is 3dfx's Voodoo5, which doesn't quite match the frame rate of the GeForce2, but which provides excellent performance for a number of games specifically optimized for the Voodoo, like Unreal, and games using the Unreal engine, like Deus Ex.

As for ATI's newest performance-oriented card, the Radeon, the jury is still out, as we haven't had a chance to get our hands on one yet. Stay tuned.

If you're not into games, you'll be happy to know that in general, you can still get roughly the same performance in most standard applications (Word 2000, Netscape, etc.) with a more budget-oriented card as you can with the most expensive new GeForce2. With most of the components of the Sysmark 2000 test suite, switching from the relatively inexpensive ATI Rage 128 to the \$500 Asus AGP-V7700 yielded little, if any, change in system performance.

For the best graphics performance, you're probably better off sticking with cards for the AGP slot, if your computer has one, because the AGP bus runs at least twice as fast as the older PCI bus, and doesn't have to compete with any other hardware on the bus. On the other hand, some users with PCI versions of new performance-oriented 3D cards report very similar performance levels, although we haven't had the opportunity to verify this in our Test Lab. □

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Windows or another OS flavour?

Continued from page 37
more stable than Windows 98, offers the ability to secure your workstation with a password, and now offers better plug-and-play support than ever before, including support for USB devices. It's not particularly good at playing games, though, despite an updated version of DirectX.

Linux: Not just for penguins

Many who are fed up with Windows or simply curious about alternatives are making the move to Linux. The biggest advantage Linux has is that it can be downloaded for

free. It's not an easy operating system to install and configure, however, especially if you're a beginner. After all, Linux was designed as an open-source solution by a number of different people, all of whom are pretty familiar with the ins and outs of code. To make Linux easier for non-technical users, a number of companies have begun to add installation programs that approach Windows or Mac OSes in ease of use. Parallel to this move to make Linux simpler to use, is the move to commercialize various distributions of Linux (which seems almost like anathema to the whole spirit of Linux). When you pay for a commercial distribu-

tion of Linux, however, you get all of the software you need (including a number of third-party applications), a paperback manual to help you better understand the Linux experience, and technical support directly from the company providing the distribution. Barely any of this is necessary if you're willing to roll up your sleeves and immerse yourself in the world of Linux. The OS is, technically, free and you can generally find a world of resources online to help you with problems you may have. Further, a lot of the third-party software is also free. When you buy the package, you're really paying for the convenience.



Recent distributions of Linux focus on ease of use, as shown by the KDE wizard (above) in Caldera's OpenLinux eDesktop 2.4.



Recent versions of Linux are a world away from the command-line version many people think of when they think of Linux. We've recently had the chance to kick the tires of Caldera Systems' OpenLinux eDesktop 2.4 (see <http://www.caldera.com>). It comes with the KDE graphical user interface (GUI), which is a window-based system that will be familiar to users of both Windows and Mac OSes.

Further, it comes with virtually everything you need to be productive right out of the box, including Netscape, StarOffice for word processing and other business applications, and various clients for the Internet (telnet, FTP, Usenet news, etc.).

It's pretty convincing as an alternative, especially as it runs fairly comfortably on machines that would be considered underpowered in the Windows universe (Caldera claims it will run on 386 and 486 boxes).

The downside to Linux is that you may not find Linux versions of all the software you want to use.

The good news is that the situation is bound to change. Many companies are starting to port their major business software over to the Linux environment (Corel being a notable example), and more games are starting to appear in Linux versions. Further, a Windows emulator, called WinE, is making it possible to run Windows software on Linux boxes, though they don't run quite as well as they do on an actual Windows-based PCs. With all of these things coming together, it's quite possible that Linux will turn into the next big thing.

Hey Mac!

Although we live in a rather Windows-centric world, sometimes the only computer that'll do is a Mac. The MacOS is well-known for its general ease-of-use, which is one of the reasons why the iMac has sparked a Macintosh renaissance. It continues to be one of the most popular platforms for education and remains an excellent choice for those who are using a computer for the first time.

What Windows users tend to forget, though, is that the MacOS is also very powerful, and is the OS of choice for a good percentage of those who work in digital content creation, from desktop publishers to graphic designers, from digital video editors to musicians. It has maintained a loyal following within these professional communities.

If your main focus is content creation, MacOS is certainly worth serious consideration, even though the hardware itself is often a bit more expensive. □

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Second USB Port PCI.....	\$35
Second Printer Port PCI / ISA.....	\$39/25

Sound Card & Speakers

16bit PnP / SB Ensoniq PCI.....	\$19/39
Sound Blaster PCI 128 / Live Value.....	\$49/76
800W Subwoofer system w/ 4 Spkrs.....	\$55
120W PMPO Speakers.....	\$9.50

DVD / CD-ROM / CD-RW

Pioneer DVD 16-T / 16-S.....	\$188/189
Toshiba DVD 12X.....	\$169
Creative Labs 52X CD-ROM.....	\$65
HP B250i / 9110i / 9310 CD-RW.....	\$265/325
Plextor 12x10x32 CD-RW.....	\$419
Yamaha Bx8x24 CD-RW.....	\$239
Panasonic / Acer 8x4x32 CD-RW.....	\$225/249
Sony 10x4x32 CD-RW.....	\$339
Goldstar 8x4x24.....	\$229

Printer / Scanner

Canon BJC 1000/2000/5100/6100.....	\$89/109/178/249
Samsung QL-5100A / QL 6050.....	\$338/445
Epson 440/ 670/ 760/ 1270P.....	\$109/129/219/668
Brother HL1030/ 1240DX/ 1270N.....	\$367/447/728
Okipage 6W LED Printer.....	\$219
Artec USB Scanner.....	\$99
Mustek 600U 36bit/ 1200U 48bit USB Scanner.....	\$89/129

Video Card

Diamond 8MB AGP / Matrox M3D 4MB PCI.....	\$49/49
Pine SIS 8M PCI / ATI 4M PCI.....	\$55/49
ATI Fury Pro 32M AGP / Maxx 64M.....	\$165/249
ATI Xpert 98 8M / Xpert 2000 32MB / Pro.....	\$65/125/149
ATI All-in-Wonder 128 32MB / Pro.....	\$249/289
VooDoo III 2000 / 3000 / 3500.....	\$118/145/275
VooDoo5 5500.....	\$389
Asus 6600 / 6800 / V7700 / Pure DDR 32MB.....	\$239/289/389
HIS TNT2 32 MB / Geforce 256 32 MB AGP w/TV out.....	\$99/209
nVidia TNT2 M64 32M / TV Out / TV In & Out.....	\$109/125/149
Matrox G400 32M S / Dual AGP 4X.....	\$179/209
Creative Annihilator 2 32M AGP.....	\$389

CPU Pentium/AMD Series ----- Call

Memory 32/64/128MB.....	Call
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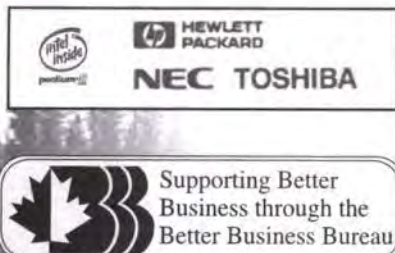
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Mother board

ABIT BF6 Pentium III Motherboard ATX	\$165.00
ABIT KA7 Athlon Motherboard ATX	\$225.00
ABIT KA7-100 Athlon Motherboard ATX	\$249.00
ABIT VA6 VIA Lots 1 Motherboard ATX	\$115.00
ABIT VT6X4 Pentium II/III/Cel VIA Motherboard w/Audio ATX	\$149.00
ASUS A7V AMD K7 Athlon/Duron Slot A Motherboard ATX	\$226.00
ASUS CUBX COP/370 Motherboard ATX	\$195.00
ASUS CUSL2 FCPGA Motherboard ATX	\$228.00
ASUS CUV4X FCPGA Motherboard ATX	\$165.00
ASUS K7M AMD K7 Athlon Slot A Motherboard No/Audio ATX	\$156.00
ASUS K7V AMD K7 Athlon Slot A Motherboard Yamaha Audio ATX	\$226.00
ASUS P3V-4X Pentium II & III PC133 Motherboard ATX	\$156.00
ASUS P5A Super7 PC100 Motherboard ATX	\$126.00
GIGABYTE GA-6VX-4X PIII Motherboard ATX	\$136.00
GIGABYTE GA-6VX7-4X PPGA/FCPGA/EPGA Motherboard ATX AC97	\$135.00
GIGABYTE GA-6VXE+ PIII Slot1 Motherboard ATX	\$105.00
GIGABYTE GA-7ZM AMD K7 Athlon/Duron Motherboard ATX	\$159.00

Monitor

AOC 15" SVGA Digital Color Monitor	\$176.00
AOC 17" SVGA Digital Color Monitor (.25mm)	\$266.00
AOC 17" SVGA Digital Color Monitor (.27mm)	\$246.00
MAG 17" 786FD SVGA Color Monitor	\$389.00
MAG 19" 810FD SVGA Color Monitor	\$718.00
NEC 17" AS70 SVGA Color Monitor	\$269.00
NEC 17" FE700 SVGA Color Monitor	\$386.00
NEC 17" FE750 SVGA Color Monitor	\$459.00
NEC 19" FE950 SVGA Color Monitor	\$658.00
Optique 17" Q71 SVGA Color Monitor .27	\$298.00
Optique 17" V73 SVGA Color Monitor .26	\$446.00
Optique 19" Q95 SVGA Color Monitor .27	\$476.00
Samsung 17" 700NF SVGA Color Monitor	\$429.00
Samsung 17" 750S SVGA Color Monitor	\$299.00

Samsung 17" 753DF SVGA Color Monitor	\$359.00
Samsung 19" 900NF SVGA Color Monitor	\$639.00
Samsung 19" 955DF SVGA Color Monitor	\$559.00
SONY 17" E200 SVGA Color Monitor	\$508.00
SONY 19" E400 SVGA Color Monitor	\$719.00
SONY 19" G400 SVGA Color Monitor	\$779.00
Viewsonic 15" VP150 LCD Color Display	\$1,429.00
Viewsonic 17" E771 SVGA Color Monitor	\$316.00
Viewsonic 17" EF70 SVGA Color monitor .25mm	\$385.00
Viewsonic 17" GF775 SVGA Color Monitor .24dpi	\$486.00
Viewsonic 17" GS773 SVGA Color Monitor	\$409.00
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Viewsonic 21" P810 SVGA Color Monitor	\$1,119.00
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CD ROM Drive

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Creative Labs 52x IDE CD ROM Drive	\$58.00
PINE 52X IDE CD-ROM DRIVE	\$56.00
Plextor 40X Int. Ultra SCSI CD ROM Drive	\$149.00
Toshiba 40x SCSI CD ROM Drive	\$109.00
Toshiba 48x IDE CD ROM Drive	\$79.00

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Afreey 8X Int. IDE DVD Drive	\$148.00
ASUS 8X Int. IDE DVD-ROM Drive	\$179.00
L.G Electronic 8X DVD Int. IDE Drive	\$159.00
Panasonic 8X IDE DVD Drive	\$189.00
Pioneer 16X DVD Int. IDE Drive	\$179.00
Toshiba 12X DVD Int. IDE Drive	\$176.00

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SoundBlaster Live MP3+ Sound Card Retail	\$128.00
SoundBlaster Live Platinum Sound Card Retail	\$259.00
SoundBlaster Live Value Sound Card	\$68.00
SoundBlaster Live X-GAME Sound Card Retail	\$129.00
SoundBlaster PCI 128 Sound Card	\$46.00

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Fujitsu 20.4GB IDE-ATA66 5400rpm/10ms/512k Hard Drive	\$145.00
Fujitsu 20.4GB IDE-ATA66 7200rpm/8.5ms/512K Hard Drive	\$179.00
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Maxtor 15GB IDE-ATA66 5400RPM/9ms/512MB Hard Drive	\$126.00
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Maxtor 20.4GB IDE-ATA66 5400RPM/9.5ms/512 Hard Drive	\$146.00
Maxtor 30.7GB IDE-ATA-100 7200rpm/8.7MS/2MB Hard Drive	\$229.00
Maxtor 30GB IDE-ATA66 5400RPM/9ms/2MB Hard Drive	\$175.00
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Quantum 20.5GB FB+ LM ATA-66 7200rpm/8.5ms/2MB Hard Drive	\$186.00
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IBM 36GB Ultra 10k/4.9ms/4MB SCSI Hard Drive	\$958.00
Seagate 18.4GB 10krpm/6ms/2MB U160 SCSI Hard Drive	\$579.00
Seagate 50.0GB U2W SCSI Hard Drive	\$1,469.00
WD 18.0GB SCSI 68pin U2 SCA2 10Krpm/8.5MS/8MB Hard Drive	\$696.00
WD 18.3GB SCSI 68pin U2 SCA2 10Krpm/7.8ms/8MB Hard Drive	\$719.00
WD 9.1GB SCSI 68pin U2W 10Krpm/8MB Hard Drive	\$498.00
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3Dfx Voodoo3 3500 16MB AGP Video Card w/TV Turner	\$249.00
3Dfx Voodoo5 5500 64MB AGP Video Card	\$416.00
ASUS 32MB V6800 DDR Delux GeForce256 AGP Video Card TV, V	\$298.00
ASUS 32MB V7700 DDR Delux GeForce-II AGP Video Card w/o TV	\$449.00
ASUS 64MB V7700 DDR GeForce-II AGP Video Card w/o TV	\$589.00
ATI 32MB All-In-Wonder Pro128 AGP Video Card OEM	\$269.00
ATI 32MB Fury Rage128 PRO AGP4 Video Card w/o TV in/out	\$145.00
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Matrox 32MB Millennium G400 MAX Dual Head Video Card Retail	\$279.00
Matrox 32MB Millennium G400 SingHead Head Video Card	\$166.00
Oxygen 32MB VX1 AGP Video Card Retail	\$269.00
Pine SIS 3D 8MB AGP Video Card	\$45.00
S3 Savage4 32MB AGP Video Card	\$89.00
SNIPER2 32M NVIDIA RIVA TNT2 M64 4X/2X AGP	\$98.00

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Fujitsu 4725 P/S2 Keyboard	\$65.00
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Logitech Cordless I Touch P/S2 Keyboard w/Mouse & Pad	\$116.00
Logitech Cordless Pro I Touch P/S2 Keyboard w/Mouse/Rest	\$158.00
Logitech Deluxe P/S2 Keyboard	\$25.00
Logitech Deluxe P/S2 Keyboard New Touch Egle	\$59.00
Logitech Internet P/S2 Keyboard	\$35.00
MS Internet P/S2 Keyboard	\$28.00
MS Internet Pro P/S2 Keyboard	\$55.00
MS Natural Elite Keyboard P/S2	\$35.00

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Logitech Cordless MouseMan Wheel	\$75.00
Logitech Cordless Wheel Mouse	\$49.00
Logitech MouseMan Wheel USB Combo	\$48.00
Logitech Trackman Marble Wheel USB	\$68.00
MS Optical Intlimouse Explorer Mouse PS/2 USB (Silver) OEM	\$75.00
MS Trekker Wheel Mouse P/S2	\$15.00
Wacom 4x5 ArtPad Serial for PC	\$116.00
Wacom Graphice Tablet 4"x5" USB	\$119.00

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Creative Labs 8x4x32 Int. IDE CD-RW Drive OEM	\$239.00
HP 8210e (4x4x6) USB Ext. CD-ReWriter Drive	\$239.00
Panasonic CW7585 (8x4x32) CD-ReWrite Drive	\$226.00
Plextor 12x10x32 Int IDE CD Writer With Kit	\$419.00
Plextor 8x4x32x Int IDE CD Writer	\$326.00
SONY 10X4X32 CDRW int. EIDE Bare Drive	\$358.00
SONY 8X4X32 CDRW int. EIDE Bare Drive	\$286.00
Yamaha CRW8424 E-IDE Int. 8X/4X/24 CDRW w/Kit	\$359.00
Yamaha CRW8424S Int. SCSI CDRW PC Kit\$	\$446.00
Yamaha CRW8824 E-IDE Int. 8X/4X/24 CDRW	\$236.00

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Altec Lansing ACS48 Speakers	\$156.00
Altec Lansing ACS54W Speakers	\$79.00
Altec Lansing ADA305W/O Whit Box Speakers	\$188.00
Altec Lansing ATP3 Speakers	\$115.00
Altec Lansing ADA70 USB Speakers	\$179.00
Creative Labs Soundworks 5.1 Speakers	\$299.00
Creative Labs PC Works w/Subwoofer Speakers	\$59.00
Creative Labs SoundWork w/Subwoofer Speakers	\$98.00
Yamaha YST M8 Speakers	\$39.00

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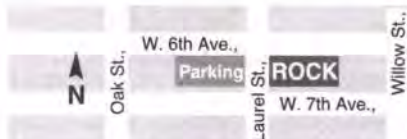
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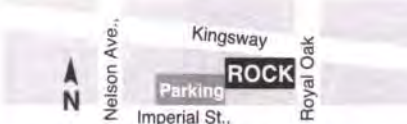


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18" Tower Case with 250W Power Supply
104 Win98 P/S2 Keyboard
Logitech 2B P/S2 Mouse
56K V.90 Integrated Voice Fax/Modem
16Bit 3D w/ Wavetable Integrated Sound
Creative Labs 52x IDE CD ROM Drive
120W Stereo Amp. w/AC Adapter Speakers
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Full warranty

15" SVGA Color Monitor **\$579**
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64MB PC133 SDRAM
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Maxtor 15GB IDE-ATA66
5400RPM/9ms/512MB Hard Drive
S3 Savage4 32MB AGP Video Card
18" Tower Case with 250W Power Supply
104 Win98 P/S2 Keyboard
Logitech 2B P/S2 Mouse
56K V.90 Int. PCI True Voice/Fax Modem Card
AC97 Soft Sound
Creative Labs 52x IDE CD ROM Drive
Juster 3D-FX1 450 Watt w/Subwoofer Speakers
One Month Internet Free
Full warranty

17" AOC SVGA Color Monitor **\$789**
Special price **\$246** with this system

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64MB PC100 SDRAM
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7200rpm/8.7MS/2MB Hard Drive
ATI 32MB Fury Rage128 PRO AGPx4 Video Card
18" Tower Case with 250W Power Supply
104 Win98 P/S2 Keyboard
Logitech 2B P/S2 Mouse
56K V.90 Int. PCI True Voice/Fax Modem Card
SoundBlaster PCI 128 Sound Card
Creative Labs 52x IDE CD ROM Drive
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Maxtor 30.7GB ATA-100
7200rpm/8.7MS/2MB Hard Drive
ASUS 32MB V6800 DDR Deluex
GeForce256 AGP Video Card
18" Tower Case with 300W Power Supply
Logitech Internet P/S2 Keyboard
Logitech P/S2 First Mouse Plus
Creative Labs 52x IDE CD ROM Drive
56K V.90 Int. PCI True Voice/Fax Modem Card
SoundBlaster Live Value Sound Card
Altec Lansing ACS54W Speakers
Pioneer 16X DVD int. IDE Drive
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Full Warranty

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Intel 2MB Integrated Video
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Toshiba 40x SCSI CD ROM Drive
Intel EtherExpress Pro/100+ Integrated Network
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Full warranty

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RAID Capable
256MB PC133 ECC SDRAM
Panasonic 1.44MB 3 1/2" Floppy Drive
Adaptec AIC-7892 Ultra 160 SCSI Integrated Controller
WD 9.1GB SCSI 68pin U2W 10Krpm/8MB Hard Drive
Intel 2MB Integrated Video
Net Server A9891 ATX Case with
300W Redundant Power Supply
Toshiba 40x SCSI CD ROM Drive
Intel EtherExpress Pro/100+ Integrated Networking Lan
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Brother MFC-1870MC Multi-Function Center	\$276.00
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EPSON DeskJet 740i Color Printer	\$146.00
EPSON DeskJet 760 Color Printer	\$146.00
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EPSON DeskJet Photo 870 Color Printer	\$398.00
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HP Color LaserJet 4500DN Printer	\$5,479.00
HP DeskJet 2000Cxi Color Printer	\$659.00
HP DeskJet 2500C+ Color Printer	\$1,366.00
HP DeskJet 2500CM Color Printer	\$2,039.00
HP DeskJet 840C Color Printer	\$226.00
HP DeskJet 930C Color Printer	\$296.00
HP DeskJet 970Cxi Color Printer	\$559.00

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3COM 12Port 10Base Hub	\$259.00
3COM 16Port Office Connect Dual Speed Hub	\$329.00
3COM 8Port 10Base TX Office Connector Hub	\$98.00
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D-Link 16Port 10/100Base Dual Hub	\$279.00
D-Link 16Port 10/100Base Dual Hub	\$438.00
D-Link 24Port 10Base Hub	\$319.00
D-Link 4Port 10/100Base Dual Hub	\$125.00
D-Link 4Port USB Hub	\$49.00
D-Link 5Port 10/100Base Dual Hub	\$98.00
D-Link 7Port USB Hub	\$106.00
D-Link 8Port 10/100Base Dual Hub	\$185.00
D-Link 9Port 10Base Hub	\$95.00
Linksys Etherfast Cable/DSL Router	\$246.00
OEM 8Port 10 base Stackable Networking Hub	\$39.00

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Canon PowerShot A50 Digital Camera	\$618.00
Canon PowerShot S10 Digital Camera	\$768.00
Creative WebCam III USB	\$69.00
EPSON PC3000Z Digital Camera	\$1,266.00
EPSON PC650 Digital Camera	\$389.00
EPSON PC750Z Digital Camera	\$649.00
EPSON PC800 Digital Camera	\$759.00
Kodak DC215 Digital Camera	\$419.00
Kodak DC220 Digital Camera	\$946.00
Logitech QuickCam Express	\$57.00
Logitech QuickCam Home (USB)	\$125.00
Logitech QuickCam VC (Parallel)	\$99.00
Logitech QuickCam VC (USB)	\$99.00
Nikon Coolpix 800 Digital Camera	\$798.00
Nikon Coolpix 990 Digital Camera/USB	\$1,389.00
Olympus DL600 With 4MB	\$1,098.00



Scanner

Acer Prisa 640U USB Scanner	\$99.00
Canon FB630P Color Scanner	\$156.00
Canon FB630U Color Scanner	\$176.00
Canon FS2710 Photo Film Color Scanner	\$699.00
Epson 1200S SCSI Perfection Scanner	\$389.00
Epson 1200U USB Perfection Scanner	\$259.00
Epson 1200U USB Photo Perfection Scanner	\$366.00
Epson 610 Perfection Scanner	\$179.00
Epson 636U Perfection Scanner	\$199.00
HP 3300C Color Scanner	\$139.00
HP 5300Cxi Business Series Color Scanner	\$339.00
HP 6300Cxi Professional Series Color Scanner	\$519.00
HP 6350Cxi Professional Series Color Scanner	\$638.00
MircoTek ScanMaker V6UPL FlatBed Scanner	\$176.00
MircoTek ScanMaker V6USL FlatBed Scanner	\$209.00
UMAX 2200 USB/SCSI FlatBed Scanner	\$218.00
UMax 2400S SCSI Scanner	\$426.00
UMAX 4000U FlatBed Scanner	\$496.00
UMAX Powerlook 3 FlatBed Scanner	\$2,698.00
Visoneer 7600 FlatBed USB Scanner	\$169.00

Tape Drive

HP 10-20GB Int IDE Tap Backup Drive	\$368.00
HP 7GB (Comp to 14GB) Travan Int IDE Tap Backup Drive	\$328.00
HP Surestore DAT 40i Tape Drive	\$1,569.00
IBM DLT 40-80GB Int SCSI Tap Backup	\$8,898.00
IBM DLT DDS-3 Tape Drive Back UP Unit	\$1,079.00
On Stream 30GB INT IDE Back UP Drive	\$398.00

Network Card

3COM 3C410 Home Connect PhoneLink Network Card	\$99.00
3COM 3C410-Kit Home Connect PhoneLink Network Kit	\$186.00
3COM 3C509B-TPO ISA RJ45 Networking Card	\$87.00
3COM 3C905B-TX-NM Ethernet 10/100 Network	\$66.00
3COM 3C905C-TXM 10/100Base PCI Networking Card w/wol/EPP	\$68.00
Acer Ethernet Combo ISA PnP 10Mbps Card	\$19.00
Acer Ethernet Combo PCI PnP 10Mbps Card	\$19.00
D-Link DFE-538TX 10/100Base PCI RJ45 Network Card	\$26.00
GVC Ethernet 10/100 PCI Networking Card	\$25.00
GVC Ethernet ISA Network Card	\$29.00
GVC Ethernet PCI Combo Network Card	\$28.00
Intel EtherXpress Pro 100 Plus PCI Network Card	\$79.00

PCMCIA Card

3COM Megahertz 10/100 LAN PC Card	\$129.00
3COM Megahertz 10/100 LAN PC Card	\$179.00
D-Link 10/100mbps 16-bit Fast ethernet PCMCIA Adapter	\$116.00
GVC 10/100 PCMCIA Ethernet Card	\$86.00
GVC 56K PCMCIA V90 Modem Card	\$96.00
LinkSys PCMP100 10/100 Lan Card	\$98.00
Netgear FA410 10/100 RJ45 PCMCIA Ethernet Card	\$86.00

Fax/Modem

ACER (AOpen) 56K V.90 Int. Voice/Fax Modem ISA	\$65.00
ACER (AOpen) 56K V.90 Int. Voice/Fax Modem/PCI (True)	\$38.00
GVC 65K V.90 Int. PCI Voice Fax/Modem Card	\$36.00
USR 56K V.90 External Sport Voice Fax/Modem	\$186.00
USR 56K V.90 External USB Pro Voice Fax/Modem	\$188.00
USR 56K V.90 Internal win Fax/Modem	\$45.00
USR 56K V.90 Internal ISA Voice/Fax Modem	\$99.00
USR 56K V.90 Internal Voice/Fax Modem Retail	\$189.00
USR 56K V.90 Internal Real PCI Voice/Fax Modem	\$96.00

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Adaptec 19160 Ultra160 SCSI Controller	\$236.00
Adaptec 2903B PCI SCSI Controller OEM	\$48.00
Parallel Port EPP/ECP ISA Card	\$16.00
Promise Fasttrack ATA100 Raid Controller	\$158.00
Promise Fasttrack ATA66 Raid Controller	\$125.00
Tekram DC390 SCSI 2 PCI Controller Card	\$78.00
Tekram DC390F UW SCSI Bootable PCI Controller Card	\$119.00
Tekram DC390U2W U2W SCSI PCI Bootable Controller Card	\$258.00
USB PCI Controller Card	\$29.00
Xnet Fire Wire IEEE-1394 Controller Card	\$98.00

Optical Drive

Imega 100MB Ext. USB ZIP Drive	\$139.00
Imega 100MB IDE Int. ZIP Drive	\$98.00
Imega 100MB Parallel & SCSI Ext. ZIP+ Drive	\$238.00
Imega 100MB Parallel Ext. ZIP Drive	\$138.00
Imega 100MB SCSI Ext. ZIP Drive	\$196.00
Imega 100MB SCSI Int. ZIP Drive	\$206.00
Imega 250MB Ext. Parallel ZIP Drive	\$269.00
Imega 250MB Ext. SCSI ZIP Drive	\$206.00
Imega 250MB Ext. USB ZIP Drive	\$248.00
Imega 250MB Int ZIP Drive	\$148.00
Imega 2GB JAZ Ext. SCSI Drive	\$439.00
Imega 2GB JAZ Int. SCSI Drive	\$446.00
Panasonic 100MB IDE Int. ZIP Drive	\$69.00
Panasonic 100MB Parallel Ext. ZIP Drive	\$166.00

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Tune it up for performance

When your system's responsiveness isn't what you think it should be, it may be time to clean house

By Sean Carruthers

You swear that your system seemed faster a year ago when it was new than it is now. Well, you're not suffering from processor envy or an overactive imagination. Over time, hard drives become fragmented, applets find their way onto your system, and a lot of other

performance-robbing changes eventually add up to a noticeable slowdown of your once-speedy PC. There are, fortunately, a number of inexpensive remedies you can apply to bring your system back up to its potential.

Hot rod wisdom

Sometimes, you've just got to start peeling

things away if you want to squeeze all the performance you can out of your system. Even if you don't want to turbocharge your machine, you can certainly improve its performance by simply eliminating some of the many things that eat into its overhead.

PCs from big-name manufacturers often come preloaded with a ton of software and util-

ities they think you might like. This can range from a special toolbar for launching Microsoft Office applications to an icon in the system tray to control your touchpad configuration, if you're using a notebook. Although these can be convenient, they also degrade your system's performance, because they run in the background and use some of your system resources.

We can take a lesson from the hot-rodders in the auto world, by stripping away convenient niceties that degrade performance. The first thing I always eliminate from my system is Creative's Launcher and the taskbar for Microsoft Office. I also tend to eliminate things like the RealPlayer Quicklauncher and any control panels that run in the Windows System Tray that aren't absolutely necessary for daily use. Items like these, which appear in the lower right-hand corner of your screen (the System Tray), can often be disabled by right-clicking on them and choosing the appropriate option.

You can find a number of other items that can be eliminated by going to the Start menu, selecting Run, and typing msconfig. You'll be presented with a tabbed menu. Click on the "startup" tab. Some of the items you'll want to keep are: SysTray, ScanRegistry and TaskMonitor. Other things, like LoadPowerProfile, you also want to keep, though this one often appears more than once (a result of installing certain programs), so you can eliminate all but one. Much of the rest of what appears here are items relating to convenience, including many of the things that appear in the system tray. Be warned, though—tinkering with msconfig can lead to unexpected results.

Yanking parts

A more drastic way to squeeze performance out of your PC is to start stripping away hardware, either physically (by yanking the cards out of the case) or logically (by going into the BIOS and disabling items). This is only really feasible if you know you're not going to use particular items. For example, if you use your PC to connect to the network, you may be able to remove the modem card. Or, if you have moved most of your hardware over to USB, you can go into the BIOS and disable your parallel port, your serial ports, and switch off many of the ISA or PCI slots that aren't in use. This can produce unexpected results, so make sure you know what you're doing and how to reverse it!

Stay cool

It always pays to keep the inside of your system cool, no matter what equipment you have running. Not only do you achieve top performance by keeping all the components running within a comfortable temperature range, you also lengthen the life of everything in the system. There are a few things you can do to achieve this.

The first and most obvious solution is to pack your system full of cooling fans, placed near anything that generates a lot of heat. This includes hard drives, the CPU, RAM, and, more recently, high-performance graphics cards. Check your motherboard, as there are often a number of places to connect specific component cooling fans. Further, most new PC cases have spots on both the front and back for intake and output fans, so you can cool the system overall by pulling cool air in from the front and

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Tune it up for performance

Continued from page 42

expelling the hot air out the rear of the machine.

Recently, we saw a computer that had no fewer than six fans inside (the CPU, power supply, one on the graphics card, one beside the graphics card, an intake fan on the front of the case, and one on the back for exhaust). It seemed excessive at first glance, but the system ran at peak performance no matter what we threw at it.

Another thing you can do to keep your system cool is to streamline all of the cables inside into neat bundles, to make sure they're not touching the heat-generating components. You should avoid using twist-ties that contain metal wires as they retain heat and the metal may touch internal components, shorting or scratching them.

Plastic ties are a better solution, either the type included with some brands of green garbage bags or specialty tie-wraps you can find in the accessory section of your local computer store. Just trim off the ends once you have everything in place. And remember: although you can bundle up the power cables and internal audio cables fairly tightly, you do not want to bunch up your IDE cables, especially if they're the more brittle versions used with UDMA/66 drives.

Defrag and cleanup!

Last but not least, to get maximum performance out of your computers, you should make it a regular habit to clean up your drive. Two easy (and free) ways to do this are included in Windows 95, 98, 2000 and Me systems, in the Programs/Accessories/System Tools area of your Start menu. They are Disk Cleanup and Disk Defragmenter.

The idea behind Disk Cleanup is simple: when you install programs, surf the Web, and run programs, temporary files are often left behind on your drive. Because your computer needs a certain amount of free space on the drive to swap data to and from memory, system performance decreases when there is too too much data stored on the drive. Disk Cleanup shows you what temporary files are left on your drive, and gives you the opportunity to safely clean them out of your system.

You can also go into the drive yourself and start deleting files, if you know what you're doing. Be careful, though, because if you delete the wrong things you can create havoc with your system... anything from annoying popup menus that tell you files or shortcuts are missing, to total system failure if you delete something your computer needs to run. If you're planning to delete entire directories, it's better to use the Add/Remove Programs function in the Control Panel to uninstall programs complete-

ly and properly.

Disk fragmentation is a bit less obvious, but it has a definite impact on your system performance. Whenever you write a file to your hard drive, it slots the information in wherever there is space—whether or not there is the right amount of room in a contiguous stretch. This leads to a bunch of tiny file fragments all over the place, which your PC reconstructs into a single file when you need it again. When files are spread out into too many fragments in different spots on the disk, your system performance can suffer greatly, because of the extended periods of hard disk access, then the reconstruction.

You should make sure to schedule regular defrag sessions, which rearrange all of your file fragments and directories into contiguous blocks, for quicker access times and less read-head jumping. The biggest problem with disk defragmentation, however, is that you can't use your system while defragmenting to avoid corrupting the data as it's being written. And, the larger your drive is, the longer you have to stay away. For this reason, it's best to set up your machine to defrag overnight while you're out of the office or asleep, because the process can literally take hours on a large drive that's nearly full.

It's also a good idea to do a disk cleanup first, because disk defragmenters need some free disk space in order to shift files around.

Those using Windows NT 4, unfortunately, don't have a built-in solution, but there are a number of programs available to do the job. Executive Software (<http://www.executive.com>) produces the most popular defragmentation program for NT, known as Diskeeper. The newest version, Diskeeper 5.0, also works on all other versions of Windows.

Even those with a built-in defragmentation solution may be interested in this program, as it has more features, including automatic scheduling of defrags (even over a network), Frag Guard protection of critical system files (for NT and 2000) and more. We had a chance to give it a test drive in the Lab, and though it took every bit as long to defrag drives (several hours for our 20 GB volume), it offered a ton of control and analysis options. Anyone who doesn't want to have to remember to defrag the drive every week or so can "set it and forget it" with Diskeeper's scheduler. Volume discounts are also available, for the corporate workspace.

There are several books that offer tips and strategies for keeping your system in top shape. Two we've looked at recently are *Optimizing Windows for Games, Graphics and Multimedia* by David Farquhar (O'Reilly, ISBN: 1-56592-677-3, \$38.50) and *Sad Macs, Bombs and Other Disasters: And What to Do About Them* by Ted Landau (Peachpit Press, ISBN 0-201-69963-X, \$41). □

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Power to go

What comes to mind when you think about the computer that you really want—a portable perhaps? Great choice, but let's be honest... portable computing isn't cheap.

By Sean Carruthers

A very basic notebook computer often costs as much as a really top-notch desktop system. Despite this, people continue to want portable solutions. When it comes to portable computers, it seems the sky is the limit when it comes to price.

A few new portables arrived in our Test Lab recently, all of which offer a twist on the usual, and are aimed at the power user with a power pocketbook to match.

Toshiba Portégé 7220CTe

From: Toshiba of Canada Information Systems Group
Tel: 800-387-5645. <http://www.toshiba.ca>
Suggested retail price: \$6,794
Size: 29.8x26.4x 3 cm. Weight: 3.3 kg
Size with dock: 31.3x28x5.5 cm. Weight: 2.1 kg
Sysmark 2000 overall score: 114

The 7220 is the latest addition to Toshiba's ultra-thin notebook line that debuted in the summer of 1998 as the Portégé 7000.

The new Portégé 7200 series pairs up an extremely thin notebook component with an optional docking unit containing both floppy and DVD drives, as well as an Ethernet jack, speakers, and the standard ports (VGA, PS/2 keyboard and mouse, parallel, serial and two USB). This allows the notebook component to remain compact (3 cm high at the thickest point, for those of you keeping score) while including one USB port, infrared, two PC card slots, a 56Kbps modem, and a VGA port.

The model we looked at was the 7220CTe, which came with a 650 MHz Pentium III processor, as well as 64 MB of RAM. With Windows 98, the performance is good, resulting in a Sysmark 2000 overall score of 114. The 7220CTe comes with a 12 GB hard drive, and a 13.3-inch TFT screen.

There are a few design issues with the Portégé that you'll either love or hate. First, it comes with the AccuPoint cursor control technology, similar to IBM's TrackPoint—some users prefer this to



Touchpad technology, while others find it totally annoying. Secondly, the left- and right-mouse buttons are located in an up-down orientation (as with all Toshiba notebook models), which may be difficult to adjust to. Thirdly, the battery sticks out the back of the machine. At first blush this seems like a bad thing, but it's actually a nice touch, as the battery acts as a brace preventing the notebook from falling over backwards when it's open on your lap.

It's worth noting that the notebook and dock are sold separately, and that the price listed above is for both. You can purchase the notebook by itself for a suggested retail price of \$5,779, but most users will find this very inconvenient, as no optical drive is included. The Portégé does come with an external floppy drive that can be attached by cable. You can add an external PC Card optical drive solution easily enough, but it's still a separate purchase. What makes the DVD Network Dock II a more attractive option overall is that it clips right onto the notebook, and

includes all of the extra built-in features.

One quirk worth mentioning: undocking the machine while it's powered on can cause the notebook to crash if you neglect to press the undock switch before pressing the eject levers. It would have been nice to see the docking buttons electronically stop the docking connections, though admittedly this is less a fault of the machine than of Windows' inability to instantly adjust to such a change.

QBE Cirrus Personal Computing Tablet

From: Aqcess Technologies
Tel: 800-478-9444. <http://www.qbenet.com>
Suggested retail price: \$4,469 (converted from US\$2,999)
Size: 26x36x5.5 cm (3.2 cm at thinnest). Weight: 3.3 kg
Sysmark 2000 overall score: 72

So, what do you get for the professional who has everything? How about a turbo-powered electronic clipboard? QBE's Cirrus Personal Computing Tablet is an interesting new portable

technology, and it's even more attractive now that its price has been nearly cut in half, from the original US\$4,745.

While there have been a few tablet format CE-based solutions, the QBE is a full Windows 98 solution, powered by a 400 MHz Pentium II processor and featuring 128 MB of RAM and a 12 GB hard drive. Essentially, where the CE solutions were scaled down, the Cirrus has the same power as a notebook. It uses a 13.3-inch TFT touch-sensitive screen, and comes with an electronic stylus for more accurate input. Although there is no keyboard built into the unit, the box contains both a keyboard module and a mouse, for use when the QBE is in one place for a bit.

Although the Cirrus comes with a folding port replicator that doubles as a stand, it's surprising just how much is built into the machine itself. The CD drive is standard, as well as a PS/2 port, modem, network jack, and two PC card slots, as well as infrared, USB and even FireWire connectivity.

Even more impressive is the inclusion of a card reader for scanning ID or using a credit card for e-commerce purposes (swipe it at your favourite Web site, perhaps?). And to top it all off, the QBE has a built-in camera capable of capturing up to 640x480 resolution images. The port replicator module adds another PS/2 port, an additional USB jack, gameport, serial, parallel, and a VGA port for attaching an external monitor.

The biggest problem most people will have with the Cirrus is input. The stylus-based solution is a really nice substitute for a mouse, allowing you to grab and drag things naturally across the screen. On the other hand, entering data can be a hassle when the external keyboard isn't connected—you either have to use the on-screen keyboard (which results in hunt-and-peck data entry), or you have to trust that the machine recognizes your handwriting (which can mean more corrections if your handwriting is not so hot), or you can use a voice recognition program, which requires training and is not completely

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Power to go

Continued from page 44

accurate.

More problematic, however, are a couple of quirks that range from annoying to seriously problematic.

The first (which is the annoying one) is that the screen switches from portrait to landscape mode seemingly randomly during boot-up. You can use the device in either orientation, but portrait is certainly the more comfortable of the two, and users really shouldn't have to reorient the device because of the machine's boot-up whims.

The second quirk (the seriously problematic one) is that the machine generates a truckload of heat, which can potentially lead the system to lock up or fail outright. In fact, during the benchmark testing, we had to shut it off a few times to give it time to cool down. Heavy users beware.

Because the unit only uses a 400 MHz Pentium II, we weren't really expecting too much in the performance department. As expected, the benchmarking score was relatively low, with a Sysmark 2000 rating of only 72 (73 for Internet content creation portions of the test, and 71 for office productivity). In the end, this device is built for convenience and not for speed, so it probably isn't that big an issue for most of the target users.

Sceptre SoundX 7300

From: Sceptre Technologies

Tel: 800-788-2878. <http://www.sceptre.com>

Suggested retail price: \$3,369 (converted from US \$2,258)

Size: 30.8x24.1x2.5 cm. Weight: 2 kg

Size with dock: 30.8x25.2x5.2 cm. Weight: 3.4 kg

Sysmark 2000 overall score: 93

Another notebook computer to take the two-part approach is the SoundX 7300, from Sceptre Technologies, which we saw for the first time at PC Expo in June. This line has actually attracted interest from other manufacturers.

The metallic blue SoundX also checks in with an ultra-thin form factor (less than 2.5 cm thick, but only by a hair), but manages to fit more onto the notebook itself than many other units of a similar size. In addition to a VGA port and modem, the notebook component also comes with one PS/2 port for mouse or keyboard, a USB port, network jack, serial, parallel and infrared ports, and one PC card slot. Further, there are two small speakers on the case, on either side of the Touchpad. Because of the size, the sound isn't as amazing as on larger units, but the fact that speakers are there at all is noteworthy.

Sceptre's dock component is referred to as the Ultra Base. In addition to a spot for the CD/DVD and floppy drives, the base also features another PS/2 port for mouse or keyboard, an additional USB port, composite video out, one standard FireWire port, as well as a connector for digital video. Even nicer, however, is a dedicated compartment for an additional battery, if you want to increase the system's runtime.

The configuration we looked at featured a 600 MHz Pentium III processor, with 64 MB of RAM, and Windows 98 installed. Although the processor is reasonably quick, the overall system performance is a little bit on the low side, scoring 93 on Sysmark 2000 (95 for the Internet content creation portions of the test, and 91 for office productivity). This is possibly due to the RAM, but the compact components probably play a bit of a role too.

Despite this slower speed, the Sceptre notebook is still a capable little device, with a ton of features packed into an ultraportable size. Even better, it's relatively inexpensive too, which makes it even more attractive for those who

want value without sacrificing features.

IBM ThinkPad T20

From: IBM Canada

Tel: 800-426-2255. <http://www.can.ibm.com>

Suggested retail price: \$5,249 and up, \$225 (port replicator), \$789 (ThinkPad dock), \$459 (add DVD drive to dock)

Size: 30.48x24.89x3.3 cm. Weight: 2.13 kg

Size with dock: 30.48x29x3.3 cm (replicator raises height of back of notebook to 6 cm)

Sysmark2000 overall score: 122 (133 with 256 MB of RAM)

IBM was one of the first in the recent wave of two-part notebooks with its ThinkPad 570, but has taken a slightly different tack with the T series. Instead of featuring a full base unit with the drives detached from the notebook itself, the T20 includes UltraBay 2000 device bay that will hold a number of hot swappable devices (a DVD drive and floppy were included on our test model).

Also included in the notebook are two PC Card slots, both modem and Ethernet jacks, as well as a USB port, PS/2 port, VGA out and S-VHS out, and a standard serial and parallel port. The modem and Ethernet jacks are inactive until you install an optional mini-PCI card, however. Rounding out the standard features is the ThinkLight, a tiny LCD lamp mounted on the top inside edge of the lid that casts a soft light over the keyboard area—for typing in darkened rooms—which works surprisingly well.

There is a small jack called the UltraPort at the top of the screen that can be used to connect wireless networking devices, or compatible cameras. This is electrically a USB connection, although it uses a unique mechanical connection design.

The port replicator dock, rather than spanning the full depth of the notebook, is more like a clip-on, angled slightly so the front of the notebook rests comfortably on the desk. The dock portion features modem and Ethernet ports, both VGA and DVI video connectors, one USB jack, two PS/2 ports for mouse and keyboard, standard serial and parallel ports, as well as a place to plug in the notebook's external floppy drive.

The configuration we tested (also known as the 2647-41U) came with 128 MB of SDRAM, a 700 MHz Pentium III processor, 6x DVD, 12 GB hard drive, and a 14.1-inch TFT screen. This configuration turned in a respectable Sysmark2000 score, with an overall rating of 122 (131 for the Internet content creation portion of the tests, and 115 for office productivity); an additional 128 MB of RAM boosts the score up to 133 overall. This is a fast system, but we have noticed that it also becomes quite warm—uncomfortably so after a half hour with it running on your lap.

The pairing we had a chance to look at was a bit on the odd side, because the port replicator dock had many of the same ports that already appeared on the notebook itself. This represented substantial duplication, but it's worth noting that when the dock was clipped on, some of the ports were covered by the dock and therefore inaccessible, so you can't even claim there were twice as many of these ports. What was nice about the port replicator dock was that there was an easy place to clip the floppy drive, as well as both DVI and FireWire ports (both of which are still quite cutting edge when it comes to consumer technology). Whether these extras are worth the price of the port replicator is debatable, however.

Those who have this particular version of the T20 would probably be further ahead with the full ThinkPad dock, which has two PC card slots, a half-sized PCI card slot for upgrades, as well as an Ultrabay for use with CD, DVD and SuperDisk modules. □

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< NEW & NOTABLE >

The future of the PC

Intel Developer Forum shows new faces of computing

By Stefan Dubowski

Judging from the funky form factors displayed at the most recent Intel Developer Forum Conference (IDF), the days of the big boxy beige PCs are numbered.

Here are some of the concepts from IDF Fall 2000, held in sunny San Jose, Calif., Aug. 22-24:

- Akiru: Created by Fiori Design Group, this tower was built for easy access to the computer's innards. Intel calls it "a high-performance system that provides features needed for the most demanding applications." It's small, but powerful with a Pentium 4 microprocessor and AGP4X carrying a 3.2 GB-per-second memory interface.
- Ntouch: This concept, built by EDC, is an all-in-one Internet appliance designed for fast, easy connection to the Internet and not much more.
- Enchant: Another all-in-one design, this one from Enlight, which combines video, audio and "interactive" features for a next-generation multimedia experience.

Intel is best known for engineer stuff, as exemplified by its microprocessors. So why is this chipmaker commissioning casework designs from artsy Bauhaus wanna-bes?

According to Doug Cooper, Intel's marketing manager for Canada and Latin America, the company is big on ease of use (a simple term Intel has shortened further to EoU). The PCs available now just don't cut it in terms of enjoyable user experience, either functional or aesthetic.

"As an industry person, you have a different perspective than the complete neophyte," Cooper said. "The things we take for granted, like booting up the computer, are completely foreign to the new user. You don't have to boot up a VCR."

In its quest to enable the effortlessly enjoyable, instant gratification version of the PC, Intel is backing totally new looks and unique architecture of future computers.

For example, the company eschews "legacy" devices, like floppy drives and serial ports. Some computer users do have them, but in Cooper's opinion they won't keep them.

"There's definitely a transition that happens," he said. "Remember, a few years ago you could get a system with both a 5.25-inch floppy drive and a 3.5-inch drive. Eventually, enough people had information on 3.5-inch disks."

And as more and more computer owners switch to CD-RWs, for example, they'll drop their aging magnetic floppy backups.

Intel and its followers aren't counting on new users alone to buy into the next generation of PC. They'd be in trouble if they did. Cooper figures 60 percent of Canadians have home computers. But "there's still a three to

four year turnover cycle for people replacing their computers. Your installed base evolves."

In Intel's legacy-free vision of the future, there's no room for parallel ports, either. Most wired connections will follow the USB standard. USB lets you connect peripherals, like scanners and printers, in a line, that traces back to a single port in the back of the computer, allowing users to forget the mess of wires created by parallel connections. At 12 Mbps, the first generation of USB is also faster than parallel data transfer. The next generation, USB 2.0, first announced at the fall IDF a year ago, will bump that speed up to hundreds of Mbps. USB 2.0 should start appearing in PCs in 2001.

Speaking of connecting peripherals to the computer, what is Intel up to on the wireless front? After all, the tech press is abuzz with Bluetooth info and rumours. Bluetooth is the industry's chosen wireless connection, good for short distance conversations between digital devices. It also debuted publicly at IDF 1999. One year later, Bluetooth products are finally nearing market readiness in significant numbers.

Cooper said Intel would save Bluetooth for its mobile wireless features. For the home PC market, Intel is betting on HomeRF, a wireless standard supported by Intel and some other manufacturers.

"It had a critical mass of industry participants," Cooper said, explaining why Intel chose HomeRF. "It's not on Intel's back to drive the technology."

The company has built HomeRF into AnyPoint, its home networking product, which is designed to link two or more computers, even if they're in different rooms on different floors. One of them, Intel assumes, has the printer and scanner all to itself.

AnyPoint ensures every computer has access to peripherals. And it should come in handy when Web-enabled fridges and microwaves penetrate the appliance market.

"We're focused on how to get the Internet further into the home," Cooper said.

Why not use Bluetooth for the home? It's simple, Cooper said: Bluetooth has very limited range. In many cases, if consumers tried to run computer-to-computer connections in a three-floor house, "that's too far for Bluetooth."

Other changes: Goodbye Industry Standard Architecture (ISA) slots. Hello Advanced Graphics Ports (AGP)—the most recent way to drive heavy graphics.

According to Cooper, the choice of AGP was a no-brainer. As computers sped up, users expected better pictures, more frames-per-second of digital video playback, and detailed realtime 3D images. Now in its fourth iteration (4x), AGP delivers all of that.

But Cooper said one thing above all drives PC innovation these days: shape.

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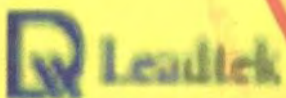
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The future of the PC

Continued from page 48

"No two consumers are alike. The way you decide to decorate your home may be completely different from the way your neighbour decorates. Why should your PCs be the same shape and size?"

We're entering the age of computer-as-home decor. But what's on the outside informs what's on the inside. Consider the computer's motherboard, one of the most awkward pieces in the box. How do you create one motherboard form for round, octagonal, and stick-shaped computers alike?

Intel and other manufacturers are looking

for that magic form. But they're looking for the golden Apple, too. Read: who wants to garner customers' attention and industry kudos by building the next iMac?

Among designers, "I think there's a certain amount of that," Cooper said. "This is an industry that grew up on grey, square boxes. Some of these designs stimulate interest." But "among manufacturers? Absolutely. The iMac was a great combination of form and function. You can't say that about many PCs."

In April, Intel displayed its Legacy Removal Concept PC, which was built on many of the expectations Cooper talked about. It has a new processor, codenamed Katmai, running

at 500 MHz, a 440BXAGP chipset, 128 MB of RAM, a graphics accelerator with 8 MB of video memory, and a 6 GB hard drive. And yes, size does matter: this computer has an 20.3 cm sq. (8 in. sq.) foot print.

But, as with the iMac, Apple is leading the way here, having announced that its 20.3x20.3x25.4 cm (8x8x10 in.) Power Mac G4 Cube computer will be shipping soon.

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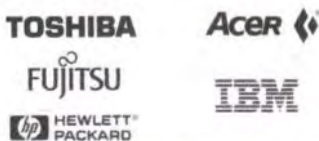
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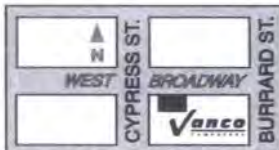
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Cowpland quits as Corel boss

Hands reins to chief technology officer

By Jeff Evans

Michael Cowpland, founder, chairman, president and chief executive officer of Ottawa-based Corel Corp. announced on Aug. 15 that he had resigned his executive position with the company he

started and led to world prominence 15 years ago. At a news conference at Corel's Ottawa offices, Cowpland stated that he will remain a director of the company, and that he intends to "get my hands really dirty with a lot of Linux technology," apparently indicating he will be involved with small, new Linux devel-

opment companies.

Derek Burney, Corel's chief technology officer and a long-time Corel executive, has been named the interim head of the company. A search for a permanent replacement for Cowpland may take months according to statements by a company representative.

Whether one or more people will take over Cowpland's positions as chief executive and president, and whether or not the long-term replacement(s) will be drawn from current Corel executives or outsiders is not known.

Corel, famous for its CorelDraw graphics software, and more recently the publisher of the WordPerfect suite of office software, Ventura Publisher, and Corel Linux, has weathered several years of generally poor financial results. In the last year Corel's stock seasawed between a brief high of about \$60 and lows of less than \$3. The company has had only a few profitable quarters in the last three years, and had recently stated that it needed an infusion of capital if it was to continue to meet its financial commitments.

The failure of Corel to muscle into the corporate office suite software market dominated by Microsoft, determined poaching of Corel's graphics software user base by rival Adobe, the failure of Corel's Java initiative, and the limited financial success to date of Corel Linux, have all diminished Corel's lustre as a Canadian high-tech superstar.

As well, Cowpland has been investigated and charged by the Ontario Securities Commission for alleged insider trading, over his sale of Corel stock shortly before the company announced poor quarterly results. The OSC charges are still to be resolved, though Cowpland maintains his absolute innocence in the matter.

Until his resignation, however, Cowpland had dismissed suggestions that he should step down. Once his decision to turn over the company to Burney was announced, he is said to have commented that the idea of his leaving the top position at Corel had been discussed with Corel's board about three months ago.

Cowpland first came to prominence on the Canadian high-tech scene well over 20 years ago when he and his partner Terry Matthews founded Mitel Corp., a telecom equipment manufacturer. Mitel enjoyed years of success, and Cowpland can be credited with being an important catalyst in starting the Ottawa region's rise to as a high-technology centre in North America. Matthews went on to found Newbridge Networks, a successful networking company.

Corel at forefront of PC graphics boom

When Cowpland started Corel in 1985, he was determined to bring the desktop publishing revolution to the Microsoft DOS/Intel PC platform. Corel's first product, a rather ungainly bundle of PC, laser printer and publishing software, was soon eclipsed by the company's release of the first version of CorelDraw.

CorelDraw exploded onto the PC stage as the first really capable, complete and easy-to-use graphics solution in the MS DOS PC world. It allowed users of the platform some of the design and publishing capabilities enjoyed by Apple Macintosh users. The program always offered unbeatable value, bundling ever-increasing numbers of fonts, clip art images, and additional programs and utilities with each succeeding version. CorelDraw 10, scheduled for a fall 2000 release, promises to be a state-of-the-art graphics program with enhanced Web publishing and animation capabilities.

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Cowpland quits as Corel boss

Continued from page 52

Very quickly, Corel built a customer base of millions of loyal CorelDraw users, and for years staged splashy, annual design galas in Ottawa to showcase the achievements of artists using its products. With the acquisition of the WordPerfect software line, the company boasted a total customer base of around 20 million people worldwide. In its glory days in the mid to late 1990s, Corel's large in-house marketing operation spent over \$100 million annually getting the Corel message out to the global market.

The company's business focus continued to expand far beyond CorelDraw, however, eventually including the Ventura Publisher typesetting and publishing program, stock photography on CD-ROM and online, family entertainment and educational CD-ROM publishing, Java software and network Java computers, server software development, the WordPerfect office software suite (acquired from Novell), and eventually the Corel Linux initiative.

Some observers criticized Corel for losing focus on its area of core competence, CorelDraw, as rival Adobe Systems targeted

CorelDraw users to convert to Adobe Illustrator, Photoshop, PageMaker, and other competing products.

Meanwhile, the flamboyant, aggressive, and "un-Canadian" personal style of Cowpland, symbolized by his fast cars, opulent Ottawa mansion, and stylish wife, began to look somewhat decadent as his company's fortunes declined.

Throughout the company's time of troubles in the last three years, Cowpland appeared undaunted, constantly presenting a brave face and predicting a bright future, first with Java, then with Linux.

With his departure from day-to-day management of Corel, the company has lost a large piece of its brand identity. Cowpland was Corel, in the eyes of many customers and industry observers.

Whatever his future in the industry, and whatever Corel's eventual fate, Cowpland will be remembered as one of the most imaginative and successful Canadian entrepreneurs in the personal computer era—a key factor in developing a made-in-Canada software industry.

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Epson refreshes printer line

Historically, Epson has refused to play in the low end of the inkjet printer market, instead focusing on specialized markets like photographic print making and industrial posters.

But that has changed this fall, according to Epson Canada spokesman Don Cameron, who briefed TCP on Epson's fall printer lineup.

Epson is now playing in the budget end of the market with the introduction of the Stylus Color 480SX, and 580, which will have suggested retail prices of \$99 and \$129, respectively. The 480SX offers 720 dots per inch (dpi) resolution and is has a rated speed of 4 ppm (pages per minute) black and 2.2 ppm for colour output. The 580 offers 1,440 dpi resolution, with a rated speed of 5 ppm black and 3 ppm colour. Both use USB connections; the 480SX also has a parallel port.

Epson has also enhanced the rest of its consumer inkjet line, offering 2,880 dpi resolution on its 700, 800 and 900 series of Stylus Color printers. According to Cameron, the new printers incorporate a feature called variable droplet technology, which is intended to increase the speed of colour printing. It senses the amount of coverage required in various parts of the print, and then will vary the size of the droplets accordingly, going down to as small as four picolitres on the 777 and 880 models, and three picolitres on the new 980.

The 777, which has a suggested retail price of \$199, will print at up to 8 ppm for black and 6 ppm for colour. It is equipped with both USB and parallel ports and comes with Windows and Mac software.

As seems to be the fashion these days, some models of the 777 also come with optional plastic covers that match the colours of iMac computers.

Epson compares its 880 model directly with Hewlett-Packard's DeskJet 932 and Lexmark's Z52.

It claims that printing an 8x10 colour photograph takes almost twice as long with its competitors' products than with the 880.

For small office printing needs, Epson positions its 980 against HP's 970c, but is pricing its somewhat lower with a suggested retail price of \$449, although for its price the HP includes a duplexing module.

And a networking version, called the 980N, comes with built-in 10/100 Ethernet support.

Epson's new models will be available in stores by mid-October with the exception of the 980N, which will be available later in the fall.

—David Tanaka



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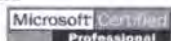


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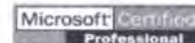
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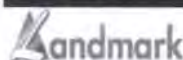
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MS SNAv.3.0 w/5 users.....\$1680

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Palm hit with virus

By Stefan Dubowski

Once upon a time, most computer viruses were designed to attack "fat PCs"—full-featured desktop or laptop computers. This "malicious code," typically written by nasty young men, was designed to spread via infected floppy disks, and with the rise of networks and the Internet, it was also devised to multiply via infected emails and file attach-

ments.

But this formerly PC-centric model of computer viruses is mutating rapidly in new directions, just in time for the expected explosion in handheld computing.

A new age in computer security threats has opened with the first reports of an annoying bug that attacks the most popular personal digital assistants (PDAs).

In August, the first full-fledged virus for

handheld PDAs attacked some of Palm Inc.'s handheld Palm devices—the most successful line of pocket computers on the market.

Known as the LibertyCrack bug, this Trojan virus hides in a pirated program that lets users play Nintendo Game Boy games on their PDAs. (A report in the *Los Angeles Times* online edition, Aug. 30, said that as news spread of the bogus software, it was removed from the Web by those who had posted it.)

When users download the infected software onto their PCs and transfer it via HotSync to their handhelds running the Palm OS, LibertyCrack deletes other programs, essentially stripping the PDA of everything but the operating system.

This can result in great inconvenience to the user. In the worst-case scenario, it can also result in the loss of critical data that hasn't been backed up.

According to Kevin Krempulec, a sales manager for security software firm Symantec Corp., we ain't seen nothing yet.

"This is like when viruses started on boot disks. This is just the beginning."

Krempulec said PDA technology embodies problems that, in turn, make these handhelds perfect hosts for viruses.

The Palm platform's tremendous popularity and success counts as one such catalyst to attract rogue writers of malicious code. Just as the popularity of Windows OSes led to that platform becoming a favourite target of PC virus writers, Palm's status as the main handheld player offers an apparently tempting opportunity for mischief.

Palm has about 80 percent of the overall North American PDA market (that share is higher in Canada). A virus writer knows that if his or her code can attack one Palm device, it can conceivably attack all the six-million-plus Palms currently in use.

It's not a big problem—yet, Krempulec said.

"In terms of the threat, we rate it as a one. That's the lowest. It won't spread like the Melissa or the ILOVEYOUs of the world."

Continued on page 61

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All in one, for all

HP PSC 500 family multifunction

By Dave Chappelle

The PSC 500 is the first all-in-one unit from Hewlett-Packard specifically designed for families. It offers 600x600 dpi colour resolution printing, 600x1,200 dpi colour printing on photo paper, and 600x2,400 dpi colour scanning. One-touch colour copying can be done without turning on a PC. The HP PSC 500 retails for approximately \$500. Purchased separately, a quality colour scanner and colour printer could cost about as much, so consider the copier function a bonus. As it measures only 47x43x27cm (18.3x16.75x10.5 in.), users don't have to make room for three separate machines.

Hewlett-Packard PSC 500

From: Hewlett-Packard Canada
Tel: 905-206-4725. <http://www.hp.com/go/all-in-one>
Suggested retail price: \$499.99

The software installs easily, as most HP software does. An HP Toolbox icon installs on the Windows desktop and all of the PSC 500 functions can be controlled from there. By accessing the thorough help index and services menus in the Toolbox, users can learn how to perform all functions from there as well.

I tested the copy and print quality with some colourful CD and book covers. Overall the reproduction was very good, even on standard paper. No doubt it would be better on photographic-quality paper.

A full page of text printed very nicely on transparency film. While I didn't test them all, the PSC 500 will also print envelopes, greeting cards, labels, continuous banner paper, and postcards. The HP scanning software also installs an icon on the desktop. This software lets users manipulate a scanned image in many ways, then export it entirely or in portions to other applications, print it, or save it. The flat glass scanner top allows users to scan images from thick books, boxes, and other objects that wouldn't feed through a sheet scanner.

Black and colour ink cartridges, bi-directional parallel IEEE 1284C cable, power cord, and a CD-ROM containing HP scanning software, Creative Photo Projects software, IRIS OCR software, a product tour, user's guide, and setup instructions are included. A nice touch is the green LED on the power cord connector that inserts into the unit, letting users know power is coming from the wall socket.

The PSC 500 requires a special printer cable, which is included. Perhaps I'm biased, but I think all peripherals should have USB capability.

As networks are becoming more common in home environments, direct networking connectivity would also be nice. However, it would increase the price. The printer function can be networked by connecting the unit to a PC and enabling sharing in Windows.

The HP Customer Care warranty is for one year, which includes a 24-hour seven-days-a-week help line.

—CanadaComputes.com

Edition. Palm's latest devices, such as the budget-priced m100, offer such connectivity options.

How many people have been hit with LibertyCrack? Krempulec couldn't say. But he added, "I know SARC [the company's virus watchdog] hasn't seen anyone affected by this yet... Probably because we caught it quick."

Krempulec said Symantec already has a fix available for LibertyCrack. But the company is still developing a patch for a more serious problem with Palm's handhelds.

"The applications can launch code to each other," much like Microsoft's software. The difference is you could turn off Microsoft's inter-program communication equipment. PDAs "don't have the access that PC applications have."

In other words, as an end user you can't always turn off an automatic syncing feature or infrared beaming feature.

Symantec has a Palm-protecting version of its security software, Norton AntiVirus, in the works. But this isn't really Symantec's headache—unless you count the stress of counting the money it could make selling handheld antivirus solutions. In truth, however, it's Palm's problem.

"That's one step Palm could take; look at the internal security," Krempulec said.

"What we can do is provide protection at the desktop. That's how these viruses move right now."

A final word: more than anything else, LibertyCrack's mild success suggests users should be careful about downloading software for their PDAs.

"The problem is this looks like a safe program," Krempulec said. "You have to have the mindset that any of these things could have a virus."

—CanadaComputes.com

Palm hit with virus

Continued from page 60

The ILOVEYOU or "Love Bug" hit corporate email boxes through Microsoft Corp.'s Outlook program in May. This worm virus deleted picture files and other files on the recipient's computer and propagated through saved email addresses.

Palm's market penetration may be solid, but its installed base is still only a fraction of the number of desktop and notebook PCs. Also, that it must be transmitted to the handheld via HotSyncing from a PC makes successful dis-

"This is like when viruses started on boot disks. This is just the beginning."

—Kevin Krempulec, Symantec

tribution of the virus quite convoluted and slow.

The major virus security threat still lies with conventional computers.

LibertyCrack does count as a threat, however. After all, the Pilot's HotSync function is a popular way of adding features.

And with the impending spread of wireless connected handhelds, it won't be long before PDAs are substantially more vulnerable to viruses carried through the Web, Krempulec said.

"As more [PDAs] have email access and Internet access you could have a worm that propagates right through [from one infected wireless device to another]."

Internet connections are quickly becoming must-haves for PDAs, such as the excellent new Research In Motion BlackBerry 957 Internet

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Beyond the two, three... and four megapixel barrier

New consumer digicams from Canon, Epson, and Fujifilm

By Sean Carruthers

It seems like only yesterday that every manufacturer was shooting for one megapixel consumer-level digital cameras. Accordingly, we all ooh'd and ah'd at the pictures, marveling at the quality digital camera technology was then capable of. It's easy to become jaded in the modern age of computing, however, because technology advances so quickly. Now, with multi-megapixel models easily available, even around the magic \$1,000 mark, a one megapixel model seems decidedly old hat.

What that means, though, is that we get new digital cameras that offer us more resolution than we really need for a price that's still relatively affordable. We recently had a chance to look at three new multi-megapixel cameras.

Canon PowerShot S100 Digital ELPH

From: Canon Canada

Tel: 800-263-1121 <http://www.powershot.com>

Suggested retail price: \$1,100

The good

- 2.1-megapixel resolution allows high-quality shots at up to 1,600x1,200 pixels.
- Incredibly small design. The front of the camera has the same dimensions as a standard credit card, or 8.7x5.7 cm (3.4x2.2 in.), and is only 2.7 cm thick (about 1 in.). It weighs only 190 g (6.7 oz) without battery and media.
- The 2x optical zoom lens retracts into the camera when not in use, and two thin plastic "eyelids" cover the lens.
- Optical zoom can be enhanced with 4x digital zoom.
- Despite the compactness of the camera body, Canon still went with the larger CompactFlash (CF) media, and included an 8 MB CF card.
- The camera comes with a rechargeable lithium ion battery, which takes up a good portion of space inside the camera (this isn't bad, it just makes it more impressive that the camera is so small, even with large battery and the CF media, which is larger than SmartMedia). A charger is included.
- Camera features both optical and LCD viewfinders.
- Menu interface is relatively easy to use.
- Camera connects to the PC, via USB (for faster picture transfer) and a TWAIN driver (which allows you to import pictures directly into paint programs like Photoshop or PaintShop Pro).
- The power button must be pressed for a couple of seconds to turn the camera on, which prevents accidental power-up and battery drain when camera is packed in a purse or knapsack.
- Macro mode shots are impressive: camera shines a



light on target object and uses that for calibration, with excellent results,

- even close up.
 - Compatible with Windows 95/98/2000, and MacOS 7.5.3 and up. Compatibility with Windows NT through serial only (cable is optional).
- The bad
- The 8 MB CF card is probably on the small side.
 - For the price, the resolution is on the thin side: really, you're paying for the compact size of the device and not so much the image quality (although to be fair, the image quality is still very good).
 - The slight delay when powering on can be inconvenient if you are trying to take a time-sensitive picture, but this is a minor concern.
- The ugly
- When you run out of battery power, you're stranded unless you have another Canon battery pack handy. Because the battery is a proprietary design, you can't just pop in AAs from the corner store.

Although it's on the pricey side for the resolution it offers (though we did see it advertised recently in a Toronto store for \$849), the PowerShot S100 is an excellent camera for those looking for a stealth model.

It tucks easily into a pocket, but still takes great pictures, and has a lot of functionality. It also has wide OS compatibility, which is a big plus.

The proprietary battery format is a mixed bag: it provides longer life than a standard AA, and the fact that it's rechargeable will save money in the long run, but it can also leave you out of luck if you need to replace it in the middle of a shoot. The use of CF for media is a plus, allowing you to upgrade to a much larger card as the need arises, though it would have been nicer if Canon had included a card with at least 16 MB—8 MB is OK with a 2.1-megapixel model, but it will

still run out of space fairly quickly. This is certainly a nice little gadget with enough power to prevent you from thinking of it as a toy.

Epson PhotoPC 3000Z

From: Epson Canada

Tel: 800-463-7766

<http://www.epson.com>

Suggested retail price: \$1,349

The good

- 3.3-megapixel resolution offers very high quality images, at up to 2,048x1,904 uncompressed (can be saved as a raw TIFF to avoid JPEG artifacts). HyPict technology uses interpolation to boost the picture to 2,544x1,904 pixels.
- Camera uses either USB or serial to connect with the PC, and a TWAIN driver for transferring pictures, which means you can import photos directly into paint programs like Photoshop or PaintShop Pro.
- The camera comes with both optical and LCD viewfinders, and the optical viewfinder has a focus control on the side.
- Slightly larger form factor of 10.8x8.9x6.5 cm (4.2x3.47x2.5 in.), makes it easier to grip this camera than the more compact models. It weighs in at 331 g (11.5 oz.) without batteries.
- 3x optical zoom lens retracts into housing when not in use (although it still sticks out from the body). An included protective lens cover can be clipped on.
- In addition to a built-in flash, there is a flash seat on the top of the camera body, for use with other external flashes.
- The selector wheel on the top makes it easy to flip between modes, including playback, record, and recording with the LCD on (for better framing), as well as burst capture mode.
- Can capture up to 25 seconds of motion video at a resolution of 320x240 at 15 frames per second (fps).
- Uses the higher-capacity CF as storage media, and comes with a 16 MB CF card.
- Audio recording capability allows you to take audio notes to go along with captured images.
- Camera takes four AA batteries, and comes with four NiMH rechargeables and the battery charger, to lower your battery costs.
- Compatible with Windows 95/98/NT/2000, as well as Mac OS System 7.5, 8.5.1, and up.

The bad

- Both the power and shutter buttons are on the top right side of the camera, which makes it very easy to turn the camera off when attempting to take a picture.
- Actual location of the shutter button is around the front end behind a bit of a ridge, which may cause the camera to wobble a bit when holding it free-hand.

Optra T614: Is 25 ppm fast enough for ya?

Lexmark has released the Optra T614, calling it the first black and white laser printer rated at 25 pages per minute (ppm). The printer offers 1,200x1,200 resolution, and is priced at \$1,800.

Optra T614

From: Lexmark Canada

Tel: 800-539-6275. <http://www.lexmark.com/canada/>

Estimated price: \$1,800

The spec sheet for this unit says the first page will print in nine seconds, with subsequent pages hitting the speeds of 25 ppm. In timed tests using the trusty TCP Test Lab stopwatch, the Optra T614 printed three copies of a nine-page document (27 pages total) in one minute and 11 seconds, including the initial seven-second warm-up from idle. While not a true measure of how quickly it would print 27 unique pages, we were impressed with the speed.

The quality of printed documents was excellent, as expected. Black and white reproductions of colour photos were very good, even before any software adjustments were made.

The spec sheet

The Optra T614 is powered by a 200 MHz processor, and can be enhanced with a wide variety of options.

Input options include 250-, 500-, and 2,000-sheet drawers, a duplex unit, and an envelope feeder. Available output options include an output expander, high-capacity output stacker, and a five-bin mailbox.

The printer measures 40.43x41.81x51.3 cm and weighs 20.4 kg. It comes with 8 MB of memory, which is expandable to 384 MB.

The Optra T614 can be connected to a network via a built-in RJ-45 jack, and can also be connected to a traditional PC parallel port. Software drivers are included for all flavours of Windows including NT, as well as AS/400, and UNIX.

Lexmark has included MarkVision with

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< HANDS ON >

Megapixel trio
Continued from page 62

- The menu interface leaves a bit to be desired in some ways, especially multi-select of pictures view, which is incredibly confusing.
- Standard captures came out a bit on the dark side out of the box (but this can be fixed with white balance).
- The ugly
- In single picture mode, it takes quite a long time to save a picture to the CF card—and you lose control over any other aspect of the camera until it is saved.
- Macro-mode shots are not very good at close range: close-ups are perfectly in focus in the LCD until you press the shutter, then the image defocuses drastically. Because these images are initially in focus, this seems to be a design flaw that should be looked into.

For me, Epson's cameras have always been quite nice but had a few key design issues that prevent them from being all they could be. This one is no exception. The resolution on this model is outstanding, with excellent detail at the lowest levels of resolution, and the external flash seat is a very nice feature. Earlier Epson cameras had a problem with the design of the playback/record selector, forcing you to scroll past "off," which retracted the lens and wasted batteries. This model fixes that, but introduces the possibility of hitting the power button when aiming for the shutter.

The buffering/processing of images is the key problem, though, which could well leave you holding the camera for 20 seconds while waiting for the previous image to save... not very handy if something picture-worthy happens during this time.

Other small things, however, show really good forethought, like the fact that the camera won't extend the lens until you remove the lens cover, preventing damage to both (it sounds basic, but some other cameras just try to ram their way through the lens cover).

I'm seriously conflicted about this camera because of this mixed bag of pros and cons. It is almost there in so many ways... but not quite close enough to get a whole-hearted recommendation.

FujiFilm FinePix 4700Zoom

From: FujiFilm Canada
Tel: 800-263-5018. <http://www.fujifilm.ca>
Suggested retail price: \$1,199

The good

- 4.3-megapixel resolution is achieved through a special FujiFilm-developed CCD, using an octagonal grid and interpolation. Pictures are captured at up to 2,400x1,800 resolution, which gives you file sizes of around 1.6 MB.
- USB connector links the camera to your PC if you use Windows 98. When connected, the camera is treated as an external drive, which allows you to simply drag photos from one location to another.
- The 4700 has the same basic form factor as the 1700 and 2700 models, using Fuji's "shirt pocket" design, 7.8x8.3x3.3 cm (3x3.8x1.3 in.), with a weight of 255 g (8.9 oz.) without batteries.
- The 3x optical zoom lens retracts into the camera when not in use and is covered by a protective plate.
- Requires only two AA batteries, and it comes with two NiMH batteries and a charger, to lower your battery costs.
- The flash is hidden inside a spring-loaded compartment. You press a button on the side of the camera to eject use it (a much more elegant solution than



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< HANDS ON >

Megapixel trio

Continued from page 64

- pushing a button repeatedly to select which flash mode you want to use).
- Up to 80 seconds of 320x240 pixel motion video capture is available at 10 fps.
- The camera has both optical and LCD viewfinders.
- Menu interface is relatively easy to use, and four directional buttons make it easy to scroll through options.
- Displays "Hello!" and "Bye!" in the control area's LCD when powering on and off, which is a friendly touch (though hardly essential).

The bad

- Despite the extremely high resolution, the JPEG algorithm creates some artifacts, which leads to a slight blurriness in some fine details and odd texturing in areas of smooth solid colours. Details actually appeared crisper on the lower-resolution Epson camera.
- The camera uses the ultra-thin SmartMedia storage

solution, which is more fragile than CF and doesn't offer the same capacity as the rival CF format, offering a maximum of 64 MB as opposed to 128 or 192 MB for CF.

- Although it ships with two NiMH AA-size batteries, if you run out of juice in the middle of a photo shoot, you may be stuck if you don't have more NiMH or NiCad batteries on-hand, because it will not accept all standard alkaline batteries (although you can use premium alkaline batteries in an emergency, it wouldn't accept any of the ones we fed it).

The ugly

- If you are using Windows NT or 2000, you cannot currently upload pictures via the USB cable (in the case of Windows 2000, it's just a question of waiting until the driver files are written and available), but instead must use the FlashPix floppy diskette adapter, which costs extra.

FujiFilm has been at the cutting edge of consumer-level image resolution for the

one-page card that directs users to the setup guide, publications CD-ROM, and driver utilities CD-ROM. Instructions and images in the setup guide are easy to understand. Also included are such helpful tips as, "make sure your fingers are not under the printer when you set it down." The publications CD-ROM takes the user to online information—which can be printed or placed on a network for other users.

The cutout handholds on each side of this unit make lifting easier. For this alone, Lexmark gets high marks from me—every heavy printer should have some form of handle, yet few do.

Lexmark warranties the Optra T614 for one year. The unit must be returned to Lexmark for repair or replacement.

—Dave Chappelle

Optra T614: Is 25 pages per minute...

Continued from page 62

the Optra T614. This software allows users to configure and change printer settings over a network, and to view printer errors, settings, printer inventory, and statistics without actually going to the printer.

Lexmark offers prebate and regular cartridges. Prebate cartridges are specially priced and can be returned only to Lexmark for remanufacturing. Regular cartridges are offered at regular prices. While shipped with a 10,000-page prebate cartridge, 25,000-page prebate and regular cartridges are available.

Acceptable media for the Optra T614 include plain paper, envelopes, card stock, and transparencies, as well as paper, vinyl, and polyester labels.

One nice touch is the Optra roadmap, a

last couple of years, and the FinePix 4700Zoom has raised the bar higher than ever.

Where most cameras use a CCD that lines up all the sensor elements in a chessboard-like grid, FujiFilm's Super CCD technology uses an octagonal grid, to better detect diagonal shading differences, as well as horizontal and vertical. The octagonal shape also allows cells to be larger, increasing light sensitivity.

When a camera is able to create such high resolution images, a natural consequence is that the image files are absolutely huge. FujiFilm has incorporated JPEG compression to reduce the file size to about 1.6 MB (allowing just nine images to be stored on the included 16 MB memory card).

Oddly, the compression or the SuperCCD technology, or some combina-

tion of the two blurs some of the detail from the final image and also introduces slight but visible mottling on some textures.

We should point out that these are not as evident in images of natural objects like foliage, and overall, will not be an issue for snapshot-size prints.

In summary, the camera takes pictures of exceptional quality, and the price point is fairly attractive, too—it's in the same ballpark as some of the two megapixel offerings that are already a lot older.

For a better idea of what each of these resolutions mean, check out this article on <http://www.canadacomputes.com>, where we'll be posting photo samples of a variety of digital cameras we've been testing, showing you the difference in fine details when you step up the megapixel ladder from one to two, to three to four. □

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NB—Pet fanatics who also happen to be Web junkies now have reason to rejoice. The Ralston Purina Company and the Radio Voyager Network are launching what they regard as the first-ever global online radio network produced exclusively for pet enthusiasts. The Purina Radio Voyager Network will include contemporary music, live CNNRadio News, original pet programming, and contests and promotions every hour. The station will be streamed from Purina's Dog Chow and Puppy Chow Web sites. The company said it plans to expand the radio network to other Purina cat and dog food sites in the future.

<http://www.purina.com/>

Mac users not forgotten

NB—DealMac.com, which says it is the Web's premier comparison-shopping resource for Apple Mac-related products and services, has launched MydealMac.com, a free online personalized bargain-hunting service that emails the hottest Mac deals directly to your mailbox. The site also provides the latest news about the best bargains, discounts, rebates and promotions for the Apple Mac community across the Web.

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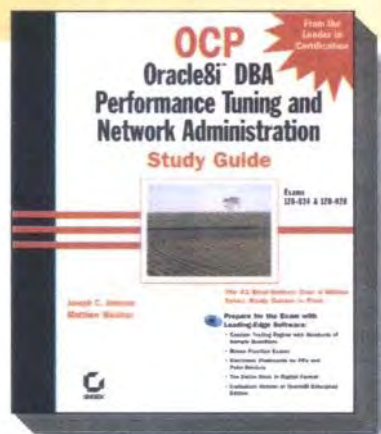
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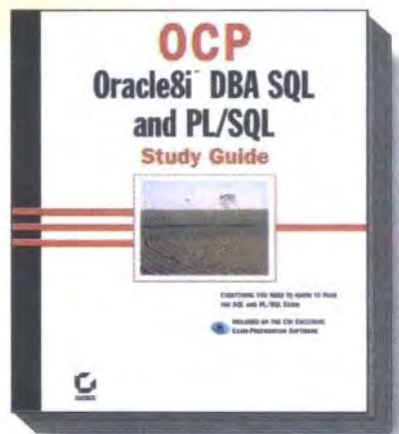
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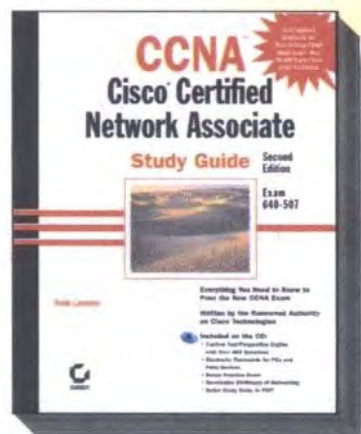
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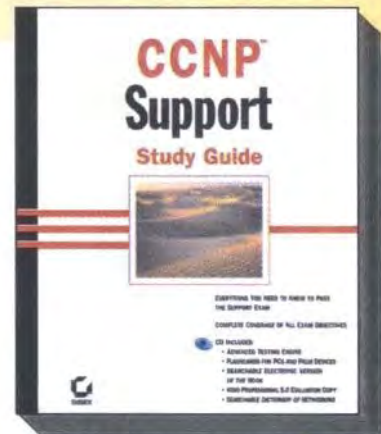
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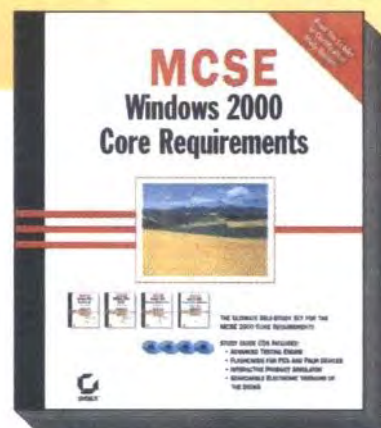
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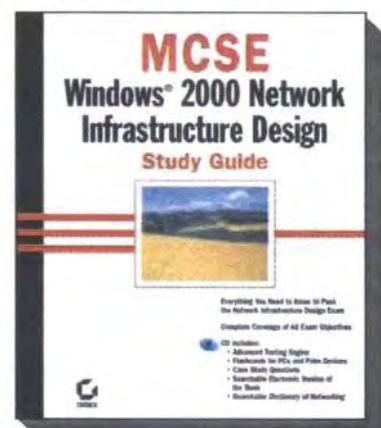
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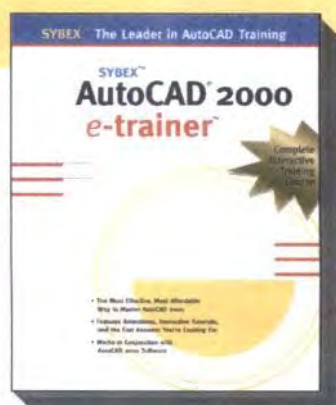
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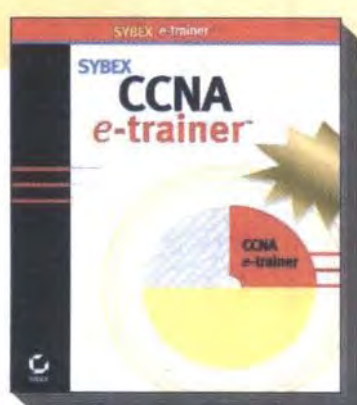
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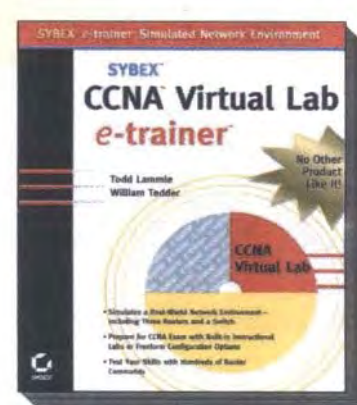
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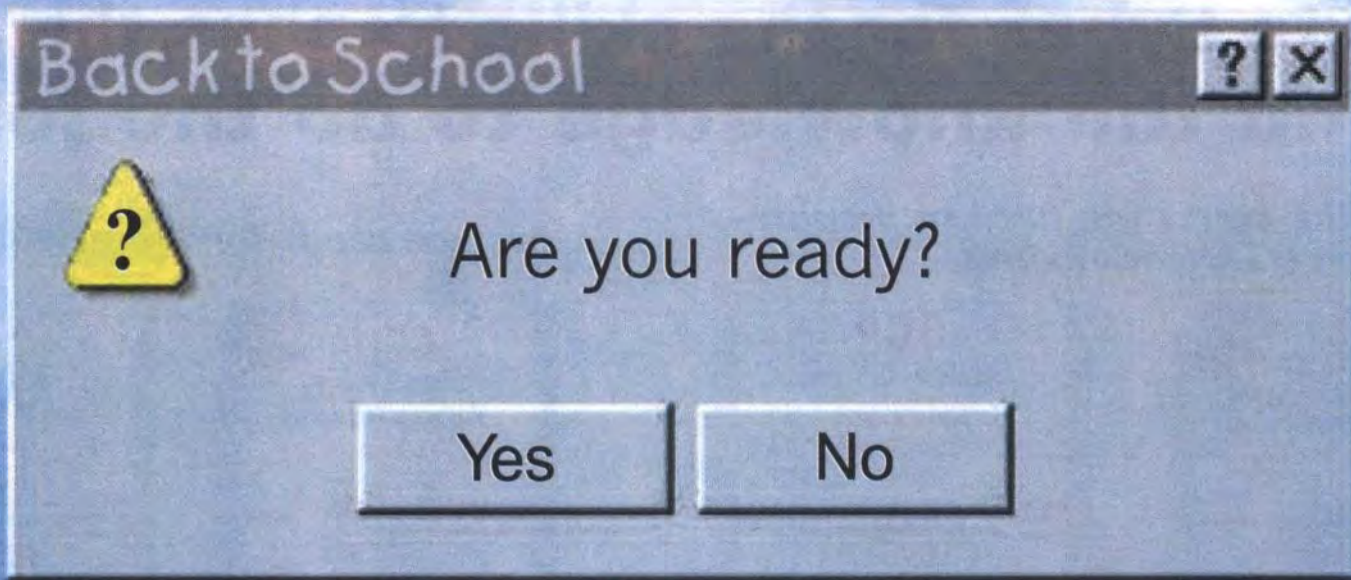
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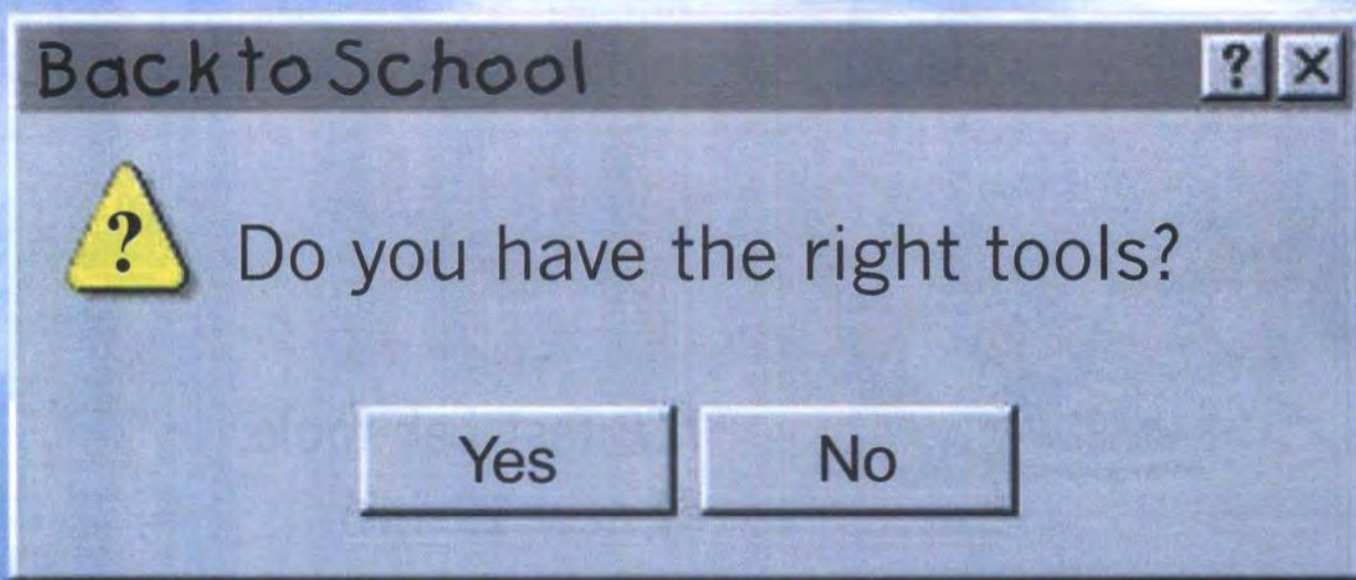
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Hey 19!

TCP Test Lab looks at new 19-inch CRT displays

By Sean Carruthers

When we predicted two years ago that 17-inch monitors were going to be big, we were only

partly making a pun on the size. In the interim, the 17-inch monitor has gone on to dominate the cathode ray tube (CRT) monitor marketplace, and those who always look for the next step up started to

just after the 19-inch models. And just as with the 17-inch models two years ago, the price point on the new 19-inch models is now low enough to be tempting to both the professional and the consumer.

There are a few groups who may be considering a move up to a 19-inch monitor:

- graphics professionals, who need as much resolution as possible for working with larger image files;
- game enthusiasts, who want to really immerse themselves in the action;
- office professionals who find that spreadsheets are getting bigger and bigger every day, and could use higher resolution to compensate;
- anyone who uses a monitor for public display purposes, for trade shows, or for advertising inside a retail location;
- everyday computer users who need to replace an older monitor, and want something nice and big... just because.

The simple fact that 19-inch displays are bigger than 17-inch models means you can get even more detail by boosting the resolution even higher: where many 17-inch monitors would comfortably top out at a resolution of 1,280x1,024, 19-inch monitors can more easily handle 1,600x1,200.

This is important for those working with projects where every bit of screen space counts. Being able to bump the resolution from 800x600 up to 1,280x1,024 without general screen defocusing is a big

Continued on page 71

Standard 19-inch CRT monitor survey

	Daytek Vista V19	Future Power 19DB02	LG Studioworks 912U	NEC AccuSync 90	ProView BZ-986	Sceptre DragonEye D98A	Tatung C9R	TTX Medallion 8997	ViewSonic E790
Specifications									
Viewable area (inches)	18	18	18	18	17.9	18	17.9	18	18
Dot pitch (mm)	0.26	0.26	0.26	0.26	0.25	0.26	0.25	0.25	0.26
Tube type	shadow mask	shadow mask	shadow mask	shadow mask	shadow mask	shadow mask	shadow mask	shadow mask	shadow mask
Screen coating	AR AS	AR AS	AR AS	AS, Opti-Clear	AG AR AS	AR AS	AR AS	AR AS	AR AS
Max. screen size (pixels)	1,600x1,200	1,600x1,200	1,600x1,200	1,920x1,440	1,600x1,200	1,600x1,200	1,600x1,200	1,920x1,440	1,600x1,200
Horizontal frequency (kHz)	30 - 95	30 - 96	30 - 110	31 - 70	30 - 86	30 - 95	30 - 95	30 - 97	30 - 95
Vertical frequency (Hz)	50 - 150	50 - 160	50 - 200	55 - 160	40 - 150	50 - 120	50 - 160	50 - 160	50 - 160
Connector	D-Sub	D-Sub	D-Sub	D-Sub	D-Sub	D-Sub	D-Sub	D-Sub	D-Sub
Max power consumption (W)	130	140	140	110	120	135	120	120	130
Emissions certification	MPR-II, TCO95	MPR-II (TCO95 opt)	MPR-II, TCO99	MPR-II	MPR-II	MPR-II (TCO99 opt)	MPR-II (TCO95 opt)	MPR-II (TCO99 opt)	MPR-II, TCO95
Weight (kg)	21.5	21	23	20	19.6	21	23	19	22
Dimensions (WxDxH in cm)	47.8x48x47.8	45.7x48.3x48	45.8x41.1x45.9	44.2x45.5x45.3	44.6x45.5x45.2	45.2x47.2x46.2	46.3x46.5x48.6	46x41.6x46.1	45.2x46.8x46.5
Controls									
Pincushion control	yes	yes	yes	yes	yes	yes	yes	yes	yes
Pinbalance control	yes	yes	yes	yes	yes	yes	yes	yes	yes
Trapezoid control	yes	yes	yes	yes	yes	yes	yes	yes	yes
Parallelogram control	yes	yes	yes	yes	yes	yes	yes	yes	yes
Rotation control	yes	yes	yes	yes	yes	yes	yes	yes	yes
Convergence control	no	no	yes	no	no	yes	no	no	yes
Other		corner pin, zoom, moiré	side pin, moiré, zoom	moiré cancel				linearity, moiré, purity	moiré, zoom, corner pin
Ratings									
Regulation - screen size	excellent	excellent	excellent	poor	good	excellent	excellent	excellent	excellent
Regulation - colour intensity	very good	very good	good	good	good	poor	very good	very good	very good
Convergence	very good	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
1,024x768	110 Hz	85 Hz	120 Hz	100 Hz	85 Hz	100 Hz	100 Hz	100 Hz	100 Hz
corner focus	very good	very good	excellent	excellent	good	excellent	excellent	excellent	excellent
moiré interference	minimal	some	minimal	medium	some	some	minimal	some	some
geometric integrity	very good	excellent	excellent	excellent	good	very good	excellent	very good	excellent
1,280x1,024	85 Hz	75 Hz	85 Hz	85 Hz	75 Hz	85 Hz	85 Hz	85 Hz	85 Hz
corner focus	very good	very good	very good	excellent	good	very good	very good	very good	excellent
moiré interference	some	some	minimal	some	some	medium	minimal	minimal	minimal
geometric integrity	very good	excellent	very good	excellent	good	very good	excellent	very good	excellent
1,600x1,200	75 Hz	75 Hz	85 Hz	75 Hz	60 Hz	75 Hz	75 Hz	75 Hz	75 Hz
corner focus	very good	good	very good	good	poor	excellent	good	very good	excellent
moiré interference	some	medium	some	medium	some	minimal	minimal	some	some
geometric integrity	very good	very good	very good	excellent	good	very good	excellent	very good	excellent
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Warranty	3 years	5 years	3 years	3 years	3 years	3 years	3 years	3 years	3 years
Price	\$450 SRP	\$399 SRP	\$619 street	\$440 street	\$429 street	\$450 street	\$465 SRP	\$499 street	\$609 SRP

Lab Test: Hey 19!

Continued from page 70

plus: you can fit more onto the screen whether it's a single large document or a series of smaller windows. Even if you choose to work at the same resolution as before, the larger screen size allows you to sit 1,600x1,200 further back from the monitor if you prefer or, at the very least, reduce eyestrain. Why squint to make out tiny little items on your screen if you don't have to?

When you get up to 19 inches, however, the picture isn't entirely rosy. Those who have already stepped up from 14- or 15-

inch models to a 17-inch display know that as your screen gets larger, the entire device starts to become a desktop monolith. The footprint can increase dramatically, eating up space from side to side, and more notably, from front to back. Before you upgrade, make sure you have the space on your desktop! It's possible that the monitor will fit, but will you still have room to set down your coffee? Will you have enough space to use your keyboard without the monitor then being four inches away?

Further, if you thought 17-inch monitors were heavy, you haven't tried lifting a

19-inch monitor yet. Standard models weigh around 25 kg (50 to 60 lb.)—even the more compact short-depth models (which save space on the desktop) are nearly the same weight. If your situation requires a monitor be moved with any regularity, a 19-inch model will provide you with the perfect opportunity to throw your back out, so be extra careful.

Why stick with the tube?

With the size and weight of these displays, you may be wondering what the rationale is for sticking with the old tube-

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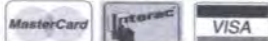
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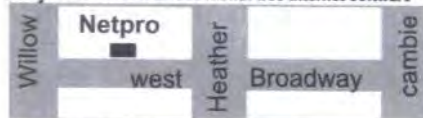
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Lab Test: Hey 19!

Continued from page 71

based CRT monitor when you could move to the shiny new world of LCD flat-panel displays, which are both compact and light. In a word: money.

Most CRT displays still provide a high-quality image at a fraction of the cost of a TFT display with a similar viewable size (compare a 19-inch CRT at around \$800 with an 18-inch TFT display at about \$5,000... quite a difference).

Further, it's easy to argue that the CRT still often provides a more flexible solution, since you can change the resolution of the display without a degradation of picture—TFTs have a hardwired optimal resolution, and changing it often leads to dithering. And if you work in graphics production you'll probably agree that TFT displays still can't match the smooth image you get from a high-quality tube display.

The impact on health of radio frequency (RF) and electric-magnetic field (EMF) emissions continue to be a concern for some users, however, and CRT monitors have higher emission levels than TFT displays. One of the selling

points of TFT monitors is the very low levels of RF and EMF emissions. Although CRTs have come an awfully long way in terms of emissions control, there still are some concerns. MPR-II and TCO95 are two of the most stringent standards for emissions, and monitors that carry these stickers have met these standards. TCO99 is the more stringent of the two, requiring that monitors have higher levels of shielding. No CRT monitors, however, provide perfect shielding against all radiation. More information on these standards can be found at the site for The Swedish Confederation of Professional Employees (<http://www.tco.se/eng/index.htm>).

Just a flicker from the past

One of the things that has plagued CRT monitors in the past is flicker. The inside of each CRT tube is covered with tri-coloured phosphor patches that get hit by beams, causing them to glow. Each patch of phosphor is refreshed many times per second; this is measured in Hz—if each patch is refreshed 100 times a second, we say that the refresh rate is 100 Hz. Flicker occurs when the phosphor loses some or all of its glow

before the next pass of the beam—the slower the refresh rate, the more noticeable this phenomenon is. Flicker diminishes or vanishes at around 60 cycles per second, so generally this is a minimum refresh rate for acceptable image stability.

The blame for flicker is two-fold: your monitor, and your video card. Older video cards with less onboard memory required a trade-off: you had to settle for a higher refresh rate or a higher resolution, but you couldn't get both. That's still the case today, to an extent, though the increase in the memory on the graphics cards has made it an irrelevant dichotomy, for the most part. On the older cards, if you wanted a screen resolution of 1,024x768, you might have to settle for a refresh rate of 60 Hz. Now, you still lose some refresh capability by upping the screen resolution to even 1,600x1,024, but you can often still run in that resolution with a refresh rate of 75 or 85 Hz. Of course, this still depends on the capabilities of both your video card and monitor—most 32 MB cards are capable of this, and you can check out this review to see a sampling of which 19-inch monitors can handle it.

Many have placed the flicker-free threshold at 75 Hz, although this is debatable. Some monitors look better than others at this resolution, and some people have eyes that can still detect some flicker at this resolution. In the lab, we generally like to use 85 Hz or higher. Most of the monitors in our roundup will easily handle 1,280x1,024 resolution at that refresh rate, and you'll only run into potential problems if you routinely run your monitor beyond that.

The tests

Monitor testing this month was conducted with the help of DisplayMate MultiMedia Edition 2.0, available from DisplayMate Technologies (<http://www.displaymate.com>). This suite has a series of tests to show a monitor's strengths and weaknesses, from moiré patterns to corner focus, from geometrical integrity to colour reproduction. We ran each monitor through the Video Obstacle Course in three different resolutions: 1,024x768, 1,280x1,024, and 1,600x1,200. The refresh rate for each resolution was the monitor's optimal setting for that resolution, and is noted on the chart beside the resolution.

Note: All prices were obtained from the vendors or their representatives, and were correct at the time of writing. As with all other areas of the computer industry, prices are subject to change. Estimated street prices and suggested retail prices are just that: estimated and suggested. Prices are subject to fluctuation from store to store and from region to region.

Standard CRT displays

By standard, we simply mean the type of CRTs we've come to know and love: those with the gently curved front. This often creates the most serious image distortion, because of the bending of the light when it hits the glass combined with the focusing issues near the edge of the screen. Most newer models have improved, but there are still some issues.

Daytek Vista V19

From: Daytek Canada
Tel: 877-329-8351. <http://www.daytek.ca>
Suggested retail price: \$450



The specs:

- 18-inch viewable area.
 - Shadow mask tube.
 - .26mm dot pitch.
 - Geometry adjustment includes pincushion, pinbalance, trapezoid, parallelogram, and rotation.
 - 1,600x1,200 maximum screen resolution (at 75 Hz).
- The tests:
- Geometry was a little bit off in the corners, with slight deformations that couldn't quite be straightened out.
 - Screen regulation was excellent, with no jumping noted and very little colour intensity shifting.
 - Minimal moiré interference was detected at 1,024x768, with more introduced at higher resolutions.
 - General focus was very good, with small text legible even at 1,280x1,024. Small text becomes indistinct at 1,600x1,200.
 - Though it doesn't have as many controls as some other monitors, the on-screen display (OSD) is quite easy to use.

Despite some minor geometric glitches around the edges of the screen, the Vista V19 is nonetheless a very good monitor overall: moiré is minimal at lower resolutions, and picture quality is consistently very good across the entire range of resolutions. The dot pitch may be on the coarse side for demanding users, but those looking to get a larger display for less money may find this unit a good choice.

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 Hercules 3D Prophet II GeForce2 GTS w/64MB RAM
 IBM Deskstar 75GXP 75GB Ultra ATA100 HD
 Dual Seagate Cheetah 18GB 15000RPM Ultra 160 SCSI HD
 Creative Labs Sound Blaster Live! Platinum
 Klipsch ProMeida V.2-400
 Adaptec Ultra 39160 SCSI controller
 PC Power & Cooling 24" full steel tower w/425W Power supply
 Microsoft Natural Keyboard Pro keyboard and Logitech mouse
 Sony F500 21" FD digital monitor (0.22, 2048X1536@75Hz)
 Windows 2000 Professional
 2 Year warranty (Parts & Labour)



\$13500

Dual Pentium III Server

Serious Server for serious tasks

Intel L440GX Dual Pentium III Server motherboard
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 Micron 256MB 168pin ECC PC100 SDRAM DIMM
 Panasonic 1.44MB floppy drive
 ASUS 50X internal CD-ROM
 Integrated Video card w/4MB RAM
 Integrated Ultra 2 SCSI controller
 Intel SRCU-21 RAID controller
 Quad Seagate Barracuda 18GB Ultra 160 hot swappable drives
 Integrated audio on board
 Intel SC5000 19" Rack mountable Server tower case
 Redundant 300W Power supply
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 Viewsonic E771 17" digital monitor
 Windows 2000 Server w/5 Client access licenses
 2 Year warranty (Parts & labour)



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Dual Pentium III 933MHz Workstation

Power workstation for Animation and 3D Graphics

MicroStar 694D Pro Dual Pentium III ATX motherboard
 VIA chipset supports UDMA100 and 4X AGP
 Dual Intel® Pentium® III 933MHz CPU (boxed model)
 Micron 512MB SDRAM DIMM w/SPD EEPROM
 Panasonic LS120 120MB floppy drive
 Plextor UltraPlex 40X internal Ultra SCSI CD-ROM
 3Dlabs Oxygen GVX420 w/128MB RAM and dual monitor support
 Quantum Atlas V 18GB Ultra 160 SCSI HD (7,200RPM, 160MB/sec)
 Adaptec Ultra 160 SCSI controller
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Realtime Digital video editing Station

Perfect system for video editing enthusiasts

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 Maxtor DiamondMax Plus 20GB UltraATA100 system drive
 Promise UltraATA 100 RAID controller
 Dual Maxtor DiamondMax Plus 15GB UltraATA100 video drive
 Creative Labs PCI 128 PCI audio card
 In-win Q500 24" full ATX tower case w/300W Power supply
 Microsoft 2-button intellimouse and internet keyboard
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 2 Year warranty (Parts & labour)



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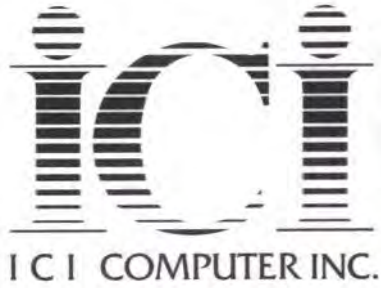
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Acer Wheel Mouse
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Acer 107 Keyboard
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20GB Ultra66 HDD
Panasonic 1.44MB FDD
ATI Xpert 2000 32M 4X AGP
Samsung 750S 17" Monitor
Acer 107 Keyboard
ATX Tower w/250W P/S
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ATI Xpert 2000 32M 4X AGP
NEC FE700 17" Flat
Logitech Internet Keyboard
ATX Tower w/ 250W P/S
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C-633MHz
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AMD Athlon (K7) PowerMax

Athlon Power User

AMD Athlon (K7) CPU
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64MB PC133MHz SDRAM
15GB Ultra66 HDD
Panasonic 1.44MB 3.5" FDD
ATI Xpert 2000 32M AGP
Samsung 750S 17".24 Monitor
Acer 107 Keyboard
ATX Tower w/ 300W P/S
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128MB PC133MHz SDRAM
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Samsung 750S 17".24 Monitor
Acer 107 Keyboard
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ICI Corporate Centre

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- 128MB PC133 ECC SDRAM
- IBM 18GB U2W SCSI Hard Drive
- On-board Adaptec Dual Channel Ultra2 SCSI Controller
- On-board GD 5480 2M Video Adapter
- On-board EtherExpress Pro 100+ LAN adapter
- Creative 52X CD-ROM
- Panasonic 1.44MB Floppy Drive
- Samsung 550S 15" SVGA Monitor
- 107-key keyboard & PS/2 mouse
- ATX Server Chassis w/300W P/S

PIII-800	PIII-866	PIII-933
\$2668	\$2828	\$3068
\$96/mo	\$102/mo	\$110/mo

Intel 815E Workstation

- Intel Pentium III 733/800/866MHz CPU
- Intel 815EEAAL MotherBoard
- 128MB PC133 SDRAM
- 20GB ATA100 Hard Drive
- On-board Intel Graphics Adapter
- On-board EtherExpress Pro 100+ LAN adapter
- On-board Creative PCI Sound Adapter
- Creative 52X CD-ROM
- Logitech Internet keyboard
- Microsoft Intellimouse
- 280W Stereo Speakers
- Panasonic 1.44MB Floppy Drive
- ICI 17" ATX case w/250W P/S
- NEC FE700 17".25 Flat Screen Monitor

PIII-733	PIII-800	PIII-866
\$1498	\$1638	\$1998
\$54/mo	\$59/mo	\$72/mo

ICI Network Solution

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- Total networking & Internet Solution.
- Internet sharing: 56K, Cable modem, ADSL.
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- Virtual private networking.
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Asus 6600 GeForce 32M Deluxe	...\$298
Asus 6800 GeForce 32M DDR Deluxe	...\$338
Asus GeForce 64M Pure/DDR	...\$268/408
Asus V7700 GeForce2 32M DDR/TV	...\$448
Asus V7700 GTS DDR 32M/64M	...\$398/518
ATI Rage 3D 8M/Xpert 2000 32M AGP	...\$48/108
ATI Rage Fury 32MB/32MB Pro	...\$148/160
ATI Rage Fury MAXX 64MB 4xAGP	...\$248
ATI Radeon 32MB/64MB DDR	...\$360/518
ATI All-in-wonder 128 Pro 16M/32M	...\$208/268
Creative GeForce2 GTS 32M	...\$408
Matrox Millennium G400 16M/32M	...\$148/188
Matrox G400 32M Dual Head/Max	...\$228/288
Matrox G400 TV 16M	...\$398
Voodoo3 2000/3000/3500 16M	...\$118/148/268
Voodoo5 5500 64M 4x AGP	...\$428

LCD Panel

NEC 1525V / 1525M 15"	\$1268/1398
NEC 1525X/ 1525S 15"	\$1589/2398
NEC 1810-1 18"/ 2010-1 20"	\$3738/5668
Panasonic LC50 15"/ LC90S 19"	\$1550/5678
Samsung 570S/ 570B	\$1298/1398
Viewsonic L700 15"	\$1328
Viewsonic VE 150/ VP 150	\$1288/1498
Viewsonic VPA 150 15"	\$1598
Viewsonic VG 150B/ 150 15"	\$1348/1488
Viewsonic VPD 150/ VP 151	\$1468/1998
Viewsonic VP181 18" (digital)	\$4228

Monitors

AOC 17" 7GlR .25 / 19" 9VLR .26	...\$278/398
NEC DP73/ DPro 710S 17"	...\$418/548
NEC DP91/ DPro 900U 19"	...\$678/888
NEC DP200U/ DPro 2040U 22"	...\$1298/1598
NEC 17" AS70 17"/ AS90 19"	...\$288/468
NEC FE700 / FE700M / FE750 17"	...\$378/448/478
NEC FE950 19"/ FE1250 22"	...\$678/1238
NEC FP950 19"/ FP1350 22"	...\$788/1368
Panasonic 17" E70/ SL75 / PL70	...\$318/358/488
Samsung 550S 15"/ 750S 17" .27	...\$198/268
Samsung 753DF 17" .20 1280x1024 (-\$30)	...\$358
Samsung 700NF 17" .25 1600x1200	...\$428
Samsung 955DF 19" .20 1600x1200	...\$578
Samsung 900NF 19" .25 1600x1200	...\$660
Sony E200/ G200	...\$518/578
Sony 19" E400 / G400	...\$698/798
Sony E500 / G500 / F500	...\$1298/1468/2468

Viewsonic Monitors

E771 17" .27mm 1280x1024	\$318
E773 17" .25mm 1280x1024	\$378
EF70 17" .25mm 1280x1024	\$398
G773 17" .26mm 1280x1024	\$388
PF77 17" .25mm 1600x1280	\$528
PF775 17" .25mm 1600x1280	\$478
PS775 17" .25mm 1600x1280	\$468
E790 19" .26mm 1600x1280	\$518
GS790 19" .26mm 1600x1280	\$598
PF790 19" .25mm 1600x1280	\$668
PF795 19" .25mm 1920x1440	\$828
P810 21" .25mm 1600x1280	\$1168
P815 21" .25mm 1800x1440	\$1268
PF815 21" .25mm 1920x1440	\$1298

NoteBook / Mobile Solution

IBM

i1210 C-500 32M 6G 12.1HPA 24X 56K	\$1568
i1230 C-500 64M 6G 13HPA 24X 56K	\$1838
i1250 C-500 64M 6G 12.1TFT 24X 56K	\$1988
i1500 C-500 64M 12G 12.1TFT 24X 56K	\$2388
A20m PIII-500 64M 6G 12.1TFT 24X 56K+LAN	\$2968
A20m PIII-700 64M 12G 14.1TFT 24X 56K+LAN	\$3918
A20p PIII-700 128M 18G 15TFT DVD 56K+LAN	\$5038
T20 PIII-650 128M 6G 13.3TFT 24X 56K+LAN	\$4088
T20 PIII-700 128M 12G 14.1TFT DVD 56K+LAN	\$4998

Acer

508T C-500 64M 4.8G12.1TFT 24X 56K	\$1946
521TE PIII-600 64M 6G 13.3TFT 24X 56K	\$2598
521TXV PIII-600 64M 6G 14.1TFT DVD 56K	\$3088
600TER PIII-600 128M 12G 13.3TFT CDRW 56K+LAN	\$3288
602TER PIII-650 196M 12G 13.3TFT CDRW 56K+LAN	\$3588

Fujitsu

E6150 C450 128M 6G 14.1TFT 24X 56K	\$2498
E6250 PIII-450 128M 6G 14.1TFT 24X 56K	\$3098

HP HANDHELD PC

HP Jornada 540 (16M)/ 548 (32M)	\$598/728
HP Jornada 680 (16M/56K)/690 (32M/56K)	\$1098/1198
HP Jornada 820 (16M/ 56K/ 640x480)	\$1298

3Com

PalmPilot IIIe/ IIIx/ IIIc	\$208/333/548
PalmPilot V/ Vx	\$438/533

TOSHIBA

4270Xdvd C-500 64M 6G 14.1TFT DVD 56K	\$2798
4270Zdvd C-500 64M 12G 15.0TFT DVD 56K	\$3398
4330 C-650 64M 10G 14.1TFT DVD 56K	\$3298
3440CT PIII-500 64M 6G 11.3TFT DVD 56K	\$3298
4260Xdvd PIII-450 64M 12G 14.1TFT DVD 56K	\$3388
4340 PIII-650 64M 12G 14.1TFT DVD 56K	\$3768
8100 PIII-500 64M 12G 14.1TFT DVD 56K	\$3758

NoteBook Add-On's

PCMCIA CARD

Adaptec 1350 Mini SCSI Parallel Port Kit	\$98
Adaptec 1460D/1480A SlimSCSI Kit	\$170/245
Intel Pro100 LAN CardBus (Realport)	\$128
Intel Pro100 LAN+56K Modem Cardbus Realport	\$298
Linksys Ethernet PCMCIA 10BT/ 10/100BT	\$78/98
MegaHertz 3CCFEM556 56K Modem+10/100	\$308
Xircor Realport 56K V.90 + 10/100 BT	\$398

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HP 820e 4X4X20 CD-RW PCMCIA/SCSI	\$498
Micro Solution Bantam 24X CD-ROM	\$218
Micro Solution Bantam 24X CD w/Sound	\$258
Micro Solution 4X4X20 CD-Writer/Dualport	\$418/448

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32/ 64/ 128M	\$80/120/238 & up
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IBM 6/ 12/ 18/ 25GB 2.5" HDD	\$248/348/525/768
Toshiba 6/ 12/ 18GB 2.5" HDD	\$228/318/428
Targus Notepac CN01/CN20	\$41/30

Network Products Centre

Intel Product Line

Network Adapter

Intel 8460B 10/100 Management Adapter	\$63
Intel 8470B 10/100 Server Adapter	\$135
Intel 8472B 10/100 Dual-Port Server Adapter	\$288
Intel 8490 Gigabit Server Adapter	\$928

Hub & Switch

Intel In-Business SH10T5 5 Port Hub (10BT)	\$64
Intel In-Business SH10T8 8 Port Hub (10BT)	\$77
Intel In-Business SH100TX4 4 Port Hub (10/100)	\$115
Intel In-Business SH100TX8 8 Port Hub (10/100)	\$160
Intel In-Business SS101TX4 4 Port 10/100 Switch	\$148
Intel In-Business SS101TX8 8 Port 10/100 Switch	\$205
Intel In-Business SH101TX16 16 Port 10/100 Hub	\$298
Intel Express 330T Stackable 16 Port Hub (10/100)	\$768
Intel Express 330T Stackable 24 Port Hub (10/100)	\$1098
Intel Express 410T Standalone 16 Port Switch (10/100)	\$780
Intel Express 410T Standalone 24 Port Switch (10/100)	\$1088
Intel Express 460T Standalone 16 Port Switch (10/100)	\$1088
Intel Express 460T Standalone 24 Port Switch (10/100)	\$1380
Intel Express 520T Scalable 12 Port Switch (10/100)	\$1868
Intel Express 550T Scalable Routing Switch	\$2888

Printer Server

Intel Netport Express 10/100 Ext. Printer Server 1 Port	\$308
Intel Netport Express 10/100 Ext. Printer Server 3 Port	\$438
Intel InBusiness Printer Station 10/100 2 Port	\$228

InBusiness Station

Intel InBusiness Internet Station	\$188
Intel InBusiness E-Mail Station	\$968
Intel InBusiness Storage Station 30G/ 60G	\$1248/1798
Intel InBusiness Small Office Network Station \$1798 (8 port Hub / 13G Storage & Backup / E-Mail / Firewall / Printer Server)	
Intel InBusiness Small Office Network Plus Station (same as above, with additional 13G for mirroring)	\$2468

Virtual Private Network

Intel Shiva VPN Gateway Express	\$5678
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3COM & D-Link

Network Adapter

3COM 3C905B-TX 10/100 PCI Adapter	\$68
Acer 10BT Combo / 10/100 PCI Adapter	\$18/25
D-Link 528CT PCI Combo	\$20
D-Link DFE-530/538TX 10/100 PCI Adapter	\$25

Home/Office Network Kit

D-Link DFE-905 4 Port 10/100 Hub/2xNIC/2xCable	\$155
Linksys 5 Port 10BT Hub/2xNIC/2x cable	\$78
Linksys EtherFast Cable/DSL Router (1 port)	\$168
Linksys EtherFast Cable/DSL Router (4 port)	\$238
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10 BaseT Hubs

3COM 3C19260 5 Port Hub	\$60
3COM 3C16440 SS II Entry Hub 12 Port	\$220
3COM 3C16441 SS II Entry Hub 24 Port	\$338
3COM 3C16700 OfficeConnect 8/TPO	\$118
D-Link DE-805 TP/C 5 Port Hub	\$55
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3COM 3C16750 OfficeConnect 8 Port 10/100BT	\$199
3COM 3C16751 OfficeConnect 16 Port 10/100BT	\$329
D-Link DSH-5 10/100 5 Port Hub	\$105
D-Link DSH-8 10/100 8 Port Hub	\$150
D-Link DSH-16 10/100 16 Port Hub	\$288
3COM 3C16951 SS-II 10 Switch 1100 12 Port	\$950
D-Link DSS8+ 8 Port 10/100 Switch	\$148

APC Power Protection

BackUPS 300 / 500 / 650M	\$125/182/249
BackUPS Pro280B/ 350/ 420/ 650	\$180/208/288/388
BackUPS Pro 1000 /1400	\$535/688
SmartUPS SU420/ SU620/ SU1000	\$318/408/718
SmartUPS SU1400/ SU2200/ SU3000	\$930/1298/2058

Network Cables

10/100 BaseT Cable 10/ 25/ 50/ 100ft	\$8/15/25/38
10/100 BaseT Cable Bulk per ft / per 1000ft	\$.25/158
Crimping Tool: RJ45 / BNC	\$22/30

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SOUND BLASTER 128 PCI (onboard)
56K V.90 D/F/V MODEM PCI
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Pentium III 933 \$999
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Celeron II S370/566/600/633 \$187/\$210/\$260
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AMD DURON 600/650/700 \$138/\$172/\$242

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Fujitsu 20G \$149
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Maxtor 30G/40G 185/\$249
Maxtor 15G/20G 7200RPM \$149/\$189
Maxtor 30G/40G 7200RPM \$245/\$329
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128MB /256MB SDRAM PC-133 \$222/\$499
128MB RAMBUS 800MHz \$555
64MB SDRAM ECC PC-100 \$133
128/256MB SDRAM ECC PC-100\$249/\$526
128/256MB SDRAM ECC PC-133\$268/\$539

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Viewsonic 17" E771 .27 \$335
Viewsonic 17" E773 .25 \$399
Viewsonic 17" G773 .26 \$409
Viewsonic 17" PS775/EF70 .25 \$499/\$419
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LG 775FT 17" \$379
SAMSUNG 17" 750S/ 700NF \$299/\$459
SAMSUNG 17" 753DF \$379
PANASONIC 17" E70/SL75 \$322/\$349
SONY G200 / G400 \$599/\$835
MAG 786/796FD \$435/\$472

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56k D/F/V PCI Modem \$29
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USR 56k Fax/D/V int PCI OEM \$55

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ASUS 50X \$65
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ATI All-in-Wonder 128 32MB AGP \$239
ATI RADEON 32MB DDR \$349
ATI RADEON 64MB DDR/VIVO \$418
ASUS V6800 32MB AGP reg/dlx \$295/\$349
ASUS V7700 32MB AGP reg/dlx \$425/\$479
Powercolor TNT2 m64 32MB AGP \$99
Powercolor TNT2 Pro 32MB AGP \$138
3dfx VooDoo3 3000 16M \$139
3dfx VooDoo5 5500 64M DDR AGP \$439
AOPEN GE-FORCE 2 MX 32MB AGP \$219

Sound / Multimedia

3D Stereo Sound Card \$18
Sound Blaster 128 PCI \$45
Creative Ensoniq PCI Sound Card \$29
Sound Blaster Live value \$69
Sound Blaster Live Xgamer \$139
Sound Blaster Live MP3 \$139
Sound Blaster Live Platinum \$255
DIAMOND Monster Sound MX300 \$89
Speaker 100W/260W \$10/\$19
Speaker 420W/480W Subwoofer \$39/\$59
Speaker 850W /Subwoofer \$79
ALTEC LANSING ACS 45.2/54 \$95/\$130
CREATIVE PCwork4 Pt1000/2000\$130/\$230

Printer

Canon BJC1000B \$79
Canon BJC2000B \$99
Canon BJC7000B \$499
Brother Laser 1030 \$379
Brother Laser 1240DX \$465
Brother Laser 1250/1270 \$555/\$729
HP Deskjet 610 \$149
HP Deskjet 840C \$229
HP Deskjet 930C \$299
HP 1100 Laser \$559
Lexmark Inkjet Z12 \$99
Lexmark Inkjet Z32 \$199
Lexmark Inkjet Z52 \$289
Epson Stylus 440 \$115
Epson Stylus 670 \$139
Epson Stylus 870 \$409
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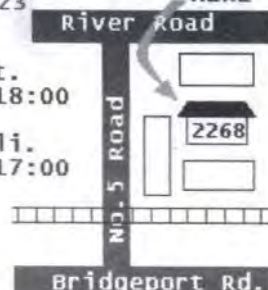
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20GB UDMA66 7200RPM HARD DISK DRIVE
QUALITY 17" ATX TOWER CASE
8X DVD DRIVE IDE
SOUND BLASTER LIVE VALUE PCI
56K V.90 D/F/V MODEM PCI
850W POWER SPEAKER W/SUBWOOFER
LOGITECH CORDLESS MULTIMEDIA

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15" MONITOR +\$180
17" MONITOR +\$269

\$1618

Multimedia Station

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128MB SDRAM PC-100
3.5" 1.44MB FLOPPY DISK DRIVE
TNT2 PRO 32MB AGP DISPALY CARD
20 GB UDMA66 HARD DISK DRIVE
QUALITY 17" ATX TOWER CASE
8X DVD DRIVE IDE
SOUND BLASTER 128 PCI
56K V.90 D/F/V MODEM PCI
850W POWER SPEAKER W/SUBWOOFER
IBM MULTIMEDIA KEYBOARD PS/2
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TNT2 M64 32MB AGP DISPLAY CARD
15GB UDMA66 7200RPM HARD DISK DRIVE
QUALITY 17" ATX TOWER CASE
48X CD-ROM DRIVE IDE
SOUND BLASTER LIVE VALUE PCI
USR 56K V.90 D/F/V MODEM PCI
500W POWER SPEAKER W/SUBWOOFER
107 KEYS WINDOWS 98 KEYBOARD PS/2
LOGITECH WHEEL MOUSE PS/2

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\$1268

Keyboard / Mouse

107 keys Win98 Keyboard \$17
Fujitsu 8725/4725 \$25/65
Microsoft internet keyboard & Mouse \$49
Microsoft natural keyboard elite & mouse \$55
Logitech cordless keyboard & mouse \$129
Logitech mouse2B/3B \$12/18
Logitech wheel Mouse PS/2/USB \$20/\$25
Microsoft intellimouse PS/2/USB \$28/\$32
Microsoft Optical wheel mouse \$98

Case

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Case Fan /Slot Fan /HDD Fan \$8/\$15/\$18

Jaz / Zip

ZIP 100MB IDE/PPL/SCSI \$79/\$158/\$178
ZIP 250MB IDE/PPL/SCSI \$179/\$248/\$248
LS120MB Floppy Drive \$129
JAZ 2G SCSI int/ext \$439/\$470
ZIP disk / JAZ disk \$16/\$114

Controller

Adaptec 2930U/2930U2 SCSI \$139/\$329
Adaptec 2940U2W / U2w Kit \$329/\$389
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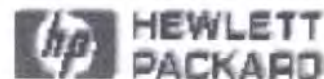
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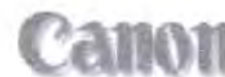
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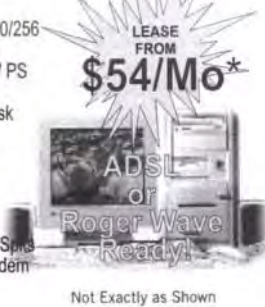


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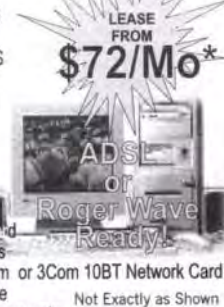


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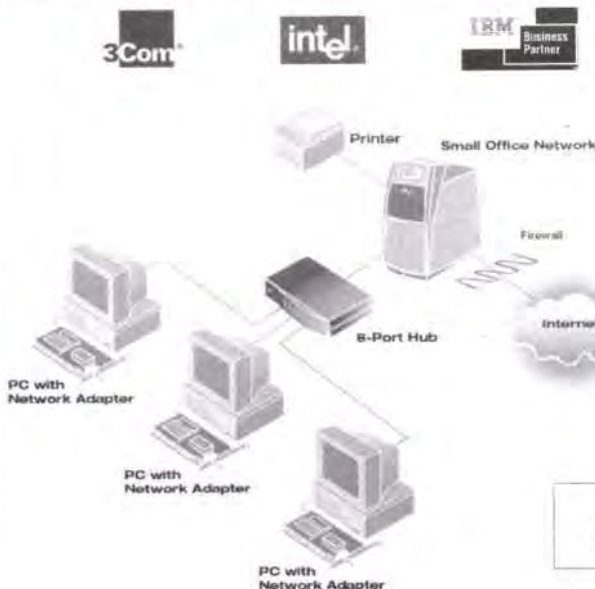
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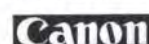
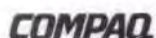
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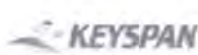
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Platform News

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This is about Me—and you

Windows Millennium Edition, or Me, hit the store shelves in mid-September. Should you sacrifice your latté budget for a couple of months and pop for this latest upgrade?

By David Tanaka

Windows 95 was a radical departure from Windows 3.x, both in terms of its onscreen appearance and its performance. The changes between Windows Millennium Edition and either Windows 95 or Windows 98, on the other hand, are incremental and subtle. Me is still recognizable as part of the 9x family.



Windows Millennium Edition

From: Microsoft Canada
http://www.microsoft.ca
Price: \$309, \$169 (upgrade from previous version)
Upgrade offer: \$84.99 (for Windows 98 users, until Jan. 15)

Microsoft says this version of Windows 9x will improve the user experience in four main areas: operating system "health," enhanced digital entertainment, home networking and Internet use. We installed the gold code version of Windows Me on two systems: a four-year-old 200 MHz Pentium desktop machine with 64 MB of RAM, and a one-year-old 400 MHz Pentium II notebook with 128 MB of RAM. Our first impressions are based on a couple of weeks experience using it on these systems. Both had had their hard drives reformatted and Windows 98 freshly installed within the last month (original Windows 98 on the desktop system and Windows 98 SE on the notebook).

Installation notes

The minimum system requirements for the revised Windows Me are a 150 MHz Pentium CPU with 32 MB of RAM, although to get the most out of some of the multimedia features, Microsoft recommends a 300 MHz processor and 64 MB of RAM.

Microsoft Canada spokesman Elliot Katz said during a product briefing that Windows Me would probably perform more sluggishly on PCs at or close to the minimum system requirement level, and our experience with the 200 MHz Pentium desktop unit bore this out, although overall, the performance was acceptable. The installation was uneventful, and timing the bootup sequence before and after showed a minor but negligible hit—one minute and five seconds on Windows 98 and

one minute and 10 seconds with Windows Me. But overall, the 200 MHz Pentium system feels about the same, but some operations—launching an application for example—feel slightly more sluggish, and there seems to be more disk thrashing. It's not something you're likely to notice unless you are specifically focusing on it.

The previously stable system began to exhibit some odd problems immediately after installation, but these did not recur. During one bootup, an alarming "out of range" message appeared on the monitor, saying that the vertical and horizontal frequency rates were set well beyond the monitor's recommended limits (the system uses an ATI All-in-Wonder Pro PCI video card and six-month old Princeton monitor). The only way we could get rid of this onscreen message was to hit the power off button on the computer, then reboot. In another instance, we were using Adaptec CD Creator 3.5 to record some data onto a disc. The session completed successfully, but then the cursor disappeared, the screen froze, and the system locked up. Again, the only way to recover was to turn the machine off and reboot.

Interestingly, in both cases, the system rebooted as though nothing were amiss. A similar lockup under Windows 98 would usually have invoked a ScanDisk session on the subsequent bootup. (But we did manage to produce a ScanDisk session on the notebook in one erratic session.)

We had a Ditto Max Pro tape drive attached to the parallel port on the desktop unit, which worked under Windows 98, but when we tried to install the Ditto98 backup software application, Windows Me gave us a warning message saying that it was not supported in this version of the operating system. We tried to install it anyway, but could not.

On the one-year-old Pentium II notebook running Windows 98 SE, Me installed with no problems in about 30 minutes (the installation on the 200 MHz Pentium desktop took approximately 45 minutes. We were pleased with the straightforward installation procedure on both machines.) After we made a few preliminary settings, we walked away and came back later to find the now-installed Me waiting for us to type in our password. Once that was done, the boot sequence finished and we were up and running.

Most of the applications that were on the notebook system work with no problems under Me. This includes Microsoft Office 2000, WordPerfect Office 2000, PageMaker 6.5, CorelDraw 9 (as well as a beta version of CorelDraw 10), and L&H Voice Xpress (Versions 4 and 5). A random selection of PC Card devices, including modem, network card, an Iomega Click! drive, IBM microdrive, and SanDisk CompactFlash memory cards (the latter two using a CF-to-PC Card

adapter) all worked as they had under Windows 98.

One exception is an oddity with Photoshop 5.5. If we double-click an image to open it in Photoshop, the filename that shows up in the image window's title bar is truncated to eight characters, plus the three-character extension. Shades of DOS! However, if we used FILE | OPEN from the menu bar to open the same file, the file name shows up properly in the title bar.

On the notebook, we have the hard drive partitioned into a primary C: drive, which holds the operating system, and two other logical drives, D: for applications and E: for data. The C: partition is just under 1 GB (994 MB) and Windows 98 and associated files occupied about half the space. After Me was installed, the system began to return "out of disk space" messages, and an inspection of C: drive properties revealed that it now contained more than 850 MB of files, with the variable-size virtual memory file often reducing the free disk space to less than 30 MB. Reassigning virtual memory to a partition with more free disk space eliminated the error messages. Microsoft technical support said that a full installation of Windows Me will occupy about 600 MB of hard disk space, so we may have to increase the size of the partition using a separate product like Partition Magic or Partition Commander to give the OS some breathing room.

Another oddity we encountered with the notebook is that sometimes on bootup, the TFT screen is a sickly pea green, as though the red video driver is not sending out a signal. If we reset the colour depth, the display becomes normal. This is a problem we are still trying to sort out, and can't say at this point if it is a driver problem or a hardware problem, and it may be entirely coincidental that it began showing up after Windows Me's installation.

We benchmarked Windows Me on one of the fast desktop systems in TCP's Test Lab, and found the scores were between five and 10 percent lower than the same system turned in running Windows 98. This is likely not a noticeable difference on a fast system, and our experience with the notebook bears this out. Overall, the 400 MHz Pentium II notebook feels about the same running Windows Me as it did under Windows 98.

Tweaks and tucks

There are a few immediate cues to tell you that you are in a different environment. The splash screen has been redesigned with the "summer" colours that are also found in Windows 2000, and once you are at the desktop screen, you'll see some redesigned icons for the Recycle Bin, My Computer and Network Neighborhood, which has been renamed My Network Places. Digging down a few mouse

Continued on page 81

Competition for Palm's low end

I remember when I got my first Palm handheld. It was the original US Robotics PalmPilot, barely a month after they had started to appear on the covers of some bleeding-edge magazines. This meant I spent considerable time justifying its existence to skeptics: why spend hundreds of dollars on a gadget when I could use an inexpensive agenda?



Handspring Visor

From: Handspring
http://www.handspring.com
Price: \$269, \$375 (deluxe)

The amazing thing was, as a busy and constantly mobile freelancer, the

PalmPilot was a wonderful replacement for my overworked Day-Timer and its innumerable Post-It Note addenda. Unlike many other gadgets I could name, the PalmPilot and its Palm descendants are actually very useful. Even the souped-up Palm V and VII series handhelds fulfill honest needs aside from just technophilia.

This is why I was so interested when

Continued on page 92

Palm does colour

But why asks a monochrome Palm fan

I have to admit that I was a little biased. The Palm IIIc is a variation on the IIIxe, the only difference being that it has a colour display and consequently costs 80 percent more.

Palm IIIc

From: Palm Inc.
http://www.palm.com
Street price: \$679

I confess that my gut reaction to the news of a colour Palm was less than open-minded; reminiscent of the prickly Harry M. Warner's reaction to the advent of movies with synchronized sound ("Who the hell wants to hear actors talk?"), I thought, "Why would anyone want a colour Palm?"

So I used it for some time, hoping to discover a reason. Instead, I found myself wanting to go back to the a

Continued on page 92

This is about Me--and you

Continued from page 80

clicks reveals some additional changes and enhancements. One surprising change is the removal of Windows Explorer from the Start menu root. It's still there, but is now found one menu deeper in the Accessories group, which is also where it is located on Windows 2000. (If you want it back to its original place, you can just drag and drop it from Accessories.)

Along with gaining a new name, My Network Places has been reorganized. Opening this screen reveals two new icons alongside the Entire Network icon found in previous Windows versions. One is called Home Networking Wizard and the name is self-explanatory: it sets up a home network by asking you a series of questions about your network work group, type of connection, etc.

The second icon is called Add Network Place. It too is a step-by-step wizard that works very similarly to the Add Printer and Add Dialup Connection wizards found in previous versions of Windows. The Add Network Place wizard accomplishes the same thing as the "map network drive" selection that comes up when you right-click on the network icon, but you can also map other sources, such as FTP sites. I had been using a LapLink FTP utility to access an editorial server in another city, but after running the wizard, now the remote FTP site appears as an icon in the My Network Places folder.

The Control Panel gains an additional layer of screens, with the most commonly used settings showing up in the initial window, and the complete group of settings icons revealed by an additional mouse click on a link. The Task Bar and Start Menu configuration screen is also redesigned, allowing you to make some changes by checking or unchecking options that appear in a scrolling window.

Windows Me implements the smart menu system we first saw in Microsoft Office 2000. The system keeps track of the most frequently accessed menu choices, then after a period, begins to move them to the top, while hiding infrequently used choices.

The healthy PC

Microsoft says one of the key improvements in Windows Me has to do with system stability and reliability. In Windows Me, approximately 900 key dynamic link library (DLL) files are protected: they can't be deleted, moved, renamed, or overwritten.

Katz said during the Windows Me briefing that in addition to users deliberately or accidentally deleting critical files, sometimes, third-party vendors may want to "optimize" DLLs so that they work better with their application. But the process of optimizing for one application may create instability for another vendor's application that uses the same DLL. So, in Windows Me, there'll be no more of that.

Microsoft says it is also working with third-party developers toward a system of digitally signed drivers, to ensure greater compatibility with the OS.

A second healthy PC component is the System Restore feature. If you do something—add a piece of hardware or software, for example—that causes your system to become unstable, you can reload a previous set of system settings, bringing the system back to where it was before the troublesome product was added.

This functionality, while useful, has been available for years from third-party developers, so Microsoft isn't breaking any new ground with this. Likewise, the auto-update

feature is similar in concept to what Symantec has been offering with its LiveUpdate utility that will, at scheduled intervals, go to the vendor's Web site to see if there are any new updates to the application. Microsoft has also removed Real Mode DOS from this version of Windows, running DOS applications in an environment called Protect Mode. Microsoft says this allows the system to boot faster, and also improves the stability of Windows.

Digital entertainment

The second area in which Microsoft says it has improved Windows Me is in support for digital media. Microsoft has developed the Windows Image Acquisition specification that allows Windows to automatically recognize digital cameras and scanners that are WIA compliant. Also new is a folder in My Documents called My Pictures, which embeds a small image-editing and -viewing utility with basic features like zoom, rotate and a larger image preview. But you can also view image thumbnails in any folder if you select the new "thumbnails" option in the View dropdown menu.

Some third-party image cataloguing pack-

ages like Jasc Media Manager are moving towards an integrated viewer for still and moving images as well as sound. We prefer this centralized multimedia cataloguing system.

The image utility works well, doing what it was intended to, but if you work with a lot of multimedia files, you will want to invest in a separate media cataloguing utility.

The Windows Movie Maker allows you to capture and digitize video from an external source such as a video camera (video capture card is also needed) and assemble digital video clips into a short movie while adding a single soundtrack (in addition to the audio that may already be on the video clip) for narration or a musical score.

Compared to the digital video movie making capabilities that are found within a iMac DV, the Windows Movie Maker is limited. The iMovie software, which ships with iMac DVs and some G4 models, uses a similar drag-and-drop shot assembly interface, but has better transition tools including titling, and supports more output formats, including writing back to a DV camcorder (which you can subsequently transfer to a standard VHS tape), so

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This is about Me--and you

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you can play your movies on a TV.

The Windows Movie Maker might be a good way for a novice to learn the basics of making video movies, and to be fair, it wasn't designed to be a full-featured video-editing software package. It will create movies at up to 320x200 pixels. For more ambitious projects, like editing a couple of hours of vacation video footage into a movie, or creating streaming video for a Web site, you'll want separate software.

The other main multimedia component in Me is the latest version of Windows Media Player, which has been available for downloading from Microsoft's Web site since mid-July. The player portion includes a set of skins that allow you to customize its look.

Microsoft claims that its compressed digital audio format creates files that are much smaller than MP3s, while providing audio reproduction equal to or better than MP3. We were previously given side-by-side comparisons of MP3 and Windows Media audio samples, and while "better than" is a highly subjective call, it was difficult to tell the difference between the two. The main limitation of the Windows Media Player is that it does not support RealAudio files, but with MP3 coming on strong (and the Media Player will play MP3s), this isn't as much a limitation as it once was.

Home networking and Internet

We have an existing Ethernet network connecting our home computers, so we did not evaluate any of new features within home networking. However, discussions with other reviewers indicate that there are improvements in this area. On our home system, Windows Me recognized the network card,

and the PC continued to work as it had under Windows 98. The notebook is used at work, and it too remained communicative with the network after Me was installed.

Microsoft says the improvements include a home-networking installation wizard, which steps the user through a series of questions. Other improvements include better support for USB and FireWire networking devices. If the improvement is real, it will be welcome, because earlier this year, we had nothing but trouble trying to configure a HomePhoneline network adapter that connected to the PC via the USB port under Windows 98 SE. The Internet sharing feature, which was introduced as part of Windows 98 SE, has also been tweaked.

Internet Explorer 5.5 is included as part of Windows Me. Among the enhancements are a print preview button, so you want to print a Web page you can see what it will look like, and the inclusion of MSN Messenger.

Conclusions

We've removed Windows Me from the 200 MHz desktop system. The small improvements are welcome, but one of that machine's primary uses is as a backup station, and the lack of support for the tape drive under Windows Me sealed the OS's fate. So primarily, the issue here is not performance, but support for legacy devices.

On the 400 MHz Pentium II notebook, we'll likely adopt Windows Me. So far, it hasn't caused anything to break seriously, there's no noticeable hit on performance, and there are a lot of small improvements we like. There are still a couple of issues we need to resolve (the oddly coloured video and the filename truncation in Photoshop). However, we don't consider either of these to be major problems.

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Small business e-essentials

New ways of doing business help small firms tap into the Net economy

By Tom Venetis

It used to be that all you needed to equip a small business was a desk, a phone, a computer, a printer, and a fax machine. After that, you simply needed the patience and stamina to make the business a success.

While the patience and stamina requirement hasn't changed, what has is the technology needed to connect today's small business to the growing Net economy.

And this is where problems begin for many small businesses. Simply connecting to the Internet is not enough, especially if the goal is to use the Internet as a tool to both make money and to communicate more effectively with employees and customers. But many small businesses believe that the technology needed to do so is both expensive and difficult to use. Because of those concerns, their first steps into the Internet-based economy are often hesitant.

"A lot of small businesses and home offices are just now starting to use email, fax, and answering systems," says Brian McElwain, vice-president of sales and marketing for 01 Communique Laboratory Inc. in Mississauga, Ont. "We have done some focus groups and some 90 percent of small business say while they need something like fax, email and voice mail, they also know they need to get onto the Internet because it is something their customers and clients are expecting."

McElwain suspects that one of the stumbling blocks is that much of the technology needed for using the Internet as a business tool takes too long to learn. Small business owners and their employees are too busy running the business to learn how to make a piece of technology or an application work.

That is why 01 Communique decided to



make its communications and messaging suite not only easy to hook onto the Internet, but also easy to use.

The Communicate! i2000 brings together Internet video, phone, fax, email, voice and paging capabilities. It comes with video capabilities that let users send video files or have a videophone conference. It also supports one analogue modem line for standard telephony functions and an optional dedicated Internet connection via a second analogue modem, ISDN modem, broadband cable modem and xDSL modem, or a T1/T3 connection through a proxy server.

McElwain says the product is unique, not just because it integrates a variety of seemingly disparate communications and Internet tools, but because it combines them into a telephone-like interface that is simple to understand. That interface cuts the learning curve for using the product, allowing users to get the most out of Internet-based communications.

"We like to say that AT&T has spent 50 years teaching people how to use a Bell telephone," McElwain says. "So when people see our interface, right away it is familiar to them."

ASP and you shall receive

Putting together a variety of applications in a simple-to-understand suite is not a radically new strategy in the computing industry.

For some time, software and productivity application vendors have created suites of their various products. Microsoft Office is a classic example. However, a growing trend is to offer many of these same kind productivity and application suites directly to small businesses over the Internet.

The application service provider (ASP) market in North America is a young sector, but has been steadily growing. By 2004 the ASP market will have grown to nearly US\$44 billion, predicts Boston, Mass.-based independent research firm, Ovum. Forrester Research, which is based in Cambridge, Mass., estimates that small businesses with

fewer than 100 employees will spend some US\$3.85 billion on ASP services by 2003.

Mickey Freeman, senior vice-president of marketing and sales for HotOffice Technologies Inc. in Boca Raton, Fla., says the greatest advantage to using an ASP is that it removes one of the greatest barriers preventing small businesses from getting onto the Internet and using it to conduct business—cost.

In most cases, small companies do not have the full-time or even temporary IT staff with the expertise required to set up and maintain the equipment and networks. At the same time, they can ill afford to maintain their systems' software with regular upgrades and additional licences as the business grows.

"Having your own company intranet can cost you up to \$15,000 to \$20,000 just on the initial startup costs and equipment," Freeman adds. "And we have not even started talking about the licensing fees, and the ongoing maintenance."

What an ASP like HotOffice does is remove these costs. HotOffice will host the networks necessary to run the Internet-based applications and services, while at the same time taking on the costs of maintaining them with regular updates. To access the applications and services, all a small business requires is a system with a Web browser and an Internet connection.

HotOffice has two packages for small businesses: a free service that is ad supported; and a monthly subscription service that offers access to the same combination of applications, but without the ads.

"What we have done is packaged together a productivity suite, including email, a group calendar, a group contact and management

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Compaq's answer to e-Vectra

By Issie Rabinovitch

The iPaq looks very much like Compaq's answer to the Hewlett-Packard e-Vectra. Naturally, that wouldn't be how Compaq describes this new range of computers. It prefers the slogan "simplified business computing for the Internet age," which would suit the e-Vectras just as well.

Compaq iPaq Net appliance

From: Compaq Canada

<http://www.compaq.ca>

Price: \$1,488 (for legacy-light unit)

IBM, Gateway, and other hardware manufacturers also have competitive models, which share the following characteristics: small, sealed, simplified, secure, and stylish.

These new business desktops are a step closer to appliances, but they are still computers.

Compaq makes two kinds of iPaqs: legacy-free and legacy-light. Neither has any ISA or PCI slot, which reduces size and cost. The differences are in the ports. Both offer microphone, headphone, line-in, line-out, VGA, and RJ-45 (Ethernet). The legacy-free models have only USB ports, two on the front panel and three in back. The legacy-light models have two USB ports in front as well as the following legacy ports on the back panel: PS/2 mouse, PS/2 keyboard, serial, and parallel.

Compaq suggests that eliminating support for older technology reduces support costs. By focusing on USB in the legacy-free models, it claims to have greatly simplified deployment, support, and usability. I'm not

completely convinced yet. However, if you don't need to connect older peripherals to the computer, definitely choose the legacy-free model since it is cheaper. Whether legacy-free models are more stable and more trouble-free in the long run remains to be established.

The iPaq I tested was a legacy-light 500 MHz Pentium III version with 128 MB of SDRAM, an 8.4 GB ATA drive, 24x CD-ROM drive, embedded Intel Pro/100+ Ethernet adapter, embedded Intel 3D graphics adapter with 4 MB of memory, an integrated sound card and speaker, and was running Windows 2000 Professional.

The only choice of operating system for legacy-free models in Windows 2000 Professional, but the legacy-light models also give you the choice of Windows 95, 98 and NT Workstation.

You can choose standard configurations that offer CPUs ranging from a 500 MHz Celeron to a 733 MHz Pentium III processor, disks that range from 4.3 GB to 10 GB, and 64 MB or 128 MB of RAM. As much as

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e-Vectra e-legant and e-conomical

A few years ago, talk of the Network Computer (NC) was all the rage. By stripping everything off the PC itself and running everything from the server, you could keep workstation costs low and leave less on the PC for the individual user to break. As everyone knows by now, the NC didn't take off because it took too much away from the individual PC workstation. But the idea of keeping the PC stripped to the basics was a good one, and Hewlett-Packard has taken the idea in an interesting new direction with the e-Vectra line of business desktop machines.

Hewlett-Packard e-Vectra

From: Hewlett-Packard Canada
Tel: 800-387-3867, <http://www.hp.com>
Estimated street price: \$899 to \$1,500 (based on config.)

The bedrock of the e-Vectra is a compact Intel 810E motherboard, running either a Celeron (533 or 566 MHz) or Pentium III (667 or 733 MHz) processor. The system comes with a choice of 64, 128 or 256 MB of SDRAM. Standard equipment includes an 8.4 GB hard drive pre-loaded with either Windows 98 or 2000, depending on your needs. And although the machine comes with no floppy drive, a slim-line CD-ROM drive

(like those found in notebook PCs) helps to keep the size of the machine down. Because it uses an 810E motherboard, both audio and video are integrated, as well as a pair of USB ports, a parallel port, a serial port, and built-in Ethernet.

Just how small is the e-Vectra? It is about the same size as a good desk dictionary. The box itself is 8.9x24x27.2 cm (that's 3.5x9.4x10.7 in.), and can be oriented either horizontally or vertically, depending on your space (the keyboard and mouse are separate, obviously). A plastic guard can be installed over the ports on the rear of the machine, adding 7.4 cm (2.78 inches) to its depth.

Part of the reason the machine is so small is that the power supply has been removed from the machine. The machine instead uses DC power supplied by a notebook-style external power block, instead of the usual power transformer box inside the case. The box itself weighs only 3.86 kg (8.3 lb.).

There are a couple of limitations to this ultra-compact configuration, compared to a standard PC setup. It is not as easy to upgrade as a standard desktop box. With both the video and audio built into the board and no upgrade slots whatsoever, you're stuck with those components. If you're adventurous, you

can try to upgrade the memory and/or processor, but it's not easy. The simplest upgrade is the hard drive, as a lockable panel on the top slides open, giving you access to the drive.

Secondly, the e-Vectra is open to the same criticisms everyone had for the iMac: no floppy drive. Since it's designed for a corporate environment rather than for the home user, this is not quite as big an omission, however. As with the iMac, an external SuperDisk solution can be added via USB, if absolutely necessary.

These downsides are pretty minimal and in the business environment, may even be considered advantages. The hard drive can be easily pulled out of the machine at the end of the day, if you want to secure your data in a locked cabinet. If you're in the IT department, the closed nature of the system makes it almost impossible for users to monkey with the system or load a virus via unauthorized floppies brought from home. More importantly, the smaller size of the machine is the perfect for a cluttered desktop. When paired with a TFT monitor—which can be placed on top of the e-Vectra box—the combined size is less than that of a conventional CRT monitor.

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Small business e-essentials

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database, a chat room, and a document management centre," Freeman says.

Small businesses with staff that travel or telecommute frequently will especially welcome the document management centre. It allows companies to securely archive documents and personal files for remote access, revision and searching. HotOffice also has a document viewer that can open 150 different document, spreadsheet, presentation, and graphic formats—which means users don't have to download additional software to their desktop or laptop PCs.

The HotOffice Business Center also offers access to such services as a package tracker, travel planner, Internet-based faxing, Web site creation, e-commerce hosting, credit card checks, and a research desk.

Since December, Regina-based Olson Goldsmiths has been using the HotOffice service to run its custom jewelry business.

Mitch Olson, head of corporate and Internet sales for the company, says he originally planned to use HotOffice for remote email and messaging in order to keep in touch with remote workers and clients, some of whom include casinos, corporate businesses, and the government.

"HotOffice allows us to use our traditional PCs that we have at home and in the office, and take advantage of all the services they offer," Olson adds. "We could try to do it internally, or we can work with such virtual office providers as HotOffice and have them maintain everything for us. They will maintain the servers, the updates to applications, and maintain the connectivity. It would just be silly for a small business like ourselves to try and do it all."

Olson says he is also considering using HotOffice's other services like NetMeeting to conduct virtual sales meetings.

Many paths to Internet enablement

But if small businesses do decide to go it alone, there are several things they need to consider first.

"When we look at the Internet for small businesses, we often make the assumption that every business will find a benefit from it," says John Hillis, small business marketing manager for Microsoft Canada in Toronto. "But with small business, what we often find is that it is a very fragmented market and there are many different kinds of solutions they can take on. For some, all they need is an email application, while others actually want to sell products online, and others want to use the Internet to change their business processes."

Hillis recommends that before any small business decides to start using the Internet as a business tool, they ask themselves how the Internet can best fit into their business model and long-term goals. After that, he says they need to find applications that not only meet their current needs, but fit their future requirements as well.

In order to help them get their businesses Internet-ready, Microsoft has started integrating Internet tools and applications into some of its popular applications. Windows 2000 is already Internet-ready and Office 2000 now comes with an Internet kit, allowing a small business to set up a simple office intranet for sharing information within the office.

Recently, Microsoft released its Small Business Server 2000, a networking solution for small businesses. It provides in a single integrated package a variety of tools that businesses can use to set up email, fax, database and secure Internet connections.

Hillis says Microsoft is also working with a Canadian partner to develop a self-installing intranet solution for small business.

More small businesses are starting to look toward Linux as a solution as well. While this OS continues to draw its greatest support from large enterprise users and as a Web server operating system, many Linux vendors are seeing a growing market for Linux with small businesses that want to leverage the Internet as a business tool. Linux is popular because of its low cost (the OS and many applications can be downloaded for free) and stability.

Sensing that Linux will gain a greater foothold among small businesses, IBM has begun shipping its IBM Small Business Pack for Linux, which is designed for businesses with up to 100 employees. It covers most critical business functions and processes such as email, building and maintaining a Web site, storing important business data and content management. It comes with IBM's DB2 database, Domino Application server, and WebSphere Application server.

Ottawa-based Corel Corp. also offers many of its popular applications, like its WordPerfect Office and CorelDraw graphics suite, for Linux.

Knowing that the Internet is becoming central to how many small businesses either operate now—or will in the future—some vendors are starting to make their office products and tools more Web ready. Printers are a good example of this phenomenon.

"Some people say that the Internet takes away a lot of the need for printing," says Ted Schnarr, areas sales director for the office printing business for Xerox Corp. in Markham, Ont. "But we say the exact opposite. The amount of data and information being spun on the Internet is driving print volumes, everything from people printing their email to downloading and printing PDF files."

Taking this into account, Xerox has started embedding Web servers into many of its network printers.

"So right out of the box, each printer has its own homepage," Schnarr adds. "You have an assigned IP address, thereby making [the printer] accessible to anyone on the network, or even those who are traveling."

Earlier this year, Xerox announced a line of Internet-ready laser printers for small and medium-sized workgroups and businesses. The DocuPrint N212, DocuPrint N2025 and the DocuPrint N3225 and N4025 all come with such standard features as Adobe PostScript3 and PCL6 emulation, Ethernet 10/100Base-T, USB connectivity and 32 MB of memory. □

Low-cost Internet sharing: Part 2



In the previous column on Internet sharing, I described how to use the UMax UGate-3000 Cable/ADSL Modem Sharing Gateway on an Ethernet LAN. I ran out of space before I was able to cover everything I wanted to discuss. In particular, I wanted to describe a service that UMax offers free for one year, which adds considerable value to the UGate 3000.

Depending on your high-speed Internet service provider (ISP), you have either a static or a dynamic IP address. A static address is much more desirable, but even that isn't enough. Ideally, you should have DNS (domain name service) but adding it is either expensive or not possible at all on some services.

If you were hosting a Web, mail, videoconferencing, PC Anywhere, or other kind of server, you would like people to be able to access it via a common name. Would you rather enter <http://www.yahoo.com> or 204.71.200.74? Even if you prefer the latter, which is unlikely, how would you feel if the numbers changed from day to day?

Regardless of whether your IP address is static or dynamic, UMax will host a DNS for you, free of charge, for 12 months (this assumes that you have purchased a UGate 3000, of course). To do this, you apply to UMax for a domain name, which we will refer to as "yourname."

If it is available on the ugate.net domain, you will receive yourname.ugate.net as a Web address. The world will be able to visit your Web site by entering <http://www.yourname.ugate.net>. That's pretty good, although <http://www.yourname.com> would probably be even better. On the other hand, you're more likely to get "yourname" on the ugate.net domain than on the Internet.

Since I wrote the previous column, UMax has introduced a new, bigger version of the UGate 3000 called the 3200. It is similar to the UGate 3000, but incorporates a seven-port autosensing switch. If the idea of an integrated switch in your router is attractive, but you don't need dynamic DNS support, there's another less expensive option to consider: Linksys Etherfast Cable/DSL Router.

The original Linksys product has a built-in four-port autosensing switch that sells for as little as \$250 in Canada. That's switch and not hub, which means this unit represents a price breakthrough. It wasn't that long ago when the purchase of a four-port switch and a router would set you back at least \$2,000.

There's a newer one-port version that hasn't crossed the border yet, but it should sell for under \$150. It's used in conjunction with your existing hub or switch. The four-port version has a WAN port, which is where I connect my cable modem. There are five other ports, one of which is an uplink port. If it is used, as it would be on a network with more than four computers, only three of the remaining ports can be used. It has a Web

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Compaq's answer to e-Vectra

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an additional 256 MB of RAM can be added, and DVD, CD, and Super Disk drives (but no floppy drive option) can be hot swapped in the black MultiBay housing (which also functions as the computer stand) that surrounds the silver iPaq.

Included with every iPaq is the following management software: asset tracking and security, fault notification and recovery, remote ROM flash, and software deployment tools.

The iPaq proved very easy to install, and required minimal configuration before it was on my network, accessing the Internet via my router, and accessing data and shared printers. There's no denying the appeal of the styling, which is particularly apparent

when it is sitting next to a conventional beige box. Compared to the e-Vectra, it is somewhat bigger and less flexible in how it can be positioned. The iPaq is designed to sit upright, like the mini-tower that it is. I prefer the e-Vectra in this respect, since it offers more options for placement.

The built-in speaker in the front of the computer doesn't offer stereo sound, but it is adequate for business audio. The integrated Intel graphics card isn't for graphics professionals, but it manages 1,024x768 resolution at 24-bit colour depth. The Intel Ethernet adapter is a no-compromise component, and the scrolling mouse and full-featured keyboard will satisfy most users.

The hard disk is an advanced model, and at 8.4 GB is more than big enough for a computer that will always be attached to a

network, but it spins at 5,400 RPM. Faster 7,200 RPM drives should be available as an option, since they make a difference in performance and don't add that much to the price.

Speaking of price, this is another attractive aspect of the iPaq line. An iPaq with 500 MHz Celeron CPU, a 4 GB hard drive, 64 MB of RAM, running Windows 2000 (legacy-free) goes for \$749, without a CD drive. The legacy-light model I tested costs \$1,488.

See Compaq Canada's Web site (<http://www.compaq.ca>) for other models and pricing. Currently, Compaq Canada doesn't offer models faster than 500 MHz. If you have higher power requirements, faster iPaq's can be purchased from the main Compaq site (<http://www.compaq.com>). □

—CanadaComputes.com

HP e-Vectra e-legant

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The system is also quite competent in the performance department. We had the chance to benchmark a model of the e-Vectra with a 667 MHz Pentium III and 128 MB of RAM, running Windows 2000. The system achieved an overall Sysmark 2000 score of 124, with 127 for the Internet content creation portion of the test and 132 in office productivity. Even with everything fitted into a tiny case, you don't have to compromise on the system speed with this system.

Suggested retail prices for the e-Vectra start \$899, and work up to around \$1,499. The street price of the system we tested was about \$1,499. Warranty period for all models is three years.

—Sean Carruthers



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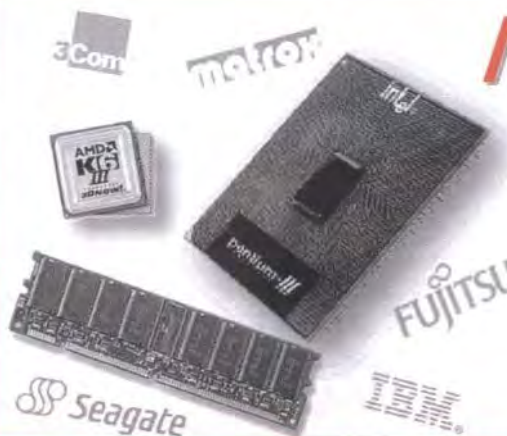
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Double take

Twin reviews of Kodak's digital camera attachment for Palm devices

Editor's Note: Two of our top reviewers looked at Kodak's PalmPix Digital Camera and turned in their separate opinions on the product. Here, for your edification, is a double exposure of the product, by Dave Chappelle and Myles White. First off, Dave!

Poof! Your Palm is a camera!

What's the coolest new accessory for Palm PDAs? The Kodak PalmPix (<http://www.kodak.ca/>) digital attachment turns a Palm into a digital camera. Any Palm user who has ever wished they'd had a camera with them no longer has to miss any photographic opportunities.

The PalmPix measures 5.59x2.8x8.38 cm (2x1x3.4 in.). It weighs 50 g (1.75 oz.) without batteries, and 72.23g (2.5 oz.) with them.

The package included two AAA Alkaline batteries, a user's guide, and a quick setup guide. The software CD-ROM contains software for controlling the camera and picture transfer functions on the Palm, PalmPix software for Windows 95, 98, and NT 4.0, as well as Presto! Mr. Photo and Image Carousel photo editing software.

The software disc was missing from our evaluation unit package. Fortunately, I was able to download the software from the support section of the excellent Kodak Web site. I installed the software, pressed the HotSync button on the Palm cradle and the PDA was quickly updated.

The PalmPix plugs into the cradle interface on the Palm (when it is out of the cradle, of course). When the user selects the PalmPix logo from the menu and presses the Date Book button, the TFT LCD of the Palm becomes the viewfinder. On the Palm IIIc model I used to test the PalmPix, images in the viewfinder were monochrome, which took getting used to. Images are captured by pressing the Date Book button.

Two colour image resolutions are available: 320x240 pixel, and 24-bit colour VGA at 640x480 pixels. Images are stored in either BMP or JPEG formats.

The PalmPix has a fixed focus lens, 6.1 mm lens focal length, 2.0 F stop, focus range of 91 mm to infinity, 2x digital zoom in 640x480 resolution, auto exposure with automatic white balance, 1/15 to 1/500 second shutter speed, and a 10-second self-timer.

Captured images are stored in Palm's memory, and can be downloaded when the PDA is attached to its cradle and the HotSync button pressed.

I asked Mitch, a photographer friend, to assist me with the field test. Without manipulation our sample images showed very natural skin tones. Whites and greens were very clean and true-to-life. In some images purples and reds were so bright they appeared almost psychedelic, but reds are the most difficult colour to reproduce accurately.

Images of subjects closer than 30 cm (1 ft.) away were slightly blurred. We found that even in low light conditions the sensitivity was good. Outdoor use requires the display brightness be



Kodak's PalmPix attached to a Palm PDA.

turned up to maximum, which will drain the batteries faster.

The PalmPix is a great little snapshot camera. It's a point-and-shoot that makes a Palm PDA even more versatile. I don't think professional photographers, or even sophisticated amateurs, would be totally happy with either the images produced or the relative lack of controls offered by such a simple camera. But it's not designed to be a professional camera. Insurance adjusters and real estate professionals will like this attachment because it would save them from carrying a separate bulky camera.

The only negative thing my photographer friend could say about the Kodak PalmPix is that it did not come with a case—which would offer protection when it's not being used and is dropped into a linty pocket.

Minimum computer requirements for the PalmPix software are Windows 95, 98, or NT, a 486 processor, 16 MB of RAM, 20 MB free hard drive space, serial port, and 256-colour 16-bit video. There is neither Mac nor Windows CE software for this device.

The PalmPix is compatible with the Palm III, IIIc, IIIe, IIIx, IIIxe, or VII handhelds running Palm OS 3.0.2 or higher; Palm V or Vx with adapters; IBM Workpads; and TRG Pro handheld organizers.

The suggested retail price of the Palm Pix is \$269, which includes a one-year warranty.

—Dave Chappelle
CanadaComputes.com

A second opinion

If you have a Palm organizer—particularly the new colour IIIc—and you have everything else, you may want to consider the new toy from Kodak, the PalmPix digital camera.

To use this device, you hold the Palm sideways with the camera on the right (and says the documentation, the lens pointing away from you—duh!). Select high (640x480) or low (320x240) resolution by tapping on the icons on the screen, then press the datebook button once for preview.

What you get is a grainy monochrome image to use as a viewfinder. Click the datebook button once again to take the picture, or use the

scroll button to select 2x zoom, then click. The image is saved to the Palm, with an on-screen counter that tells you how many more images you can store before you have to transfer them off the unit. When you click on the image name with the Palm's stylus, the picture appears on its screen—in colour if you have the IIIc, otherwise in monochrome.

Even in colour, the image quality is pretty bad on the Palm. This is because of the limits imposed by its limited 256-colour palette. However, when you use HotSync to move them to your desktop system, the images display in full 24-bit colour (at the original resolution and 72 dpi). That's sufficient quality for you to carry pictures of your kids or to post them at a Web site, but not great for publication.

The Kodak representative who delivered the PalmPix proudly (and justifiably, too) showed me shots of his kids, then a shot of a parking garage locator sign (great if you're the type who gets lost in underground lots). I could dream up all manner of other options for the regular list of people who can benefit from a digital camera (adjusters, estimators, real-estate salespeople, and so forth).

However, using the camera takes practice. I found the preview screen to be very interactive—images wouldn't stay put and the barest tremble of your hands often resulted in having to patiently coax the image back to where you wanted it. There's also a significant delay—much longer than for any standard film or digital still camera—between the time you hit the button to capture the image and the time it actually begins to do so. It was more than enough time, for example, for the cat I was trying to photograph to get bored with the process and look away from the lens.

You also have to be careful with the 2x digital zoom. It works after a fashion, but automatically selects 640x480, then cuts the image size in half so images transferred to your PC come in at 320x240.

This quibble is more of an annoyance than a real problem and perhaps Kodak Canada will have it sorted out soon after you read this. The toll-free tech support phone number in the manual is out of date, and when you call the number the recorded message gives you, the receptionist had no idea what a PalmPix was (film, digital, video?) and ended up sending me to the wrong queue. Tedious.

My last quibble is actually about Kodak's PalmPix application on the Palm and Club Photo's Album to Go software that comes bundled with the IIIc. They can't talk to each other unless you transfer the PalmPix image to the desktop and back to the Palm. Perhaps the two companies could talk to each other.

The PalmPix fits the Palm IIIc more or less (hint: have the cover open when you attach it; otherwise it can jam), but it doesn't fit the Palm V series unless you purchase an optional adapter (the bottom of the V series is too wide). However, the camera does work with a V and, even though the pictures in the Palm are displayed in bad shades of grey, they transfer to a desktop in full colour.

—Myles White
CanadaComputes.com

Banner ads passé, says new media research firm

LONDON—Research just completed by the new media division of Lewis (<http://www.lewispr.com>), a marketing communications firm with offices in the U.S. and several European countries, shows that 82 percent of businesses favour requiring users to register to use a Web search engine portal, rather than simply bombarding them with banner ads.

Suzanne Sinden, head of new media with the firm, says that the research, which took in responses from 60 high-tech companies, revealed that the majority of respondents now use search engine registration as the focal point of their online marketing mix.

The conclusion from this, she says, is that the days of banner ads on the Internet appear to be numbered as high-tech marketers are now shunning high-cost, low-return online advertising in favour of a top-10 listing through registration.

The survey revealed that 82 percent of those surveyed currently use search engine registration as the focal point of their online marketing mix. This compares to only 45 percent that run banner ads, reciprocal link programs, or email marketing campaigns.

On average, the firm says, search engine optimization was quoted as producing the best return on investment in terms of driving traffic to Web sites.

This, Lewis says, was an important consideration for all of those interviewed, because most only allocate 10 percent to 20 percent of their total marketing budget currently to online activity.

The marketing communications firm adds that this strategy is supported by the latest research from Forrester Research, completed in May. The research firm's *U.K. Internet User Monitor* survey found 81 percent of users tend to find Web sites they are interested in using search engines, up from 67 percent in 1999.

The next most popular source was by following links, a method used by 59 percent of those surveyed. "Viral marketing," meanwhile, came third.

Sinden says that, with an increasing number of journalists moving online, search engines are often the first port of call when they are researching a story.

"At the end of the day, if the organization they're looking for isn't listed in the top 10 on the retrieval list, the journalist will give up," she said.

Sinden went on to say that it is good news that technology companies place search engine registration so highly in their online marketing mix.

"These results really demonstrate the shift away from expensive banner advertising towards direct online promotion," she said.

—Newsbytes

Nexmedia says E-Sign software to expand advertising opportunities

By Chris Keam

A Vancouver company is planning to revolutionize the out-of-home advertising industry with a Web-based software product that allows any playback device with an IP address to receive and display text, image, audio, or video files.

Nexmedia Technologies Inc. will launch its E-Sign software, which is loosely based on current cable television advertising software, in October.

According to company president and chief executive officer, John Quee, E-Sign is a breakthrough product that will remove the cost barrier to many businesses that want to advertise but can't afford billboards

or backlit displays, while at the same time create opportunities to increase revenues for companies that provide out-of-home advertising.

E-Sign allows users to format and schedule advertising content via the Web for display on any IP address-equipped playback device in the world.

Transmission of the content can be achieved through traditional television or phone lines, satellite, or wireless data transfer.

One platform E-Sign is focusing its efforts on is large-format plasma displays, such as Fujitsu's 42-inch model.

"It enables real-time, site-specific information to be delivered in a timely nature. The range is limitless, from outdoor

Jumbotron displays and plasma monitors, to television sets and computer monitors," says Quee.

"There are some obvious competitive advantages [with E-Sign] to traditional outdoor and indoor displays. Our product will streamline delivery of content for suppliers of advertising space by utilizing the Internet and also make plasma displays a cost-effective alternative to backlit displays by allowing multiple advertising messages to be displayed, where currently, only one advertiser can take advantage of the site at a time."

Out of home advertising was a \$3.7 billion industry in North America in 1997. The estimated market globally currently hovers around the \$20-billion mark. □

Low-cost Internet sharing

Continued from page 86

interface, as does the UGate 3000. You enter 192.168.1.1 in your Web browser, log in with the default password, and go through some basic configuration to get it up and running. The default installation provides even better security than the UGate 3000. The Linksys router isn't ideal for all Internet connectivity problems, but for basic Internet connection sharing of a high-speed connection, it is an excellent solution.

As I've mentioned in previous columns, it is possible to achieve Internet connection sharing via software. Microsoft introduced this feature in Windows 98 Second Edition,

and earlier this year it appeared in Windows 2000 Professional. Now, it has been made easier to implement in Windows Millennium Edition.

Microsoft must have received feedback from some users that Internet Connection Sharing was too difficult to install, because they've done a better job in Windows Me. It's not quite foolproof to install, especially on a computer that has already been configured to connect to the Internet via other means, but it's pretty close to it.

A Home Networking Wizard guides the user through a series of easy and mostly non-technical questions. There's nothing harder than "Do you want to share your Internet

connection with the other computers on your network?" You provide a name for your workgroup, decide whether to share your My Documents folder, insert a formatted blank diskette to create a setup disk for other computers on the network running Windows 95 or 98.

All that is required to allow one of these computers to use the shared connection on the Windows Me computer is to run the setup.exe program on the diskette. Computers running Windows Me don't use the setup disk.

Instead they run the Home Networking Wizard and answer a few simple questions appropriately.

Once this is done, everyone on the network can use the Internet at the same time, regardless of whether the Internet connection is through a phone line, ADSL, or cable modem. Without any additional configuration of the client software, each computer can use any of the Internet services it would normally use if connected directly to the Web. Security is good, in that just one computer is exposed directly to the Internet. The situation with a router is better, since only the router's IP address is exposed. I wasn't able to check whether Windows Me supports the sharing of a Bell Sympatico High Speed Edition (HSE) connection. Windows 98 SE did not, and I don't believe anything has changed, but there is a chance that I'm wrong.

The reason why Sympatico HSE is often troublesome is that it uses the newer PPPoE rather than the standard TCP/IP protocol. It also seems that installations within the past couple of months differ in some way from older installations. Bell doesn't acknowledge this, but the anecdotal evidence is strong.

A consultant I met with described his experiences with Sympatico HSE and the Linksys router. He was able to install it successfully 100 percent of the time for clients with older accounts. However, with more recent installation of Sympatico HSE, he met with failure every time. The Linksys router was simply not able to connect to the Internet in those cases. When he discussed the problem with technical support, he was informed that they didn't know how to get the Linksys unit to work, but that Sympatico is now offering a router for more than \$800 that would do the job.

Whether you use hardware or software to do the job, there's no denying that there is finally a good choice of low-cost, or no-cost, methods of sharing an Internet connection.

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The Computer Paper, June 2000

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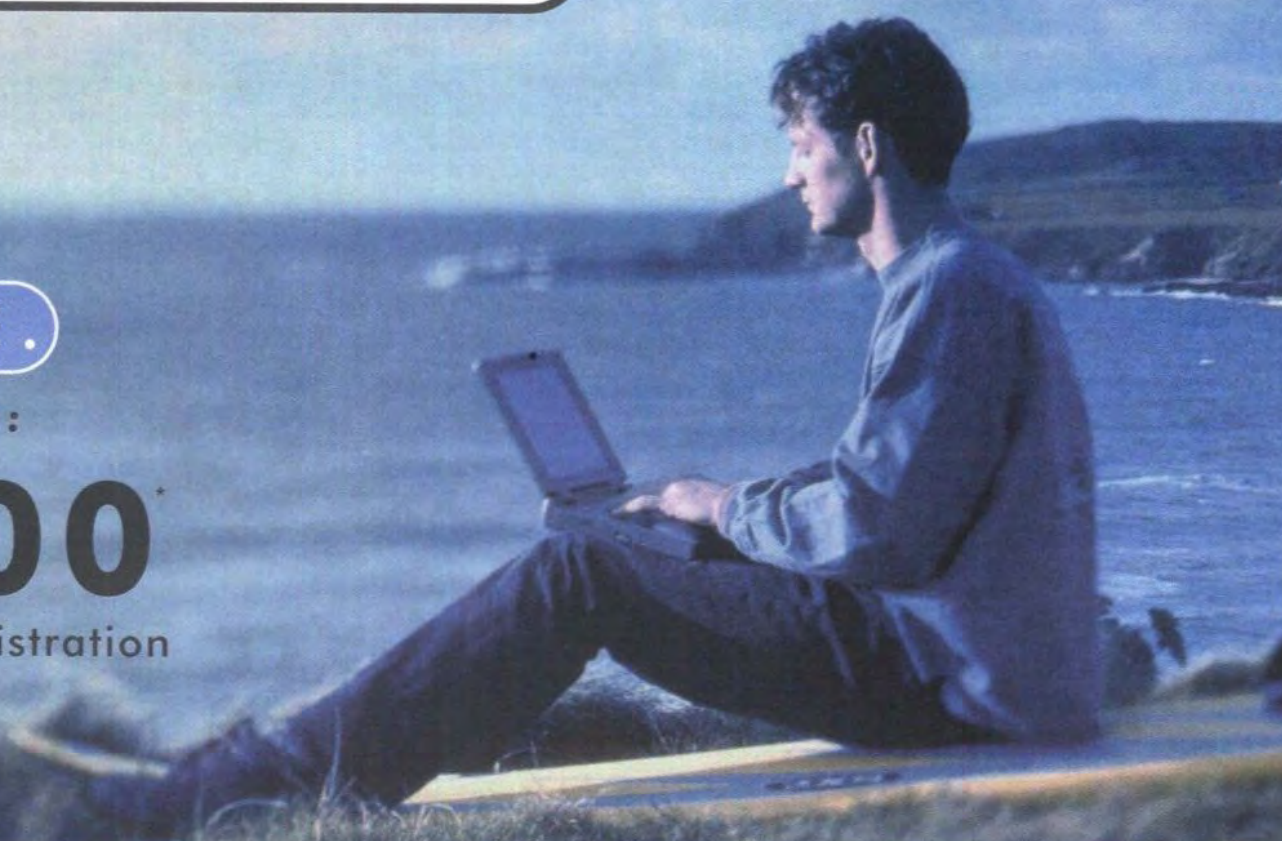
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Rock around the clock with Linux MP3

By Steve Coe

Unless you've been living under a cave or in a rock—and, yes, I mean that the way it's written—you'll have heard of the MP3 format. You also have heard about how the recording industry would like you to believe MP3 is the epitome of evil and that poor college students are taking much needed money away from the multiple billions made by the recording industry. This despite proof that people who use Napster, the current MP3 scapegoat, actually buy more CDs.

XMMS: X Multimedia System
Download: <http://www.xmms.org/>

While MP3 is evil and only used by the unclean, the criminal and the delinquents of the world, Linux has what I believe to be the best MP3 player available. Unlike it's main competitor in Windows, the beauty of this MP3 player is that it is open source.

If you head on over to the Web site noted above, you can download either the source code for XMMS or the standard Redhat Package Manager format, a self contained archive of the compiled program.

Installation is a snap in both cases but, obviously, if you have the means and run a Redhat system, I recommend the RPM. If for no other reason than if one day you decide to repent and reject the evils of the MP3, you can easily uninstall the software.

Once it's installed, you might need to recon-

figure the program's sound output. This is easy enough. Click on the tiny "O" on the side of the program, choose preferences, then adjust the output options.

XMMS is by far the best MP3 player I've found in Linux. With it's default install it can play MP3s, convert MP3s to WAV files suitable for using to make an audio CD and be used as an audio CD player. The latter is the only thing I dislike using XMMS since it puts a gap between tracks, which can be irritating on mixed CDs.

When playing MP3s in Windows, if I wanted to do anything like load Netscape, the audio regularly dropped out and jumped. In Linux, XMMS barely causes a blip on the CPU usage scale, even though I only use a nasty old 166 MHz Pentium-powered system.

If you want a great MP3 player, XMMS is the way to go. The fun, however, begins when you download the plugins—little add-on programs for XMMS that do cool stuff.

To list all the plugins here would take forever. Suffice it to say, when you download XMMS, you should really investigate the plugins. They are grouped into various categories such as effect, input, output. Some of the plugins I find most interesting are located in the Visualization category. My favourite is the GDancer plugin. By default it gives you a dancing Space Ghost character, but there are other characters you can download.

XMMS is a terrific program. If you're into MP3s and haven't tried XMMS, you're missing out on one of the best MP3 players around. A must for any MP3 fan's software collection. Just try not to get mesmerized by Cornholio's dancing.

—CanadaComputes.com

Competition for Palm's low end

Continued from page 80

Handspring announced its Visor handheld at roughly the same time Palm announced its Palm IIIc. It seemed to me that as Microsoft began pushing its latest iteration of Windows CE and the new Pocket PC handhelds, the Palm platform was at a critical juncture. Of course, Palms have long dominated the market they pretty much created, but then, so did Netscape.

Handspring, founded by Palm creators Jeff Hawkins, Donna Dubinsky, and Ed Colligan, are employing the tactic buzzword mavens used to call "coopetition"—working with Palm by licensing its operating system (the Visor uses a slightly modified PalmOS 3.1) while releasing a device that directly competes with Palm hardware.

The Handspring Visor only recently became available in Canada (first directly from its Web site, and more recently, in retail computer and office supply stores), but it's been selling like gangbusters in the States. That's because for all intents and purposes, the Visor is a Palm IIIe (the Visor Deluxe is a Palm IIIxe)—lurking at the low end with the same ease of use that makes the Palm series so popular, but offering a bit more to sweeten the deal.

"A bit more" means improved Calculator and Date Book applications, a built-in microphone, a shade less width and weight, and—for Visor Deluxe owners—a choice of four iMac-like colors as an alternative to plain old Graphite. The synchronization cradle uses a USB connection for easy (and speedy) PC or Macintosh connectivity, and, most intriguing of all, there's the slot for Springboard expansion modules, which can be used for... well, anything. The press kit lists such expansion modules as a modem, removable media, games, an MP3 player, and even one for analyzing soil samples.

After using the Visor Deluxe for some time, I came to the conclusion that it was just as pleasurable to use as a Palm IIIxe. Considering it has pretty much the same specs (8 MB of memory, approximately two months of battery life from two AAA batteries, an infrared port) and they both list at the same price, the only deciding factor would be the extras—the included USB cradle (serial connector is optional) and perhaps the selection of Springboard modules. The only downside is the hard protective cover, which is less convenient than the Palm's flip-top.

—Emru Townsend

Palm lobs m100 into Visor's court

Not wanting to be outflanked at the low end by upstart Handspring, Palm has introduced the m100, which will be replacing the IIIe as the budget Palm—and with a street price of around \$230, it's also \$50 cheaper than the Visor. We've used the m100 for the past three weeks, and it's—well, a smaller Palm in more ways than just physical dimensions.

The smaller screen (5x5 cm versus 6x6 cm on the Palm III) cramps the work area noticeably. We don't care for this downsizing, although it still passes the fingertip-as-stylus test; for example, you can still use the onscreen calculator buttons with your fingertip, rather than having to resort to the stylus.

Unlike previous Palms, the m100 does not ship with a docking cradle, one of the hallmarks of Palm design. A cradle is available as an extra cost option, but if you were thinking you could borrow the cradle from someone's Palm III, don't bother—the connector shape is different. However, the m100 does come with a serial cable that allows you to communicate with a PC.

We think the m100 is more attractive than the Palm III or Visor, and with the interchangeable colour front plates, also betters the Handspring unit in colour coordination options, if that's your thing.

In terms of usability enhancements, the m100 includes an electronic ink note feature, which allows you to save bitmap images of your handwriting or printing for referring to later. This makes it quite easy to quickly jot down a phone number or address, just as you would on a scrap of paper—especially useful if you haven't reached a high level of proficiency with Graffiti.

A special double hinge allows the protective cover to be folded completely over, like a coiled notepad cover—a more elegant solution than the Palm III's cover.

Overall, the m100 has a few attractive styling tweaks, although it doesn't break much new ground in terms of application set. It gives existing users little reason to trade in their cherished Palm IIIs. As a device to attract a new group of budget- and style-conscious users to the Palm fold, we expect it will enjoy some success against direct competitors like the Visor. But Visor's Springboard expansion bay gives Handspring the edge.

—David Tanaka

Palm does colour

Continued from page 80

monochrome unit like the Handspring Visor, the Palm IIIc's flip-top and slightly more advanced operating system (PalmOS 3.5) notwithstanding. Simply put, the colour offends my sense of what the Palm is all about.

Although the icons are more attractive, colour doesn't make the Palm IIIc any easier to use; quite the opposite, in fact, since the two-month battery life has now been cut down to a mere two weeks. (That's actually not as bad as it sounds. The Palm IIIc uses a lithium-ion rechargeable battery, which doesn't have to be completely exhausted before charging. Leave the Palm in its cradle for a little while every day and you'll have nothing to worry about. I'd like to see this become standard issue on all handhelds.)

—Emru Townsend

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VOS32 K7 Athlon, PIII, SECC, SECC II Cooler Ball Bearing 3 pin	\$35
DP5-5G51, FC-PGA, K6II/III Cooler Ball Bearing FAN 3 Pin	\$18
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AMD Thunderbird 800/850	\$299/388
AMD Thunderbird 900/950/1GHz	\$435/560/760
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Intel Pentium III 667/733	\$289/299
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Online & Connected

Internet Trends • Wired and Wireless • Online Services • Work & Play on the Web

Your very own candid camera

By Antonietta Palleschi

If you think reality-based TV shows like *Big Brother* or *Survivor* mark the pinnacle of our voyeuristic potential, think again. A humble Webcam provides an even better window into the reality of daily life—set it on a kitchen table, point it out the window, or better yet, aim it at yourself or your family.

The term Webcam refers to both the digital camera hardware that grabs images, and to Web sites that stream images from live video cameras. The actual cameras are like little video eyeballs that grab a digital image of what's in front of them—like camcorders without the tape. They're a lot of fun, too, letting you watch yourself, or anything else you aim the Webcam at, in a window on your computer screen. With a Webcam, you can grab still images, record video, or even connect the Webcam's video stream through your Internet connection to other computer screens anywhere in the world.

What better way for a far away grandpar-



ent to keep in touch with your children than to see and talk to them live (if you both have

Webcam) over the computer. Many Webcams are designed to resemble an eye-

ball, though "cue ball" or "tiny flying saucer" are probably more apt descriptions.

Typically, these tiny cameras sit on a small desk stand or on top of your PC monitor. Desktop cameras for sending images over the Internet come cheap these days. You can find a whole bunch for \$50 to \$100 range (those in the \$150 to \$180 range often include an impressive software bundle). As videoconferencing and "video mail" over the Internet has grown from early adopter experiments into business tools, that cost can be written off a business expense for some users.

Webcam setup is generally easy. Position your camera where you want, orient it to look at you—the first image most people want to send—and plug the cable into the computer. This can be complicated if you have an older model with a video capture card. You'll have to open your computer up to plug that circuit board into a PCI slot—found on most newer Windows and Macintosh systems. If your computer is too

Continued on page 123

Canada moves closer to big '.ca' sales

OTTAWA—Long-awaited reform of the process for meting out Internet domain names under the Canadian country-code designation ".ca" took a big step forward in mid-August when outfits eager to resell the addresses were allowed to apply as registrars.

Maureen Cubberley, board chairman for the Canadian Internet Registry Authority (CIRA, <http://www.cira.ca>), said that many potential registrars were already champing at the bit and began snapping up applications on the organization's Web site as soon as the process was opened up Aug. 15.

However, it will be late fall before those registrars will begin reselling domains to end users in response to what is expected to be a flood of requests from individuals and companies in Canada eager to own .ca addresses for Web sites and email.

Many of the organizations expecting to get into the business of selling .ca domain names—which previously have not been widely available—are likely to already be trading in more-familiar general top-level domains (gTLDs) as .com, .org, and .net, Cubberley said.

"We've set the bar fairly high as to what qualifies a registrar," she said. "So, it will be the organizations that know what they're doing and can do a good job. It requires a level of knowledge about the domain name business in order to be able to participate as a potential registrar. And that's deliberate because we want to make sure that it's a very high-quality registry that we run."

Previously, the Canadian country-code domains (or ccTLDs) were handed out spar-

ingly by a largely volunteer organization with roots in such bastions of early Internet development as universities.

To obtain a Canadian ccTLD, an organization typically had to be federally incorporated or doing business in more than one Canadian province.

Smaller outfits might end up with a regional qualifier (such as ".on.ca" for an Ontario company, or bc.ca for a British Columbia-based firm). Even then, only one domain name was available per legal entity, which has resulted in some Canadian domain-name speculators incorporating multiple companies just to qualify for more than one Internet address.

The requirement that domain-name applicants be able to show a legal right to the name they chose meant it was next to impossible for individuals to register personal addresses.

This spring, CIRA, the University of British Columbia, and the federal government finally agreed on the terms under which CIRA would assume responsibility for the .ca registry.

While the new process for obtaining .ca names will be akin to that already in place for the gTLDs, new Canadian addresses will only be going to individuals or organizations meeting certain "Canadian presence" requirements. That includes Canadian citizens and permanent residents, Canadian corporations, partnerships where more than 66 percent of the partners meet the Canadian presence requirements, and clubs where 80 percent of members meet those requirements.

The new registrars have to meet similar Canadian-presence minimums, making it more difficult for some current popular gTLD registrars to participate.

Cubberley said that before the new registrars start providing .ca domains to the pub-

New Canadian addresses will only be going to individuals or organizations meeting certain "Canadian presence" requirements.

lic, existing domain-name holders will have a 30-day grace period during which they can take steps to transfer addresses to the registrar of their choice—effectively reserving their addresses under the new regime.

"Everybody who has a name in .ca right now has been contacted according the information that exists in the database," she said. "The intention is to see that everybody who has a .ca name and wants to keep it does so."

Current address holders who do not transfer their domains by the end of the grace period could lose those monikers, since they will automatically become available to all comers.

Exactly what end users will pay for those domains is largely up to the registrars, Cubberley said.

"CIRA will charge the registrar \$20 per domain name. The registrar will have a

choice as to what they do with that. Some will pass it on, some will add other services and include it in whatever ISP services they provide... so that's entirely up to the individual registrar that the person chooses to deal with. The key thing here is that people will have a choice and choose whatever registrar they want to."

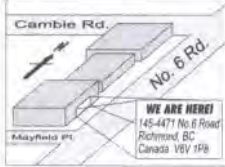
Cubberley said that before the system is finally opened to the public, CIRA will have a domain-name dispute process in place in order to deal with what could be trademark-related disputes arising from the name-picking free-for-all. She said that process will look familiar to those who have observed the Uniform Domain Name Dispute Resolution Policy of the organization responsible for gTLDs, the Internet Corporation for Assigned Names and Numbers (ICANN).

"We started with the ICANN model and looked at it to see if there are any details that needed to be altered to fit a Canadian situation," she said. "We did put that up for public consultation, and got good feedback on that, but it's still in the works. It will all be finalized before the operational transfer date. There will be (a) dispute resolution process and it will probably be similar to—or at least have a few key elements of—the ICANN one."

"We do have trademark laws and related rights in Canada, so what we have to do is develop the dispute resolution process that recognizes that," she added. "At the same time, we have to balance the new requests coming in. So, it will be based very much on existing laws..."

—Newsbytes

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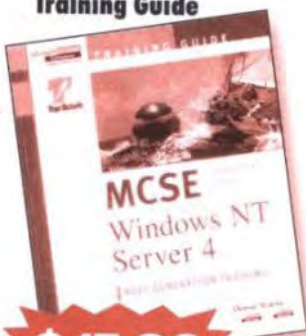
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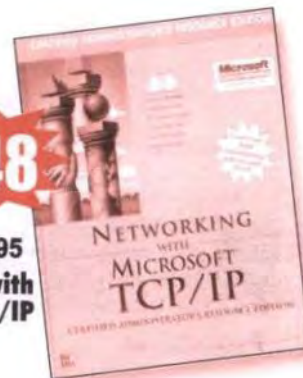
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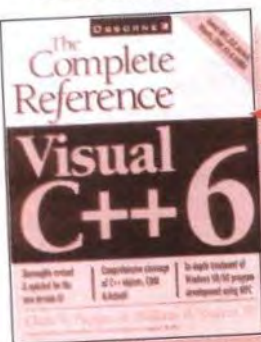
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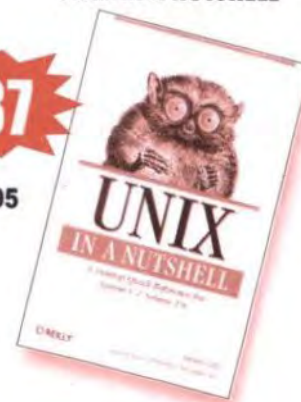
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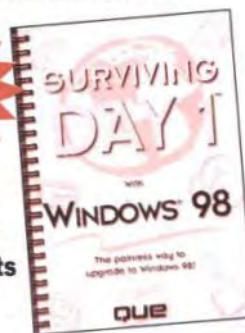


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Creating a Word form



Helen Bradley
OFFICE SUITE TRAINING

Imagine completing a form inside your word processor by simply clicking with your mouse and typing data into fields that are already set up for you. If it's your job to fill-in forms, then you'll find clicking an easier process than

performing lots of typing. If you're the person who has to do something with the information, then you'll love Word 97/2000's forms because the information you get is more likely to be accurate.

Word's forms aren't as powerful as those you can create using dedicated (and usually more expensive) forms software. However, they are pretty easy to create and, because you're using Word, you won't have to learn commands for a new program.

This month, I'll show you how to use Word's forms tools with a simple and practical project. As you step through the project, you'll see how to use many of Word's forms tools and, at the end, you'll have a simple phone message form (Fig. 1) that you can complete and print out as a record of phone messages, or which you can email to someone else in your office.

Once you see how easy it is to create the form and you learn something about the various form elements available, you'll find heaps of uses for similar forms around home and at the office. Anything from fax coversheets and survey forms, to time sheets and order forms can be automated this way.

The basics of the form

Forms are best saved as templates so you can open them and fill them in without destroying the original document. Because you'll save your final form as a Word template, begin by creating a new template document. To do this, choose File, New, select the General tab, then Blank Document. Choose

the Template option button and click OK.

One of the easiest ways to layout a document like a telephone message slip—where you have information side by side—is to lay it out inside a table. Tables allow you to easily put data side by side by simply putting it in adjacent cells—and when you make a change to the data in one cell it doesn't affect the data in the cell beside it. Your tables don't have to look like boring black and white grids either. When you remove the borders, add some colour and an image, your document will look great!

Add a table to your document by choosing Table, Insert Table, select Columns: 3, and Rows: 8 and click OK. Adjust each column width by dragging the vertical dividing line between the table columns with your mouse to widen or narrow the column to the immediate left. Using the final illustration as a guide, set the columns to these widths; Column 1 at 2 cm (approximately 1 in.) wide; Column 2 at 6 cm (approximately 2.5 in.) wide; and Column 3 at 0.5 cm (approximately 0.25 in.) wide.

Into the cells down the column on the left

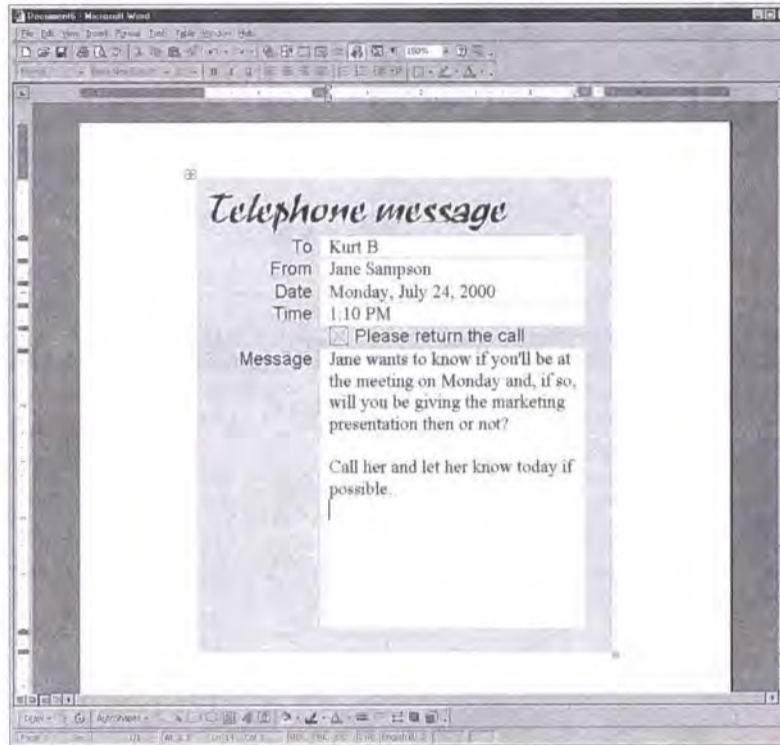


Fig. 1: Word's form tools allow you to create template forms that you can fill in by clicking and typing into preset areas.

side of the table, type these headings, one per cell:

Telephone Message
To
From
Date
Time
<leave blank>
Message

You should find that the bottom cell and the one third from last will be empty. Format the text in these columns using a plain font such as Arial. Right align the text in all the cells (except the text in the top cell) by selecting the cells and select the Align Right button on the Formatting Toolbar.

Select the entire table by placing your
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Java Tutorials: Part 2

More Java syntax

By Jacques Surveyer

In the first tutorial of this series, we wrote one Java program (the simple but classic Hello World) and learned the following:

- Java variable names are case sensitive.
- Java names start with any letter or underscore (_) or dollar sign (\$).
- Java names can be of any length up to 64 characters.
- Java uses semi-colons (;) to separate statements, braces ({ }) to separate code blocks, and brackets ([]) for array indices.
- Java uses the following three comments:
 1. //
 2. /* ... */
 3. /** ... */
- Java has familiar datatypes like char, string, int, etc.

In sum, Java is fairly approachable because it has about 50 commands, many of which are derived from C and C++ syntax. Thus a whole host of programmers will feel immediately comfortable with Java. Also, Java is object oriented from the start. One cannot write a Java program without using at least one class and therefore object definition.

This is important because in other languages like Ada, C++, and Visual Basic one can mix object-oriented and non-object-oriented code in a fashion that can become hard to follow, especially for larger programs. In this tutorial we shall write two types of Java programs: a stand alone application that runs in character mode; and a windowing application at the same time as we uncover more Java syntax.

Before we go any further, let's make clear that despite all the legal wrangling between Sun and Microsoft over Java, the language is alive and well and runs in all versions of Windows. Fig. 1 shows the results of running a Java windowing application in Windows 2000. The application is fairly simple—in fact it's like the tail (the small "Demo of
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Creating a Word form

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insertion point inside the table and choose Table, Select, then Table. Now set the background colour of the table by choosing Format, Borders and Shading, select the Shading tab, choose the colour you want, and ensure the Apply To area is set to Table. Choose the Borders tab, then choose the same colour as you selected for the background colour, click All, ensure the Apply to area is set to Table, then click OK.

Continue the table formatting by choosing the second to fifth cells in the second column and choose Format, Borders and Shading, Shading tab. Choose a contrasting colour for these cells, ensure the Apply To area is set to Cells and click OK. Repeat this for the cell opposite the heading "Message."

Adjust the layout of the table by selecting the three cells across the first row of the table and merge them to create the heading by selecting Table, then Merge Cells. You can now increase the font size for the heading so it stands out on the page. If you like, you can also format your heading text to a different font and colour so it contrasts with the background colour of the table.

The final step in preparing the layout of the table is to make the row containing the message much larger so you have room to type your message into it. Do this by placing your insertion point inside the table and, with your left mouse button, drag the bottom border of this cell downwards to make a larger space. You are now ready to add the form elements to your document.

Adding the form elements

Check that Word is not set up to display Field codes by selecting Tools, Options, select the View tab and ensure the Field Codes checkbox is not selected, then choose OK. Now you'll see the actual form elements and not merely a description of them. You should also display the Forms toolbar on the screen by selecting View, Toolbars, then Forms.

The first form field you'll use is a dropdown list containing the names of everyone you're likely to take messages for. When you have this list you can simply select the person's name from the list rather than having to type their name each time you take a message for them.

To add this field, place the insertion point in the cell in the second row of the table, middle column. This will be directly opposite the heading "To." From the Forms toolbar, select the Drop-Down Form Field button. You'll notice that a dropdown list is automatically created in the table cell. Double-click on the field to display the Options dialogue (see Fig. 2). Type the name of the first person you want to appear in your list, then click Add. Continue typing names and clicking Add until you have all the other names you need.

To customize your user interface, choose the Add Help Text button, choose the Status Bar tab, then the Type Your Own option button. In the text area type "From the list select the message recipient" and click OK, then OK again. This help text will be used later as a prompt to the user to remind them what they should do at this point. When you're done, you'll see the first element from the dropdown list appear in the form.

You may notice that the field is shaded grey, this allows you to see clearly where it is in the table and helps you while you're designing the form. You can toggle this shading on and off using the Form Field Shading button on the Forms toolbar. However, as this shading appears only on the screen form, and

not on any printed copy, you'll probably find it easier to work with shading turned on at least for now.

To add the next form element, move down one row until you are positioned opposite the word "From." Here you'll add a text area for the name of the person leaving the message. Because you won't know who might call, a dropdown list isn't as appropriate as an area into which you can type plain text. Add the field by clicking the Text Form Field button on the Forms toolbar then double-click the field to display the Options dialogue.

From the Type dropdown list, select Regular text and set the Maximum length to

70 as this should be sufficient for most needs. As you did for the previous field, choose the Add Help Text button, Status Bar tab and the Type Your Own option. In the text area type "Enter the name of the person leaving the message" and select OK, then OK again. When you're done you'll see an empty field on the form.

Move down another row to create the field into which you will insert the current date. If we assume you'll fill in the message on the spot, we can simply add the current date to this cell. To do this, add a Text Form Field and display the Options dialogue. From the Type dropdown list select Current date and from

the Date format dropdown list choose the date format you'd like to use to display your dates and click OK. There's no need for any help text for this field as the entry will be made automatically each time without requiring operator input.

Continuing with our assumption that the form will be filled in as the phone call is being taken, move down another row and use the same process that you use for the Date to add a field for inserting the current time. To do this, add a Text Form Field to the table and display its Options dialogue. From the Type dropdown list select Current time and from

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More Java syntax

Continued from page 100

FileDialog”) wagging the dog (the Windows 2000 OpenFileDialog “Your File Dialog”). The program reports back what file was chosen and from what directory. The demo program is included with the zip file of this tutorial available at my Web site as noted at the end of this article.

Some more class declarations

Remember the rule: every Java program must have at least one class. In this tutorial we learn more about classes and how they allow users to extend the language. To illustrate the power and extensibility of Java, a simple program of Points will be created. By creating the class Point, we demonstrate the strength of an object-oriented language like Java.

In effect, we have added a new data type, called a Point, to the language. After declaring the class Point, a statement like Point mypoint = new Point(6,6); creates a brand new data type, an instance of Point. Note that all the Java code is italicized, comments (preceded by //) are not:

```
class Point {
    // Note that the declaration of a class looks like a struct
    // in C or C++ just change class for struct
    public double x1;
    public double y1;
    // But notice the constructor ( missing in C) allows
    // different ways of initializing a Point
    // The first constructor tells Java to initialize a Point with
    // coordinates set at 0, 0 (the origin)
    public Point(){
        x1=0; y1=0;
    }
    // The second constructor allows users to define
    // the x1 and y1 values
    public Point(double xx, double yy){
        x1=xx; y1=yy;
    }
}
```

```
// But here is the major difference. Unlike a
// struct in C,
// a Java class (like C++) can have
// methods/functions
// built right into the class
public double distance(){
    // Note we call on the Java library Math for its
    // square root function
    return Math.sqrt(x1*x1 + y1*y1);
}
public void assign(Point pt){
    this.x1=pt.x1; this.y1=pt.y1;
}
public double distance(Point pt){
    // Calculate the distance between
    // two co-ordinate points
    return Math.sqrt((this.x1 - pt.x1)*(this.x1 - pt.x1)
    +(this.y1 - pt.y1)*(this.y1 - pt.y1));
}
// See below why we have added the 7 lines of
// code
// and comments
public String toString(Point pt){
    return "Point value is x1="+x1+" y1="+y1;
}
// if the variable x1 and x2 are declare private instead
// of public then you would have to add the following
// routines by removing the comments characters "//"
// public double getX1(){ return this.x1; } public double
// getY1(){ return this.y1; }
// public void setX1(double xx){ this.x1=xx; } public void
// setY1(double yy){ this.y1=yy; }
```

The important points to note about a class in Java are that:

- The class uses any combination of basic data types like float, int, boolean, etc. (we will cover them in detail in a future tutorial). In Point, we use double variables. In the process we have created a new data type, Point, which is usable in any Java program.
- The class has a constructor that allows the user to specify one or more ways class



Fig. 2A (top) and Fig. 2B (bottom): Assignment statement gone awry in Java.

instances (also known as values or objects) will be initialized when they are declared in a Java program.

- And, here is the major difference, functions or methods that work on Java class instances are declared right inside the class as in the case of our distance() method.

So, if you ask what can be done with a Point data type, it really can't do too much. Besides declaring a point, we can find the distance between two points, as in Sun_center.class Point { distance(Pluto_point), bu)}t not an awful lot else yet. As we shall see in the next tutorial, we can use Point in creating other related classes or data types.

However, there are three more concepts we should explain about our Point class. First, as we have seen, just as there are two versions of the constructor function, in like fashion there are two versions of the distance() function. This practice of allowing many forms or versions of the same function is called polymorphism in object-oriented programming.

The idea is to let the function calculate the same return value but using different inputs and/or calculations. These calculations could be done with switch variables and dummy arguments, but polymorphism is not only more elegant but also less mistake prone.

Second, to every class there are four or five functions that are immediate candidates to be included although none of them have to be. One of those functions is toString(). Some others are assign(), compareTo(), equals(), getVariable(), setVariable(). The toString() gets called whenever a class instance or object is used where a String is called for as in System.out.println(Pluto_point) or in concatenation operations such as "The co-ordinates of Pluto are: " + Pluto_point .

Third, there is a gaping security hole in this class definition, almost as wide as the hole in Microsoft's Outlook highlighted by the Melissa and ILOVEYOU viruses. Point constituent variables are declared as public.

This is very important because any other Java class or method could now write to these variables(Pluto_point.x1 = 1.2;). This visibility can sometimes make programming easier; but as programs grow there is a price to pay. So we can make all Point data values hidden from other classes and functions with one simple change. Instead of declaring the variables public double x1; public double y1; we would declare them private as follows:

```
class Point {
    private double x1; private double y1;
    ...
}
```

With this change, access to the values of x1 and y2 are severely restricted. For example, the following code snippet no longer works:

```
Point pt = new Point(33.3, -17.6);
pt.x1=33; pt.y2=-17; //Here we round to the nearest digit
System.out.println("The value of Point pt is " + pt + " and
Continued on page 107
```

Creating a Word form

Continued from page 101

the Time format dropdown list choose your preferred time format and click OK.

Move one row down, this time to the empty row and add a checkbox by clicking the Check Box Form Field button. The default setting for a checkbox is that it will be unchecked—as this is the setting we want, we can leave this form element as it is. Move your insertion point to the right of the checkbox and type "Please return the call" and format it to match the headings.

Move down another row to where you'll type the actual message itself. To do this, add a Text Form Field and display the Options dialogue. From the Type dropdown list choose Regular text and set the Maximum length to Unlimited so you can type a long message if required. Choose Add Help Text, Status Bar tab, Type Your Own option and, in the text area type "Type the text of the message here" and select OK twice. A small text field area will appear on the form—don't worry, if your message is larger it will stretch to accommodate it.

The final touches

Now that you've added all the required fields to your form you're ready to put the final touches to it so you can actually put it to some practical use.

You'll begin by first protecting the form. To do this, select the Protect Form button on the Forms toolbar. Protecting the form safeguards it so that the user can only move the

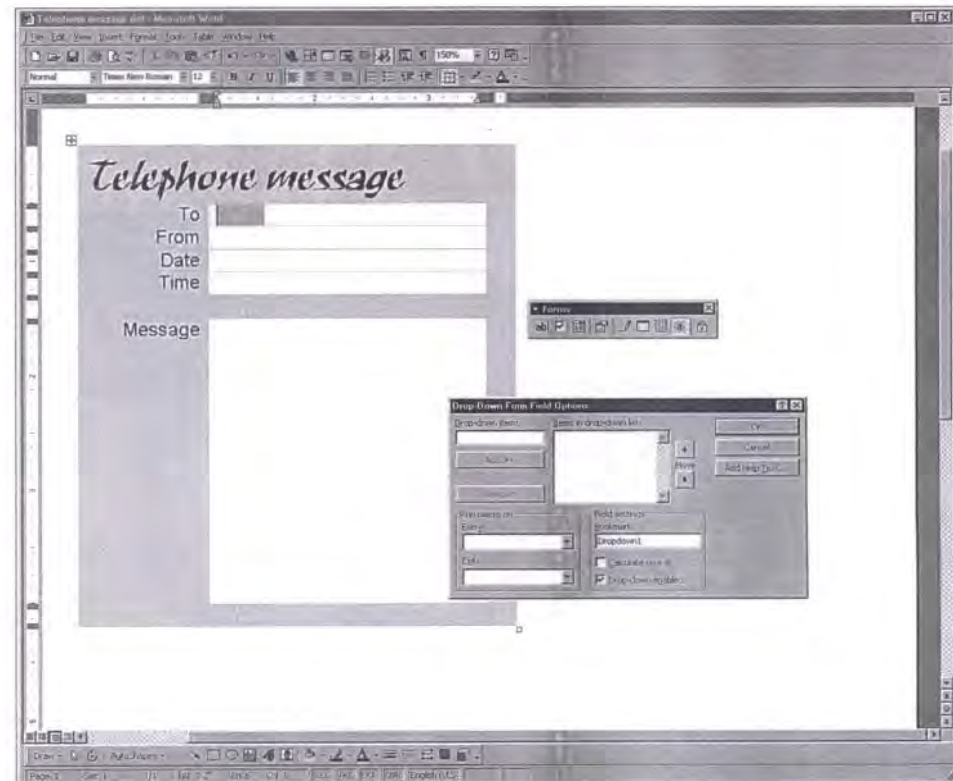
insertion point from one field to the next and so that they can only enter text where there is a field for text entry actually provided. This means a user can't make any other changes to the text on the form—either to its layout or to its formatting. When you're designing forms for use by others you'll find that protecting the form makes it easier for that person to complete the form without having to know much at all about using Word—they simply can't move anywhere you haven't designed for them to go.

It's now time to put your form to the test. Use the Tab key to move from field to field. Notice that you can't change the date or the time fields as they are set to display the current date and time settings that the computer provides automatically. Choose a name from the To dropdown list by clicking the arrow and select the name. Type the name of the person who left the message in the space provided, click the checkbox to enable and disable it and finish by typing a sample message.

If you need to make changes to the form, click the Protect Form button to reverse the protection, make your changes, and protect the form again. You'll notice that protecting and unprotecting the form clears anything you've entered into the form, which you'll need to do before you save it.

Save your form using File, then Save. Call it MessageForm.dot and save it into your main template directory (Templates) or one of the subdirectories off this directory. Choose File, Close to close the file.

To use your form for a message, choose



Design your form using a table, then add the various form elements into the cells of the table.

File, New, select the template MessageForm from your list of templates and click OK. You can now enter the details of the message and email, fax, print, or save it as you would any other document.

Once you've created this form you're sure to find many ways forms can assist you at

work and at home. □

Helen Bradley specializes in writing hands-on tutorials. Her columns appear regularly in a number of publications in the U.S., Australia, and the U.K. She also reports on the computer industry for Australian Radio. Contact Helen at helen@helenbradley.com.

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Shell concepts



By Gene Wilburn

The Linux toolkit, with its rich collection of GNU and Unix utilities, provides a rewarding computing environment

for programmers and end users alike. The glue that binds these utilities together is the shell, or command-line interface (CLI). Although X programs and graphical environments, such as KDE and GNOME, are now a common and welcome part of Linux, you may notice that Unix veterans always keep a few xterm windows open so they can access the command line. The Unix shell is an integral part of Unix (hence Linux) philosophy. There are literally 30 years' worth of sophisticated, refined utilities awaiting your command.

Something that will quickly propel you from newbie to intermediate status is learning how to harness these utilities, incorporating them into shell scripts. But before you can write scripts, you need some concept of what the Linux shell is and what it can do. Let's begin with a brief overview of Unix shells.

The shell game

The shell is an essential layer of the Unix operating system, providing an interpreter that reads input from the command line; sets up pipes, redirection and background processing; and sets up programs for execution. If you've used the command-line interpreter of DOS or Windows, you already have some idea of what a shell does. Think of the Unix shell as DOS on steroids.

Unix offers several shells to choose from. The earliest and best-known Unix shell, written by Stephen Bourne for V7 of AT&T Unix, is called the Bourne shell (sh). To this day, the Bourne shell retains its role as the common denominator of most shell scripting. At the University of California at Berkeley, Bill Joy, the author of vi, created the C shell (csh) as part of 2BSD Unix. The C shell introduced many innovations, including command-line history and a programming environment similar to the C programming language. Unfortunately, the syntax of C shell is not compatible with Bourne shell syntax. Even so, the C shell has remained popular for years and is readily available for Linux systems—tcsh (an enhanced but totally compatible csh) being the most widely distributed version.

Next came the Korn Shell (ksh), created by David Korn at AT&T Labs in the mid-1980s. The Korn Shell maintained a high level of Bourne Shell compatibility while adding

some slick new features and a nicer command-line history than the C Shell. The Korn Shell is still widely used in commercial Unix systems such as IBM's AIX. Until recently, however, licensing restrictions have prevented the Korn shell from being widely deployed in the open-source community. There is a public-domain version of the Korn shell called pdksh available for Linux systems.

The default shell of Linux is the Free Software Foundation's GNU Bash (Bourne-Again Shell). As the punny name suggests, Bash evolved from the Bourne Shell. It incorporates many of the best features of C and Korn, as well as introducing a number of its own enhancements. Bash is highly Bourne-shell and Korn-shell compatible, meaning that if you pick up an older Unix book on shell scripting, most of the examples will work without change.

Some shell basics

When you first log in to a Linux system, the OS automatically starts up the default shell for your system, which in turn initializes a number of shell variables and file descriptors. The shell variables include PATH, HOME, HOSTTYPE, OSTYPE, PS1, PS2, and several others. If you would like to see which variables are initialized in your session, type "set | more" at the command line.

The standard command-line prompt in Linux for a normal user account using Bourne, Bash or Korn shell is the dollar sign

(\$), while the root prompt is a hash symbol (#). By contrast the traditional C shell prompt is a percent symbol (%). A quick glance at the command line prompt will usually let you know if you're issuing a command as a normal user or as root. The command-line prompt for Red Hat systems includes additional information, as seen in this prompt on my Red Hat Linux 6.2 portable:

```
[gene@755cx newbies]$
```

This prompt has three Bash-shell variables set: user name ("gene"), host name ("755cx"), and current working directory ("newbies") minus the full path. This format is configured system wide in the file /etc/bashrc:

```
PS1="\u@\h \W]\$ "
```

In the primary command-line prompt string (PS1), the \u indicates user, \h is host and \W is current directory. If you prefer a different command-line prompt, you can change your individual profile by adjusting .bashrc in your home directory or adjusting the /etc/bashrc file to set the string globally for all users. Some system administrators prefer to include the entire path, which you can achieve by changing \W to \w (lower case). I personally find that the full pathname

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More Java syntax

Continued from page 104
its distance is:" + pt.distance());

After these changes, the Java compiler will flag the rounding statements as incorrect, `pt.x1=33; pt.x2= -17;` because we have declared the variables `x1` and `y1` to be private. This is called variable hiding or encapsulation in the literature on object-oriented programming. Most object-oriented programming experts encourage developers to hide most variables in a class definition. The reason is that the hardest bugs to uncover in development are those involving changes to public variables in some obscure routine that is trying to create a shortcut. Efficiency works against security and reliability such that when programs become huge—in the tens of thousands of lines of code—the speed of development suffers when trying to track down these obscure bugs. Encapsulation or data hiding helps to prevent these types of errors.

However, by using private variables in a class declaration, the program designer may want to allow legitimate users to read and/or write to the underlying variables: the so-called accessor functions `getVariable()` and `setVariable()`. In the definition of class `Point` we have at the end defined these accessor functions: `getX1()`, `setX1()`, `getY1()`, and `setY1()`. With these accessor functions plus another security mode, protected, Java allows

the programmer to control precisely how users can access and/or change the variable values.

Just to demonstrate how vexing the problems of debugging code can be, readers should carefully examine Fig. 2A and Fig. 2B. Carefully examine the code, then try to explain why the values print out as they do. Even better, all the code for the `Point.java` is included in the zip file for the tutorial that is available at my Web site. I look forward to seeing users' explanations of what they think is going on.

In the meantime, let's summarize what we have learned. Java is an object-oriented language. We have seen how Java supports object-oriented principles such as encapsulation and polymorphism. We have also seen how Java extends the expressive power of the programmer because classes in effect are just new data types with special contained functions that the programmer defines to allow the new data type to be used in novel but carefully proscribed ways.

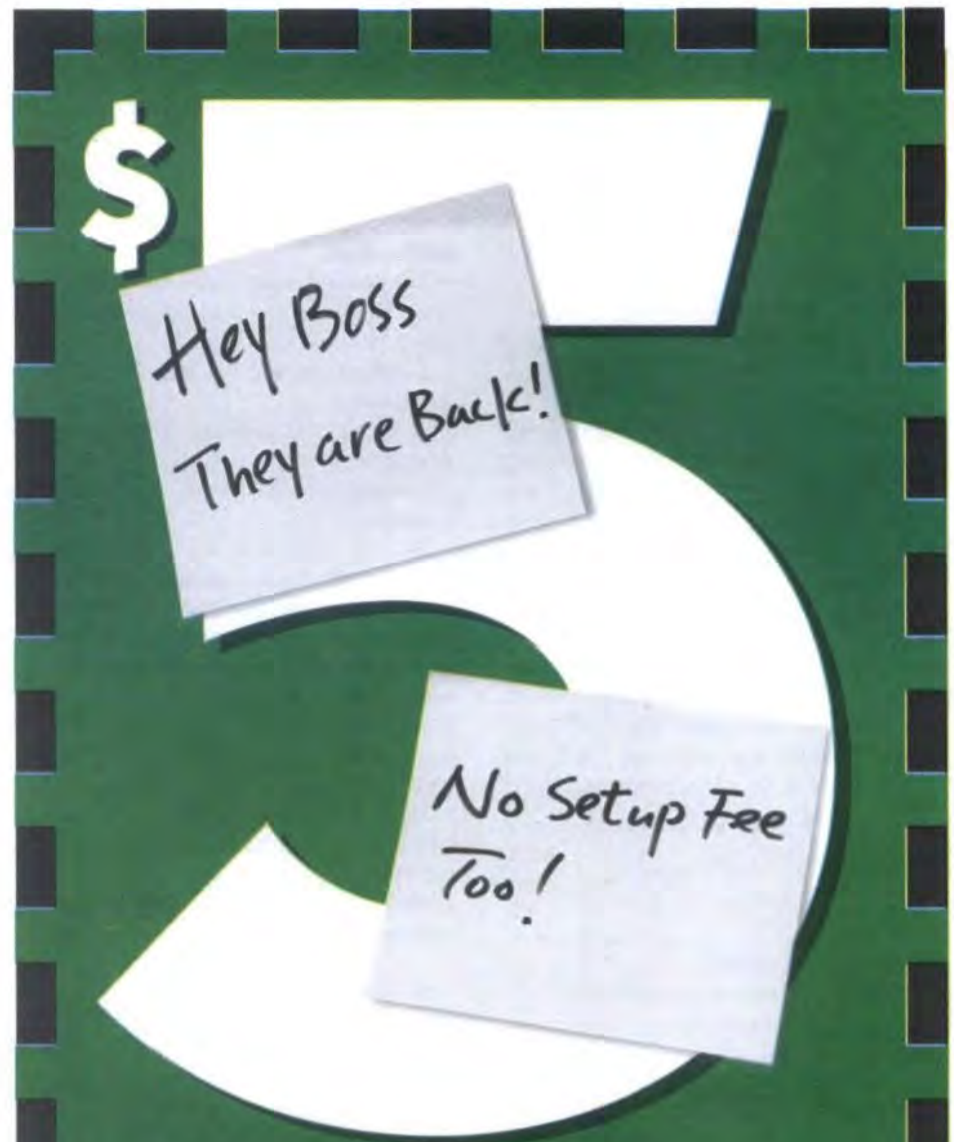
Next month we will make sure users are up and running with the Java JDK, examine more details of Java syntax and continue to compare Java to C and C++. □

Jacques Surveyer is a consultant who chats Java and Visual Basic at jbsurv@inforamp.net. This tutorial and all the source code is available online at his Web site: <http://www.inforamp.net/~jbsurv>.

Table 1

Comparison of C and Java syntax

Item	Keyword/syntax element	Java equivalents or commentary
C only (not available in Java)		
• variable forms	struct, enum, union	class with no methods = <i>struct</i> ; class with constants and equals method = <i>enum</i> ; <i>union</i> is considered bad memory practice
• type modifiers	auto, signed, unsigned	<i>auto</i> is not necessary as Java allows declarations anywhere in the code; all numeric variables are <i>signed</i> in Java
• type modifiers	extern, register, volatile	Java's cross-platform and memory models preclude these options
• commands	goto, sizeof, typedef	rendered redundant in Java
Common to C and Java		
• datatypes	char, int, short, long, float, double, void	but Java is precise in definition of size
• modifiers	static	more meanings in Java
• commands	if, else, for, while, do, switch, case, default, breaks, continue, return	remarkably similar in syntax and use just as is the case for operators
• operators with their precedence and associativity	() [] . !~ ++ -- + - (cast) * / % + - << >> <<= >= == != & & && ?: += -= *= /= %= &= = <<= >>=	scoping—left to right unary—right to left multiply, divide, modulo—left to right add, subtract—left to right right and left shift—left to right greater than, less than—left to right equals, not equals—left to right logical and—left to right logical Xor—left to right logical or—left to right bitwise and—left to right bitwise or—left to right if-then—left to right assignment—right to left
Java only (not C)		
• datatypes	byte, boolean	very small data types
• commands	try, catch, finally, throw	exception handling
• operators	>>>, new, instance of	
• modifiers	private, public, protected, transient, synchronized, native, final, threadsafe, abstract	much more control of visibility of variables and methods
• declarations	import, class, extends, implements, interface, package	here are main object-oriented extensions of Java
• predefined constants	true, false, this, super	



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Linux for Newbies

Continued from page 106

gets tiresome once you get deep into a file system so I prefer the Red Hat default. The actual default for Bash without any tweaking is:

```
PS1="bash$"
```

Which produces the very spare:

```
bash$
```

Some distributions of Linux give you only the default Bash prompt string, assuming you will adjust it to taste. That's fine if you already know how, but having an intelligently configured prompt, as per Red Hat, is a nice touch for beginning users. You'll find other metacharacters that can be used for the command-line prompt by typing "man bash." (Remember the refrain: "man is your friend.") To see which prompting symbols are available in Bash, type "/PROMPTING" while reading the man page and it will lead you to a list of all the metacharacters. Here is a partial listing:

- \t the current time in HH:MM:SS format
- \d the date in "Weekday Month Date" format
- \n newline
- \w the current working directory
- \W the basename of the current working directory
- \u the username of the current user
- \h the hostname

You can use these metacharacters in your prompt string to customize the command-line prompt to your liking.

Shell features

The Bash shell incorporates a number of features that you can use on an ad-hoc basis from the command line, or write into a script if the commands are something you want to repeat periodically. Let's review a few of the common features:

Redirection

When you log in to Linux, the shell sets up three file descriptors and assigns numbers to them:

1. stdin (standard in). Your keyboard: file descriptor 0
2. stdout (standard out). Your display: file descriptor 1
3. stderr (standard error). Your display: file descriptor 2

You can redirect these I/O (input/output) streams with the following three operators: >, >>, and <. The first operator, >, will redirect into a file, overwriting any file of the same name. The >> operator appends to an existing file, if the file exists, or creates a new file if not. The < operator redirects input from a file to some process rather than using keyboard input.

Here's an example: you want to know where all the .txt files are on your system. You can start out looking for them with the find command by typing the following at the command line:

```
$ find / -name *.txt -print
```

You may want to save the results into a file that you can examine at leisure. To do this, simply redirect the above—which would normally go to stdout (your terminal)—into a file, e.g.:

```
$ find / -name *.txt -print > ~/tmp/textfiles
```

The Bash shell in this example provides us with two special features: redirection into a file called textfiles and "tilde expansion," a feature that uses the tilde character (~) as shorthand for "my home directory." Fully expanded, on my system, the file will be written to /home/genew/tmp/textfiles.

Perhaps after examining the results you wish it had also included .doc files. To add these to the file, you can use the append operator:

```
$ find / -name *.doc -print >> ~/tmp/textfiles
```

In the course of running this command, especially as a non-root user, you probably received a bunch of error lines. These errors occur when find attempts to read files in directories for which you have no access privilege, e.g.:

```
find: /var/lib/mysql/mysql: Permission denied
```

We can easily bypass this annoyance. Remember that stderr is set as file descriptor 2 by the shell. Although it is initially assigned to your display screen, it can be redirected elsewhere. One of the time-honoured places to redirect stuff you're not interested in is /dev/null, the old "bit bucket in the sky." To send something to /dev/null is to send it to oblivion. Here's how to see all the .txt files on your system without any distracting error messages:

```
$ find / -name *.txt -print 2> /dev/null
```

Notice the "2>" construct. It redirects all the stuff for filehandle 2 (standard error) to /dev/null.

Pipelines

Another major feature the shell provides is pipelining using the "|" pipe, or vertical bar, character. A pipeline spawns a new process that takes the output of the previous process (stdout) as the input to a new process (stdin). Programs or utilities that can be plugged into a pipeline are frequently called filter programs—most classic Unix utilities are written specifically to be used as filter programs.

One of the things that makes Unix (hence Linux) so attractive is that the possibilities for combining pipelines, filters, and redirection are limited only by your imagination. By using pre-written, time-tested utilities, you can create custom programs that take very little time to assemble, compared to writing programs from scratch in C or Java. The shell provides conditional logic, branching, and looping structures for creating sophisticated custom scripts.

Shell examples

Let's take a cursory look at how tools can be combined. In the following example we extract user names and their home directories from the /etc/passwd file, then sort them alphabetically and store them in a file called users:

```
$ cat /etc/passwd | awk -F: '{print $1 "\t" $6}' \
| sort > ~/tmp/users
```

The sequence here is that cat pipes the contents of the password file to awk, which parses the file and pipes field 1 (login name) and field 6 (home directory) separated by a tab (\t), to sort, which alphabetizes the list then redirects it to a file. The backslash (\) at the end of a line of Bash prompts allows you to carry commands over several lines for easier readability. The awk program, a predecessor to Perl, is very adept at parsing fields from a line of text.

Let's close with a simple shell script. Many of you have your Linux system connected to the Internet 24 hours a day via a high-speed cable or DSL modem connection. Here's a script that will adjust your system clock to an atomic time standard every day at 2 a.m., then adjust your system's hardware clock to match the updated system clock. Log in as root and using vi or your favourite editor, create a file in /root called timesync with the following lines:

```
#!/bin/sh
/usr/bin/rdate -s ben.cs.wisc.edu
setclock
```

Make the file executable by typing the following:

```
chmod +x timesync
```

The Linux utility for running scheduled programs is called cron and it is accessed with the crontab (cron table) command. Type "crontab -e" (no quotes) to add the following lines to crontab (using vi commands):

```
# update system clock daily
0 2 * * * /root/timesync
```

Your computer will now have its system clock adjusted to an atomic time standard once every 24 hours at 2:00 a.m. Forget the TV—you can set your wristwatch by your Linux system.

Next month we'll take a look at further shell scripting examples. □

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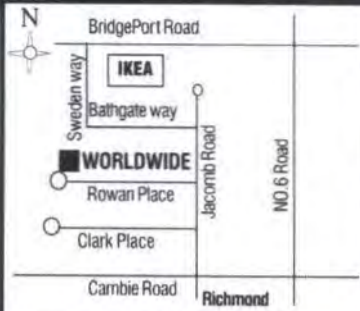
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Creating a wizard

By Jacques Surveyer

One of the advantages of using Visual Basic for Applications (VBA) is that it gives you a virtual copy of the Visual Basic (VB) development environ for free in every copy of Microsoft Word, Excel, Powerpoint, and nearly 200 other application programs running in Windows 95, 98, NT, and 2000. However, Visual Basic 6 and VBA are not exactly the same. So in our next exercise we will create a VBA wizard (see Fig. 1) that uses exactly the same techniques and code written by Microsoft developers. In the process we shall point out where VB and VBA differ while at the same time review-

ing some of the graphic user interface (GUI) techniques and methods learned over the past few lessons.

This exercise will span at least two tutorials, so in order to encourage users to try out the code, we are running a contest. Readers are encouraged



Fig. 1: The setup wizard.

to create their own VBA wizards using any application program that supports VBA. Send your entries to me at the email address listed at the end of this tutorial, or mail a diskette containing the code to me, care of *The Computer Paper*, 625 Church St., 6th Floor, Toronto, ON M4Y 2G1). The top three wizards will be published in this column and receive a small prize.

The setup wizard

The setup wizard as shown in Fig. 1 is from a real application and uses coding tricks adopted from *Office 2000 Visual Basic for Applications Fundamentals* by David Boctor, (published by Microsoft Press). However, we have simplified some of the graphics and coding methods, while hopefully retaining the richness of the design.

A wizard is designed to instruct and to get users over a rough spot in an application at the same time. So the Wizard itself better be easy navigate and use otherwise it will defeat its own purpose. So, as readers will shortly see, wizards are designed with two or even three sets of navigation controls and all sorts of aids and cues to reassure the user that what they are doing is correct (or conversely to prevent users from making mistakes).

Our setup wizard has three sets of navigation controls: a tab or multi-page control, command buttons, and what Microsoft GUI engineers call a subway map. The subway map is actually made up of small image controls and labels that react to mouse clicks (HTML veterans will be familiar with the equivalent image maps and links). The setup wizard has been designed to simplify the process of setting up a commercial application that requires the user to obtain a password by call-

ing or emailing the supplier with their registration information.

As shown on the subway map in Fig. 1, setup and registration involves four steps:

- Intro: Tells the user what the wizard will do for them.
- Info: Gathers and validates the registration information.
- Logon: Gets the registration information over the Internet, or instructs the user how to get the information by phoning a toll-free number if an Internet connection is not available.
- Go: Verifies the passwords received and after doing the final program registration, launches the user into their newly purchased program.

First phase

The first phase will set up and test the tab/multi-page control and the command buttons. Launch your VBA program (Excel 2000 is our choice but



Fig. 2: Adding image control.

much of the code was actually developed in Visio's VBA edition). Select TOOLS | MACRO | VISUAL BASIC EDITOR. Then in the VBA Editor, select INSERT | USERFORM and a small blank form will appear in VBA. In the property editor, rename the caption from UserForm to Setup Wizard. Add four Command Buttons to your form along the bot-

Continued on page 112

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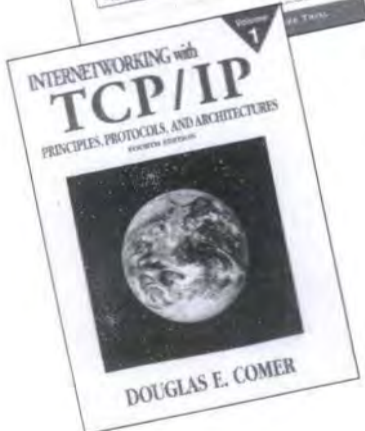
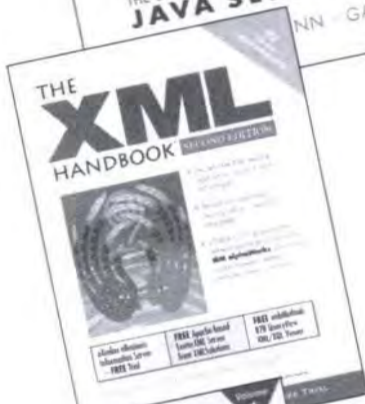


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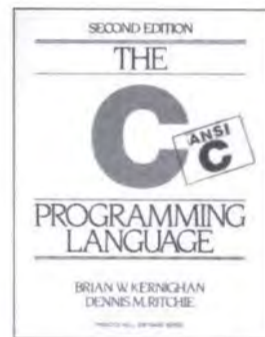


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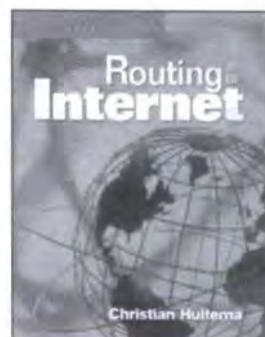
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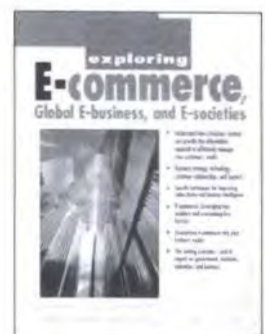
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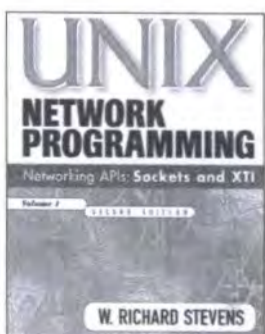
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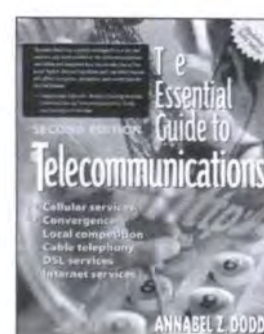
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VB Tutorial: Creating a wizard

Continued from page 110

tom. (Hint: in VBA if you double-click the icon for Command Buttons in VBA—CTRL+click does the equivalent in VB—you can draw the Command Buttons in one operation. Click on the pointer to deactivate the Command Button tool).

Now, for some quick tricks to make all the Command Buttons the same size and to line them up along the bottom of the form.

First, lasso the buttons with the mouse so all four are highlighted.

Then choose the menu items **FORMAT | MAKE SAME SIZE | BOTH**. Then align the buttons along the same top line with **FORMAT | ALIGN | TOPS**.

Finally, make the spacing between buttons even by choosing **FORMAT | HORIZONTAL SPACING | MAKE EQUAL**. You can do all of this manually, one button at a time, but the menus make it faster—trust me.

Next change the Captions and Names of the Command Buttons as follows using the Properties Window:

CommandButton1 => Cancel and Name =>

cbCancel
CommandButton2 => Previous and Name => cbPrevious
CommandButton3 => Next and name => cbNext
CommandButton4 => Finish and name => cbFinish

Now double-click on the Cancel button. VBA should automatically switch you into text-editing mode, creating an empty subroutine *cbCancel-Click()*. Add one line of code to that subroutine: **Unload Me**. Return to VBA's visual design mode by clicking on the View Object icon in the

Project window. (Users are going to find that switching between visual design and text editing is as common an operation in VBA as in VB. So it pays to leave the Project Window with the View Code and View Object icons constantly open so switching contexts is just a mouse-click away.) So, switch back to visual design and double-click the Finish button. Again enter the one line of code: **Unload Me**.

Now we are ready to add the most important control: the Tab or Multipage control.

From toolbox, click on the Multipage control, drag and drop it in the upper two-thirds of the form. Right-click on any tab of the Multipage and choose New Page from the popup menu. Right-click again and add a fourth New Page. Change the Page as follows:

Page1 to Intro
Page2 to Info
Page3 to Logon
Page4 to Go

Then rename the Multipage1 to Tabs. Double-click the Next button and add the line of code: **Tabs.Value = Tabs.Value + 1**

Add a similar line of code to the Previous button: **Tabs.Value = Tabs.Value - 1**. Finally, add to the *Tabs_Change()* subroutine the following Select Case, which manages all the buttons whenever one of the Tabs is selected or Tabs.Value changes and the code is as follows:

```
Select Case Tabs.Value
Case 0 'Intro chosen
cbNext.Enabled = True
cbPrevious.Enabled = False
cbFinish.Enabled = False
Case maxTabs - 1 'Finish chosen
cbNext1.Enabled = True
cbPrevious.Enabled = False
cbFinish.Enabled = False
Case Else ' Info or Logon chosen - so make sure
Next and
cbNext1.Enabled = True
cbPrevious.Enabled = False
cbFinish.Enabled = False
End Select
```

Finally, we add the Image control to the left third of the form, as shown in Fig. 2. Change Image1 BackColor to Black.

So now we have two ways to navigate in the Setup Wizard: using the Command Buttons (Cancel, Previous, Next, Finish) or the Tabs (Info, Intro, Logon, Go).

We'll test the code and make sure the Command Buttons change when various Tabs are selected or, conversely, the Tabs change when the various Command Buttons are selected.

In the next tutorial we shall add a third navigation tool the Subway Map. When the Subway Map is set in place we shall in effect "cover-up" the Tabs MultiPage so the tabs are no longer available but the control still works with the Subway Map and Command Buttons. □

Jacques Surveyer is your VB and VBA coach at jbsurv@inforamp.net.

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PentiumIII800/850 \$1239/1379	PentiumIII 650 \$979	PIII 733/750 \$1549/1629	AMD Athlon/Thunderbird CPU:	AMD Athlon Thunderbird CPU:
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Celeron 633/667 \$1039/1069	PIII 866/933 \$1239/1479	Asus P3V4X/CEV4X MB w/4X AGP	900/950/1000 \$1589/1699/1859	900/950/1000 \$1159/1279/1459
Acer Aopen MX64/MX34 w/4xAGP	Masonic 754LMR MB. w/ATA66 &	128MB PC133 SDRAM	Gigabyte GA-7VX/7ZX MB w/4X AGP	M805LR ATA66/4x AGP/266MHz FSB
/Ultra ATA66 & upto150Mhz FSB	133 MHz Front Side Bus	30.7G Ultra DMA66 Hard Drive	128 MB PC-100 SDRAM	32MB PC-100 SDRAM
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			NT 4.0 Workstation /\$170	MS Natural Keyboard \$38

Rogers @ Home high speed cable internet Service Kit special (first month free) \$19

Memory

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Video Cards

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 Pine 3D PCI 4M/8M..... 37/47
 Power Color 32M Riva TNT2/TV out 98/128
 Acer Aopen GeForce2 MX 32M Retail box 199
 Asus V6600 GeForce256 32M Pure/Delux...228/269
 Asus V6800 Pure/Delux..... 274/288
 Asus 32M GeForce2 MX 7100/7700 Pure... 224/394
 VoodooIII 3000(TV out)/3500 All-in-one...138/239
 Voodoo III 2000 AGP/PCI 98/139
 Voodoo-5 5500 64M 405
 Diamond Speed Star A50 8M/A90 16M 39/65
 Diamond Stealth3 S540 Savage4 Pro 4x 32M... 94
 ATI All-in-Wonder Pro 8M/128 32M 169/235
 ATI All-in-Wonder 128 Pro 16M/32M 209/268
 ATI Xpert 98 8M/Play PC2TV..... 47/68
 ATI Xpert 32M 2000/2000Pro 108/138
 ATI Rage128 16M /32M Fury(PC2TV)..... 104/149
 ATI Fury Pro 32M/Fury Maxx 64M..... 155/229
 Matrox Millennium G400 AGP 16M/32M138/168
 Matrox Millennium G400 32M Dual/Max..... 218/276
 Matrox Millennium G400 16M Marval 388
 ATI TV Tuner 88
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 Samsung Flat Tube 753DF/955DF(\$30*) ..315/505
 Samsung 700IFT*/900IFT/900NF*(50)..369/599/599
 LG Goldstare 775FT/795FT..... 375/418
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 ViewSonic 21" G810/P815 1099/1238
 Mitsubishi Dimond Plus71/91 489/749
 Panasonic E70/SL75/SL95..... 299/385/595

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 ASUS P3V133/P3V4x/CEV4X 135/164/164
 ASUS P3C-E/P3C-2000/CUSL2.....268/209/225
 ASUS PIII P2B-S/P2B-DS/P2B-D..... 439/629/389
 ASUS Athlon MB K7M/K7V/AV7..... 158/184/228
 ASUS 512k Cache P5A-B/P5A-A 124/129
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Sound Cards & Speakers

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 Yamaha MS30(w/subwoofer) 88
 Altec Lansing ACS45.2/48/54 82/149/82
 Acer Ms-810 Subwoofer 1000W Remote controll..69
 Polar Bear-600 600w Speakers w/Subwoofer 35

Keyboards & Mice

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 Surecom 100Mb HUB 5/8/16..... 85/125/299
 Surecom PCMCIA 56K FAX/LAN79/59
 D-Link 530TX 10/100M Wake on LAN...22
 D-Link DFE-2624X 24 Port 10/100MB...369
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 3Com 3C16750B 10M/100M 8 Port.....249
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 HP 950C/1220CXI*(S75) 439/574*
 Lexmark Z11/Z32*/Z52*(S50).....98/129*/239*
 Canon 1000/2000*(20)/2100.....75/78*/98
 Canon BJC 5100/6100..... 178/198
 Canon BJC 50/85 469/379
 Epson 440/670/740..... 99/128/145
 HP Laser 1100/2100 539/959
 Brother HL1020/1240/1250DX..299/459/539
 Brother MFC -1970/7150*(50)..... 299/449*
 HP Scanner 4200/5300*(S50) 199/329*
 Acer 320P/640U 89/98
 Plustek 600CP/1200CU..... 98/149

Accessories:

Canon Ink Cartridge BCI-21B /BCI-21C... 9/14
 Canon BC-22 Photo Kit/Value Pack..... 59/29
 Epson Ink Jet Paper (photo quality)15
 Epson Printer Cartridge Black/Color14/19
 Brother toner TN-200HL/TN-300HL..... 39/39
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 AMD K6II 500/550 95/139
 AMD Duron 600/650/700109/129/169
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 K7- 850/900/950/1000 379/429/559/785
 PentiumIII 533/550/600/650...189/209/278/279
 PentiumIII 667/700/733/750...279/289/308/379
 PIII 800/850/866/933 399/549/549/759
 Celeron 533/566/600/633..... 149/149/159/185

Modems

Impression 56k PCI Voice Fax/Modem \$22
 PCI 56k Voice Diamond Supra/GVC..... 45/44
 Acer 56K Voice V90 PCI/ISA 31/64
 USR PCI 56k V.90 Real Modem/Voice..... 78/89
 USR 56k V.90 PCI Win Modeem/Voice.. 44/54
 USR Ext. 56K V90 Fax Modem/Voice..194/248
 56k Voice Ext. Retail Box 89
 Cardinal 128K ISDN 129

Zip Drivers

Iomega Zip IDE 100M Int./Disk \$68/13
 Iomega Zip IDE 250M Int./Disk 138/24
 LS120 (120M) Super Drive 2x/Disk87/13
 Iomega 2G Jaz Diver SCSI 499
 Iomega 2G Jaz Disk/2G Tape 125/25

Cases & Misc.

USB Port Controller PCI..... \$39
 Ultra DMA66 Hard Drive Controller 59
 15/19" Tower Case w/PS 29/42
 25" Full Size Tower Case w/PS 79
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Webmaster guide falls short in key areas

By Jacques Surveyer

Back in 1996, when the whole world of the Internet was exploding, Web developers probably welcomed *Webmaster in a Nutshell* with open arms. Its coverage of HTML, JavaScript, CGI, and PERL, plus the popular Apache server, would have helped a frazzled Web staff cope with the sheer problem of keeping Internet/intranet systems up and running. But

four years later, *Webmaster in a Nutshell, 2nd Edition* has not moved along nearly as quickly as the server side of Internet industry. Security (think of the denial of service attacks, or the Melissa and ILOVEYOU viruses), privacy (think of cookie controversies and click-through analysis), performance (think of incredible demand surges from one million hits per day to 10-plus million hits per day) and reliability (think of major outages on Charles Schwab, e-Bay, and

other major Internet sites in just the last six months) are just some of the issues vexing Webmasters.

Webmaster in a Nutshell

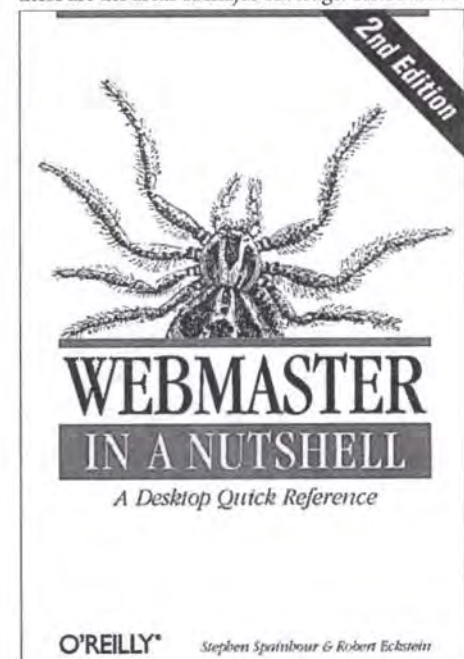
Authors: Stephen Spainhour and Robert Eckstein
From: O'Reilly Press
530 pages 1999
ISBN: 1-56592-325-1
Price: \$24.95

Overview: Solid coverage of Web servers from Unix/Linux/Apache point of view, but omits broader Web admin issues.
Layout & readability: Spare use of diagrams and illustrations in a topic area that begs for them.
Overall rating: 3.3 out of 5

But be honest, back in mid-1998 when Stephen Spainhour and Robert Eckstein probably started work on this new edition, would you have predicted any of the four factors above as being major concerns for Webmasters? Whatever the reason, the book is short on or lacking discussion of some the following topic areas:

- security topics such as firewalls, proxy servers, message filters and the trade-offs of accessibility/scalability versus security;
- load balancing, cache servers, SANs and other Web performance enhancing technology—both hardware and software;
- dynamic server revolution, in which static pages give way to dynamic ones created on the fly to match user requests;
- database servers and their pivotal role in Web site operations;
- major Web servers from Microsoft, Netscape, and others, plus their underlying dynamic page creation technologies like Active Server Pages, Java Server Pages, Enterprise JavaBeans, etc;
- key application servers like Lotus Domino, IBM WebSphere, BEA Enterprise Server, Oracle JDeveloper to name just a few (better still would be a discussion of the criteria and measures of performance by which a Webmaster might choose among both Web and application servers);
- and privacy and personalization, and how these mutually interact so that a solution in one area will impact the other.

In short, the book should really be entitled "Open Source Webmaster in a Nutshell" because these are the areas of major coverage. There are 70



pages on PHP, a hypertext preprocessor, 50 pages on CGI/PERL, and another 50 pages on Apache Server modules. Yet in the performance tuning section at the end of the book, the authors note "[interpreted code] and CGI execution time [are] likely to be the bottleneck under any but the lightest loads. CGIs typically take far more CPU and other resources than [any other method of] serving HTML pages." So why spend a third of the book elaborating on what is essentially obsolete technology for all but startup Web sites?

Continued on page 116

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Total entries in salary survey: **15408**
High yearly salary: US\$**132,000** per year
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(www.computerjobs.com)

MCSD-Windows 2000 (Microsoft Certified Solution Developer)

MCSD stands for Microsoft Certified Solution Developer. The Microsoft Certified Solution Developer (MCSD) credential is the premier certification for professionals who design and develop leading-edge business solutions with Microsoft development tools, technologies, platforms, and the Windows DNA architecture. The types of applications MCSDs are able to develop include desktop applications and multi-user, Web-based, N-tier, and transaction-based applications. The credential covers job tasks ranging from analyzing business requirements to maintaining solutions.

Total entries in salary survey: **15408**
High yearly salary: US \$**132,000** per year
Low yearly salary: US \$**12,000** per year
Average yearly salary: US \$**53,000** per year
(www.computerjobs.com)

Microsoft Certified Solution Provider

MCSE-Windows 2000 (Microsoft Certified Systems Engineer)

MCSE stands for Microsoft Certified Systems Engineer. MCSEs are network professionals that are qualified to efficiently plan, implement, and support business solutions with Microsoft Windows 2000 Server and Microsoft Backoffice.

Total entries in salary survey: **17233**
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Total entries in salary survey: **9300**
High yearly salary: US \$**95,000** per year
Low yearly salary: US \$**27,000** per year
Average yearly salary: US \$**57,000** per year
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Quick Tips

Excel tips and tricks

Emptying data from a cell

Place your cell pointer in a cell and press Delete to remove the cell's contents but not its formatting.

Emptying the lot!

To remove everything from a cell—it's contents, formatting and comments—select the cell and choose Edit, Clear, then All.

Borders begone!

To remove only a cell's borders use the keyboard shortcut Ctrl + Shift + _ (underscore character).

Creating a worksheet title

Type a title for your worksheet in cell A1. Select this cell and every cell to its right across the width of the spreadsheet. Click the Merge and Center button on the Formatting toolbar or choose Format, Cells, the Alignment tab, then enable the Merge Cells checkbox. Set Horizontal to Center and click OK.

Size it to fit

When a worksheet is too wide or long to print on a single sheet of paper, shrink it to fit. Choose File, Print Preview and select the Setup button, the Page tab, then select the Fit To option button and enter 1 in both boxes to reduce the worksheet size to fit a single page.

Centre the printout

To centre your worksheet on the printed

page, choose File, Print Preview, Setup button, Margins tab. Enable both the Horizontally and Vertically checkboxes before clicking OK.

Add a background image

Brighten your worksheet screen by adding a background image. Choose Format, Sheet, and Background, then choose an image from your disk. If the image is smaller than your worksheet it will be tiled to fit. A good choice of image to use is a background texture suitable for use on a Web page.

Picture charts

Add pizzazz to an Excel chart by replacing the bars with pictures. Click a bar on a regular bar or column chart, right click and choose Format Data Series, the Patterns tab, the Fill Effects button, the Picture tab, then click Select Picture. Choose an image from your disk and click OK. Click the Stack option button and click OK twice before repeating for each series in your chart.

Function help

When you need help in finding or creating a function, click the cell to contain the function and choose Insert, Function. From the dialogue box, browse the functions by category and choose the function to use. Excel makes a "best guess" about any cells to which the function refers and offers help if you need it. You can change the cells referred to by clicking the Collapse dialogue

Continued on page 116



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AMD TB 700 CPU \$950



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Excel tips and tricks

Continued from page 115

box, selecting the correct cells, then clicking the Collapse dialogue box button again. When you have built the function click OK to finish.

Play your trumpet!

This simple macro allows you to play a sound automatically when your Excel workbook opens. Open your workbook and choose Tools, Macro, then Visual Basic Editor. Select View, Project Explorer, locate the project for the current file and double click its ThisWorkbook entry to open the code window. Choose General from the left dropdown list and Declarations from the right dropdown list. Then, in the window below, type the following text as unbroken line:

```
Private Declare Function sndPlaySound Lib "winmm.dll"
Alias "sndPlaySoundA" (ByVal lpszSoundName As
String, ByVal uFlags As Long) As Long
```

From the left dropdown list select Workbook and from the right dropdown list select Open. Between the lines "Private Sub Workbook_Open()" and "End Sub" type the following text on a single line replacing the filename and path with the filename and path of the .WAV file you want to play when the file opens:

```
sound% = sndPlaySound("c:\Windows\media\The
Microsoft Sound.wav", 1)
```

Select File, then Close and Return to Microsoft Excel and save and close your Excel file. When you next open the file your sound file will play.

Weekdays only

Create a list of consecutive dates that includes only weekdays (omitting weekends dates) by entering the first date into a cell. Drag the fill handle (the plus symbol in the bottom right corner of the cell) downwards using the right-mouse button. When you release the mouse, you'll see a choice of items to fill the series with, choose Fill Weekdays.

Tracing problems

When your worksheet looks like it has an error, chances are you have a formula that is using incorrect data. Trace the problem using Excel's auditing tools by choosing Tools, Auditing, then Show Auditing Toolbar. Select the cell containing the formula you want to test. Click Trace Precedents and you'll see the

cells which contribute data to that cell are highlighted. Remove the markers by choosing the Remove Precedent Arrows button.

Excel bits and pieces

The Microsoft Web site contains a heap of handy tools, information and free downloads for Excel 2000. Find this information at <http://officeup.date.microsoft.com/welcome/excel.asp> or select Help, Office on the Web. At the very least, check the Downloads section periodically to make sure you keep your version updated with any relevant security patches. □

Helen Bradley specializes in writing hands-on tutorials. Her columns appear regularly in a number of publications in the U.S., Australia, and the U.K. She also reports on the computer industry for Australian Radio. Contact Helen at helen@helenbradley.com.

Webmaster guide falls short

Continued from page 114

Well, open source does have some effective retorts. First, Apache as a Web server (much to Microsoft's chagrin) is leading and growing in Web server market share. Open source code has the virtues of being free, very reliable and very customizable/fixable (after all, you have the source). Also, software like CGI/Perl, JavaScript or PHP is simple and easy to understand. So there is definitely an audience for this book. And what the open source Webmasters get is a most credible reference.

Although the book cannot match its client-side counterpart *Web Design in a Nutshell* by Jennifer Niederst for diagrammatic virtuosity; nonetheless the book is a good reference source for server side HTML, JavaScript, CGI/PERL, PHP, XML, HTTP, and Apache Server modules usage. In par-

ticular the book covers two topics (JavaScript and Apache Server modules) with some good sample scripts that go beyond reference and into the realm of mini tutorials. But the coverage of XML, Flash, JSP, EJB, CSS, and DOM is thin to non-existent.

The discussion of server performance tuning comes closest to meeting the need for discussion of some sort of operational topics noted above. However, I for one would steal from the 70 pages on PHP for an elaboration beyond the 15 pages devoted to server performance.

In sum, it may be a case of misnomer: as "Open Source Webmaster in a Nutshell" the book rates a 4.2 out of 5; as *Webmaster in a Nutshell* it's a 3.3 out of 5. □

Jacques Surveyer is a Web programmer and writer. He can be reached at jbsurv@inforamp.net.

Audio 'film noir' for the Web

NB—We've been seeing online movie trailers—those extended preview commercials that long ago replaced cartoons in movie theaters—for some time. So why not Webcast a trailer for a murder mystery that exists only on audiocassette? It's happening at the site dedicated to audio play *Too Dead To Swing*, written by San Francisco playwright Hal Glatzer. The play, a sort of film noir for your tape deck, is set in 1940, contains a number of swing-era songs and is performed by a full cast of Broadway actors. Glatzer says the work combines the best of both radio plays and audio books; it features the natural dialogue of radio plays, but contains about five hours of material.

<http://www.toodeadtoswing>

Say hello to the Macromedia university

NB—Macromedia and Element K, an e-learning specialist, have teamed up to launch the Macromedia University, which will serve as an online training source for mastering market-leading Macromedia products. With the launch of the new site, Macromedia says it can now provide effective online e-learning services for professional developers.

<http://macromedia.elementk.com>

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More than one way to process words

Word processors are the mainstays of document preparation, but as formatting complexities and distribution requirements rise, desktop publishing packages or Web authoring tools may better serve your needs

By Jacques Surveyer

Many reviews of word processing software now comment on how close word processing programs have come to desktop publishing (DTP) programs. I would like to advance the notion that the opposite is also true. And that, further in their favour, DTP programs provide fine format and print control that word processing programs are just not interested in yet.

What makes the matter even more interesting is that top quality DTP programs like Adobe Pagemaker 6.5 and Microsoft Publisher 2000 are now priced very competitively with Microsoft Word or Corel WordPerfect and other popular word processing programs. So this article will suggest that it's time to pack the word processor in and move on up to DTP. Given the more ambitious brochures, forms, and reports people are now producing, the new ease of use features in DTP make that crossover point closer than ever.

(It should be noted that for commercial applications like magazine or newspaper publishing, there's no substitute for a high-end DTP application like QuarkXPress or Adobe InDesign.)

In the course of this article we shall highlight Microsoft's Publisher 2000 as the DTP

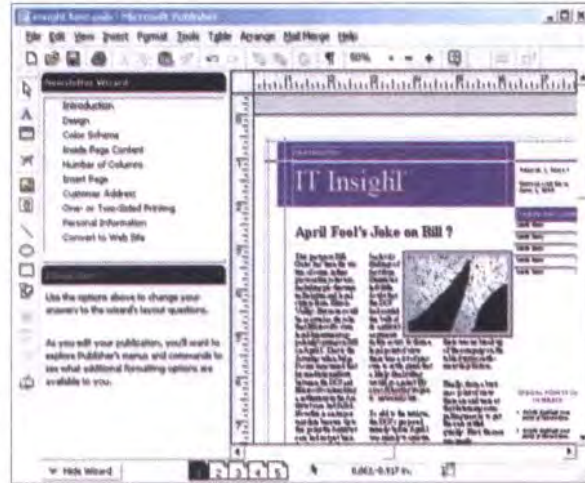
point of comparison because its unique Help and Wizard system make it the most approachable of the DTP programs. Also, I believe Publisher's improved features—though not yet offering Pagemaker's or Ventura's level of functionality—offer a wealth of solid DTP features that put it a step ahead of its word processing confreres.

As well, Publisher's street price of about \$105 is hard to beat. However, DTP advocates may very well beg to differ, especially with the very accomplished Adobe Pagemaker 6.5 selling for a street price of \$150 if you are upgrading from other DTP tools.

Comparison of features

In their book, *Mastering Office 2000: Premium Edition* (Sybex Press, 1999), authors Gini Courter and Annette Marquis ask which tool is right for the job: "Should you use Word or Publisher? The answer to that question depends largely on how comfortable you are with the tool and the design of the document you want to produce. There aren't many features available in one program that are unavailable in the other."

Table 1 shows a detailed comparison of



Creating a newsletter with Microsoft Publisher DTP software.

features common in the word processing programs Microsoft Word, Corel WordPerfect and Lotus WordPro. The DTP results are primarily taken from Microsoft Publisher 2000, Adobe Pagemaker 6.5 and Corel Ventura 7

Document creation

Having worked with word processing tools more than DTP software, I was pleasantly surprised to see all the different document types supported in most DTP software. Publisher 2000 really leads the parade, set-

ting the standard for document creation wizards. Publisher 2000 not only offers hundreds of document templates, but includes excellent previews of these documents. A series of wizards allow users to further customize the colour, layout and style of their documents.

Pagemaker, Ventura and even the word processors have similar templates, but not any that offer this level of ease and control in the very important initial design stage. Even better, as in most of the other systems, Publisher 2000 allows users to create their own templates, which can be added to the template library.

If all Microsoft software were this good, there would be less talk of bloatware and more willingness to give credit for innovation. Instead, most of Office 2000 is burdened with the pesky Help Assistant that lacks the charm of even the Aflac duck.

Conclusion: Programs are roughly equal except for macro extensibility, where word processing applications are clearly better.

Layout control

In the areas of layout control and formatting, word processors appear to be catching up to DTP with headers, footers, and text boxes that can flow into other text boxes. But just try to reposition a text box in Word or

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More than one way to process words

Continued from page 118

WordPerfect or apply precise word wrap and gutter spacing controls. Ouch! The problem with all the word processors is that the layout feature set has accreted over time rather than having been integral to the initial design.

Ventura, for example matches the ease of Lotus WordPro's property sheets (which is the best in word processing software), then tops that with accessible and customizable stylesheets and frame properties.

Similarly, in the area of formatting a document, both word processing and DTP programs allow for many different objects and images, as well as precise styling with shading, borders, spacing, bullets, and drop caps. Both DTP and word processors use context sensitive right-mouse click menus to enhance formatting specific text objects. But

badly when faced with multiple columns, paragraphs with borders/shadowing/styling options, image or frame positioning and word wraps. This is partly due to HTML and CSS styles just catching up to exacting positioning requirements. But as well, both DTP and word processing programs have yet to integrate well with the Net.

One exception might be in the area of XML and SGML output. With the notable exception of Corel WordPerfect, the DTP programs offer more XML/SGML processing options. This should change with the next revision of word processing software. But let's see how all this adds up in a practical sense.

Turning points

About four years ago, one of the other publications I write for demanded that all submissions be in HTML format. So, since then, I have written more and more of my stories using either Symantec's excellent Visual Page or Macromedia Dreamweaver Web tools.

But more often I am asked to do special reports incorporating images, calendars, project schedule charts, and many sidebar elements. I found these projects can be done in a word processor. Problems arose, though, when I came to make changes. Sometimes I needed to move whole blocks of text around—create side bars, change a style element, yet retain precise print controls. Because of that, I started switching between word processing software, using WordPro for precise frame control and switching to Word or WordPerfect for some particular layout task or printing feature such as references and expanding footers.

Pretty soon compiling my reports involved three or four programs. Yet Web page programs like Visual Page and Dreamweaver allowed me to do everything in one program. I could mix images, text, and even multimedia with precise layout control using tables and/or layers. Why is the same not possible for creating reports and brochures in word processing applications?

Then I remembered how impressed I had been with DTP programs like Ventura and Pagemaker for layout control. But still I made no move, the program cost and retraining burden in the case of Pagemaker was too high.

When reviewing Microsoft Office 2000 suite late last year, however, Publisher 2000 impressed me with its great wizards and helpful standby help. I was able to create some complex reports in Publisher 2000. At the same time, I compared notes with a colleague who was moving from Word back to Pagemaker for roughly the same reasons (the

bargain upgrade price was part of the lure).

We had come to the same conclusion: DTP was not only very usable, but also helped consolidate document assembly projects that were spilling over into too many programs. Work was getting done faster and with a lot less cussing.

So here is my rule of thumb: if it's a note or letter or memo (especially one that can be dictated) use a word processor; if it has any possibility of going on the Internet, then my

personal preference is to use Web authoring tools; but for print and especially when there are two or more graphics or charts, plus any side bars or footer/headers and any likelihood of formatting changes, then DTP programs are best. And, as you may have already surmised, my DTP program of choice is Publisher 2000. □

Jacques Surveyer is a consultant and writer, he can be reached at jbsurv@inforamp.net.

Word processing vs. Desktop publishing features

Feature	Word processor	Desktop publisher
Document types supported including starting templates or wizards		
Letter, memo, fax, resume	2-4 styles for each	Dozens of styles
Legal documents	Varies, Corel does best	Varies widely, Ventura is best
Business brochure, report	1-2 styles for each	8-12 styles, dozens of samples
Publications: Manual, thesis, directory	Most have one or two	Varies, PM & Ventura best
Other: mailing list, envelopes, web page	email, several Web page styles	Dozens including mail merge
Preview of templates	Fairly simple, Lotus does best	Good, Pub2000 is best
Wizard help to customize layout on startup	Varies, Corel does best	Varies, Pub 2000 is best

Conclusion: DTP has more/better document choices and ongoing customizing wizards

Layout Control for paper size, margins, columns, headers, footers, borders, text boxes/frames		
Frame control	Good, Lotus is best	Excellent
Insert objects like plots, org charts, images	Very good	Very good
Derived pages: ToC, indexes, references	Good	Very good
Sidebar and secondary format areas	Simple	Good, PM is best
Widows, orphans, other contingent layout	Good	Better

Conclusion: DTP as might be expected shines here, particularly for text layout control

Format options like stylesheets, themes, font control, bullets/lists, tables, dropcaps		
Ready access to formatting properties	Good, Lotus is best	Good
Ease of access and editing stylesheets	Varies,	Very good, Ventura best
Text effects: kerning, hyphenation, word art	Good	Excellent
Table functionality including calculations	Very Good	Very Good
Paragraph borders, backgrounds, shading	Good to very Good	Very Good

Conclusion: DTP again shines in the formatting area

Text Control search/replace, spell check, thesaurus, grammar check, import/export, doc statistics		
Import/Export range and ease	Very good	Good to very good
Document check for grammar, readability	Very good	Fair to Mixed
Typing aids, shortcuts, voice input	Good to very good	Fair
Collaborative review, notes, corrections	Very good	Good to very good
Check in, check out, version control	3rd party	Good or 3rd party
XML/SGML support	Mixed, Corel is best	Mixed to Good

Conclusion: Word processing really shines here as DTP often imports finished text from WP programs

Output Control like print preview, print control, email, PDF, web output		
Precise print controls	Good	Better
Database and mail merge outputs	Very good	Good to very good
Web output WYSIWYG	poor to good, very mixed	fair to good, but very mixed

Conclusion: DTP programs really shine on Output, especially printing control

Program Tools like customizable toolbars, macros, workspaces, help system, wizards		
Customizable interface, toolbars, menus	Very Good	Very Good
Help, tutorials, wizards	Consistently very good	Good to excellent, Pub2000 is best
Macros and program extensibility	Very good with VBA/LotusScript	Good to very good

Conclusion: Programs are roughly equal except for macro extensibility where word processing is clearly better.

DTP applications shine because precise text control has been their business for such a long time.

again, DTP applications shine because precise text control—including more kerning, hyphenation and special font control options—has been their business since their inception.

Through its help system and wizards, Publisher 2000 does a superb job in helping new users master some of the complicated formatting steps and processes.

Only in the arena of editing control options do word processors wrest advantage away from DTP. Word processors do a better job with convenient editing alerts like red squiggle underlines for typos, green for grammatical errors/potential mishaps, and abbreviation-like "smartfill" typing shortcuts. Also word processors were the first to tightly integrate voice dictation. Corel WordPerfect, for example, integrates Dragon Naturally Speaking, and Lotus WordPro offers IBM ViaVoice.

In addition, word processors take the lead in letting users customize their workspace layout, menus, and toolbars, but DTP programs are also innovating in this area.

Internet publishing

Neither word processing nor DTP software have done a uniformly good job of prepping output for the Internet. DTP applications tend toward the take-a-picture-of-the-page approach, while word processors stumble

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Lab Test: Hey 19!

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Future Power 19DB02

From: Future Power, Inc.

Tel: 888-818-4776. <http://www.futurepowerusa.com>

Suggested retail price: \$399



The specs:

- 18-inch viewable area.
- .26mm dot pitch.
- Shadow mask.
- Geometry controls include: pincushion, pin balance, corner pin, parallelogram, trapezoid, rotation, zoom, and moiré reduction.
- 1,600x1,200 maximum resolution (at 75 Hz).

The tests:

- Geometry integrity was very good, with any minor distortions correctible.
- OSD control has an interesting and usable layout, though sometimes the buttons are touchy: you press one of the buttons to adjust, and it shoots past the setting you want.
- The .26mm dot pitch may be on the grainy side, especially for more detailed work.
- Some moiré interference was noted, even at 1,024x768.
- Focus was generally very good up to 1,600x1,200, though the corners were blurrier, and bottom corners on our test model had a bit of discolouration. At 1,600x1,200 the focus became more generally blurry.
- Regulation on the monitor was very good to excellent, with next to no jumping noted, and only minor shifting of colour intensity.
- We found the colour of the monitor was a bit blue-shifted, but it is minor enough that most won't notice.

At lower resolutions, the Future Power 19DB02 offers a really good picture with solid regulation, although the refresh rates are a bit puzzling: the monitor is capable of 75 Hz refresh at its highest resolution, but only 85 Hz at 1,024x768 (we would have expected lower refresh at 1,600x1,200, or higher at 1,024x768, but not such a narrow band between the two

resolutions). The picture correction is reasonably extensive with this model. Demanding users who want to focus on detail-oriented work will find this monitor unsuitable, but it's perfectly good for general-purpose work, especially when you consider the price.

LG Studioworks 912U

From: LG Electronics Canada

Tel: 888-542-2623. <http://www.lge.ca>

Estimated street price: \$619



The specs:

- 18-inch viewable area.
- Shadow mask.
- .26mm dot pitch
- Short-depth design saves space on the desktop.
- Geometry controls include: pincushion, pinbalance, trapezoid, parallelogram, rotation, several different types of edge pin correction, zoom, moiré cancellation, and convergence.
- 1,600x1,200 maximum resolution (at 85 Hz).
- As with some other LG monitors, a four-port USB hub is built into the rear of this monitor.

The tests:

- OSD controls are somewhat non-intuitive.
- During regulation testing, some definite colour-intensity shifting was noted, but there was next to no picture jumping.
- Only minimal moiré interference appeared at resolutions up to 1,280x1,024, but some was introduced at 1,600x1,200.
- Small text is readable up to 1,280x1,024, and is a bit indistinct at 1,600x1,200 but can still be made out if necessary.
- Some of the specs listed for this monitor on the Web site say it is capable of 1,880x1,440 resolution, but we could not achieve that. The 1,600x1,200 resolution is listed as maximum in the manual, and it is accurate.

One of the three short-depth monitors we had a chance to look at, the Studioworks 912U is a really nice solution if you have limited space on the desktop, offering reasonable performance and the bonus of a built-in USB hub. One could

really only take issue (as we continue to do) with the fact that the USB ports are all located on the rear of the monitor, which means you have to pull everything out from the wall when you want to attach a USB device (which defeats the purpose of a short-depth monitor), or spend time fumbling around trying to plug items in sight unseen (which defeats the purpose of including the hub as a "convenience"). If you plan to plug all of your USB devices in at the beginning and just leave them all plugged, however, everything else about the monitor makes it a decent choice.

NEC AccuSync 90

From: NEC-Mitsubishi

Tel: 888-632-6487. <http://www.necmitsubishi.com>

Estimated street price: \$440



The specs:

- 18-inch viewable area.
- Shadow mask.
- .26mm dot pitch.
- Geometric correction includes pincushion, pinbalance, trapezoid, parallelogram, and rotation, as well as both horizontal and vertical moiré cancellation.
- 1,920x1,440 maximum screen resolution (at 60 Hz).

The tests:

- Screen regulation was a problem on the AccuSync 90. Though colour intensity shifting wasn't too bad, the screen jumped noticeably, which could be a serious issue if you work with rapidly changing images.
- The .26mm dot pitch is a bit grainy, and leads to a few problems: moiré was very noticeable at 1,024x768, though it lessened somewhat at 1,280x1,024, appearing again at 1,600x1,200.
- Small text was quite legible up to 1,280x1,024, and more indistinct at higher resolutions.
- Generally, 1,600x1,200 is hard on the eyes because of the dot pitch; 1,920x1,440 resolution is almost unusable for most things, as most of the detail tends to disappear into the grains.
- OSD control uses only three buttons, which is a rather elegant solution, and quite easy to use.

The AccuSync 90 is one of NEC's budget-oriented selections, and it has a nice set of features... but a few problems. The .26mm dot pitch is the biggest problem of all, causing general graininess and moiré problems, even at lower resolutions. While the monitor features moiré cancellation, this tends to roughen up the display even further. Overall, it's not your best choice if you have intensive graphic work to do, but for general use at lower resolution, it offers a fair deal of flexibility.

ProView BZ-986

From: Proview Canada

Tel: 877-964-2323. <http://www.proview.net>

Estimated street price: \$429



The specs:

- 17.9-inch viewable area.
- Shadow mask.
- Built-in microphone and speaker compatibility (not included on our test model).
- Geometry adjustment includes: pincushion, pinbalance, trapezoid, parallelogram, and rotation.
- .25mm dot pitch.
- 1,600x1,200 maximum supported resolution (at 60 Hz).

The tests:

- A single button controls the OSD, which is elegant but makes it harder to change basic settings: any changes involve a lot of pushing and spinning; separating brightness and contrast would have been more convenient.
- Colour accuracy was very good.
- Test model had some vertical stripe disruptions that are noticeable with solid colours but not so much with mixed graphics.
- There was some image distortion along the sides. Geometry correction fixed most but not all of this. At resolutions higher than 1,024x768, however, items defocus and distort.
- Some jumping was noted during testing of screen regulation, as well as black-level shifting.
- Slight defocusing around the edges of the screen at 1,024x768, but readability is still good even with

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- MS Windows98 (OEM)

Monitor glossary

Here are a few terms you may encounter in a discussion about cathode ray tube monitors.

D-Sub: The standard 15-pin monitor connector PC users have been familiar with for years. It's also sometimes known as a VGA connector, but that leads to confusion with the resolution of the display, so D-Sub it is.

BNC: Usually only found on the highest end displays, this style of connector divides the signal up into five separate circular connectors.

DVI: Stands for digital video interface, which is set to become the new standard. It provides a purely digital signal for TFT flat-panel displays, but is also being incorporated on some new CRT displays. We received no DVI-capable monitors this month, but keep your eyes open, as they're bound to start trickling into stores in the very near future.

Viewable area: When we refer to a 19-inch CRT display, we're actually referring to the diagonal measurement of the front of the entire tube. There is a certain section of this space that is unsuitable for display, and a certain amount that is covered by the plastic casing (you have to hold the monitor in somehow). What's left is the viewable area of the monitor. In general, the difference is about an inch, meaning all 19-inch CRT monitors have a viewable area of approximately 18 inches.

Dot pitch: This is a measurement, usually in millimeters, of the distance between two like-coloured phosphor dots of the CRT tube. The lower the number is, the closer the dots are to each other and the smoother the display should look. Often, manufacturers provide dot pitch measurements for vertical, horizontal and diagonal; we have chosen the diagonal measurement for each monitor, as it is the standard measurement.

Shadow mask: This is one of the two main methods of getting the electron beams for each colour to hit the correct phosphor dots on the inside of the screen. With this type of tube, beams shine through a perforated plate, often made of a material called Invar, towards the phosphor patches. Shadow mask pictures tend to be very crisp, but the colours not as intense as aperture grille monitors.

Aperture grille: This is the other main method of aligning beams to phosphors. With aperture grille, a series of guide wires running along the side of the tube are used to align the beams. This method produces richer colours, but has an unfortunate side-effect: two restraining wires are necessary to hold the other wires in position, leaving two distinct horizontal lines running across the screen (one near the top and one near the bottom). Some users find this "signature" annoying, though many quickly get used to it.

Screen regulation: This refers to how stable the picture is when dramatic changes happen on-screen. One of the tests in our display suite features a flashing white square on a black background, with a thin white line running around the edge of the screen. On a well-regulated display, this thin line should remain rock-solid, though it often jumps around. Another regulation test involved colour intensity: when a white square flashes next to a number of different shades of grey approaching black, often the colouration of the grey squares changes quite noticeably, either from bad regulation or internal glare.

Power consumption: Measured in watts, this is an indication of how much power the monitor draws when turned on. The higher the rating, the more power it will suck back.

Moiré interference: When you try to display very fine graphics on a row of phosphors, sometimes the numbers won't add up, and you'll get dropouts (if you're trying to display 100 discrete graphic items across 84 phosphors, some will go missing). These appear on the screen as a series of curved lines, but generally only in finely detailed items. Moiré patterns are more common on monitors with higher dot pitch.

Corner focus: This is just what it sounds like—how well the monitor can focus in the corners of the screen. This is an issue because colour beams are shot from the centre of the back of the tube. Because they have to travel farther to reach the corners of the screen, the beams are consequently more susceptible to defocusing or deformation in these extremities.

—Sean Carruthers

Digital controls for the birds

Over the last few years, monitor manufacturers have been adding a lot of digital controls to correct the geometrical aspects of the picture. It's been our experience over that same period that the more of these controls that are added, the more out-of-whack the picture tends to be when the monitor comes out of the box. It's almost as if the correction options themselves are causing the problems: you have so much control over the geometric shape of the picture that you can distort it so horribly that it can take you hours to get it back into shape.

A lot of this is probably simple economics in that it's likely cheaper to ship slightly imperfect tubes with a full range of digital correction options than it would be to ship perfect tubes every time. Undoubtedly, much of it has to do with the increasing size of the displays, as well, and the greater distances the beams have to travel to hit the screen.

Even recognizing that there are variables that make such digital correction necessary, we pine for the days when each monitor had a few simple analogue wheels under the bezel: contrast, brightness, vertical and horizontal size, and vertical and horizontal phase. Almost everyone we've asked that had one of those monitors rarely had problems with geometry or edge distortion.

We'd like to hear your thoughts on digital geometry in new monitors: is it indispensable, or do you too pine for the good old days? Let us know, at letters@tcp.ca.

—Sean Carruthers

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Cascading Style Sheets explained

By Jacques Surveyer

The Web has revolutionized access to information, giving way to the five As of the Internet—anybody authorized, anytime, anywhere, on any device. Internet designers and Web developers have also benefited because documents have become better defined for the purposes of transmitting them more efficiently and effectively over the Web.

The Web breaks information in a document into four categories. Structure tells how the document is organized and laid out.

Metadata provides information about the document itself (author, date of issue, date of last revision, word count, subjects treated, etc.). Styling provides the detailed layout and formatting instructions for data on output. Data or contents is the actual information to be conveyed.

Core CSS

Author: Keith Schengili-Roberts
From: Prentice Hall
Includes CD-ROM 635 pages 2000
ISBN: 0-13-083456-4
Price: \$60
Overview: State-of-the-art review of Cascading Style Sheets—CSS1 and CSS2.
Style: Excellent use of examples and screenshots to illustrate formatting and layout control possible using CSS in HTML.
Summary: Excellent review of Cascading Style Sheets from the formatting orientation of CSS1 (also the safest

to use) to the broader layout tricks of CSS2.
Overall Rating: 4.5 out of 5

Cascading Style Sheets, as the phrase implies, were designed to accomplish task three—styling or formatting HTML and other Web documents especially for output to the Web, print and now any device. To an extent, CSS overlaps with HTML and XSL (stylesheets for XML).

The overlap with HTML is because many HTML tags carry not just structural information but also styling information as well.

For example, in the following section of HTML code, the <p> tag conveys not just the paragraph structure and data content but also styling instructions in align="center":

```
<p align="center"><b>Figure 1 - Hidden Luster in Microsoft.NET</b></p>
```

However, Cascading Style Sheets are designed to do a more effective job of formatting and styling. In effect, as Keith Schengili-Roberts argues and demonstrates in *Core CSS*, Cascading Style Sheets provide a more succinct and effective way to format HTML documents. (*TCP* readers may recognize Schengili-Roberts as the author of the hugely popular "Weaving your own Web site" series that ran in this magazine every month for more than four years.)

It is important to point out how well organized and formatted this book is.

First, the preface truly tells prospective readers with different interests and competencies how to approach *Core CSS* for maximum individual benefit. Second, the book is organized into three parts: Overview, which describes CSS and how it works; CSS1, which is a detailed account of the base syntax; and CSS2, which describes the advanced features of CSS. This progression likely follows many individual readers' needs and interests. Third, the use of dozens of examples of CSS properties and stylesheets, including browser screen shots, make understanding how exactly they work much simpler. Fourth, right smack in the middle of the book (almost as if on cue, since this reviewer was muttering in his mind, "this book needs an overview of CSS status among the browsers") is a colour table showing most of the CSS properties and how they have been implemented in the current browsers (Microsoft Internet Explorer 5.0, Netscape Mozilla test browser, Opera 3.62). This chart is a great overview with green blocks showing the safe properties, yellow the partial implementations, and red blocks showing the problems—incomplete or incompatible.

But to give you an example of how fast things are moving on the Web, these browser results are superseded by new versions—IE 5.5, Netscape 6.0 beta 2, and Opera 4.0.

And this may be the overall problem with CSS. Its time may have come and

gone. XML in the form of XHTML may form the core of the next generation of browser technologies.

In addition, XML is the current darling technology of the Internet set, and this now includes such strange bedfellows as IBM, Microsoft, Oracle, and Sun among others. And Microsoft raised a few eyebrows by not fully implementing CSS in its recently introduced Internet Explorer 5.5, reneging on a three-year-old commitment and throwing its full weight behind XML in its Microsoft.NET announcement. Perhaps this signals a general shift to XML. If that is true, XSL, not CSS may become the formatting and styling "language" of the Web.

However, as Schengili-Roberts so ably shows, there is a core set of CSS that is implemented across the board in all the browsers. And they make formatting a lot easier.

Even the major Web development tools like Adobe GoLive and Macromedia Dreamweaver are using these CSS elements in their templates, toolboxes and wizards.

So Web designers wanting to come up to date with CSS in all its details will find *Core CSS* not only comprehensive but also quite approachable in revealing all the styling possible with Cascading Style Sheets. □

Jacques Surveyer is a Web developer and mentor. He can be reached at jbsurv@inforamp.net.

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Writers groups file lawsuits against electronic archivists

NEW YORK—An issue that has been bugging freelance writers for years—electronic reprints of work for which they receive no additional payments—is translating into a spate of lawsuits against some of the industry’s largest archivers of content originally found in newspapers, magazines and scholarly publications.

At issue are works for which the original authors sold only the initial rights and maintain copyright themselves. Unlike staff writers—whose output is typically seen as work-for-hire and the property of their publishers—freelancers often sell one-time publishing rights to their work. And, frequently, work is sold without any formal agreements being signed by publishers and writers.

Two lawsuits announced in August aim to reclaim revenue for such freelancers whose work has been resold by companies responsible for major electronic databases, including Bell & Howell, Dialog, Reed Elsevier, Dow Jones Reuters Interactive, and Thomson Corp., which is based in Canada. In both cases, the lawyers behind

the suits are aiming to begin class actions that could involve any author whose copyrighted works appear in the companies’ databases.

In a precedent-setting case in late 1999 involving a number of writers whose work had appeared in such publications as the *New York Times*, *Atlantic Monthly*, and *Newsday*, the U.S. Court of Appeals upheld the notion that copyright holders should be paid for electronic repurposing of their works.

The court backed the argument that freelancers retain the copyright for their work unless they specifically sign it away.

Shortly after that ruling, lawyers for the UnCover Company, a unit of bibliographic database company CARL Corp., were inspired to settle a lawsuit launched by freelancers as long ago as October 1997. The eventual settlement in that case could see CARL—which has since sold the company to U.K.-based Ingenta PLC—pay out as much as US\$7.5 million and begin a search for what could be thousands of authors, poets and other academic and

creative writers who may have had their works sold by UnCover in the past.

Not long after the UnCover settlement was inked in July, Contentville (<http://www.contentville.com>), a newly launched aggregator of electronic books and periodicals, moved quickly to avoid a lawsuit altogether by working a deal with the National Writers Union (<http://www.nwu.org/>) that will implement a system for identifying authors who should be paid fees when their work is resold online.

The Contentville agreement will make use of the union’s Publications Rights Clearinghouse (PRC) to verify and pay royalties to those writers when their work is sold on Contentville.

Of the two lawsuits announced, one filed in New York is backed by the Author’s Guild, an organization which manages its own Authors Registry (<http://www.authorsregistry.org/>), which has served as a clearing house for royalty payments (though mostly for offline reprints) since 1996.

The second suit was filed in San Francisco by a group that includes the estate of Jessica Mitford, author of *The American Way of Death*.

Dwight Mater, vice-president of business development for Bell & Howell—which, along with Thomson Corp., was named in both suits—said that his company hadn’t yet been served with the court documents and so was unaware of the details of the complaints.

However, he said, “we have been in the business of republishing content for several decades—starting with microfilm and descriptions of newspapers and periodicals. And, in all of those years, we have always been very mindful of copyright laws and abided by all of the law and expect to continue to do so.”

Mater said the Internet makes a difference “in terms of delivery mechanisms and how people can conduct research, but in terms of being respectful of publishers’ and authors’ rights, online doesn’t change anything for us.”

—Newsbytes

Your very own candid camera

Continued from page 96

old for a PCI slot, it might be too slow to take real advantage of video anyway.

There are Webcams that plug into a parallel printer port. These are easier than PCI plug-ins, but can still cause troubles for “pass-through” signals—such as to your printer—and can require plugging a second cable into the keyboard socket. The easiest Webcams to install are those that plug into a USB port. These ports are found in most Windows PCs built within the last few years, and in iMacs and other new Apple systems.

Portable computers can also be outfitted with a Webcam, through their parallel or USB ports, or through their portable PC Card slot. If that slot supports Zoomed Video you’ll get better results. Indeed, both USB and Zoomed Video PC Card Webcams outperform their PCI and parallel cousins with faster reaction time, meaning smoother and more realistic video images.

What else is important in a Webcam? Naturally, you have to look for software compatibility. The Webcam will be useful only if it has “drivers” for your computer, whatever its version of the Windows or Mac operating system. Easy-to-use programs for on-screen viewing and recording to the hard

disk for both still images and video sequences are also important. Software to edit these digital images is nice, but not crucial.

Videoconferencing software lets you communicate with this new technology. Microsoft’s NetMeeting is a clear leader for Windows, but there is no standard yet. In hardware, you’ll want a long, flexible cable leading to the Webcam and a stable stand so you can place and orient it in any way. I’ve wrestled some Webcams into a position only to watch them slump or wriggle back to a misfiring position as the stand and cable fight against me.

Choice of views

In selecting your Webcam, you’ll also want one with a choice of viewing angles, from narrow to wide. You’ll want simple controls for focus and brightness, with a lens cover for protection when not in use. A shutter button so you can capture images without using software controls is sometimes handy, turning your Webcam into a tethered digital camera.

A built-in microphone is useful if you intend to videoconference, or just want sound with your images. This is rarely vital, though, because most computers now come with a microphone, but it can make setup

easier.

The number of frames per second (fps), is a very important specification. Moving images are made out of a quick succession of still images. The more stills, or “frames,” per second, the smoother the motion. With fps, 15 is a bare minimum, 30 is good, and 40 is great. Don’t expect to always get those rates in practice, though. They’re like gas mileage estimates for cars: higher than in the real world. That maximum fps rate will typically only work for the smallest video window on screen, about half the size of a credit card. If you want to see a larger window, the fps rate falls.

The resolution—or number of “pixel” image bits shown in the window—is worth examining as well. Higher resolution is better: 176x144 is too low, 320x240 is decent, 640x480 is good, and 1,280x960 is great. Make sure the resolution you’re quoted is for the video or moving image, not the still or captured image. The still-image resolution of a Webcam is typically four times—twice the vertical and twice the horizontal—of the moving video resolution. And don’t expect that top resolution to happen at the top frame rate. Your Webcam may manage only 6 fps when set to highest resolution.

Finally, no matter what the fps and resolution, you’ll want a good image. This starts

with a solid, clear, focused, non-grainy, properly coloured still image that can then quickly react to and catch any motion or changes in lighting without blurring or ghosting. If you can’t get a look at your potential Webcam in action, make sure to get a money-back guarantee so you can test it with your own system.

Webcams

Some examples of Webcams and pricing currently available. Note that all of these kits include a range software for activities such as videoconferencing, still image and video editing, and entertainment.

Video Blaster WebCam Go Plus

From: Creative Labs
<http://www.creative.com>
Street price: US\$149.99

X-Cam2 with XRay Vision Kit

From: X10.com
<http://www.x10.com>
Street price: US\$129.99

Intel PC Camera Pro Pack

From: Intel
<http://www.intel.com>
Street price: US\$130

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It ain't bragging if you can do it

High-tech companies have their ups and downs. The true measure of success is whether, after a down, they can get up again. Compaq has. Corel hasn't.



Jeff Evans

Corel Corp. founder, Michael Cowpland, stepped down as chief executive officer and president of the Ottawa-based software company in August, capping the almost continuous decline of the company under his leadership over the past four years. His departure was overdue. After years of failed Corel initiatives in corporate office software, consumer CD-ROM publishing, and Java, Cowpland had bet the farm again, this

strategy. However, he was sacked by the board of directors led by chairman Ben Rosen in time for the company to be rescued and resume growth.

Canion's successor, Eckhard Pfeiffer, after a successful run as Compaq's head through much of the '90s, became embroiled in head office power struggles to the detriment of the company's performance, at a time when the market was again changing suddenly due to the Internet and the challenge from Dell Computer. He too was promptly let go by Rosen, and the current chief executive officer, Michael Capellas, stepped into the top job.

Capellas has focused on finishing the integration of the Digital and Tandem product lines into Compaq, and has driven the company to reshape itself to exploit the opportunities of a trillion dollar Internet and a "billion connected devices" market over the next five years.

After several bad quarters, Compaq has returned to growth. In its most recent quarter, the company reported worldwide quarterly revenue of US\$10.1 billion (a "run-rate" of more than US\$40 billion per year), and an increase in quarterly operating profits of US\$828 million over a year earlier.

Compaq also appears to have accurately focused on the main business opportunities in the real-world computer market, and it is delivering products that customers, ranging from Fortune 500 companies to families, actually want. "Simply stated: delivering better technology matters," according to Capellas. The company's nonstop enterprise servers, Proliant small servers, and Deskpro business PCs are all winners in the corporate market. In the consumer PC arena, Compaq has declared that it will only compete in product categories where



Compaq has a clear road map for its future... products designed to dominate the Net

it can make a profit, leaving the "sub-\$500" PC market to other players.

By contrast, Corel's current technology lineup is not nearly as impressive. Adobe Systems scooped up most of CorelDraw's professional user base during the years when Cowpland's attention was fixed on imaginary quick buck schemes like Java. Many of the other product lines that diverted Corel's attention from its core graphics software have been sold off for a pittance.

What remains other than Corel Linux, ironically, are two very old brands: CorelDraw, and the WordPerfect Office suite. Neither is a market leader anymore, but both still have millions of loyal users, and could be the basis for rebuilding the company under new management.

What Corel has to do, and quickly, is to devise a strategy for earning a place in the future of computing, and deliver better technology than its competitors.

Compaq has a clear road map for its future. It sees the Internet as the bedrock of the information technology industry, and it has products designed to dominate the entire infrastructure of the Net, from mainframes at the centre of the Net, to small, scalable servers at the edge of the Net, to end users' Internet devices of all descrip-

tions—from PCs to handhelds.

Compaq has plenty of tough competitors but in addition to developing products in-house, the company is forming alliances to bring it the best technology for the Internet age from whatever source. For instance, Compaq has announced that in addition to its home-grown Pocket PC handhelds, it is partnering with Canada's Research In Motion (RIM) company to offer the RIM BlackBerry 957 in the U.S.

The BlackBerry 957 competes in some areas with Compaq's own handhelds, but the BlackBerry currently is the best wireless Internet handheld solution on the market. RIM itself has spent 10 years getting to the point where it seems poised for takeoff, and it remains to be seen if it can manage the transition to the big time.

For Compaq, however, a key to its continued survival seems to be that its executives can never rest on past successes.

Unlike Cowpland, these top executives know that their performance is constantly being judged, and that they cannot ever afford to lose touch with the pulse of the market. □

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Lab Test: Hey 19!

Continued from page 120

- small text.
- Moiré interference noticeable on fine graphics, but was not enough to interfere with the picture, even at 1,600x1,200.

The ProView monitor reviewed this month is a fairly basic model with generally good visual reproduction at all but the very highest resolution, where it isn't quite as good. Demanding users who want to do fine detail work with graphics may not find this an adequate solution, but those who want a monitor for general purpose work will find it an economical solution.

Sceptre DragonEye D98A

From: Sceptre Computer
Tel: 800-788-2878. <http://www.sceptre.com>
Estimated street price: \$450



- The specs:
- 18-inch viewable area.
 - Shadow mask.
 - .26mm dot pitch.

- Geometry controls include pincushion, pinbalance, parallelogram, trapezoid, rotation, and both horizontal and vertical convergence.
 - 1,600x1,200 maximum resolution.
 - Three-year warranty.
- The tests:
- Neither the contrast or brightness controls were very responsive, which is typical on Sceptre monitors. Those looking for wide variation may be disappointed.
 - Some moiré interference appeared in fine graphics at lower resolutions, but was generally minimal past 1,024x768.
 - Geometry was generally very good, though there was distortion around the edges of the screen.
 - Screen regulation showed no jumping, but colour intensity varied noticeably, and was especially severe with the subtle differences between dark shades.
 - Small text (below 10 pixels) becomes a bit indistinct at 1,280x1,024, though it can still be made out.

The DragonEye D98A is a quirky beast: the monitor did not play well with our GeForce2 card—during testing, the monitor indicated a refresh rate of only 85 Hz even when Windows indicated a higher value, and display size maxed out at only 1,152x864. Even when we switched to a different manufacturer's GeForce2 card, the refresh problem persisted. And though we were able to get the screen up to 1,280x1,024, the picture quality was very poor.

We were able to trick the monitor into working by setting up the resolution/refresh combination with a different monitor, then switching to the Sceptre without rebooting—obviously not all users will have this option. After

tricking the monitor to work with the GeForce2, the D98A provided one of the nicest 1,600x1,200 pictures in our roundup, with good solid lines and a minimum of moiré interference, even though very small text tends to be hard to read at this resolution.

The monitor's refusal to work within specs while hooked up to a GeForce2 card is a pretty serious problem, however. Hopefully a driver tweak will be made available to fix this, but until then GeForce2 users may want to stay away. The monitor did appear to work just fine with other video cards, including the ATI Rage 128.

Tatung C9R

From: Tatung Co. of Canada Inc.
Tel: 800-827-2850. <http://www.tatungca.com>
Suggested retail price: \$465



- The specs:
- 17.9-inch viewable area.
 - Shadow mask.
 - .25mm dot pitch.
 - Geometrical correction includes pincushion, pinbalance, trapezoid, parallelogram, and rotation.
 - 1,600x1,200 maximum resolution (at 75 Hz).
- The tests:
- During regulation testing only minimal shifts in colour intensity were noted (mostly owing to internal glare), and virtually no jumping.
 - Very little moiré interference was noted at any of the tested resolutions.
 - Small text became slightly indistinct at 1,280x1,024 and beyond, and focus was a bit off in general at 1,600x1,200, which made the resolution not so usable for most applications.
 - Geometrical integrity was excellent at all tested resolutions.

Although 1,600x1,200 mode wasn't overly usable on our test model, everything below that was very good, with excellent geometrical integrity and next to no moiré in any of the resolutions. Anyone who feels most comfortable at

1,280x1,024 or lower resolutions should find this monitor more than adequate (even a more professional user on a budget).

TTX Medallion 8997

From: TTX Canada
Tel: 888-843-9889. <http://www.ttx.ca>
Estimated street price: \$499



- The specs:
- 18-inch viewable area.
 - Shadow mask.
 - .25mm dot pitch.
 - Short-length design saves space on the desktop.
 - Geometrical adjustment includes: pincushion, pinbalance, corner pin, trapezoid, parallelogram, rotation, moiré correction, linearity (changes distribution of lines from top to bottom) and purity.
 - 1,920x1,440 maximum resolution (at 60 Hz).
 - Also offers USB control of the OSD.
- The tests:
- Although the buttons themselves are straightforward, the on-screen icons are arranged in a horseshoe configuration around the outside of a box, which is less than intuitive and often leads you to move left when you wanted to move right.
 - The monitor offers a lot of ways to adjust the geometry, which became necessary during our tests: the picture was a bit deformed out of the box, but we were able to whip it into decent shape.
 - During regulation testing, some colour intensity shifting was noted, but virtually no jumping.
 - There was some moiré interference noted at 1,024x768, though this eased off at 1,280x1,024.
 - Geometry was generally good, though there was a bit of horizontal stretching at the edges of the screen.
 - Small text became a bit indistinct beyond 1,024x768.

The TTX Medallion is one of the few short-length monitors we saw this month, which is a welcome feature when desktop space is tight.

While the screen required quite a bit of tweaking to get it into shape, the bottom line is that this monitor provided

Continued on page 133

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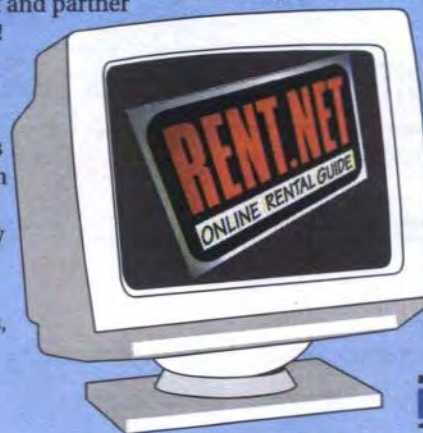
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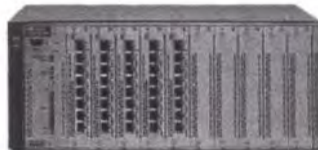
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Lab Test: Hey 19!

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decent performance all around, and would make a great all-purpose monitor for those whose needs aren't overly demanding.

ViewSonic E790

From: ViewSonic Corporation
Tel: 800-888-8583. <http://www.viewsonic.com>
Suggested retail price: \$609



The specs:

- 18-inch viewable area.
- 26mm dot pitch.
- Shadow mask.
- Geometrical correction includes pincushion, pinbalance, corner pin, trapezoid, parallelogram, rotation, moiré reduction, zoom, and convergence.
- 1,600x1,200 maximum resolution (at 75 Hz).

The tests:

- OSD options are clearly labeled and generally easy to use throughout.
- During regulation testing colour intensity shifted somewhat (owing mostly to internal glare), but jumping was next to non-existent.
- Moiré interference was somewhat noticeable at 1,024x768 and 1,600x1,200, though it eased off at 1,280x1,024.
- Small text was easy to read all the way up to 1,600x1,200, at which point it became a bit indistinct.
- Geometrical integrity and corner focus was excellent through all tested resolutions.

The E790 is a perfect example of why many people prefer ViewSonic: it had excellent picture quality at all the resolutions we tested, with moiré interference creeping in only occasionally.

This is one of the newer models in ViewSonic's value-oriented E2 series, but it's bound to appeal to more general users as well as professionals on a budget.

A short-depth version, the GS790, is also available with similar performance and specifications, and offers the same quality to those who have limited desktop space... for a higher price, of course (it has a suggested retail of \$709).

Editor's choice



ViewSonic E790

Although it costs more than some of the other

models we looked at, it's really hard to argue with the performance of the E790: excellent picture, good geometric correction options, and general flexibility.

With an estimated street price of \$539 (compared to the suggested retail price of \$609), it's not actually that far out of the running, price-wise, either.

Expanded coverage

For this TCP Test Lab Report we also tested eight flat-screen CRT monitors. (Not to be confused with flat-panel LCD monitors, flat-screen CRTs use a tube

design but with a flat monitor face, which helps eliminate geometric distortion.)

These included the KDS Avitron AV-195TF, LaCie Electron 19 Blue, LG Flatron 915FT Plus, Mitsubishi Diamond Plus 91 Natural Flat, NEC MultiSync FE-950, Samsung SyncMaster 955DF, Tatung F9F and ViewSonic PF790.

Space limitations prevent us from including that portion of the report in print. The report can be found on *The Computer Paper's* Web site: <http://www.canadacomputes.com>.

Free Java-based grasshopper software

NB-IKV is a Berlin-based software house that is offering a free download of its Java-based mobile agent platform. Known as Grasshopper, the software, which can run under most Windows environments, including CE, comes with free manuals. Mobile agents are dynamic software processes with the ability to move between different systems on their own accord in order to execute the tasks assigned to them.

<http://www.grasshopper.de>

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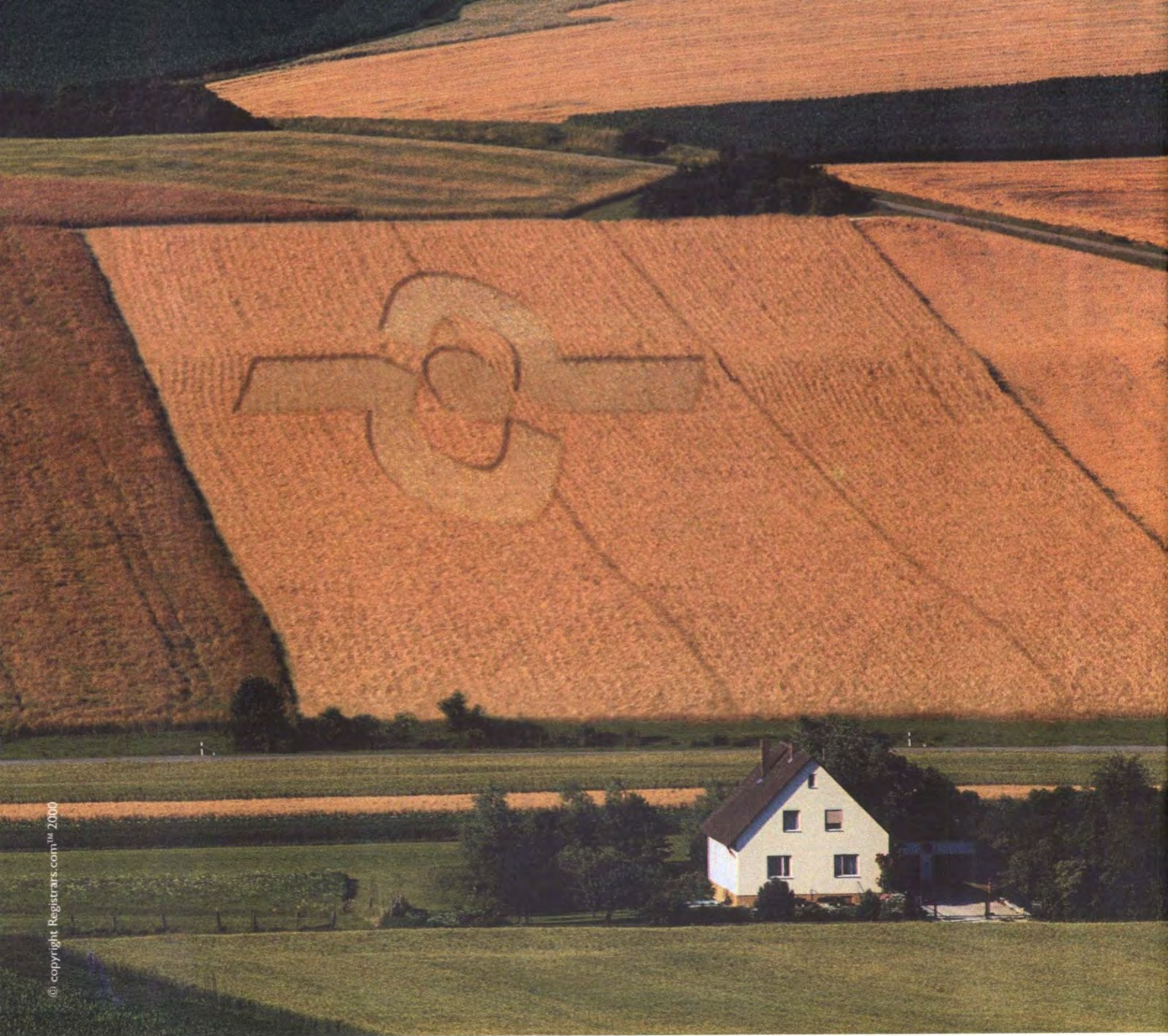
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